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(56)參考文獻：

WO 2012/158948A1 WO 2016/196740A1

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(54)名稱

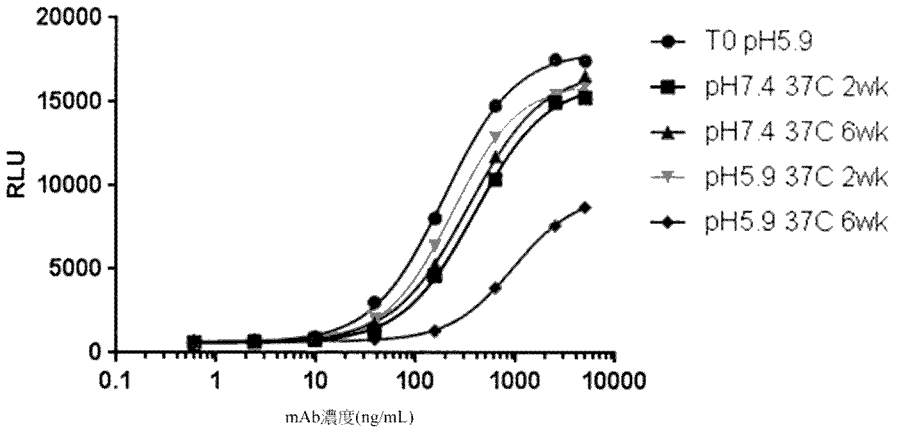
靶向 HIV GP120 之抗體及使用方法

(57)摘要

本發明揭示結合至 HIV gp120 且中和 HIV 之抗體。亦揭示使用該等抗體單獨或與其他治療劑組合以治療或預防 HIV 感染的方法。

Antibodies that bind to HIV gp120 and neutralize HIV are disclosed. Also disclosed are methods of using such antibodies alone or in combination with other therapeutic agents to treat or prevent HIV infection.

指定代表圖：


20000
15000
10000
5000
0
RLU
0.1
1
10
100
1000
10000
mAb濃度(ng/mL)
T0 pH5.9
pH7.4 37C 2wk
pH7.4 37C 6wk
pH5.9 37C 2wk
pH5.9 37C 6wk

【圖1】

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【發明摘要】

【中文發明名稱】

靶向HIV GP120之抗體及使用方法

【英文發明名稱】

ANTIBODIES THAT TARGET HIV GP120 AND METHODS OF USE

【中文】

本發明揭示結合至HIV gp120且中和HIV之抗體。亦揭示使用該等抗體單獨或與其他治療劑組合以治療或預防HIV感染的方法。

【英文】

Antibodies that bind to HIV gp120 and neutralize HIV are disclosed. Also disclosed are methods of using such antibodies alone or in combination with other therapeutic agents to treat or prevent HIV infection.

【指定代表圖】

圖1

【代表圖之符號簡單說明】

無

【發明說明書】

【中文發明名稱】

靶向HIV GP120之抗體及使用方法

【英文發明名稱】

ANTIBODIES THAT TARGET HIV GP120 AND METHODS OF USE

【技術領域】

【0001】 本揭示內容係關於用於治療及/或預防人類免疫缺陷病毒(HIV)感染之抗體及其抗原結合片段。

【先前技術】

【0002】 人類免疫缺陷病毒(HIV)感染及相關疾病係世界範圍內之嚴重公共健康問題。最近批准之HIV感染療法靶向病毒反轉錄酶、蛋白酶及整合酶。但HIV對該等現存藥物之抗性、長期毒性及缺乏患者對每日投藥方案之順從性與該等療法相關。因此，重要的是發現並研發具有適於治療用途之有利性質的新抗HIV抗體。

【0003】 WO 2012/158948闡述源自HIV感染之供體之記憶B細胞的人類抗HIV抗體，其能抑制由來自複數個分支之HIV-1物種感染。抗HIV抗體亦揭示於(例如) WO 2005/058963、WO 2013/090644、WO 2014/063059及EP 0690132B1中。抗體之治療用途因其患者內病毒覆蓋、藥物動力學、多特異性及其他性質而受限。因此，需要用於治療用途之新穎抗HIV抗體。

【發明內容】

【0004】 本發明提供用於治療或預防HIV之組合物。更特定而言，本文提供結合人類免疫缺陷病毒(HIV)包膜(Env)醣蛋白gp120

(gp120)之抗體。本揭示內容提供抗HIV抗體及其抗原結合片段(包括廣泛中和抗HIV抗體及其抗原結合片段)、含有該等抗體及其片段之醫藥組合物及使用該等抗體及其片段治療及預防HIV感染之方法。

【0005】 在一態樣中，本揭示內容提供結合至人類免疫缺陷病毒-1 (HIV-1)包膜醣蛋白gp120之抗體或其抗原結合片段。抗體或其抗原結合片段包括包含VH互補決定區(CDR)之重鏈可變區(VH)及包含VL CDR之輕鏈可變區(VL)。在一些實施例中，VH CDR及VL CDR具有以下中所述之序列：分別地SEQ ID NO.: 137、138、139、140、141及142；分別地SEQ ID NO.: 159、138、139、140、141及142；分別地SEQ ID NO.: 137、160、139、140、141及142；分別地SEQ ID NO.: 137、161、139、140、141及142；分別地SEQ ID NO.: 137、162、139、140、141及142；分別地SEQ ID NO.: 137、163、139、140、141及142；分別地SEQ ID NO.: 137、138、164、140、141及142；分別地SEQ ID NO.: 159、138、164、140、141及142；分別地SEQ ID NO.: 137、138、139、140、165及142；分別地SEQ ID NO.: 137、138、139、140、166及142；分別地SEQ ID NO.: 137、138、139、140、167及142；分別地SEQ ID NO.: 137、138、139、140、168及142；分別地SEQ ID NO.: 137、138、154、140、141及142，或分別地SEQ ID NO.: 137、138、139、570、141及142。在一些情形下，抗體或其抗原結合片段在VH之框架區3 (FR3)中在對應於74a、74b、74c及74d之位置(Kabat編號)包含SEQ ID NO: 453或SEQ ID NO: 627中所述之胺基酸序列。在一些中，VH CDR及VL CDR分別具有以下中所述之序列：SEQ ID NO.: 137、138、139、140、141及142，其中抗體或其抗原結合片段在VH之框架區3 (FR3)中在對應於74a、74b、74c及

74d之位置(Kabat編號)包含SEQ ID NO: 627中所述之胺基酸序列。在一些情形下，抗體或其抗原結合片段包括包含以下胺基酸序列之VH之FR3 ： RVSLTRHASWDFDTFSFYMDLKALRSDDTAVYFCAR (SEQ ID NO: 628)或RVSLTRHASFDFDTFSFYMDLKALRSDDTAVYFCAR (SEQ ID NO: 629)。在某些實施例中，抗體或其抗原結合片段包括包含以下胺基酸序列之VH之FR3：RVSLTRHASFDFDTFSFYMDLKALRSDDTAVYFCAR (SEQ ID NO: 629)。在一些中，VH CDR及VL CDR分別具有以下中所述之序列：SEQ ID NO.: 137、138、139、140、141及142，其中抗體或其抗原結合片段包括包含以下胺基酸序列之VH之FR3：RVSLTRHASFDFDTFSFYMDLKALRSDDTAVYFCAR (SEQ ID NO: 629)。

【0006】 在另一態樣中，VH CDR及VL CDR具有以下中所述之序列：分別地SEQ ID NO.: 137、138、139、140、141及142；或分別地SEQ ID NO.: 153、138、139、140、141及142。在某些情形下，此抗體之VH具有以下中之一或多者：在3位之組胺酸、在5位之絲胺酸、在72位之麩醯胺酸、在76位之酪胺酸、在82c位之纈胺酸、在89位之異白胺酸(位置根據Kabat編號)。在某些情形下，此抗體之VL具有以下中之一或多者：在14位之精胺酸、在60位之丙胺酸、在83位之纈胺酸及在98位之異白胺酸(位置根據Kabat編號)。在一些情形下，抗體或其抗原結合片段在VH之框架區3 (FR3)中在對應於74a、74b、74c及74d之位置(Kabat編號)包含SEQ ID NO: 453或SEQ ID NO: 627中所述之胺基酸序列。在一些情形下，抗體或其抗原結合片段包括包含以下胺基酸序列之VH之FR3：

RVSLTRHASWDFDTFSFYMDLKALRSDDTAVYFCAR (SEQ ID NO: 628) 或 RVSLTRHASFDFDTFSFYMDLKALRSDDTAVYFCAR (SEQ ID NO: 629)。在某些實施例中，抗體或其抗原結合片段包括包含以下胺基酸序列之VH之FR3：RVSLTRHASFDFDTFSFYMDLKALRSDDTAVYFCAR (SEQ ID NO: 629)。在某些實施例中，抗體或其抗原結合片段包含具有以下中所述之序列之VH CDR及VL CDR：分別地SEQ ID NO.: 137、138、139、140、141及142，且在VH之框架區3 (FR3)中在對應於74a、74b、74c及74d之位置(Kabat編號)包含SEQ ID NO: 627中所述之胺基酸序列。在某些實施例中，抗體或其抗原結合片段包含具有以下中所述之序列之VH CDR及VL CDR：分別地SEQ ID NO.: 137、138、139、140、141及142，且包括包含以下胺基酸序列之VH之FR3：RVSLTRHASFDFDTFSFYMDLKALRSDDTAVYFCAR (SEQ ID NO: 629)。在某些實施例中，抗體或其抗原結合片段包含具有以下中所述之序列之VH CDR及VL CDR：分別地SEQ ID NO.: 137、138、139、140、141及142，且包括包含以下胺基酸序列之VH之FR3：RVSLTRHASFDFDTFSFYMDLKALRSDDTAVYFCAR (SEQ ID NO: 629)，且包括包含SEQ ID NO: 278中所述之胺基酸序列之VL。在某些實施例中，抗體或其抗原結合片段包含具有以下中所述之序列之VH CDR及VL CDR：分別地SEQ ID NO.: 137、138、139、140、141及142，且包含與SEQ ID NO: 477中所述之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、例如100%一致性的VH及與SEQ ID NO: 278中所述之胺基酸序列具有至少80%、至少

85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、例如100%一致性的VL，且包括包含以下胺基酸序列之VH之FR3：RVSLTRHASFDFDTFSFYMDLKALRSDDTAVYFCAR (SEQ ID NO: 629)。在某些實施例中，抗體或其抗原結合片段包含具有以下中所述之序列之VH CDR及VL CDR：分別地SEQ ID NO.: 137、138、139、140、141及142，且包含與SEQ ID NO: 477中所述之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、例如100%一致性的VH，且包括包含以下胺基酸序列之VH之FR3：RVSLTRHASFDFDTFSFYMDLKALRSDDTAVYFCAR (SEQ ID NO: 629)，且包括包含SEQ ID NO: 278中所述之胺基酸序列之VL。

【0007】 前述抗體可進一步包含具有在指示位置(位置根據Kabat編號)之以下胺基酸中之一或多者(例如1、2、3、4、5、6、7、8、9、10、11、12、13、14、15、16、17或18者)的VH：在5位之纈胺酸、在10位之麩胺酸、在12位之離胺酸、在23位之離胺酸、在28位之天冬醯胺、在30位之精胺酸、在32位之酪胺酸、在68位之蘇胺酸、在69位之甲硫胺酸、在72位之組胺酸、在76位之苯丙胺酸、在78位之丙胺酸、在82a位之絲胺酸、在82b位之精胺酸、在89位之蘇胺酸、在99位之酪胺酸、在105位之麩醯胺酸或在108位之甲硫胺酸。在某些實施例中，抗體可進一步包含具有在指示位置(位置根據Kabat編號)之以下胺基酸的VH：在28位之天冬醯胺、在30位之精胺酸、在32位之酪胺酸、在72位之組胺酸及在99位之酪胺酸(例如在28位之天冬醯胺、在30位之精胺酸、在32位之酪胺酸、在73位之組胺酸及在98位之酪胺酸，其中胺基

酸位置係相對於SEQ ID NO: 477)。在某些實施例中，抗體或其抗原結合片段包含具有以下中所述之序列之VH CDR及VL CDR：分別地SEQ ID NO.: 137、138、139、140、141及142，且包含具有在指示位置(位置根據Kabat編號)之以下胺基酸的VH：在28位之天冬醯胺、在30位之精胺酸、在32位之酪胺酸、在72位之組胺酸及在99位之酪胺酸(例如在28位之天冬醯胺、在30位之精胺酸、在32位之酪胺酸、在73位之組胺酸及在98位之酪胺酸，其中胺基酸位置係相對於SEQ ID NO: 477)。在某些實施例中，抗體或其抗原結合片段包含具有以下中所述之序列之VH CDR及VL CDR：分別地SEQ ID NO.: 137、138、139、140、141及142，且包含具有在指示位置(位置根據Kabat編號)之以下胺基酸的VH：在28位之天冬醯胺、在30位之精胺酸、在32位之酪胺酸、在72位之組胺酸、在74a位之苯丙胺酸及在99位之酪胺酸(例如在28位之天冬醯胺、在30位之精胺酸、在32位之酪胺酸、在73位之組胺酸、在76位之苯丙胺酸及在98位之酪胺酸，其中胺基酸位置係相對於SEQ ID NO: 477)。在某些實施例中，抗體或其抗原結合片段包含具有以下中所述之序列之VH CDR及VL CDR：分別地SEQ ID NO.: 137、138、139、140、141及142，且包含與SEQ ID NO: 477中所述之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、例如100%一致性的VH及與SEQ ID NO: 278中所述之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、例如100%一致性的VL，且包含具有在指示位置(位置根據Kabat編號)之以下胺基酸的VH：在28位之天冬醯胺、在30位之精胺酸、在32位之酪胺

酸、在72位之組胺酸及在99位之酪胺酸(例如在28位之天冬醯胺、在30位之精胺酸、在32位之酪胺酸、在73位之組胺酸及在98位之酪胺酸，其中胺基酸位置係相對於SEQ ID NO: 477)。在某些實施例中，抗體或其抗原結合片段包含具有以下中所述之序列之VH CDR及VL CDR：分別地SEQ ID NO.: 137、138、139、140、141及142，且包含與SEQ ID NO: 477中所述之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、例如100%一致性的VH及與SEQ ID NO: 278中所述之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、例如100%一致性的VL，且包含具有在指示位置(位置根據Kabat編號)之以下胺基酸的VH：在28位之天冬醯胺、在30位之精胺酸、在32位之酪胺酸、在72位之組胺酸、在74a位之苯丙胺酸及在99位之酪胺酸(例如在28位之天冬醯胺、在30位之精胺酸、在32位之酪胺酸、在73位之組胺酸、在76位之苯丙胺酸及在98位之酪胺酸，其中胺基酸位置係相對於SEQ ID NO: 477)。

【0008】在一些實施例中，VL在指示位置(位置根據Kabat編號)包含以下胺基酸中之一或多者(例如1、2、3、4、5、6、7、8、9、10者)：在18位之精胺酸、在39位之離胺酸、在40位之脯胺酸、在56位之蘇胺酸、在65位之絲胺酸、在72位之蘇胺酸、在76位之絲胺酸、在77位之絲胺酸、在99位之蘇胺酸、在99位之甘胺酸、在103位之天冬醯胺或在106位之異白胺酸。在其他實施例中，VL在指示位置(位置根據Kabat編號)包含以下胺基酸中之一或多者(例如1、2、3、4、5、6、7、8、9、10者)：在18位之精胺酸、在19位之丙胺酸、在65位之絲胺

酸、在72位之蘇胺酸或組胺酸、在74位之離胺酸、在76位之絲胺酸、在77位之絲胺酸、在98位之苯丙胺酸或在99位之甘胺酸。在某些實施例中，VL包含在19位之丙胺酸(Kabat編號)。在其他實施例中，VH在指示位置(位置根據Kabat編號)包含以下胺基酸中之一或多者：在72位之組胺酸、在76位之苯丙胺酸或在74a位之苯丙胺酸。在其他實施例中，VL在指示位置(位置根據Kabat編號)包含以下胺基酸中之一或多者(例如1、2、3、4、5、6、7、8者)：在18位之精胺酸、在19位之丙胺酸、在65位之絲胺酸、在72位之蘇胺酸、在76位之絲胺酸、在77位之絲胺酸、在98位之苯丙胺酸或在99位之甘胺酸。在某些實施例中，抗體或其抗原結合片段包含具有以下中所述之序列之VH CDR及VL CDR：分別地SEQ ID NO.: 137、138、139、140、141及142，且包含與SEQ ID NO: 477中所述之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、例如100%一致性的VH及與SEQ ID NO: 278中所述之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、例如100%一致性的VL，且包含具有在指示位置(位置根據Kabat編號)之以下胺基酸的VH：在28位之天冬醯胺、在30位之精胺酸、在32位之酪胺酸、在72位之組胺酸、在76位之苯丙胺酸、及在74a位之苯丙胺酸、及在99位之酪胺酸(例如在28位之天冬醯胺、在30位之精胺酸、在32位之酪胺酸、在73位之組胺酸、在76位之苯丙胺酸及在98位之酪胺酸，其中胺基酸位置係相對於SEQ ID NO: 477)。在某些實施例中，抗體或其抗原結合片段包含具有以下中所述之序列之VH CDR及VL CDR：分別地SEQ ID NO.: 137、

138、139、140、141及142，且包含與SEQ ID NO: 477中所述之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、例如100%一致性的VH及與SEQ ID NO: 278中所述之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、例如100%一致性的VL，且包含具有在19位之丙胺酸(Kabat編號)的VL。在某些實施例中，抗體或其抗原結合片段包含具有以下中所述之序列之VH CDR及VL CDR：分別地SEQ ID NO.: 137、138、139、140、141及142，且包含與SEQ ID NO: 477中所述之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、例如100%一致性的VH及與SEQ ID NO: 278中所述之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、例如100%一致性的VL，且包含具有在指示位置(位置根據Kabat編號)之以下胺基酸的VH：在28位之天冬醯胺、在30位之精胺酸、在32位之酪胺酸、在72位之組胺酸、在76位之苯丙胺酸、及在74a位之苯丙胺酸、及在99位之酪胺酸，且包含具有在指示位置(位置根據Kabat編號)之以下胺基酸的VL：在19位之丙胺酸。

【0009】在某些實施例中，VL包含SEQ ID NO.: 332至342中任一者中所述之胺基酸序列。在一些情形下，抗體包含人類IgG1 Fc區。在某些實施例中，人類IgG1 Fc區係IgG1m17 (SEQ ID NO: 348)。

【0010】前述抗體或其抗原結合片段進一步包含人類IgG1 Fc

區，其包含(位置根據EU編號來編號)：(i) 在239位之天冬胺酸、在332位之麩胺酸、在236位之丙胺酸、在330位之白胺酸；(ii) 在239位之天冬胺酸、在332位之麩胺酸、在428位之白胺酸、及在434位之絲胺酸；(iii) 在239位之天冬胺酸、在332位之麩胺酸、在236位之丙胺酸、在428位之白胺酸、及在434位之絲胺酸；(iv) 在239位之天冬胺酸、在332位之麩胺酸、在330位之白胺酸、在428位之白胺酸、及在434位之絲胺酸；(v) 在239位之天冬胺酸、在332位之麩胺酸、在236位之丙胺酸、在330位之白胺酸、在428位之白胺酸、及在434位之絲胺酸；或(vi) 在243位之白胺酸、在292位之脯胺酸、在300位之白胺酸、在305位之異白胺酸、在396位之白胺酸、在428位之白胺酸、及在434位之絲胺酸。在某些實施例中，抗體或其抗原結合片段進一步包含人類IgG1 Fc區，其包含(位置根據EU編號來編號)：在239位之天冬胺酸、在332位之麩胺酸、在236位之丙胺酸、在330位之白胺酸、在428位之白胺酸、及在434位之絲胺酸。在某些實施例中，抗體或其抗原結合片段包含具有以下中所述之序列之VH CDR及VL CDR：分別地SEQ ID NO.: 137、138、139、140、141及142，且進一步包含人類IgG1 Fc區。在某些實施例中，抗體或其抗原結合片段包含具有以下中所述之序列之VH CDR及VL CDR：分別地SEQ ID NO.: 137、138、139、140、141及142，且進一步包含人類IgG1 Fc區，其包含(位置根據EU編號來編號)：在239位之天冬胺酸、在332位之麩胺酸、在236位之丙胺酸、在330位之白胺酸、在428位之白胺酸、及在434位之絲胺酸。在某些實施例中，抗體或其抗原結合片段包含具有以下中所述之序列之VH CDR及VL CDR：分別地SEQ ID NO.: 137、138、139、140、141及142，且包含與SEQ ID NO: 477中所述之胺基酸序列具有至少80%、至少

85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、例如100%一致性的VH及與SEQ ID NO: 278中所述之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、例如100%一致性的VL，且進一步包含人類IgG1 Fc區。在某些實施例中，抗體或其抗原結合片段包含具有以下中所述之序列之VH CDR及VL CDR：分別地SEQ ID NO.: 137、138、139、140、141及142，且包含與SEQ ID NO: 477中所述之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、例如100%一致性的VH及與SEQ ID NO: 278中所述之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、例如100%一致性的VL，且進一步包含人類IgG1 Fc區，其包含(位置根據EU編號來編號)：在239位之天冬胺酸、在332位之麩胺酸、在236位之丙胺酸、在330位之白胺酸、在428位之白胺酸、及在434位之絲胺酸。

【0011】 在某些實施例中，抗體包含人類κ輕鏈恆定區。在一些情形下，人類κ輕鏈恆定區係Km3 (SEQ ID NO:351)。在某一實施例中，人類κ輕鏈恆定區係Km3 (SEQ ID NO: 351)。在某些實施例中，抗體或其抗原結合片段包含具有以下中所述之序列之VH CDR及VL CDR：分別地SEQ ID NO.: 137、138、139、140、141及142，且進一步包含人類κ輕鏈恆定區Km3 (SEQ ID NO: 351)。在某些實施例中，抗體或其抗原結合片段包含具有以下中所述之序列之VH CDR及VL

CDR：分別地SEQ ID NO.: 137、138、139、140、141及142，且包含與SEQ ID NO: 477中所述之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、例如100%一致性的VH及與SEQ ID NO: 278中所述之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、例如100%一致性的VL，且進一步包含人類κ輕鏈恆定區Km3 (SEQ ID NO: 351)。在某些實施例中，抗體或其抗原結合片段包含具有以下中所述之序列之VH CDR及VL CDR：分別地SEQ ID NO.: 137、138、139、140、141及142，且包含與SEQ ID NO: 477中所述之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、例如100%一致性的VH及與SEQ ID NO: 278中所述之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、例如100%一致性的VL，且進一步包含人類IgG1 Fc區，其包含(位置根據EU編號來編號)：在239位之天冬胺酸、在332位之麩胺酸、在236位之丙胺酸、在330位之白胺酸、在428位之白胺酸、及在434位之絲胺酸、及人類κ輕鏈恆定區Km3 (SEQ ID NO: 351)。

【0012】在一些實施例中，與其他抗HIV抗體(例如抗體A)相比，該抗體或抗原結合片段在哺乳動物中(例如在非人類靈長類動物中、在人類中)具有改良、延長、增強或增加之血清半衰期。在一些實施例中，抗體或抗原結合片段在人類中之血清半衰期為至少約3天、例

如至少約4天、至少約5天、至少約6天、至少約7天、至少約8天、至少約9天、至少約10天、至少約12天、至少約14天、至少約16天、至少約18天、至少約20天、至少約21天、至少約24天、至少約28天、至少約30天或更長時間。在一些實施例中，與其他抗HIV抗體(例如抗體A)相比，該抗體或抗原結合片段具有HIV感染細胞之改良、增強或增加之殺死功效。在某些實施例中，抗體或其抗原結合片段包含具有以下中所述之序列之VH CDR及VL CDR：SEQ ID NO.: 分別137、138、139、140、141及142，且與其他抗HIV抗體(例如抗體A)相比，在哺乳動物中(例如在非人類靈長類動物中、在人類中)具有改良、延長、增強或增加之血清半衰期。在某些實施例中，抗體或其抗原結合片段包含具有以下中所述之序列之VH CDR及VL CDR：SEQ ID NO.: 分別137、138、139、140、141及142，且與其他抗HIV抗體(例如抗體A)相比，具有HIV感染細胞之改良、增強或增加之殺死功效。

【0013】在另一態樣中，本揭示內容提供結合至HIV-1包膜醣蛋白gp120之抗體。該抗體包括包含VH CDR 1-3之VH及包含VL CDR 1-3之VL，其中VH CDR 1-3及VL CDR 1-3具有以下中所述之序列：分別地SEQ ID NO.: 137、138、139、140、141及142；或分別地SEQ ID NO.: 153、138、154、140、141及142。抗體包含人類IgG1 Fc區，其包含(位置根據EU編號來編號)：(i) 在239位之天冬胺酸、在332位之麩胺酸、在236位之丙胺酸、在330位之白胺酸；(ii) 在239位之天冬胺酸、在332位之麩胺酸、在428位之白胺酸、及在434位之絲胺酸；(iii) 在239位之天冬胺酸、在332位之麩胺酸、在236位之丙胺酸、在428位之白胺酸、及在434位之絲胺酸；(iv) 在239位之天冬胺酸、在332位之麩胺酸、在330位之白胺酸、在428位之白胺酸、及在434位之絲胺酸；

(v) 在239位之天冬胺酸、在332位之麩胺酸、在236位之丙胺酸、在330位之白胺酸、在428位之白胺酸、及在434位之絲胺酸；或(vi) 在243位之白胺酸、在292位之脯胺酸、在300位之白胺酸、在305位之異白胺酸、在396位之白胺酸、在428位之白胺酸、及在434位之絲胺酸。在某些實施例中，抗體包括包含VH CDR 1-3之VH及包含VL CDR 1-3之VL，其中VH CDR 1-3及VL CDR 1-3具有以下中所述之序列：分別地SEQ ID NO.: 137、138、139、140、141及142，其中抗體包含人類IgG1 Fc區，其包含(位置根據EU編號來編號)：在239位之天冬胺酸、在332位之麩胺酸、在236位之丙胺酸、在330位之白胺酸、在428位之白胺酸、及在434位之絲胺酸。

【0014】 在某些實施例中，抗體包括包含在19位之丙胺酸(Kabat編號)的輕鏈。在一些實施例中，抗體在VH之框架區3 (FR3)中在對應於74a、74b、74c及74d (Kabat編號)之位置包含SEQ ID NO:453或SEQ ID NO: 627中所述之胺基酸序列。在某些實施例中，抗體在VH之框架區3 (FR3)中在對應於74a、74b、74c及74d (Kabat編號)之位置包含SEQ ID NO: 627中所述之胺基酸序列。在一些實施例中，抗體包括包含以下胺基酸序列之VH之FR3：RVSLTRHASWDFDTFSFYMDLKALRSDDTAVYFCAR (SEQ ID NO: 628) 或 RVSLTRHASFDFDTFSFYMDLKALRSDDTAVYFCAR (SEQ ID NO: 629)。在一些實施例中，抗體包括包含以下胺基酸序列之VH之FR3：RVSLTRHASFDFDTFSFYMDLKALRSDDTAVYFCAR (SEQ ID NO: 629)。在一些實施例中，抗體包含SEQ ID NO.: 332至342中任一者中所述之胺基酸序列。在一些情形下，抗體分別包含具有SEQ ID NO.: 182及223中所述之胺基酸序列的VH及VL。在一些情形下，抗體

分別包含具有SEQ ID NO.: 220及276中所述之胺基酸序列的VH及VL。在某些實施例中，抗體分別包含具有SEQ ID NO.: 477及278中所述之胺基酸序列的VH及VL。在其他實施例中，人類IgG1 Fc區係IgG1m17 (SEQ ID NO: 348)。在一些實施例中，抗體包含人類κ輕鏈恆定區。在某些情形下，人類κ輕鏈恆定區係Km3 (SEQ ID NO: 351)。

【0015】 在一些實施例中，與其他抗HIV抗體(例如抗體A及/或抗體B)相比，該抗體或抗原結合片段在哺乳動物中(例如在非人類靈長類動物中、在人類中)具有改良、延長、增強或增加之血清半衰期。在一些實施例中，抗體或抗原結合片段在人類中之血清半衰期為至少約3天、例如至少約4天、至少約5天、至少約6天、至少約7天、至少約8天、至少約9天、至少約10天、至少約12天、至少約14天、至少約16天、至少約18天、至少約20天、至少約21天、至少約24天、至少約28天、至少約30天或更長時間。在一些實施例中，與其他抗HIV抗體(例如抗體A及/或抗體B)相比，該抗體具有HIV感染細胞之改良、增加或增強之殺死功效。在某些實施例中，抗體或其抗原結合片段包含具有以下中所述之序列之VH CDR及VL CDR：分別地SEQ ID NO.: 137、138、139、140、141及142，其中抗體包含人類IgG1 Fc區，其包含(位置根據EU編號來編號)：在428位之白胺酸、及在434位之絲胺酸，且與其他抗HIV抗體(例如抗體A及/或抗體B)相比，在哺乳動物中(例如在非人類靈長類動物中、在人類中)具有改良、延長、增強或增加之血清半衰期。在某些實施例中，抗體或其抗原結合片段包含具有以下中所述之序列之VH CDR及VL CDR：分別地SEQ ID NO.: 137、138、139、140、141及142，其中該抗體包含人類IgG1 Fc區，其包含(位置根據EU編號來編號)：在239位之天冬胺酸、在332位之麩胺酸、在236位之

丙胺酸、在330位之白胺酸，且與其他抗HIV抗體(例如抗體A及/或抗體B)相比，具有HIV感染細胞之改良、增強或增加之殺死功效。

【0016】在又一態樣中，本揭示內容提供包含重鏈可變區(VH)及輕鏈可變區(VL)之抗體或其抗原結合片段，其中VH及VL分別包含以下中所述之胺基酸序列：(1) SEQ ID NO.: 184及223；(2) SEQ ID NO.: 185及223；(3) SEQ ID NO.: 182及225；(4) SEQ ID NO.: 185及225；(5) SEQ ID NO.: 186及223；(6) SEQ ID NO.: 187及223；(7) SEQ ID NO.: 188及223；(8) SEQ ID NO.: 189及223；(9) SEQ ID NO.: 190及223；(10) SEQ ID NO.: 191及223；(11) SEQ ID NO.: 192及223；(12) SEQ ID NO.: 193及223；(13) SEQ ID NO.: 194及223；(14) SEQ ID NO.: 195及223；(15) SEQ ID NO.: 196及223；(16) SEQ ID NO.: 197及223；(17) SEQ ID NO.: 198及223；(18) SEQ ID NO.: 199及223；(19) SEQ ID NO.: 200及223；(20) SEQ ID NO.: 201及223；(21) SEQ ID NO.: 202及223；(22) SEQ ID NO.: 203及223；(23) SEQ ID NO.: 204及223；(24) SEQ ID NO.: 205及223；(25) SEQ ID NO.: 206及223；(26) SEQ ID NO.: 207及223；(27) SEQ ID NO.: 208及223；(28) SEQ ID NO.: 209及223；(29) SEQ ID NO.: 182及226；(30) SEQ ID NO.: 182及227；(31) SEQ ID NO.: 182及229；(32) SEQ ID NO.: 182及230；(33) SEQ ID NO.: 182及231；(34) SEQ ID NO.: 182及232；(35) SEQ ID NO.: 182及233；(36) SEQ ID NO.: 182及234；(37) SEQ ID NO.: 182及235；(38) SEQ ID NO.: 182及236；(39) SEQ ID NO.: 182及237；(40) SEQ ID NO.: 182及238；(41) SEQ ID NO.: 182及239；(42) SEQ ID NO.: 182及240；(43) SEQ ID NO.: 182及241；(44) SEQ ID NO.: 182及242；(45) SEQ ID NO.: 182及

243；(46) SEQ ID NO.: 182及244；(47) SEQ ID NO.: 182及245；(48) SEQ ID NO.: 182及246；(49) SEQ ID NO.: 182及247；(50) SEQ ID NO.: 182及248；(51) SEQ ID NO.: 182及249；(52) SEQ ID NO.: 182及250；(53) SEQ ID NO.: 182及251；(54) SEQ ID NO.: 182及252；(55) SEQ ID NO.: 182及253；(56) SEQ ID NO.: 210及238；(57) SEQ ID NO.: 211及238；(58) SEQ ID NO.: 212及238；(59) SEQ ID NO.: 210及240；(60) SEQ ID NO.: 211及240；(61) SEQ ID NO.: 212及240；(62) SEQ ID NO.: 213及223；(63) SEQ ID NO.: 214及223；(64) SEQ ID NO.: 215及223；(65) SEQ ID NO.: 216及223；(66) SEQ ID NO.: 217及223；(67) SEQ ID NO.: 218及223；(68) SEQ ID NO.: 182及254；(69) SEQ ID NO.: 213及254；(70) SEQ ID NO.: 214及254；(71) SEQ ID NO.: 215及254；(72) SEQ ID NO.: 216及254；(73) SEQ ID NO.: 217及254；(74) SEQ ID NO.: 218及254；(75) SEQ ID NO.: 182及255；(76) SEQ ID NO.: 213及255；(77) SEQ ID NO.: 214及255；(78) SEQ ID NO.: 215及255；(79) SEQ ID NO.: 216及255；(80) SEQ ID NO.: 217及255；(81) SEQ ID NO.: 218及255；(82) SEQ ID NO.: 182及256；(83) SEQ ID NO.: 213及256；(84) SEQ ID NO.: 214及256；(85) SEQ ID NO.: 215及256；(86) SEQ ID NO.: 216及256；(87) SEQ ID NO.: 217及256；(88) SEQ ID NO.: 218及256；(89) SEQ ID NO.: 182及257；(90) SEQ ID NO.: 213及257；(91) SEQ ID NO.: 214及257；(92) SEQ ID NO.: 215及257；(93) SEQ ID NO.: 216及257；(94) SEQ ID NO.: 217及257；(95) SEQ ID NO.: 218及257；(96) SEQ ID NO.: 182及258；(97) SEQ ID NO.: 213及258；(98) SEQ ID NO.: 214及258；(99) SEQ ID NO.: 215及

258；(100) SEQ ID NO.: 216及258；(101) SEQ ID NO.: 217及258；(102) SEQ ID NO.: 218及258；(103) SEQ ID NO.: 182及259；(104) SEQ ID NO.: 213及259；(105) SEQ ID NO.: 214及259；(106) SEQ ID NO.: 215及259；(107) SEQ ID NO.: 216及259；(108) SEQ ID NO.: 217及259；(109) SEQ ID NO.: 218及259；(110) SEQ ID NO.: 182及260；(111) SEQ ID NO.: 182及261；(112) SEQ ID NO.: 182及262；(113) SEQ ID NO.: 182及263；(114) SEQ ID NO.: 182及264；(115) SEQ ID NO.: 182及265；(116) SEQ ID NO.: 182及266；(117) SEQ ID NO.: 182及267；(118) SEQ ID NO.: 182及268；(119) SEQ ID NO.: 182及269；(120) SEQ ID NO.: 182及270；(121) SEQ ID NO.: 182及271；(122) SEQ ID NO.: 182及272；(123) SEQ ID NO.: 219及273；(124) SEQ ID NO.: 191及274；(125) SEQ ID NO.: 182及275；(126) SEQ ID NO.: 220及277；(127) SEQ ID NO.: 182及278；(128) SEQ ID NO.: 182及279；(129) SEQ ID NO.: 182及280；(130) SEQ ID NO.: 182及281；(131) SEQ ID NO.: 182及282；(132) SEQ ID NO.: 221及228；(133) SEQ ID NO.: 221及283；(134) SEQ ID NO.: 182及284；(135) SEQ ID NO.: 221及285；(136) SEQ ID NO.: 182及286；(137) SEQ ID NO.: 221及287；(138) SEQ ID NO.: 221及288；(139) SEQ ID NO.: 221及289；(140) SEQ ID NO.: 182及290；(141) SEQ ID NO.: 221及291；(142) SEQ ID NO.: 182及292；(143) SEQ ID NO.: 221及293；(144) SEQ ID NO.: 221及294；(145) SEQ ID NO.: 221及295；(146) SEQ ID NO.: 182及296；(147) SEQ ID NO.: 221及297；(148) SEQ ID NO.: 182及298；(149) SEQ ID NO.: 221及299；(150) SEQ ID NO.: 221及300；(151) SEQ ID NO.: 221及

301；(152) SEQ ID NO.: 182及302；(153) SEQ ID NO.: 221及303；(154) SEQ ID NO.: 182及304；(155) SEQ ID NO.: 221及305；(156) SEQ ID NO.: 182及306；(157) SEQ ID NO.: 182及307；(158) SEQ ID NO.: 182及308；(159) SEQ ID NO.: 182及309；(160) SEQ ID NO.: 220及310；(161) SEQ ID NO.: 220及311；(162) SEQ ID NO.: 182及228；(163) SEQ ID NO.: 465及276；(164) SEQ ID NO.: 466及276；(166) SEQ ID NO.: 182及479；(167) SEQ ID NO.: 465及479；(168) SEQ ID NO.: 466及479；(169) SEQ ID NO.: 182及480；(170) SEQ ID NO.: 465及480；(171) SEQ ID NO.: 466及480；(172) SEQ ID NO.: 182及481；(173) SEQ ID NO.: 182及482；(174) SEQ ID NO.: 465及482；(175) SEQ ID NO.: 466及482；(176) SEQ ID NO.: 182及483；(177) SEQ ID NO.: 182及484；(178) SEQ ID NO.: 465及484；(179) SEQ ID NO.: 466及484；(180) SEQ ID NO.: 182及485；(181) SEQ ID NO.: 182及486；(182) SEQ ID NO.: 465及486；(183) SEQ ID NO.: 466及486；(184) SEQ ID NO.: 182及487；(185) SEQ ID NO.: 182及488；(186) SEQ ID NO.: 465及488；(187) SEQ ID NO.: 466及488；(188) SEQ ID NO.: 182及489；(189) SEQ ID NO.: 465及489；(190) SEQ ID NO.: 466及489；(191) SEQ ID NO.: 182及491；(192) SEQ ID NO.: 465及491；(193) SEQ ID NO.: 466及491；(194) SEQ ID NO.: 182及492；(195) SEQ ID NO.: 465及492；(196) SEQ ID NO.: 466及492；(197) SEQ ID NO.: 182及493；(198) SEQ ID NO.: 182及494；(199) SEQ ID NO.: 465及494；(200) SEQ ID NO.: 466及494；(201) SEQ ID NO.: 182及277；(202) SEQ ID NO.: 465及277；(203) SEQ ID NO.: 466及277；(204) SEQ ID NO.: 182及

495；(205) SEQ ID NO.: 465及495；(206) SEQ ID NO.: 466及495；(207) SEQ ID NO.: 182及496；(208) SEQ ID NO.: 465及496；(209) SEQ ID NO.: 466及496；(210) SEQ ID NO.: 182及497；(211) SEQ ID NO.: 465及497；(212) SEQ ID NO.: 466及497；(213) SEQ ID NO.: 182及498；(214) SEQ ID NO.: 182及499；(215) SEQ ID NO.: 465及499；(216) SEQ ID NO.: 466及499；(217) SEQ ID NO.: 182及500；(218) SEQ ID NO.: 182及501；(219) SEQ ID NO.: 465及501；(220) SEQ ID NO.: 466及501；(221) SEQ ID NO.: 182及502；(222) SEQ ID NO.: 182及503；(223) SEQ ID NO.: 182及504；(224) SEQ ID NO.: 182及505；(225) SEQ ID NO.: 182及506；(226) SEQ ID NO.: 182及507；(227) SEQ ID NO.: 182及508；(228) SEQ ID NO.: 182及509；(229) SEQ ID NO.: 182及510；(230) SEQ ID NO.: 182及511；(231) SEQ ID NO.: 182及512；(232) SEQ ID NO.: 182及513；(233) SEQ ID NO.: 182及514；(234) SEQ ID NO.: 182及515；(235) SEQ ID NO.: 467及223；(236) SEQ ID NO.: 468及223；(237) SEQ ID NO.: 469及223；(238) SEQ ID NO.: 470及223；(239) SEQ ID NO.: 471及223；(240) SEQ ID NO.: 472及223；(241) SEQ ID NO.: 473及223；(242) SEQ ID NO.: 474及223；(243) SEQ ID NO.: 475及223；(244) SEQ ID NO.: 476及223；(245) SEQ ID NO.: 182及516；(246) SEQ ID NO.: 182及276；(247) SEQ ID NO.: 182及569；(248) SEQ ID NO.: 477及223；(249) SEQ ID NO.: 477及278；(250) SEQ ID NO.: 477及292；或(251) SEQ ID NO.: 478及276。

【0017】在一些實施例中，VH及VL分別包含SEQ ID NO.: 182及275中所述之胺基酸序列。在其他實施例中，VH及VL分別包含SEQ

ID NO.: 182及278中所述之胺基酸序列。在一些實施例中，VH及VL分別包含SEQ ID NO.: 182及223中所述之胺基酸序列。在其他實施例中，VH及VL分別包含SEQ ID NO.: 182及292中所述之胺基酸序列。在某些實施例中，VH及VL分別包含SEQ ID NO.: 465及276中所述之胺基酸序列。在其他實施例中，VH及VL分別包含SEQ ID NO.: 466及276中所述之胺基酸序列。在某些實施例中，VH及VL分別包含SEQ ID NO.: 182及491中所述之胺基酸序列。在一些實施例中，VH及VL分別包含SEQ ID NO.: 465及491中所述之胺基酸序列。在其他實施例中，VH及VL分別包含SEQ ID NO.: 466及491中所述之胺基酸序列。在某些實施例中，VH及VL分別包含SEQ ID NO.: 182及493中所述之胺基酸序列。在一些實施例中，VH及VL分別包含SEQ ID NO.: 220及276中所述之胺基酸序列。在其他實施例中，VH及VL分別包含SEQ ID NO.: 182及516中所述之胺基酸序列。在其他實施例中，VH及VL分別包含SEQ ID NO.: 182及276中所述之胺基酸序列。在其他實施例中，VH及VL分別包含SEQ ID NO.: 182及569中所述之胺基酸序列。在一些實施例中，VH及VL分別包含SEQ ID NO.: 477及223中所述之胺基酸序列。在一些實施例中，VH及VL分別包含SEQ ID NO.: 477及278中所述之胺基酸序列。在一些實施例中，VH及VL分別包含SEQ ID NO.: 477及292中所述之胺基酸序列。在其他實施例中，VH及VL分別包含SEQ ID NO.: 478及276中所述之胺基酸序列。

【0018】在一些實施例中，抗體或其抗原結合片段包含與選自由SEQ ID NO: 181-221及465-478組成之群之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、或100%一致性的

VH，及與選自由SEQ ID NO: 222-311、479-516及569組成之群之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、或100%一致性的VL。在一些實施例中，抗體或其抗原結合片段包含與SEQ ID NO: 477中所述之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、例如100%一致性的VH及與SEQ ID NO: 278中所述之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、例如100%一致性的VL。

【0019】在一些實施例中，抗體進一步包含人類IgG1 Fc區。在一些情況下，人類IgG1 Fc區係IgG1m17 (SEQ ID NO:348)。在某些實施例中，抗體包含人類IgG1 Fc區，其包含(位置根據EU編號來編號)：(i) 在239位之天冬胺酸、在332位之麩胺酸、在236位之丙胺酸、在330位之白胺酸；(ii) 在239位之天冬胺酸、在332位之麩胺酸、在428位之白胺酸、及在434位之絲胺酸；(iii) 在239位之天冬胺酸、在332位之麩胺酸、在236位之丙胺酸、在428位之白胺酸、及在434位之絲胺酸；(iv) 在239位之天冬胺酸、在332位之麩胺酸、在330位之白胺酸、在428位之白胺酸、及在434位之絲胺酸；(v) 在239位之天冬胺酸、在332位之麩胺酸、在236位之丙胺酸、在330位之白胺酸、在428位之白胺酸、及在434位之絲胺酸；或(vi) 在243位之白胺酸、在292位之脯胺酸、在300位之白胺酸、在305位之異白胺酸、在396位之白胺酸、在428位之白胺酸、及在434位之絲胺酸。在一些實施例中，抗體包含人

類κ輕鏈恆定區。在某些情形下，人類κ輕鏈恆定區係Km3 (SEQ ID NO: 351)。

【0020】 在一些實施例中，與其他抗HIV抗體(例如抗體A及/或抗體B)相比，該抗體或抗原結合片段在哺乳動物中(例如在非人類靈長類動物中、在人類中)具有改良、延長、增強或增加之血清半衰期。在一些實施例中，抗體或抗原結合片段在人類中之血清半衰期為至少約3天、例如至少約4天、至少約5天、至少約6天、至少約7天、至少約8天、至少約9天、至少約10天、至少約12天、至少約14天、至少約16天、至少約18天、至少約20天、至少約21天、至少約24天、至少約28天、至少約30天或更長時間。在一些實施例中，與其他抗HIV抗體(例如抗體A及/或抗體B)相比，該抗體或抗原結合片段具有HIV感染細胞之改良、增強或增加之殺死功效。

【0021】 在另一態樣中，本揭示內容提供包含重鏈及輕鏈之抗體，其中重鏈及輕鏈分別包含表X及XI中中所述之胺基酸序列中之任一者。

【0022】 在一些實施例中，重鏈及輕鏈分別具有SEQ ID NO.: 2及49中所述之胺基酸序列。在一些實施例中，重鏈及輕鏈分別具有SEQ ID NO.: 2及100中所述之胺基酸序列。在一些實施例中，重鏈及輕鏈分別具有SEQ ID NO.: 42及101中所述之胺基酸序列。在一些實施例中，重鏈及輕鏈分別具有SEQ ID NO.: 2及103中所述之胺基酸序列。在一些實施例中，重鏈及輕鏈分別具有SEQ ID NO.: 2及117中所述之胺基酸序列。在一些實施例中，重鏈及輕鏈分別具有SEQ ID NO.: 517及101中所述之胺基酸序列。在一些實施例中，重鏈及輕鏈分別具有SEQ ID NO.: 518及101中所述之胺基酸序列。在一些實施例中，重鏈及輕鏈

分別具有SEQ ID NO.: 2及542中所述之胺基酸序列。在一些實施例中，重鏈及輕鏈分別具有SEQ ID NO.: 517及542中所述之胺基酸序列。在一些實施例中，重鏈及輕鏈分別具有SEQ ID NO.: 518及542中所述之胺基酸序列。在一些實施例中，重鏈及輕鏈分別具有SEQ ID NO.: 2及544中所述之胺基酸序列。在一些實施例中，重鏈及輕鏈分別具有SEQ ID NO.: 2及567中所述之胺基酸序列。在一些實施例中，重鏈及輕鏈分別具有SEQ ID NO.: 2及568中所述之胺基酸序列。在一些實施例中，重鏈及輕鏈分別具有SEQ ID NO.: 529及49中所述之胺基酸序列。在一些實施例中，重鏈及輕鏈分別具有SEQ ID NO.: 529及103中所述之胺基酸序列。在一些實施例中，重鏈及輕鏈分別具有SEQ ID NO.: 529及117中所述之胺基酸序列。在一些實施例中，重鏈及輕鏈分別具有SEQ ID NO.: 530及101中所述之胺基酸序列。在一些實施例中，抗體包含與選自由SEQ ID NO: 1-47及517-530組成之群之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、或100%一致性的重鏈(HC)，及與選自由SEQ ID NO: 48-136及531-567組成之群之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、或100%一致性的輕鏈(LC)。在某些實施例中，抗體包含與SEQ ID NO: 529中所述之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、例如100%一致性的重鏈(HC)，及與SEQ ID NO: 103中所述之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、

至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、例如100%一致性的輕鏈(LC)。在一些實施例中，VL中之至少50%、至少60%、至少70%、至少80%、至少85%、至少90%或更多之N-連接醣基化位點經唾液酸化。在一些實施例中，VL中之N-連接醣基化位點具有至少40%、至少50%、至少60%、至少70%、至少80%、至少85%、至少90%或更大之唾液酸佔有率(例如包含一個或兩個末端唾液酸殘基之聚醣)。

【0023】 在有關態樣中，提供結合至人類免疫缺陷病毒-1 (HIV-1)包膜醣蛋白gp120之抗體或其抗原結合片段，該抗體或其抗原結合片段包含(i) 包含VH互補決定區1-3 (CDR 1-3)之重鏈可變區(VH)及(ii)包含VL CDR 1-3之輕鏈可變區(VL)，其中VH CDR 1-3及VL CDR 1-3具有以下中所述之序列：(i) 分別地SEQ ID NO.: 159、138、139、140、141及142；(ii) 分別地SEQ ID NO.: 137、160、139、140、141及142；(iii) 分別地SEQ ID NO.: 137、161、139、140、141及142；(iv) 分別地SEQ ID NO.: 137、162、139、140、141及142；(v) 分別地SEQ ID NO.: 137、163、139、140、141及142；(vi) 分別地SEQ ID NO.: 137、138、164、140、141及142；(vii) 分別地SEQ ID NO.: 159、138、164、140、141及142；(viii) 分別地SEQ ID NO.: 137、138、139、140、165及142；(ix) 分別地SEQ ID NO.: 137、138、139、140、166及142；(x) 分別地SEQ ID NO.: 137、138、139、140、167及142；(xi) 分別地SEQ ID NO.: 137、138、139、140、168及142；(xii) 分別地SEQ ID NO.: 137、138、154、140、141及142，或(xiii) 分別地SEQ ID NO.: 137、138、139、140、141及142，且其中VL中至少50%、至少60%、至少70%、至少80%、至少85%、至少

90%或更多之N-連接醣基化位點經唾液酸化。在某些實施例中，提供結合至人類免疫缺陷病毒-1 (HIV-1)包膜醣蛋白gp120之抗體或其抗原結合片段，該抗體或其抗原結合片段包含(i) 包含VH互補決定區1-3 (CDR 1-3)之重鏈可變區(VH)及(ii) 包含VL CDR 1-3之輕鏈可變區(VL)，其中VH CDR 1-3及VL CDR 1-3具有以下中所述之序列：分別地SEQ ID NO.: 137、138、139、140、141及142，且其中VL中至少50%、至少60%、至少70%、至少80%、至少85%、至少90%或更多之N-連接醣基化位點經唾液酸化。在某些實施例中，提供結合至人類免疫缺陷病毒-1 (HIV-1)包膜醣蛋白gp120之抗體或其抗原結合片段，該抗體或其抗原結合片段包含(i) 包含VH互補決定區1-3 (CDR 1-3)之重鏈可變區(VH)及(ii) 包含VL CDR 1-3之輕鏈可變區(VL)，其中VH CDR 1-3及VL CDR 1-3具有以下中所述之序列：分別地SEQ ID NO.: 137、138、139、140、141及142，其中包含具有在指示位置(位置根據Kabat編號)之以下胺基酸的VH：在28位之天冬醯胺、在30位之精胺酸、在32位之酪胺酸、在72位之組胺酸、在76位之苯丙胺酸、及在74a位之苯丙胺酸、及在99位之酪胺酸(例如在28位之天冬醯胺、在30位之精胺酸、在32位之酪胺酸、在73位之組胺酸、在76位之苯丙胺酸及在98位之酪胺酸，其中胺基酸位置係相對於SEQ ID NO: 477)，且其中VL中至少50%、至少60%、至少70%、至少80%、至少85%、至少90%或更多之N-連接醣基化位點經唾液酸化。在一些實施例中，VL中之N-連接醣基化位點具有至少40%、至少50%、至少60%、至少70%、至少80%、至少85%、至少90%或更大之唾液酸佔有率(例如一個或兩個末端唾液酸殘基)。在一些實施例中，根據Kabat編號在VL胺基酸位置72之天冬醯胺(N72)經唾液酸化。在一些實施例中，VL中之唾液酸化N-

連接醣基化位點包含1至5個唾液酸殘基、例如1至4個唾液酸殘基、例如1至3個唾液酸殘基、例如1至2個唾液酸殘基。在一些實施例中，VL經N-乙醯基神經胺酸(NANA)唾液酸化。在一些實施例中，唾液酸殘基存於二天線結構中。在一些實施例中，唾液酸殘基存於複合N-連接聚醣結構中。在一些實施例中，唾液酸殘基存於雜合N-連接聚醣結構中。

【0024】在另一態樣中，提供包含以下之雙特異性抗體：結合至gp120之第一抗原結合臂，該第一抗原結合臂包含(i) VH CDR 1-3及VL CDR 1-3，或(ii) 技術方案1至63中任一者之VH及VL；及結合至第二抗原之第二抗原結合臂。在某些實施例中，提供包含以下之雙特異性抗體：結合至gp120之第一抗原結合臂，該第一抗原結合臂分別包含如SEQ ID NO.: 137、138、139、140、141及142中所述之VH CDR 1-3及VL CDR 1-3；及結合至第二抗原之第二抗原結合臂。在某些實施例中，提供包含以下之雙特異性抗體：結合至gp120之第一抗原結合臂，該第一抗原結合臂分別包含包含SEQ ID NO: 477及278中所述之胺基酸序列的VH及VL；及結合至第二抗原之第二抗原結合臂。在一些實施例中，第二抗原係選自由以下組成之群：CD3、FcγRI (CD64)、FcγRII (CD32)、FcγRIII (CD16)；CD89、CCR5、CD4、gp41、殺手細胞免疫球蛋白樣受體三個Ig結構域及長胞質尾區1 (KIR3DL1)、殺手細胞免疫球蛋白樣受體三個Ig結構域及長胞質尾區1 (KIR3DL1)、殺手細胞免疫球蛋白樣受體兩個Ig結構域及長胞質尾區1 (KIR2DL1)、殺手細胞免疫球蛋白樣受體兩個Ig結構域及長胞質尾區2 (KIR2DL2)、殺手細胞免疫球蛋白樣受體兩個Ig結構域及長胞質尾區3 (KIR2DL3)、殺手細胞凝集素樣受體C1 (KLRC1)、殺手細胞凝集素樣受體C2 (KLRC2)、殺手

細胞凝集素樣受體C3 (KLRC3)、殺手細胞凝集素樣受體C4 (KLRC4)、殺手細胞凝集素樣受體D1 (KLRD1)、殺手細胞凝集素樣受體K1 (KLRK1)、天然細胞毒性觸發受體3 (NCR3或NKp30)、天然細胞毒性觸發受體2 (NCR2或NK-p44)、天然細胞毒性觸發受體1 (NCR1或NK-p46)、CD226 (DNAM-1)、細胞毒性及調節性T細胞分子(CRTAM或CD355)、信號傳導淋巴球活化分子家族成員1 (SLAMF1)、CD48 (SLAMF2)、淋巴球抗原9 (LY9或SLAMF3)、CD244 (2B4或SLAMF4)、CD84 (SLAMF5)、SLAM家族成員6 (SLAMF6或NTB-A)、SLAM家族成員7 (SLAMF7或CRACC)、CD27 (TNFRSF7)、信號素(semaphorin) 4D (SEMA4D或CD100)、及CD160 (NK1)、及gp120之第二表位。

【0025】本揭示內容亦提供包含本文所述抗體或抗原結合片段及醫藥上可接受之載劑的醫藥組合物。

【0026】在某些實施例中，醫藥組合物進一步包含用於治療HIV感染之第二藥劑(例如一或多種另外藥劑)。在一些情形下，醫藥組合物進一步包含潛伏逆轉劑(LRA)或免疫刺激劑，例如類鐸受體(toll-like receptor，TLR)之激動劑，例如TLR1、TLR2、TLR3、TLR4、TLR5、TLR6、TLR7、TLR8、TLR9及/或TLR10之激動劑。在一些實施例中，LRA係TLR7激動劑或TLR8激動劑。在某些情況下，TLR7激動劑係選自由以下組成之群：維沙莫特(vesatolimod)、咪喹莫特(imiquimod)及雷西莫特(resiquimod)。在一些實施例中，醫藥組合物進一步包含結合、抑制及/或中和HIV之抗體或其抗原結合片段。在一些實施例中，醫藥組合物進一步包含結合、抑制及/或中和HIV之第二抗體或其抗原結合片段，其中第二抗體或其抗原結合片段不與如本文所

述之抗體或抗原結合片段競爭結合至gp120。在一些實施例中，結合、抑制及/或中和HIV之第二抗體或其抗原結合片段與針對HIV之廣泛中和抗體(bNAb)競爭或包含針對HIV之廣泛中和抗體(bNAb)的VH及VL可變結構域。在一些實施例中，結合、抑制及/或中和HIV之第二抗體或其抗原結合片段結合至gp120之選自由以下組成之群之表位或區：(i) 第三可變環(V3)及/或包含N332寡甘露糖聚醣之高甘露糖區塊(patch)；(ii) 第二可變環(V2)及/或Env三聚體頂端；(iii) gp120/gp41界面；或(iv) gp120之沉默面。在一些實施例中，結合、抑制及/或中和HIV之第二抗體或其抗原結合片段結合至第三可變環(V3)及/或包含N332寡甘露糖聚醣之高甘露糖區塊中gp120之表位或區且與選自由以下組成之群之抗體競爭或包含該抗體之VH及VL區：GS-9722、PGT-121.60、PGT-121.66、PGT-121、PGT-122、PGT-123、PGT-124、PGT-125、PGT-126、PGT-128、PGT-130、PGT-133、PGT-134、PGT-135、PGT-136、PGT-137、PGT-138、PGT-139、10-1074、VRC24、2G12、BG18、354BG8、354BG18、354BG42、354BG33、354BG129、354BG188、354BG411、354BG426、DH270.1、DH270.6、PGDM12、VRC41.01、PGDM21、PCDN-33A、BF520.1及VRC29.03。在一些實施例中，結合、抑制及/或中和HIV之第二抗體或其抗原結合片段結合至第二可變環(V2)及/或Env三聚體頂端中gp120之表位或區且與選自由以下組成之群之抗體競爭或包含該抗體之VH及VL區：PG9、PG16、PGC14、PGG14、PGT-142、PGT-143、PGT-144、PGT-145、CH01、CH59、PGDM1400、CAP256、CAP256-VRC26.08、CAP256-VRC26.09、CAP256-VRC26.25、PCT64-24E及VRC38.01。在一些實施例中，第二抗體或抗原結合片段結合至

gp120/gp41界面中gp120之表位或區且與選自由以下組成之群之抗體競爭或包含該抗體之VH及VL區：PGT-151、CAP248-2B、35O22、8ANC195、ACS202、VRC34及VRC34.01。在一些實施例中，結合、抑制及/或中和HIV之第二抗體或其抗原結合片段結合至gp120沉默面之表位或區且與選自由以下組成之群之抗體競爭或包含該抗體之VH及VL區：VRC-PG05及SF12。在一些實施例中，結合、抑制及/或中和HIV之第二抗體或其抗原結合片段結合至近膜區(MPER)中gp41之表位或區。在一些實施例中，結合、抑制及/或中和HIV之第二抗體或其抗原結合片段結合至近膜區(MPER)中gp41之表位或區且與選自由以下組成之群之抗體競爭或包含該抗體之VH及VL區：10E8、10E8v4、10E8-5R-100cF、4E10、DH511.11P、2F5、7b2及LN01。在一些實施例中，結合、抑制及/或中和HIV之第二抗體或其抗原結合片段結合至gp41融合肽之表位或區且與選自由以下組成之群之抗體競爭或包含該抗體之VH及VL區：VRC34及ACS202。在一些實施例中，結合、抑制及/或中和HIV之第二或其抗原結合片段包含PGT121.60或PGT121.66之VH及VL。在某些情形下，結合、抑制及/或中和HIV之抗體或其抗原結合片段包含SEQ ID NO: 443及/或SEQ ID NO: 447之VH及VL。在其他情形下，結合、抑制及/或中和HIV之抗體或其抗原結合片段包含SEQ ID NO: 454內之VH及SEQ ID NO: 455內之VL。在又一些情形下，結合、抑制及/或中和HIV之抗體或其抗原結合片段包含SEQ ID NO: 454內之VH及SEQ ID NO: 456內之VL。

【0027】 在另一態樣中，本揭示內容提供編碼本文揭示之抗體或抗原結合片段的核酸、核苷酸或多核苷酸。在一些實施例中，該(等)核酸包含DNA、cDNA或mRNA。在一些實施例中，該(等)核酸編碼選自

由SEQ ID NO: 181-221及465-478組成之群且與選自由SEQ ID NO: 572-581組成之群之核酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、或100%一致性的VH；且編碼選自由SEQ ID NO: 222-311、479-516及569組成之群且與選自由SEQ ID NO: 582-595組成之群之核酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、或100%一致性的VL。在一些實施例中，該(等)核酸編碼選自由SEQ ID NO: 1-47及517-530組成之群且與選自由SEQ ID NO: 596-605組成之群之核酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、或100%一致性的HC；且編碼選自由SEQ ID NO: 48-136及531-567組成之群且與選自由SEQ ID NO: 606-619組成之群之核酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、或100%一致性的LC。在另一態樣中，本揭示內容提供表現包含可操作地連接至調節序列之該(等)核酸的一或多種表現載體。在一些實施例中，該(等)表現載體包含質體載體或病毒載體。進一步提供包含如本文所述之該(等)核酸或該(等)表現載體及醫藥上可接受之載劑的醫藥組合物。進一步提供包含如本文所述之該(等)核酸或該(等)表現載體的脂質奈米粒子。

【0028】 在又一態樣中，本揭示內容提供包含本文所述之該(等)核酸或該(等)表現載體的宿主細胞或宿主細胞群體。在一些實施例中，細胞或細胞群體包含真核細胞。在一些實施例中，細胞或細胞群體包含

哺乳動物細胞、人類細胞、倉鼠細胞、昆蟲細胞、植物細胞或酵母細胞。在一些實施例中，哺乳動物細胞係中國倉鼠卵巢(CHO)細胞或人類細胞(例如人類胚腎細胞或人類B細胞)。在一些實施例中，細胞主要唾液酸化所表現之抗原結合分子(例如表現之抗體或抗原結合片段)之可變結構域(Fv)中的N-連接醣基化位點。在一些實施例中，細胞唾液酸化所表現之抗體或抗原結合片段之可變結構域(Fv)中之至少50%、至少55%、至少60%、至少65%、至少70%、至少75%、至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%或更多N-連接醣基化位點。在一些實施例中，細胞唾液酸化所表現之抗體或抗原結合片段之VL中之至少50%、至少60%、至少70%、至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%或更多N-連接醣基化位點。在一些實施例中，根據Kabat編號在VL胺基酸位置72之天冬醯胺(N72)經唾液酸化。在一些實施例中，VL中之唾液酸化N-連接醣基化位點包含1至5個唾液酸殘基、例如1至4個唾液酸殘基、例如1至3個唾液酸殘基、例如1至2個唾液酸殘基。在一些實施例中，VL經N-乙醯基神經胺酸(NANA)唾液酸化。在一些實施例中，唾液酸殘基存於二天線結構中。在一些實施例中，唾液酸殘基存於複合N-連接聚醣結構中。在一些實施例中，唾液酸殘基存於雜合N-連接聚醣結構中。

【0029】在又一態樣中，本文提供本文所述抗體之抗原結合片段。在一些實施例中，抗原結合片段係選自由以下組成之群：scFv、$sc(Fv)_2$、Fab、$F(ab)_2$、Fab'、$F(ab')_2$、Facb或Fv片段。進一步提供包括如本文所述之抗原結合抗體片段的嵌合抗原受體(CAR)。在某些實施例中，CAR在T細胞、B細胞、巨噬細胞或NK細胞上表現。進一步提供

包括如本文所述之CAR的CAR T細胞。在某些實施例中，T細胞係CD4+ T細胞、CD8+ T細胞或其組合。在某些實施例中，細胞投與給個體。在某些實施例中，細胞係自體的。在某些實施例中，細胞係同種異體的。

【0030】 在又一態樣中，本文提供產生本文所述抗體或其抗原結合片段之方法。該方法涉及在細胞培養基中培養宿主細胞及自細胞培養基分離抗體或抗原結合片段。在某些情形下，該方法進一步涉及將抗體或抗原結合片段調配成適於投與人類個體之無菌醫藥組合物。

【0031】 在另一態樣中，本揭示內容提供治療或預防有需要之人類個體之HIV的方法。該方法涉及向個體投與有效量之本文所述抗體或其抗原結合片段或醫藥組合物。

【0032】 在一些實施例中，該方法進一步包含向個體投與用於治療HIV感染之第二藥劑(例如一或多種另外藥劑)。在一些情形下，該方法包含向個體投與TLR7激動劑。在某些情況下，TLR7激動劑係選自由以下組成之群：維沙莫特、咪喹莫特及雷西莫特。在一些實施例中，該方法進一步包含向個體投與結合、抑制及/或中和HIV之抗體或其抗原結合片段。在一些實施例中，該方法進一步包含投與結合、抑制及/或中和HIV之第二抗體或其抗原結合片段，其中該第二抗體或其抗原結合片段不與如本文所述之抗體或抗原結合片段競爭結合至gp120。在一些實施例中，結合、抑制及/或中和HIV之第二抗體或其抗原結合片段與針對HIV之廣泛中和抗體(bNAb)競爭或包含針對HIV之廣泛中和抗體(bNAb)的VH及VL可變結構域。在一些實施例中，結合、抑制及/或中和HIV之第二抗體或其抗原結合片段結合至gp120之選自由以下組成之群之表位或區：(i) 第三可變環(V3)及/或包含N332寡甘露糖聚醣之高

甘露糖區塊；(ii) 第二可變環(V2)及/或Env三聚體頂端；(iii) gp120/gp41界面；或(iv) gp120之沉默面。在一些實施例中，結合、抑制及/或中和HIV之第二抗體或其抗原結合片段結合至第三可變環(V3)及/或包含N332寡甘露糖聚醣之高甘露糖區塊中gp120之表位或區且與選自由以下組成之群之抗體的VH及VL區競爭或包含該抗體之VH及VL區　　：GS-9722、GS-9722、PGT-121.60、PGT-121.66、PGT-121、PGT-122、PGT-123、PGT-124、PGT-125、PGT-126、PGT-128、PGT-130、PGT-133、PGT-134、PGT-135、PGT-136、PGT-137、PGT-138、PGT-139、10-1074、VRC24、2G12、BG18、354BG8、354BG18、354BG42、354BG33、354BG129、354BG188、354BG411、354BG426、DH270.1、DH270.6、PGDM12、VRC41.01、PGDM21、PCDN-33A、BF520.1及VRC29.03。在一些實施例中，結合、抑制及/或中和HIV之第二抗體或其抗原結合片段結合至第二可變環(V2)及/或Env三聚體頂端中gp120之表位或區且與選自由以下組成之群之抗體的VH及VL區競爭或包含該抗體之VH及VL區：PG9、PG16、PGC14、PGG14、PGT-142、PGT-143、PGT-144、PGT-145、CH01、CH59、PGDM1400、CAP256、CAP256-VRC26.08、CAP256-VRC26.09、CAP256-VRC26.25、PCT64-24E及VRC38.01。在一些實施例中，第二抗體或抗原結合片段結合至gp120/gp41界面中gp120之表位或區且與選自由以下組成之群之抗體的VH及VL區競爭或包含該抗體之VH及VL區：PGT-151、CAP248-2B、35O22、8ANC195、ACS202、VRC34及VRC34.01。在一些實施例中，結合、抑制及/或中和HIV之第二抗體或其抗原結合片段結合至gp120沉默面之表位或區且與選自由以下組成之群之抗體的VH及VL區

競爭或包含該抗體之VH及VL區：VRC-PG05及SF12。在一些實施例中，結合、抑制及/或中和HIV之第二抗體或其抗原結合片段結合至近膜區(MPER)中gp41之表位或區。在一些實施例中，結合、抑制及/或中和HIV之第二抗體或其抗原結合片段結合至近膜區(MPER)中gp41之表位或區且與選自由以下組成之群之抗體競爭或包含該抗體之VH及VL區：10E8、10E8v4、10E8-5R-100cF、4E10、DH511.11P、2F5、7b2及LN01。在一些實施例中，結合、抑制及/或中和HIV之第二抗體或其抗原結合片段結合至gp41融合肽之表位或區且與選自由以下組成之群之抗體競爭或包含該抗體之VH及VL區：VRC34及ACS202。在一些實施例中，結合、抑制及/或中和HIV之第二或其抗原結合片段包含PGT121.60或PGT121.66之VH及VL。在某些情形下，結合、抑制及/或中和HIV之抗體或其抗原結合片段包含SEQ ID NO: 443及/或SEQ ID NO: 447之VH及VL。在其他情形下，結合、抑制及/或中和HIV之抗體或其抗原結合片段包含SEQ ID NO: 454內之VH及SEQ ID NO: 455內之VL。在又一些情形下，結合、抑制及/或中和HIV之抗體或其抗原結合片段包含SEQ ID NO: 454內之VH及SEQ ID NO: 456內之VL。在一些實施例中，如本文所述之抗體或抗原結合片段與抗HIV疫苗共投與人類個體。在各個實施例中，抗HIV疫苗包含病毒疫苗。在某些實施例中，病毒疫苗係來自選自由以下組成之群之病毒：沙粒病毒、腺病毒、痘病毒及棒狀病毒。

【0033】 在另一態樣中，本揭示內容係關於抑制有需要之人類個體之HIV的方法。該方法涉及向個體投與有效量之本文所述抗體或其抗原結合片段或醫藥組合物。

【0034】 除非另有定義，否則本文所用之所有技術及科學術語皆

具有與熟習本發明所屬領域技術者通常所理解之含義相同的含義。儘管在本發明之實踐或測試中可使用與本文所述之彼等方法及材料類似或等效之方法及材料，但下文闡述實例性方法及材料。本文所提及之所有出版物、專利申請案、專利及其他參考文獻之全部內容皆以引用方式併入本文中。倘若衝突，則以本說明案(包括定義)為準。該等材料、方法及實例僅係說明性的且並非意欲加以限制。

【圖式簡單說明】

【0035】 圖1圖解說明對抗體A-1應力組執行之ADCC報導基因分析之結果。在37℃下在pH 5.9下調配物緩衝液中應力處理6週之樣品顯示活性相對於其他樣品大大降低。

【0036】 圖2圖解說明在應力組中量測之W74a氧化隨時間之動力學。菱形：抗體A-1，25℃，pH 5.9。空心圓形：抗體A-1，37℃，pH 5.9。空心三角形：抗體A-1，37℃，pH 7.4。在37℃下經受應力達6週之pH 5.9樣品中的氧化程度最大，表明W74a氧化可為此條件下觀察到之功效損失之來源。除了在pH 5.9條件下觀察到之重鏈W74a之顯著氧化外，在來自細胞培養物之構築體上觀察到輕鏈位置N26處之去醯胺之穩定百分比，且在pH7.4培育條件下進一步增加。

【0037】 圖3圖解說明在應力組中量測之N26去醯胺隨時間之動力學(包括氧化成天冬胺酸、異天冬胺酸及天冬胺醯基琥珀醯亞胺中間體)。菱形：抗體A-1，25℃，pH 5.9。空心圓形：抗體A-1，37℃，pH 5.9。空心三角形：抗體A-1，37℃，pH 7.4。在37℃下經受應力6週之pH 7.4樣品的去醯胺程度最大。

【0038】 圖4圖解說明七個mAb變體之中和特性之點圖表示。針對用來自B亞型血漿病毒純系(n=133)及分離株(n=19)之Env假型化的一

組152個患者源HIV-1篩選抗體。每個點代表一種病毒之中和IC95。在括號(寬度/中位數IC95)內。寬度代表經中和之病毒%，其中IC95 ≤50 mg/mL。使用IC95 ≤50 mg/mL之病毒計算中值IC95值。(1) 抗體A-1 (89%/2.66 μg/mL)；(2) 1.1.90-1 (86%/2.59 μg/mL)；(3) 1.1.64-1 (92%/2.25 μg/mL)；(4) 1.1.10-1 (86%/1.93 μg/mL)；(5) 1.52.1-1 (83%/3.66 μg/mL)；(6) 1.52.90 (78%/4.42 μg/mL)；(7) 1.1.138-1 (82%/2.59 μg/mL)。

【0039】 圖5圖解說明三種mAb之中和特性之點圖表示。針對用來自B亞型血漿分離株之Env假型化的一組142個HIV-1篩選抗體。在括號(寬度/中值IC95)中，定義與圖4相同。每個點代表一種病毒之中和IC95。(1) 抗體A (87%/1.72 μg/mL)；(2) 抗體A-1 (87%/1.09 μg/mL)；(3) 1.52.64-1 (86%/2.0 μg/mL)。

【0040】 圖6圖解說明增強效應細胞殺死活性之IgG1 Fc突變(例如，根據EU編號(DEAL)，在239位之天冬胺酸、在332位之麩胺酸、在236位之丙胺酸、在330位之白胺酸)可縮短活體內血清半衰期。該縮短之血清半衰期可藉由亦在IgG1 Fc中納入增強FcRn結合之突變(例如，根據EU編號(LS)，在428位之白胺酸及在434位之絲胺酸)而部分或完全逆轉。繪示IV給予幼稚食蟹猴(n=3)之PGT121-WT (圓形)、PGT121-DEAL (三角形)、PGT121.60 (方形)、PGT121-LS (菱形)及A-1 (實心圓形)之闡釋性劑量正規化藥物動力學曲線。每一符號係量測之平均(± SD)血清濃度。

【0041】 圖7圖解說明在靜脈內(IV)給予幼稚雄性食蟹猴(n=3)後抗體A (三角形)、抗體A-1批次14(圓形)、抗體A-1批次22(空心三角形)、抗體A-1批次3(空心圓形)、抗體A-1批次10(方形)及抗體A-1批次

7(空心方形)之藥物動力學曲線。每一符號係量測之平均(± SD)血清濃度。

【0042】 圖8圖解說明在IV投與幼稚雄性及雌性食蟹猴(n=3)後三批1.52.64-1之平均血清(±SD)濃度-時間曲線。批次4 (空心方形)係以0.5 mg/k慢IV濃注投與，而批次18-PP21 (空心圓形)及批次14525-32 (圓形)係以30 mg/kg經由30分鐘IV輸注投與。每一符號係量測之平均(± SD)血清濃度。

【實施方式】

相關申請案之交叉參考

【0043】 本申請案主張於2018年7月3日提出申請之美國臨時申請案第62/693,642號及於2019年2月25日提出申請之美國臨時申請案第62/810,191號在35 U.S.C. § 119(e)下之權益，該等案件之全文出於所有目的以引用方式併入本文中。

序列表

【0044】 本申請案含有序列表，其以ASCII格式電子提交，且其全文以引用方式併入本文中。該ASCII拷貝創建於2019年6月10日，命名為1232_P2F_SL.txt且大小為899,216個位元組。

【0045】 本揭示內容提供靶向人類免疫缺陷病毒(HIV)之抗體。本文所述抗體結合至HIV包膜(Env)蛋白gp120 (gp120)。在一些實施例中，該等抗體係HIV中和抗體。在某些實施例中，該等抗體廣泛中和HIV。

【0046】 HIV-1係HIV之主要家族且佔全世界所有感染之95%。HIV-2主要見於幾個西非國家。HIV病毒分成特定組M、N、O及P，其中M係「主要」組且係全球大多數HIV/AIDS之原因。基於其遺傳序

列，M組進一步細分為在不同地理位置具有盛行率之亞型(亦稱為分支)。

【0047】 M組「亞型」或「分支」係由遺傳序列數據定義之HIV-1 M組之亞型。M組亞型之實例包括亞型A-K。已知一些亞型更具毒力或對不同藥物具有抗性。亦存在源自不同亞型病毒之間之重組之「循環重組形式」或CRF，其各自被給予一個數字。例如，CRF12_BF係亞型B與F之間之重組。亞型A在西非係常見的。亞型B在歐洲、美洲、日本、泰國及澳大利亞係主要形式。亞型C係在南非、東非、印度、尼泊爾及中國部分地區係主要形式。亞型D通常僅見於東非及中非。亞型E從未被鑑別為非重組，僅與亞型A重組為CRF01_AE。亞型F在中非、南美洲及東歐被發現。亞型G(及CRF02_AG)在非洲及中歐被發現。亞型H限於中非。亞型I最初用於闡述現在被認為係CRF04_cpx之菌株，其中cpx用於若干亞型之「複雜」重組。亞型J主要在北非、中非及西非以及加勒比地區被發現。亞型K限於剛果民主共和國及喀麥隆。該等亞型有時進一步分為子亞型，例如A1及A2或F1及F2。2015年，發現菌株CRF19 (即亞型A、亞型D及亞型G與亞型D蛋白酶之重組)在古巴與AIDS之快速進展強烈相關。

【0048】 本揭示內容提供靶向HIV感染細胞表面上之gp120多肽的中和抗體(例如廣泛中和Ab)。不受任何假設束縛，針對病毒套膜蛋白之中和抗體可藉由阻斷易感細胞之感染來提供抗HIV-1暴露之適應性免疫防禦。寬中和指示抗體可中和來自不同分支之HIV-1分離株。因此，本揭示內容所涵蓋之抗體具有交叉分支結合活性。

HIV包膜醣蛋白gp120

【0049】 包膜醣蛋白gp120 (或gp120)係作為HIV之外層之一部分

的120 kDa醣蛋白。其表現為由連接在一起之gp120之三個分子組成且由gp41蛋白錨定至膜的病毒膜刺突。Gp120對於病毒感染係必需的，此乃因其經由其與細胞表面受體之相互作用促進HIV進入宿主細胞。該等受體包括DC-SIGN、硫酸乙醯肝素蛋白多醣、CD4受體、C-C基序趨化介素受體5 (CCR5)及C-X-C基序趨化介素受體4 (CXCR4)。結合至輔助T細胞上之CD4誘導gp120及gp41中一系列構形變化之開始，此導致病毒與宿主細胞膜之融合。

【0050】 Gp120由HIV *env*基因編碼。*env*基因編碼約850個胺基酸之基因產物。初級*env*產物係蛋白gp160，其藉由細胞蛋白酶弗林蛋白酶(furin)在內質網中裂解成gp120 (約480個胺基酸)及gp41 (約345個胺基酸)。

【0051】 下文提供HIV純系WITO之實例性gp160多肽的胺基酸序列(V3超變環加粗且N332潛在N-連接醣基化位點加粗且加下劃線)：

MKVMGTKKNYQHLWRWGIMLLGMLMMSSAAEQLWVTVYY
GVPVWREANTTLFCASDAKAYDTEVHNVWATHACVPTDPNPQEV
VMGNVTEDFNMWKNNMVEQMHEDIISLWDQSLKPCVKLTPLCVT
LHCTNVTISSTNGSTANVTMREEMKNCSFNTTTVIRDKIQKEYALF
YKLDIVPIEGKNTNTSYRLINCNTSVITQACPKVSFEPIPIHYCAPAG
FAILKCNNKTFNGKGPCRNVSTVQCTHGIKPVVSTQLLLNGSLAEE
DIIIRSENFTNNGKNIIVQLKEPVKIN**CTRPGNNTRRSINIGPGRAF**
YATGAIIGDIRKAHC<u>**N**</u>ISTEQWNNTLTQIVDKLREQFGNKTIIFNQ
SSGGDPEVVMHTFNCGGEFFYCNSTQLFNSTWFNNGTSTWNSTAD
NITLPCRIKQVINMWQEVGKAMYAPPIRGQIDCSSNITGLILTRDGG
SNSSQNETFRPGGGNMKDNWRSELYKYKVVKIEPLGIAPTRAKRR

VVQREKRAVTLGAVFLGFLGAAGSTMGAASLTLTVQARLLLSGIV
QQQSNLLRAIEAQQHMLQLTVWGIKQLQARVLAIERYLKDQQLLG
IWGCSGKLICTTTVPWNTSWSNKSYDYIWNNMTWMQWEREIDNY
TGFIYTLIEESQNQQEKNELELLELDKWASLWNWFNITNWLWYIKL
FIMIIGGLVGLRIVCAVLSIVNRVRQGYSPLSFQTRLPNPRGPDRPEE
TEGEGGERDRDRSARLVNGFLAIIWDDLRSLCLFSYHRLRDLLLIV
ARVVEILGRRGWEILKYWWNLLKYWSQELKNSAVSLLNVTAIAVA
EGTDRVIEIVQRAVRAILHIPTRIRQGFERALL (SEQ ID NO: 343)

【0052】 下文提供實例性gp120多肽之胺基酸序列(V3超變環加粗且N332潛在N-連接醣基化位點加粗且加下劃線)：

AEQLWVTVYYGVPVWREANTTLFCASDAKAYDTEVHNVWA
THACVPTDPNPQEVVMGNVTEDFNMWKNNMVEQMHEDIISLWD
QSLKPCVKLTPLCVTLHCTNVTISSTNGSTANVTMREEMKNCSFNT
TTVIRDKIQKEYALFYKLDIVPIEGKNTNTSYRLINCNTSVITQACP
KVSFEPIPIHYCAPAGFAILKCNNKTFNGKGPCRNVSTVQCTHGIKP
VVSTQLLLNGSLAEEDIIIRSENFTNNGKNIIVQLKEPVKIN**CTRPG**
NNTRRSINIGPGRAFYATGAIIGDIRKAHC<u>**N**</u>ISTEQWNNTLTQIVD
KLREQFGNKTIIFNQSSGGDPEVVMHTFNCGGEFFYCNSTQLFNST
WFNNGTSTWNSTADNITLPCRIKQVINMWQEVGKAMYAPPIRGQI
DCSSNITGLILTRDGGSNSSQNETFRPGGGNMKDNWRSELYKYKV
VKIEPLGIAPTRAKRRVVQREKR (SEQ ID NO: 344)

【0053】 下文提供另一實例性gp120多肽之胺基酸序列(參見bioafrica.net/proteomics/ENV-GP120prot.html) (V3超變環加粗且N332潛在N-連接醣基化位點加粗且加下劃線)：

TEKLWVTVYY GVPVWKEATT TLFCASDAKA YDTEVHNVWA THACVPTDPN PQEVVLVNVT ENFNMWKNDM VEQMHEDIIS LWDQSLKPCV KLTPLCVSLK CTDLKNDTNT NSSSGRMIME KGEIKNCSFN ISTSIRGKVQ KEYAFFYKLD IIPIDNDTTS YKLTSCNTSV ITQACPKVSF EPIPIHYCAP AGFAILKCNN KTFNGTGPCT NVSTVQCTHG IRPVVSTQLL LNGSLAEEEV VIRSVNFTDN AKTIIVQLNT SVEIN**CTRPN NNTRKRIRIQ RGPGRAFVTI GKIGNMRQAH C**N**I**SRAKWNN TLKQIASKLR EQFGNNKTII FKQSSGGDPE IVTHSFNCGG EFFYCNSTQL FNSTWFNSTW STEGSNNTEG SDTITLPCRI KQIINMWQKV GKAMYAPPIS GQIRCSSNIT GLLLTRDGGN SNNESEIFRP GGGDMRDNWR SELYKYKVVK IEPLGVAPTK AKRRVVQREK R (SEQ ID NO: 345)

【0054】在獨立人類免疫缺陷病毒1型(HIV-1)分離株中、在較小程度上在來自同一患者之連續分離株中及甚至在單一患者分離株中的基因體多樣性係眾所周知之HIV-1特徵。儘管此序列異質性分佈在整個基因體中，但大部分異質性位於*env*基因中。來自若干不同分離株之預測之胺基酸序列之比較顯示，序列異質性聚集在表面醣蛋白gp120之五個超變區(命名為V1至V5)中。V3區儘管僅有35個胺基酸長，但展現相當大之序列可變性。儘管存在此可變性，但V3區包括介導與$CD4^+$細胞之相互作用的決定子。gp120可變性之增加導致更高程度之病毒複製，表明受多種HIV-1變體感染之個體之病毒適應性增加。不受理論束縛，較高程度之病毒複製可能係由於宿主免疫反應壓力(例如免疫反應逃逸)及/或適應每一個別宿主以最大化病毒複製之速率。潛在N-連接醣基化位

點(PNGS)之可變性亦導致病毒適應性增加。PNGS容許長鏈碳水化合物與gp120之高可變區結合。因此，*env*中PNGS之數量及精確位置可能會藉由對宿主免疫反應提供或多或少之敏感性、特別是中和抗體，影響病毒之適應性、或每一病毒變體之複製能力。

【0055】下文提供gp120之V3區之共有序列(Milich等人，*J. Virol.*, 67(9):5623-5634 (1993))：

CTRPNNNTRKSIHIGPGRAFYTTGEIIGDIRQAHC (SEQ ID NO: 346)。

【0056】本文所述抗體變體結合至HIV gp120之CD4結合位點(CD4bs)。CD4結合位點(CD4bs)涉及位於gp120之β1-α1、環D、β20-β21 (橋接片)及β24-α5內的結構保守位點，其決定CD4結合且參與CD4bs引導之抗體之表位(Qiao,等人，*Antiviral Res.* 2016年8月；132:252-61)。gp120之CD4bs形成由涉及一或多個選自以下之胺基酸殘基之抗CD4bs抗體識別的構形表位：Thr278、Asp279、Ala281、Thr283、Asp368、Trp427、Glu460、Ser461、Glu462、Leu452、Leu453及Arg476。胺基酸殘基及位置編號係參照HXB2亞型B HIV-1分離株，其對應於下文提供之NCBI Ref Seq No. NP_057856.1之殘基1-511。可促進gp120 CD4bs之殘基Thr278、Asp279、Asn280、Ala281、Thr283、Asp368、Trp427、Leu452、Leu453、Gly459、Glu464、Ser465、Glu466、Ile467、Gly472、Gly473及Arg476加粗且加下劃線：

MRVKEKYQHLWRWGWRWGTMLLGMLMICSATEKLWVTVY
YGVPVWKEATTTLFCASDAKAYDTEVHNVWATHACVPTDPNPQE
VVLVNVTENFNMWKNDMVEQMHEDIISLWDQSLKPCVKLTPLCV

SLKCTDLKNDTNTNSSSGRMIMEKGEIKNCSFNISTSIRGKVQKEY AFFYKLDIIPIDNDTTSYKLTSCNTSVITQACPKVSFEPIPIHYCAPA GFAILKCNNKTFNGTGPCTNVSTVQCTHGIRPVVSTQLLLNGSLAE EEVVIRSVNF**TDNA**K**T**IIVQLNTSVEINCTRPNNNTRKRIRIQRGPG RAFVTIGKIGNMRQAHCNISRAKWNNTLKQIASKLREQFGNNKTII FKQSSGG**D**PEIVTHSFNCGGEFFYCNSTQLFNSTWFNSTWSTEGSN NTEGSDTITLPCRIKQIINM**W**QKVGKAMYAPPISGQIRCSSNITG**LL** LTRDG**G**NSNN**ESEI**FRPG**GG**DM**R**DNWRSELYKYKVVKIEPLGVAP TKAKRRVVQREKR (SEQ ID NO: 571)。

【0057】 繪示促進gp120 CD4bs之胺基酸殘基的三維模型提供於以下中：例如，Canducci等人，*Retrovirology*. 2009年1月15日；6:4；Falkowska等人，*J Virol*. 2012年4月；86(8):4394-403；及Li等人，*J. Virol*. 2012年10月；86(20):11231-41；Gristick等人，*Nat Struct Mol Biol*. 2016年10月；23(10):906-915；Kwon等人，*Nat Struct Mol Biol*. 2015年7月；22(7):522-31；Liu等人，*Nat Struct Mol Biol*. 2017年4月；24(4):370-378；Chen等人，*Science*. 2009年11月20日；326(5956):1123-7及Lyumkis等人，*Science*. 2013年12月20日；342(6165):1484-90。在一些實施例中，本文所述抗體變體與抗CD4bs抗體b12、CH103、1NC9、12A12、VRC01、VRC07-523、N6、3BNC117、NIH45-46及/或PGV04 (VRC-PG04)競爭結合至gp120 CD4bs。在一些實施例中，本文所述抗體變體結合至與由抗CD4bs抗體b12、CH103、1NC9、12A12、VRC01、VRC07-523、N6、3BNC117、NIH45-46及/或PGV04 (VRC-PG04)結合之表位重疊或相同的表位。

抗gp120抗體

【0058】本揭示內容提供抗gp120抗體。在某些實施例中，該等抗體結合至細胞表面上表現之HIV-1抗原且消除或殺死感染之細胞。

【0059】在某些實施例中，該等抗體係靶向HIV-1之中和抗抗體(例如單株)。「中和抗體」係指中和HIV在宿主中及/或在活體外靶細胞中起始及/或永久化感染之能力者。本揭示內容提供中和單株人類抗體，其中抗體識別來自HIV之抗原，例如gp120多肽。在某些實施例中，「中和抗體」可抑制HIV-1病毒(例如SF162及/或JR-CSF)之進入，其中中和指數>1.5或>2.0 (Kostrikis LG等人，*J. Virol.*,70(1): 445-458 (1996))。

【0060】在一些實施例中，該等抗體係靶向HIV-1之廣泛中和抗體(例如單株)。「廣泛中和抗體」抑制中和分析中之一種以上之HIV-1病毒物種(來自不同分支及分支內之不同菌株)之抗體。廣泛中和抗體可中和至少2、3、4、5、6、7、8、9或更多不同之HIV-1菌株，該等菌株屬相同或不同分支。在一些實施例中，廣泛中和抗體可中和屬至少2、3、4、5或6種不同分支之多種HIV-1物種。在某些實施例中，抗體之抑制濃度可小於約0.0001 μg/mL、小於約0.001 μg/mL、小於約0.01 μg/mL、小於約0.1 μg/mL、小於約0.5 μg/mL、小於約1.0 μg/mL、小於約5 μg/mL、小於約10 μg/mL、小於約25 μg/mL、小於約50 μg/mL或小於約100 μg/mL以在中和分析中中和輸入病毒之約50%。

【0061】在某些實施例中，該等抗體顯示廣泛之強效活性且屬高活性激動抗CD4結合位點抗體(HAAD)之組。該等抗體模擬宿主受體CD4蛋白與gp120之結合。在某些實施例中，抗體或其抗原結合片段在其重鏈可變區中包含在50位之色胺酸；在58位之天冬醯胺；在71位之

精胺酸；及在100位之色胺酸(位置根據Kabat編號)。在某些實施例中，抗體或其抗原結合片段在其輕鏈可變區中包含在67位之色胺酸或苯丙胺酸；及在96位之麩胺酸(位置根據Kabat編號)。在某些實施例中，抗體或其抗原結合片段在其輕鏈可變區中包含在67位之色胺酸及在96位之麩胺酸(位置根據Kabat編號)。在某些情況下，輕鏈可變區包括框架區3中之N-連接醣基化位點。在某些實施例中，抗體或其抗原結合片段在其重鏈可變區中包含在50位之色胺酸；在58位之天冬醯胺；在71位之精胺酸；及在100位之色胺酸；且在其輕鏈可變區中包含在67位之色胺酸或苯丙胺酸；及在96位之麩胺酸(位置根據Kabat編號)。在某些實施例中，抗體或其抗原結合片段在其重鏈可變區中包含在50位之色胺酸；在58位之天冬醯胺；在71位之精胺酸；及在100位之色胺酸；且在其輕鏈可變區中包含在67位之色胺酸及在96位之麩胺酸(位置根據Kabat編號)。在某些實施例中，抗體或其抗原結合片段包含具有以下中所述之序列之VH CDR及VL CDR：分別地SEQ ID NO.: 137、138、139、140、141及142，且在其重鏈可變區中進一步包含在50位之色胺酸；在58位之天冬醯胺；在71位之精胺酸；及在100位之色胺酸；且在其輕鏈可變區中包含在67位之色胺酸及在96位之麩胺酸(位置根據Kabat編號)。在某些實施例中，抗體或其抗原結合片段包含具有以下中所述之序列之VH CDR及VL CDR：分別地SEQ ID NO.: 137、138、139、140、141及142，且在其輕鏈可變區中進一步包含在67位之色胺酸及在96位之麩胺酸(位置根據Kabat編號)。在某些實施例中，抗體或其抗原結合片段包含具有以下中所述之序列之VH CDR及VL CDR：分別地SEQ ID NO.: 137、138、139、140、141及142，且在其重鏈可變區中進一步包含在50位之色胺酸；在58位之天冬醯胺；在71位之精胺

酸；及在100位之色胺酸；且在其輕鏈可變區中包含在67位之色胺酸及在96位之麩胺酸(位置根據Kabat編號)且在其輕鏈可變區中包含在67位之色胺酸及在96位之麩胺酸(位置根據Kabat編號)。

【0062】 實例性HAAD包括本文揭示之抗體以及以下中所揭示之彼等：Scheid等人，*Science*, 333:1633-1637 (2011)；及West等人，*Proc. Natl. Acad. Sci. USA*, E2083-E2090 (2012)。研究已顯示，抗體A及抗體B屬來自一個患者之相同B細胞譜系且在其輕鏈可變區中有四個胺基酸位置不同且在在其重鏈可變區中有十個胺基酸位置不同(Scheid等人，2011)。實例性抗體包括(但不限於)抗體A、抗體B及包含抗體A之重鏈及抗體B之輕鏈的抗體。

【0063】 表I提供根據Kabat、Chothia及IMGT定義之抗體A及抗體B之重鏈可變區及輕鏈可變區的互補決定區(CDR)。

【0064】 表I. 抗體A及抗體B之CDR

抗體A CDR	**Kabat**	**Chothia**	**IMGT**
VH-CDR1	DYFIH (SEQ ID NO: 137)	GYNIRDY (SEQ ID NO: 143)	GYNIRDYF (SEQ ID NO: 149)
VH-CDR2	WINPKTGQPNNPRQFQG (SEQ ID NO: 138)	PKTG (SEQ ID NO: 144)	INPKTGQP (SEQ ID NO: 150)
VH-CDR3	QRSDYWDFDV (SEQ ID NO: 139)	RSDYWDFD (SEQ ID NO: 145)	ARQRSDYWDFDV (SEQ ID NO: 151)
VL-CDR1	QANGYLN (SEQ ID NO: 140)	NGY (SEQ ID NO: 146)	GY (SEQ ID NO: 152)

抗體A CDR	Kabat	Chothia	IMGT
VL-CDR2	DGSKLER (SEQ ID NO: 141)	DGS (SEQ ID NO: 147)	DGS (SEQ ID NO: 147)
VL-CDR3	QVYEF (SEQ ID NO: 142)	YE (SEQ ID NO: 148)	QVYEF (SEQ ID NO: 142)

抗體B CDR	Kabat	Chothia	IMGT
VH-CDR1	DHFIH (SEQ ID NO: 153)	GYKISDH (SEQ ID NO: 155)	GYKISDHF (SEQ ID NO: 157)
VH-CDR2	WINPKTGQPNNPRQFQG (SEQ ID NO: 138)	PKTG (SEQ ID NO: 144)	INPKTGQP (SEQ ID NO: 150)
VH-CDR3	QRSDFWDFDV (SEQ ID NO: 154)	RSDFWDFD (SEQ ID NO: 156)	ARQRSDFWDFDV (SEQ ID NO: 158)
VL-CDR1	QANGYLN (SEQ ID NO: 140)	NGY (SEQ ID NO: 146)	GY (SEQ ID NO: 152)
VL-CDR2	DGSKLER (SEQ ID NO: 141)	DGS (SEQ ID NO: 147)	DGS (SEQ ID NO: 147)
VL-CDR3	QVYEF (SEQ ID NO: 142)	YE (SEQ ID NO: 148)	QVYEF (SEQ ID NO: 142)

【0065】 下文提供本申請案之實例性抗體的互補決定區(CDR)：

根據Kabat定義(表II及V)、Chothia定義(表III及VI)及IMGT定義(表IV及VII)之CDR。本申請案涵蓋下文列示之包含CDR之抗體。

【0066】在某些實施例中，本揭示內容之抗gp120抗體或其gp120結合片段除了包括根據下文提供之Kabat、Chothia或IMGT定義之抗體A或抗體B的六個CDR外，亦包括在Kabat位置74a之色胺酸(W)或苯丙胺酸(F)、在Kabat位置74b之天冬胺酸(D)、在Kabat位置74c之苯丙胺酸(F)及在Kabat位置74d之天冬胺酸(D)；即，其VH或重鏈結構域之框架區3中之WDFD (SEQ ID NO: 453)或FDFD (SEQ ID NO: 627)序列。在某些實施例中，本揭示內容之抗gp120抗體或其gp120結合片段除了包括抗體A之六個CDR之外，亦包括在Kabat位置74a之苯丙胺酸(F)、在Kabat位置74b之天冬胺酸(D)、在Kabat位置74c之苯丙胺酸(F)及在Kabat位置74d之天冬胺酸(D)；即，其VH或重鏈結構域之框架區3中之FDFD (SEQ ID NO: 627)序列。結晶學結構已顯示，在VH Kabat位置編號74a、74b、74c及74d之框架區3形成本文所述抗體變體之互補位的部分，從而直接接觸抗原靶標gp120。參見(例如) Lee等人，*Immunity* (2017) 46(4): 690-702 (圖1G，鑑別殘基W71d)；Klein等人，*Cell*. (2013) 153(1):126-38 (圖4及5)；及Zhou等人，(2013) *Immunity* (2013) 39 245-258 (表1)；5V8L、5V8M、4JPV及4LSV之結晶結構之帶狀圖可參閱rcsb.org。

表II. 抗體之CDR定義(Kabat)					
VH-CDR1	**VH-CDR2**	**VH-CDR3**	**VL-CDR1**	**VL-CDR2**	**VL-CDR3**
DYFIH (SEQ ID NO: 137)	WINPKTGQPNNPRQFQG (SEQ ID NO: 138)	QRSDYWDFDV (SEQ ID NO: 139)	QANGYLN (SEQ ID NO: 140)	DGSKLER (SEQ ID NO: 141)	QVYEF (SEQ ID NO: 142)
DYFMH (SEQ ID NO: 159)	WINPKTGQPNNPRQFQG (SEQ ID NO: 138)	QRSDYWDFDV (SEQ ID NO: 139)	QANGYLN (SEQ ID NO: 140)	DGSKLER (SEQ ID NO: 141)	QVYEF (SEQ ID NO: 142)
DYFIH (SEQ ID NO: 137)	WINPKWGQPNNPRQFQG (SEQ ID NO: 160)	QRSDYWDFDV (SEQ ID NO: 139)	QANGYLN (SEQ ID NO: 140)	DGSKLER (SEQ ID NO: 141)	QVYEF (SEQ ID NO: 142)
DYFIH (SEQ ID NO: 137)	WINPKGGQPNNPRQFQG (SEQ ID NO: 161)	QRSDYWDFDV (SEQ ID NO: 139)	QANGYLN (SEQ ID NO: 140)	DGSKLER (SEQ ID NO: 141)	QVYEF (SEQ ID NO: 142)
DYFIH (SEQ ID NO: 137)	WINPKAGQPNNPRQFQG (SEQ ID NO: 162)	QRSDYWDFDV (SEQ ID NO: 139)	QANGYLN (SEQ ID NO: 140)	DGSKLER (SEQ ID NO: 141)	QVYEF (SEQ ID NO: 142)

表II. 抗體之CDR定義(Kabat)					
VH-CDR1	**VH-CDR2**	**VH-CDR3**	**VL-CDR1**	**VL-CDR2**	**VL-CDR3**
DYFIH (SEQ ID NO: 137)	WINPKHGQPNNPRQFQG (SEQ ID NO: 163)	QRSDYWDFDV (SEQ ID NO: 139)	QANGYLN (SEQ ID NO: 140)	DGSKLER (SEQ ID NO: 141)	QVYEF (SEQ ID NO: 142)
DYFIH (SEQ ID NO: 137)	WINPKTGQPNNPRQFQG (SEQ ID NO: 138)	QRTDYWDFDV (SEQ ID NO: 164)	QANGYLN (SEQ ID NO: 140)	DGSKLER (SEQ ID NO: 141)	QVYEF (SEQ ID NO: 142)
DYFMH (SEQ ID NO: 159)	WINPKTGQPNNPRQFQG (SEQ ID NO: 138)	QRTDYWDFDV (SEQ ID NO: 164)	QANGYLN (SEQ ID NO: 140)	DGSKLER (SEQ ID NO: 141)	QVYEF (SEQ ID NO: 142)
DYFIH (SEQ ID NO: 137)	WINPKTGQPNNPRQFQG (SEQ ID NO: 138)	QRSDYWDFDV (SEQ ID NO: 139)	QANGYLN (SEQ ID NO: 140)	DASKLER (SEQ ID NO: 165)	QVYEF (SEQ ID NO: 142)
DYFIH (SEQ ID NO: 137)	WINPKTGQPNNPRQFQG (SEQ ID NO: 138)	QRSDYWDFDV (SEQ ID NO: 139)	QANGYLN (SEQ ID NO: 140)	DGSNLER (SEQ ID NO: 166)	QVYEF (SEQ ID NO: 142)

表II. 抗體之CDR定義(Kabat)					
VH-CDR1	**VH-CDR2**	**VH-CDR3**	**VL-CDR1**	**VL-CDR2**	**VL-CDR3**
DYFIH (SEQ ID NO: 137)	WINPKTGQPNNPRQFQG (SEQ ID NO: 138)	QRSDYWDFDV (SEQ ID NO: 139)	QANGYLN (SEQ ID NO: 140)	DGSKLET (SEQ ID NO: 167)	QVYEF (SEQ ID NO: 142)
DYFIH (SEQ ID NO: 137)	WINPKTGQPNNPRQFQG (SEQ ID NO: 138)	QRSDYWDFDV (SEQ ID NO: 139)	QANGYLN (SEQ ID NO: 140)	DASNLER (SEQ ID NO: 168)	QVYEF (SEQ ID NO: 142)
DHFIH (SEQ ID NO: 153)	WINPKTGQPNNPRQFQG (SEQ ID NO: 138)	QRSDYWDFDV (SEQ ID NO: 139)	QANGYLN (SEQ ID NO: 140)	DGSKLER (SEQ ID NO: 141)	QVYEF (SEQ ID NO: 142)
DYFIH (SEQ ID NO: 137)	WINPKTGQPNNPRQFQG (SEQ ID NO: 138)	QRSDFWDFDV (SEQ ID NO: 154)	QANGYLN (SEQ ID NO: 140)	DGSKLER (SEQ ID NO: 141)	QVYEF (SEQ ID NO: 142)
DYFIH (SEQ ID NO: 137)	WINPKTGQPNNPRQFQG (SEQ ID NO: 138)	QRSDFWDFDV (SEQ ID NO: 154)	QATGYLN (SEQ ID NO: 570)	DGSKLER (SEQ ID NO: 141)	QVYEF (SEQ ID NO: 142)

表III. 抗體之CDR定義(Chothia)					
VH-CDR1	**VH-CDR2**	**VH-CDR3**	**VL-CDR1**	**VL-CDR2**	**VL-CDR3**
GYNIRDY (SEQ ID NO:143)	PKTG (SEQ ID NO: 144)	RSDYWDFD (SEQ ID NO: 145)	NGY (SEQ ID NO: 146)	DGS (SEQ ID NO: 147)	YE (SEQ ID NO: 148)
GYNIRDY (SEQ ID NO:143)	PKWG (SEQ ID NO: 169)	RSDYWDFD (SEQ ID NO: 145)	NGY (SEQ ID NO: 146)	DGS (SEQ ID NO: 147)	YE (SEQ ID NO: 148)
GYNIRDY (SEQ ID NO: 143)	PKGG (SEQ ID NO: 170)	RSDYWDFD (SEQ ID NO: 145)	NGY (SEQ ID NO: 146)	DGS (SEQ ID NO: 147)	YE (SEQ ID NO: 148)
GYNIRDY (SEQ ID NO: 143)	PKAG (SEQ ID NO: 171)	RSDYWDFD (SEQ ID NO: 145)	NGY (SEQ ID NO: 146)	DGS (SEQ ID NO: 147)	YE (SEQ ID NO: 148)
GYNIRDY (SEQ ID NO: 143)	PKHG (SEQ ID NO: 172)	RSDYWDFD (SEQ ID NO: 145)	NGY (SEQ ID NO: 146)	DGS (SEQ ID NO: 147)	YE (SEQ ID NO: 148)
GYNIRDY (SEQ ID NO: 143)	PKTG (SEQ ID NO: 144)	RTDYWDFD (SEQ ID NO: 173)	NGY (SEQ ID NO: 146)	DGS (SEQ ID NO: 147)	YE (SEQ ID NO: 148)
GYNIRDY (SEQ ID NO: 143)	PKTG (SEQ ID NO: 144)	RSDYWDFD (SEQ ID NO: 145)	NGY (SEQ ID NO: 146)	DAS (SEQ ID NO: 174)	YE (SEQ ID NO: 148)
GYKIRDY (SEQ ID NO: 459)	PKTG (SEQ ID NO: 144)	RSDYWDFD (SEQ ID NO: 145)	NGY (SEQ ID NO: 146)	DGS (SEQ ID NO: 147)	YE (SEQ ID NO: 148)
GYNISDY (SEQ ID NO: 460)	PKTG (SEQ ID NO: 144)	RSDYWDFD (SEQ ID NO: 145)	NGY (SEQ ID NO: 146)	DGS (SEQ ID NO: 147)	YE (SEQ ID NO: 148)
GYNIRDH	PKTG	RSDYWDFD	NGY	DGS	YE

表III. 抗體之CDR定義(Chothia)					
VH-CDR1	**VH-CDR2**	**VH-CDR3**	**VL-CDR1**	**VL-CDR2**	**VL-CDR3**
(SEQ ID NO: 461)	(SEQ ID NO: 144)	(SEQ ID NO: 145)	(SEQ ID NO: 146)	(SEQ ID NO: 147)	(SEQ ID NO: 148)
GYNIRDY (SEQ ID NO: 143)	PKTG (SEQ ID NO: 144)	RSDFWDFD (SEQ ID NO: 156)	NGY (SEQ ID NO: 146)	DGS (SEQ ID NO: 147)	YE (SEQ ID NO: 148)

表IV. 抗體之CDR定義(IMGT)					
VH-CDR1	**VH-CDR2**	**VH-CDR3**	**VL-CDR1**	**VL-CDR2**	**VL-CDR3**
GYNIRDYF (SEQ ID NO: 149)	INPKTGQP (SEQ ID NO: 150)	ARQRSDYWDFDV (SEQ ID NO: 151)	GY (SEQ ID NO: 152)	DGS (SEQ ID NO: 147)	QVYEF (SEQ ID NO: 142)
GYNIRDYF (SEQ ID NO: 149)	INPKWGQP (SEQ ID NO: 175)	ARQRSDYWDFDV (SEQ ID NO: 151)	GY (SEQ ID NO: 152)	DGS (SEQ ID NO: 147)	QVYEF (SEQ ID NO: 142)
GYNIRDYF (SEQ ID NO: 149)	INPKGGQP (SEQ ID NO: 176)	ARQRSDYWDFDV (SEQ ID NO: 151)	GY (SEQ ID NO: 152)	DGS (SEQ ID NO: 147)	QVYEF (SEQ ID NO: 142)
GYNIRDYF (SEQ ID NO: 149)	INPKAGQP (SEQ ID NO: 177)	ARQRSDYWDFDV (SEQ ID NO: 151)	GY (SEQ ID NO: 152)	DGS (SEQ ID NO: 147)	QVYEF (SEQ ID NO: 142)
GYNIRDYF (SEQ ID NO: 149)	INPKHGQP (SEQ ID NO: 178)	ARQRSDYWDFDV (SEQ ID NO: 151)	GY (SEQ ID NO:	DGS (SEQ ID NO:	QVYEF (SEQ ID NO:

表IV. 抗體之CDR定義(IMGT)					
VH-CDR1	**VH-CDR2**	**VH-CDR3**	**VL-CDR1**	**VL-CDR2**	**VL-CDR3**
			152)	147)	142)
GYNIRDYF (SEQ ID NO: 149)	INPKTGQP (SEQ ID NO: 150)	ARQRTDYWDFDV (SEQ ID NO: 179)	GY (SEQ ID NO: 152)	DGS (SEQ ID NO: 147)	QVYEF (SEQ ID NO: 142)
GYNIRDYF (SEQ ID NO: 149)	INPKTGQP (SEQ ID NO: 150)	ARQRSDYWDFDV (SEQ ID NO: 151)	GY (SEQ ID NO: 152)	DAS (SEQ ID NO: 180)	QVYEF (SEQ ID NO: 142)
GYKIRDYF (SEQ ID NO: 462)	INPKTGQP (SEQ ID NO: 150)	ARQRSDYWDFDV (SEQ ID NO: 151)	GY (SEQ ID NO: 152)	DGS (SEQ ID NO: 147)	QVYEF (SEQ ID NO: 142)
GYNISDYF (SEQ ID NO: 463)	INPKTGQP (SEQ ID NO: 150)	ARQRSDYWDFDV (SEQ ID NO: 151)	GY (SEQ ID NO: 152)	DGS (SEQ ID NO: 147)	QVYEF (SEQ ID NO: 142)
GYNIRDHF (SEQ ID NO: 464)	INPKTGQP (SEQ ID NO: 150)	ARQRSDYWDFDV (SEQ ID NO: 151)	GY (SEQ ID NO: 152)	DGS (SEQ ID NO: 147)	QVYEF (SEQ ID NO: 142)
GYNIRDYF (SEQ ID NO: 149)	INPKTGQP (SEQ ID NO: 150)	ARQRSDFWDFDV (SEQ ID NO: 158)	GY (SEQ ID NO: 152)	DGS (SEQ ID NO: 147)	QVYEF (SEQ ID NO: 142)

表V. 抗體之CDR定義(Kabat)					
VH-CDR1	**VH-CDR2**	**VH-CDR3**	**VL-CDR1**	**VL-CDR2**	**VL-CDR3**
DYFIH (SEQ ID NO: 137)	WINPKTG QPNNPRQF QG (SEQ ID NO: 138)	QRSDYWDFDV (SEQ ID NO: 139)	QANGYL N (SEQ ID NO: 140)	DGSKLE R (SEQ ID NO: 141)	QVYEF (SEQ ID NO: 142
DHFIH (SEQ ID NO: 153)	WINPKTG QPNNPRQF QG (SEQ ID NO: 138)	QRSDYWDFDV (SEQ ID NO: 139)	QANGYL N (SEQ ID NO: 140)	DGSKLE R (SEQ ID NO: 141)	QVYEF (SEQ ID NO: 142

表VI. 抗體之CDR定義(Chothia)					
VH-CDR1	**VH-CDR2**	**VH-CDR3**	**VL-CDR1**	**VL-CDR2**	**VL-CDR3**
GYNIRDY (SEQ ID NO: 143)	PKTG (SEQ ID NO: 144)	RSDYWDFD (SEQ ID NO: 145)	NGY (SEQ ID NO: 146)	DGS (SEQ ID NO: 147)	YE (SEQ ID NO: 148)
GYKIRDH (SEQ ID NO: 457)	PKTG (SEQ ID NO: 144)	RSDYWDFD (SEQ ID NO: 145)	NGY (SEQ ID NO: 146)	DGS (SEQ ID NO: 147)	YE (SEQ ID NO: 148)

表VII. 抗體之CDR定義(IMGT)					
VH-CDR1	**VH-CDR2**	**VH-CDR3**	**VL-CDR1**	**VL-CDR2**	**VL-CDR3**
GYNIRDYF (SEQ ID NO: 149)	INPKTGQP (SEQ ID NO: 150)	ARQRSDYWDFDV (SEQ ID NO: 151)	GY (SEQ ID NO: 152)	DGS (SEQ ID NO: 147)	QVYEF (SEQ ID NO: 142)
GYKIRDHF (SEQ ID NO: 458)	INPKTGQP (SEQ ID NO: 150)	ARQRSDYWDFDV (SEQ ID NO: 151)	GY (SEQ ID NO: 152)	DGS (SEQ ID NO: 147)	QVYEF (SEQ ID NO: 142)

【0067】 本申請案涵蓋包括本文揭示之抗體(例如，參見表I-VII)中之每一者之六個CDR的抗gp120抗體或其gp120結合片段。在某些實施例中，該等抗gp120抗體或其gp120結合片段中之一或多者亦包括在Kabat位置74a之色胺酸(W)或苯丙胺酸(F)、在Kabat位置74b之天冬胺酸(D)、在Kabat位置74c之苯丙胺酸(F)及在Kabat位置74d之天冬胺酸(D)。應理解，本揭示內容亦涵蓋根據本文揭示之抗HIV抗體之任何其他CDR定義(例如Honegger定義、增強之Chothia定義、AbM定義、contact定義，例如參見www.bioinf.org.uk/abs/#cdrdef)包含CDR的抗gp120抗體或其gp120結合片段。在某些情況下，與抗體A及/或抗體B相比，本文揭示之抗gp120抗體或gp120結合片段具有HIV-1感染之靶CD4 T細胞之改良之殺死活性。在某些實施例中，與抗體A及/或抗體B相比，包含分別包含SEQ ID NO.: 477及278中所述之胺基酸序列之VH及VL、或分別包含SEQ ID NO.: 529及103中所述之胺基酸序列之HC及LC的抗體具有HIV-1感染之靶CD4 T細胞之改良之殺死活性。在某些情況下，在NK細胞介導之HIV感染細胞(例如HIV-1感染細胞)之殺死的ADCC分析中，本文揭示之抗gp120抗體或gp120結合片段具有0.05至2 μg/mL之EC_{50}。在某些情況下，本文揭示之抗gp120抗體或gp120結合

片段具有0.05至1.5 μg/mL之EC_{50}。在某些情況下，本文揭示之抗gp120抗體或gp120結合片段具有0.05至1.0 μg/mL之EC_{50}。在某些情況下，本文揭示之抗gp120抗體或gp120結合片段具有0.05至0.85 μg/mL之EC_{50}。在某些情況下，本文揭示之抗gp120抗體或gp120結合片段具有0.05至0.75 μg/mL之EC_{50}。在某些情況下，本文揭示之抗gp120抗體或gp120結合片段具有0.05至0.5 μg/mL之EC_{50}。在某些情況下，本文揭示之抗gp120抗體或gp120結合片段具有0.05至0.3 μg/mL之EC_{50}。在某些情況下，本文揭示之抗gp120抗體或gp120結合片段具有0.07至0.2 μg/mL之EC_{50}。

【0068】本申請案之實例性抗體之重鏈可變區(VH)及輕鏈可變區(VL)的胺基酸序列分別提供於表VIII及IX中。亦包括本揭示內容之一些分析中所用之對照(例如抗體C及抗體D)之VH及VL的胺基酸序列。

表VIII. VH序列

SEQ ID NO	名稱	重鏈可變區(VH)胺基酸序列
181	C	QVRLSQSGGQMKKPGDSMRISCRASGYEFINCPINWI RLAPGKRPEWMGWMKPRWGAVSYARQLQGRVTMTR DMYSETAFLELRSLTSDDTAVYFCTRGKYCTARDYYN WDFEHWGQGTPVTVSS
182	A-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHW WRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTR HASWDFDTFSFYMDLKALRSDDTAVYFCARQRSDYW DFDVWGSGTQVTVSS

表VIII. VH序列		
SEQ ID NO	**名稱**	**重鏈可變區(VH)胺基酸序列**
183	D-1	QVRLSQSGGQMKKPGDSMRISCRASGYEFINCPINWI RLAPGKRPEWMGWMKPRHGAVSYARQLQGRVTMTR DMYSETAFLELRSLTSDDTAVYFCTRGKYCTARDYYN WDFEHWGQGTPVTVSS
184	1v2-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHW WRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTR HASWDFDTYSFYMDLKALRSDDTAVYFCARQRSDY WDFDVWGSGTQVTVSS
185	1.2.1-1	QVQLLQSGAEVKKPGASVRVSCEASGYNIRDYFIHW WRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTR HASWDFDTFSFYMDLKALRSDDTAVYFCARQRSDYW DFDVWGSGTMVTVSS
186	1.3.1-1	QVSLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHWW RQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRH ASWDFDTFSFYMDLKALRSDDTAVYFCARQRSDYWD FDVWGSGTQVTVSS
187	1.4.1-1	QVQLVQSGAAVTKPGASVRVSCEASGYNIRDYFIHW WRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTR HASWDFDTFSFYMDLKALRSDDTAVYFCARQRSDYW DFDVWGSGTQVTVSS
188	1.5.1-1	QVQLVQSGAAVTKPGASVRVSCKASGYNIRDYFIHW WRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTR HASWDFDTFSFYMDLKALRSDDTAVYFCARQRSDYW DFDVWGSGTQVTVSS

表VIII. VH序列		
SEQ ID NO	**名稱**	**重鏈可變區(VH)胺基酸序列**
189	1.6.1-1	QVQLLQSGAEVTKPGASVRVSCEASGYNIRDYFIHW WRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTR HASWDFDTFSFYMDLKALRSDDTAVYFCARQRSDYW DFDVWGSGTQVTVSS
190	1.7.1-1	QVQLLQSGAEVKKPGASVRVSCEASGYNIRDYFIHW WRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTR HASWDFDTFSFYMDLKALRSDDTAVYFCARQRSDYW DFDVWGSGTQVTVSS
191	1.8.1-1	QVQLVQSGAEVTKPGASVRVSCEASGYNIRDYFIHW WRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTR HASWDFDTFSFYMDLKALRSDDTAVYFCARQRSDYW DFDVWGSGTQVTVSS
192	1.9.1-1	QVQLVQSGAEVKKPGASVRVSCKASGYNIRDYFIHW WRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTR HASWDFDTFSFYMDLKALRSDDTAVYFCARQRSDYW DFDVWGSGTQVTVSS
193	1.10.1-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFMHW WRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTR HASWDFDTFSFYMDLKALRSDDTAVYFCARQRSDYW DFDVWGSGTQVTVSS
194	1.11.1-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFMHW WRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTR HASWDFDTFSAYMDLKALRSDDTAVYFCARQRSDYW DFDVWGSGTQVTVSS

表VIII. VH序列		
SEQ ID NO	**名稱**	**重鏈可變區(VH)胺基酸序列**
195	1.15.1-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHW WRQAPGQGLQWVGWINPKWGQPNNPRQFQGRVSLT RHASWDFDTFSFYMDLKALRSDDTAVYFCARQRSDY WDFDVWGSGTQVTVSS
196	1.16.1-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHW WRQAPGQGLQWVGWINPKGGQPNNPRQFQGRVSLT RHASWDFDTFSFYMDLKALRSDDTAVYFCARQRSDY WDFDVWGSGTQVTVSS
197	1.17.1-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHW WRQAPGQGLQWVGWINPKAGQPNNPRQFQGRVSLT RHASWDFDTFSFYMDLKALRSDDTAVYFCARQRSDY WDFDVWGSGTQVTVSS
198	1.18.1-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHW WRQAPGQGLQWVGWINPKHGQPNNPRQFQGRVSLT RHASWDFDTFSFYMDLKALRSDDTAVYFCARQRSDY WDFDVWGSGTQVTVSS
199	1.19.1-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHW WRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVTLTR HASWDFDTFSFYMDLKALRSDDTAVYFCARQRSDYW DFDVWGSGTQVTVSS
200	1.20.1-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHW WRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVTMT RHASWDFDTFSFYMDLKALRSDDTAVYFCARQRSDY WDFDVWGSGTQVTVSS

表VIII. VH序列		
SEQ ID NO	**名稱**	**重鏈可變區(VH)胺基酸序列**
201	1.21.1-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHW WRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTR DASWDFDTFSFYMDLKALRSDDTAVYFCARQRSDYW DFDVWGSGTQVTVSS
202	1.22.1-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHW WRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTR HASTFSFYMDLKALRSDDTAVYFCARQRSDYWDFDV WGSGTQVTVSS
203	1.24.1-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHW WRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTR HASWDFDTFSFSMDLKALRSDDTAVYFCARQRSDYW DFDVWGSGTQVTVSS
204	1.25.1-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHW WRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTR HASWDFDTFSFYMDLSRLRSDDTAVYFCARQRSDYW DFDVWGSGTQVTVSS
205	1.26.1-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHW WRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTR HASWDFDTFSFYMDLKALRSDDTATYFCARQRSDYW DFDVWGSGTQVTVSS
206	1.27.1-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHW WRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTR HASWDFDTFSFYMDLKALRSDDTAVYFCARQRTDYW DFDVWGSGTQVTVSS

表VIII. VH序列		
SEQ ID NO	**名稱**	**重鏈可變區(VH)胺基酸序列**
207	1.28.1-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHW WRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTR HASWDFDTFSFYMDLKALRSDDTATYFCARQRTDYW DFDVWGSGTQVTVSS
208	1.29.1-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHW WRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTR HASWDFDTFSFYMDLKALRSDDTAVYFCARQRSDYW DFDVWGQGTQVTVSS
209	1.30.1-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHW WRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTR HASWDFDTFSFYMDLKALRSDDTAVYFCARQRSDYW DFDVWGSGTMVTVSS
210	1.12.15-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHWV RQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRH ASWDFDTFSFYMDLKALRSDDTAVYFCARQRSDYWD FDVWGSGTQVTVSS
211	1.13.15-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFMHW VRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTR HASWDFDTFSFYMDLKALRSDDTAVYFCARQRSDYW DFDVWGSGTQVTVSS
212	1.14.15-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFMHW VRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTR HASWDFDTFSAYMDLKALRSDDTAVYFCARQRSDYW DFDVWGSGTQVTVSS

表VIII. VH序列		
SEQ ID NO	**名稱**	**重鏈可變區(VH)胺基酸序列**
213	1.31.1-1	QVQLVQSGAEVTKPGASVRVSCEASGYNIRDYFIHW WRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTR HASWDFDTFSFYMDLKALRSDDTATYFCARQRSDYW DFDVWGSGTQVTVSS
214	1.32.1-1	QVQLVQSGAEVTKPGASVRVSCEASGYNIRDYFIHW WRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTR HASWDFDTFSFYMDLKALRSDDTAVYFCARQRTDYW DFDVWGSGTQVTVSS
215	1.33.1-1	QVQLVQSGAEVKKPGASVRVSCKASGYNIRDYFIHW WRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVTLTR HASWDFDTFSFYMDLKALRSDDTATYFCARQRSDYW DFDVWGSGTQVTVSS
216	1.34.1-1	QVQLVQSGAEVKKPGASVRVSCKASGYNIRDYFIHW WRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVTLTR HASWDFDTFSFYMDLKALRSDDTAVYFCARQRTDYW DFDVWGSGTQVTVSS
217	1.35.1-1	QVQLVQSGAEVKKPGASVRVSCKASGYNIRDYFMHW WRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVTMT RHASWDFDTFSFYMDLSRLRSDDTATYFCARQRTDY WDFDVWGQGTMVTVSS
218	1.36.1-1	QVQLVQSGAEVKKPGASVRVSCKASGYNIRDYFMHW WRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVTMT RHASWDFDTFSAYMDLSRLRSDDTATYFCARQRTDY WDFDVWGQGTMVTVSS

表VIII. VH序列		
SEQ ID NO	**名稱**	**重鏈可變區(VH)胺基酸序列**
219	1.37.51-1	QVQLVQSGAEVKKPGASVRVSCKASGYNIRDYFIHWWRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRHASWDFDTYSFYMDLSRLRSDDTAVYFCARQRSDYWDFDVWGQGTMVTVSS
220	B-1	QVHLSQSGAAVTKPGASVRVSCEASGYKISDHFIHWWRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRQASWDFDTYSFYMDLKAVRSDDTAIYFCARQRSDFWDFDVWGSGTQVTVSS
221	1.41.5-1	QVQLVQSGAEVKKPGASVRVSCKASGYNIRDYFIHWWRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRHASWDFDTFSFYMDLKALRSDDTAVYFCARQRSDYWDFDVWGQGTMVTVSS
465	2.2.1-1	QVHLSQSGAAVTKPGASVRVSCEASGYKIRDHFIHWWRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRHASWDFDTFSFYMDLKAVRSDDTAIYFCARQRSDYWDFDVWGSGTQVTVSS
466	2.3.1-1	QVHLSQSGAAVTKPGASVRVSCEASGYNIRDYFIHWWRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRHASWDFDTFSFYMDLKAVRSDDTAIYFCARQRSDYWDFDVWGSGTQVTVSS
467	1.42.1-1	QVHLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHWWRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRHASWDFDTFSFYMDLKALRSDDTAVYFCARQRSDYWDFDVWGSGTQVTVSS

表VIII. VH序列		
SEQ ID NO	**名稱**	**重鏈可變區(VH)胺基酸序列**
468	1.43.1-1	QVQLSQSGAAVTKPGASVRVSCEASGYNIRDYFIHWW RQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRH ASWDFDTFSFYMDLKALRSDDTAVYFCARQRSDYWD FDVWGSGTQVTVSS
469	1.44.1-1	QVQLLQSGAAVTKPGASVRVSCEASGYKIRDYFIHW WRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTR HASWDFDTFSFYMDLKALRSDDTAVYFCARQRSDYW DFDVWGSGTQVTVSS
470	1.45.1-1	QVQLLQSGAAVTKPGASVRVSCEASGYNISDYFIHWW RQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRH ASWDFDTFSFYMDLKALRSDDTAVYFCARQRSDYWD FDVWGSGTQVTVSS
471	1.46.1-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDHFIHW WRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTR HASWDFDTFSFYMDLKALRSDDTAVYFCARQRSDYW DFDVWGSGTQVTVSS
472	1.47.1-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHW WRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTR QASWDFDTFSFYMDLKALRSDDTAVYFCARQRSDYW DFDVWGSGTQVTVSS
474	1.49.1-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHW WRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTR HASWDFDTFSFYMDLKAVRSDDTAVYFCARQRSDYW DFDVWGSGTQVTVSS

表VIII. VH序列		
SEQ ID NO	**名稱**	**重鏈可變區(VH)胺基酸序列**
475	1.50.1-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHW WRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTR HASWDFDTFSFYMDLKALRSDDTAIYFCARQRSDYW DFDVWGSGTQVTVSS
476	1.51.1-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHW WRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTR HASWDFDTFSFYMDLKALRSDDTAVYFCARQRSDFW DFDVWGSGTQVTVSS
477	1.52.64-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHW WRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTR HASFDFDTFSFYMDLKALRSDDTAVYFCARQRSDYW DFDVWGSGTQVTVSS
478	2.4.1-1	QVHLSQSGAAVTKPGASVRVSCEASGYKIRDHFIHWW RQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRH ASFDFDTFSFYMDLKAVRSDDTAIYFCARQRSDYWDF DVWGSGTQVTVSS

表IX. VL序列		
SEQ ID NO	**名稱**	**輕鏈可變區(VL)胺基酸序列**
222	C	EIVLTQSPGTLSLSPGETAIISCRTSQYGSLAWYQQRPGQAPRLVIYSGSTRAAGIPDRFSGSRWGPDYNLTISNLESGDFGVYYCQQYEFFGQGTKVQVDIK
223	A-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQEYNLTINNLQPEDIATYFCQVYEFVVPGTRLDLK
224	D-1	SLTQSPGTLSLSPGETAIISCRTSQYGSLAWYQQRPGQAPRLVIYSGSTRAAGIPDRFSGSRWGPDYNLTISNLESGDFGVYYCQQYEFFGQGTKVQVDIK
225	1.1.2-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQKPGKAPKLLIYDGSKLERGVPSRFSGRRWGQEYNLTINNLQPEDIATYFCQVYEFVVPGTKVDIK
226	1.1.3-1	EIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQEYNLTINNLQPEDIATYFCQVYEFVVPGTRLDLK
227	1.1.4-1	DIQMTQSPSSLSASVGDRVTITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQEYNLTINNLQPEDIATYFCQVYEFVVPGTRLDLK
228	1.1.5-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQKPGKAPKLLIYDGSKLERGVPSRFSGRRWGQEYNLTINNLQPEDIATYFCQVYEFVVPGTRLDLK
229	1.1.6-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKAPKLLIYDASKLERGVPSRFSGRRWGQEYNLTINNLQPEDIATYFCQVYEFVVPGTRLDLK

表IX. VL序列		
SEQ ID NO	**名稱**	**輕鏈可變區(VL)胺基酸序列**
230	1.1.7-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDGSNLERGVPSRFSGRRWGQE YNLTINNLQPEDIATYFCQVYEFVVPGTRLDLK
231	1.1.8-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDASNLERGVPSRFSGRRWGQE YNLTINNLQPEDIATYFCQVYEFVVPGTRLDLK
232	1.1.9-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLETGVPSRFSGRRWGQE YNLTINNLQPEDIATYFCQVYEFVVPGTRLDLK
233	1.1.10-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YTLTINNLQPEDIATYFCQVYEFVVPGTRLDLK
234	1.1.11-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGSRWGQE YTLTINNLQPEDIATYFCQVYEFVVPGTRLDLK
235	1.1.12-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YNLTISSLQPEDIATYFCQVYEFVVPGTRLDLK
236	1.1.13-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGSRWGQE YTLTISSLQPEDIATYFCQVYEFVVPGTRLDLK
237	1.1.14-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGSGSGTDF TFTINNLQPEDIATYFCQVYEFVVPGTRLDLK
238	1.1.15-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YNLTINNLQPEDIATYFCQVYEFFVPGTRLDLK

表IX. VL序列		
SEQ ID NO	**名稱**	**輕鏈可變區(VL)胺基酸序列**
239	1.1.16-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YNLTINNLQPEDIATYFCQVYEFVGPGTRLDLK
240	1.1.17-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YNLTINNLQPEDIATYFCQVYEFFGPGTRLDLK
241	1.1.18-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YNLTINNLQPEDIATYFCQVYEFVSPGTRLDLK
242	1.1.19-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YNLTINNLQPEDIATYFCQVYEFVTPGTRLDLK
243	1.1.20-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YNLTINNLQPEDIATYFCQVYEFVVPGTNLDLK
244	1.1.21-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YNLTINNLQPEDIATYFCQVYEFVGPGTNLDLK
245	1.1.22-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YNLTINNLQPEDIATYFCQVYEFVSPGTNLDLK
246	1.1.23-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YNLTINNLQPEDIATYFCQVYEFVTPGTNLDLK
247	1.1.24-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YNLTINNLQPEDIATYFCQVYEFVVPGTRVDLK

表IX. VL序列		
SEQ ID NO	**名稱**	**輕鏈可變區(VL)胺基酸序列**
248	1.1.25-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YNLTINNLQPEDIATYFCQVYEFVVPGTNVDLK
249	1.1.26-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YNLTINNLQPEDIATYFCQVYEFVVPGTRLDIK
250	1.1.27-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YNLTINNLQPEDIATYFCQVYEFVVPGTRVDIK
251	1.1.28-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YNLTINNLQPEDIATYFCQVYEFVVPGTNVDIK
252	1.1.29-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YNLTINNLQPEDIATYFCQVYEFVGPGTNVDIK
253	1.1.30-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YNLTINNLQPEDIATYFCQVYEFVTPGTNVDIK
254	1.1.31-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YTLTISSLQPEDIATYFCQVYEFVVPGTNLDLK
255	1.1.32-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YTLTISSLQPEDIATYFCQVYEFVTPGTRLDLK
256	1.1.33-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDGSNLERGVPSRFSGRRWGQE YTLTISSLQPEDIATYFCQVYEFVVPGTNLDIK

表IX. VL序列		
SEQ ID NO	**名稱**	**輕鏈可變區(VL)胺基酸序列**
257	1.1.34-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDGSNLERGVPSRFSGRRWGQE YTLTISSLQPEDIATYFCQVYEFVTPGTRLDIK
258	1.1.35-1	DIQMTQSPSSLSASVGDRVTITCQANGYLNWYQ QKPGKAPKLLIYDGSNLETGVPSRFSGSRWGQE YTLTISSLQPEDIATYFCQVYEFVGPGTNLDIK
259	1.1.36-1	DIQMTQSPSSLSASVGDRVTITCQANGYLNWYQ QKPGKAPKLLIYDGSNLETGVPSRFSGSRWGQE YTLTISSLQPEDIATYFCQVYEFVTPGTNLDIK
260	1.1.37-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YTFTINNLQPEDIATYFCQVYEFVVPGTRLDLK
261	1.1.38-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YSLTINNLQPEDIATYFCQVYEFVVPGTRLDLK
262	1.1.39-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YSFTINNLQPEDIATYFCQVYEFVVPGTRLDLK
263	1.1.40-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YALTINNLQPEDIATYFCQVYEFVVPGTRLDLK
264	1.1.41-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YAFTINNLQPEDIATYFCQVYEFVVPGTRLDLK
265	1.1.42-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YHLTINNLQPEDIATYFCQVYEFVVPGTRLDLKR

表IX. VL序列		
SEQ ID NO	**名稱**	**輕鏈可變區(VL)胺基酸序列**
266	1.1.43-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YHFTINNLQPEDIATYFCQVYEFVVPGTRLDLK
267	1.1.44-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YQLTINNLQPEDIATYFCQVYEFVVPGTRLDLK
268	1.1.45-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YQFTINNLQPEDIATYFCQVYEFVVPGTRLDLK
269	1.1.46-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YNLKINNLQPEDIATYFCQVYEFVVPGTRLDLK
270	1.1.47-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YNFKINNLQPEDIATYFCQVYEFVVPGTRLDLK
271	1.1.48-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YNLAINNLQPEDIATYFCQVYEFVVPGTRLDLK
272	1.1.49-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YNFAINNLQPEDIATYFCQVYEFVVPGTRLDLK
273	1.37.51-1	DIQMTQSPSSLSASVGDRVTITCQANGYLNWYQ QKPGKAPKLLIYDGSKLETGVPSRFSGSRWGQE YTLTINNLQPEDIATYFCQVYEFFGPGTRLDLK
274	1.8.52-1	DIQMTQSPSSLSASVGDRVTITCQANGYLNWYQ QKPGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YTLTINNLQPEDIATYFCQVYEFVVPGTRLDLK

表IX. VL序列		
SEQ ID NO	**名稱**	**輕鏈可變區(VL)胺基酸序列**
275	1.1.54-1	DIQMTQSPSSLSASVGDTATITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YTLTINNLQPEDIATYFCQVYEFVVPGTRLDLK
276	B-1	DIQMTQSPSSLSARVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPARFSGRRWGQE YNLTINNLQPEDVATYFCQVYEFIVPGTRLDLK
277	2.1.2-1	DIQMTQSPSSLSARVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPARFSGRRWGQE YHLTINNLQPEDVATYFCQVYEFIVPGTRLDLK
278	1.1.64-1	DIQMTQSPSSLSASVGDTATITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YNLTINNLQPEDIATYFCQVYEFVVPGTRLDLK
279	1.1.67-1	DIQMTQSPSSLSASVGDTATITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YNLTINNLQPEDIATYFCQVYEFFGPGTRLDLK
280	1.1.72-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YHLTINNLQPEDIATYFCQVYEFFGPGTRLDLK
281	1.1.75-1	DIQMTQSPSSLSASVGDTATITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YHLTINNLQPEDIATYFCQVYEFVVPGTRLDLK
282	1.1.78-1	DIQMTQSPSSLSASVGDTATITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YHLTINNLQPEDIATYFCQVYEFFGPGTRLDLK
283	1.41.81-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQ QKPGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YNLTINNLQPEDIATYFCQVYEFFGPGTRLDLK

表IX. VL序列		
SEQ ID NO	**名稱**	**輕鏈可變區(VL)胺基酸序列**
284	1.1.82-1	DIQMTQSPSSLSASVGDRVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGSRWGQE YNLTISSLQPEDIATYFCQVYEFVVPGTRLDLK
285	1.41.83-1	DIQMTQSPSSLSASVGDRVTITCQANGYLNWYQ QKPGKAPKLLIYDGSKLERGVPSRFSGSRWGQE YNLTISSLQPEDIATYFCQVYEFVVPGTRLDLK
286	1.1.84-1	DIQMTQSPSSLSASVGDRVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGSRWGQE YNLTISSLQPEDIATYFCQVYEFFGPGTRLDLK
287	1.41.85-1	DIQMTQSPSSLSASVGDRVTITCQANGYLNWYQ QKPGKAPKLLIYDGSKLERGVPSRFSGSRWGQE YNLTISSLQPEDIATYFCQVYEFFGPGTRLDLK
288	1.41.86-1	DIQMTQSPSSLSASVGDTATITCQANGYLNWYQ QKPGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YNLTINNLQPEDIATYFCQVYEFVVPGTRLDLK
289	1.41.87-1	DIQMTQSPSSLSASVGDTATITCQANGYLNWYQ QKPGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YNLTINNLQPEDIATYFCQVYEFFGPGTRLDLK
290	1.1.88-1	DIQMTQSPSSLSASVGDRATITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGSRWGQE YNLTISSLQPEDIATYFCQVYEFVVPGTRLDLK
291	1.41.89-1	DIQMTQSPSSLSASVGDRATITCQANGYLNWYQ QKPGKAPKLLIYDGSKLERGVPSRFSGSRWGQE YNLTISSLQPEDIATYFCQVYEFVVPGTRLDLK
292	1.1.90-1	DIQMTQSPSSLSASVGDRATITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGSRWGQE YNLTISSLQPEDIATYFCQVYEFFGPGTRLDLK

表IX. VL序列		
SEQ ID NO	**名稱**	**輕鏈可變區(VL)胺基酸序列**
293	1.41.91-1	DIQMTQSPSSLSASVGDRATITCQANGYLNWYQ QKPGKAPKLLIYDGSKLERGVPSRFSGSRWGQE YNLTISSLQPEDIATYFCQVYEFFGPGTRLDLK
294	1.41.92-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQ QKPGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YHLTINNLQPEDIATYFCQVYEFVVPGTRLDLK
295	1.41.93-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQ QKPGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YHLTINNLQPEDIATYFCQVYEFFGPGTRLDLK
296	1.1.94-1	DIQMTQSPSSLSASVGDRVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGSRWGQE YHLTISSLQPEDIATYFCQVYEFVVPGTRLDLK
297	1.41.95-1	DIQMTQSPSSLSASVGDRVTITCQANGYLNWYQ QKPGKAPKLLIYDGSKLERGVPSRFSGSRWGQE YHLTISSLQPEDIATYFCQVYEFVVPGTRLDLK
298	1.1.96-1	DIQMTQSPSSLSASVGDRVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGSRWGQE YHLTISSLQPEDIATYFCQVYEFFGPGTRLDLK
299	1.41.97-1	DIQMTQSPSSLSASVGDRVTITCQANGYLNWYQ QKPGKAPKLLIYDGSKLERGVPSRFSGSRWGQE YHLTISSLQPEDIATYFCQVYEFFGPGTRLDLK
300	1.41.98-1	DIQMTQSPSSLSASVGDTATITCQANGYLNWYQ QKPGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YHLTINNLQPEDIATYFCQVYEFVVPGTRLDLK
301	1.41.99-1	DIQMTQSPSSLSASVGDTATITCQANGYLNWYQ QKPGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YHLTINNLQPEDIATYFCQVYEFFGPGTRLDLK

表IX. VL序列		
SEQ ID NO	**名稱**	**輕鏈可變區(VL)胺基酸序列**
302	1.1.100-1	DIQMTQSPSSLSASVGDRATITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGSRWGQE YHLTISSLQPEDIATYFCQVYEFVVPGTRLDLK
303	1.41.101-1	DIQMTQSPSSLSASVGDRATITCQANGYLNWYQ QKPGKAPKLLIYDGSKLERGVPSRFSGSRWGQE YHLTISSLQPEDIATYFCQVYEFVVPGTRLDLK
304	1.1.102-1	DIQMTQSPSSLSASVGDRATITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGSRWGQE YHLTISSLQPEDIATYFCQVYEFFGPGTRLDLK
305	1.41.103-1	DIQMTQSPSSLSASVGDRATITCQANGYLNWYQ QKPGKAPKLLIYDGSKLERGVPSRFSGSRWGQE YHLTISSLQPEDIATYFCQVYEFFGPGTRLDLK
306	1.1.110-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGTRRGQD YIFSINNLQPEDIATYFCQVYEFVVPGTRLDLK
307	1.1.111-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRFGQD YILTINNLQPEDIATYFCQVYEFVVPGTRLDLK
308	1.1.112-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGSRFGQK YQLSINNLQPEDIATYFCQVYEFVVPGTRLDLK
309	1.1.113-1	DIQMTQSPSSLSASVGDTATITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRFGQD YILTINNLQPEDIATYFCQVYEFVVPGTRLDLK
310	2.1.3-1	DIQMTQSPSSLSARVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPARFSGRRFGQD YILTINNLQPEDVATYFCQVYEFIVPGTRLDLK

表IX. VL序列		
SEQ ID NO	**名稱**	**輕鏈可變區(VL)胺基酸序列**
311	2.1.4-1	DIQMTQSPSSLSARVGDTATITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPARFSGRRFGQD YILTINNLQPEDVATYFCQVYEFIVPGTRLDLK
479	3.1.8-1	DIQMTQSPSSLSARVGDTATITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPARFSGRRWGQE YNLTINNLQPEDVATYFCQVYEFIVPGTRLDLK
480	3.1.9-1	DIQMTQSPSSLSARVGDTATITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPARFSGRRWGQE YNLTINNLQPEDVATYFCQVYEFFGPGTRLDLK
481	1.1.115-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YILTINNLQPEDIATYFCQVYEFVVPGTRLDLK
482	3.1.10-1	DIQMTQSPSSLSARVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPARFSGRRWGQE YILTINNLQPEDVATYFCQVYEFIVPGTRLDLK
483	1.1.116-1	DIQMTQSPSSLSASVGDTATITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YILTINNLQPEDIATYFCQVYEFVVPGTRLDLK
484	3.1.11-1	DIQMTQSPSSLSARVGDTATITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPARFSGRRWGQE YILTINNLQPEDVATYFCQVYEFIVPGTRLDLK
485	1.1.117-1	DIQMTQSPSSLSASVGDTATITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YILTINNLQPEDIATYFCQVYEFFGPGTRLDLK
486	3.1.12-1	DIQMTQSPSSLSARVGDTATITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPARFSGRRWGQE YILTINNLQPEDVATYFCQVYEFFGPGTRLDLK

表IX. VL序列		
SEQ ID NO	**名稱**	**輕鏈可變區(VL)胺基酸序列**
487	1.1.118-1	DIQMTQSPSSLSASVGDRATITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGSRWGQE YILTISSLQPEDIATYFCQVYEFFGPGTRLDLK
488	3.1.13-1	DIQMTQSPSSLSARVGDRATITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPARFSGSRWGQE YILTISSLQPEDVATYFCQVYEFFGPGTRLDLK
489	3.1.14-1	DIQMTQSPSSLSARVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPARFSGRRWGQE YTLTINNLQPEDVATYFCQVYEFIVPGTRLDLK
491	3.1.5-1	DIQMTQSPSSLSARVGDTATITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPARFSGRRWGQE YTLTINNLQPEDVATYFCQVYEFIVPGTRLDLK
492	3.1.15-1	DIQMTQSPSSLSARVGDTATITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPARFSGRRWGQE YTLTINNLQPEDVATYFCQVYEFFGPGTRLDLK
493	1.1.119-1	DIQMTQSPSSLSASVGDRATITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGSRWGQE YTLTISSLQPEDIATYFCQVYEFFGPGTRLDLK
494	3.1.7-1	DIQMTQSPSSLSARVGDRATITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPARFSGSRWGQE YTLTISSLQPEDVATYFCQVYEFFGPGTRLDLK
495	3.1.16-1	DIQMTQSPSSLSARVGDTATITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPARFSGRRWGQE YHLTINNLQPEDVATYFCQVYEFIVPGTRLDLK
496	3.1.17-1	DIQMTQSPSSLSARVGDTATITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPARFSGRRWGQE YHLTINNLQPEDVATYFCQVYEFFGPGTRLDLK

表IX. VL序列		
SEQ ID NO	**名稱**	**輕鏈可變區(VL)胺基酸序列**
497	3.1.18-1	DIQMTQSPSSLSARVGDRATITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPARFSGSRWGQE YHLTISSLQPEDVATYFCQVYEFFGPGTRLDLK
498	1.1.120-1	DIQMTQSPSSLSASVGDTATITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQD YILTINNLQPEDIATYFCQVYEFVVPGTRLDLK
499	3.1.19-1	DIQMTQSPSSLSARVGDTATITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPARFSGRRWGQD YILTINNLQPEDVATYFCQVYEFIVPGTRLDLK
500	1.1.121-1	DIQMTQSPSSLSASVGDTATITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRFGQE YILTINNLQPEDIATYFCQVYEFVVPGTRLDLK
501	3.1.20-1	DIQMTQSPSSLSARVGDTATITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPARFSGRRFGQE YILTINNLQPEDVATYFCQVYEFIVPGTRLDLK
502	1.1.122-1	DIQMTQSPSSLSASVGDTATITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YVLTINNLQPEDIATYFCQVYEFVVPGTRLDLK
503	1.1.123-1	DIQMTQSPSSLSASVGDTATITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YLLTINNLQPEDIATYFCQVYEFVVPGTRLDLK
504	1.1.124-1	DIQMTQSPSSLSASVGDTATITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YMLTINNLQPEDIATYFCQVYEFVVPGTRLDLK
505	1.1.125-1	DIQMTQSPSSLSASVGDTATITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YALTINNLQPEDIATYFCQVYEFVVPGTRLDLK

表IX. VL序列		
SEQ ID NO	**名稱**	**輕鏈可變區(VL)胺基酸序列**
506	1.1.126-1	DIQMTQSPSSLSASVGDTATITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YSLTINNLQPEDIATYFCQVYEFVVPGTRLDLK
507	1.1.127-1	DIQMTQSPSSLSASVGDTATITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YFLTINNLQPEDIATYFCQVYEFVVPGTRLDLK
508	1.1.128-1	DIQMTQSPSSLSASVGDTATITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGTRWGQE YILTINNLQPEDIATYFCQVYEFVVPGTRLDLK
509	1.1.129-1	DIQMTQSPSSLSASVGDTATITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRRGQE YILTINNLQPEDIATYFCQVYEFVVPGTRLDLK
510	1.1.130-1	DIQMTQSPSSLSASVGDTATITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRYGQE YILTINNLQPEDIATYFCQVYEFVVPGTRLDLK
511	1.1.131-1	DIQMTQSPSSLSASVGDTATITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGTRWGQD YILTINNLQPEDIATYFCQVYEFVVPGTRLDLK
512	1.1.132-1	DIQMTQSPSSLSARVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YNLTINNLQPEDIATYFCQVYEFVVPGTRLDLK
513	1.1.133-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPARFSGRRWGQE YNLTINNLQPEDIATYFCQVYEFVVPGTRLDLK
514	1.1.134-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YNLTINNLQPEDVATYFCQVYEFVVPGTRLDLK

表IX. VL序列		
SEQ ID NO	名稱	輕鏈可變區(VL)胺基酸序列
515	1.1.135-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YNLTINNLQPEDIATYFCQVYEFIVPGTRLDLK
569	1.1.138-1	DIQMTQSPSSLSASVGDTVTITCQATGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YNLTINNLQPEDIATYFCQVYEFVVPGTRLDLK
516	1.1.104-1	DIQMTQSPSSLSASVGDTATITCQANGYLNWYQ QRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQE YTLTINNLQPEDIATYFCQVYEFFGPGTRLDLK

【0069】 在一些實施例中，本文所述抗gp120抗體或gp120結合片段具有與選自由SEQ ID NO: 181-221及465-478組成之群之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、或100%一致性的VH及與選自由SEQ ID NO: 222-311、479-516及569組成之群之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、或100%一致性的VL。在一些實施例中，本文所述抗gp120抗體或gp120結合片段具有選自由SEQ ID NO: 181-221及465-478組成之群之VH及選自由SEQ ID NO: 222-311、479-516及569組成之群之VL。

【0070】 當比較多核苷酸及多肽序列時，若當如下文所述比對最大對應性時兩個序列中之核苷酸或胺基酸之序列相同，則據稱兩個序列「相同」。兩個序列之間之比較通常係藉由在比較窗內比較序列以鑑別

並比較序列相似性之局部區來實施。如本文所用「比較窗」係指至少約20、通常30至約75、40至約50個鄰接位置之區段，其中在最佳化比對兩個序列後，可比較一序列與相同數目之鄰接位置之參照序列。

【0071】用於比較之序列的比對可使用生物資訊學軟體(DNASTAR, Inc., Madison, WI)之Lasergene套組中之Megalign程式使用缺省參數來執行。此程式體現以下參考文獻中所述之若干比對方案：Dayhoff, M.O. (1978) A model of evolutionary change in proteins - Matrices for detecting distant relationships. In Dayhoff, M.O. (編輯) Atlas of Protein Sequence and Structure, National Biomedical Research Foundation, Washington DC，第5卷，增刊3，第 345-358頁；Hein J. (1990) Unified Approach to Alignment and Phylogenes，第 626-645頁，Methods in Enzymology，第183卷，Academic Press, Inc., San Diego, CA；Higgins, D.G.及Sharp, P.M. (1989) CABIOS 5: 151-153；Myers, E.W.及Muller W. (1988) CABIOS 4:11-17；Robinson, E.D. (1971) Comb. Theor 77: 105；Santou, N. Nes, M. (1987) Mol. Biol. Evol. 4:406-425；Sneath, P.H.A.及Sokal, R.R. (1973) Numerical Taxonomy - the Principles and Practice of Numerical Taxonomy, Freeman Press, San Francisco, CA；Wilbur, W.J.及Lipman, D.J. (1983) Proc. Natl. Acad., Sci. USA 80:726-730。

【0072】或者，用於比較之序列的比對可藉由Smith及Waterman (1981) Add. APL. Math 2:482之局部一致性算法、藉由Needleman及Wunsch (1970) J. Mol. Biol. 48:443之一致性比對算法、藉由Pearson及Lipman (1988) Proc. Natl. Acad. Sci. USA 85: 2444之相似性方法之搜索、藉由該等算法(Wisconsin Genetics軟體包中之GAP、

BESTFIT、BLAST、FASTA及TFASTA，Genetics Computer Group (GCG), 575 Science Dr., Madison, WI)之電腦執行或藉由檢查來執行。

【0073】 適於測定序列一致性百分比及序列相似性之算法的其他實例係BLAST及BLAST 2.0算法，其分別闡述於以下中：Altschul等人(1977) Nucl.Acids Res. 25:3389-3402及Altschul等人(1990) J. Mol. Biol. 215:403-410。BLAST及BLAST 2.0可(例如)與本文所述參數一起用於測定本文所述多核苷酸及多肽之序列一致性百分比。用於實施BLAST分析之軟體可經由National Center for Biotechnology資訊公開獲得。

【0074】 在一個闡釋性實例中，對於核苷酸序列，累積評分可使用參數M (匹配殘基對之獎勵評分；始終>0)及N (不匹配殘基之懲罰評分；始終< 0)來計算。重複代碼在每一方向上之延伸在以下時候將停止：累積比對評分自其所達成之最大值降低了X量；由於一或多個負評分殘基比對累加而使累積評分變為零或負值；或達到任一序列之端點。BLAST算法參數W、T及X確定比對之靈敏度及速度。BLASTN程式(對於核苷酸序列而言)使用之缺省值有代碼長度(W) 11及預期值(E) 10及BLOSUM62評分矩陣(參見Henikoff及Henikoff，(1989) Proc. Natl. Acad. Sci. USA 89:10915)比對(B) 50、預期值(E) 10、M=5、N=-4及兩條鏈之比較值。

【0075】 對於胺基酸序列而言，可使用評分矩陣來計算累積評分。重複代碼在每一方向上之延伸在以下時候將停止：累積比對評分自其所達成之最大值降低了X量；由於一或多個負評分殘基比對累加而使累積評分變為零或負值；或達到任一序列之端點。BLAST算法參數

W、T及X確定比對之靈敏度及速度。

【0076】在一種方法中，「序列一致性百分比」係藉由在至少20個位置之比較之窗內比較兩個最佳比對之序列來測定，其中與用於兩個序列之比對之參照序列(其不包含添加或缺失)相比，比較窗中之多核苷酸或多肽序列之部分可包含20%或更少、通常5至15%、或10至12%之添加或缺失(即，空位)。該百分比係藉由以下方式來計算：測定相同核酸鹼基或胺基酸殘基在兩個序列中出現之位置數以產生匹配位置數，用匹配位置數除以參考序列(即，窗大小)中之總位置數且用結果乘以100，產生序列一致性百分比。

【0077】本揭示內容涵蓋包括本文揭示之抗體中之任一者之VH的抗gp120抗體或其gp120結合片段。在某些實施例中，抗gp120抗體或其gp120結合片段包括抗體A-1、抗體1.1.64-1、抗體1.90-1、抗體2.2.1-1、抗體2.3.1-1、抗體3.1.5-1、抗體2.2.5-1、抗體2.3.5-1、抗體1.1.119-1、抗體1.1.104-1、抗體1.52.64-1、抗體2.4.1-1、抗體1.1.54-1或抗體2-1中之任一者之VH。在某些實施例中，抗gp120抗體或其gp120結合片段包括抗體1.52.64-1之VH。

【0078】本揭示內容涵蓋包括上文揭示之抗體中之任一者之VL的抗gp120抗體或其gp120結合片段。在某些實施例中，抗gp120抗體或其gp120結合片段包括抗體A-1、抗體1.1.64-1、抗體1.1.90-1、抗體2.2.1-1、2.3.1-1、抗體3.1.5-1、抗體2.2.5-1、2.3.5-1、抗體1.1.119-1、抗體1.1.104-1、抗體1.52.64-1、抗體2.4.1-1、抗體1.1.54-1或抗體B-1-1中之任一者之VL。亦涵蓋包括本文揭示之抗體中之任一者之VH及VL的抗gp120抗體或其gp120結合片段。在某些實施例中，抗gp120抗體或其gp120結合片段包括抗體A-1、抗體1.1.64-1、抗體1.1.90-1、

抗體2.2.1-1、抗體2.3.1-1、抗體3.1.5-1、抗體2.2.5-1、抗體2.3.5-1、抗體1.1.119-1、抗體1.1.104-1、抗體1.52.64-1、抗體2.4.1-1、抗體1.1.54-1或抗體B-1中之任一者之VH及VL。本揭示內容亦涵蓋包含上述VL及/或VH序列中之任一者之CDR的抗體。

【0079】在某些情況下，除了本文揭示之抗體中之任一者之VH胺基酸序列之外，抗gp120抗體或其gp120結合片段包括包含具有0至10(例如1、2、3、4、5、6、7、8、9、10)個胺基酸取代之以下胺基酸序列的重鏈恆定區：

ASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNS GALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPS NTKVDKKVEPKSCDKTHTCPPCPAPELLAGPDVFLFPPKPKDTLMI SRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYN STYRVVSVLTVLHQDWLNGKEYKCKVSNKALPLPEEKTISKAKGQ PREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPE NNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEALH NHYTQKSLSLSPGK (SEQ ID NO: 437)；

ASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNS GALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPS NTKVDKKVEPKSCDKTHTCPPCPAPELLAGPDVFLFPPKPKDTLMI SRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYN STYRVVSVLTVLHQDWLNGKEYKCKVSNKALPLPEEKTISKAKGQ PREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPE NNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEALH SHYTQKSLSLSPGK (SEQ ID NO: 438)；

ASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNS
GALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPS
NTKVDKKVEPKSCDKTHTCPPCPAPELLGGPDVFLFPPKPKDTLMI
SRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYN
STYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPEEKTISKAKGQ
PREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPE
NNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEALH
SHYTQKSLSLSPGK (SEQ ID NO: 439)；

ASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNS
GALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPS
NTKVDKKVEPKSCDKTHTCPPCPAPELLAGPDVFLFPPKPKDTLMI
SRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYN
STYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPEEKTISKAKGQ
PREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPE
NNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEALH
SHYTQKSLSLSPGK (SEQ ID NO: 440)；

ASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNS
GALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPS
NTKVDKKVEPKSCDKTHTCPPCPAPELLGGPDVFLFPPKPKDTLMI
SRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYN
STYRVVSVLTVLHQDWLNGKEYKCKVSNKALPLPEEKTISKAKGQ
PREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPE
NNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEALH
SHYTQKSLSLSPGK (SEQ ID NO: 441)；或

ASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNS GALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPS NTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLLPPKPKDTLMI SRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPPEEQYN STLRVVSILTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQP REPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPEN NYKTTPLVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEALHS HYTQKSLSLSPGK (SEQ ID NO: 442)。

【0080】 在某些實施例中，抗gp120抗體或其gp120結合片段包含SEQ ID NO: 477中所述之胺基酸序列之VH及包含具有0至10 (例如1、2、3、4、5、6、7、8、9、10)個胺基酸取代之SEQ ID NO: 438中所述之胺基酸序列的重鏈恆定區。

【0081】 本申請案之實例性抗體之重鏈及輕鏈的胺基酸序列分別示於表X及XI中。亦包括本揭示內容之許多分析中所用之對照抗體(例如抗體C及抗體D-1)的重鏈及輕鏈之胺基酸序列。

表X. 重鏈序列		
SEQ ID NO	名稱	重鏈胺基酸序列
1	C	QVRLSQSGGQMKKPGDSMRISCRASGYEFINCPINWIRLAP GKRPEWMGWMKPRWGAVSYARQLQGRVTMTRDMYSET AFLELRSLTSDDTAVYFCTRGKYCTARDYYNWDFEHWGQ GTPVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYF PEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSS LGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAP ELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEV KFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQ DWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTL PPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNY KTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEA LHNHYTQKSLSLSPGK
2	A-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHWWRQ APGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRHASWDF DTFSFYMDLKALRSDDTAVYFCARQRSDYWDFDVWGSGT QVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPE PVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSL GTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPE LLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVK FNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQD WLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLP PSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYK TTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEAL HSHYTQKSLSLSPGK

表X. 重鏈序列		
SEQ ID NO	名稱	重鏈胺基酸序列
3	A	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHWWRQ APGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRHASWDF DTFSFYMDLKALRSDDTAVYFCARQRSDYWDFDVWGSGT QVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPE PVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSL GTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPE LLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVK FNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQD WLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLP PSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYK TTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEAL HNHYTQKSLSLSPGK
4	D-1	QVRLSQSGGQMKKPGDSMRISCRASGYEFINCPINWIRLAP GKRPEWMGWMKPRHGAVSYARQLQGRVTMTRDMYSET AFLELRSLTSDDTAVYFCTRGKYCTARDYYNWDFEHWGQ GTPVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYF PEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSS LGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAP ELLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEV KFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQ DWLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTL PPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNY KTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEA LHSHYTQKSLSLSPGK

表X. 重鏈序列		
SEQ ID NO	名稱	重鏈胺基酸序列
5	1v2-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHWWRQ APGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRHASWDF DTYSFYMDLKALRSDDTAVYFCARQRSDYWDFDVWGSG TQVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFP EPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSL GTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPE LLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVK FNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQD WLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLP PSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYK TTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEAL HSHYTQKSLSLSPGK
6	1.2.1-1	QVQLLQSGAEVKKPGASVRVSCEASGYNIRDYFIHWWRQ APGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRHASWDF DTFSFYMDLKALRSDDTAVYFCARQRSDYWDFDVWGSGT MVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPE PVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSL GTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPE LLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVK FNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQD WLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLP PSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYK TTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEAL HSHYTQKSLSLSPGK

表X. 重鏈序列		
SEQ ID NO	名稱	重鏈胺基酸序列
7	1.3.1-1	QVSLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHWWRQA PGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRHASWDFD TFSFYMDLKALRSDDTAVYFCARQRSDYWDFDVWGSGTQ VTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEP VTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLG TQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPEL LAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKF NWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDW LNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLPPS REEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTT PPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEALHS HYTQKSLSLSPGK
8	1.4.1-1	QVQLVQSGAAVTKPGASVRVSCEASGYNIRDYFIHWWRQ APGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRHASWDF DTFSFYMDLKALRSDDTAVYFCARQRSDYWDFDVWGSGT QVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPE PVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSL GTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPE LLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVK FNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQD WLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLP PSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYK TTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEAL HSHYTQKSLSLSPGK

表X. 重鏈序列		
SEQ ID NO	名稱	重鏈胺基酸序列
9	1.5.1-1	QVQLVQSGAAVTKPGASVRVSCKASGYNIRDYFIHWWRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRHASWDFDTFSFYMDLKALRSDDTAVYFCARQRSDYWDFDVWGSGTQVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEALHSHYTQKSLSLSPGK
10	1.6.1-1	QVQLLQSGAEVTKPGASVRVSCEASGYNIRDYFIHWWRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRHASWDFDTFSFYMDLKALRSDDTAVYFCARQRSDYWDFDVWGSGTQVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEALHSHYTQKSLSLSPGK

表X. 重鏈序列		
SEQ ID NO	名稱	重鏈胺基酸序列
11	1.7.1-1	QVQLLQSGAEVKKPGASVRVSCEASGYNIRDYFIHWWRQ APGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRHASWDF DTFSFYMDLKALRSDDTAVYFCARQRSDYWDFDVWGSGT QVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPE PVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSL GTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPE LLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVK FNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQD WLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLP PSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYK TTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEAL HSHYTQKSLSLSPGK
12	1.8.1-1	QVQLVQSGAEVTKPGASVRVSCEASGYNIRDYFIHWWRQ APGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRHASWDF DTFSFYMDLKALRSDDTAVYFCARQRSDYWDFDVWGSGT QVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPE PVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSL GTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPE LLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVK FNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQD WLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLP PSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYK TTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEAL HSHYTQKSLSLSPGK

表X. 重鏈序列		
SEQ ID NO	名稱	重鏈胺基酸序列
13	1.9.1-1	QVQLVQSGAEVKKPGASVRVSCKASGYNIRDYFIHWWRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRHASWDFDTFSFYMDLKALRSDDTAVYFCARQRSDYWDFDVWGSGTQVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEALHSHYTQKSLSLSPGK
14	1.10.1-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFMHWWRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRHASWDFDTFSFYMDLKALRSDDTAVYFCARQRSDYWDFDVWGSGTQVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEALHSHYTQKSLSLSPGK

表X. 重鏈序列		
SEQ ID NO	名稱	重鏈胺基酸序列
15	1.11.1-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFMHWWRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRHASWDFDTFSAYMDLKALRSDDTAVYFCARQRSDYWDFDVWGSGTQVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEALHSHYTQKSLSLSPGK
16	1.15.1-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHWWRQAPGQGLQWVGWINPKWGQPNNPRQFQGRVSLTRHASWDFDTFSFYMDLKALRSDDTAVYFCARQRSDYWDFDVWGSGTQVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEALHSHYTQKSLSLSPGK

表X. 重鏈序列		
SEQ ID NO	**名稱**	**重鏈胺基酸序列**
17	1.16.1-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHWWRQAPGQGLQWVGWINPKGGQPNNPRQFQGRVSLTRHASWDFDTFSFYMDLKALRSDDTAVYFCARQRSDYWDFDVWGSGTQVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEALHSHYTQKSLSLSPGK
18	1.17.1-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHWWRQAPGQGLQWVGWINPKAGQPNNPRQFQGRVSLTRHASWDFDTFSFYMDLKALRSDDTAVYFCARQRSDYWDFDVWGSGTQVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEALHSHYTQKSLSLSPGK

表X. 重鏈序列		
SEQ ID NO	**名稱**	**重鏈胺基酸序列**
19	1.18.1-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHWWRQAPGQGLQWVGWINPKHGQPNNPRQFQGRVSLTRHASWDFDTFSFYMDLKALRSDDTAVYFCARQRSDYWDFDVWGSGTQVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEALHSHYTQKSLSLSPGK
20	1.19.1-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHWWRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVTLTRHASWDFDTFSFYMDLKALRSDDTAVYFCARQRSDYWDFDVWGSGTQVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEALHSHYTQKSLSLSPGK

表X. 重鏈序列		
SEQ ID NO	名稱	重鏈胺基酸序列
21	1.20.1-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHWWRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVTMTRHASWDFDTFSFYMDLKALRSDDTAVYFCARQRSDYWDFDVWGSGTQVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEALHSHYTQKSLSLSPGK
22	1.21.1-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHWWRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRDASWDFDTFSFYMDLKALRSDDTAVYFCARQRSDYWDFDVWGSGTQVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEALHSHYTQKSLSLSPGK

表X. 重鏈序列		
SEQ ID NO	**名稱**	**重鏈胺基酸序列**
23	1.22.1-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHWWRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRHASTFSFYMDLKALRSDDTAVYFCARQRSDYWDFDVWGSGTQVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEALHSHYTQKSLSLSPGK
24	1.24.1-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHWWRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRHASWDFDTFSFSMDLKALRSDDTAVYFCARQRSDYWDFDVWGSGTQVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEALHSHYTQKSLSLSPGK

表X. 重鏈序列		
SEQ ID NO	名稱	重鏈胺基酸序列
25	1.25.1-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHWWRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRHASWDFDTFSFYMDLSRLRSDDTAVYFCARQRSDYWDFDVWGSGTQVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEALHSHYTQKSLSLSPGK
26	1.26.1-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHWWRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRHASWDFDTFSFYMDLKALRSDDTATYFCARQRSDYWDFDVWGSGTQVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEALHSHYTQKSLSLSPGK

表X. 重鏈序列		
SEQ ID NO	名稱	重鏈胺基酸序列
27	1.27.1-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHWWRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRHASWDFDTFSFYMDLKALRSDDTAVYFCARQRTDYWDFDVWGSGTQVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEALHSHYTQKSLSLSPGK
28	1.28.1-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHWWRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRHASWDFDTFSFYMDLKALRSDDTATYFCARQRTDYWDFDVWGSGTQVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEALHSHYTQKSLSLSPGK

表X. 重鏈序列		
SEQ ID NO	**名稱**	**重鏈胺基酸序列**
29	1.29.1-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHWWRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRHASWDFDTFSFYMDLKALRSDDTAVYFCARQRSDYWDFDVWGQGTQVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEALHSHYTQKSLSLSPGK
30	1.30.1-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHWWRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRHASWDFDTFSFYMDLKALRSDDTAVYFCARQRSDYWDFDVWGSGTMVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEALHSHYTQKSLSLSPGK

表X. 重鏈序列		
SEQ ID NO	名稱	重鏈胺基酸序列
31	1.12.15-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHWVRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRHASWDFDTFSFYMDLKALRSDDTAVYFCARQRSDYWDFDVWGSGTQVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEALHSHYTQKSLSLSPGK
32	1.13.15-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFMHWVRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRHASWDFDTFSFYMDLKALRSDDTAVYFCARQRSDYWDFDVWGSGTQVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEALHSHYTQKSLSLSPGK

表X. 重鏈序列		
SEQ ID NO	**名稱**	**重鏈胺基酸序列**
33	1.14.15-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFMHWVRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRHASWDFDTFSAYMDLKALRSDDTAVYFCARQRSDYWDFDVWGSGTQVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEALHSHYTQKSLSLSPGK
34	1.31.1-1	QVQLVQSGAEVTKPGASVRVSCEASGYNIRDYFIHWWRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRHASWDFDTFSFYMDLKALRSDDTATYFCARQRSDYWDFDVWGSGTQVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEALHSHYTQKSLSLSPGK

表X. 重鏈序列		
SEQ ID NO	名稱	重鏈胺基酸序列
35	1.32.1-1	QVQLVQSGAEVTKPGASVRVSCEASGYNIRDYFIHWWRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRHASWDFDTFSFYMDLKALRSDDTAVYFCARQRTDYWDFDVWGSGTQVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEALHSHYTQKSLSLSPGK
36	1.33.1-1	QVQLVQSGAEVKKPGASVRVSCKASGYNIRDYFIHWWRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVTLTRHASWDFDTFSFYMDLKALRSDDTATYFCARQRSDYWDFDVWGSGTQVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEALHSHYTQKSLSLSPGK

表X. 重鏈序列		
SEQ ID NO	**名稱**	**重鏈胺基酸序列**
37	1.34.1-1	QVQLVQSGAEVKKPGASVRVSCKASGYNIRDYFIHWWRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVTLTRHASWDFDTFSFYMDLKALRSDDTAVYFCARQRTDYWDFDVWGSGTQVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEALHSHYTQKSLSLSPGK
38	1.35.1-1	QVQLVQSGAEVKKPGASVRVSCKASGYNIRDYFMHWWRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVTMTRHASWDFDTFSFYMDLSRLRSDDTATYFCARQRTDYWDFDVWGQGTMVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEALHSHYTQKSLSLSPGK

表X. 重鏈序列		
SEQ ID NO	名稱	重鏈胺基酸序列
39	1.36.1-1	QVQLVQSGAEVKKPGASVRVSCKASGYNIRDYFMHWWR QAPGQGLQWVGWINPKTGQPNNPRQFQGRVTMTRHASW DFDTFSAYMDLSRLRSDDTATYFCARQRTDYWDFDVWGQ GTMVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYF PEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSS LGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAP ELLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEV KFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQ DWLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTL PPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNY KTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEA LHSHYTQKSLSLSPGK
40	1.37.51-1	QVQLVQSGAEVKKPGASVRVSCKASGYNIRDYFIHWWRQ APGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRHASWDF DTYSFYMDLSRLRSDDTAVYFCARQRSDYWDFDVWGQG TMVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFP EPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSL GTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPE LLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVK FNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQD WLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLP PSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYK TTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEAL HSHYTQKSLSLSPGK

表X. 重鏈序列		
SEQ ID NO	名稱	重鏈胺基酸序列
41	A-2	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHWWRQ APGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRHASWDF DTFSFYMDLKALRSDDTAVYFCARQRSDYWDFDVWGSGT QVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPE PVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSL GTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPE LLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVK FNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQD WLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLP PSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYK TTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEAL HNHYTQKSLSLSPGK
42	B-1	QVHLSQSGAAVTKPGASVRVSCEASGYKISDHFIHWWRQA PGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRQASWDFD TYSFYMDLKAVRSDDTAIYFCARQRSDFWDFDVWGSGTQ VTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEP VTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLG TQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPEL LAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKF NWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDW LNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLPPS REEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTT PPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEALHS HYTQKSLSLSPGK

表X. 重鏈序列		
SEQ ID NO	**名稱**	**重鏈胺基酸序列**
43	A-3	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHWWRQ APGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRHASWDF DTFSFYMDLKALRSDDTAVYFCARQRSDYWDFDVWGSGT QVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPE PVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSL GTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPE LLGGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVK FNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQD WLNGKEYKCKVSNKALPAPEEKTISKAKGQPREPQVYTLP PSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYK TTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEAL HSHYTQKSLSLSPGK
44	A-4	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHWWRQ APGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRHASWDF DTFSFYMDLKALRSDDTAVYFCARQRSDYWDFDVWGSGT QVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPE PVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSL GTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPE LLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVK FNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQD WLNGKEYKCKVSNKALPAPEEKTISKAKGQPREPQVYTLP PSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYK TTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEAL HSHYTQKSLSLSPGK

表X. 重鏈序列		
SEQ ID NO	**名稱**	**重鏈胺基酸序列**
45	A-5	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHWWRQ APGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRHASWDF DTFSFYMDLKALRSDDTAVYFCARQRSDYWDFDVWGSGT QVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPE PVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSL GTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPE LLGGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVK FNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQD WLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLP PSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYK TTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEAL HSHYTQKSLSLSPGK
46	A-6	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHWWRQ APGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRHASWDF DTFSFYMDLKALRSDDTAVYFCARQRSDYWDFDVWGSGT QVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPE PVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSL GTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPE LLGGPSVFLLPPKPKDTLMISRTPEVTCVVVDVSHEDPEVK FNWYVDGVEVHNAKTKPPEEQYNSTLRVVSILTVLHQDW LNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPS REEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTT PLVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEALHS HYTQKSLSLSPGK

表X. 重鏈序列		
SEQ ID NO	**名稱**	**重鏈胺基酸序列**
47	1.41.5-1	QVQLVQSGAEVKKPGASVRVSCKASGYNIRDYFIHWWRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRHASWDFDTFSFYMDLKALRSDDTAVYFCARQRSDYWDFDVWGQGTMVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEALHSHYTQKSLSLSPGK
517	2.2.1-1	QVHLSQSGAAVTKPGASVRVSCEASGYKIRDHFIHWWRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRHASWDFDTFSFYMDLKAVRSDDTAIYFCARQRSDYWDFDVWGSGTQVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEALHSHYTQKSLSLSPGK

表X. 重鏈序列		
SEQ ID NO	名稱	重鏈胺基酸序列
518	2.3.1-1	QVHLSQSGAAVTKPGASVRVSCEASGYNIRDYFIHWWRQ APGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRHASWDF DTFSFYMDLKAVRSDDTAIYFCARQRSDYWDFDVWGSGT QVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPE PVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSL GTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPE LLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVK FNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQD WLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLP PSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYK TTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEAL HSHYTQKSLSLSPGK
519	1.42.1-1	QVHLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHWWRQ APGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRHASWDF DTFSFYMDLKALRSDDTAVYFCARQRSDYWDFDVWGSGT QVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPE PVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSL GTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPE LLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVK FNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQD WLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLP PSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYK TTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEAL HSHYTQKSLSLSPGK

表X. 重鏈序列		
SEQ ID NO	**名稱**	**重鏈胺基酸序列**
520	1.43.1-1	QVQLSQSGAAVTKPGASVRVSCEASGYNIRDYFIHWWRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRHASWDFDTFSFYMDLKALRSDDTAVYFCARQRSDYWDFDVWGSGTQVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEALHSHYTQKSLSLSPGK
521	1.44.1-1	QVQLLQSGAAVTKPGASVRVSCEASGYKIRDYFIHWWRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRHASWDFDTFSFYMDLKALRSDDTAVYFCARQRSDYWDFDVWGSGTQVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEALHSHYTQKSLSLSPGK

表X. 重鏈序列		
SEQ ID NO	名稱	重鏈胺基酸序列
522	1.45.1-1	QVQLLQSGAAVTKPGASVRVSCEASGYNISDYFIHWWRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRHASWDFDTFSFYMDLKALRSDDTAVYFCARQRSDYWDFDVWGSGTQVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEALHSHYTQKSLSLSPGK
523	1.46.1-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDHFIHWWRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRHASWDFDTFSFYMDLKALRSDDTAVYFCARQRSDYWDFDVWGSGTQVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEALHSHYTQKSLSLSPGK

表X. 重鏈序列		
SEQ ID NO	名稱	重鏈胺基酸序列
524	1.47.1-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHWWRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRQASWDFDTFSFYMDLKALRSDDTAVYFCARQRSDYWDFDVWGSGTQVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEALHSHYTQKSLSLSPGK
526	1.49.1-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHWWRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRHASWDFDTFSFYMDLKAVRSDDTAVYFCARQRSDYWDFDVWGSGTQVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEALHSHYTQKSLSLSPGK

表X. 重鏈序列		
SEQ ID NO	名稱	重鏈胺基酸序列
527	1.50.1-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHWWRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRHASWDFDTFSFYMDLKALRSDDTAIYFCARQRSDYWDFDVWGSGTQVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEALHSHYTQKSLSLSPGK
528	1.51.1-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHWWRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRHASWDFDTFSFYMDLKALRSDDTAVYFCARQRSDFWDFDVWGSGTQVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEALHSHYTQKSLSLSPGK

表X. 重鏈序列		
SEQ ID NO	**名稱**	**重鏈胺基酸序列**
529	1.52.64-1	QVQLLQSGAAVTKPGASVRVSCEASGYNIRDYFIHWWRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRHASFDFDTFSFYMDLKALRSDDTAVYFCARQRSDYWDFDVWGSGTQVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEALHSHYTQKSLSLSPGK
530	2.4.1-1	QVHLSQSGAAVTKPGASVRVSCEASGYKIRDHFIHWWRQAPGQGLQWVGWINPKTGQPNNPRQFQGRVSLTRHASFDFDTFSFYMDLKAVRSDDTAIYFCARQRSDYWDFDVWGSGTQVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEALHSHYTQKSLSLSPGK

表XI. 輕鏈序列		
SEQ ID NO	**名稱**	**輕鏈胺基酸序列**
48	C	EIVLTQSPGTLSLSPGETAIISCRTSQYGSLAWYQQRPGQAP RLVIYSGSTRAAGIPDRFSGSRWGPDYNLTISNLESGDFGV YYCQQYEFFGQGTKVQVDIKRTVAAPSVFIFPPSDEQLKS GTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTE QDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPV TKSFNRGEC
49	A-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKA PKLLIYDGSKLERGVPSRFSGRRWGQEYNLTINNLQPEDIA TYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGT ASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQD SKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTK SFNRGEC
50	D-1	SLTQSPGTLSLSPGETAIISCRTSQYGSLAWYQQRPGQAPRL VIYSGSTRAAGIPDRFSGSRWGPDYNLTISNLESGDFGVYY CQQYEFFGQGTKVQVDIKRTVAAPSVFIFPPSDEQLKSGTA SVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDS KDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKS FNRGEC
51	1.1.3-1	EIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKA PKLLIYDGSKLERGVPSRFSGRRWGQEYNLTINNLQPEDIA TYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGT ASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQD SKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTK SFNRGEC

表XI. 輕鏈序列		
SEQ ID NO	名稱	輕鏈胺基酸序列
52	1.1.4-1	DIQMTQSPSSLSASVGDRVTITCQANGYLNWYQQRRGKA PKLLIYDGSKLERGVPSRFSGRRWGQEYNLTINNLQPEDIA TYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGT ASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQD SKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTK SFNRGEC
53	1.1.5-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQKPGKA PKLLIYDGSKLERGVPSRFSGRRWGQEYNLTINNLQPEDIA TYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGT ASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQD SKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTK SFNRGEC
54	1.1.6-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKA PKLLIYDASKLERGVPSRFSGRRWGQEYNLTINNLQPEDIA TYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGT ASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQD SKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTK SFNRGEC
55	1.1.7-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKA PKLLIYDGSNLERGVPSRFSGRRWGQEYNLTINNLQPEDIA TYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGT ASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQD SKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTK SFNRGEC

表XI. 輕鏈序列		
SEQ ID NO	名稱	輕鏈胺基酸序列
56	1.1.8-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKA PKLLIYDASNLERGVPSRFSGRRWGQEYNLTINNLQPEDIA TYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGT ASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQD SKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTK SFNRGEC
57	1.1.9-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKA PKLLIYDGSKLETGVPSRFSGRRWGQEYNLTINNLQPEDIA TYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGT ASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQD SKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTK SFNRGEC
58	1.1.10-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKA PKLLIYDGSKLERGVPSRFSGRRWGQEYTLTINNLQPEDIA TYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGT ASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQD SKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTK SFNRGEC
59	1.1.11-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKA PKLLIYDGSKLERGVPSRFSGSRWGQEYTLTINNLQPEDIA TYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGT ASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQD SKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTK SFNRGEC

表XI. 輕鏈序列		
SEQ ID NO	名稱	輕鏈胺基酸序列
60	1.1.12-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQEYNLTISSLQPEDIATYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
61	1.1.13-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPSRFSGSRWGQEYTLTISSLQPEDIATYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
62	1.1.14-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPSRFSGSGSGTDFTFTINNLQPEDIATYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
63	1.1.15-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQEYNLTINNLQPEDIATYFCQVYEFFVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC

表XI. 輕鏈序列		
SEQ ID NO	名稱	輕鏈胺基酸序列
64	1.1.16-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKA PKLLIYDGSKLERGVPSRFSGRRWGQEYNLTINNLQPEDIA TYFCQVYEFVGPGTRLDLKRTVAAPSVFIFPPSDEQLKSGT ASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQD SKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTK SFNRGEC
65	1.1.17-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKA PKLLIYDGSKLERGVPSRFSGRRWGQEYNLTINNLQPEDIA TYFCQVYEFFGPGTRLDLKRTVAAPSVFIFPPSDEQLKSGT ASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQD SKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTK SFNRGEC
66	1.1.18-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKA PKLLIYDGSKLERGVPSRFSGRRWGQEYNLTINNLQPEDIA TYFCQVYEFVSPGTRLDLKRTVAAPSVFIFPPSDEQLKSGT ASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQD SKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTK SFNRGEC
67	1.1.19-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKA PKLLIYDGSKLERGVPSRFSGRRWGQEYNLTINNLQPEDIA TYFCQVYEFVTPGTRLDLKRTVAAPSVFIFPPSDEQLKSGT ASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQD SKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTK SFNRGEC

表XI. 輕鏈序列		
SEQ ID NO	**名稱**	**輕鏈胺基酸序列**
68	1.1.20-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKA PKLLIYDGSKLERGVPSRFSGRRWGQEYNLTINNLQPEDIA TYFCQVYEFVVPGTNLDLKRTVAAPSVFIFPPSDEQLKSGT ASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQD SKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTK SFNRGEC
69	1.1.21-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKA PKLLIYDGSKLERGVPSRFSGRRWGQEYNLTINNLQPEDIA TYFCQVYEFVGPGTNLDLKRTVAAPSVFIFPPSDEQLKSGT ASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQD SKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTK SFNRGEC
70	1.1.22-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKA PKLLIYDGSKLERGVPSRFSGRRWGQEYNLTINNLQPEDIA TYFCQVYEFVSPGTNLDLKRTVAAPSVFIFPPSDEQLKSGT ASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQD SKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTK SFNRGEC
71	1.1.23-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKA PKLLIYDGSKLERGVPSRFSGRRWGQEYNLTINNLQPEDIA TYFCQVYEFVTPGTNLDLKRTVAAPSVFIFPPSDEQLKSGT ASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQD SKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTK SFNRGEC

表XI. 輕鏈序列		
SEQ ID NO	名稱	輕鏈胺基酸序列
72	1.1.24-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKA PKLLIYDGSKLERGVPSRFSGRRWGQEYNLTINNLQPEDIA TYFCQVYEFVVPGTRVDLKRTVAAPSVFIFPPSDEQLKSGT ASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQD SKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTK SFNRGEC
73	1.1.25-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKA PKLLIYDGSKLERGVPSRFSGRRWGQEYNLTINNLQPEDIA TYFCQVYEFVVPGTNVDLKRTVAAPSVFIFPPSDEQLKSGT ASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQD SKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTK SFNRGEC
74	1.1.26-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKA PKLLIYDGSKLERGVPSRFSGRRWGQEYNLTINNLQPEDIA TYFCQVYEFVVPGTRLDIKRTVAAPSVFIFPPSDEQLKSGT ASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQD SKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTK SFNRGEC
75	1.1.27-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKA PKLLIYDGSKLERGVPSRFSGRRWGQEYNLTINNLQPEDIA TYFCQVYEFVVPGTRVDIKRTVAAPSVFIFPPSDEQLKSGT ASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQD SKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTK SFNRGEC

表XI. 輕鏈序列		
SEQ ID NO	名稱	輕鏈胺基酸序列
76	1.1.28-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQEYNLTINNLQPEDIATYFCQVYEFVVPGTNVDIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
77	1.1.29-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQEYNLTINNLQPEDIATYFCQVYEFVGPGTNVDIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
78	1.1.30-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQEYNLTINNLQPEDIATYFCQVYEFVTPGTNVDIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
79	1.1.31-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQEYTLTISSLQPEDIATYFCQVYEFVVPGTNLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC

表XI. 輕鏈序列		
SEQ ID NO	名稱	輕鏈胺基酸序列
80	1.1.32-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKA PKLLIYDGSKLERGVPSRFSGRRWGQEYTLTISSLQPEDIAT YFCQVYEFVTPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTA SVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDS KDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKS FNRGEC
81	1.1.33-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKA PKLLIYDGSNLERGVPSRFSGRRWGQEYTLTISSLQPEDIAT YFCQVYEFVVPGTNLDIKRTVAAPSVFIFPPSDEQLKSGTA SVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDS KDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKS FNRGEC
82	1.1.34-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKA PKLLIYDGSNLERGVPSRFSGRRWGQEYTLTISSLQPEDIAT YFCQVYEFVTPGTRLDIKRTVAAPSVFIFPPSDEQLKSGTA SVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDS KDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKS FNRGEC
83	1.1.35-1	DIQMTQSPSSLSASVGDRVTITCQANGYLNWYQQKPGKA PKLLIYDGSNLETGVPSRFSGSRWGQEYTLTISSLQPEDIAT YFCQVYEFVGPGTNLDIKRTVAAPSVFIFPPSDEQLKSGTA SVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDS KDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKS FNRGEC

表XI. 輕鏈序列		
SEQ ID NO	名稱	輕鏈胺基酸序列
84	1.1.36-1	DIQMTQSPSSLSASVGDRVTITCQANGYLNWYQQKPGKA PKLLIYDGSNLETGVPSRFSGSRWGQEYTLTISSLQPEDIAT YFCQVYEFVTPGTNLDIKRTVAAPSVFIFPPSDEQLKSGTA SVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDS KDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKS FNRGEC
85	1.1.37-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKA PKLLIYDGSKLERGVPSRFSGRRWGQEYTFTINNLQPEDIA TYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGT ASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQD SKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTK SFNRGEC
86	1.1.38-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKA PKLLIYDGSKLERGVPSRFSGRRWGQEYSLTINNLQPEDIA TYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGT ASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQD SKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTK SFNRGEC
87	1.1.39-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKA PKLLIYDGSKLERGVPSRFSGRRWGQEYSFTINNLQPEDIA TYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGT ASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQD SKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTK SFNRGEC

表XI. 輕鏈序列		
SEQ ID NO	**名稱**	**輕鏈胺基酸序列**
88	1.1.40-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKA PKLLIYDGSKLERGVPSRFSGRRWGQEYALTINNLQPEDIA TYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGT ASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQD SKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTK SFNRGEC
89	1.1.41-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKA PKLLIYDGSKLERGVPSRFSGRRWGQEYAFTINNLQPEDIA TYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGT ASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQD SKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTK SFNRGEC
90	1.1.42-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKA PKLLIYDGSKLERGVPSRFSGRRWGQEYHLTINNLQPEDIA TYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGT ASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQD SKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTK SFNRGEC
91	1.1.43-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKA PKLLIYDGSKLERGVPSRFSGRRWGQEYHFTINNLQPEDIA TYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGT ASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQD SKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTK SFNRGEC

表XI. 輕鏈序列		
SEQ ID NO	**名稱**	**輕鏈胺基酸序列**
92	1.1.44-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQEYQLTINNLQPEDIATYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
93	1.1.45-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQEYQFTINNLQPEDIATYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
94	1.1.46-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQEYNLKINNLQPEDIATYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
95	1.1.47-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQEYNFKINNLQPEDIATYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC

表XI. 輕鏈序列		
SEQ ID NO	名稱	輕鏈胺基酸序列
96	1.1.48-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQEYNLAINNLQPEDIATYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
97	1.1.49-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQEYNFAINNLQPEDIATYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
98	1.37.51-1	DIQMTQSPSSLSASVGDRVTITCQANGYLNWYQQKPGKAPKLLIYDGSKLETGVPSRFSGSRWGQEYTLTINNLQPEDIATYFCQVYEFFGPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
99	1.8.52-1	DIQMTQSPSSLSASVGDRVTITCQANGYLNWYQQKPGKAPKLLIYDGSKLERGVPSRFSGRRWGQEYTLTINNLQPEDIATYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC

表XI. 輕鏈序列		
SEQ ID NO	**名稱**	**輕鏈胺基酸序列**
100	1.1.54-1	DIQMTQSPSSLSASVGDTATITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQEYTLTINNLQPEDIATYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
101	B-1	DIQMTQSPSSLSARVGDTVTITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPARFSGRRWGQEYNLTINNLQPEDVATYFCQVYEFIVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
102	2.1.2-1	DIQMTQSPSSLSARVGDTVTITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPARFSGRRWGQEYHLTINNLQPEDVATYFCQVYEFIVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
103	1.1.64-1	DIQMTQSPSSLSASVGDTATITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQEYNLTINNLQPEDIATYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC

表XI. 輕鏈序列		
SEQ ID NO	名稱	輕鏈胺基酸序列
104	1.1.67-1	DIQMTQSPSSLSASVGDTATITCQANGYLNWYQQRRGKA PKLLIYDGSKLERGVPSRFSGRRWGQEYNLTINNLQPEDIA TYFCQVYEFFGPGTRLDLKRTVAAPSVFIFPPSDEQLKSGT ASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQD SKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTK SFNRGEC
105	1.1.72-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKA PKLLIYDGSKLERGVPSRFSGRRWGQEYHLTINNLQPEDIA TYFCQVYEFFGPGTRLDLKRTVAAPSVFIFPPSDEQLKSGT ASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQD SKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTK SFNRGEC
106	1.1.75-1	DIQMTQSPSSLSASVGDTATITCQANGYLNWYQQRRGKA PKLLIYDGSKLERGVPSRFSGRRWGQEYHLTINNLQPEDIA TYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGT ASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQD SKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTK SFNRGEC
107	1.1.78-1	DIQMTQSPSSLSASVGDTATITCQANGYLNWYQQRRGKA PKLLIYDGSKLERGVPSRFSGRRWGQEYHLTINNLQPEDIA TYFCQVYEFFGPGTRLDLKRTVAAPSVFIFPPSDEQLKSGT ASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQD SKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTK SFNRGEC

表XI. 輕鏈序列		
SEQ ID NO	名稱	輕鏈胺基酸序列
108	1.41.81-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQKPGKAPKLLIYDGSKLERGVPSRFSGRRWGQEYNLTINNLQPEDIATYFCQVYEFFGPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
109	1.1.82-1	DIQMTQSPSSLSASVGDRVTITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPSRFSGSRWGQEYNLTISSLQPEDIATYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
110	1.41.83-1	DIQMTQSPSSLSASVGDRVTITCQANGYLNWYQQKPGKAPKLLIYDGSKLERGVPSRFSGSRWGQEYNLTISSLQPEDIATYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
111	1.1.84-1	DIQMTQSPSSLSASVGDRVTITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPSRFSGSRWGQEYNLTISSLQPEDIATYFCQVYEFFGPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC

表XI. 輕鏈序列		
SEQ ID NO	名稱	輕鏈胺基酸序列
112	1.41.85-1	DIQMTQSPSSLSASVGDRVTITCQANGYLNWYQQKPGKAPKLLIYDGSKLERGVPSRFSGSRWGQEYNLTISSLQPEDIATYFCQVYEFFGPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
113	1.41.86-1	DIQMTQSPSSLSASVGDTATITCQANGYLNWYQQKPGKAPKLLIYDGSKLERGVPSRFSGRRWGQEYNLTINNLQPEDIATYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
114	1.41.87-1	DIQMTQSPSSLSASVGDTATITCQANGYLNWYQQKPGKAPKLLIYDGSKLERGVPSRFSGRRWGQEYNLTINNLQPEDIATYFCQVYEFFGPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
115	1.1.88-1	DIQMTQSPSSLSASVGDRATITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPSRFSGSRWGQEYNLTISSLQPEDIATYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC

表XI. 輕鏈序列		
SEQ ID NO	名稱	輕鏈胺基酸序列
116	1.41.89-1	DIQMTQSPSSLSASVGDRATITCQANGYLNWYQQKPGKA PKLLIYDGSKLERGVPSRFSGSRWGQEYNLTISSLQPEDIAT YFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTA SVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDS KDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKS FNRGEC
117	1.1.90-1	DIQMTQSPSSLSASVGDRATITCQANGYLNWYQQRRGKA PKLLIYDGSKLERGVPSRFSGSRWGQEYNLTISSLQPEDIAT YFCQVYEFFGPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTA SVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDS KDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKS FNRGEC
118	1.41.91-1	DIQMTQSPSSLSASVGDRATITCQANGYLNWYQQKPGKA PKLLIYDGSKLERGVPSRFSGSRWGQEYNLTISSLQPEDIAT YFCQVYEFFGPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTA SVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDS KDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKS FNRGEC
119	1.41.92-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQKPGKA PKLLIYDGSKLERGVPSRFSGRRWGQEYHLTINNLQPEDIA TYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGT ASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQD SKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTK SFNRGEC

表XI. 輕鏈序列		
SEQ ID NO	名稱	輕鏈胺基酸序列
120	1.41.93-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQKPGKAPKLLIYDGSKLERGVPSRFSGRRWGQEYHLTINNLQPEDIATYFCQVYEFFGPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
121	1.1.94-1	DIQMTQSPSSLSASVGDRVTITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPSRFSGSRWGQEYHLTISSLQPEDIATYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
122	1.41.95-1	DIQMTQSPSSLSASVGDRVTITCQANGYLNWYQQKPGKAPKLLIYDGSKLERGVPSRFSGSRWGQEYHLTISSLQPEDIATYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
123	1.1.96-1	DIQMTQSPSSLSASVGDRVTITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPSRFSGSRWGQEYHLTISSLQPEDIATYFCQVYEFFGPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC

表XI. 輕鏈序列		
SEQ ID NO	**名稱**	**輕鏈胺基酸序列**
124	1.41.97-1	DIQMTQSPSSLSASVGDRVTITCQANGYLNWYQQKPGKAPKLLIYDGSKLERGVPSRFSGSRWGQEYHLTISSLQPEDIATYFCQVYEFFGPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
125	1.41.98-1	DIQMTQSPSSLSASVGDTATITCQANGYLNWYQQKPGKAPKLLIYDGSKLERGVPSRFSGRRWGQEYHLTINNLQPEDIATYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
126	1.41.99-1	DIQMTQSPSSLSASVGDTATITCQANGYLNWYQQKPGKAPKLLIYDGSKLERGVPSRFSGRRWGQEYHLTINNLQPEDIATYFCQVYEFFGPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
127	1.1.100-1	DIQMTQSPSSLSASVGDRATITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPSRFSGSRWGQEYHLTISSLQPEDIATYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC

表XI. 輕鏈序列		
SEQ ID NO	**名稱**	**輕鏈胺基酸序列**
128	1.41.101-1	DIQMTQSPSSLSASVGDRATITCQANGYLNWYQQKPGKAPKLLIYDGSKLERGVPSRFSGSRWGQEYHLTISSLQPEDIATYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
129	1.1.102-1	DIQMTQSPSSLSASVGDRATITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPSRFSGSRWGQEYHLTISSLQPEDIATYFCQVYEFFGPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
130	1.41.103-1	DIQMTQSPSSLSASVGDRATITCQANGYLNWYQQKPGKAPKLLIYDGSKLERGVPSRFSGSRWGQEYHLTISSLQPEDIATYFCQVYEFFGPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
131	1.1.110-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPSRFSGTRRGQDYIFSINNLQPEDIATYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC

表XI. 輕鏈序列		
SEQ ID NO	名稱	輕鏈胺基酸序列
132	1.1.111-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPSRFSGRRFGQDYILTINNLQPEDIATYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
133	1.1.112-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPSRFSGSRFGQKYQLSINNLQPEDIATYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
134	1.1.113-1	DIQMTQSPSSLSASVGDTATITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPSRFSGRRFGQDYILTINNLQPEDIATYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
135	2.1.3-1	DIQMTQSPSSLSARVGDTVTITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPARFSGRRFGQDYILTINNLQPEDVATYFCQVYEFIVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC

表XI. 輕鏈序列		
SEQ ID NO	**名稱**	**輕鏈胺基酸序列**
136	2.1.4-1	DIQMTQSPSSLSARVGDTATITCQANGYLNWYQQRRGKA PKLLIYDGSKLERGVPARFSGRRFGQDYILTINNLQPEDVA TYFCQVYEFIVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGT ASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQD SKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTK SFNRGEC
531	3.1.8-1	DIQMTQSPSSLSARVGDTATITCQANGYLNWYQQRRGKA PKLLIYDGSKLERGVPARFSGRRWGQEYNLTINNLQPEDV ATYFCQVYEFIVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGT ASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQD SKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTK SFNRGEC
532	3.1.9-1	DIQMTQSPSSLSARVGDTATITCQANGYLNWYQQRRGKA PKLLIYDGSKLERGVPARFSGRRWGQEYNLTINNLQPEDV ATYFCQVYEFFGPGTRLDLKRTVAAPSVFIFPPSDEQLKSG TASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQ DSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVT KSFNRGEC
533	1.1.115 -1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKA PKLLIYDGSKLERGVPSRFSGRRWGQEYILTINNLQPEDIA TYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGT ASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQD SKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTK SFNRGEC

表XI. 輕鏈序列		
SEQ ID NO	**名稱**	**輕鏈胺基酸序列**
534	3.1.10-1	DIQMTQSPSSLSARVGDTVTITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPARFSGRRWGQEYILTINNLQPEDVATYFCQVYEFIVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
535	1.1.116-1	DIQMTQSPSSLSASVGDTATITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQEYILTINNLQPEDIATYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
536	3.1.11-1	DIQMTQSPSSLSARVGDTATITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPARFSGRRWGQEYILTINNLQPEDVATYFCQVYEFIVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
537	1.1.117-1	DIQMTQSPSSLSASVGDTATITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQEYILTINNLQPEDIATYFCQVYEFFGPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC

表XI. 輕鏈序列		
SEQ ID NO	名稱	輕鏈胺基酸序列
538	3.1.12-1	DIQMTQSPSSLSARVGDTATITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPARFSGRRWGQEYILTINNLQPEDVATYFCQVYEFFGPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
539	1.1.118-1	DIQMTQSPSSLSASVGDRATITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPSRFSGSRWGQEYILTISSLQPEDIATYFCQVYEFFGPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
540	3.1.13-1	DIQMTQSPSSLSARVGDRATITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPARFSGSRWGQEYILTISSLQPEDVATYFCQVYEFFGPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
541	3.1.14-1	DIQMTQSPSSLSARVGDTVTITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPARFSGRRWGQEYTLTINNLQPEDVATYFCQVYEFIVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC

表XI. 輕鏈序列		
SEQ ID NO	**名稱**	**輕鏈胺基酸序列**
542	3.1.5-1	DIQMTQSPSSLSARVGDTATITCQANGYLNWYQQRRGKA PKLLIYDGSKLERGVPARFSGRRWGQEYTLTINNLQPEDV ATYFCQVYEFIVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGT ASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQD SKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTK SFNRGEC
543	3.1.15-1	DIQMTQSPSSLSARVGDTATITCQANGYLNWYQQRRGKA PKLLIYDGSKLERGVPARFSGRRWGQEYTLTINNLQPEDV ATYFCQVYEFFGPGTRLDLKRTVAAPSVFIFPPSDEQLKSG TASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQ DSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVT KSFNRGEC
544	1.1.119-1	DIQMTQSPSSLSASVGDRATITCQANGYLNWYQQRRGKA PKLLIYDGSKLERGVPSRFSGSRWGQEYTLTISSLQPEDIAT YFCQVYEFFGPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTA SVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDS KDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKS FNRGEC
545	3.1.7-1	DIQMTQSPSSLSARVGDRATITCQANGYLNWYQQRRGKA PKLLIYDGSKLERGVPARFSGSRWGQEYTLTISSLQPEDVA TYFCQVYEFFGPGTRLDLKRTVAAPSVFIFPPSDEQLKSGT ASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQD SKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTK SFNRGEC

表XI. 輕鏈序列		
SEQ ID NO	名稱	輕鏈胺基酸序列
546	3.1.16-1	DIQMTQSPSSLSARVGDTATITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPARFSGRRWGQEYHLTINNLQPEDVATYFCQVYEFIVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
547	3.1.17-1	DIQMTQSPSSLSARVGDTATITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPARFSGRRWGQEYHLTINNLQPEDVATYFCQVYEFFGPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
548	3.1.18-1	DIQMTQSPSSLSARVGDRATITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPARFSGSRWGQEYHLTISSLQPEDVATYFCQVYEFFGPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
549	1.1.120-1	DIQMTQSPSSLSASVGDTATITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQDYILTINNLQPEDIATYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC

表XI. 輕鏈序列		
SEQ ID NO	名稱	輕鏈胺基酸序列
550	3.1.19-1	DIQMTQSPSSLSARVGDTATITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPARFSGRRWGQDYILTINNLQPEDVATYFCQVYEFIVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
551	1.1.121-1	DIQMTQSPSSLSASVGDTATITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPSRFSGRRFGQEYILTINNLQPEDIATYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
552	3.1.20-1	DIQMTQSPSSLSARVGDTATITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPARFSGRRFGQEYILTINNLQPEDVATYFCQVYEFIVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
553	1.1.122-1	DIQMTQSPSSLSASVGDTATITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQEYVLTINNLQPEDIATYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC

表XI. 輕鏈序列		
SEQ ID NO	**名稱**	**輕鏈胺基酸序列**
554	1.1.123-1	DIQMTQSPSSLSASVGDTATITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQEYLLTINNLQPEDIATYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
555	1.1.124-1	DIQMTQSPSSLSASVGDTATITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQEYMLTINNLQPEDIATYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
556	1.1.125-1	DIQMTQSPSSLSASVGDTATITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQEYALTINNLQPEDIATYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
557	1.1.126-1	DIQMTQSPSSLSASVGDTATITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQEYSLTINNLQPEDIATYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC

表XI. 輕鏈序列		
SEQ ID NO	**名稱**	**輕鏈胺基酸序列**
558	1.1.127-1	DIQMTQSPSSLSASVGDTATITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQEYFLTINNLQPEDIATYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
559	1.1.128-1	DIQMTQSPSSLSASVGDTATITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPSRFSGTRWGQEYILTINNLQPEDIATYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
560	1.1.129-1	DIQMTQSPSSLSASVGDTATITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPSRFSGRRRGQEYILTINNLQPEDIATYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
561	1.1.130-1	DIQMTQSPSSLSASVGDTATITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPSRFSGRRYGQEYILTINNLQPEDIATYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC

表XI. 輕鏈序列		
SEQ ID NO	名稱	輕鏈胺基酸序列
562	1.1.131-1	DIQMTQSPSSLSASVGDTATITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPSRFSGTRWGQDYILTINNLQPEDIATYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
563	1.1.132-1	DIQMTQSPSSLSARVGDTVTITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQEYNLTINNLQPEDIATYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
564	1.1.133-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPARFSGRRWGQEYNLTINNLQPEDIATYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
565	1.1.134-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQEYNLTINNLQPEDVATYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC

表XI. 輕鏈序列		
SEQ ID NO	名稱	輕鏈胺基酸序列
566	1.1.135-1	DIQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQEYNLTINNLQPEDIATYFCQVYEFIVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
568	1.1.138-1	DIQMTQSPSSLSASVGDTVTITCQATGYLNWYQQRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQEYNLTINNLQPEDIATYFCQVYEFVVPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC
567	1.1.104-1	DIQMTQSPSSLSASVGDTATITCQANGYLNWYQQRRGKAPKLLIYDGSKLERGVPSRFSGRRWGQEYTLTINNLQPEDIATYFCQVYEFFGPGTRLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC

【0082】 在一些實施例中，本文所述抗gp120抗體或gp120結合片段具有與選自由SEQ ID NO: 1-47及517-530組成之群之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、或100%一致性的重鏈(HC)及與選自由SEQ ID NO: 48-136及531-567組成之群之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少

98%、至少99%或100%一致性的輕鏈(LC)。在一些實施例中，本文所述抗gp120抗體或gp120結合片段具有選自由SEQ ID NO: 1-47及517-530組成之群之HC及選自由SEQ ID NO: 48-136及531-567組成之群之LC。在一些實施例中，本文所述抗gp120抗體或gp120結合片段具有與SEQ ID NO: 529中所述之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、例如100%一致性的重鏈(HC)及與SEQ ID NO: 103中所述之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、例如100%一致性的輕鏈(LC)。在一些實施例中，本文所述抗gp120抗體或gp120結合片段具有含SEQ ID NO: 529中所述之胺基酸序列的HC及含SEQ ID NO: 103中所述之胺基酸序列的LC。

【0083】本揭示內容涵蓋包括本文揭示之抗體中之任一者之重鏈的抗gp120抗體或其gp120結合片段。在某些實施例中，抗gp120抗體或其gp120結合片段包括抗體A-1、抗體1.1.64-1、抗體1.1.90-1、抗體2.2.1-1、抗體2.3.1-1、抗體3.1.5-1、抗體2.2.5-1、抗體2.3.5-1、抗體1.1.119-1、抗體1.1.104-1、抗體1.52.64-1、抗體2.4.1-1、抗體1.1.54-1或抗體B-1中之任一者的重鏈。在某些實施例中，抗gp120抗體或其gp120結合片段包括抗體1.52.64-1之重鏈。

【0084】本揭示內容涵蓋包括本文揭示之抗體中之任一者之輕鏈的抗gp120抗體或其gp120結合片段。在某些實施例中，抗gp120抗體或其gp120結合片段包括抗體A-1、抗體1.1.64-1、抗體1.1.90-1、抗體2.2.1-1、抗體2.3.1-1、抗體3.1.5-1、抗體2.2.5-1、抗體2.3.5-1、抗體

1.1.119-1、抗體1.1.104-1、抗體1.52.64-1、抗體2.4.1-1、抗體1.1.54-1或抗體B-1中之任一者的輕鏈。在某些實施例中，抗gp120抗體或其gp120結合片段包括抗體1.52.64-1之輕鏈。

【0085】亦涵蓋包括本文揭示之抗體中任一者之重鏈及輕鏈的抗gp120抗體或其gp120結合片段。在某些實施例中，抗gp120抗體或其gp120結合片段包括抗體A-1、抗體1.1.64-1、抗體1.1.90-1、抗體2.2.1-1、抗體2.3.1-1、抗體3.1.5-1、抗體2.2.5-1、抗體2.3.5-1、抗體1.1.119-1、抗體1.1.104-1、抗體1.52.64-1、抗體2.4.1-1、抗體1.1.54-1或抗體B-1中任一者之重鏈及輕鏈。在某些實施例中，抗gp120抗體或其gp120結合片段包括抗體1.52.64-1之重鏈及輕鏈。

【0086】本揭示內容涵蓋包括上文顯示之VH及/或VL胺基酸取代中任一者的抗gp120抗體或其gp120結合片段。

【0087】在一些實施例中，本揭示之抗gp120抗體中任一者之可變重鏈連接至包含CH1結構域及鉸鏈區之重鏈恆定區。在一些實施例中，本揭示之抗gp120抗體中任一者的可變重鏈連接至包含CH3結構域之重鏈恆定區。在某些實施例中，本揭示之抗gp120抗體中任一者的可變重鏈連接至包含IgG4之CH1結構域、鉸鏈區及CH2結構域以及CH3結構域(例如來自IgG1、IgG2、IgG3或IgG4)的重鏈恆定區。在一些情況下，本揭示之抗gp120抗體中任一者的可變重鏈連接至包含來自IgG1、IgG2、IgG3或IgG4之CH1結構域、鉸鏈區、CH2結構域及CH3結構域的重鏈恆定區。在某些實施例中，本揭示之抗gp120抗體中任一者的可變重鏈連接至包含來自IgG1 (例如人類IgG1，例如IgG1m3同種異型)之CH1結構域、CH2結構域及CH3結構域以及IgG3鉸鏈區(例如在WO 2017/096221 (參見例如此PCT公開案之圖2)中命名為「IgG3 C-」

之「開放」 IgG3鉸鏈區)的重鏈恆定區。預計此IgG3鉸鏈區展現改良之Fab臂可撓性及跨200A°距離之能力，其足夠用於三聚體內相互作用。在某些實施例中，該嵌合抗體含有重鏈恆定區之一或多個另外突變，其增加嵌合抗體之穩定性。在某些實施例中，重鏈恆定區包括修改抗體性質(例如增加效應功能、改良藥物動力學、增加或減少Fc受體結合、增加或減少抗體醣基化、增加或減少與C1q之結合、增加半衰期)之取代。

【0088】 在某些實施例中，抗gp120抗體係IgG抗體(例如IgG1、IgG2、IgG3、IgG4)。在一個實施例中，抗體係人類IgG1。在另一實施例中，抗體係人類IgG2。在一些實施例中，抗體具有嵌合重鏈恆定區(例如具有人類IgG4之CH1、鉸鏈及CH2區及人類IgG1之CH3區)。在某些實施例中，抗體包括包含VH CDR 1-3之VH及包含VL CDR 1-3之VL，其中VH CDR 1-3及VL CDR 1-3具有以下中所述之序列：分別地SEQ ID NO.: 137、138、139、140、141及142，且抗體係人類IgG1。在某些實施例中，抗gp120抗體或gp120結合片段具有與SEQ ID NO: 477中所述之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、例如100%一致性的VH及與SEQ ID NO: 278中所述之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、例如100%一致性的VL，且抗體係人類IgG1。

【0089】 IgG抗體以各種同種異型及同族同種異型存在。在某些實施例中，本發明抗體包括具有G1m1、nG1m2、G1m3、G1m17,1、

G1m17,1,2、G1m3,1或G1m17之同種異型的IgG1重鏈。該等同種異型或同族同種異型中之每一者之特徵在於在IgG1重鏈恆定區(Fc)內指示位置之以下胺基酸殘基(EU編號)：G1m1：D356、L358；nG1m1：E356、M358；G1m3：R214、E356、M358、A431；G1m17,1：K214、D356、L358、A431；G1m17,1,2：K214、D356、L358、G431；G1m3,1：R214、D356、L358、A431；　及G1m17：K214、E356、M358、A431。在某些實施例中，抗體包括包含VH CDR 1-3之VH及包含VL CDR 1-3之VL，其中VH CDR 1-3及VL CDR 1-3具有分別地SEQ ID NO.: 137、138、139、140、141及142中所述之序列，且抗體具有含G1m1、nG1m2、G1m3、G1m17,1、G1m17,1,2、G1m3,1或G1m17之同種異型的IgG1重鏈。在某些實施例中，抗gp120抗體或gp120結合片段具有與SEQ ID NO: 477中所述之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、例如100%一致性的VH及與SEQ ID NO: 278中所述之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、例如100%一致性的VL，且抗體具有含G1m1、nG1m2、G1m3、G1m17,1、G1m17,1,2、G1m3,1或G1m17之同種異型的IgG1重鏈。

【0090】 在一個實施例中，本文揭示之抗gp120抗體之VH中的任一者直接連接至或經由中間胺基酸序列(例如G-S連接體)連接至下文提供之野生型IgG1m3序列(代表性同種異型決定殘基以粗體指示)。

ASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNS
GALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPS

NTKVDK**R**VEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDTLMI SRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYN STYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQ PREPQVYTLPPSR**E**E**M**TKNQVSLTCLVKGFYPSDIAVEWESNGQPE NNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHE**A**LH NHYTQKSLSLSPGK (SEQ ID NO: 347)。

【0091】 在另一實施例中，本文揭示之抗gp120抗體之VH中的任一者直接連接至或經由中間胺基酸序列(例如G-S連接體)連接至下文提供之野生型IgG1m17序列(代表性同種異型決定殘基以粗體指示)。

【0092】 IgG1m17：

ASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNS GALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPS NTKVDK**K**VEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDTLMI SRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYN STYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQ PREPQVYTLPPSR**E**E**M**TKNQVSLTCLVKGFYPSDIAVEWESNGQPE NNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHE**A**LH NHYTQKSLSLSPGK (SEQ ID NO: 348)。

【0093】 在某些實施例中，抗gp120抗體本文揭示之VH直接連接至或經由中間胺基酸序列(例如G-S連接體)連接至在SEQ ID NO:348中具有1至10 (例如1、2、3、4、5、6、7、8、9、10)個胺基酸取代(例如進行取代以改良效應功能及/或增加半衰期)之IgG1m17序列。Fc區(來自例如，IgG1，例如IgG1m17)中之實例性胺基酸取代包括S239D、I332E、G236A、A330L、M428L、N434S；S239D、I332E、

G236A、A330L；S239D、I332E　M428L、N434S；S239D、I332E、A330L、M428L、N434S；F243L、R292P、Y300L、V305I、P396L、M428L、N434S；及S239D、I332E、G236A、A330L。

【0094】在某些實施例中，抗gp120抗體係人類IgG1/人類κ抗體。在一些實施例中，本揭示內容之抗體包含具有選自Km1、Km1,2或Km3之同種異型的κ輕鏈。該等同種異型中之每一者之特徵在於在輕鏈內位置內之以下胺基酸殘基(EU編號)：Km1：V153、L191；Km1,2：A153、L191；及Km3：A153、V191。在某些實施例中，抗體包括包含VH CDR 1-3之VH及包含VL CDR 1-3之VL，其中VH CDR 1-3及VL CDR 1-3具有分別地SEQ ID NO.: 137、138、139、140、141及142中所述之序列，且包含具有選自Km1、Km1,2或Km3之同種異型的κ輕鏈。在某些實施例中，抗體包括包含VH CDR 1-3之VH及包含VL CDR 1-3之VL，其中VH CDR 1-3及VL CDR 1-3具有分別地SEQ ID NO.: 137、138、139、140、141及142中所述之序列，且包含具有同種異型Km3之κ輕鏈。在某些實施例中，抗體包括包含VH CDR 1-3之VH及包含VL CDR 1-3之VL，其中VH CDR 1-3及VL CDR 1-3具有分別地SEQ ID NO.: 137、138、139、140、141及142中所述之序列，且係人類IgG1/人類κ抗體，例如人類IgG1/Km3。在某些實施例中，抗gp120抗體或gp120結合片段具有與SEQ ID NO: 477中所述之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、例如100%一致性的VH及與SEQ ID NO: 278中所述之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、例如

100%一致性的VL，且係人類IgG1/人類κ抗體，例如人類IgG1/Km3。

【0095】在某些實施例中，本揭示內容之抗gp120抗體包括包含以下胺基酸序列中之一者之人類κ輕鏈，其中代表性同種異型決定殘基以粗體指示：Km1：

RTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWK VDN**V**LQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHK**L**YAC EVTHQGLSSPVTKSFNRGEC (SEQ ID NO: 349);

Km1,2：

RTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWK VDN**A**LQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHK**L**YAC EVTHQGLSSPVTKSFNRGEC (SEQ ID NO: 350)；或

Km3：

RTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWK VDN**A**LQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHK**V**YAC EVTHQGLSSPVTKSFNRGEC (SEQ ID NO: 351)。

【0096】在一個實施例中，本揭示內容之抗gp120抗體包含人類κ輕鏈Km3。在具體實施例中，本文揭示之抗gp120抗體之VL直接連接至或經由中間胺基酸序列(例如G-S連接體)連接至野生型人類Km3序列(SEQ ID NO:351)。在某些實施例中，本文揭示之抗gp120抗體之VL直接連接至或經由中間胺基酸序列(例如G-S連接體)連接至SEQ ID NO:351內具有1至5 (即，1、2、3、4、5)個胺基酸取代之突變人類Km3序列。

【0097】在某些實施例中，抗gp120抗體係人類IgG1/人類λ抗體。每一個別人類包括介於7與11之間個不同λ輕鏈基因，其編碼選自

λ1、λ2、λ3、λ4、λ5、λ6及λ7之輕鏈。在某些實施例中，本發明之抗體包含選自λ1、λ2、λ3、λ4、λ5、λ6及λ7之λ輕鏈。在一些實施例中，本文所述抗體包括包含以下胺基酸序列中之一者之λ輕鏈，其中代表性λ決定殘基以粗體指示：

λ1：

GQPKA**N**P**T**VTLFPPSSEELQANKATLVCL**I**SDFYPGAVTVAWK ADG**S**PV**K**AGVETT**K**PSKQSNNKYAASSYLSLTPEQWKSH**R**SYSC**Q** VTHEGSTVEKTVAP**T**ECS (SEQ ID NO: 352)；

λ2：

GQPKA**A**P**S**VTLFPPSSEELQANKATLVCL**I**SDFYPGAVTVAWK ADS**S**PV**K**AGVETT**T**PSKQSNNKYAASSYLSLTPEQWKSH**R**SYSC**Q** VTHEGSTVEKTVAP**T**ECS (SEQ ID NO: 353)；

λ3：

GQPKA**A**P**S**VTLFPPSSEELQANKATLVCL**I**SDFYPGAVTVAWK ADS**S**P**A**K**A**GVETT**T**PSKQSNNKYAASSYLSLTPEQWKSH**K**SYSC**Q** VTHEGSTVEKTVAP**T**ECS (SEQ ID NO: 354)；

或λ7：

GQPKA**A**P**S**VTLFPPSSEELQANKATLVCL**V**SDFYPGAVTVAW KAD**G**SP**V**K**V**GVETT**K**PSKQSNNKYAASSYLSLTPEQWKSH**R**SYSC **R**VTHEGSTVEKTVAP**A**ECS (SEQ ID NO: 355)。

【0098】在一個實施例中，抗gp120抗體係人類IgG1m17/人類Km3抗體。恆定區(輕及/或重)可包括1至10 (例如1、2、3、4、5、6、7、8、9、10)個胺基酸取代(例如進行取代以改良效應功能及/或增加半衰期)。在一些實施例中，抗體經無岩藻醣基化。在一些實施例中，抗

體包含一或多個標籤。在某些實施例中，一或多個標籤包含抗生物素蛋白標籤。在某些實施例中，抗體包括包含VH CDR 1-3之VH及包含VL CDR 1-3之VL，其中VH CDR 1-3及VL CDR 1-3具有分別地SEQ ID NO.: 137、138、139、140、141及142中所述之序列，且係人類IgG1m17/人類Km3抗體。在某些實施例中，抗體包括包含VH CDR 1-3之VH及包含VL CDR 1-3之VL，其中VH CDR 1-3及VL CDR 1-3具有分別地SEQ ID NO.: 137、138、139、140、141及142中所述之序列，且係人類IgG1m17/人類Km3抗體，其中重鏈恆定區包括1至10個胺基酸取代。在某些實施例中，抗體包括包含VH CDR 1-3之VH及包含VL CDR 1-3之VL，其中VH CDR 1-3及VL CDR 1-3具有分別地SEQ ID NO.: 137、138、139、140、141及142中所述之序列，且係人類IgG1m17/人類Km3抗體，其中與SEQ ID NO: 348相比，重鏈恆定區包括以下胺基酸取代：S239D、I332E、G236A、A330L、M428L、N434S。在某些實施例中，抗gp120抗體或gp120結合片段具有與SEQ ID NO: 477中所述之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、例如100%一致性的VH及與SEQ ID NO: 278中所述之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、例如100%一致性的VL，且係人類IgG1/人類κ抗體，例如人類IgG1/Km3，其中與SEQ ID NO: 348相比，重鏈恆定區包括以下胺基酸取代：S239D、I332E、G236A、A330L、M428L、N434S。在某些實施例中，該等取代改良效應功能。在某些實施例中，該等取代增加半衰期。在某些實施例中，該等取代改良效應

功能且改良半衰期。

【0099】在某些實施例中，結合至gp120之抗體包含本文揭示之抗gp120抗體之VH及本文揭示之抗gp120抗體之VL的胺基酸序列。抗gp120抗體之實例性VH及VL胺基酸序列包括以下中所述之序列：分別地SEQ ID NO: 182及223；分別地SEQ ID NO: 182及275；分別地SEQ ID NO: 182及278；分別地SEQ ID NO.: 182及292；分別地SEQ ID NO: 220及276；分別地SEQ ID NO: 465及276；分別地SEQ ID NO: 466及276；分別地SEQ ID NO: 182及491；分別地SEQ ID NO: 465及491；分別地SEQ ID NO.: 466及491；分別地SEQ ID NO: 182及493；分別地SEQ ID NO: 182及516；分別地SEQ ID NO: 182及276；分別地SEQ ID NO: 182及569；分別地SEQ ID NO: 477及223；分別地SEQ ID NO: 477及278；分別地SEQ ID NO: 477及292；及分別地SEQ ID NO: 478及276。在某些實施例中，抗體包含分別包含SEQ ID NO.: 477及278中所述之胺基酸序列的VH及VL。在某些實施例中，該等抗體中之每一者係人類IgG1m17/人類Km3抗體。在某些實施例中，該等抗體包含SEQ ID NO: 348及/或351中所述之胺基酸序列。在一些情況下，該等抗體包括分別地SEQ ID NO: 348及/或351內之最多10 (例如1、2、3、4、5、6、7、8、9、10)個胺基酸取代(例如進行取代以改良效應功能及/或增加半衰期)。在某些實施例中，抗體包括包含VH CDR 1-3之VH及包含VL CDR 1-3之VL，其中VH CDR 1-3及VL CDR 1-3具有分別地SEQ ID NO.: 137、138、139、140、141及142中所述之序列，且包含SEQ ID NO: 348及351中所述之胺基酸序列且SEQ ID NO: 348及/或351內具有1至10個胺基酸序列取代。在某些實施例中，抗體包括包含VH CDR 1-3之VH及包含VL CDR 1-3之VL，其中VH CDR

1-3及VL CDR 1-3具有分別地SEQ ID NO.: 137、138、139、140、141及142中所述之序列，且包含SEQ ID NO: 348及351中所述之胺基酸序列且SEQ ID NO: 348內具有1至10個胺基酸序列取代。在某些實施例中，抗體包括包含VH CDR 1-3之VH及包含VL CDR 1-3之VL，其中VH CDR 1-3及VL CDR 1-3具有分別地SEQ ID NO.: 137、138、139、140、141及142中所述之序列，且包含SEQ ID NO: 348及351中所述之胺基酸序列，且SEQ ID NO: 348中具有以下胺基酸取代：S239D、I332E、G236A、A330L、M428L、N434S。在某些實施例中，抗體包括包含VH CDR 1-3之VH及包含VL CDR 1-3之VL，其中VH CDR 1-3及VL CDR 1-3具有分別地SEQ ID NO.: 137、138、139、140、141及142中所述之序列，且係IgGm17/人類Km3抗體。在某些實施例中，抗體包括包含VH CDR 1-3之VH及包含VL CDR 1-3之VL，其中VH CDR 1-3及VL CDR 1-3具有分別地SEQ ID NO.: 137、138、139、140、141及142中所述之序列，且抗體包括包含SEQ ID NO: 351中所述之胺基酸序列的人類κ輕鏈及具有含SEQ ID NO: 348中所述之胺基酸序列之同種異型的IgG1重鏈。在某些實施例中，抗體包含分別包含SEQ ID NO.: 477及278中所述之胺基酸序列的VH及VL，且包含SEQ ID NO: 348及351中所述之胺基酸序列且SEQ ID NO: 348及/或351內具有1至10個胺基酸序列取代。在某些實施例中，抗體包含分別包含SEQ ID NO.: 477及278中所述之胺基酸序列的VH及VL，且包含SEQ ID NO: 348及351中所述之胺基酸序列且SEQ ID NO: 348內具有1至10個胺基酸序列取代。在某些實施例中，抗體包含分別包含SEQ ID NO.: 477及278中所述之胺基酸序列的VH及VL，且包含SEQ ID NO: 348及351中所述之胺基酸序列，且SEQ ID NO: 348中具有以下胺基酸取代：S239D、

I332E、G236A、A330L、M428L、N434S。在某些實施例中，抗體包含分別包含SEQ ID NO.: 477及278中所述之胺基酸序列的VH及VL，且係IgGm17/人類Km3抗體。在某些實施例中，抗體包含分別包含SEQ ID NO.: 477及278中所述之胺基酸序列的VH及VL，且抗體包括包含SEQ ID NO: 351中所述之胺基酸序列的人類κ輕鏈及具有含SEQ ID NO: 348中所述之胺基酸序列之同種異型的IgG1重鏈。

【0100】在某些實施例中，結合至gp120之抗體包含本文揭示之抗gp120抗體之重鏈及本文揭示之抗gp120抗體之輕鏈的胺基酸序列。抗gp120抗體之實例性重鏈及輕鏈序列包括以下中所述之序列：分別地SEQ ID NO: 2及49；分別地SEQ ID NO: 2及100；分別地SEQ ID NO: 42及101；分別地SEQ ID NO: 2及103；分別地SEQ ID NO: 517及101；分別地SEQ ID NO: 518及101；分別地SEQ ID NO: 2及542；分別地SEQ ID NO: 517及542；分別地SEQ ID NO: 2及117；分別地SEQ ID NO: 518及542；分別地SEQ ID NO: 2及544；分別地SEQ ID NO: 2及567；分別地SEQ ID NO: 2及568；分別地SEQ ID NO: 529及49；分別地SEQ ID NO: 529及103；分別地SEQ ID NO: 529及117；及分別地SEQ ID NO: 530及101。在某些實施例中，結合至gp120之抗體包含具有SEQ ID NO: 529中所述之胺基酸序列的重鏈及具有SEQ ID NO: 103中所述之胺基酸序列的輕鏈。

【0101】本文所述抗體或抗原結合片段可(例如)藉由製備及表現編碼抗體之胺基酸序列之核酸來製得。

多特異性抗體

【0102】在另一態樣中，本揭示內容提供多特異性抗體。多特異性抗體係結合兩個或更多個不同表位之抗體(例如雙特異性抗體、三價

抗體、四價抗體)。可包含上述抗gp120抗體作為多特異性抗體之部分。多特異性抗體可具有與不由多特異性抗體之抗gp120抗體結合位點結合的至少一種其他抗原或一個其他表位的結合位點。包含多特異性抗體之抗gp120可包括二聚化結構域及三個或更多個(例如三個、四個、五個、六個)抗原結合位點。實例性二聚化結構域包含Fc區(或由其組成)。包含多特異性抗體之抗gp120可包含三個至約八個(即，三個、四個、五個、六個、七個、八個)抗原結合位點(或由其組成)。多特異性抗體視情況包含至少一條多肽鏈(例如兩條多肽鏈、三條多肽鏈)，其中多肽鏈包含三個或更多個可變結構域。例如，多肽鏈可包含(例如) VD1-$(X1)_n$-VD2-$(X2)_n$-Fc或VD1-$(X1)_n$-VD2-$(X2)_n$-VD3-$(X3)_n$ -Fc，其中VD1係第一可變結構域，VD2係第二可變結構域，VD3係第三可變結構域，Fc係Fc區之多肽鏈，X1、X2及X3代表胺基酸或肽間隔體，且n係0或1。在某些情況下，可變結構域可各自為scFv。多特異性抗體可容易地藉由編碼抗體之多肽鏈之核酸的重組表現而產生。

雙特異性抗體

【0103】在一個態樣中，多特異性抗體係雙特異性抗體。雙特異性抗體係對兩個不同表位藉由結合特異性之抗體。雙特異性抗體具有兩個「臂」。雙特異性抗體之一個臂結合一個表位且另一臂結合另一表位。在一個實施例中，雙特異性抗體之一個臂結合第一抗原且雙特異性抗體之另一臂結合第二抗原。在另一實施例中，雙特異性抗體之兩個臂結合相同抗原(例如gp120)之兩個不同表位。

【0104】在一態樣中，本揭示內容提供特異性結合至gp120且特異性結合至第二抗原之雙特異性抗體。在某些實施例中，第二抗原係白血球上之觸發分子以將細胞防禦機制聚焦及局域化至感染細胞。在一些

情形下，第二抗原係T細胞受體分子(例如CD3、CD4)；IgG之Fc受體(FcγR)，例如FcγRI (CD64)、FcγRII (CD32)、FcγRIII (CD16)；CD89；HIV-1抗原(例如gp41)；CCR5；KIR家族成員，例如殺手細胞免疫球蛋白樣受體三個Ig結構域及長胞質尾區1 (KIR3DL1)、殺手細胞免疫球蛋白樣受體三個Ig結構域及長胞質尾區1 (KIR3DL1)、殺手細胞免疫球蛋白樣受體兩個Ig結構域及長胞質尾區1 (KIR2DL1)、殺手細胞免疫球蛋白樣受體兩個Ig結構域及長胞質尾區2 (KIR2DL2)、殺手細胞免疫球蛋白樣受體兩個Ig結構域及長胞質尾區3 (KIR2DL3)；NKG2家族受體，例如殺手細胞凝集素樣受體C1 (KLRC1)、殺手細胞凝集素樣受體C2 (KLRC2)、殺手細胞凝集素樣受體C3 (KLRC3)、殺手細胞凝集素樣受體C4 (KLRC4)、殺手細胞凝集素樣受體D1 (KLRD1)、殺手細胞凝集素樣受體K1 (KLRK1)；天然細胞毒性觸發受體，例如天然細胞毒性觸發受體3 (NCR3或NKp30)、天然細胞毒性觸發受體2 (NCR2或NK-p44)、天然細胞毒性觸發受體1 (NCR1或NK-p46)、CD226 (DNAM-1)、細胞毒性及調節性T細胞分子(CRTAM或CD355)；SLAM家族成員，例如信號傳導淋巴球活化分子家族成員1 (SLAMF1)、CD48 (SLAMF2)、淋巴球抗原9 (LY9或SLAMF3)、CD244 (2B4或SLAMF4)、CD84 (SLAMF5)、SLAM家族成員6 (SLAMF6或NTB-A)、SLAM家族成員7 (SLAMF7或CRACC)；CD27 (TNFRSF7)、信號素4D (SEMA4D或CD100)或CD160 (NK1)。在某些實施例中，雙特異性抗體之第二臂結合gp120之不同表位。

【0105】在另一實施例中，本揭示內容之雙特異性抗體分子包括雙重可變結構域抗體(DVD-Ig)，其中每一輕鏈及重鏈含有經由短肽鏈接串聯之兩個可變結構域(Wu等人，Generation and Characterization

of a Dual Variable Domain Immunoglobulin (DVD-Ig™) Molecule, In: Antibody Engineering, Springer Berlin Heidelberg (2010))。在一些實施例中，雙特異性抗體係化學連接之雙特異性(Fab')2片段。在其他實施例中，雙特異性抗體包含Tandab (即，兩種單鏈雙價抗體之融合物，從而產生對於每一靶抗原具有兩個結合位點之四價雙特異性抗體)。在某些實施例中，雙特異性抗體係撓性抗體(flexibody)，其係scFvs與雙價抗體之組合從而產生多價分子。在另一實施例中，雙特異性抗體包含基於蛋白激酶A中之「二聚化及停靠結構域」的「塢及鎖」分子，其在施加至Fab時可產生由連接至不同Fab片段之兩個相同Fab片段組成的三價雙特異性結合蛋白。在另一情況下，本揭示內容之雙特異性抗體包含「蠍(Scorpion)分子」，其包含(例如)融合至人類Fab-壁之兩個末端之兩個scFv。在另一實施例中，本揭示內容之雙特異性抗體包含雙價抗體。

【0106】 雙特異性抗體之實例性類別包括(但不限於)具有互補CH3結構域以迫使異二聚化之IgG樣分子；IgG融合分子，其中全長IgG抗體融合至另外Fab片段或Fab片段之部分；Fc融合分子，其中單鏈Fv分子或穩定之雙價抗體融合至重鏈恆定結構域、Fc區或其部分；Fab融合分子，其中不同Fab片段融合在一起；重組IgG樣雙重靶向分子，其中分子之兩側各自含有至少兩種不同抗體之Fab片段或Fab片段之部分；scFv-及雙價抗體基及重鏈抗體(例如結構域抗體、奈米抗體)，其中不同單鏈Fv分子或不同雙價抗體或不同重鏈抗體(例如結構域抗體、奈米抗體)彼此融合或融合至另一蛋白或載劑分子。

【0107】 Fab融合雙特異性抗體之實例包括(但不限於) $F(ab)_2$ (Medarex/AMGEN)、雙重作用或雙-Fab (Genentech)、塢及鎖(DNL) (ImmunoMedics)、二價雙特異性(Biotecnol)及Fab-Fv (UCB-

Celltech)。

【0108】 scFv-、雙價抗體基及結構域抗體之實例包括(但不限於)雙特異性T細胞接頭(BITE) (Micromet, Tandem Diabody (Tandab) (Affimed)、雙重親和力重靶向技術(DART) (MacroGenics)、單鏈雙價抗體(Academic)、TCR樣抗體(AIT, ReceptorLogics)、人類血清白蛋白ScFv融合物(Merrimack)及COMBODY (Epigen Biotech)、雙重靶向奈米抗體(Ablynx)及雙重靶向僅重鏈結構域抗體。

抗原結合片段

【0109】 本揭示內容涵蓋本文揭示之抗gp120抗體的抗原結合片段。抗原結合抗體片段(例如scFv、$sc(Fv)_2$、Fab、$F(ab)_2$、Fab'、$F(ab')_2$、Facb及Fv)可(例如)藉由重組方法或藉由完整抗體之蛋白水解消解來製備。舉例而言，抗體片段可藉由用酶(例如木瓜酶、胃蛋白酶或胞漿素)處理完整抗體來獲得。完整抗體之木瓜酶消解產生F(ab)2或Fab片段；完整抗體之胃蛋白酶消解產生$F(ab')_2$或Fab'；且完整抗體之胞漿素消解產生Facb片段。

【0110】 或者，抗體片段可重組產生。舉例而言，編碼所關注抗體片段之核酸可經構築、引入表現載體中且在適宜宿主細胞中表現。參見(例如) Co, M.S.等人，*J. Immunol.*, 152:2968-2976 (1994)；Better, M.及Horwitz, A.H., *Methods in Enzymology*, 178:476-496 (1989)；Plueckthun, A.及Skerra, A., *Methods in Enzymology*, 178:476-496 (1989)；Lamoyi, E., *Methods in Enzymology*, 121:652-663 (1989)；Rousseaux, J.等人，*Methods in Enzymology*, (1989) 121:663-669 (1989)；及Bird, R.E.等人，*TIBTECH*, 9:132-137 (1991))。抗體片段可在大腸桿菌(*E. coli*)中表現且自其分泌，由此容許大量該等片段之容

易產生。抗體片段可自抗體噬菌體文庫分離。或者，Fab'-SH片段可直接自大腸桿菌回收且化學偶合以形成$F(ab)_2$片段(Carter等人，*Bio/Technology*, 10:163-167 (1992))。根據另一方法，$F(ab')_2$片段可直接自重組宿主細胞培養物分離。具有增加之活體內半衰期且包含補救受體結合表位殘基之Fab及$F(ab')_2$片段闡述於美國專利第5,869,046號中。

微小抗體

【0111】 本揭示內容亦涵蓋結合gp120之微小抗體。微小抗體包括雙價抗體、單鏈(scFv)及單鏈$(Fv)_2$ ($sc(Fv)_2$)。

【0112】 「雙價抗體」係藉由基因融合構築之二價微小抗體(例如，參見Holliger, P.等人，*Proc. Natl. Acad. Sci. U. S. A.*, 90:6444-6448 (1993)；EP 404,097；WO 93/11161)。雙價抗體係由兩條多肽鏈構成之二聚體。雙價抗體之每一多肽鏈之VL及VH結構域由連接體結合。構成連接體之胺基酸殘基的數目可介於2至12個殘基之間(例如3-10個殘基或5個或約5個殘基)。雙價抗體中之多肽之連接體通常過短以致於不容許VL及VH彼此結合。因此，同一多肽鏈中編碼之VL及VH不能形成單鏈可變區片段，而是相反與不同單鏈可變區片段形成二聚體。因此，雙價抗體具有兩個抗原結合位點。

【0113】 scFv係藉由用連接體連接VH及VL獲得之單鏈多肽抗體(例如，參見Huston等人，*Proc. Natl. Acad. Sci. U. S. A.*, 85:5879-5883 (1988)；及Plickthun, 「The Pharmacology of Monoclonal Antibodies」，第113卷，編輯Resenburg及Moore, Springer Verlag, New York，第269-315頁，(1994))。欲連接之VH及VL之次序並無具體限制，且其可以任何次序佈置。佈置之實例包括：[VH]連接體[VL]；或[VL]連接體[VH]。scFv中之H鏈V區及L鏈V區可源自任何本文所述

抗gp120抗體或其抗原結合片段。

【0114】 $sc(Fv)_2$係其中兩個VH及兩個VL由連接體連接以形成單鏈之微小抗體(Hudson等人，*J. Immunol. Methods*, (1999), 231: 177-189)。$sc(Fv)_2$可(例如)藉由連接scFv與連接體來製備。本發明之$sc(Fv)_2$包括較佳其中兩個VH及兩個VL以如下次序佈置之抗體：VH、VL、VH及VL ([VH]連接體[VL]連接體[VH]連接體[VL])，自單鏈多肽之N末端開始；然而，兩個VH及兩個VL之次序並不限於上述佈置，且其可以任何次序佈置。下文列示佈置之實例：

[VL]連接體[VH]連接體[VH]連接體[VL]

[VH]連接體[VL]連接體[VL]連接體[VH]

[VH]連接體[VH]連接體[VL]連接體[VL]

[VL]連接體[VL]連接體[VH]連接體[VH]

[VL]連接體[VH]連接體[VL]連接體[VH]

【0115】 通常，當連接四個抗體可變區時，需要三個連接體；所用連接體可相同或不同。對連接微小抗體之VH及VL區之連接體無特定限制。在一些實施例中，連接體係肽連接體。包含約3至25 (例如5、6、7、8、9、10、11、12、13、14、15、16、17、18)個殘基之任何任意單鏈肽可用作連接體。該等肽連接體之實例包括：Ser；Gly Ser；Gly Gly Ser；Ser Gly Gly；Gly Gly Gly Ser (SEQ ID NO: 427)；Ser Gly Gly Gly (SEQ ID NO: 428)；Gly Gly Gly Gly Ser (SEQ ID NO: 429)；Ser Gly Gly Gly Gly (SEQ ID NO: 430)；Gly Gly Gly Gly Gly Ser (SEQ ID NO: 431)；Ser Gly Gly Gly Gly Gly (SEQ ID NO: 432)；Gly Gly Gly Gly Gly Gly Ser (SEQ ID NO: 433)；Ser Gly Gly Gly Gly Gly Gly (SEQ ID NO: 434)；$(Gly\ Gly\ Gly\ Gly\ Ser)_n$ (SEQ ID

NO: 435)，其中n係1或更大之整數；及(Ser Gly Gly Gly Gly)$_n$ (SEQ ID NO: 436)，其中n係1或更大之整數。

【0116】在某些實施例中，連接體係合成化合物連接體(化學交聯劑)。市場上有售之交聯劑之實例包括N-羥基琥珀醯亞胺(NHS)、栓酸二琥珀醯亞胺基酯(DSS)、栓酸雙(磺基琥珀醯亞胺基)酯(BS3)、二硫基雙(琥珀醯亞胺基丙酸酯) (DSP)、二硫基雙(磺基琥珀醯亞胺基丙酸酯) (DTSSP)、乙二醇雙(琥珀醯亞胺基琥珀酸酯) (EGS)、乙二醇雙(磺基琥珀醯亞胺基琥珀酸酯) (磺基-EGS)、酒石酸二琥珀醯亞胺基酯(DST)、酒石酸二磺基琥珀醯亞胺基酯(磺基-DST)、雙[2-(琥珀醯亞胺基氧基羰基氧基)乙基]碸(BSOCOES)及雙[2-(磺基琥珀醯亞胺基氧基羰基氧基)乙基]碸(磺基-BSOCOES)。

【0117】微小抗體中之VH或VL之胺基酸序列可包括諸如取代、缺失、添加及/或插入等修飾。舉例而言，修飾可在抗gp120抗體或其抗原結合片段之CDR的一或多者中。在某些實施例中，修飾涉及抗gp120微小抗體之VH及/或VL結構域之一或多個CDR中的一個、兩個或三個胺基酸取代。進行該等取代以改良抗gp120微小抗體之結合及/或功能活性。在其他實施例中，可缺失或添加抗gp120抗體或其抗原結合片段之CDR的一個、兩個或三個胺基酸，只要當VH及VL締合時存在gp120結合及/或功能活性即可。

【0118】在一些實施例中，本文所述抗體及其抗原結合片段不包含信號肽。在一些實施例中，本文所述抗體及其抗原結合片段包含N-末端信號肽。信號肽可為內源信號肽(例如來自天然或野生型免疫球蛋白蛋白)或來自異源多肽(例如非免疫球蛋白蛋白)。在一些實施例中，異源信號肽係來自分泌之蛋白，例如血清蛋白、免疫球蛋白或細胞介

素。在一些實施例中，信號肽係來自血清白蛋白信號肽(例如具有胺基酸序列KWVTFISLLFLFSSAYS (SEQ ID NO: 620))。在一些實施例中，信號肽包含選自由以下組成之群之序列：MDPKGSLSWRILLFLSLAFELSYG (SEQ ID NO: 621)、MSVPTQVLGLLLLWLTDARC (SEQ ID NO: 622)、METDTLLLWVLLLWVPGSTG (SEQ ID NO: 623)、MKWVTFISLLFLFSSAYS (SEQ ID NO: 624)、MRCLAEFLGLLVLWIPGAIG (SEQ ID NO: 625)及MDPKGSLSWRILLFLSLAFELSYG (SEQ ID NO: 626)。信號肽可經設計以(例如)在自細胞分泌後解離，以形成成熟融合蛋白。發現可用於表現本發明融合蛋白之在細胞中分泌蛋白的經修飾之人類血清白蛋白信號肽闡述於(例如) Attallah等人，*Protein Expr Purif.* (2017) 132:27-33中。用於表現本文所述抗體及其抗原結合片段之信號肽序列之選擇的另外指南闡述於以下中：例如，Kober等人，*Biotechnol Bioeng.* (2013) 110(4):1164-73；Gibson等人，*Biotechnol Bioeng.* 2017年9月；114(9):1970-1977；Lin等人，*Biotechnol J.* 2017年9月；12(9). doi: 10.1002/biot.201700268 (PMID 28727292)；Ramezani等人，*Protein Expr Purif.* 2017年7月；135:24-32；及Haryadi等人，*PLoS One.* 2015年2月23日；10(2):e0116878。若適當，在表現為個別蛋白時，重鏈及輕鏈或其抗原結合片段可具有相同或不同信號肽。

Fc修飾

【0119】在某些實施例中，與IgG1m17胺基酸序列(即， SEQ ID NO: 348)相比，本揭示內容之抗體包括重鏈恆定區(Fc)中之一或多個胺基酸序列修飾。在某些實施例中，與其他抗HIV-抗體(例如抗體A或抗

體B)相比，本揭示內容之抗體包括重鏈恆定區(Fc)中之一或多個胺基酸序列修飾。在一些實施例中，與抗體A或抗體B相比，該等修飾增加經修飾之抗體之穩定性或增加經修飾之抗體之結合親和力。在某些實施例中，與抗體A或抗體B相比，該等修飾增加經修飾之抗體之穩定性或增加經修飾之抗體之效應功能。在一些實施例中，與抗體A或抗體B相比，該等修飾中之某些改良抗體之藥物動力學。在某些實施例中，與抗體A或抗體B相比，該等修飾中之某些增加抗體之半衰期。在其他實施例中，與抗體A或抗體B相比，該等修飾中之某些增加抗體之抗體效應功能且改良抗體之藥物動力學。在其他實施例中，與抗體A或抗體B相比，該等修飾中之某些增加抗體之抗體效應功能且增加抗體之半衰期。在某些實施例中，抗體包括包含VH CDR 1-3之VH及包含VL CDR 1-3之VL，其中VH CDR 1-3及VL CDR 1-3具有以下中所述之序列：分別地SEQ ID NO.: 137、138、139、140、141及142，且包含與SEQ ID NO: 348相比具有一或多個胺基酸序列修飾之重鏈恆定區。在某些實施例中，抗gp120抗體或gp120結合片段具有與SEQ ID NO: 477中所述之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、例如100%一致性的VH及與SEQ ID NO: 278中所述之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、例如100%一致性的VL。在某些實施例中，抗體包含分別包含SEQ ID NO.: 477及278中所述之胺基酸序列的VH及VL，且包含與SEQ ID NO: 348相比具有一或多個胺基酸序列修飾的重鏈恆定區。在一些實施例中，該等取代改良效應功能。在一些實施例中，該等

取代增加半衰期。在一些實施例中，該等取代改良效應功能且增加半衰期。

【0120】在某些實施例中，一或多個修飾係選自以下Fc胺基酸取代(EU編號)或其組合：L234F；L235E；G236A；S239D；F243L；D265E；D265A；S267E；H268F；R292P；N297Q；N297A；S298A；S324T；I332E；S239D；A330L；L234F；L235E；P331S；F243L；Y300L；V305I；P396L；S298A；E333A；K334A；E345R；L235V；F243L；R292P；Y300L；P396L；M428L；E430G；N434S；G236A、S267E、H268F、S324T及I332E；G236A、S239D及I332E；S239D、A330L、I332E；L234F、L235E及P331S；F243L、R292P、Y300L、V305I及P396L；G236A、H268F、S324T及I332E；S239D、H268F、S324T及I332E；S298A、E333A及K334A；L235V、F243L、R292P、Y300L及P396L；S239D、I332E；S239D、S298A及I332E；G236A、S239D、I332E、M428L及N434S；G236A、S239D、A330L、I332E、M428L及N434S；S239D、I332E、G236A及A330L；M428L及N4343S；M428L、N434S；G236A、S239D、A330L及I332E；及G236A及I332E。在某些實施例中，向Fc區中引入一個、兩個、三個、四個或更多個胺基酸取代以改變(例如增加)抗體之效應功能。舉例而言，該等取代位於選自由以下組成之群之位置：胺基酸殘基236、239、330及332 (根據EU編號)。該等位置可經不同胺基酸殘基置換，使得抗體具有改良之效應功能。在某些實施例中，抗體包括包含VH CDR 1-3之VH及包含VL CDR 1-3之VL，其中VH CDR 1-3及VL CDR 1-3具有以下中所述之序列：分別地SEQ ID NO.: 137、138、139、140、141及142，且包含與SEQ

ID NO: 348相比具有以下修飾(EU編號)之重鏈恆定區：S239D、I332E、G236A、A330L、M428L、N434S。在某些實施例中，抗gp120抗體或gp120結合片段具有與SEQ ID NO: 477中所述之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、例如100%一致性的VH及與SEQ ID NO: 278中所述之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、例如100%一致性的VL，且包含與SEQ ID NO: 348相比具有以下修飾(EU編號)之重鏈恆定區：S239D、I332E、G236A、A330L、M428L、N434S。在某些實施例中，抗體包含分別包含SEQ ID NO.: 477及278中所述之胺基酸序列的VH及VL，且包含與SEQ ID NO: 348相比具有以下修飾(EU編號)之重鏈恆定區：S239D、I332E、G236A、A330L、M428L、N434S。在一些實施例中，該等取代改良效應功能。在一些實施例中，該等取代增加半衰期。在一些實施例中，該等取代改良效應功能且增加半衰期。

【0121】在某些情況下，本申請案之抗體包含藉由增加Fc與活化FcγR之結合來增加或增強效應功能之突變。在一些情況下，本申請案之抗體包含增加抗體之藥物動力學半衰期之突變。

【0122】增加抗體之半衰期之突變為業內已知。在一個實施例中，本文所述抗體之恆定區包含在252位(EU編號)之甲硫胺酸經酪胺酸取代、在254位(EU編號)之絲胺酸經蘇胺酸取代及在256位(EU編號)之蘇胺酸經麩胺酸取代。參見(例如)美國專利第7,658,921號。命名為「YTE突變體」之此類型之突變體相對於相同抗體之野生型型式展現四

倍增加之半衰期(Dall'Acqua等人，*J Biol Chem*, 281: 23514-24 (2006)；Robbie等人，*Antimicrob Agents Chemotherap.*, 57(12):6147-6153 (2013))。在某些實施例中，抗體包括包含在251-257、285-290、308-314、385-389及428-436位(EU編號)之胺基酸殘基之一個、兩個、三個或更多個胺基酸取代的IgG恆定結構域。在其他實施例中，本文所述抗體包含T250Q及M428L (EU編號)突變。在其他實施例中，本文所述抗體(例如Duobodies®)包含H433K及N434F (EU編號)突變。

偶聯抗體

【0123】本文揭示之抗體中之任一者可為偶聯抗體，其結合至各種分子，包括巨分子物質，例如聚合物(例如聚乙二醇(PEG)、經PEG修飾之聚乙烯亞胺(PEI) (PEI-PEG)、聚麩胺酸(PGA) (N-(2-羥基丙基)甲基丙烯醯胺(HPMA)共聚物)、玻尿酸、放射性材料(例如^{90}Y、^{131}I、^{125}I、^{35}S、^{3}H、^{121}In、^{99}Tc)、螢光物質(例如螢光黃及玫瑰紅)、發光物質(例如發光胺)、量子點、半抗原、酶(例如葡萄糖氧化酶)、金屬螯合物、生物素、抗生物素蛋白及藥物。

【0124】在一些實施例中，本文所述抗體或其抗原結合片段偶聯至細胞毒性劑，例如用於遞送至HIV感染細胞並將其殺死。在各個實施例中，細胞毒性劑係小有機化合物或抑制性核酸，例如短抑制性RNA (siRNA)、微小RNA (miRNA)。在一些實施例中，本文所述抗體或其抗原結合片段偶聯至選自由以下組成之群之細胞毒性劑：單甲基奧裡斯他汀(auristatin) E (MMAE)、單甲基奧裡斯他汀F (MMAF)、卡奇黴素(calicheamicin)、安絲菌素(ansamitocin)、美登素(maytansine)或其類似物(例如莫登素(mertansine)/艾坦辛(emtansine) (DM1)、拉夫坦辛(ravtansine)/索拉夫坦辛(soravtansine) (DM4))、蒽環(例如多柔比星

(doxorubicin)、道諾黴素(daunorubicin)、泛艾黴素(epirubicin)、伊達比星(idarubicin))、吡咯并苯并二氮呼(PBD) DNA交聯劑SC-DR002(D6.5)、倍癌黴素(duocarmycin)、微管抑制劑(MTI) (例如紫杉烷(taxane)、長春花生物鹼(vinca alkaloid)、埃博黴素(epothilone))、吡咯并苯并二氮呼(PBD)或其二聚體、倍癌黴素(A、B1、B2、C1、C2、D、SA、CC-1065)及假單胞菌屬(*Pseudomonas*)外毒素。

【0125】 上述偶聯抗體可藉由對本文所述抗體或其低分子量型式實施化學修飾來製備。修飾抗體之方法為業內熟知(例如US 5,057,313及US 5,156,840)。

核酸

【0126】 本揭示內容亦提供編碼本文所述抗體或抗原結合片段之一或多種多核苷酸、包含該等多核苷酸之載體及包含該等多核苷酸或表現載體之宿主細胞(例如哺乳動物細胞，包括倉鼠細胞或人類細胞、植物細胞、酵母細胞、細菌細胞，包括大腸桿菌細胞)。本文提供包含編碼本文提供之抗體中之任一者之核苷酸序列的多核苷酸、以及包含該等多核苷酸序列之載體，例如用於其在宿主細胞(例如哺乳動物細胞)中足夠表現之表現載體。

【0127】 在另一態樣中，本揭示內容提供編碼本發明之抗體或其抗原結合片段的多核苷酸或核酸分子。在一些實施例中，核酸分子編碼本申請案之抗體輕鏈(或其片段)或抗體重鏈(或其片段)或二者。在其他實施例中，核酸係DNA、cDNA或mRNA。在一些其他實施例中，核酸分子經密碼子最佳化以增強在宿主細胞中之表現。

【0128】 在一態樣中，本揭示內容提供包含編碼結合至gp120之抗體或抗原結合片段的VH、VL、或VH及VL之核苷酸序列的多核苷

酸。在某些情況下，VH及VL具有以下SEQ ID NO.中分別闡述之胺基酸 ：182及275；182及278；182及279；182及280；182及281；182及282；182及292；182及304；182及307；182及309；220及310； 或220及311。

【0129】在另一態樣中，本文提供包含編碼本文所述抗體之CDR、輕鏈或重鏈之核苷酸序列的多核苷酸。多核苷酸可包含編碼包含本文所述抗體之VL CDR之輕鏈或輕鏈可變結構域的核苷酸序列(例如，參見上表)。多核苷酸可包含編碼包含本文所述抗體之VH CDR之重鏈或重鏈可變結構域的核苷酸序列(例如，參見上表)。在一個實施例中，本文所述多核苷酸編碼可變輕鏈或具有分別包含SEQ ID NO: 140、141及142中所述之胺基酸序列之VL-CDR的輕鏈。在另一實施例中，本文所述多核苷酸編碼可變重鏈或具有分別包含SEQ ID NO: 137、138及139中所述之胺基酸序列之VH CDR的重鏈。在一個實施例中，本文所述多核苷酸編碼包含SEQ ID NO:275、278、279、280、281、282、292、304、307、309、310或311中所述之胺基酸序列的VL結構域。在另一實施例中，本文所述多核苷酸編碼包含SEQ ID NO:182或220中所述之胺基酸序列的VH結構域。在另一實施例中，本文所述多核苷酸編碼包含SEQ ID NO:49、100、101、103、104、105、106、107、117、129、132、134、135或136中所述之胺基酸序列的輕鏈。在另一實施例中，本文所述多核苷酸編碼包含SEQ ID NO: 2或42中所述之胺基酸序列的重鏈。在一個實施例中，本文所述多核苷酸編碼包含SEQ ID NO: 278中所述之胺基酸序列的VL結構域。在另一實施例中，本文所述多核苷酸編碼包含SEQ ID NO: 477中所述之胺基酸序列的VH結構域。在另一實施例中，本文所述多核苷酸編碼包含

SEQ ID NO: 103中所述之胺基酸序列的輕鏈。在另一實施例中，本文所述多核苷酸編碼包含SEQ ID NO: 529中所述之胺基酸序列的重鏈。

【0130】在一些實施例中，該(等)核酸編碼選自由SEQ ID NO: 181-221及465-478組成之群且與選自由SEQ ID NO: 572-581組成之群之核酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%或100%一致性的VH；且編碼選自由SEQ ID NO: 222-311、479-516及569組成之群且與選自由SEQ ID NO: 582-595組成之群之核酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%或100%一致性的VL。

【0131】在一些實施例中，該(等)核酸編碼選自由SEQ ID NO: 1-47及517-530組成之群且與選自由SEQ ID NO: 596-605組成之群之核酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%或100%一致性的HC；且編碼選自由SEQ ID NO: 48-136及531-567組成之群且與選自由SEQ ID NO: 606-619組成之群之核酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%或100%一致性的LC。

【0132】在一些實施例中，核酸分子或分子具有密碼子偏好性以增強在期望宿主細胞(例如人類細胞、哺乳動物細胞、酵母細胞、植物細胞、昆蟲細胞或細菌細胞，例如大腸桿菌細胞)中之表現。因此，提供編碼如本文所述之抗體或抗原結合片段的多核苷酸，其中多核苷酸具

有密碼子偏好性，包含置換異源信號序列，及/或消除mRNA不穩定元件。生成密碼子偏好之核酸之方法可藉由採用以下中所述之方法來實施：例如，美國專利第 5,965,726號；第6,174,666號；第6,291,664號；第6,414,132號；及第6,794,498號。用於抗體或抗原結合片段在期望宿主細胞中表現之較佳密碼子使用提供於(例如) kazusa.or.jp/codon/；及genscript.com/tools/codon-frequency-table。

【0133】密碼子偏好之用於在哺乳動物宿主細胞中改良表現之編碼本文所述抗gp120抗體及抗原結合片段之VH及VL的闡釋性多核苷酸提供於表XII及XIII中。密碼子偏好之用於在哺乳動物宿主細胞中改良表現之編碼本文所述抗gp120抗體及抗原結合片段之HC及LC的闡釋性多核苷酸提供於表XIV及XV中。

【0134】若適當，在某些實施例中，編碼本文所述抗體或抗原結合片段之一或多種多核苷酸的3′端包含多個串聯終止密碼子，例如兩個或更多個串聯TAG (「amber」)、TAA (「ochre」)或TGA (「opal」或「umber」)終止密碼子。多個串聯終止密碼子可相同或不同。在多核苷酸係mRNA之實施例中，多核苷酸之3′端可包含多-A尾。

【0135】本揭示內容亦涵蓋編碼抗gp120抗體或其抗原結合片段、抗CD3抗體或其抗原結合片段、抗CD16抗體或其抗原結合片段或抗CD89抗體或其抗原結合片段之多核苷酸，其(例如)藉由密碼子最佳化、用異源信號序列置換及消除mRNA不穩定元件經最佳化。生成最佳化核酸之方法可藉由採用以下中所述之方法來實施：例如，美國專利第5,965,726號；第6,174,666號；第6,291,664號；第6,414,132號；及第6,794,498號。

【0136】在一些實施例中，編碼本文所述抗體或抗原結合片段之

一或多個多核苷酸調配或囊封於脂質奈米粒子(LNP)中。如本文所用術語「脂質奈米粒子」係指一或多個球形奈米粒子，其中平均直徑介於約10至約1000奈米之間，且其包含可溶解親脂性分子之固體脂質核基質。在某些實施例中，脂質核係藉由表面活性劑(例如乳化劑)穩定，且可包含以下中之一或多者：甘油三酯(例如三硬脂)、甘油二酯(例如甘油山嵛酸酯)、單甘油酯(例如甘油單硬脂酸酯)、脂肪酸(例如硬脂酸)、類固醇(例如膽固醇)及蠟(例如棕櫚酸鯨蠟酯)，包括其組合。脂質奈米粒子闡述於以下中：例如，Petrilli等人，Curr Pharm Biotechnol. 15:847-55, 2014；及美國專利第 6,217,912號；第6,881,421號；第7,402,573號；第7,404,969號；第7,550,441號；第7,727,969號；第8,003,621號；第8,691,750號；第8,871,509號；第9,017,726號；第9,173,853號；第9,220,779號；第9,227,917號；及第9,278,130號，其各自全文以引用方式併入。編碼廣泛中和抗體之LNP囊封之mRNA分子闡述於(例如) Pardi等人，*Nat Commun.* (2017) 8:14630中。在某些實施例中，編碼本文所述抗體或抗原結合片段之一或多種多核苷酸調配或囊封於包括例如莫耳比分別為約50:10:38.5:1.5 mol mol^{-1}之可電離陽離子脂質/磷酯醯膽鹼/膽固醇/PEG-脂質之LNP中。

表XII - 編碼重鏈可變區(VH)之多核苷酸	
SEQ ID NO:	**編碼VH之多核苷酸序列**
572	CAGGTGCAGTTGTTGCAGTCTGGCGCCGCTGTTACAAAGCCTGGCGCTTCTGTT AGAGTGTCCTGCGAGGCCTCCGGCTACAACATCAGAGACTACTTCATCCACTGG TGGCGGCAGGCTCCAGGACAGGGATTGCAATGGGTCGGATGGATCAACCCTAAG ACCGGCCAGCCTAACAACCCTAGACAGTTCCAGGGCAGAGTGTCCCTGACCAG ACACGCCTCTTGGGACTTCGACACCTTCAGCTTCTACATGGACCTGAAGGCCCT GAGATCCGACGATACCGCCGTGTACTTCTGCGCCAGACAGAGAAGCGACTACTG GGATTTCGATGTGTGGGGCTCTGGCACCCAAGTGACCGTGTCCTCT
573	CAGGTGCAGCTGCTGCAGTCTGGCGCCGCTGTGACAAAACCAGGCGCTTCTGT GCGGGTGTCCTGCGAGGCCAGCGGCTACAACATCCGGGACTACTTCATTCACTG GTGGCGCCAGGCCCCTGGACAGGGACTGCAGTGGGTGGGATGGATCAACCCCA AGACCGGCCAGCCCAACAACCCCAGACAGTTCCAGGGCAGAGTGTCCCTGACC AGACACGCCAGCTGGGACTTCGACACCTTCAGCTTCTACATGGACCTGAAGGCC CTGCGGAGCGACGATACCGCCGTGTACTTCTGCGCCAGACAGAGAAGCGACTAC TGGGATTTCGACGTGTGGGGCAGCGGCACCCAAGTGACCGTGTCATCT

表XII - 編碼重鏈可變區(VH)之多核苷酸	
SEQ ID NO:	**編碼VH之多核苷酸序列**
574	CAGGTGCAGTTGTTGCAGTCTGGCGCCGCTGTTACAAAGCCTGGCGCTTCTGTT AGAGTGTCCTGCGAGGCCTCCGGCTACAACATCAGAGACTACTTCATCCACTGG TGGCGGCAGGCTCCAGGACAGGGATTGCAATGGGTCGGATGGATCAACCCTAAG ACCGGCCAGCCTAACAACCCTAGACAGTTCCAGGGCAGAGTGTCCCTGACCAG ACACGCCTCTTTCGACTTCGACACCTTCAGCTTCTACATGGACCTGAAGGCCCT GAGATCCGACGATACCGCCGTGTACTTCTGCGCCAGACAGAGAAGCGACTACTG GGACTTCGATGTGTGGGGCTCTGGCACCCAAGTGACCGTGTCCTCT
575	CAGGTGCAGCTGCTGCAGTCTGGCGCCGCTGTGACAAAACCAGGCGCTTCTGT GCGGGTGTCCTGCGAGGCCAGCGGCTACAACATCCGGGACTACTTCATTCACTG GTGGCGCCAGGCCCCTGGACAGGGACTGCAGTGGGTGGGATGGATCAACCCCA AGACCGGCCAGCCCAACAACCCCAGACAGTTCCAGGGCAGAGTGTCCCTGACC AGACACGCCAGCTTCGACTTCGACACCTTCAGCTTCTACATGGACCTGAAGGCC CTGCGGAGCGACGATACCGCCGTGTACTTCTGCGCCAGACAGAGAAGCGACTAC TGGGATTTCGACGTGTGGGGCAGCGGCACCCAAGTGACCGTGTCATCT

表XII - 編碼重鏈可變區(VH)之多核苷酸	
SEQ ID NO:	**編碼VH之多核苷酸序列**
576	CAGGTCCACTTGTCTCAATCTGGCGCCGCTGTGACAAAGCCTGGCGCTTCTGTC AGAGTGTCTTGCGAGGCCTCTGGCTACAAGATCCGGGACCACTTTATCCACTGG TGGCGACAGGCTCCAGGACAGGGATTGCAGTGGGTCGGATGGATCAACCCTAA GACCGGCCAGCCTAACAACCCTAGACAGTTCCAGGGCAGAGTGTCCCTGACCA GACACGCCTCTTGGGACTTCGACACCTTCAGCTTCTACATGGACCTGAAGGCCG TGCGGAGCGACGACACCGCTATCTACTTTTGCGCCAGACAGAGATCCGACTACT GGGATTTCGATGTGTGGGGCTCTGGCACCCAAGTGACCGTGTCCTCT
577	CAGGTCCACCTGTCTCAATCTGGCGCCGCTGTTACAAAACCAGGCGCCTCTGTT AGAGTGTCTTGCGAGGCCAGCGGCTACAAGATCAGGGACCACTTTATTCACTGG TGGCGCCAGGCTCCAGGACAGGGACTTCAATGGGTCGGATGGATCAACCCTAAG ACCGGCCAGCCTAACAACCCCAGACAGTTCCAGGGCAGAGTGTCTCTGACAAG ACACGCCAGCTGGGACTTCGACACCTTCAGCTTCTACATGGACCTGAAGGCCGT GCGGAGCGACGACACCGCCATCTATTTTTGCGCCAGACAGAGAAGCGACTACTG GGATTTCGATGTGTGGGGCAGCGGCACCCAAGTGACAGTCTCTTCT

表XII - 編碼重鏈可變區(VH)之多核苷酸	
SEQ ID NO:	**編碼VH之多核苷酸序列**
578	CAGGTCCACTTGTCTCAATCTGGCGCCGCTGTGACAAAGCCTGGCGCTTCTGTC AGAGTGTCTTGCGAGGCCTCTGGCTACAAGATCCGGGACCACTTTATCCACTGG TGGCGACAGGCTCCAGGACAGGGATTGCAGTGGGTCGGATGGATCAACCCTAA GACCGGCCAGCCTAACAACCCTAGACAGTTCCAGGGCAGAGTGTCCCTGACCA GACACGCCTCTTTCGACTTCGACACCTTCAGCTTCTACATGGACCTGAAGGCCG TGCGGAGCGACGACACCGCTATCTACTTTTGCGCCAGACAGAGATCCGACTACT GGGACTTCGATGTGTGGGGCTCTGGCACCCAAGTGACCGTGTCCTCT
579	CAGGTCCACCTGTCTCAATCTGGCGCCGCTGTTACAAAACCAGGCGCCTCTGTT AGAGTGTCTTGCGAGGCCAGCGGCTACAAGATCAGGGACCACTTTATTCACTGG TGGCGCCAGGCTCCAGGACAGGGACTTCAATGGGTCGGATGGATCAACCCTAAG ACCGGCCAGCCTAACAACCCCAGACAGTTCCAGGGCAGAGTGTCTCTGACAAG ACACGCCAGCTTCGACTTCGACACCTTCAGCTTCTACATGGACCTGAAGGCCGT GCGGAGCGACGACACCGCCATCTATTTTTGCGCCAGACAGAGAAGCGACTACTG GGATTTCGATGTGTGGGGCAGCGGCACCCAAGTGACAGTCTCTTCT

表XII - 編碼重鏈可變區(VH)之多核苷酸	
SEQ ID NO:	**編碼VH之多核苷酸序列**
580	CAGGTCCACTTGTCTCAATCTGGCGCCGCTGTGACAAAGCCTGGCGCTTCTGTC AGAGTGTCTTGCGAGGCCTCCGGCTACAACATCCGGGACTACTTTATCCACTGG TGGCGGCAGGCTCCAGGACAGGGATTGCAATGGGTCGGATGGATCAACCCTAAG ACCGGCCAGCCTAACAACCCTAGACAGTTCCAGGGCAGAGTGTCCCTGACCAG ACACGCCTCTTGGGACTTCGACACCTTCAGCTTCTACATGGACCTGAAGGCCGT GCGGAGCGACGACACCGCTATCTACTTTTGCGCCAGACAGAGATCCGACTACTG GGATTTCGATGTGTGGGGCTCTGGCACCCAAGTGACCGTGTCCTCT
581	CAGGTCCACCTGTCTCAATCTGGCGCCGCTGTTACAAAACCAGGCGCCTCTGTT AGAGTGTCTTGCGAGGCCAGCGGCTACAACATCCGGGACTACTTTATTCACTGG TGGCGCCAGGCTCCAGGACAGGGACTTCAATGGGTCGGATGGATCAACCCTAAG ACCGGCCAGCCTAACAACCCCAGACAGTTCCAGGGCAGAGTGTCTCTGACAAG ACACGCCAGCTGGGACTTCGACACCTTCAGCTTCTACATGGACCTGAAGGCCGT GCGGAGCGACGACACCGCCATCTATTTTTGCGCCAGACAGAGAAGCGACTACTG GGATTTCGATGTGTGGGGCAGCGGCACCCAAGTGACAGTCTCTTCT

表XIII -編碼輕鏈可變區(VL)之多核苷酸	
SEQ ID NO:	編碼VL之多核苷酸序列
582	GACATCCAGATGACCCAGAGCCCTTCCTCTTTATCCGCTAGCGTCGGCGATACCG TGACCATCACATGCCAAGCTAACGGCTACCTCAACTGGTACCAGCAGCGGAGGG GAAAGGCCCCCAAGCTGCTGATCTACGACGGCTCCAAGCTGGAGAGGGGAGTG CCTTCCCGGTTCAGCGGAAGGAGGTGGGGACAAGAATACAATTTAACCATCAAC AATTTACAGCCCGAGGACATCGCTACCTACTTCTGCCAAGTTTACGAGTTCGTGG TGCCCGGCACTCGTCTGGATCTGAAG
583	GACATCCAGATGACCCAGAGCCCTAGCAGCCTGAGCGCCAGCGTGGGCGATACC GTGACCATTACCTGCCAGGCCAACGGCTACCTGAACTGGTATCAGCAGCGGAGA GGCAAGGCCCCCAAGCTGCTGATCTACGACGGCAGCAAGCTGGAAAGAGGCGT GCCCAGCAGATTCAGCGGCAGAAGATGGGGCCAGGAGTACAACCTGACCATCA ACAACCTGCAGCCCGAGGATATCGCCACATACTTTTGCCAGGTGTACGAGTTCG TGGTGCCCGGCACACGGCTGGACCTGAAA

表XIII -編碼輕鏈可變區(VL)之多核苷酸	
SEQ ID NO:	編碼VL之多核苷酸序列
584	GACATCCAGATGACCCAGTCTCCATCCTCTCTGTCTGCCTCTGTGGGCGATACCG CTACCATCACCTGTCAGGCCAACGGCTACCTGAACTGGTATCAGCAGAGAAGAG GCAAGGCCCCTAAGCTGCTGATCTACGACGGCTCCAAACTGGAAAGAGGCGTG CCCTCTCGGTTCTCTGGCAGAAGATGGGGCCAAGAGTACAACCTGACCATCAAC AACCTGCAGCCTGAGGATATCGCCACATACTTTTGCCAGGTGTACGAGTTCGTG GTGCCTGGCACAAGACTGGACCTGAAG
585	GATATTCAGATGACACAGAGCCCCAGTAGCCTGAGCGCCAGCGTGGGCGACACC GCAACCATCACCTGTCAGGCCAACGGCTATCTGAACTGGTATCAACAGAGGAGG GGCAAGGCCCCCAAGCTCCTGATATACGACGGCAGCAAGCTGGAGAGGGGCGT TCCCAGCCGCTTCAGCGGCAGGAGGTGGGGCCAGGAGTACAACCTTACAATCA ACAACCTGCAGCCCGAGGACATCGCCACCTATTTCTGCCAAGTTTACGAGTTCG TGGTGCCCGGCACCAGGCTGGACCTGAAG

表XIII -編碼輕鏈可變區(VL)之多核苷酸	
SEQ ID NO:	編碼VL之多核苷酸序列
586	GACATCCAGATGACCCAGTCTCCATCCTCTCTGTCTGCCTCTGTGGGCGACAGA GCTACCATCACCTGTCAGGCCAACGGCTACCTGAACTGGTATCAGCAGAGAAGA GGCAAGGCCCCTAAGCTGCTGATCTACGACGGCTCCAAACTGGAAAGAGGCGT GCCCTCCAGATTCTCCGGCTCTAGATGGGGCCAAGAGTACAACCTGACCATCTC CAGCCTCCAGCCTGAGGATATCGCCACATACTTTTGCCAGGTGTACGAGTTCTTC GGCCCTGGCACCAGACTGGACCTGAAG
587	GATATTCAGATGACACAGAGCCCCAGTAGCCTGAGCGCCAGCGTGGGCGACAG AGCAACCATCACCTGTCAGGCCAACGGCTATCTGAACTGGTATCAACAGAGAAG GGGCAAGGCCCCCAAGCTCCTGATATACGACGGCAGCAAGCTGGAGAGGGGCG TTCCCAGCCGCTTCAGCGGCTCAAGGTGGGGCCAGGAGTACAACCTTACAATCT CATCCCTGCAGCCCGAGGACATCGCCACCTATTTCTGCCAAGTTTACGAGTTCTT CGGACCCGGCACCAGGCTGGACCTGAAG

表XIII -編碼輕鏈可變區(VL)之多核苷酸	
SEQ ID NO:	編碼VL之多核苷酸序列
588	GACATCCAGATGACCCAGTCTCCATCCTCTCTGTCTGCCAGAGTGGGCGACACC GTGACAATCACCTGTCAGGCCAACGGCTACCTGAACTGGTATCAGCAGAGAAG AGGCAAGGCCCCTAAGCTGCTGATCTACGACGGCTCCAAACTGGAAAGAGGCG TGCCCGCTAGATTCTCCGGCAGAAGATGGGGCCAAGAGTACAACCTGACCATCA ACAACCTGCAGCCTGAGGACGTGGCCACATACTTTTGCCAGGTGTACGAGTTCA TCGTGCCCGGCACCAGACTGGACCTGAAG
589	GATATTCAGATGACACAGAGCCCCAGTAGCCTGAGCGCCCGCGTGGGCGACACC GTGACCATCACCTGTCAGGCCAACGGCTATCTGAACTGGTATCAACAGAGGAGG GGCAAGGCCCCCAAGCTCCTGATATACGACGGCAGCAAGCTGGAGAGGGGCGT TCCCGCACGCTTCAGCGGCAGGAGGTGGGGCCAGGAGTACAACCTTACAATCA ACAACCTGCAGCCCGAGGACGTCGCCACCTATTTCTGCCAAGTTTACGAGTTCA TCGTGCCCGGCACCAGGCTGGACCTGAAG

表XIII -編碼輕鏈可變區(VL)之多核苷酸	
SEQ ID NO:	編碼VL之多核苷酸序列
590	GACATCCAGATGACCCAGTCTCCATCCTCTCTGTCTGCCTCTGTGGGCGATACCG CTACCATCACCTGTCAGGCCAACGGCTACCTGAACTGGTATCAGCAGAGAAGAG GCAAGGCCCCTAAGCTGCTGATCTACGACGGCTCCAAACTGGAAAGAGGCGTG CCCTCTCGGTTCTCTGGCAGAAGATGGGGCCAAGAGTACACCCTGACCATCAAC AACCTGCAGCCTGAGGATATCGCCACATACTTTTGCCAGGTGTACGAGTTCTTCG GCCCTGGCACCAGACTGGACCTGAAG
591	GACATCCAGATGACACAGAGCCCTAGCAGCCTGTCTGCCAGCGTGGGAGATACC GCCACAATTACCTGTCAGGCCAACGGCTACCTGAACTGGTATCAGCAGCGGAGA GGCAAGGCCCCTAAGCTGCTGATCTACGACGGCAGCAAGCTGGAAAGAGGCGT GCCCAGCAGATTCAGCGGCAGAAGATGGGGCCAAGAGTACACCCTGACCATCA ACAACCTGCAGCCTGAGGATATTGCCACATACTTTTGCCAGGTGTACGAGTTCTT CGGCCCTGGCACCAGACTGGACCTGAAG

表XIII -編碼輕鏈可變區(VL)之多核苷酸	
SEQ ID NO:	編碼VL之多核苷酸序列
592	GACATCCAGATGACCCAGTCTCCATCCTCTCTGTCTGCCTCTGTGGGCGACAGA GCTACCATCACCTGTCAGGCCAACGGCTACCTGAACTGGTATCAGCAGAGAAGA GGCAAGGCCCCTAAGCTGCTGATCTACGACGGCTCCAAACTGGAAAGAGGCGT GCCCTCCAGATTCTCCGGCTCTAGATGGGGCCAAGAGTACACCCTGACCATCTCT AGCCTGCAGCCTGAGGATATCGCCACATACTTTTGCCAGGTGTACGAGTTCTTCG GCCCTGGCACCAGACTGGACCTGAAG
593	GACATCCAGATGACACAGAGCCCTAGCAGCCTGTCTGCCTCTGTGGGCGATAGA GCCACAATCACCTGTCAGGCCAACGGCTACCTGAACTGGTATCAGCAGAGAAG AGGCAAGGCCCCTAAGCTGCTGATCTACGACGGCAGCAAACTGGAAAGAGGCG TGCCAAGCAGATTCAGCGGCTCTAGATGGGGCCAAGAGTACACCCTGACCATCT CTAGCCTGCAGCCTGAGGATATCGCCACATACTTTTGCCAGGTGTACGAGTTCTT CGGCCCTGGCACCAGACTGGACCTGAAA

表XIII -編碼輕鏈可變區(VL)之多核苷酸	
SEQ ID NO:	編碼VL之多核苷酸序列
594	GACATCCAGATGACCCAGTCTCCATCCTCTCTGTCTGCCAGAGTGGGCGATACC GCTACCATCACCTGTCAGGCCAACGGCTACCTGAACTGGTATCAGCAGAGAAGA GGCAAGGCCCCTAAGCTGCTGATCTACGACGGCTCCAAACTGGAAAGAGGCGT GCCCGCTAGATTCTCCGGCAGAAGATGGGGCCAAGAGTACACCCTGACCATCAA CAACCTGCAGCCTGAGGACGTGGCCACATACTTTTGCCAGGTGTACGAGTTCAT CGTGCCCGGCACCAGACTGGACCTGAAG
595	GATATTCAGATGACACAGAGCCCCAGTAGCCTGAGCGCCCGCGTGGGCGACACC GCGACCATCACCTGTCAGGCCAACGGCTATCTGAACTGGTATCAACAGAGGAGG GGCAAGGCCCCCAAGCTCCTGATATACGACGGCAGCAAGCTGGAGAGGGGCGT TCCCGCACGCTTCAGCGGCAGGAGGTGGGGCCAGGAGTACACCCTTACAATCA ACAACCTGCAGCCCGAGGACGTCGCCACCTATTTCTGCCAAGTTTACGAGTTCA TCGTGCCCGGCACCAGGCTGGACCTGAAG

表XIV -編碼重鏈(HC)之多核苷酸	
SEQ ID NO:	編碼HC之多核苷酸序列
596	CAGGTGCAGTTGTTGCAGTCTGGCGCCGCTGTTACAAAGCCTGGCGCTTCTGTTA GAGTGTCCTGCGAGGCCTCCGGCTACAACATCAGAGACTACTTCATCCACTGGTG GCGGCAGGCTCCAGGACAGGGATTGCAATGGGTCGGATGGATCAACCCTAAGAC CGGCCAGCCTAACAACCCTAGACAGTTCCAGGGCAGAGTGTCCCTGACCAGACA CGCCTCTTGGGACTTCGACACCTTCAGCTTCTACATGGACCTGAAGGCCCTGAGA TCCGACGATACCGCCGTGTACTTCTGCGCCAGACAGAGAAGCGACTACTGGGATT TCGATGTGTGGGGCTCTGGCACCCAAGTGACCGTGTCCTCTGCTTCTACCAAGGG ACCCTCTGTGTTCCCTCTGGCTCCTTCCAGCAAGTCTACCTCTGGTGGAACCGCT GCTCTGGGCTGCCTGGTCAAGGATTACTTTCCTGAGCCTGTGACAGTGTCCTGGA ACTCTGGTGCTCTGACCTCCGGCGTGCACACATTTCCAGCTGTGCTGCAGTCCTC CGGCCTGTACTCTCTGTCCTCTGTCGTGACCGTGCCTTCTAGCTCTCTGGGCACCC AGACCTACATCTGCAACGTGAACCACAAGCCTTCCAACACCAAGGTGGACAAGA AGGTGGAACCCAAGTCCTGCGACAAGACCCACACCTGTCCTCCATGTCCTGCTCC AGAACTGCTGGCTGGCCCCGATGTCTTTCTGTTCCCTCCAAAGCCTAAGGACACC CTGATGATCTCTCGGACCCCTGAAGTGACCTGCGTGGTGGTGGATGTGTCTCACG AGGATCCCGAAGTGAAGTTCAATTGGTACGTGGACGGCGTGGAAGTGCACAACG

表XIV -編碼重鏈(HC)之多核苷酸	
SEQ ID NO:	**編碼HC之多核苷酸序列**
	CCAAGACCAAGCCTAGAGAGGAACAGTACAACTCCACCTACAGAGTGGTGTCCG TGCTGACCGTGCTGCACCAGGATTGGCTGAACGGCAAAGAGTACAAGTGCAAGG TGTCCAACAAGGCCCTGCCTCTGCCTGAGGAAAAGACCATCTCTAAGGCTAAGG GCCAGCCTCGCGAGCCTCAGGTTTACACACTGCCTCCATCTCGGGAAGAGATGAC CAAGAACCAGGTGTCACTGACCTGCCTCGTGAAGGGCTTCTACCCTTCCGATATC GCCGTGGAATGGGAGTCCAATGGCCAGCCTGAGAACAACTACAAGACAACCCCT CCTGTGCTGGACTCCGACGGCTCATTCTTCCTGTACTCCAAGCTGACAGTGGACA AGTCTCGGTGGCAGCAGGGCAACGTGTTCTCTTGTAGTGTGCTGCACGAGGCCCT GCACTCCCACTATACCCAGAAGTCTCTGTCTCTGAGCCCCGGCAAA
597	CAGGTGCAGCTGCTGCAGTCTGGCGCCGCTGTGACAAAACCAGGCGCTTCTGTG CGGGTGTCCTGCGAGGCCAGCGGCTACAACATCCGGGACTACTTCATTCACTGGT GGCGCCAGGCCCCTGGACAGGGACTGCAGTGGGTGGGATGGATCAACCCCAAGA CCGGCCAGCCCAACAACCCCAGACAGTTCCAGGGCAGAGTGTCCCTGACCAGAC ACGCCAGCTGGGACTTCGACACCTTCAGCTTCTACATGGACCTGAAGGCCCTGCG GAGCGACGATACCGCCGTGTACTTCTGCGCCAGACAGAGAAGCGACTACTGGGA TTTCGACGTGTGGGGCAGCGGCACCCAAGTGACCGTGTCATCTGCTAGCACCAA

表XIV -編碼重鏈(HC)之多核苷酸	
SEQ ID NO:	**編碼HC之多核苷酸序列**
	GGGCCCCAGCGTGTTCCCTCTGGCCCCTAGCAGCAAGAGCACATCTGGCGGAAC AGCCGCCCTGGGCTGCCTCGTGAAGGACTACTTTCCCGAGCCCGTGACCGTGTCC TGGAACTCTGGCGCTCTGACAAGCGGCGTGCACACCTTTCCAGCCGTGCTGCAG AGCAGCGGCCTGTACTCTCTGAGCAGCGTCGTGACAGTGCCCAGCAGCTCTCTG GGCACCCAGACCTACATCTGCAACGTGAACCACAAGCCCAGCAACACCAAGGTG GACAAGAAGGTGGAACCCAAGAGCTGCGACAAGACCCACACCTGTCCCCCTTGT CCTGCCCCCGAACTGCTGGCTGGCCCTGACGTGTTCCTGTTCCCCCCAAAGCCCA AGGACACCCTGATGATCAGCCGGACCCCCGAAGTGACCTGCGTGGTGGTGGATG TGTCCCACGAGGACCCTGAAGTGAAGTTCAATTGGTACGTGGACGGCGTGGAAG TGCACAACGCCAAGACCAAGCCTAGAGAGGAACAGTACAACAGCACCTACCGGG TGGTGTCCGTGCTGACAGTGCTGCACCAGGACTGGCTGAACGGCAAAGAGTACA AGTGCAAGGTGTCCAACAAGGCCCTGCCCCTGCCCGAGGAAAAGACCATCTCTA AGGCCAAGGGACAGCCCCGCGAGCCCCAGGTGTACACACTGCCTCCAAGCCGGG AAGAGATGACCAAGAACCAGGTGTCCCTGACCTGTCTCGTGAAAGGCTTCTACC CCAGCGACATTGCCGTGGAATGGGAGAGCAACGGCCAGCCCGAGAACAACTACA AGACCACCCCCCCTGTGCTGGACAGCGACGGCTCATTCTTCCTGTACAGCAAGCT

表XIV -編碼重鏈(HC)之多核苷酸	
SEQ ID NO:	**編碼HC之多核苷酸序列**
	GACCGTGGACAAGTCCCGGTGGCAGCAGGGCAACGTGTTCAGCTGTAGCGTGTT GCATGAGGCTCTGCACAGCCACTACACGCAGAAGAGCCTCTCCCTGTCTCCGGGT AAA
598	CAGGTGCAGTTGTTGCAGTCTGGCGCCGCTGTTACAAAGCCTGGCGCTTCTGTTA GAGTGTCCTGCGAGGCCTCCGGCTACAACATCAGAGACTACTTCATCCACTGGTG GCGGCAGGCTCCAGGACAGGGATTGCAATGGGTCGGATGGATCAACCCTAAGAC CGGCCAGCCTAACAACCCTAGACAGTTCCAGGGCAGAGTGTCCCTGACCAGACA CGCCTCTTTCGACTTCGACACCTTCAGCTTCTACATGGACCTGAAGGCCCTGAGA TCCGACGATACCGCCGTGTACTTCTGCGCCAGACAGAGAAGCGACTACTGGGACT TCGATGTGTGGGGCTCTGGCACCCAAGTGACCGTGTCCTCTGCTTCTACCAAGGG ACCCTCTGTGTTCCCTCTGGCTCCTTCCAGCAAGTCTACCTCTGGTGGAACCGCT GCTCTGGGCTGCCTGGTCAAGGATTACTTTCCTGAGCCTGTGACAGTGTCCTGGA ACTCTGGTGCTCTGACCTCCGGCGTGCACACATTTCCAGCTGTGCTGCAGTCCTC CGGCCTGTACTCTCTGTCCTCTGTCGTGACCGTGCCTTCTAGCTCTCTGGGCACCC AGACCTACATCTGCAACGTGAACCACAAGCCTTCCAACACCAAGGTGGACAAGA AGGTGGAACCCAAGTCCTGCGACAAGACCCACACCTGTCCTCCATGTCCTGCTCC

表XIV -編碼重鏈(HC)之多核苷酸	
SEQ ID NO:	**編碼HC之多核苷酸序列**
	AGAACTGCTGGCTGGCCCCGATGTCTTTCTGTTCCCTCCAAAGCCTAAGGACACC CTGATGATCTCTCGGACCCCTGAAGTGACCTGCGTGGTGGTGGATGTGTCTCACG AGGATCCCGAAGTGAAGTTCAATTGGTACGTGGACGGCGTGGAAGTGCACAACG CCAAGACCAAGCCTAGAGAGGAACAGTACAACTCCACCTACAGAGTGGTGTCCG TGCTGACCGTGCTGCACCAGGATTGGCTGAACGGCAAAGAGTACAAGTGCAAGG TGTCCAACAAGGCCCTGCCTCTGCCTGAGGAAAAGACCATCTCTAAGGCTAAGG GCCAGCCTCGCGAGCCTCAGGTTTACACACTGCCTCCATCTCGGGAAGAGATGAC CAAGAACCAGGTGTCACTGACCTGCCTCGTGAAGGGCTTCTACCCTTCCGATATC GCCGTGGAATGGGAGTCCAATGGCCAGCCTGAGAACAACTACAAGACAACCCCT CCTGTGCTGGACTCCGACGGCTCATTCTTCCTGTACTCCAAGCTGACAGTGGACA AGTCTCGGTGGCAGCAGGGCAACGTGTTCTCTTGTAGTGTGCTGCACGAGGCCCT GCACTCCCACTATACCCAGAAGTCTCTGTCTCTGAGCCCCGGCAAA
599	CAGGTGCAGCTGCTGCAGTCTGGCGCCGCTGTGACAAAACCAGGCGCTTCTGTG CGGGTGTCCTGCGAGGCCAGCGGCTACAACATCCGGGACTACTTCATTCACTGGT GGCGCCAGGCCCCTGGACAGGGACTGCAGTGGGTGGGATGGATCAACCCCAAGA CCGGCCAGCCCAACAACCCCAGACAGTTCCAGGGCAGAGTGTCCCTGACCAGAC

表XIV -編碼重鏈(HC)之多核苷酸	
SEQ ID NO:	編碼HC之多核苷酸序列
	ACGCCAGCTTCGACTTCGACACCTTCAGCTTCTACATGGACCTGAAGGCCCTGCG GAGCGACGATACCGCCGTGTACTTCTGCGCCAGACAGAGAAGCGACTACTGGGA TTTCGACGTGTGGGGCAGCGGCACCCAAGTGACCGTGTCATCTGCTAGCACCAA GGGCCCCAGCGTGTTCCCTCTGGCCCCTAGCAGCAAGAGCACATCTGGCGGAAC AGCCGCCCTGGGCTGCCTCGTGAAGGACTACTTTCCCGAGCCCGTGACCGTGTCC TGGAACTCTGGCGCTCTGACAAGCGGCGTGCACACCTTTCCAGCCGTGCTGCAG AGCAGCGGCCTGTACTCTCTGAGCAGCGTCGTGACAGTGCCCAGCAGCTCTCTG GGCACCCAGACCTACATCTGCAACGTGAACCACAAGCCCAGCAACACCAAGGTG GACAAGAAGGTGGAACCCAAGAGCTGCGACAAGACCCACACCTGTCCCCCTTGT CCTGCCCCCCGAACTGCTGGCTGGCCCTGACGTGTTCCTGTTCCCCCCAAAGCCCA AGGACACCCTGATGATCAGCCGGACCCCCGAAGTGACCTGCGTGGTGGTGGATG TGTCCCACGAGGACCCTGAAGTGAAGTTCAATTGGTACGTGGACGGCGTGGAAG TGCACAACGCCAAGACCAAGCCTAGAGAGGAACAGTACAACAGCACCTACCGGG TGGTGTCCGTGCTGACAGTGCTGCACCAGGACTGGCTGAACGGCAAAGAGTACA AGTGCAAGGTGTCCAACAAGGCCCTGCCCCTGCCCGAGGAAAAGACCATCTCTA AGGCCAAGGGACAGCCCCGCGAGCCCCAGGTGTACACACTGCCTCCAAGCCGGG

表XIV -編碼重鏈(HC)之多核苷酸	
SEQ ID NO:	**編碼HC之多核苷酸序列**
	AAGAGATGACCAAGAACCAGGTGTCCCTGACCTGTCTCGTGAAAGGCTTCTACC CCAGCGACATTGCCGTGGAATGGGAGAGCAACGGCCAGCCCGAGAACAACTACA AGACCACCCCCCCTGTGCTGGACAGCGACGGCTCATTCTTCCTGTACAGCAAGCT GACCGTGGACAAGTCCCGGTGGCAGCAGGGCAACGTGTTCAGCTGTAGCGTGTT GCATGAGGCTCTGCACAGCCACTACACGCAGAAGAGCCTCTCCCTGTCTCCGGGT AAA
600	CAGGTCCACTTGTCTCAATCTGGCGCCGCTGTGACAAAGCCTGGCGCTTCTGTCA GAGTGTCTTGCGAGGCCTCTGGCTACAAGATCCGGGACCACTTTATCCACTGGTG GCGACAGGCTCCAGGACAGGGATTGCAGTGGGTCGGATGGATCAACCCTAAGAC CGGCCAGCCTAACAACCCTAGACAGTTCCAGGGCAGAGTGTCCCTGACCAGACA CGCCTCTTGGGACTTCGACACCTTCAGCTTCTACATGGACCTGAAGGCCGTGCGG AGCGACGACACCGCTATCTACTTTTGCGCCAGACAGAGATCCGACTACTGGGATT TCGATGTGTGGGGCTCTGGCACCCAAGTGACCGTGTCCTCTGCTTCTACCAAGGG ACCCTCTGTGTTCCCTCTGGCTCCTTCCAGCAAGTCTACCTCTGGTGGAACCGCT GCTCTGGGCTGCCTGGTCAAGGATTACTTTCCTGAGCCTGTGACAGTGTCCTGGA ACTCTGGTGCTCTGACCTCCGGCGTGCACACATTTCCAGCTGTGCTGCAGTCCTC

表XIV -編碼重鏈(HC)之多核苷酸	
SEQ ID NO:	**編碼HC之多核苷酸序列**
	CGGCCTGTACTCTCTGTCCTCTGTCGTGACCGTGCCTTCTAGCTCTCTGGGCACCC AGACCTACATCTGCAACGTGAACCACAAGCCTTCCAACACCAAGGTGGACAAGA AGGTGGAACCCAAGTCCTGCGACAAGACCCACACCTGTCCTCCATGTCCTGCTCC AGAACTGCTGGCTGGCCCCGATGTCTTTCTGTTCCCTCCAAAGCCTAAGGACACC CTGATGATCTCTCGGACCCCTGAAGTGACCTGCGTGGTGGTGGATGTGTCTCACG AGGATCCCGAAGTGAAGTTCAATTGGTACGTGGACGGCGTGGAAGTGCACAACG CCAAGACCAAGCCTAGAGAGGAACAGTACAACTCCACCTACAGAGTGGTGTCCG TGCTGACCGTGCTGCACCAGGATTGGCTGAACGGCAAAGAGTACAAGTGCAAGG TGTCCAACAAGGCCCTGCCTCTGCCTGAGGAAAAGACCATCTCTAAGGCTAAGG GCCAGCCTCGCGAGCCTCAGGTTTACACACTGCCTCCATCTCGGGAAGAGATGAC CAAGAACCAGGTGTCACTGACCTGCCTCGTGAAGGGCTTCTACCCTTCCGATATC GCCGTGGAATGGGAGTCCAATGGCCAGCCTGAGAACAACTACAAGACAACCCCT CCTGTGCTGGACTCCGACGGCTCATTCTTCCTGTACTCCAAGCTGACAGTGGACA AGTCTCGGTGGCAGCAGGGCAACGTGTTCTCTTGTAGTGTGCTGCACGAGGCCCT GCACTCCCACTATACCCAGAAGTCCCTGTCTCTGTCCCCTGGCAAA
601	CAGGTCCACCTGTCTCAATCTGGCGCCGCTGTTACAAAACCAGGCGCCTCTGTTA

表XIV -編碼重鏈(HC)之多核苷酸	
SEQ ID NO:	**編碼HC之多核苷酸序列**
	GAGTGTCTTGCGAGGCCAGCGGCTACAAGATCAGGGACCACTTTATTCACTGGTG GCGCCAGGCTCCAGGACAGGGACTTCAATGGGTCGGATGGATCAACCCTAAGAC CGGCCAGCCTAACAACCCCAGACAGTTCCAGGGCAGAGTGTCTCTGACAAGACA CGCCAGCTGGGACTTCGACACCTTCAGCTTCTACATGGACCTGAAGGCCGTGCGG AGCGACGACACCGCCATCTATTTTTGCGCCAGACAGAGAAGCGACTACTGGGATT TCGATGTGTGGGGCAGCGGCACCCAAGTGACAGTCTCTTCTGCTAGCACCAAGG GCCCCAGCGTGTTCCCTCTGGCCCCTAGCAGCAAGAGCACATCTGGCGGAACAG CCGCCCTGGGCTGCCTCGTGAAGGACTACTTTCCCGAGCCCGTGACCGTGTCCTG GAACTCTGGCGCTCTGACAAGCGGCGTGCACACCTTTCCAGCCGTGCTGCAGAG CAGCGGCCTGTACTCTCTGAGCAGCGTCGTGACAGTGCCCAGCAGCTCTCTGGGC ACCCAGACCTACATCTGCAACGTGAACCACAAGCCCAGCAACACCAAGGTGGAC AAGAAGGTGGAACCCAAGAGCTGCGACAAGACCCACACCTGTCCCCCTTGTCCT GCCCCCGAACTGCTGGCTGGCCCTGACGTGTTCCTGTTCCCCCCAAAGCCCAAGG ACACCCTGATGATCAGCCGGACCCCCGAAGTGACCTGCGTGGTGGTGGATGTGTC CCACGAGGACCCTGAAGTGAAGTTCAATTGGTACGTGGACGGCGTGGAAGTGCA CAACGCCAAGACCAAGCCTAGAGAGGAACAGTACAACAGCACCTACCGGGTGGT

表XIV -編碼重鏈(HC)之多核苷酸	
SEQ ID NO:	**編碼HC之多核苷酸序列**
	GTCCGTGCTGACAGTGCTGCACCAGGACTGGCTGAACGGCAAAGAGTACAAGTG CAAGGTGTCCAACAAGGCCCTGCCCCTGCCCGAGGAAAAGACCATCTCTAAGGC CAAGGGACAGCCCCGCGAGCCCCAGGTGTACACACTGCCTCCAAGCCGGGAAGA GATGACCAAGAACCAGGTGTCCCTGACCTGTCTCGTGAAAGGCTTCTACCCCAGC GACATTGCCGTGGAATGGGAGAGCAACGGCCAGCCCGAGAACAACTACAAGACC ACCCCCCCTGTGCTGGACAGCGACGGCTCATTCTTCCTGTACAGCAAGCTGACCG TGGACAAGTCCCGGTGGCAGCAGGGCAACGTGTTCAGCTGTAGCGTGTTGCATG AGGCTCTGCACAGCCACTACACGCAGAAGAGCCTCTCCCTGTCTCCGGGTAAA
602	CAGGTCCACTTGTCTCAATCTGGCGCCGCTGTGACAAAGCCTGGCGCTTCTGTCA GAGTGTCTTGCGAGGCCTCTGGCTACAAGATCCGGGACCACTTTATCCACTGGTG GCGACAGGCTCCAGGACAGGGATTGCAGTGGGTCGGATGGATCAACCCTAAGAC CGGCCAGCCTAACAACCCTAGACAGTTCCAGGGCAGAGTGTCCCTGACCAGACA CGCCTCTTTCGACTTCGACACCTTCAGCTTCTACATGGACCTGAAGGCCGTGCGG AGCGACGACACCGCTATCTACTTTTGCGCCAGACAGAGATCCGACTACTGGGACT TCGATGTGTGGGGCTCTGGCACCCAAGTGACCGTGTCCTCTGCTTCTACCAAGGG ACCCTCTGTGTTCCCTCTGGCTCCTTCCAGCAAGTCTACCTCTGGTGGAACCGCT

表XIV -編碼重鏈(HC)之多核苷酸	
SEQ ID NO:	**編碼HC之多核苷酸序列**
	GCTCTGGGCTGCCTGGTCAAGGATTACTTTCCTGAGCCTGTGACAGTGTCCTGGA ACTCTGGTGCTCTGACCTCCGGCGTGCACACATTTCCAGCTGTGCTGCAGTCCTC CGGCCTGTACTCTCTGTCCTCTGTCGTGACCGTGCCTTCTAGCTCTCTGGGCACCC AGACCTACATCTGCAACGTGAACCACAAGCCTTCCAACACCAAGGTGGACAAGA AGGTGGAACCCAAGTCCTGCGACAAGACCCACACCTGTCCTCCATGTCCTGCTCC AGAACTGCTGGCTGGCCCCGATGTCTTTCTGTTCCCTCCAAAGCCTAAGGACACC CTGATGATCTCTCGGACCCCTGAAGTGACCTGCGTGGTGGTGGATGTGTCTCACG AGGATCCCGAAGTGAAGTTCAATTGGTACGTGGACGGCGTGGAAGTGCACAACG CCAAGACCAAGCCTAGAGAGGAACAGTACAACTCCACCTACAGAGTGGTGTCCG TGCTGACCGTGCTGCACCAGGATTGGCTGAACGGCAAAGAGTACAAGTGCAAGG TGTCCAACAAGGCCCTGCCTCTGCCTGAGGAAAAGACCATCTCTAAGGCTAAGG GCCAGCCTCGCGAGCCTCAGGTTTACACACTGCCTCCATCTCGGGAAGAGATGAC CAAGAACCAGGTGTCACTGACCTGCCTCGTGAAGGGCTTCTACCCTTCCGATATC GCCGTGGAATGGGAGTCCAATGGCCAGCCTGAGAACAACTACAAGACAACCCCT CCTGTGCTGGACTCCGACGGCTCATTCTTCCTGTACTCCAAGCTGACAGTGGACA AGTCTCGGTGGCAGCAGGGCAACGTGTTCTCTTGTAGTGTGCTGCACGAGGCCCT

表XIV -編碼重鏈(HC)之多核苷酸	
SEQ ID NO:	**編碼HC之多核苷酸序列**
	GCACTCCCACTATACCCAGAAGTCCCTGTCTCTGTCCCCTGGCAAA
603	CAGGTCCACCTGTCTCAATCTGGCGCCGCTGTTACAAAACCAGGCGCCTCTGTTA GAGTGTCTTGCGAGGCCAGCGGCTACAAGATCAGGGACCACTTTATTCACTGGTG GCGCCAGGCTCCAGGACAGGGACTTCAATGGGTCGGATGGATCAACCCTAAGAC CGGCCAGCCTAACAACCCCAGACAGTTCCAGGGCAGAGTGTCTCTGACAAGACA CGCCAGCTTCGACTTCGACACCTTCAGCTTCTACATGGACCTGAAGGCCGTGCGG AGCGACGACACCGCCATCTATTTTTGCGCCAGACAGAGAAGCGACTACTGGGATT TCGATGTGTGGGGCAGCGGCACCCAAGTGACAGTCTCTTCTGCTAGCACCAAGG GCCCCAGCGTGTTCCCTCTGGCCCCTAGCAGCAAGAGCACATCTGGCGGAACAG CCGCCCTGGGCTGCCTCGTGAAGGACTACTTTCCCGAGCCCGTGACCGTGTCCTG GAACTCTGGCGCTCTGACAAGCGGCGTGCACACCTTTCCAGCCGTGCTGCAGAG CAGCGGCCTGTACTCTCTGAGCAGCGTCGTGACAGTGCCCAGCAGCTCTCTGGGC ACCCAGACCTACATCTGCAACGTGAACCACAAGCCCAGCAACACCAAGGTGGAC AAGAAGGTGGAACCCAAGAGCTGCGACAAGACCCACACCTGTCCCCCTTGTCCT GCCCCCGAACTGCTGGCTGGCCCTGACGTGTTCCTGTTCCCCCCAAAGCCCAAGG ACACCCTGATGATCAGCCGGACCCCCGAAGTGACCTGCGTGGTGGTGGATGTGTC

表XIV -編碼重鏈(HC)之多核苷酸	
SEQ ID NO:	**編碼HC之多核苷酸序列**
	CCACGAGGACCCTGAAGTGAAGTTCAATTGGTACGTGGACGGCGTGGAAGTGCA CAACGCCAAGACCAAGCCTAGAGAGGAACAGTACAACAGCACCTACCGGGTGGT GTCCGTGCTGACAGTGCTGCACCAGGACTGGCTGAACGGCAAAGAGTACAAGTG CAAGGTGTCCAACAAGGCCCTGCCCCTGCCCGAGGAAAAGACCATCTCTAAGGC CAAGGGACAGCCCCGCGAGCCCCAGGTGTACACACTGCCTCCAAGCCGGGAAGA GATGACCAAGAACCAGGTGTCCCTGACCTGTCTCGTGAAAGGCTTCTACCCCAGC GACATTGCCGTGGAATGGGAGAGCAACGGCCAGCCCGAGAACAACTACAAGACC ACCCCCCCTGTGCTGGACAGCGACGGCTCATTCTTCCTGTACAGCAAGCTGACCG TGGACAAGTCCCGGTGGCAGCAGGGCAACGTGTTCAGCTGTAGCGTGTTGCATG AGGCTCTGCACAGCCACTACACGCAGAAGAGCCTCTCCCTGTCTCCGGGTAAA
604	CAGGTCCACTTGTCTCAATCTGGCGCCGCTGTGACAAAGCCTGGCGCTTCTGTCA GAGTGTCTTGCGAGGCCTCCGGCTACAACATCCGGGACTACTTTATCCACTGGTG GCGGCAGGCTCCAGGACAGGGATTGCAATGGGTCGGATGGATCAACCCTAAGAC CGGCCAGCCTAACAACCCTAGACAGTTCCAGGGCAGAGTGTCCCTGACCAGACA CGCCTCTTGGGACTTCGACACCTTCAGCTTCTACATGGACCTGAAGGCCGTGCGG AGCGACGACACCGCTATCTACTTTTGCGCCAGACAGAGATCCGACTACTGGGATT

表XIV -編碼重鏈(HC)之多核苷酸	
SEQ ID NO:	**編碼HC之多核苷酸序列**
	TCGATGTGTGGGGCTCTGGCACCCAAGTGACCGTGTCCTCTGCTTCTACCAAGGG ACCCTCTGTGTTCCCTCTGGCTCCTTCCAGCAAGTCTACCTCTGGTGGAACCGCT GCTCTGGGCTGCCTGGTCAAGGATTACTTTCCTGAGCCTGTGACAGTGTCCTGGA ACTCTGGTGCTCTGACCTCCGGCGTGCACACATTTCCAGCTGTGCTGCAGTCCTC CGGCCTGTACTCTCTGTCCTCTGTCGTGACCGTGCCTTCTAGCTCTCTGGGCACCC AGACCTACATCTGCAACGTGAACCACAAGCCTTCCAACACCAAGGTGGACAAGA AGGTGGAACCCAAGTCCTGCGACAAGACCCACACCTGTCCTCCATGTCCTGCTCC AGAACTGCTGGCTGGCCCCGATGTCTTTCTGTTCCCTCCAAAGCCTAAGGACACC CTGATGATCTCTCGGACCCCTGAAGTGACCTGCGTGGTGGTGGATGTGTCTCACG AGGATCCCGAAGTGAAGTTCAATTGGTACGTGGACGGCGTGGAAGTGCACAACG CCAAGACCAAGCCTAGAGAGGAACAGTACAACTCCACCTACAGAGTGGTGTCCG TGCTGACCGTGCTGCACCAGGATTGGCTGAACGGCAAAGAGTACAAGTGCAAGG TGTCCAACAAGGCCCTGCCTCTGCCTGAGGAAAAGACCATCTCTAAGGCTAAGG GCCAGCCTCGCGAGCCTCAGGTTTACACACTGCCTCCATCTCGGGAAGAGATGAC CAAGAACCAGGTGTCACTGACCTGCCTCGTGAAGGGCTTCTACCCTTCCGATATC GCCGTGGAATGGGAGTCCAATGGCCAGCCTGAGAACAACTACAAGACAACCCCT

表XIV -編碼重鏈(HC)之多核苷酸	
SEQ ID NO:	**編碼HC之多核苷酸序列**
	CCTGTGCTGGACTCCGACGGCTCATTCTTCCTGTACTCCAAGCTGACAGTGGACA AGTCTCGGTGGCAGCAGGGCAACGTGTTCTCTTGTAGTGTGCTGCACGAGGCCCT GCACTCCCACTATACCCAGAAGTCCCTGTCTCTGTCCCCTGGCAAA
605	CAGGTCCACCTGTCTCAATCTGGCGCCGCTGTTACAAAACCAGGCGCCTCTGTTA GAGTGTCTTGCGAGGCCAGCGGCTACAACATCCGGGACTACTTTATTCACTGGTG GCGCCAGGCTCCAGGACAGGGACTTCAATGGGTCGGATGGATCAACCCTAAGAC CGGCCAGCCTAACAACCCCAGACAGTTCCAGGGCAGAGTGTCTCTGACAAGACA CGCCAGCTGGGACTTCGACACCTTCAGCTTCTACATGGACCTGAAGGCCGTGCGG AGCGACGACACCGCCATCTATTTTTGCGCCAGACAGAGAAGCGACTACTGGGATT TCGATGTGTGGGGCAGCGGCACCCAAGTGACAGTCTCTTCTGCTAGCACCAAGG GCCCCAGCGTGTTCCCTCTGGCCCCTAGCAGCAAGAGCACATCTGGCGGAACAG CCGCCCTGGGCTGCCTCGTGAAGGACTACTTTCCCGAGCCCGTGACCGTGTCCTG GAACTCTGGCGCTCTGACAAGCGGCGTGCACACCTTTCCAGCCGTGCTGCAGAG CAGCGGCCTGTACTCTCTGAGCAGCGTCGTGACAGTGCCCAGCAGCTCTCTGGGC ACCCAGACCTACATCTGCAACGTGAACCACAAGCCCAGCAACACCAAGGTGGAC AAGAAGGTGGAACCCAAGAGCTGCGACAAGACCCACACCTGTCCCCCTTGTCCT

表XIV -編碼重鏈(HC)之多核苷酸	
SEQ ID NO:	**編碼HC之多核苷酸序列**
	GCCCCCGAACTGCTGGCTGGCCCTGACGTGTTCCTGTTCCCCCCAAAGCCCAAGG ACACCCTGATGATCAGCCGGACCCCCGAAGTGACCTGCGTGGTGGTGGATGTGTC CCACGAGGACCCTGAAGTGAAGTTCAATTGGTACGTGGACGGCGTGGAAGTGCA CAACGCCAAGACCAAGCCTAGAGAGGAACAGTACAACAGCACCTACCGGGTGGT GTCCGTGCTGACAGTGCTGCACCAGGACTGGCTGAACGGCAAAGAGTACAAGTG CAAGGTGTCCAACAAGGCCCTGCCCCTGCCCGAGGAAAAGACCATCTCTAAGGC CAAGGGACAGCCCCGCGAGCCCCAGGTGTACACACTGCCTCCAAGCCGGGAAGA GATGACCAAGAACCAGGTGTCCCTGACCTGTCTCGTGAAAGGCTTCTACCCCAGC GACATTGCCGTGGAATGGGAGAGCAACGGCCAGCCCGAGAACAACTACAAGACC ACCCCCCCTGTGCTGGACAGCGACGGCTCATTCTTCCTGTACAGCAAGCTGACCG TGGACAAGTCCCGGTGGCAGCAGGGCAACGTGTTCAGCTGTAGCGTGTTGCATG AGGCTCTGCACAGCCACTACACGCAGAAGAGCCTCTCCCTGTCTCCGGGTAAA

表XV - 編碼輕鏈(LC)之多核苷酸	
SEQ ID NO:	**編碼LC之多核苷酸序列**
606	GACATCCAGATGACCCAGAGCCCTTCCTCTTTATCCGCTAGCGTCGGCGATACCGT GACCATCACATGCCAAGCTAACGGCTACCTCAACTGGTACCAGCAGCGGAGGGG AAAGGCCCCCAAGCTGCTGATCTACGACGGCTCCAAGCTGGAGAGGGGAGTGCC TTCCCGGTTCAGCGGAAGGAGGTGGGGACAAGAATACAATTTAACCATCAACAAT TTACAGCCCGAGGACATCGCTACCTACTTCTGCCAAGTTTACGAGTTCGTGGTGC CCGGCACTCGTCTGGATCTGAAGAGGACCGTGGCCGCCCCCTCCGTGTTCATCTT TCCCCCTTCCGACGAGCAGCTGAAGTCCGGCACCGCCTCCGTGGTGTGTTTACTG AACAACTTCTACCCTCGTGAGGCCAAGGTGCAGTGGAAGGTGGACAACGCTTTA CAGTCCGGCAACTCCCAAGAATCCGTGACCGAGCAAGATAGCAAGGACTCCACC TACTCCCTCTCCAGCACTTTAACTTTATCCAAGGCCGACTACGAGAAGCACAAGG TGTACGCTTGTGAGGTGACCCACCAAGGTCTGTCCTCCCCCGTGACAAAGTCCTT CAATCGGGGCGAGTGT

表XV - 編碼輕鏈(LC)之多核苷酸	
SEQ ID NO:	**編碼LC之多核苷酸序列**
607	GACATCCAGATGACCCAGAGCCCTAGCAGCCTGAGCGCCAGCGTGGGCGATACC GTGACCATTACCTGCCAGGCCAACGGCTACCTGAACTGGTATCAGCAGCGGAGAG GCAAGGCCCCCAAGCTGCTGATCTACGACGGCAGCAAGCTGGAAAGAGGCGTGC CCAGCAGATTCAGCGGCAGAAGATGGGGCCAGGAGTACAACCTGACCATCAACA ACCTGCAGCCCGAGGATATCGCCACATACTTTTGCCAGGTGTACGAGTTCGTGGT GCCCGGCACACGGCTGGACCTGAAACGTACGGTGGCTGCACCATCTGTCTTCATC TTCCCGCCATCTGATGAGCAGTTGAAATCTGGAACTGCCTCTGTTGTGTGCCTGCT GAATAACTTCTATCCCAGAGAGGCCAAAGTACAGTGGAAGGTGGATAACGCCCTC CAATCGGGTAACTCCCAGGAGAGTGTCACAGAGCAGGACAGCAAGGACAGCACC TACAGCCTCAGCAGCACCCTGACGCTGAGCAAAGCAGACTACGAGAAACACAAA GTCTACGCCTGCGAAGTCACCCATCAGGGCCTGAGCTCGCCCGTCACAAAGAGC TTCAACAGGGGAGAGTGT

表XV - 編碼輕鏈(LC)之多核苷酸	
SEQ ID NO:	**編碼LC之多核苷酸序列**
608	GACATCCAGATGACCCAGTCTCCATCCTCTCTGTCTGCCTCTGTGGGCGATACCGC TACCATCACCTGTCAGGCCAACGGCTACCTGAACTGGTATCAGCAGAGAAGAGGC AAGGCCCCTAAGCTGCTGATCTACGACGGCTCCAAACTGGAAAGAGGCGTGCCC TCTCGGTTCTCTGGCAGAAGATGGGGCCAAGAGTACAACCTGACCATCAACAAC CTGCAGCCTGAGGATATCGCCACATACTTTTGCCAGGTGTACGAGTTCGTGGTGC CTGGCACAAGACTGGACCTGAAGAGAACCGTGGCCGCTCCTTCCGTGTTCATCTT CCCACCATCTGACGAGCAGCTGAAGTCTGGCACCGCTTCTGTCGTGTGCCTGCTG AACAACTTCTACCCTCGGGAAGCCAAGGTGCAGTGGAAGGTGGACAATGCCCTG CAGTCCGGCAACTCCCAAGAGTCTGTGACCGAGCAGGACTCCAAGGACTCTACC TACAGCCTGTCCTCCACACTGACCCTGTCTAAGGCCGACTACGAGAAGCACAAG GTGTACGCCTGCGAAGTGACCCATCAGGGACTGTCTAGCCCCGTGACCAAGTCCT TCAACAGAGGCGAGTGT

表XV - 編碼輕鏈(LC)之多核苷酸	
SEQ ID NO:	**編碼LC之多核苷酸序列**
609	GATATTCAGATGACACAGAGCCCCAGTAGCCTGAGCGCCAGCGTGGGCGACACC GCAACCATCACCTGTCAGGCCAACGGCTATCTGAACTGGTATCAACAGAGGAGGG GCAAGGCCCCCAAGCTCCTGATATACGACGGCAGCAAGCTGGAGAGGGGCGTTC CCAGCCGCTTCAGCGGCAGGAGGTGGGGCCAGGAGTACAACCTTACAATCAACA ACCTGCAGCCCGAGGACATCGCCACCTATTTCTGCCAAGTTTACGAGTTCGTGGT GCCCGGCACCAGGCTGGACCTGAAGCGGACCGTGGCCGCCCCCAGCGTGTTCAT CTTCCCTCCCAGCGACGAGCAGCTGAAGTCTGGCACCGCCAGCGTGGTGTGCCT GCTGAACAACTTCTACCCCCGCGAGGCCAAGGTGCAGTGGAAGGTGGACAACGC CCTGCAGAGCGGCAACAGCCAGGAGAGCGTGACCGAGCAGGACTCCAAGGACA GCACCTACAGCCTGAGCAGCACCCTGACCCTGAGCAAGGCCGACTACGAGAAGC ACAAGGTGTACGCCTGCGAGGTGACCCACCAGGGACTGTCTAGCCCCGTGACCA AGAGCTTCAACCGGGGCGAGTGC

表XV - 編碼輕鏈(LC)之多核苷酸	
SEQ ID NO:	**編碼LC之多核苷酸序列**
610	GACATCCAGATGACCCAGTCTCCATCCTCTCTGTCTGCCTCTGTGGGCGACAGAG CTACCATCACCTGTCAGGCCAACGGCTACCTGAACTGGTATCAGCAGAGAAGAGG CAAGGCCCCTAAGCTGCTGATCTACGACGGCTCCAAACTGGAAAGAGGCGTGCC CTCCAGATTCTCCGGCTCTAGATGGGGCCAAGAGTACAACCTGACCATCTCCAGC CTCCAGCCTGAGGATATCGCCACATACTTTTGCCAGGTGTACGAGTTCTTCGGCCC TGGCACCAGACTGGACCTGAAGAGAACAGTGGCCGCTCCTTCCGTGTTCATCTTC CCACCATCTGACGAGCAGCTGAAGTCTGGCACCGCTTCTGTCGTGTGCCTGCTGA ACAACTTCTACCCTCGGGAAGCCAAGGTGCAGTGGAAGGTGGACAATGCTCTCC AGTCCGGCAACTCCCAAGAGTCTGTGACCGAGCAGGACTCCAAGGACTCTACCT ACAGCCTGTCCTCCACACTGACCCTGTCTAAGGCCGACTACGAGAAGCACAAGG TGTACGCCTGCGAAGTGACCCATCAGGGACTGTCTAGCCCCGTGACCAAGTCCTT CAACAGAGGCGAGTGT

表XV - 編碼輕鏈(LC)之多核苷酸	
SEQ ID NO:	**編碼LC之多核苷酸序列**
611	GATATTCAGATGACACAGAGCCCCAGTAGCCTGAGCGCCAGCGTGGGCGACAGA GCAACCATCACCTGTCAGGCCAACGGCTATCTGAACTGGTATCAACAGAGAAGGG GCAAGGCCCCCAAGCTCCTGATATACGACGGCAGCAAGCTGGAGAGGGGCGTTC CCAGCCGCTTCAGCGGCTCAAGGTGGGGCCAGGAGTACAACCTTACAATCTCATC CCTGCAGCCCGAGGACATCGCCACCTATTTCTGCCAAGTTTACGAGTTCTTCGGA CCCGGCACCAGGCTGGACCTGAAGCGGACCGTGGCCGCCCCCAGCGTGTTCATC TTCCCTCCCAGCGACGAGCAGCTGAAGTCTGGCACCGCCAGCGTGGTGTGCCTG CTGAACAACTTCTACCCCCGCGAGGCCAAGGTGCAGTGGAAGGTGGACAACGCC CTGCAGAGCGGCAACAGCCAGGAGAGCGTGACCGAGCAGGACTCCAAGGACAG CACCTACAGCCTGAGCAGCACCCTGACCCTGAGCAAGGCCGACTACGAGAAGCA CAAGGTGTACGCCTGCGAGGTGACCCACCAGGGACTGTCTAGCCCCGTGACCAA GAGCTTCAACCGGGGCGAGTGC

表XV - 編碼輕鏈(LC)之多核苷酸	
SEQ ID NO:	**編碼LC之多核苷酸序列**
612	GACATCCAGATGACCCAGTCTCCATCCTCTCTGTCTGCCAGAGTGGGCGACACCG TGACAATCACCTGTCAGGCCAACGGCTACCTGAACTGGTATCAGCAGAGAAGAG GCAAGGCCCCTAAGCTGCTGATCTACGACGGCTCCAAACTGGAAAGAGGCGTGC CCGCTAGATTCTCCGGCAGAAGATGGGGCCAAGAGTACAACCTGACCATCAACA ACCTGCAGCCTGAGGACGTGGCCACATACTTTTGCCAGGTGTACGAGTTCATCGT GCCCGGCACCAGACTGGACCTGAAGAGAACAGTTGCCGCTCCTTCCGTGTTCATC TTCCCACCTTCCGACGAGCAGCTGAAGTCTGGCACAGCTTCTGTCGTGTGCCTGC TGAACAACTTCTACCCTCGGGAAGCCAAGGTGCAGTGGAAGGTGGACAATGCCC TGCAGTCCGGCAACTCCCAAGAGTCTGTGACCGAGCAGGACTCCAAGGACTCTA CCTACAGCCTGTCCTCCACACTGACCCTGTCTAAGGCCGACTACGAGAAGCACAA GGTGTACGCCTGCGAAGTGACCCATCAGGGACTGTCTAGCCCCGTGACCAAGTCC TTCAACAGAGGCGAGTGT

表XV - 編碼輕鏈(LC)之多核苷酸	
SEQ ID NO:	**編碼LC之多核苷酸序列**
613	GATATTCAGATGACACAGAGCCCCAGTAGCCTGAGCGCCCGCGTGGGCGACACC GTGACCATCACCTGTCAGGCCAACGGCTATCTGAACTGGTATCAACAGAGGAGGG GCAAGGCCCCCAAGCTCCTGATATACGACGGCAGCAAGCTGGAGAGGGGCGTTC CCGCACGCTTCAGCGGCAGGAGGTGGGGCCAGGAGTACAACCTTACAATCAACA ACCTGCAGCCCGAGGACGTCGCCACCTATTTCTGCCAAGTTTACGAGTTCATCGT GCCCGGCACCAGGCTGGACCTGAAGCGGACCGTGGCCGCCCCCAGCGTGTTCAT CTTCCCTCCCAGCGACGAGCAGCTGAAGTCTGGCACCGCCAGCGTGGTGTGCCT GCTGAACAACTTCTACCCCCGCGAGGCCAAGGTGCAGTGGAAGGTGGACAACGC CCTGCAGAGCGGCAACAGCCAGGAGAGCGTGACCGAGCAGGACTCCAAGGACA GCACCTACAGCCTGAGCAGCACCCTGACCCTGAGCAAGGCCGACTACGAGAAGC ACAAGGTGTACGCCTGCGAGGTGACCCACCAGGGACTGTCTAGCCCCGTGACCA AGAGCTTCAACCGGGGCGAGTGC

表XV - 編碼輕鏈(LC)之多核苷酸	
SEQ ID NO:	**編碼LC之多核苷酸序列**
614	GACATCCAGATGACCCAGTCTCCATCCTCTCTGTCTGCCTCTGTGGGCGATACCGC TACCATCACCTGTCAGGCCAACGGCTACCTGAACTGGTATCAGCAGAGAAGAGGC AAGGCCCCTAAGCTGCTGATCTACGACGGCTCCAAACTGGAAAGAGGCGTGCCC TCTCGGTTCTCTGGCAGAAGATGGGGCCAAGAGTACACCCTGACCATCAACAACC TGCAGCCTGAGGATATCGCCACATACTTTTGCCAGGTGTACGAGTTCTTCGGCCCT GGCACCAGACTGGACCTGAAGAGAACAGTGGCCGCTCCTTCCGTGTTCATCTTCC CACCATCTGACGAGCAGCTGAAGTCTGGCACCGCTTCTGTCGTGTGCCTGCTGAA CAACTTCTACCCTCGGGAAGCCAAGGTGCAGTGGAAGGTGGACAATGCCCTGCA GTCCGGCAACTCCCAAGAGTCTGTGACCGAGCAGGACTCCAAGGACTCTACCTA CAGCCTGTCCTCCACACTGACCCTGTCTAAGGCCGACTACGAGAAGCACAAGGT GTACGCCTGCGAAGTGACCCATCAGGGACTGTCTAGCCCCGTGACCAAGTCCTTC AACAGAGGCGAGTGT

表XV - 編碼輕鏈(LC)之多核苷酸	
SEQ ID NO:	**編碼LC之多核苷酸序列**
615	GACATCCAGATGACACAGAGCCCTAGCAGCCTGTCTGCCAGCGTGGGAGATACCG CCACAATTACCTGTCAGGCCAACGGCTACCTGAACTGGTATCAGCAGCGGAGAGG CAAGGCCCCTAAGCTGCTGATCTACGACGGCAGCAAGCTGGAAAGAGGCGTGCC CAGCAGATTCAGCGGCAGAAGATGGGGCCAAGAGTACACCCTGACCATCAACAA CCTGCAGCCTGAGGATATTGCCACATACTTTTGCCAGGTGTACGAGTTCTTCGGCC CTGGCACCAGACTGGACCTGAAGAGAACAGTGGCCGCTCCTAGCGTGTTCATCTT CCCACCTTCCGACGAGCAGCTGAAGTCTGGCACAGCCTCTGTCGTGTGCCTGCTG AACAACTTCTACCCCAGAGAAGCCAAGGTGCAGTGGAAGGTGGACAACGCCCTG CAGAGCGGCAATAGCCAAGAGAGCGTGACCGAGCAGGACAGCAAGGACTCTACC TACTCTCTGAGCAGCACCCTGACACTGAGCAAGGCCGACTACGAGAAGCACAAA GTGTACGCCTGCGAAGTGACCCACCAGGGCCTTTCTAGCCCTGTGACCAAGAGCT TCAACCGGGGCGAGTGT

表XV - 編碼輕鏈(LC)之多核苷酸	
SEQ ID NO:	**編碼LC之多核苷酸序列**
616	GACATCCAGATGACCCAGTCTCCATCCTCTCTGTCTGCCTCTGTGGGCGACAGAG CTACCATCACCTGTCAGGCCAACGGCTACCTGAACTGGTATCAGCAGAGAAGAGG CAAGGCCCCTAAGCTGCTGATCTACGACGGCTCCAAACTGGAAAGAGGCGTGCC CTCCAGATTCTCCGGCTCTAGATGGGGCCAAGAGTACACCCTGACCATCTCTAGC CTGCAGCCTGAGGATATCGCCACATACTTTTGCCAGGTGTACGAGTTCTTCGGCCC TGGCACCAGACTGGACCTGAAGAGAACAGTGGCCGCTCCTTCCGTGTTCATCTTC CCACCATCTGACGAGCAGCTGAAGTCTGGCACCGCTTCTGTCGTGTGCCTGCTGA ACAACTTCTACCCTCGGGAAGCCAAGGTGCAGTGGAAGGTGGACAATGCCCTGC AGTCCGGCAACTCCCAAGAGTCTGTGACCGAGCAGGACTCCAAGGACTCTACCT ACAGCCTGTCCTCCACACTGACCCTGTCTAAGGCCGACTACGAGAAGCACAAGG TGTACGCCTGCGAAGTGACCCATCAGGGACTGTCTAGCCCCGTGACCAAGTCCTT CAACAGAGGCGAGTGT

表XV - 編碼輕鏈(LC)之多核苷酸	
SEQ ID NO:	**編碼LC之多核苷酸序列**
617	GACATCCAGATGACACAGAGCCCTAGCAGCCTGTCTGCCTCTGTGGGCGATAGAG CCACAATCACCTGTCAGGCCAACGGCTACCTGAACTGGTATCAGCAGAGAAGAG GCAAGGCCCCTAAGCTGCTGATCTACGACGGCAGCAAACTGGAAAGAGGCGTGC CAAGCAGATTCAGCGGCTCTAGATGGGGCCAAGAGTACACCCTGACCATCTCTAG CCTGCAGCCTGAGGATATCGCCACATACTTTTGCCAGGTGTACGAGTTCTTCGGCC CTGGCACCAGACTGGACCTGAAACGTACGGTGGCTGCACCATCTGTCTTCATCTT CCCGCCATCTGATGAGCAGTTGAAATCTGGAACTGCCTCTGTTGTGTGCCTGCTG AATAACTTCTATCCCAGAGAGGCCAAAGTACAGTGGAAGGTGGATAACGCCCTCC AATCGGGTAACTCCCAGGAGAGTGTCACAGAGCAGGACAGCAAGGACAGCACCT ACAGCCTCAGCAGCACCCTGACGCTGAGCAAAGCAGACTACGAGAAACACAAA GTCTACGCCTGCGAAGTCACCCATCAGGGCCTGAGCTCGCCCGTCACAAAGAGC TTCAACAGGGGAGAGTGT

表XV - 編碼輕鏈(LC)之多核苷酸	
SEQ ID NO:	**編碼LC之多核苷酸序列**
618	GACATCCAGATGACCCAGTCTCCATCCTCTCTGTCTGCCAGAGTGGGCGATACCG CTACCATCACCTGTCAGGCCAACGGCTACCTGAACTGGTATCAGCAGAGAAGAGG CAAGGCCCCTAAGCTGCTGATCTACGACGGCTCCAAACTGGAAAGAGGCGTGCC CGCTAGATTCTCCGGCAGAAGATGGGGCCAAGAGTACACCCTGACCATCAACAAC CTGCAGCCTGAGGACGTGGCCACATACTTTTGCCAGGTGTACGAGTTCATCGTGC CCGGCACCAGACTGGACCTGAAGAGAACAGTTGCCGCTCCTTCCGTGTTCATCTT CCCACCTTCCGACGAGCAGCTGAAGTCTGGCACAGCTTCTGTCGTGTGCCTGCTG AACAACTTCTACCCTCGGGAAGCCAAGGTGCAGTGGAAGGTGGACAATGCCCTG CAGTCCGGCAACTCCCAAGAGTCTGTGACCGAGCAGGACTCCAAGGACTCTACC TACAGCCTGTCCTCCACACTGACCCTGTCTAAGGCCGACTACGAGAAGCACAAG GTGTACGCCTGCGAAGTGACCCATCAGGGACTGTCTAGCCCCGTGACCAAGTCCT TCAACAGAGGCGAGTGT

表XV - 編碼輕鏈(LC)之多核苷酸	
SEQ ID NO:	**編碼LC之多核苷酸序列**
619	GATATTCAGATGACACAGAGCCCCAGTAGCCTGAGCGCCCGCGTGGGCGACACC GCGACCATCACCTGTCAGGCCAACGGCTATCTGAACTGGTATCAACAGAGGAGGG GCAAGGCCCCCAAGCTCCTGATATACGACGGCAGCAAGCTGGAGAGGGGCGTTC CCGCACGCTTCAGCGGCAGGAGGTGGGGCCAGGAGTACACCCTTACAATCAACA ACCTGCAGCCCGAGGACGTCGCCACCTATTTCTGCCAAGTTTACGAGTTCATCGT GCCCGGCACCAGGCTGGACCTGAAGCGGACCGTGGCCGCCCCCAGCGTGTTCAT CTTCCCTCCCAGCGACGAGCAGCTGAAGTCTGGCACCGCCAGCGTGGTGTGCCT GCTGAACAACTTCTACCCCCGCGAGGCCAAGGTGCAGTGGAAGGTGGACAACGC CCTGCAGAGCGGCAACAGCCAGGAGAGCGTGACCGAGCAGGACTCCAAGGACA GCACCTACAGCCTGAGCAGCACCCTGACCCTGAGCAAGGCCGACTACGAGAAGC ACAAGGTGTACGCCTGCGAGGTGACCCACCAGGGACTGTCTAGCCCCGTGACCA AGAGCTTCAACCGGGGCGAGTGC

載體及宿主細胞

【0137】本揭示內容亦涵蓋包含本文揭示之核酸之載體。載體可具有任何類型，例如，重組載體，例如表現載體。載體包括(但不限於)質體、黏粒、細菌人工染色體(BAC)及酵母人工染色體(YAC)及源自噬菌體或植物或動物(包括人類)病毒之載體。載體可包含由所提出宿主細胞識別且在表現載體、啟動子及其他調節區之情形下由宿主細胞識別的複製起點。在其他實施例中，載體包含編碼可操作連接至啟動子及視情況另外調節元件之本揭示內容之抗體的多核苷酸。某些載體能夠在引入其之宿主細胞中進行自主複製(例如，具有細菌複製起點之載體可在細菌中複製)。其他載體在引入宿主中時可整合至宿主之基因體中且藉此與宿主基因體一起複製。載體包括(但不限於)適於重組產生本文揭示之抗體之彼等。

【0138】載體之選擇取決於所遵循之重組程序及所用之宿主。向宿主細胞中引入載體可藉由尤其磷酸鈣轉染、病毒感染、DEAE-聚葡萄糖介導之轉染、陽離子脂質體轉染或電穿孔來實現。載體可自主複製或可與其整合於其中之染色體一起複製。在某些實施例中，載體含有一或多個選擇標記物。標記物之選擇可取決於所選宿主細胞。該等標記包括(但不限於)康黴素(kanamycin)、新黴素(neomycin)、嘌呤黴素(puromycin)、潮黴素(hygromycin)、吉歐黴素(zeocin)、來自單純疱疹病毒之胸苷激酶基因(HSV-TK)及來自小鼠之二氫葉酸還原酶基因(dhfr)。本揭示內容亦涵蓋包含一或多個編碼本文所述抗體且可操作連接至一或多個編碼可用於分離抗體之蛋白質或肽之核酸分子之核酸分子的載體。該等蛋白質或肽包括(但不限於)麩胱甘肽-S-轉移酶、麥芽糖結合蛋白、金屬結合聚組胺酸、綠色螢光蛋白、螢光素酶及β-半乳糖苷

酶。

【0139】在其他實施例中，所用載體係pcDNA™3.1+(ThermoFisher, MA)。

【0140】本揭示內容亦提供包含本文所述核酸或載體之宿主細胞。可使用多種宿主細胞中之任一者。在一個實施例中，宿主細胞係原核細胞，例如大腸桿菌。在另一實施例中，宿主細胞係真核細胞，例如酵母細胞、植物細胞(例如煙草植物細胞)；或哺乳動物細胞，例如中國倉鼠卵巢(CHO)細胞(例如CHO-S、CHO-K1、CHO-K1a、CHO DG44、ExpiCHO™)、COS細胞、BHK細胞、NSO細胞或Bowes黑色素瘤細胞。人類宿主細胞之實例尤其係HeLa、911、AT1080、A549、293及HEK293 (例如HEK293E、HEK293T、Expi293™)細胞。另外，抗體(例如scFv's)可在酵母細胞(例如畢赤酵母(*Pichia*) (例如，參見Powers等人，J Immunol Methods. 251:123-35 (2001))、漢遜酵母(*Hanseula*)或酵母菌屬(*Saccharomyces*))中表現。轉基因煙草植物及培養之植物細胞中之抗體產生闡述於(例如) Sacks等人，*Plant Biotechnol J.* (2015) 13(8):1094-105；Klimyuk等人，*Curr Top Microbiol Immunol.* (2014) 375:127-54及Cramer等人，*Curr Top Microbiol Immunol.* (1999) 240:95-118中。

【0141】在一些實施例中，宿主細胞主要唾液酸化具有免疫球蛋白抗原結合結構域之可變區的N-連接醣基化位點。在一些實施例中，編碼如本文所述之抗體或其抗原結合片段之多核苷酸在唾液酸化所表現之抗體或其抗原結合片段之可變結構域(Fv，特別是VL)中的至少50%、至少55%、至少60%、至少65%、至少70%、至少75%、至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少

94%、至少95%或更多N-連接醣基化位點之宿主細胞中表現。在一些實施例中，細胞唾液酸化所表現之抗體或抗原結合片段之VL中的至少50%、至少60%、至少70%、至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%或更多N-連接醣基化位點。在一些實施例中，VL中之N-連接醣基化位點具有至少40%、至少50%、至少60%、至少70%、至少80%、至少85%、至少90%或更大之唾液酸佔有率(例如包含一個或兩個末端唾液酸殘基之聚醣)。如本文所用之「佔有率」係指聚醣在預測胺基酸醣基化位點連接之時間的百分比。在一些實施例中，根據Kabat編號VL胺基酸位置72之天冬醯胺(N72)經唾液酸化。在一些實施例中，VL中之唾液酸化N-連接醣基化位點包含1至5個唾液酸殘基、例如1至4個唾液酸殘基、例如1至3個唾液酸殘基、例如1至2個唾液酸殘基。人類及倉鼠宿主細胞主要利用N-乙醯基神經胺酸(NANA)唾液酸化。在一些實施例中，VL係利用N-乙醯基神經胺酸(NANA)唾液酸化或主要唾液酸化。小鼠宿主細胞主要利用N-羥乙醯基神經胺酸(NGNA)唾液酸化。在一些實施例中，VL係利用N-乙醯基神經胺酸(NGNA)唾液酸化或主要唾液酸化。在一些實施例中，唾液酸殘基存於二天線結構中。在一些實施例中，唾液酸殘基存於複雜N-連接聚醣結構中(例如可含有幾乎任何數目之其他類型之糖，包括超過初始兩種N-乙醯基葡糖胺)。在一些實施例中，唾液酸殘基存於雜合N-連接聚醣結構中(例如可在分枝之一側上含有甘露糖殘基，而在另一側上，N-乙醯基葡糖胺起始複雜分枝)。

【0142】 術語「核酸分子」係指核苷酸之聚合形式且包括RNA之有義及反義鏈、cDNA、基因體DNA及上述之合成形式及混合聚合物。如本文所用術語核酸分子可與術語多核苷酸互換。在一些實施例中，核

苷酸係指核糖核苷酸、去氧核苷酸或經修飾形式之任一類型之核苷酸、及其組合。該等術語亦包括(但不限於) DNA之單鏈及雙鏈形式。另外，多核苷酸(例如cDNA或mRNA)可包括由天然及/或非天然核苷酸鏈接連接在一起之任一或兩種天然及修飾核苷酸。核酸分子可以化學或生物化學方式經修飾或可含有非天然或衍生核苷酸鹼基，如熟習此項技術者易於瞭解。該等修飾包括(例如)標記、甲基化、天然核苷酸中之一或多者經類似物取代、核苷酸間修飾(例如不帶電鏈接(例如膦酸甲酯、磷酸三酯、胺基磷酸酯、胺基甲酸酯等)、帶電鏈接(例如硫代磷酸酯、二硫代磷酸酯等))、側接部分(例如多肽)、嵌入劑(例如吖啶、補骨脂素等)、螯合劑、烷基化劑及經修飾鏈接(例如α變旋異構核酸等)。上述術語亦意欲包括任何拓樸構形，包括單鏈、雙鏈、部分雙工化、三工、髮夾、圓形及扣鎖構形。除非另外規定，否則核酸序列之提及涵蓋其補體。因此，具有特定序列之核酸分子應理解為涵蓋具有其互補序列之其互補鏈。術語亦包括密碼子最佳化核酸。

【0143】 術語「可操作連接」係指通常物理連接且彼此呈功能關係之兩個或更多個核酸序列元件。例如，若啟動子能夠起始或調節編碼序列之轉錄或表現，則啟動子可操作連接至編碼序列，在該情形下，編碼序列應理解為「在啟動子之控制下」。

【0144】 如本文所用「取代」表示一或多個胺基酸或核苷酸分別由不同胺基酸或核苷酸置換。

【0145】 「經分離」核酸係指已與其天然環境中之組分分離之核酸分子。經分離核酸包括通常含有核酸分子之細胞中所含的核酸分子，但該核酸分子存在於染色體外或存在於與其天然染色體位置不同之染色體位置處。「編碼抗體或其片段之經分離核酸」係指編碼抗體重鏈及輕

鏈(或其片段)之一或多個核酸分子，包括單一載體或單獨載體中之該(等)核酸分子及存在於宿主細胞中一或多個位置處之該(等)核酸分子。

【0146】 如本文所用術語「載體」係指能夠傳播與其連接之另一核酸的核酸分子。該術語包括呈自複製核酸結構之載體，以及納入引入其之宿主細胞基因組中的載體。一些載體適於遞送本申請案之核酸分子或多核苷酸。某些載體能夠引導與其可操作地連接之核酸的表現。該等載體在本文中稱為表現載體。

【0147】 術語「宿主細胞」、「宿主細胞系」及「宿主細胞培養物」可互換使用且係指向其中引入外源核酸之細胞，包括該等細胞之子代。宿主細胞包括「轉變體」及「經轉變細胞」，其包括原代經轉變細胞及源自其之子代(與傳代次數無關)。子代之核酸含量可與親代細胞並不完全相同，而是可含有突變。本文包括如經篩選或選擇用於原始經轉變細胞中之具有相同功能或生物活性的突變體子代。

【0148】 如本文所用術語多核苷酸「變體」係與本文具體揭示之多核苷酸之不同之處通常在於一或多個取代、缺失、添加及/或插入的多核苷酸。該等變體可為天然的或可(例如)藉由修飾本發明之多核苷酸序列中之一或多者及評估如本文所述之經編碼多肽之一或多種生物活性及/或使用業內熟知之多種技術中之任一者而合成生成。

【0149】 術語「變體」亦可指包含一或多個核苷酸或胺基酸突變之任何天然或工程化分子。

【0150】 進一步提供包括如本文所述之抗原結合抗體片段之嵌合抗原受體(CAR)。在某些實施例中，CAR在T細胞或NK細胞上表現。進一步提供包括如本文所述之CAR之CAR T細胞。在某些實施例中，T細胞係CD4+ T細胞、CD8+ T細胞或其組合。在某些實施例中，細胞投

與給個體。在某些實施例中，細胞係自體的。在某些實施例中，細胞係同種異體的。

產生抗體之方法

【0151】 結合至gp120之單特異性抗體及結合至gp120及人類CD3(例如人類CD3ε或人類CD3δ)或結合至gp120及CD89之雙特異性抗體可藉由業內熟知用於合成抗體之任何方法、例如藉由化學合成或藉由重組表現技術來產生。

【0152】 製造單特異性抗體之方法為業內充分熟知。製造雙特異性抗體之方法闡述於(例如)美國專利第5,731,168號、第5,807,706號、第5,821,333號及美國申請公開案第2003/020734號及第2002/0155537號中。雙特異性四價抗體及其製造方法闡述於(例如) WO 02/096948及WO 00/44788中，二者之揭示內容全文以引用方式併入本文中。另外，與製備雙特異性抗體有關之其他出版物包括WO 91/00360、WO 92/08802、WO92/05793及WO 93/17715；Tutt等人，*J. Immunol.* 147:60-69 (1991)；美國專利第4,474,893號、第4,714,681號、第4,925,648號、第5,573,920號、第5,601,819號及第9,212,230號；及Kostelny等人，*J. Immunol.* 148:1547-1553 (1992)。

【0153】 製造雙特異性抗體之另一實例性方法係藉由杵臼結構技術(Ridgway等人，*Protein Eng.*, 9:617-621 (1996)；WO 2006/028936)。作為製造雙特異性抗體之首要缺點之Ig重鏈的錯配問題在此技術中藉由使形成IgG中之CH3結構域之界面的所選胺基酸突變而減少。在兩條重鏈直接相互作用之CH3結構域內之位置，將具有小側鏈(臼)之胺基酸引入一條重鏈之序列中且將具有大側鏈(杵)之胺基酸引入另一重鏈上之對應體相互作用殘基位置中。在一些情況下，本揭示內容

之抗體具有免疫球蛋白鏈，其中藉由使在兩個多肽之間之界面處相互作用以便優先形成雙特異性抗體之所選胺基酸突變來修飾CH3結構域。雙特異性抗體可由相同亞類或不同亞類之免疫球蛋白鏈構成。在一種情況下，結合至gp120及CD3之雙特異性抗體包含「杵鏈」中之T366W (EU編號)突變及「臼鏈」中之T366S、L368A、Y407V (EU編號)突變。在某些實施例中，藉由(例如)將Y349C突變引入「杵鏈」中及將E356C突變或S354C突變引入「臼鏈」中在CH3結構域之間引入另外鏈間二硫橋。在某些實施例中，在「杵鏈」中引入R409D、K370E突變及在「臼鏈」中引入D399K、E357K突變。在其他實施例中，在一條鏈中引入Y349C、T366W突變且在對應體鏈中引入E356C、T366S、L368A、Y407V突變。在一些實施例中， 在一條鏈中引入Y349C、T366W突變且在對應體鏈中引入S354C、T366S、L368A、Y407V突變。在一些實施例中，在一條鏈中引入Y349C、T366W突變且在對應體鏈中引入S354C、T366S、L368A、Y407V突變。在其他實施例中，在一條鏈中引入Y349C、T366W突變且在對應體鏈中引入S354C、T366S、L368A、Y407V突變(所有皆係EU編號)。

【0154】 製造雙特異性抗體之另一實例性方法係藉由使用雙特異性T細胞接頭(BiTEs®)平臺。BiTE係藉由經由撓性肽連接體(例如GGGGS (SEQ ID NO: 429))將第一scFv (例如結合gp120之scFv)基因融合至第二scFv (例如結合人類CD3之scFv)來製造。參見(例如) Staerz等人，*Nature*, 314:628-631 (1985)；Mack等人，PNAS, 92:7021-7025 (1995)；Huehls等人，*Immunol. Cell Biol.*, 93:290-296 (2015)。

【0155】 製造雙特異性抗體之另一實例性方法係藉由使用雙親和力再靶向(DART)平臺。此技術係基於Holliger等人 (*PNAS*, 90:6444-

6448 (1993))之雙價抗體格式且針對VH及VL鏈之穩定性及最佳配對進一步經改良(Johnson等人，*J Mol. Biol.*, 399:436-449 (2010)；Sung等人，*J Clin Invest.*, 125(11): 4077-4090 (2015))。

【0156】製造雙特異性抗體之又一實例性方法係藉由使用三功能雜合抗體平臺- Triomab®。此平臺採用由不同同型之兩種全長抗體小鼠IgG2及大鼠IgG2b之一半構成的嵌合構築。此技術依賴於物種優先重/輕鏈配對相關性。參見Lindhofer等人，*J Immunol.*, 155:219-225 (1995)。

【0157】製造雙特異性抗體之又一實例性方法係藉由使用TandAb®平臺。此技術係基於雙價抗體概念，但設計為包含短連接體之單一多肽鏈VH1-VL2-VH2-VL1以防止鏈內配對。此單鏈之頭對尾二聚化導致形成四價同二聚體(Kipriyanov等人，*J Mol. Biol.*, 293:41-56 (1999))。

【0158】製造雙特異性抗體之又一方法係CrossMab技術。CrossMab係由兩個全長抗體之一半構成之嵌合抗體。對於正確鏈配對，其組合兩種技術：(i)杵臼結構，其有利於兩條重鏈之間之正確配對；及(ii) 兩個Fab之一之重鏈及輕鏈之間交換以引入避免輕鏈錯配之不對稱。參見Ridgway等人，*Protein Eng.*, 9:617-621 (1996)；Schaefer等人，*PNAS*, 108:11187-11192 (2011)。CrossMabs可組合兩個或更多個抗原結合結構域用於靶向兩個或更多個靶標或用於朝向一個靶標引入二價，例如2:1格式。

【0159】本揭示內容之抗體可在細菌或真核細胞中產生。抗體亦可在真核細胞(例如經轉變細胞系(例如基於CHO或CHO源細胞系(例如CHO-S、CHO DG44、ExpiCHO™、CHOZN® ZFN修飾之GS-/- CHO

細胞系、CHO-K1、CHO-K1a)、293E、293T、COS、NIH3T3))中產生。另外，抗體(包括抗體片段，例如Fab、scFv)可在酵母細胞(例如畢赤酵母)(例如，參見Powers等人，*J Immunol Methods*. 251:123-35 (2001))、漢遜酵母或酵母菌屬)中表現。在一個實施例中，本文所述抗體在CHO細胞系(例如CHO-S、CHO DG44、ExpiCHO™、CHOZN®、CHO-K1或CHO-K1a細胞系)中產生。為了產生所關注抗體，編碼抗體之多核苷酸經構築，引入表現載體中，且然後在適宜宿主細胞中表現。使用標準分子生物學技術來製備重組表現載體，轉染宿主細胞，針對轉變體進行選擇，培養宿主細胞並回收抗體。

【0160】若抗體在細菌細胞(例如大腸桿菌)中表現，則表現載體應具有允許載體在細菌細胞中擴增之特徵。另外，當大腸桿菌(例如JM109、DH5α、HB101或XL1-Blue)用作宿主時，載體必須具有可容許在大腸桿菌中足夠表現之啟動子，例如lacZ啟動子(Ward等人，341:544-546 (1989)、araB啟動子(Better等人，*Science*, 240:1041-1043 (1988))或T7啟動子。該等載體之實例包括(例如) M13系列載體、pUC系列載體、pBR322、pBluescript、pCR-Script、pGEX-5X-1 (Pharmacia)、「QIAexpress system」 (QIAGEN)、pEGFP及pET (當使用此表現載體時，宿主較佳係BL21表現之T7 RNA聚合酶)。表現載體可含有抗體分泌之信號序列。對在大腸桿菌之周質中產生，*pelB*信號序列(Lei等人，*J. Bacteriol*., 169:4379 (1987))可用作抗體分泌之信號序列。對於細菌表現，可使用氯化鈣方法或電穿孔方法以將表現載體引入細菌細胞中。

【0161】若抗體在動物細胞(例如CHO, CHO-S, CHO DG44, CHOZN®, ExpiCHO™, CHO-K1, CHO-K1a, COS及NIH3T3細胞)中表

現，則表現載體包括在該等細胞中表現所必需之啟動子，例如SV40啟動子(Mulligan等人，*Nature*, 277:108 (1979))、MMLV-LTR啟動子、EF1α啟動子(Mizushima等人，*Nucleic Acids Res.*, 18:5322 (1990))或CMV啟動子。除了編碼免疫球蛋白或其結構域之核酸序列之外，重組表現載體可攜帶另外序列，例如調節宿主細胞中載體之複製之序列(例如複製起點)及可選標記物基因。可選標記物基因有利於選擇其中已引入載體之宿主細胞(例如，參見美國專利第4,399,216號、第4,634,665號及第5,179,017號)。例如，通常可選標記物基因賦予已引入載體之宿主細胞對藥物(例如G418、潮黴素(hygromycin)或胺甲喋呤(methotrexate))之抗性。具有可選標記物之載體之實例包括pMAM、pDR2、pBK-RSV、pBK-CMV、pOPRSV及pOP13。

【0162】在一個實施例中，在哺乳動物細胞中產生抗體。用於表現抗體之實例性哺乳動物宿主細胞包括中國倉鼠卵巢(CHO細胞，包括例如CHO-S、CHO DG44、ExpiCHO™、CHOZN®、CHO-K1或CHO-K1a細胞) (包括*dhfr*- CHO細胞，闡述於Urlaub及Chasin (1980) *Proc. Natl. Acad. Sci. USA* 77:4216-4220中，與DHFR可選標記物一起使用，例如，如Kaufman及Sharp (1982) *Mol. Biol.* 159:601-621中所述)、人類胚腎293細胞(例如293、293E、293T)、COS細胞、NIH3T3細胞、人類B細胞、淋巴球細胞系(例如NS0骨髓瘤細胞及SP2細胞)及來自轉基因動物(例如轉基因哺乳動物)之細胞。舉例而言，在一些實施例中，細胞係乳腺上皮細胞。

【0163】在抗體表現之實例性系統中，藉由磷酸鈣介導之轉染將編碼本揭示內容之抗體之抗體重鏈及抗體輕鏈的重組表現載體引入*dhfr*- CHO細胞中。在具體實施例中，*dhfr*- CHO細胞係DG44細胞系之

細胞，例如DG44i (例如，參見Derouaz等人，*Biochem Biophys Res Commun*., 340(4):1069-77 (2006))。在重組表現載體內，抗體重鏈及輕鏈基因各自可操作地連接至增強劑/啟動子調節元件(例如，衍生自SV40、CMV、腺病毒及諸如此類，例如CMV增強劑/AdMLP啟動子調節元件或SV40增強劑/AdMLP啟動子調節元件)，以驅使基因高程度轉錄。重組表現載體亦攜帶*DHFR*基因，其容許使用胺甲喋呤選擇/擴增來選擇已經載體轉染之CHO細胞。培養所選轉變體宿主細胞以容許表現抗體重鏈及輕鏈，且自培養基回收抗體。

【0164】 抗體亦可由轉基因動物產生。舉例而言，美國專利第5,849,992號闡述使抗體在轉基因哺乳動物細菌乳腺中表現之方法。構築包括乳特異性啟動子及編碼所關注抗體之核酸及用於分泌之信號序列的轉基因。由該等轉基因哺乳動物之雌性產生之乳包括其中分泌之所關注抗體。抗體可自乳純化，或對於一些應用，直接使用。亦提供包含本文所述核酸中之一或多者之動物。

【0165】 本發明抗體可自宿主細胞之內部或外部(例如介質)分離且純化為實質上純的均質抗體。常用於抗體純化之分離及純化方法可用於抗體之分離及純化，且不限於任何特定方法。抗體可藉由適當選擇及組合(例如)管柱層析、過濾、超濾、鹽析、溶劑沈澱、溶劑萃取、蒸餾、免疫沈澱、SDS-聚丙烯醯胺凝膠電泳、等電聚焦、透析及重結晶來分離及純化。層析包括(例如)親和層析、離子交換層析、疏水層析、凝膠過濾、反相層析及吸附層析(Strategies for Protein Purification and Characterization: A Laboratory Course Manual. Daniel R. Marshak等人編輯，Cold Spring Harbor Laboratory Press, 1996)。層析可使用液相層析(例如HPLC及FPLC)來實施。用於親和層析之管柱包

括蛋白A管柱及蛋白G管柱。使用蛋白A管柱之管柱的實例包括Hyper D、POROS及Sepharose FF (GE Healthcare Biosciences)。本發明亦包括使用該等純化方法高度純化之抗體。

醫藥組合物

【0166】本揭示內容亦包括包含本文所述抗體或編碼本文所述抗體之多核苷酸及醫藥上可接受之稀釋劑、載劑或賦形劑的醫藥組合物。在某些實施例中，醫藥組合物包含治療有效量之抗體或多核苷酸。

【0167】熟習此項技術者鑒於本發明將已知各種醫藥上可接受之稀釋劑、載劑及賦形劑及製備及使用醫藥組合物之技術。闡釋性醫藥組合物及醫藥上可接受之稀釋劑、載劑及賦形劑亦闡述於以下中：Remington: The Science and Practice of Pharmacy，第20版(Lippincott, Williams & Wilkins 2003)；Loyd V. Allen Jr (編輯),「Remington: The Science and Practice of Pharmacy」, 第22版, 2012, Pharmaceutical Press；Brunton、Knollman及Hilal-Dandan,「Goodman and Gilman's The Pharmacological Basis of Therapeutics」, 第13版，2017, McGraw-Hill Education / Medical；McNally及Hastedt (編輯),「Protein Formulation and Delivery, 第2版, 2007, CRC Press；Banga,「Therapeutic Peptides and Proteins: Formulation, Processing, and Delivery Systems」, 第3版, 2015, CRC Press；Lars Hovgaard, Frokjaer及van de Weert (編輯),「Pharmaceutical Formulation Development of Peptides and Proteins」, 第2版, 2012, CRC Press；Carpenter及Manning (編輯),「Rational Design of Stable Protein Formulations: Theory and Practice」, 2002, Springer (Pharmaceutical Biotechnology (書籍

13))；Meyer (編輯), 「Therapeutic Protein Drug Products: Practical Approaches to Formulation in the Laboratory, Manufacturing, and the Clinic, 2012, Woodhead Publishing； 及Shire, 「Monoclonal Antibodies: Meeting the Challenges in Manufacturing, Formulation, Delivery and Stability of Final Drug Product, 2015, Woodhead Publishing。

【0168】 在一些實施例中，每一載劑、稀釋劑或賦形劑在與醫藥組合物之其他成分相容之意義上係「可接受的」且對個體無害。通常，醫藥上可接受之載劑係pH緩衝水溶液。可用作醫藥上可接受之載劑、稀釋劑或賦形劑之材料之一些實例包括：無菌水；緩衝液，例如磷酸緩衝鹽水；糖，例如乳糖、葡萄糖及蔗糖；澱粉，例如玉米澱粉及馬鈴薯澱粉；纖維素及其衍生物，例如羧甲基纖維素鈉、乙基纖維素及乙酸纖維素；粉末狀黃蓍膠；麥芽；明膠；滑石；賦形劑，例如可可油及栓劑蠟；油，例如花生油、棉籽油、紅花油、芝麻油、橄欖油、玉米油及大豆油；二醇，例如丙二醇；多元醇，例如甘油、山梨醇、甘露醇及聚乙二醇；酯，例如油酸乙酯及月桂酸乙酯；瓊脂；緩衝劑，例如氫氧化鎂及氫氧化鋁；海藻酸；無熱源水；等滲鹽水；林格氏溶液(Ringer's solution)；乙醇；磷酸鹽緩衝溶液；胺基酸(例如帶電胺基酸，包括但不限於天冬胺酸鹽、天冬醯胺、脯胺酸鹽、脯胺醯胺、組胺酸、離胺酸)；及用於醫藥調配物中之其他無毒相容物質。潤濕劑、乳化劑及潤滑劑(例如月桂基硫酸鈉及硬脂酸鎂)以及著色劑、釋放劑、包衣劑、甜味劑、矯味劑及加香劑、防腐劑及抗氧化劑亦可存在於組合物中。

【0169】 醫藥組合物之調配及遞送方法通常將根據欲治療之位點及疾病而改變。實例性調配物包括(但不限於)適於非經腸投與(例如靜

脈內、動脈內、肌內或皮下投與)之彼等，包括囊封於膠束、脂質體或藥物釋放膠囊中之調配物(活性劑納入經設計用於緩慢釋放之生物相容包衣內)；可攝取調配物；局部使用之調配物，例如乳霜、軟膏劑及凝膠；及其他調配物，例如吸入劑、氣溶膠及噴霧。

使用方法

【0170】本揭示內容提供治療或預防有需要之個體(例如人類個體)之HIV感染或有關疾病或病症的方法，其包含向有需要之個體提供有效量之一或多種本文所述抗體或編碼該(等)抗體之多核苷酸。在向個體投與療法背景中本文所用術語「有效量」係指達成期望預防或治療效應之療法之量。多核苷酸可存在於載體(例如病毒載體)中。在一些實施例中，有關疾病或病症係由HIV感染引起。在其他實施例中，其係獲得性免疫缺陷症候群(AIDS)。在某些實施例中，個體係病毒學抑制之HIV感染哺乳動物，而在其他實施例中，個體係未經治療之HIV感染哺乳動物。在某些實施例中，未經治療之個體具有介於10^3與10^5個拷貝/ml之間之病毒負荷，且在某些實施例中，病毒學抑制之個體具有< 50個拷貝/ml之病毒負荷。在另一實施例中，個體係哺乳動物，例如人類。在某些實施例中，個體經診斷患有HIV (例如HIV-1或HIV-2)感染或有關疾病或病症(例如AIDS)，或被認為處於發生HIV (例如HIV-1或HIV-2)感染或有關疾病或病症(例如AIDS)之風險。處於HIV有關疾病或病症風險之個體包括已接觸感染人員或已以一些其他方式暴露於HIV之患者。預防性藥劑之投與可在HIV有關疾病或病症之特徵性症狀表現之前進行，使得預防疾病或病症，或另一選擇為延遲其進展。在某些實施例中，抗體或其抗原結合片段包含具有以下中所述之序列之VH CDR及VL CDR：分別地SEQ ID NO.: 137、138、139、140、141及142。

在某些實施例中，抗體或其抗原結合片段包含具有以下中所述之序列之VH CDR及VL CDR：分別地SEQ ID NO.: 137、138、139、140、141及142，且包含與SEQ ID NO: 477中所述之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、例如100%一致性的VH及與SEQ ID NO: 278中所述之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、例如100%一致性的VL。在某些實施例中，抗體或其抗原結合片段包含SEQ ID NO: 477中所述之VH序列及SEQ ID NO: 278中所述之VL序列。在某些實施例中，抗體或其抗原結合片段包含具有以下中所述之序列之VH CDR及VL CDR：分別地SEQ ID NO.: 137、138、139、140、141及142，且包含與SEQ ID NO: 529中所述之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、例如100%一致性的重鏈及與SEQ ID NO: 103中所述之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、例如100%一致性的輕鏈。在某些實施例中，抗體或其抗原結合片段包含SEQ ID NO: 529中所述之重鏈序列及SEQ ID NO: 103中所述之輕鏈序列。

【0171】亦提供預防或抑制個體(例如人類個體)中HIV病毒效價、病毒複製、病毒增殖或HIV病毒DNA、HIV原病毒DNA或HIV病毒蛋白之量增加的方法。在一個實施例中，該方法包含向有需要之個體提供有效預防個體之HIV效價、病毒複製或一或多種HIV菌株或分離株之

HIV蛋白之量增加的量之本文所述一或多種抗體(或抗原結合片段)或編碼該(等)抗體(或其抗原結合片段)之多核苷酸。在某些實施例中，該方法進一步包含(例如)在個體中提供本發明之一或多種抗體之前及之後在一或多個時間點量測HIV病毒或原病毒DNA或蛋白的量。測定個體之HIV病毒或原病毒DNA或蛋白之量的方法及生物標記為業內已知且可獲得，且闡述於(例如) Siliciano, J.D.等人，*Curr Opin. HIV AIDS*, 5(6):491-7 (2010)及Rouzioux, C.等人，*Curr Opin HIV AIDS*, 8(3):170-5 (2013)中。

【0172】 在某些態樣中，本發明之一或多種抗體可用於(例如)抑制已知某些病毒(例如本文所述HIV分離株)、預防性抑制或預防某些病毒(例如本文所述HIV分離株)感染、檢測樣品中之某些病毒(例如本文所述HIV分離株)、或診斷某些病毒(例如本文所述HIV分離株)的方法中。

【0173】 對於哺乳動物個體(例如人類)之活體內治療，可向個體投與或提供包含本文所述一或多種抗體之醫藥組合物。當用於活體內療法時，本文所述一或多種抗體通常以治療有效量(即，消除或減少患者之病毒負荷及/或病毒儲存庫(viral reservoir)之量)投與或提供給患者。抗體係根據已知方法(例如但不限於靜脈內投與，例如以濃注形式或藉由在一段時間內連續輸注、藉由肌內、腹膜內、腦脊髓內、皮下、關節內、滑膜內、鞘內、經口、局部或吸入途徑)投與或提供給哺乳動物個體(例如人類)。抗體可在非經腸、在可能時在靶細胞位點或靜脈內投與。在一個實施例中，該(等)抗體至個體之投與係經由靜脈內途徑。在另一實施例中，該(等)抗體至個體之投與係經由皮下途徑。在其他實施例中，本揭示內容之醫藥組合物係全身、非經腸或局部投與個體。

【0174】 在某些實施例中，本發明提供治療HIV感染之方法，其

包含向有需要之人類個體投與治療有效量之本文揭示之一或多種抗體。在一些實施例中，本發明提供預防HIV感染之方法，其包含向有需要之人類個體投與治療有效量本文揭示之一或多種抗體。

組合療法

【0175】在某些實施例中，本揭示內容提供治療(例如包括長期或延長抑制)或預防患有HIV感染或處於患有HIV感染風險之人類個體之HIV感染的方法。該方法包含向人類個體投與治療有效量之本文揭示之一或多種抗體或其醫藥組合物與治療有效量之一或多種(例如一種、兩種、三種、一種或兩種、或一種至三種)另外治療劑的組合。在某些實施例中，抗體或其抗原結合片段包含具有以下中所述之序列之VH CDR及VL CDR：分別地SEQ ID NO.: 137、138、139、140、141及142。在某些實施例中，抗體或其抗原結合片段包含具有以下中所述之序列之VH CDR及VL CDR：分別地SEQ ID NO.: 137、138、139、140、141及142，且包含與SEQ ID NO: 477中所述之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、例如100%一致性的VH及與SEQ ID NO: 278中所述之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、例如100%一致性的VL。在某些實施例中，抗體或其抗原結合片段包含SEQ ID NO: 477中所述之VH序列及SEQ ID NO: 278中所述之VL序列。在某些實施例中，抗體或其抗原結合片段包含具有以下中所述之序列之VH CDR及VL CDR：分別地SEQ ID NO.: 137、138、139、140、141及142，且包含與SEQ ID NO: 529中所述之胺基酸序列具有至少80%、

至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、例如100%一致性的重鏈及與SEQ ID NO: 103中所述之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、例如100%一致性的輕鏈。在某些實施例中，抗體或其抗原結合片段包含SEQ ID NO: 529中所述之重鏈序列及SEQ ID NO: 103中所述之輕鏈序列。在一個實施例中，提供治療患有感染或處於患有感染之人類個體之HIV感染的方法，該方法包含向人類個體投與治療有效量本文揭示之一或多種抗體或其醫藥上可接受之鹽與治療有效量之一或多種(例如一種、兩種、三種、一種或兩種、或一種至三種)另外治療劑的組合。在一些實施例中，在一或多次投與抗體或其抗原結合片段視情況以及一或多種另外治療劑後，在不存在抗反轉錄病毒治療(ART)情況下在至少6個月、至少1年、至少2年、至少3年或更長時間內，個體不展現HIV或AIDS之症狀。在一些實施例中，在一或多次投與結合分子後，在不存在抗反轉錄病毒治療(ART)情況下在至少6個月、至少1年、至少2年、至少3年或更長時間內，個體之拷貝/ml血液之病毒負荷小於500、例如小於400、小於300、小於200、小於100、小於50。

【0176】 多項臨床研究現已顯示，用單一廣泛中和抗體(bNAb)治療HIV感染之個體會導致敏感病毒之暫時性抑制，之後係抗性病毒之快速過度生長 - 其中許多似乎係罕見的預先存在之病毒變體。

【0177】 先前顯示抗體A及抗體B可中和活體外測試之118個交叉分支病毒之96% (Scheid等人，Science, 333: 1633-1637 (2011))。臨床試驗顯示，許多接受抗體治療之HIV感染患者即使在其血漿HIV分離株

似乎對抗體敏感時亦會出現罕見且預先存在之抗性純系(Caskey等人，Nature, 522:487-491 (2016)；Scheid等 人 ，Nature, 535:556-560 (2016))。該等結果表明，抗體A在針對自不同患者收集之HIV分離株進行測試時可為寬的(患者間寬度)，但其在個別患者內不可中和100%病毒分離株(患者內寬度)。

【0178】 亦在臨床試驗中測試稱為10-1074之抗體(PGT121譜系之一部分且取自同一供體並具有相似之中和寬度)(Mouquet等人，PNAS, 109:E3268-3277 (2012)；Caskey等 人 ，Nature Medicine, 23:185-191 (2017))。最初顯示10-1074可中和約66%之60種在低於50 μg/ mL之IC50下測試之病毒(Mouquet等人，PNAS(上文文獻))。10-1074試驗顯示，在許多接受10-1074療法之患者中，即使血漿HIV分離株似乎對抗體敏感，亦存在抗性純系(Caskey等人 Nature Medicine (上文文獻))。此數據表明，大多數患者可能擁有對10-1074具有抗性之罕見的預先存在之病毒變體。該等10-1074抗性變體顯示與PGT121相關之交叉抗性，與10-1074及PGT121之間之密切進化關係一致。然而，幾乎所有在10-1074臨床試驗中分離之抗性病毒皆對由抗體A中和敏感(Caskey等人(上文文獻)。此數據表明使用互補bNAb之組合抗體療法可容許更完整之患者內病毒覆蓋。

【0179】 bNAb組合可達成完全患者內病毒覆蓋。在一些實施例中，組合療法包括具有本文揭示之抗體中之任一者及另一抗HIV bNAb抗體(即，中和多種HIV-1病毒株之中和抗體)之相同CDR、VH、VL、VH及VL、重、輕或重鏈及輕鏈的抗體。各種bNAb為業內已知且可用於本發明中。實例包括(但不限於)闡述於以下中之彼等：美國專利第8673307號 、 第9,493,549號 、 第9,783,594號 、WO2014/063059、

WO2012/158948、WO2015/117008及PCT/US2015/41272、及WO2017/096221，包括抗體12A12、12A21、NIH45-46、bANC131、8ANC134、IB2530、INC9、8ANC195。8ANC196、10-259、10-303、10-410、10-847、10-996、10-1074、10-1121、10-1130、10-1146、10-1341、10-1369及10-1074GM。另外實例包括以下中所述之彼等：Klein等人，*Nature*, 492(7427): 118-22 (2012), Horwitz等人，*Proc Natl Acad Sci U S A*, 110(41): 16538-43 (2013), Scheid等人，*Science*, 333 : 1633-1637 (2011), Scheid等人，*Nature*, 458:636-640 (2009), Eroshkin等人，*Nucleic Acids Res.*, 42 (資料庫專刊):Dl 133-9 (2014), Mascola等人，*Immunol Rev.*, 254(l):225-44 (2013)，例如2F5、4E10、M66.6、CAP206-CH12、10E81 (其皆結合gp41之MPER)；PG9、PG16、CH01-04 (其皆結合V1V2-聚醣)、2G12 (其結合至外部結構域聚醣)；b12、HJ16、CH103-106、VRC01-03、VRC-PG04、04b、VRC-CH30-34、3BNC62、3BNC89、3BNC91、3BNC95、3BNC104、3BNC176及8ANC131 (其皆結合至CD4結合位點)。

【0180】在一些實施例中，本文所述抗體或其抗原結合片段與結合至選自由以下組成之群之gp120之表位或區的第二抗體或其抗原結合片段(例如第二非競爭廣泛中和抗體(bNAb))組合或共投與：(i) 第三可變環(V3)及/或包含N332寡甘露糖聚醣之高甘露糖區塊；(ii) 第二可變環(V2)及/或Env三聚體頂端；(iii) gp120/gp41界面；或(iv) gp120之沉默面。由廣泛中和抗體結合之gp120之前述表位或區闡述於以下中：例如McCoy, Retrovirology (2018) 15:70；Sok及Burton, Nat Immunol. 2018 19(11):1179-1188；Possas等人，Expert Opin Ther Pat. 2018年7

月；28(7):551-560；及Stephenson及Barouch, Curr HIV/AIDS Rep (2016) 13:31-37，其出於所有目的全文以引用方式併入本文中。

【0181】在一些實施例中，本文所述抗體或其抗原結合片段與結合至第三可變環(V3)及/或包含N332寡甘露糖聚醣之高甘露糖區塊中的gp120之表位或區且與選自由以下組成之群之抗體競爭或包含該抗體之VH及VL區的第二抗體或其抗原結合片段(例如第二非競爭廣泛中和抗體(bNAb)組合或共投與：GS-9722、PGT-121.60、PGT-121.66、PGT-121、PGT-122、PGT-123、PGT-124、PGT-125、PGT-126、PGT-128、PGT-130、PGT-133、PGT-134、PGT-135、PGT-136、PGT-137、PGT-138、PGT-139、10-1074、VRC24、2G12、BG18、354BG8、354BG18、354BG42、354BG33、354BG129、354BG188、354BG411、354BG426、DH270.1、DH270.6、PGDM12、VRC41.01、PGDM21、PCDN-33A、BF520.1及VRC29.03。結合至第三可變環(V3)及/或包含N332寡甘露糖聚醣之高甘露糖區塊中之gp120且可用作第二抗體或其抗原結合片段的另外廣泛中和抗體闡述於(例如) WO 2012/030904、WO 2014/063059、WO 2016/149698、WO 2017/106346、WO 2018/075564、WO 2018/125813及WO 2018/237148中，其出於所有目的全文以引用方式併入本文中。

【0182】在一些實施例中，組合療法包括具有本文揭示之抗體中之任一者之相同CDR、VH、VL、VH及VL、重、輕、或重鏈及輕鏈的抗體及具有US2017/0190763A1之表1及2之抗體中之任一者之相同CDR、VH、VL、VH及VL、重、輕、或重鏈及輕鏈的另一抗HIV抗體(例　如GS-9722、PGT-121.60、PGT-121.66、PGT-121、PGT-122、

PGT-123、PGT-124、PGT-133、或PGT-134)。PGT121之該等改良或最佳化型式具有增強之藥物樣性質、降低之免疫原性、增強之ADCC及適宜藥物動力學性質。顯示該等抗體可結合至在病毒粒子或感染細胞表面上表現且介導病毒之直接中和以及該等細胞之強效NK、單核球及PBMC殺死二者的HIV包膜醣蛋白。此性質藉由中和病毒容許抗體治療HIV感染，且亦殺死及消除受感染個體之潛伏HIV感染細胞，從而導致HIV之滅菌治癒。

【0183】 在一個實施例中，組合療法包括具有本文揭示之抗體中之任一者之相同CDR、VH、VL、VH及VL、重、輕、或重鏈及輕鏈的抗體及具有含以下序列之抗體之相同CDR、VH、VL、VH及VL、重、輕、或重鏈及輕鏈的抗體：

重鏈 (VH加下劃線)	QMQLQESGPGLVKPSETLSLTCSVSGASISDSYWSWIRR SPGKGLEWIGYVHKSGDTNYNPSLKSRVHLSLDTSKNQ VSLSLTGVTAADSGKYYCARTLHGRRIYGIVAFNEWFT YFYMDVWGTGTQVTVSSASTKGPSVFPLAPSSKSTSGG TAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQS SGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKK VEPKSCDKTHTCPPCPAPELLAGPDVFLFPPKPKDTLMI SRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKT KPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNK ALPLPEEKTISKAKGQPREPQVYTLPPSREEMTKNQVSL TCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGS FFLYSKLTVDKSRWQQGNVFSCSVLHEALHSHYTQKSL SLSPGK (SEQ ID NO: 443)
重CDR1 Kabat	DSYWS (SEQ ID NO: 444)
重CDR2 Kabat	YVHKSGDTNYNPSLKS (SEQ ID NO: 445)
重CDR3 Kabat	TLHGRRIYGIVAFNEWFTYFYMDV (SEQ ID NO: 446)
輕鏈	SDISVAPGETARISCGEKSLGSRAVQWYQHRAGQAPSLI

(VL加下劃線)	IYNNQDRPSGIPERFSGSPDSRPGTTATLTITSVEAGDEA DYYCHIWDSRVPTKWVFGGGTTLTVLGQPKAAPSVTL FPPSSEELQANKATLVCLISDFYPGAVTVAWKADSSPVK AGVETTTPSKQSNNKYAASSYLSLTPEQWKSHRSYSCQ VTHEGSTVEKTVAPTECS (SEQ ID NO: 447)
輕CDR1 Kabat	GEKSLGSRAVQ (SEQ ID NO: 448)
輕CDR2 Kabat	NNQDRPS (SEQ ID NO: 449)
輕CDR3 Kabat	HIWDSRVPTKWV (SEQ ID NO: 450)

【0184】 在一個實施例中，組合療法包括具有本文揭示之抗體中之任一者之相同CDR、VH、VL、VH及VL、重、輕、或重鏈及輕鏈的抗體及具有其他另外抗HIV抗體(例如US2017/0190763中揭示之彼等)之相同CDR、VH、VL、VH及VL、重、輕、或重鏈及輕鏈的抗體。在某些實施例中，另外抗HIV抗體包括包含下文提供之VH (或重)及VL (或輕)鏈之抗體：

【0185】 重鏈(VH加下劃線)：

QMQLQESGPGLVKPSETLSLTCSVSGASISDSYWSWIRRSPGK GLEWIGYVHKSGDTNYNPSLKSRVHLSLDTSKNQVSLSLTGVTAA DSGKYYCARTLHGRRIYGIVAFNEWFTYFYMDVWGTGTQVTVSS ASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGAL TSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTK VDKKVEPKSCDKTHTCPPCPAPELLAGPDVFLFPPKPKDTLMISRT PEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTY RVVSVLTVLHQDWLNGKEYKCKVSNKALPLPEEKTISKAKGQPRE PQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNY KTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEALHSHYT QKSLSLSPGK (SEQ ID NO: 454)

【0186】 輕鏈(VL加下劃線)：

SDISVAPGETARISCGEKSLGSRAVQWYQHRAGQAPSLIIYNN QDRPSGIPERFSGSPDYRPGTTATLTITSVEAGDEADYYCHIWDSRV PTKWVFGGGTTLTVLGQPKAAPSVTLFPPSSEELQANKATLVCLIS DFYPGAVTVAWKADSSPVKAGVETTTPSKQSNNKYAASSYLSLTPE QWKSHRSYSCQVTHEGSTVEKTVAPTECS (SEQ ID NO: 455)

【0187】 在一個實施例中，組合療法包括具有本文揭示之抗體中之任一者之相同CDR、VH、VL、VH及VL、重、輕、或重鏈及輕鏈的抗體及具有另一抗HIV抗體之相同CDR、VH、VL、VH及VL、重、輕、或重鏈及輕鏈的抗體，其之重鏈具有SEQ ID NO:40中所述之胺基酸序列且其之輕鏈具有下文提供之序列：

【0188】 輕鏈(VL加下劃線)：

SDISVAPGETARISCGEKSLGSRAVQWYQHRAGQAPSLIIYNN QDRPSGIPERFSGSPDFRPGTTATLTITSVEAGDEADYYCHIWDSRV PTKWVFGGGTTLTVLGQPKAAPSVTLFPPSSEELQANKATLVCLIS DFYPGAVTVAWKADSSPVKAGVETTTPSKQSNNKYAASSYLSLTPE QWKSHRSYSCQVTHEGSTVEKTVAPTECS(SEQ ID NO: 456)

【0189】 在一個實施例中，組合療法包括具有本文揭示之抗體中之任一者之相同CDR、VH、VL、VH及VL、重、輕、或重鏈及輕鏈的抗體及具有下述抗體之相同CDR、VH、VL、VH及VL、重、輕、或重鏈及輕鏈的抗體：

純系命名	PGT121.42 hIgG1/hλ
重鏈 (VH加下劃線)	QMQLQESGPGLVKPSETLSLTCSVSGASISDSYWSWIRR SPGKGLEWIGYVHKSGDTNYNPSLKSRVHLSLDTSKNQ VSLSLSSVTAADSGKYYCARTLHGRRIYGIVAFNEWFT YFYMDVWGKGTQVTVSSASTKGPSVFPLAPSSKSTSG GTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQ SSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKK VEPKSCDKTHTCPPCPAPELLAGPDVFLFPPKPKDTLMI SRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKT KPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNK ALPLPEEKTISKAKGQPREPQVYTLPPSREEMTKNQVSL TCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGS FFLYSKLTVDKSRWQQGNVFSCSVLHEALHSHYTQKSL SLSPGK (SEQ ID NO: 451)
重CDR1 Kabat	DSYWS (SEQ ID NO: 444)
重CDR2 Kabat	YVHKSGDTNYNPSLKS (SEQ ID NO: 445)
重CDR3 Kabat	TLHGRRIYGIVAFNEWFTYFYMDV (SEQ ID NO: 446)
輕鏈 (VL加下劃線)	SDISVAPGETARISCGEKSLGSRAVQWYQHRAGQAPSLI IYNNQDRPSGIPERFSGSPDSPFGTTATLTITSVEAGDEA DYYCHIWDSRVPTKWVFGGGTTLTVLGQPKAAPSVTL FPPSSEELQANKATLVCLISDFYPGAVTVAWKADSSPVK AGVETTTPSKQSNNKYAASSYLSLTPEQWKSHRSYSCQ VTHEGSTVEKTVAPTECS (SEQ ID NO: 452)
輕CDR1 Kabat	GEKSLGSRAVQ (SEQ ID NO: 448)
輕CDR2 Kabat	NNQDRPS (SEQ ID NO: 449)
輕CDR3 Kabat	HIWDSRVPTKWV (SEQ ID NO: 450)

【0190】 在一些實施例中，本文所述抗體或其抗原結合片段與結合至第二可變環(V2)及/或Env三聚體頂端中gp120之表位或區且與選自由以下組成之群之抗體競爭或包含該抗體之VH及VL區的第二抗體或其抗原結合片段(例如第二非競爭廣泛中和抗體(bNAb))組合或共投與：

PG9、PG16、PGC14、PGG14、PGT-142、PGT-143、PGT-144、PGT-145、CH01、CH59、PGDM1400、CAP256、CAP256-VRC26.08、CAP256-VRC26.09、CAP256-VRC26.25、PCT64-24E及VRC38.01。結合至第二可變環(V2)及/或Env三聚體頂端中之gp120且可用作第二抗體或其抗原結合片段的另外廣泛中和抗體闡述於(例如)WO 2010/107939、WO 2012/030904、WO 2018/075564及WO 2018/125813中，其出於所有目的全文以引用方式併入本文中。

【0191】在一些實施例中，本文所述抗體或其抗原結合片段與結合至gp120/gp41界面中gp120之表位或區且與選自由以下組成之群之抗體競爭或包含該抗體之VH及VL區的第二抗體或其抗原結合片段(例如第二非競爭廣泛中和抗體(bNAb))組合或共投與：PGT-151、CAP248-2B、35O22、8ANC195、ACS202、VRC34及VRC34.01。結合至gp120/gp41界面中之gp120且可用作第二抗體或其抗原結合片段之另外廣泛中和抗體闡述於(例如) WO 2011/038290、WO 2012/030904及WO2017/079479中，其出於所有目的全文以引用方式併入本文中。

【0192】在一些實施例中，本文所述抗體或其抗原結合片段與結合至gp120沉默面之表位或區且與選自由以下組成之群之抗體競爭或包含該抗體之VH及VL區的第二抗體或其抗原結合片段(例如第二非競爭廣泛中和抗體(bNAb))組合或共投與：VRC-PG05及SF12。參見(例如) Schoofs等人，「Broad and Potent Neutralizing Antibodies Recognize the Silent Face of the HIV Envelope」, *Immunity* (2019) 5月14日. pii: S1074-7613(19)30194-3 (PMID 31126879)。

【0193】在一些實施例中，本文所述抗體或其抗原結合片段與結合至近膜區(MPER)中gp41之表位或區的第二抗體或其抗原結合片段

(例如第二非競爭廣泛中和抗體(bNAb))組合或共投與。結合至MPER中之gp41且可用作第二抗體或其抗原結合片段之另外廣泛中和抗體闡述於(例如) WO 2011/034582、WO 2011/038290、WO 2011/046623及WO 2013/070776中，其出於所有目的全文以引用方式併入本文中。

【0194】 在一些實施例中，本文所述抗體或其抗原結合片段與結合至近膜區(MPER)中gp41之表位或區且與選自由以下組成之群之抗體競爭或包含該抗體之VH及VL區的第二抗體或其抗原結合片段(例如第二非競爭廣泛中和抗體(bNAb))組合或共投與：10E8、10E8v4、10E8-5R-100cF、4E10、DH511.11P、2F5、7b2及LN01。

【0195】 在一些實施例中，本文所述抗體或其抗原結合片段與結合至gp41融合肽之表位或區且與選自由以下組成之群之抗體競爭或包含該抗體之VH及VL區的第二抗體或其抗原結合片段(例如第二非競爭廣泛中和抗體(bNAb))組合或共投與：VRC34及ACS202。

【0196】 可用作組合療法中之第二治療劑之另外廣泛中和抗體闡述於(例如)美國專利第 8,673,307號、第9,493,549號、第9,783,594號、及WO 2012/154312、WO2012/158948、WO 2013/086533、WO 2013/142324、WO2014/063059、WO 2014/089152、WO 2015/048462、WO 2015/103549、WO 2015/117008、WO2016/014484、WO 2016/154003、WO 2016/196975、WO 2016/149710、WO2017/096221、WO 2017/133639、WO 2017/133640中，其出於所有目的全文以引用方式併入本文中。另外實例包括闡述於以下中之彼等：Sajadi等人，Cell. (2018) 173(7):1783-1795；Sajadi等人，J Infect Dis. (2016) 213(1):156-64；Klein等人，Nature, 492(7427): 118-22 (2012), Horwitz等人，Proc Natl Acad Sci

U S A, 110(41): 16538-43 (2013), Scheid等人，Science, 333 : 1633-1637 (2011), Scheid等人，Nature, 458:636-640 (2009), Eroshkin等人，Nucleic Acids Res., 42 (資料庫專刊):Dl 133-9 (2014), Mascola等人，Immunol Rev., 254(l):225-44 (2013)，例如2F5、4E10、M66.6、CAP206-CH12、10E8、10E8v4、10E8-5R-100cF、DH511.11P、7b2及LN01 (其皆結合gp41之MPER)；PG9、PG16、CH01-04 (其皆結合V1V2-聚醣)、2G12 (其結合至外部結構域聚醣)，其出於所有目的全文以引用方式併入本文中。

【0197】用於組合療法中之本揭示內容之抗gp120抗體的實例性VH及VL胺基酸序列包括以下中所述之序列：分別地SEQ ID NO: 182及275；分別地SEQ ID NO: 182及278；分別地SEQ ID NO: 182及279；分別地SEQ ID NO: 182及280；分別地SEQ ID NO: 182及281；分別地SEQ ID NO: 182及282；分別地SEQ ID NO: 182及292；分別地SEQ ID NO: 182及304；分別地SEQ ID NO: 182及307；分別地SEQ ID NO: 182及309；分別地SEQ ID NO: 182及310；分別地SEQ ID NO: 220及310；分別地SEQ ID NO: 477及223；分別地SEQ ID NO: 477及278；分別地SEQ ID NO: 477及292；及分別地SEQ ID NO: 220及311。在某些實施例中，用於組合療法中之抗gp120抗體的VH及VL胺基酸序列係分別地SEQ ID NO: 477及278中所述之序列。在某些實施例中，結合至gp120之雙特異性抗體的臂包含本文揭示之抗gp120抗體之重鏈的胺基酸序列。在某些實施例中，結合至gp120之雙特異性抗體的臂包含本文揭示之抗gp120抗體之輕鏈的胺基酸序列。用於組合療法中之本揭示內容之抗gp120抗體的實例性重鏈及輕鏈序列包括以下中所述之序列：分別地SEQ ID NO: 2及49；分別地SEQ ID NO: 2及100；

分別地SEQ ID NO: 42及101；分別地SEQ ID NO: 2及103；分別地SEQ ID NO: 2及104；分別地SEQ ID NO: 2及105；分別地SEQ ID NO: 2及106；分別地SEQ ID NO: 2及107；分別地SEQ ID NO: 2及117；分別地SEQ ID NO: 2及129；分別地SEQ ID NO: 2及132；分別地SEQ ID NO: 2及134；分別地SEQ ID NO: 2及569；分別地SEQ ID NO: 42及135；分別地SEQ ID NO: 529及49；分別地SEQ ID NO: 529及103；分別地SEQ ID NO: 529及117；及分別地SEQ ID NO: 42及136。在某些實施例中，用於組合療法中之抗gp120抗體的重鏈及輕鏈序列係分別地SEQ ID NO: 529及103中所述之序列。

【0198】在一個實施例中，提供醫藥組合物，其包含本文揭示之抗體或其醫藥組合物與一或多種(例如，一種、兩種、三種、四種、一種或兩種或一種至三種或一種至四種)另外治療劑的組合及醫藥上可接受之載劑、稀釋劑或賦形劑。

【0199】在某些實施例中，本發明提供治療HIV感染之方法，其包含向有需要之患者投與治療有效量之本文揭示之抗體或其醫藥組合物與治療有效量之一或多種適於治療HIV感染之另外治療劑的組合。

【0200】在某些實施例中，本文揭示之抗體或其醫藥組合物與一種、兩種、三種、四種或更多種另外治療劑組合。在某些實施例中，本文揭示之抗體或其醫藥組合物與兩種另外治療劑組合。在其他實施例中，本文揭示之抗體或其醫藥組合物與三種另外治療劑組合。在其他實施例中，本文揭示之抗體或其醫藥組合物與四種另外治療劑組合。該一種、兩種、三種、四種或更多種另外治療劑可為選自同一類別之治療劑之不同治療劑，及/或其可選擇不同類別之治療劑。

【0201】在某些實施例中，本文揭示之抗體與一或多種另外治療

劑一起投與。本文揭示之抗體與一或多種另外治療劑之共投與通常係指本文揭示之化合物及一或多種另外治療劑之同時或依序投與，使得治療有效量之本文揭示之抗體及一或多種另外治療劑二者皆存在於患者體內。在依序投與時，該組合可以兩次或更多次投與來投與。

【0202】 共投與包括在投與一或多種另外治療劑之單位劑量之前或之後投與本文揭示之抗體之單位劑量。舉例而言，本文揭示之抗體可在投與一或多種另外治療劑之數秒、數分鐘或數小時內投與。在一些實施例中，首先投與本文揭示之抗體之單位劑量，之後在數秒或數分鐘內投與一或多種另外治療劑之單位劑量。或者，首先投與一或多種另外治療劑之單位劑量，之後在數秒或數分鐘內投與本文揭示之抗體之單位劑量。在其他實施例中，首先投與本文揭示之抗體之單位劑量，之後在數小時(例如1-12小時)之時段後投與一或多種另外治療劑之單位劑量。在其他實施例中，首先投與一或多種另外治療劑之單位劑量，之後在數小時(例如1-12小時)之時段後投與本文揭示之抗體之單位劑量。

【0203】 在某些實施例中，本文揭示之抗體與一或多種另外治療劑組合以單式劑型同時投與患者，例如以固體劑型用於經口投與。

【0204】 在某些實施例中，本揭示內容之抗體調配為液體，其可視情況含有可用於治療HIV之另外治療劑。在某些實施例中，液體可含有用於治療HIV之另一活性成分，例如另一抗HIV抗體或其抗原結合片段、HIV蛋白酶抑制劑、反轉錄酶之HIV非核苷或非核苷酸抑制劑、反轉錄酶之HIV核苷或核苷酸抑制劑、HIV整合酶抑制劑、HIV非催化位點(或別位)整合酶抑制劑、藥物動力學增強劑及其組合。

【0205】 在一些實施例中，另外治療劑係潛伏逆轉劑(LRA)，例如類鐸受體(TLR)激動劑，例如TLR1 (NCBI Gene ID: 7096)、TLR2

(NCBI Gene ID: 7097)、TLR3 (NCBI Gene ID: 7098)、TLR4 (NCBI Gene ID: 7099)、TLR5 (NCBI Gene ID: 7100)、TLR6 (NCBI Gene ID: 10333)、TLR7 (NCBI Gene ID: 51284)、TLR8 (NCBI Gene ID: 51311)、TLR9 (NCBI Gene ID: 54106)及/或TLR10 (NCBI Gene ID: 81793)之激動劑。在一些實施例中，LRA係TLR7激動劑。在其他實施例中，另外治療劑係潛伏逆轉劑(LRA)，例如TLR8激動劑。TLR激動劑之實例包括(但不限於)維沙莫特。另外實例包括(但不限於)美國專利第8,367,670號中所述之化合物及美國專利申請公開案第2016/0289229號中所述之化合物。在一個實施例中，本發明之抗體可與TLR7激動劑(例如維沙莫特)組合。在另一實施例中，本發明之抗體可與TLR8激動劑(例如GS-9688)組合。在一個實施例中，另外治療劑係TLR調節劑。TLR調節劑可包括TLR1、TLR2、TLR3、TLR4、TLR5、TLR6、TLR7、TLR8、TLR9、TLR10、TLR11、TLR12及TLR13之調節劑。TLR3調節劑之實例包括林托莫德(rintatolimod)、聚-ICLC、RIBOXXON®、阿普西姆(Apoxxim)、RIBOXXIM®、IPH-33、MCT-465、MCT-475及ND-1.1。TLR7調節劑之實例包括GS-9620、GSK-2245035、咪喹莫特、雷西莫特、DSR-6434、DSP-3025、IMO-4200、MCT-465、MEDI-9197、3M-051、SB-9922、3M-052、Limtop、TMX-30X、TMX-202、RG-7863、RG-7795及揭示於US20100143301 (Gilead Sciences)、US20110098248 (Gilead Sciences)及US20090047249 (Gilead Sciences)中之化合物。TLR8調節劑之實例包括GS-9688、莫托莫德(motolimod)、雷西莫特、3M-051、3M-052、MCT-465、IMO-4200、VTX-763、VTX-1463及揭示於以下中之化合物：US20140045849 (Janssen)、US20140073642

(Janssen)、WO2014/056953 (Janssen)、WO2014/076221 (Janssen)、WO2014/128189 (Janssen)、US20140350031 (Janssen)、WO2014/023813 (Janssen)、US20080234251 (Array Biopharma)、US20080306050 (Array Biopharma)、US20100029585 (Ventirx Pharma)、US20110092485 (Ventirx Pharma)、US20110118235 (Ventirx Pharma)、US20120082658 (Ventirx Pharma)、US20120219615 (Ventirx Pharma)、US20140066432 (Ventirx Pharma)、US20140088085 (Ventirx Pharma)、US20140275167 (Novira Therapeutics)及US20130251673 (Novira Therapeutics)。TLR9調節劑之實例包括BB-001、BB-006、CYT-003、IMO-2055、IMO-2125、IMO-3100、IMO-8400、IR-103、IMO-9200、阿托莫德(agatolimod)、DIMS-9054、DV-1079、DV-1179、AZD-1419、來特莫德(leftolimod) (MGN-1703)、利尼莫德(litenimod)及CYT-003-QbG10。

【0206】在一些實施例中，另外治療劑係DExD/H-盒解旋酶58 (DDX58；亦稱為RIG-I、RIG1、RIGI、RLR-1、SGMRT2；NCBI Gene ID: 23586)之激動劑。闡釋性RIG-I激動劑係由Hemann等人，*J Immunol*, 2016年5月1日, 196 (增刊1) 76.1闡述之KIN1148。另外RIG-I激動劑闡述於(例如) Elion等人，*Cancer Res.* (2018) 78(21):6183-6195；及Liu等人，*J Virol.* (2016) 90(20):9406-19中。RIG-I激動劑可自(例如) Invivogen (invivogen.com)購得。

【0207】在某些實施例中，該等調配物適於每日一次投藥。

【0208】在一些實施例中，另外治療劑可為抗HIV劑。在一些情況下，另外治療劑可為HIV蛋白酶抑制劑、反轉錄酶之HIV非核苷或非

核苷酸抑制劑、反轉錄酶之HIV核苷或核苷酸抑制劑、HIV整合酶抑制劑、HIV非催化位點(或別位)整合酶抑制劑、HIV進入抑制劑、HIV成熟抑制劑、HIV衣殼抑制劑、HIV Tat或Rev抑制劑、免疫調節劑(例如免疫刺激劑)、免疫治療劑、抗體-藥物偶聯物、基因修飾劑、基因編輯劑(例如CRISPR/Cas9、鋅指核酸酶、歸巢核酸酶、合成核酸酶、TALEN)、細胞療法(例如嵌合抗原受體T細胞、CAR-T及工程化T細胞受體、TCR-T、自體T細胞療法)、潛伏逆轉劑、靶向HIV衣殼之化合物、基於免疫之療法、磷脂醯肌醇3-激酶(PI3K)抑制劑、HIV抗體、雙特異性抗體及「抗體樣」治療性蛋白、HIV p17基質蛋白抑制劑、IL-13拮抗劑、肽基-脯胺醯基順式-反式異構酶A調節劑、蛋白雙硫鍵異構酶抑制劑、補體C5a受體拮抗劑、DNA甲基轉移酶抑制劑、HIV vif基因調節劑、Vif二聚化拮抗劑、HIV-1病毒感染性因子抑制劑、TAT蛋白抑制劑、HIV-1 Nef調節劑、Hck酪胺酸激酶調節劑、混合譜系激酶-3(MLK-3)抑制劑、HIV-1剪接抑制劑、Rev蛋白抑制劑、整聯蛋白拮抗劑、核蛋白抑制劑、剪接因子調節劑、含有COMM結構域之蛋白1調節劑、HIV核糖核酸酶H抑制劑、逆轉環狀素調節劑、CDK-9抑制劑、樹枝狀ICAM-3抓取非整聯蛋白1抑制劑、HIV GAG蛋白抑制劑、HIV POL蛋白抑制劑、補體因子H調節劑、泛素連接酶抑制劑、去氧胞苷激酶抑制劑、細胞週期蛋白依賴性激酶抑制劑、前蛋白轉化酶PC9刺激物、ATP依賴性RNA解旋酶DDX3X抑制劑、反轉錄酶引發複合抑制劑、G6PD及NADH-氧化酶抑制劑、藥物動力學增強劑、HIV基因療法、HIV疫苗及其組合。

【0209】在一些實施例中，另外治療劑係選自由以下組成之群：用於HIV之組合藥物、用於治療HIV之其他藥物、HIV蛋白酶抑制劑、

HIV反轉錄酶抑制劑、HIV整合酶抑制劑、HIV非催化位點(或別位)整合酶抑制劑、HIV進入(融合)抑制劑、HIV成熟抑制劑、潛伏逆轉劑、衣殼抑制劑、基於免疫之療法、PI3K抑制劑、HIV抗體、及雙特異性抗體、及「抗體樣」治療性蛋白及其組合。

組合藥物

【0210】在某些實施例中，本文所述抗體或抗原結合片段與HIV組合藥物組合。在某些實施例中，抗體或其抗原結合片段包含具有以下中所述之序列之VH CDR及VL CDR：分別地SEQ ID NO.: 137、138、139、140、141及142。在某些實施例中，抗體或其抗原結合片段包含具有以下中所述之序列之VH CDR及VL CDR：分別地SEQ ID NO.: 137、138、139、140、141及142，且包含與SEQ ID NO: 477中所述之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、例如100%一致性的VH及與SEQ ID NO: 278中所述之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、例如100%一致性的VL。在某些實施例中，抗體或其抗原結合片段包含SEQ ID NO: 477中所述之VH序列及SEQ ID NO: 278中所述之VL序列。在某些實施例中，抗體或其抗原結合片段包含具有以下中所述之序列之VH CDR及VL CDR：分別地SEQ ID NO.: 137、138、139、140、141及142，且包含與SEQ ID NO: 529中所述之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、例如100%一致性的重鏈及與SEQ ID NO: 103中所述

之胺基酸序列具有至少80%、至少85%、至少90%、至少91%、至少92%、至少93%、至少94%、至少95%、至少96%、至少97%、至少98%、至少99%、例如100%一致性的輕鏈。在某些實施例中，抗體或其抗原結合片段包含SEQ ID NO: 529中所述之重鏈序列及SEQ ID NO: 103中所述之輕鏈序列。可與本揭示內容之抗體一起使用之組合藥物的實例包括ATRIPLA® (依法韋侖(efavirenz)、富馬酸泰諾福韋二吡呋酯(tenofovir disoproxil fumarate)及恩曲他濱(emtricitabine))；COMPLERA® (EVIPLERA®；利匹韋林(rilpivirine)、富馬酸泰諾福韋二吡呋酯及恩曲他濱)；STRIBILD® (埃替格韋(elvitegravir)、可比司他(cobicistat)、富馬酸泰諾福韋二吡呋酯及恩曲他濱)；TRUVADA® (富馬酸泰諾福韋二吡呋酯及恩曲他濱；TDF+FTC)；DESCOVY® (泰諾福韋艾拉酚胺(tenofovir alafenamide)及恩曲他濱)；ODEFSEY® (泰諾福韋艾拉酚胺、恩曲他濱及利匹韋林)；GENVOYA® (泰諾福韋艾拉酚胺、恩曲他濱、可比司他及埃替格韋)；達如那韋(darunavir)、半富馬酸泰諾福韋艾拉酚胺、恩曲他濱及可比司他；依法韋侖、拉米夫定(lamivudine)及富馬酸泰諾福韋二吡呋酯；拉米夫定及富馬酸泰諾福韋二吡呋酯；泰諾福韋及拉米夫定；泰諾福韋艾拉酚胺及恩曲他濱；半富馬酸泰諾福韋艾拉酚胺及恩曲他濱；半富馬酸泰諾福韋艾拉酚胺、恩曲他濱及利匹韋林；半富馬酸泰諾福韋艾拉酚胺、恩曲他濱、可比司他及埃替格韋；COMBIVIR® (齊多夫定(zidovudine)及拉米夫定；AZT+3TC)；EPZICOM® (LIVEXA®；硫酸阿巴卡韋(abacavir sulfate)及拉米夫定；ABC+3TC)；KALETRA® (ALUVIA®；洛匹那韋(lopinavir)及利托那韋(ritonavir))；TRIUMEQ® (德羅格韋(dolutegravir)、阿巴卡韋及拉米夫定)；

TRIZIVIR®（硫酸阿巴卡韋、齊多夫定及拉米夫定；ABC+AZT+3TC)；阿紮那韋(atazanavir)及可比司他；硫酸阿紮那韋及可比司他；硫酸阿紮那韋及利托那韋；達如那韋及可比司他；德羅格韋及利匹韋林；德羅格韋及鹽酸利匹韋林；德羅格韋、硫酸阿巴卡韋及拉米夫定；拉米夫定、奈韋拉平及齊多夫定；雷特格韋(raltegravir)及拉米夫定；多拉韋林(doravirine)、拉米夫定、及富馬酸泰諾福韋二吡呋酯；多拉韋林、拉米夫定及泰諾福韋二吡呋酯；德羅格韋 + 拉米夫定、拉米夫定 + 阿巴卡韋 + 齊多夫定、拉米夫定 + 阿巴卡韋、拉米夫定 + 富馬酸泰諾福韋二吡呋酯、拉米夫定 + 齊多夫定 + 奈韋拉平、洛匹那韋 + 利托那韋、洛匹那韋 + 利托那韋 + 阿巴卡韋 + 拉米夫定、洛匹那韋 + 利托那韋 + 齊多夫定 + 拉米夫定、泰諾福韋 + 拉米夫定及富馬酸泰諾福韋二吡呋酯 + 恩曲他濱 + 鹽酸利匹韋林、洛匹那韋、利托那韋、齊多夫定及拉米夫定；Vacc-4x及羅米地辛(romidepsin)；及APH-0812。

其他HIV藥物

【0211】可與本揭示內容之抗體組合的用於治療HIV之其他藥物之實例包括醋孟南(acemannan)、阿拉泊韋(alisporivir)、BanLec、去鐵酮(deferiprone)、加米木恩(Gamimune)、美騰法林(metenkefalin)、那曲酮(naltrexone)、普拉司汀(Prolastin)、REP 9、RPI-MN、VSSP、H1病毒、SB-728-T、1,5-二綠原酸、rHIV7-shl-TAR-CCR5RZ、AAV-eCD4-Ig基因療法、MazF基因療法、BlockAide、ABX-464、AG-1105、APH-0812、BIT-225、CYT-107、HGTV-43、HPH-116、HS-10234、IMO-3100、IND-02、MK-1376、MK-2048、MK-4250、MK-8507、MK-8591、NOV-205、PA-1050040 (PA-040)、PGN-007、

SCY-635、SB-9200、SCB-719、TR-452、TEV-90110、TEV-90112、TEV-90111、TEV-90113、RN-18、Immuglo及VIR-576。

HIV蛋白酶抑制劑

【0212】在某些實施例中，本文所述抗體或抗原結合片段與HIV蛋白酶抑制劑組合。可與本揭示內容之抗體組合之HIV蛋白酶抑制劑的實例包括安普那韋(amprenavir)、阿紮那韋、貝卡那韋(brecanavir)、達如那韋、呋山那韋(fosamprenavir)、呋山那韋鈣、茚地那韋(indinavir)、硫酸茚地那韋、洛匹那韋、奈芬那韋(nelfinavir)、甲磺酸奈芬那韋、利托那韋、沙奎那韋(saquinavir)、甲磺酸沙奎那韋、替拉那韋(tipranavir)、DG-17、TMB-657 (PPL-100)、T-169、BL-008、MK-8122、TMB-607及TMC-310911。

HIV反轉錄酶抑制劑

【0213】在某些實施例中，本文所述抗體或抗原結合片段與非核苷或非核苷酸抑制劑組合。可與本揭示內容之抗體組合之反轉錄酶的HIV非核苷或非核苷酸抑制劑之實例包括達匹韋林(dapivirine)、地拉韋定(delavirdine)、甲磺酸地拉韋定、多拉韋林、依法韋侖、依曲韋林(etravirine)、香菇多醣(lentinan)、奈韋拉平、利匹韋林、ACC-007、AIC-292、KM-023、PC-1005及艾法韋林(elsulfavirine) (VM-1500)。

【0214】在某些實施例中，本文所述抗體或抗原結合片段與HIV核苷或核苷酸抑制劑組合。可與本揭示內容之抗體組合之反轉錄酶的HIV核苷或核苷酸抑制劑的實例包括阿德福韋(adefovir)、阿德福韋二匹伏酯(adefovir dipivoxil)、阿茲夫定(azvudine)、恩曲他濱、泰諾福韋、泰諾福韋艾拉酚胺、富馬酸泰諾福韋艾拉酚胺、半富馬酸泰諾福韋艾拉酚胺、泰諾福韋二吡呋酯、富馬酸泰諾福韋二吡呋酯、半富馬酸泰

諾福韋二吡呋酯、VIDEX®及VIDEX EC® (去羥肌苷，ddl)、阿巴卡韋、硫酸阿巴卡韋、阿洛夫定、阿立他濱(apricitabine)、森薩烏定(censavudine)、去羥肌苷、艾夫他濱、費替那韋(festinavir)、磷夫定酯(fosalvudine tidoxil)、CMX-157、達匹韋林、多拉韋林、依曲韋林、OCR-5753、乳清酸泰諾福韋二吡呋酯(tenofovir disoproxil orotate)、福齊夫定替酯(fozivudine tidoxil)、拉米夫定、磷酸胺地(phosphazid)、司他夫定(stavudine)、紮昔他濱(zalcitabine)、齊多夫定、羅瓦福韋艾他拉酚胺(rovafovir etalafenamide) (GS-9131)、GS-9148、MK-8504、MK-8591、MK-858、VM-2500及KP-1461。

HIV整合酶抑制劑

【0215】在某些實施例中，本文所述抗體或抗原結合片段與HIV整合酶抑制劑組合。可與本揭示內容之抗體組合之HIV整合酶抑制劑的實例包括埃替格韋、薑黃素、薑黃素衍生物、菊苣酸、菊苣酸衍生物、3,5-二綠原酸、3,5-二綠原酸衍生物、金精三羧酸、金精三羧酸衍生物、咖啡酸苯乙基酯、咖啡酸苯乙基酯衍生物、酪胺酸磷酸化抑制劑、酪胺酸磷酸化抑制劑衍生物、槲皮素、槲皮素衍生物、雷特格韋、德羅格韋、JTK-351、比特拉韋(bictegravir)、AVX-15567、卡博特韋(cabotegravir) (長效可注射)、二酮基喹啉-4-1衍生物、整合酶-LEDGF抑制劑、來德金(ledgin)、M-522、M-532、NSC-310217、NSC-371056、NSC-48240、NSC-642710、NSC-699171、NSC-699172、NSC-699173、NSC-699174、二苯乙烯二磺酸、T-169、VM-3500及卡博特韋。

【0216】在某些實施例中，本文所述抗體或抗原結合片段與HIV非催化位點或別位整合酶抑制劑(NCINI)組合。可與本揭示內容之抗體

組合之HIV非催化位點或別位整合酶抑制劑(NCINI)的實例包括CX-05045、CX-05168及CX-14442。

HIV進入抑制劑

【0217】在某些實施例中，本文所述抗體或抗原結合片段與HIV進入抑制劑組合。可與本揭示內容之抗體組合之HIV進入(融合)抑制劑的實例包括賽尼克韋羅(cenicriviroc)、CCR5抑制劑、gp41抑制劑、CD4連接抑制劑、gp120抑制劑及CXCR4抑制劑。

【0218】在某些實施例中，本文所述抗體或抗原結合片段與CCR5抑制劑組合。可與本揭示內容之抗體組合之CCR5抑制劑的實例包括阿拉韋羅(aplaviroc)、維克韋羅(vicriviroc)、馬拉維洛、賽尼克韋羅、來羅利單抗(leronlimab) (PRO-140)、阿達他韋(adaptavir) (RAP-101)、尼非韋羅(nifeviroc) (TD-0232)、抗GP120/CD4或CCR5雙特異性抗體、B-07、MB-66、多肽C25P、TD-0680及vMIP (Haimipu)。

【0219】在某些實施例中，本文所述抗體或抗原結合片段與gp41抑制劑組合。可與本揭示內容之抗體組合之gp41抑制劑的實例包括艾博韋肽、恩夫韋肽(albuvirtide)、BMS-986197、恩夫韋肽生物改良藥、恩夫韋肽生物相似藥、HIV-1融合抑制劑(P26-Bapc)、ITV-1、ITV-2、ITV-3、ITV-4、PIE-12三聚體及西夫韋肽(sifuvirtide)。

【0220】在某些實施例中，本文所述抗體或抗原結合片段與CD4連接抑制劑組合。可與本揭示內容之抗體組合之CD4連接抑制劑的實例包括伊巴利珠單抗(ibalizumab)及CADA類似物。

【0221】在某些實施例中，本文所述抗體或抗原結合片段與gp120抑制劑組合。可與本揭示內容之抗體組合之gp120抑制劑的實例包括Radha-108 (瑞賽特爾(receptol)) 3B3-PE38、BanLec、基於膨潤

土之奈米醫藥、福斯特薩維(fostemsavir)胺丁三醇、IQP-0831及BMS-663068。

【0222】在某些實施例中，本文所述抗體或抗原結合片段與CXCR4抑制劑組合。可與本揭示內容之抗體組合之CXCR4抑制劑的實例包括普樂沙福(plerixafor)、ALT-1188、N15肽及vMIP (Haimipu)。

【0223】在某些實施例中，本文所述抗體或抗原結合片段與HIV成熟抑制劑組合。可與本揭示內容之抗體組合之HIV成熟抑制劑的實例包括BMS-955176、GSK-3640254及GSK-2838232。

潛伏逆轉劑

【0224】在某些實施例中，本文所述抗體或抗原結合片段與潛伏逆轉劑(LRA)組合。可與本揭示內容之抗體組合之潛伏逆轉劑的實例包括類鐸受體(TLR)激動劑(包括TLR7激動劑，例如GS-9620，及TLR8激動劑，例如GS-9688)、組織蛋白去乙醯酶(HDAC)抑制劑、蛋白酶體抑制劑(例如萬科(velcade))、蛋白激酶C (PKC)活化劑、Smyd2抑制劑、BET-溴結構域4 (BRD4)抑制劑、離子黴素、IAP拮抗劑(細胞凋亡蛋白抑制劑，例如APG-1387、LBW-242)、SMAC模擬物(包括TL32711、LCL161、GDC-0917、HGS1029、AT-406)、PMA、SAHA (辛二醯苯胺異羥肟酸(suberanilohydroxamic acid或suberoyl, anilide, 及hydroxamic acid))、NIZ-985、IL-15調節抗體(包括IL-15、IL-15融合蛋白及IL-15受體激動劑，例如ALT-803)、JQ1、雙硫侖(disulfiram)、兩性黴素B、及泛素抑制劑，例如拉格唑拉(largazole)類似物、APH-0812、及GSK-343。HDAC抑制劑之實例包括羅米地辛、伏立諾他(vorinostat)及帕比司他(panobinostat)。PKC活化劑之實例包括吲哚內醯胺(indolactam)、普羅斯左汀(prostratin)、英格諾爾B (ingenol B)及

DAG-內酯。

類鐸受體(TLR)激動劑

【0225】在各個實施例中，如本文所述之抗體或抗原結合片段與類鐸受體(TLR)激動劑(例如TLR1 (NCBI Gene ID: 7096)、TLR2 (NCBI Gene ID: 7097)、TLR3 (NCBI Gene ID: 7098)、TLR4 (NCBI Gene ID: 7099)、TLR5 (NCBI Gene ID: 7100)、TLR6 (NCBI Gene ID: 10333)、TLR7 (NCBI Gene ID: 51284)、TLR8 (NCBI Gene ID: 51311)、TLR9 (NCBI Gene ID: 54106)、及/或TLR10 (NCBI Gene ID: 81793)之激動劑)組合。可共投與之TLR7激動劑的實例包括(但不限於) AL-034、DSP-0509、GS-9620 (維沙莫特)、LHC-165、TMX-101 (咪喹莫特)、GSK-2245035、雷西莫特、DSR-6434、DSP-3025、IMO-4200、MCT-465、MEDI-9197、3M-051、SB-9922、3M-052、Limtop、TMX-30X、TMX-202、RG-7863、RG-7854、RG-7795及揭示於以下中之化合物：US20100143301 (Gilead Sciences)、US20110098248 (Gilead Sciences)、及US20090047249 (Gilead Sciences)、US20140045849 (Janssen)、US20140073642 (Janssen)、WO2014/056953 (Janssen)、WO2014/076221 (Janssen)、WO2014/128189 (Janssen)、US20140350031 (Janssen)、WO2014/023813 (Janssen)、US20080234251 (Array Biopharma)、US20080306050 (Array Biopharma)、US20100029585 (Ventirx Pharma)、US20110092485 (Ventirx Pharma)、US20110118235 (Ventirx Pharma)、US20120082658 (Ventirx Pharma)、US20120219615 (Ventirx Pharma)、US20140066432 (Ventirx Pharma)、US20140088085 (Ventirx Pharma)、US20140275167

(Novira Therapeutics)、及US20130251673 (Novira Therapeutics)。可共投與之TLR7/TLR8激動劑係NKTR-262、特拉特莫德(telratolimod)及BDB-001。可共投與之TLR8激動劑的實例包括(但不限於) E-6887、IMO-4200、IMO-8400、IMO-9200、MCT-465、MEDI-9197、莫托莫德、雷西莫特、GS-9688、VTX-1463、VTX-763、3M-051、3M-052、及揭示於以下中之化合物：US20140045849 (Janssen)、US20140073642 (Janssen)、WO2014/056953 (Janssen)、WO2014/076221 (Janssen)、WO2014/128189 (Janssen)、US20140350031 (Janssen)、WO2014/023813 (Janssen)、US20080234251 (Array Biopharma)、US20080306050 (Array Biopharma)、US20100029585 (Ventirx Pharma)、US20110092485 (Ventirx Pharma)、US20110118235 (Ventirx Pharma)、US20120082658 (Ventirx Pharma)、US20120219615 (Ventirx Pharma)、US20140066432 (Ventirx Pharma)、US20140088085 (Ventirx Pharma)、US20140275167 (Novira Therapeutics)及US20130251673 (Novira Therapeutics)。可共投與之TLR9激動劑的實例包括(但不限於) AST-008、科比特莫德(cobitolimod)、CMP-001、IMO-2055、IMO-2125、利尼莫德、MGN-1601、BB-001、BB-006、IMO-3100、IMO-8400、IR-103、IMO-9200、阿托莫德、DIMS-9054、DV-1079、DV-1179、AZD-1419、來飛特莫德(lefitolimod)(MGN-1703)、CYT-003、CYT-003-QbG10、替色特莫德(tilsotolimod)及PUL-042。TLR3激動劑之實例包括林托莫德、聚-ICLC、RIBOXXON®、阿普西姆、RIBOXXIM®、IPH-33、MCT-465、MCT-475及ND-1.1。TLR4激動劑之實例包括G-100及GSK-

1795091。

組織蛋白去乙醯酶(HDAC)抑制劑

【0226】在各個實施例中，如本文所述之抗體或抗原結合片段與組織蛋白去乙醯酶(例如，組織蛋白去乙醯酶9 (HDAC9、HD7、HD7b、HD9、HDAC、HDAC7、HDAC7B、HDAC9B、HDAC9FL、HDRP、MITR；Gene ID: 9734))之抑制劑組合。HDAC抑制劑之實例包括(但不限於)阿貝司他(abexinostat)、ACY-241、AR-42、BEBT-908、貝林司他(belinostat)、CKD-581、CS-055 (HBI-8000)、CUDC-907 (非美諾司他(fimepinostat))、恩替諾特(entinostat)、吉維司他(givinostat)、莫賽替諾司他(mocetinostat)、帕比司他、普西司他(pracinostat)、奎司司他(quisinostat) (JNJ-26481585)、瑞米司他(resminostat)、利科司他(ricolinostat)、羅米地辛、SHP-141、丙戊酸(VAL-001)、伏立諾他、氮芥(tinostamustine)、瑞米替諾司他(remetinostat)、恩替諾特。

衣殼抑制劑

【0227】在某些實施例中，本文所述抗體或抗原結合片段與衣殼抑制劑組合。可與本揭示內容之抗體組合之衣殼抑制劑的實例包括衣殼聚合抑制劑或衣殼破壞化合物、HIV核衣殼p7 (NCp7)抑制劑(例如偶氮二甲醯胺)、HIV p24衣殼蛋白抑制劑、GS-6207、AVI-621、AVI-101、AVI-201、AVI-301及AVI-CAN1-15系列。

基於免疫之療法

【0228】在某些實施例中，本文所述抗體或抗原結合片段與基於免疫之療法組合。可與本揭示內容之抗體組合之基於免疫之療法的實例包括類鐸受體(TLR)調節劑(例如激動劑)，例如TLR1、TLR 2、TLR

3、TLR 4、TLR 5、TLR 6、TLR 7、TLR 8、TLR 9、TLR 10、TLR 11、TLR 12及/或TLR 13激動劑；程式性細胞死亡蛋白1 (PD-1)調節劑；程式化死亡-配體1 (PD-L1)調節劑；IL-15激動劑(例如ALT-803)；DermaVir；介白素-7；普拉奎尼(plaquenil) (羥基氯喹)；普留淨(proleukin) (阿地介白素，IL-2)；干擾素α；干擾素α-2b；干擾素α-n3；聚乙二醇化干擾素α；干擾素γ；羥基脲；麥考酚酸(mycophenolic acid，MPA)及其酯衍生物嗎替麥考酚酯(MMF)；利巴韋林；林托莫德、聚合物聚乙亞胺(PEI)；吉噴(gepon)；IL-12；WF-10；VGV-1；MOR-22；BMS-936559；CYT-107、介白素-15/Fc融合蛋白、AM-0015、ALT-803、NIZ-985、NKTR-255、諾弗龍(normferon)、聚乙二醇干擾素α-2a、聚乙二醇干擾素α-2b、重組介白素-15、RPI-MN、GS-9620、GS-9688、STING調節劑、RIG-I調節劑、NOD2調節劑、SB-9200及IR-103。

【0229】在某些實施例中，本文所述抗體或抗原結合片段與TLR激動劑組合。TLR激動劑之實例包括(但不限於)：維沙莫特(GS-9620)、來飛特莫德、替色特莫德、林托莫德、DSP-0509、AL-034、G-100、科比特莫德、AST-008、莫托莫德、GSK-1795091、GSK-2245035、VTX-1463、GS-9688、LHC-165、BDB-001、RG-7854及特拉特莫德。

免疫檢查點受體蛋白調節劑

【0230】在各個實施例中，如本文所述之抗體或抗原結合片段與抑制性免疫檢查點蛋白或受體之一或多種阻斷劑或抑制劑及/或與一或多種刺激性免疫檢查點蛋白或受體之一或多種刺激物、活化劑或激動劑組合。抑制性免疫檢查點之阻斷或抑制可正性調節T細胞或NK細胞活

化且防止感染細胞之免疫逃逸。刺激性免疫檢查點之活化或刺激可增強免疫檢查點抑制劑在感染性治療劑中之效應。在各個實施例中，免疫檢查點蛋白或受體調節T細胞反應(例如綜述於Xu等人，J Exp Clin Cancer Res. (2018) 37:110中)。在各個實施例中，免疫檢查點蛋白或受體調節NK細胞反應(例如綜述於Davis等人，Semin Immunol. (2017) 31:64-75及Chiossone等人，Nat Rev Immunol. (2018) 18(11):671-688中)。

【0231】 免疫檢查點蛋白或受體之實例包括(但不限於) CD27、CD70；CD40、CD40LG；CD47、CD48 (SLAMF2)、含跨膜及免疫球蛋白結構域2 (TMIGD2、CD28H)、CD84 (LY9B、SLAMF5)、CD96、CD160、MS4A1 (CD20)、CD244 (SLAMF4)；CD276 (B7H3)；含有V組結構域之T細胞活化抑制劑1 (VTCN1、B7H4)；V組免疫調節性受體(VSIR、B7H5、VISTA)；免疫球蛋白超家族成員11 (IGSF11、VSIG3)；天然殺手細胞細胞毒性受體3配體1 (NCR3LG1、B7H6)；HERV-H LTR相關2 (HHLA2、B7H7)；可誘導型T細胞共刺激物(ICOS、CD278)；可誘導型T細胞共刺激物配體(ICOSLG、B7H2)；TNF受體超家族成員4 (TNFRSF4、OX40)；TNF超家族成員4 (TNFSF4、OX40L)；TNFRSF8 (CD30)、TNFSF8 (CD30L)；TNFRSF10A (CD261、DR4、TRAILR1)、TNFRSF9 (CD137)、TNFSF9 (CD137L)；TNFRSF10B (CD262、DR5、TRAILR2)、TNFRSF10 (TRAIL)；TNFRSF14 (HVEM、CD270)、TNFSF14 (HVEML)；CD272 (B及T淋巴球相關(BTLA))；TNFRSF17 (BCMA、CD269)、TNFSF13B (BAFF)；TNFRSF18 (GITR)、TNFSF18 (GITRL)；MHC I類多肽有關序列A (MICA)；MHC I類多肽有關序列B

(MICB)；CD274 (CD274、PDL1、PD-L1)；程式性細胞死亡1 (PDCD1、PD1、PD-1)；細胞毒性T-淋巴球相關蛋白4 (CTLA4、CD152)；CD80 (B7-1)、CD28；結合素細胞黏著分子2 (結合素2、CD112)；CD226 (DNAM-1)；脊髓灰白質炎病毒受體(PVR)細胞黏著分子(PVR、CD155)；含PVR有關免疫球蛋白結構域(PVRIG、CD112R)；具有Ig及ITIM結構域之T細胞免疫受體(TIGIT)；含T細胞免疫球蛋白及黏蛋白結構域4 (TIMD4；TIM4)；A型肝炎病毒細胞受體2 (HAVCR2、TIMD3、TIM3)；半乳糖凝集素9 (LGALS9)；淋巴球活化3 (LAG3、CD223)；信號傳導淋巴球活化分子家族成員1 (SLAMF1、SLAM、CD150)；淋巴球抗原9 (LY9、CD229、SLAMF3)；SLAM家族成員6 (SLAMF6、CD352)；SLAM家族成員7 (SLAMF7、CD319)；UL16結合蛋白1 (ULBP1)；UL16結合蛋白2 (ULBP2)；UL16結合蛋白3 (ULBP3)；視黃酸早期轉錄本1E (RAET1E；ULBP4)；視黃酸早期轉錄本1G (RAET1G；ULBP5)；視黃酸早期轉錄本1L (RAET1L；ULBP6)；淋巴球活化3 (CD223)；殺手細胞免疫球蛋白樣受體三個Ig結構域及長胞質尾區1 (KIR、CD158E1)；殺手細胞凝集素樣受體C1 (KLRC1、NKG2A、CD159A)；殺手細胞凝集素樣受體K1 (KLRK1、NKG2D、CD314)；殺手細胞凝集素樣受體C2 (KLRC2、CD159c、NKG2C)；殺手細胞凝集素樣受體C3 (KLRC3、NKG2E)；殺手細胞凝集素樣受體C4 (KLRC4、NKG2F)；殺手細胞免疫球蛋白樣受體兩個Ig結構域及長胞質尾區1 (KIR2DL1)；殺手細胞免疫球蛋白樣受體兩個Ig結構域及長胞質尾區2 (KIR2DL2)；殺手細胞免疫球蛋白樣受體兩個Ig結構域及長胞質尾區3 (KIR2DL3)；殺手細胞免疫球蛋白樣受體三個Ig結構域及長胞

質尾區1 (KIR3DL1)；殺手細胞凝集素樣受體D1 (KLRD1)；及SLAM家族成員7 (SLAMF7)。

【0232】在各個實施例中，如本文所述之抗體或抗原結合片段與一或多種T細胞抑制性免疫檢查點蛋白或受體之一或多種阻斷劑或抑制劑組合。闡釋性T細胞抑制性免疫檢查點蛋白或受體包括(但不限於) CD274 (CD274、PDL1、PD-L1)；程式性細胞死亡1配體2 (PDCD1LG2、PD-L2、CD273)；程式性細胞死亡1 (PDCD1、PD1、PD-1)；細胞毒性T-淋巴球相關蛋白4 (CTLA4、CD152)；CD276 (B7H3)；含有V組結構域之T細胞活化抑制劑1 (VTCN1、B7H4)；V組免疫調節性受體(VSIR、B7H5、VISTA)；免疫球蛋白超家族成員11 (IGSF11、VSIG3)；TNFRSF14 (HVEM、CD270)、TNFSF14 (HVEML)；CD272 (B及T淋巴球相關(BTLA))；含有PVR有關免疫球蛋白結構域(PVRIG、CD112R)；具有Ig及ITIM結構域之T細胞免疫受體(TIGIT)；淋巴球活化3 (LAG3、CD223)；A型肝炎病毒細胞受體2 (HAVCR2、TIMD3、TIM3)；半乳糖凝集素9 (LGALS9)；殺手細胞免疫球蛋白樣受體三個Ig結構域及長胞質尾區1 (KIR、CD158E1)；殺手細胞免疫球蛋白樣受體兩個Ig結構域及長胞質尾區1 (KIR2DL1)；殺手細胞免疫球蛋白樣受體兩個Ig結構域及長胞質尾區2 (KIR2DL2)；殺手細胞免疫球蛋白樣受體兩個Ig結構域及長胞質尾區3 (KIR2DL3)；及殺手細胞免疫球蛋白樣受體三個Ig結構域及長胞質尾區1 (KIR3DL1)。在各個實施例中，如本文所述之FLT3L-Fc融合蛋白、同二聚體、異二聚體、多核苷酸、載體、LNP及/或醫藥組合物與一或多種T細胞刺激性免疫檢查點蛋白或受體之一或多種激動劑或活化劑組合。闡釋性T細胞刺激性免疫檢查點蛋白或受體包括(但不限於) CD27、CD70；CD40、

CD40LG；可誘導型T細胞共刺激物(ICOS、CD278)；可誘導型T細胞共刺激物配體(ICOSLG、B7H2)；TNF受體超家族成員4 (TNFRSF4、OX40)；TNF超家族成員4 (TNFSF4、OX40L)；TNFRSF9 (CD137)、TNFSF9 (CD137L)；TNFRSF18 (GITR)、TNFSF18 (GITRL)；CD80 (B7-1)、CD28；結合素細胞黏著分子2 (結合素2、CD112)；CD226 (DNAM-1)；CD244 (2B4、SLAMF4)、脊髓灰白質炎病毒受體(PVR)細胞黏著分子(PVR、CD155)。參見(例如)Xu等人，J Exp Clin Cancer Res. (2018) 37:110。

【0233】在各個實施例中，如本文所述之抗體或抗原結合片段與一或多種NK細胞抑制性免疫檢查點蛋白或受體之一或多種阻斷劑或抑制劑組合。闡釋性NK細胞抑制性免疫檢查點蛋白或受體包括(但不限於)殺手細胞免疫球蛋白樣受體三個Ig結構域及長胞質尾區1 (KIR、CD158E1)；殺手細胞免疫球蛋白樣受體兩個Ig結構域及長胞質尾區1 (KIR2DL1)；殺手細胞免疫球蛋白樣受體兩個Ig結構域及長胞質尾區2 (KIR2DL2)；殺手細胞免疫球蛋白樣受體兩個Ig結構域及長胞質尾區3 (KIR2DL3)；殺手細胞免疫球蛋白樣受體三個Ig結構域及長胞質尾區1 (KIR3DL1)；殺手細胞凝集素樣受體C1 (KLRC1、NKG2A、CD159A)；及殺手細胞凝集素樣受體D1 (KLRD1、CD94)。在各個實施例中，如本文所述之FLT3L-Fc融合蛋白、同二聚體、異二聚體、多核苷酸、載體、LNP及/或醫藥組合物與一或多種NK細胞刺激性免疫檢查點蛋白或受體之一或多種激動劑或活化劑組合。闡釋性NK細胞刺激性免疫檢查點蛋白或受體包括(但不限於) CD16、CD226 (DNAM-1)；CD244 (2B4、SLAMF4)；殺手細胞凝集素樣受體K1 (KLRK1、NKG2D、CD314)；SLAM家族成員7 (SLAMF7)。參見(例如) Davis,

等人，Semin Immunol. (2017) 31:64-75；Fang,等人，Semin Immunol. (2017) 31:37-54；及Chiossone,等人，Nat Rev Immunol. (2018) 18(11):671-688。

【0234】在一些實施例中，一或多種免疫檢查點抑制劑包含PD-L1 (CD274)、PD-1 (PDCD1)或CTLA4之蛋白質性(例如抗體或其片段、或抗體模擬物)抑制劑。在一些實施例中，一或多種免疫檢查點抑制劑包含PD-L1 (CD274)、PD-1 (PDCD1)或CTLA4之小有機分子抑制劑。

【0235】可共投與之CTLA4之抑制劑的實例包括(但不限於)伊匹單抗(ipilimumab)、曲美目單抗(tremelimumab)、BMS-986218、AGEN1181、AGEN1884、BMS-986249、MK-1308、REGN-4659、ADU-1604、CS-1002、BCD-145、APL-509、JS-007、BA-3071、ONC-392、AGEN-2041、JHL-1155、KN-044、CG-0161、ATOR-1144、PBI-5D3H5、BPI-002、以及多特異性抑制劑FPT-155 (CTLA4/PD-L1/CD28)、PF-06936308 (PD-1/ CTLA4)、MGD-019 (PD-1/CTLA4)、KN-046 (PD-1/CTLA4)、MEDI-5752 (CTLA4/PD-1)、XmAb-20717 (PD-1/CTLA4)及AK-104 (CTLA4/PD-1)。

【0236】可共投與之PD-L1 (CD274)或PD-1 (PDCD1)之抑制劑的實例包括(但不限於)派姆單抗(pembrolizumab)、尼沃魯單抗(nivolumab)、賽米普利單抗(cemiplimab)、匹利珠單抗(pidilizumab)、AMP-224、MEDI0680 (AMP-514)、斯巴他利珠單抗(spartalizumab)、阿替珠單抗(atezolizumab)、阿維魯單抗(avelumab)、德瓦魯單抗(durvalumab)、BMS-936559、CK-301、PF-06801591、BGB-A317 (替雷利珠單抗(tislelizumab))、GLS-010

(WBP-3055)、AK-103 (HX-008)、AK-105、CS-1003、HLX-10、MGA-012、BI-754091、AGEN-2034、JS-001 (特瑞普利單抗(toripalimab))、JNJ-63723283、傑諾單抗(genolimzumab) (CBT-501)、LZM-009、BCD-100、LY-3300054、SHR-1201、SHR-1210 (卡瑞利珠單抗(camrelizumab))、Sym-021、ABBV-181、PD1-PIK、BAT-1306、(MSB0010718C)、CX-072、CBT-502、TSR-042 (多塔利單抗(dostarlimab))、MSB-2311、JTX-4014、BGB-A333、SHR-1316、CS-1001 (WBP-3155、KN-035、IBI-308 (信迪利單抗(sintilimab))、HLX-20、KL-A167、STI-A1014、STI-A1015 (IMC-001)、BCD-135、FAZ-053、TQB-2450、MDX1105-01、GS-4224、GS-4416、INCB086550、MAX10181、以及多特異性抑制劑FPT-155 (CTLA4/PD-L1/CD28)、PF-06936308 (PD-1/ CTLA4)、MGD-013 (PD-1/LAG-3)、FS-118 (LAG-3/PD-L1) MGD-019 (PD-1/CTLA4)、KN-046 (PD-1/CTLA4)、MEDI-5752 (CTLA4/PD-1)、RO-7121661 (PD-1/TIM-3)、XmAb-20717 (PD-1/CTLA4)、AK-104 (CTLA4/PD-1)、M7824 (PD-L1/TGFβ-EC結構域)、CA-170 (PD-L1/VISTA)、CDX-527 (CD27/PD-L1)、LY-3415244 (TIM3/PDL1)及INBRX-105 (4-1BB/PDL1)。

【0237】在一些實施例中，CD274或PDCD1之小分子抑制劑係選自由以下組成之群：GS-4224、GS-4416、INCB086550及MAX10181。在一些實施例中，CTLA4之小分子抑制劑包含BPI-002。

【0238】在各個實施例中，如本文所述之抗體或抗原結合片段與抗TIGIT抗體(例如BMS-986207、RG-6058、AGEN-1307)組合。

TNF受體超家族(TNFRSF)成員激動劑或活化劑

【0239】在各個實施例中，如本文所述之抗體或抗原結合片段與一或多個TNF受體超家族(TNFRSF)成員之激動劑(例如以下中之一或多者之激動劑：TNFRSF1A (NCBI Gene ID: 7132)、TNFRSF1B (NCBI Gene ID: 7133)、TNFRSF4 (OX40、CD134；NCBI Gene ID: 7293)、TNFRSF5 (CD40；NCBI Gene ID: 958)、TNFRSF6 (FAS、NCBI Gene ID: 355)、TNFRSF7 (CD27、NCBI Gene ID: 939)、TNFRSF8 (CD30、NCBI Gene ID: 943)、TNFRSF9 (4-1BB、CD137、NCBI Gene ID: 3604)、TNFRSF10A (CD261、DR4、TRAILR1、NCBI Gene ID: 8797)、TNFRSF10B (CD262、DR5、TRAILR2、NCBI Gene ID: 8795)、TNFRSF10C (CD263、TRAILR3、NCBI Gene ID: 8794)、TNFRSF10D (CD264、TRAILR4、NCBI Gene ID: 8793)、TNFRSF11A (CD265、RANK、NCBI Gene ID: 8792)、TNFRSF11B (NCBI Gene ID: 4982)、TNFRSF12A (CD266、NCBI Gene ID: 51330)、TNFRSF13B (CD267、NCBI Gene ID: 23495)、TNFRSF13C (CD268、NCBI Gene ID: 115650)、TNFRSF16 (NGFR、CD271、NCBI Gene ID: 4804)、TNFRSF17 (BCMA、CD269、NCBI Gene ID: 608)、TNFRSF18 (GITR、CD357、NCBI Gene ID: 8784)、TNFRSF19 (NCBI Gene ID: 55504)、TNFRSF21 (CD358、DR6、NCBI Gene ID: 27242)及TNFRSF25 (DR3、NCBI Gene ID: 8718))組合。

【0240】可共投與之抗TNFRSF4 (OX40)抗體之實例包括(但不限於) MEDI6469、MEDI6383、MEDI0562 (他伏利昔珠單抗(tavolixizumab))、MOXR0916、PF-04518600、RG-7888、GSK-3174998、INCAGN1949、BMS-986178、GBR-8383、ABBV-368以

及闡述於WO2016179517、WO2017096179、WO2017096182、WO2017096281及WO2018089628中之彼等。

【0241】可共投與之抗TNFRSF5 (CD40)抗體的實例包括(但不限於) RG7876、SEA-CD40、APX-005M及ABBV-428。

【0242】在一些實施例中，共投與抗TNFRSF7 (CD27)抗體瓦利盧單抗(varlilumab) (CDX-1127)。

【0243】可共投與之抗TNFRSF9 (4-1BB, CD137)抗體之實例包括(但不限於)烏瑞魯單抗(urelumab)、烏托米單抗(utomilumab) (PF-05082566)、AGEN2373及ADG-106。

【0244】可共投與之抗TNFRSF18 (GITR)抗體之實例包括(但不限於) MEDI1873、FPA-154、INCAGN-1876、TRX-518、BMS-986156、MK-1248、GWN-323及闡述於WO2017096179、WO2017096276、WO2017096189及WO2018089628中之彼等。在一些實施例中，共投與共靶向TNFRSF4 (OX40)及TNFRSF18 (GITR)之抗體或其片段。該等抗體闡述於(例如) WO2017096179及WO2018089628中。

雙特異性及多特異性天然殺手(NK)細胞接頭

【0245】在各個實施例中，如本文所述之抗體或抗原結合片段與以下物質組合：針對NK細胞活化受體(例如CD16A、C型凝集素受體(CD94/NKG2C、NKG2D、NKG2E/H及NKG2F)、天然細胞毒性受體(NKp30、NKp44及NKp46)、殺手細胞C型凝集素樣受體(NKp65、NKp80)、Fc受體FcγR (其介導抗體依賴性細胞細胞毒性)、SLAM家族受體(例如2B4、SLAM6及SLAM7)、殺手細胞免疫球蛋白樣受體(KIR)(KIR-2DS及KIR-3DS)、DNAM-1及CD137 (41BB)之雙特異性NK細胞

接頭(BiKE)或三特異性NK細胞接頭(TriKE) (例如無Fc)或雙特異性抗體(例如具有Fc)。可共投與之闡釋性抗CD16雙特異性抗體、BiKE或TriKE包括AFM26 (BCMA/CD16A)及AFM-13 (CD16/CD30)。若適當，抗CD16結合雙特異性分子可具有或可不具有Fc。BiKE及TriKE闡述於(例如) Felices等人，Methods Mol Biol. (2016) 1441:333-346；Fang等人，Semin Immunol. (2017) 31:37-54中。三特異性NK細胞接頭(TRiKE)之實例包括OXS-3550及CD16-IL-15-B7H3 TriKe。

磷脂醯肌醇3-激酶(PI3K)抑制劑

【0246】在某些實施例中，本文所述抗體或抗原結合片段與PI3K抑制劑組合。可與本揭示內容之抗體組合之PI3K抑制劑的實例包括艾代拉裡斯(idelalisib)、阿哌裡斯(alpelisib)、布帕裡斯(buparlisib)、CAI乳清酸鹽、庫盤尼西(copanlisib)、杜維裡斯(duvelisib)、戈達托裡斯(gedatolisib)、來那替尼(neratinib)、帕奴裡斯(panulisib)、哌立福辛(perifosine)、皮克裡斯(pictilisib)、皮拉裡斯(pilaralisib)、甲磺酸普喹替尼(puquitinib mesylate)、瑞格色替(rigosertib)、瑞格色替鈉、松裡昔布(sonolisib)、他塞利昔布(taselisib)、AMG-319、AZD-8186、BAY-1082439、CLR-1401、CLR-457、CUDC-907、DS-7423、EN-3342、GSK-2126458、GSK-2269577、GSK-2636771、INCB-040093、LY-3023414、MLN-1117、PQR-309、RG-7666、RP-6530、RV-1729、SAR-245409、SAR-260301、SF-1126、TGR-1202、UCB-5857、VS-5584、XL-765及ZSTK-474。

α-4/β-7拮抗劑

【0247】在某些實施例中，本文所述抗體或抗原結合片段與α-4/β-7拮抗劑組合。可與本揭示內容之抗體組合之整聯蛋白α-4/β-7拮抗

劑的實例包括PTG-100、TRK-170、阿瑞魯單抗(abrilumab)、艾曲利珠單抗(etrolizumab)、甲基卡羅特斯特(carotegrast methyl)及維多珠單抗(vedolizumab)。

【0248】可與本揭示內容之抗體組合之HIV抗體、雙特異性抗體及「抗體樣」治療性蛋白的實例包括DARTs®、DUOBODIES®、BITES®、XmAbs®、TandAbs®、Fab衍生物、bNAb(廣泛中和HIV-1抗體)、BMS-936559、TMB-360、及靶向HIV gp120或gp41之彼等、靶向HIV之抗體招募分子、抗CD63單株抗體、抗GB C型病毒抗體、抗GP120/CD4、CCR5雙特異性抗體、抗nef單一結構域抗體、抗Rev抗體、駱駝科動物源抗CD18抗體、駱駝科動物源抗ICAM-1抗體、DCVax-001、gp140靶向之抗體、基於gp41之HIV治療性抗體、人類重組mAb (PGT-121)、伊巴利珠單抗、Immuglo、MB-66。以該方式靶向HIV之彼等的實例包括巴維昔單抗(bavituximab)、UB-421、C2F5、2G12、C4E10、C2F5+C2G12+C4E10、8ANC195、3-BNC-117、3BNC117-LS、3BNC60、D1D2、10-1074、10-1074-LS、GS-9722、DH411-2、BG18、PGT145、PGT121、PGT122、PGT-151、PGT-133、PGT-134、PGT-135、PGT-128、MDX010(伊匹單抗)、DH511、DH511-2、N6、N6LS、N49P6、N49P7、N49P7.1、N49P9、N49P11、N60P1.1、N60P25.1、N60P2.1、N60P31.1、N60P22、NIH 45-46、PG9、PG16、2Dm2m、4Dm2m、6Dm2m、PGDM1400、MDX010(伊匹單抗)、VRC01、VRC-01-LS、A32、7B2、10E8、VRC-07-523、VRC07-523LS、10E8VLS、3810109、10E8v4、IMC-HIV、iMabm36、eCD4-Ig、IOMA、CAP256-VRC26.25、DRVIA7、VRC-HIVMAB080-00-AB、VRC-

HIVMAB060-00-AB、P2G12、VRC07及SF12。HIV雙特異性及三特異性抗體之實例包括MGD014、TMB-雙特異性、SAR-441236、VRC-01/PGDM-1400/10E8v4、10E8.4/iMab、10E8v4/PGT121-VRC01。活體內遞送之bnAB之實例包括例如AAV8-VRC07；編碼抗HIV抗體VRC01之mRNA；及編碼3BNC117之工程化B細胞(Hartweger等人，*J. Exp. Med.* (2019), 1301)。

藥物動力學增強劑

【0249】在某些實施例中，本文所述抗體或抗原結合片段與藥物動力學增強劑組合。可與本揭示內容之抗體組合之藥物動力學增強劑的實例包括可比司他及利托那韋。

另外治療劑

【0250】可與本揭示內容之抗體組合之另外治療劑的實例包括揭示於以下中之化合物：WO 2004/096286 (Gilead Sciences)、WO 2006/015261 (Gilead Sciences)、WO 2006/110157 (Gilead Sciences)、WO 2012/003497 (Gilead Sciences)、WO 2012/003498 (Gilead Sciences)、WO 2012/145728 (Gilead Sciences)、WO 2013/006738 (Gilead Sciences)、WO 2013/159064 (Gilead Sciences)、WO 2014/100323 (Gilead Sciences)、US 2013/0165489 (University of Pennsylvania)、US 2014/0221378 (Japan Tobacco)、US 2014/0221380 (Japan Tobacco)、WO 2009/062285 (Boehringer Ingelheim)、WO 2010/130034 (Boehringer Ingelheim)、WO 2013/006792 (Pharma Resources)、US 20140221356 (Gilead Sciences)、US 20100143301 (Gilead Sciences)及WO 2013/091096 (Boehringer Ingelheim)。

HIV疫苗

【0251】在某些實施例中，本文所述抗體或抗原結合片段與HIV疫苗組合。在各個實施例中，HIV疫苗引發T細胞反應。可與本文所述抗體及其片段組合之闡釋性疫苗包括(但不限於)病毒載體疫苗(例如沙粒病毒、腺病毒、痘病毒、棒狀病毒)以及基於核酸之疫苗(例如DNA、RNA及自我複製RNA)。在一些實施例中，抗HIV疫苗包含一或多種多肽疫苗免疫原。可與本揭示內容之抗體組合之HIV疫苗的實例包括肽疫苗、重組亞單位蛋白疫苗、活載體疫苗、DNA疫苗、CD4源肽疫苗,疫苗組合、腺病毒載體疫苗、黑猩猩腺病毒疫苗(例如ChAdOX1、ChAd68、ChAd3等)、基於柯薩奇病毒(Coxsackievirus)之疫苗、大猩猩腺病毒疫苗、沙粒病毒疫苗(LCMV，皮欽德(Pichinde))、基於麻疹病毒之疫苗、基於水痘帶狀疱疹病毒之疫苗、基於人類副流行性感冒病毒3 (PIV3)之疫苗、基於痘病毒之疫苗(改良型牛痘病毒安卡拉株(modified vaccinia virus Ankara，MVA)、NYVAC及ALVAC株)；基於棒狀病毒之疫苗，例如VSV及馬拉巴病毒(marabavirus)；基於α病毒之疫苗，例如塞姆利基森林病毒(semliki forest virus)、委內瑞拉馬腦炎病毒(venezuelan equine encephalitis virus)及辛得比斯病毒(sindbis virus)；(參見Lauer, *Clinical and Vaccine Immunology*, (2017), DOI: 10.1128/CVI.00298-16)；LNP調配之基於mRNA之治療性疫苗；LNP調配之自我複製RNA/自我擴增RNA疫苗、rgp120 (AIDSVAX)、ALVAC HIV (vCP1521)/AIDSVAX B/E (gp120) (RV144)、單體gp120 HIV-1亞型C疫苗、Remune、ITV-1、Contre Vir、Ad5-ENVA-48、DCVax-001 (CDX-2401)、Vacc-4x、Vacc-C5、VAC-3S、多分支DNA重組腺病毒-5 (rAd5)、rAd5 gag-pol env A/B/C疫苗、Pennvax-G、

Pennvax-GP、Pennvax-G/MVA-CMDR、HIV-TriMix-mRNA疫苗、HIV-LAMP-vax、Ad35、Ad35-GRIN、NAcGM3/VSSP ISA-51、聚-ICLC輔助疫苗、TatImmune、GTU-多HIV (FIT-06)、gp140[δ]V2.TV1+MF-59、rVSVIN HIV-1 gag疫苗、SeV-Gag疫苗、AT-20、DNK-4、ad35-Grin/ENV、TBC-M4、HIVAX、HIVAX-2、NYVAC-HIV-PT1、NYVAC-HIV-PT4、DNA-HIV-PT123、rAAV1-PG9DP、GOVX-B11、GOVX-B21、TVI-HIV-1、Ad-4 (Ad4-env Clade C+Ad4-mGag)、Paxvax、EN41-UGR7C、EN41-FPA2、PreVaxTat、AE-H、MYM-V101、CombiHIVvac、ADVAX、MYM-V201、MVA-CMDR、DNA-Ad5 gag/pol/nef/nev (HVTN505)、MVATG-17401、ETV-01、CDX-1401、rcAD26.MOS1.HIV-Env、Ad26.Mod.HIV疫苗、Ad26.Mod.HIV + MVA馬賽克疫苗+ gp140、AGS-004、AVX-101、AVX-201、PEP-6409、SAV-001、ThV-01、TL-01、TUTI-16、VGX-3300、IHV-001、及類病毒顆粒疫苗(例如假病毒粒子疫苗)、CombiVICHvac、LFn-p24 B/C融合疫苗、基於GTU之DNA疫苗、HIV gag/pol/nef/env DNA疫苗、抗TAT HIV疫苗、偶聯多肽疫苗、樹枝狀細胞疫苗(例如DermaVir)、基於gag之DNA疫苗、GI-2010、gp41 HIV-1疫苗、HIV疫苗(PIKA佐劑)、I i-鑰/MHC II類表位雜合肽疫苗、ITV-2、ITV-3、ITV-4、LIPO-5、多分支Env疫苗、MVA疫苗、Pennvax-GP、pp71缺陷性HCMV載體HIV gag疫苗、重組肽疫苗(HIV感染)、NCI、rgp160 HIV疫苗、RNActive HIV疫苗、SCB-703、Tat Oyi疫苗、TBC-M4、治療性HIV疫苗、UBI HIV gp120、Vacc-4x + 羅米地辛、變體gp120多肽疫苗、rAd5 gag-pol env A/B/C疫苗、DNA.HTI及MVA.HTI、VRC-HIVDNA016-00-VP +

VRC-HIVADV014-00-VP、INO-6145、JNJ-9220、gp145 C.6980；基於eOD-GT8 60聚體之疫苗、PD-201401、env (A、B、C、A/E)/gag (C) DNA疫苗、gp120 (A,B,C,A/E)蛋白疫苗、PDPHV-201401、Ad4-EnvCN54、EnvSeq-1 Envs HIV-1疫苗(GLA-SE輔助)、HIV p24gag 初免-追加質體DNA疫苗、基於沙粒病毒載體之疫苗(Vaxwave、TheraT)、MVA-BN HIV-1疫苗方案、UBI HIV gp120、基於mRNA之預防性疫苗及TBL-1203HI。

節育(避孕)組合療法

【0252】在某些實施例中，本文所述抗體或抗原結合片段與節育或避孕方案組合。可與本揭示內容之抗體組合之用於節育(避孕)之治療劑包括乙酸環丙孕酮(cyproterone acetate)、去氧孕烯(desogestrel)、地諾孕素(dienogest)、屈螺酮(drospirenone)、戊酸雌二醇(estradiol valerate)、乙炔基雌二醇(ethinyl Estradiol)、炔諾醇(ethynodiol)、依託孕烯(etonogestrel)、左甲基四氫葉酸鹽(levomefolate)、左炔諾孕酮(levonorgestrel)、利奈孕醇(lynestrenol)、乙酸甲羥助孕酮(medroxyprogesterone acetate)、美雌醇(mestranol)、美服培酮(mifepristone)、米索前列醇(misoprostol)、乙酸諾美孕酮(nomegestrol acetate)、甲基孕酮(norelgestromin)、炔諾酮(norethindrone)、異炔諾酮(noretynodrel)、諾孕酯(norgestimate)、奧美昔芬(ormeloxifene)、乙酸塞孕酮(segesterone acetate)、乙酸烏利司他(ulipristal acetate)及其任何組合。

【0253】在一個實施例中，本文揭示之抗體或其醫藥上可接受之鹽與一種、兩種、三種、四種或更多種選自以下之另外治療劑：ATRIPLA® (依法韋侖、富馬酸泰諾福韋二吡呋酯及恩曲他濱)；

COMPLERA® (EVIPLERA®；利匹韋林、富馬酸泰諾福韋二吡呋酯及恩曲他濱)；STRIBILD® (埃替格韋、可比司他、富馬酸泰諾福韋二吡呋酯及恩曲他濱)；TRUVADA® (富馬酸泰諾福韋二吡呋酯及恩曲他濱；TDF +FTC)；DESCOVY® (泰諾福韋艾拉酚胺及恩曲他濱)；ODEFSEY® (泰諾福韋艾拉酚胺、恩曲他濱及利匹韋林)；GENVOYA® (泰諾福韋艾拉酚胺、恩曲他濱、可比司他及埃替格韋)；阿德福韋；阿德福韋二匹伏酯；可比司他；恩曲他濱；泰諾福韋；泰諾福韋二吡呋酯；富馬酸泰諾福韋二吡呋酯；泰諾福韋艾拉酚胺；半富馬酸泰諾福韋艾拉酚胺；TRIUMEQ® (德羅格韋、阿巴卡韋及拉米夫定)；德羅格韋、硫酸阿巴卡韋及拉米夫定；雷特格韋；雷特格韋及拉米夫定；馬拉維洛；恩夫韋肽；ALUVIA® (KALETRA®；洛匹那韋及利托那韋)；COMBIVIR® (齊多夫定及拉米夫定；AZT+3TC)；EPZICOM® (LIVEXA®；硫酸阿巴卡韋及拉米夫定；ABC+3TC)；TRIZIVIR® (硫酸阿巴卡韋、齊多夫定及拉米夫定；ABC+AZT+3TC)；利匹韋林；鹽酸利匹韋林；硫酸阿紮那韋及可比司他；阿紮那韋及可比司他；達如那韋及可比司他；阿紮那韋；硫酸阿紮那韋；德羅格韋；埃替格韋；利托那韋；硫酸阿紮那韋及利托那韋；達如那韋；拉米夫定；普拉司汀；呋山那韋；呋山那韋鈣、依法韋侖；依曲韋林；奈芬那韋；甲磺酸奈芬那韋；干擾素；去羥肌苷；司他夫定；茚地那韋；硫酸茚地那韋；泰諾福韋及拉米夫定；齊多夫定；奈韋拉平；沙奎那韋；甲磺酸沙奎那韋；阿地介白素；紮昔他濱；替拉那韋；安普那韋；地拉韋定；甲磺酸地拉韋定；Radha-108 (瑞賽特爾)；拉米夫定及富馬酸泰諾福韋二吡呋酯；依法韋侖、拉米夫定及富馬酸泰諾福韋二吡呋酯；磷酸胺地；拉米夫定、奈韋拉平及齊多夫定；阿巴卡韋；

及硫酸阿巴卡韋。

【0254】在一些實施例中，本文揭示之抗體或其醫藥組合物與反轉錄酶之HIV核苷或核苷酸抑制劑及反轉錄酶之HIV非核苷抑制劑組合。在另一特定實施例中，本文揭示之抗體或其醫藥組合物與反轉錄酶之HIV核苷或核苷酸抑制劑及HIV蛋白酶抑制化合物組合。在另一實施例中，本文揭示之抗體或其醫藥組合物與反轉錄酶之HIV核苷或核苷酸抑制劑、反轉錄酶之HIV非核苷抑制劑及藥物動力學增強劑組合。在某些實施例中，本文揭示之抗體或其醫藥組合物與反轉錄酶之至少一種HIV核苷抑制劑、整合酶抑制劑及藥物動力學增強劑組合。在另一實施例中，本文揭示之抗體或其醫藥組合物與反轉錄酶之兩種HIV核苷或核苷酸抑制劑組合。

【0255】在某一實施例中，本文揭示之抗體或其醫藥組合物與硫酸阿巴卡韋、泰諾福韋、泰諾福韋二吡呋酯、富馬酸泰諾福韋二吡呋酯、半富馬酸泰諾福韋二吡呋酯、泰諾福韋艾拉酚胺、或半富馬酸泰諾福韋艾拉酚胺組合。

【0256】在另一實施例中，本文揭示之抗體或其醫藥組合物與泰諾福韋、泰諾福韋二吡呋酯、富馬酸泰諾福韋二吡呋酯、泰諾福韋艾拉酚胺、或半富馬酸泰諾福韋艾拉酚胺組合。

【0257】在另一實施例中，本文揭示之抗體或其醫藥組合物與選自由硫酸阿巴卡韋、泰諾福韋、泰諾福韋二吡呋酯、富馬酸泰諾福韋二吡呋酯、泰諾福韋艾拉酚胺及半富馬酸泰諾福韋艾拉酚胺組成之群之第一另外治療劑及選自由恩曲他濱及拉米夫定組成之群之第二另外治療劑組合。

【0258】在另一實施例中，本文揭示之抗體或其醫藥組合物與選

自由泰諾福韋、泰諾福韋二吡呋酯、富馬酸泰諾福韋二吡呋酯、泰諾福韋艾拉酚胺及半富馬酸泰諾福韋艾拉酚胺組成之群之第一另外治療劑及第二另外治療劑組合，其中第二另外治療劑係恩曲他濱。

【0259】在一些實施例中，本文揭示之抗體或其醫藥組合物與選自由以下組成之群之第一另外治療劑(避孕劑)組合：乙酸環丙孕酮、去氧孕烯、地諾孕素、屈螺酮、戊酸雌二醇、乙炔基雌二醇、炔諾醇、依託孕烯、左甲基四氫葉酸鹽、左炔諾孕酮、利奈孕醇、乙酸甲羥助孕酮、美雌醇、美服培酮、米索前列醇、乙酸諾美孕酮、甲基孕酮、炔諾酮、異炔諾酮、諾孕酯、奧美昔芬、乙酸塞孕酮、乙酸烏利司他及其任何組合。

基因療法及細胞療法

【0260】在某些實施例中，本文所述抗體或抗原結合片段與基因或細胞療法方案組合。基因療法及細胞療法包括(但不限於)用以使基因沉默之基因修飾；用以直接殺死感染細胞之基因方法；輸注免疫細胞，其經設計以代替大部分患者之自身免疫系統以增強對感染細胞之免疫反應、或活化患者之自身免疫系統以殺死感染細胞、或發現並殺死感染細胞；用以修飾細胞活性以進一步改變針對感染之內源免疫反應的基因方法。樹突細胞療法之實例包括AGS-004。CCR5基因編輯劑包括SB-728T。CCR5基因抑制劑包括Cal-1。在一些實施例中，表現CD4陽性T細胞之C34-CCR5/C34-CXCR4與本文所述抗體或其抗原結合片段共投與。在一些實施例中，抗體或抗原結合片段與AGT-103轉導之自體T細胞療法或AAV-eCD4-Ig基因療法共投與。

基因編輯劑

【0261】在某些實施例中，本文所述抗體或抗原結合片段與基因

編輯劑(例如靶向HIV之基因編輯劑)組合。在各個實施例中，基因體編輯系統可選自由以下組成之群：CRISPR/Cas9複合物、鋅指核酸酶複合物、TALEN複合物、歸巢內核酸酶複合物及大範圍核酸酶複合物。闡釋性HIV靶向CRISPR/Cas9系統包括(但不限於) EBT-101。

CAR-T細胞療法

【0262】在一些實施例中，本文所述抗體或抗原結合片段可與經工程化改造以表現嵌合抗原受體(CAR)之免疫效應細胞群體共投與，其中CAR包含HIV抗原結合結構域。HIV抗原包括HIV套膜蛋白或其部分、gp120或其部分、gp120上之CD4結合位點、gp120上之CD4誘導之結合位點、gp120上之N聚醣、gp120之V2、gp41上之近膜區。免疫效應細胞係T細胞或NK細胞。在一些實施例中，T細胞係CD4+ T細胞、CD8+ T細胞或其組合。細胞可為自體或同種異體。HIV CAR-T之實例包括經遺傳工程化改造以表現CD4 CAR及C46肽之VC-CAR-T、CMV-N6-CART、抗CD4 CART細胞療法、自體造血幹細胞。

TCR-T細胞療法

【0263】在某些實施例中，本文所述抗體或抗原結合片段與TCR-T細胞群體組合。TCR-T細胞經工程化改造以靶向病毒感染細胞表面上存在之HIV源肽。

B細胞療法

【0264】在某些實施例中，本文所述抗體或抗原結合片段與經遺傳修飾以表現廣泛中和抗體(例如3BNC117)之B細胞群體組合(Hartweger等人，*J. Exp. Med.* 2019, 1301, Moffett等人，*Sci. Immunol.* 4, eaax0644 (2019) 2019年5月17日)。

套組

【0265】 本揭示內容亦涵蓋包含本文所述一或多種抗體或抗原結合片段或其偶聯物的套組。在一種情況下，本文提供包含一或多個填充有本文所述醫藥組合物之一或多種成分(例如本文提供之一或多種抗體)之容器(例如小瓶、安剖)的醫藥包或套組。在一些情況下，套組含有本文所述醫藥組合物。在一個實施例中，提供包含本文揭示之抗體或其醫藥組合物與一或多種(例如一種、兩種、三種、一種或兩種、或一種至三種)另外治療劑(例如上文所述彼等)之組合的套組。

【0266】 在一些實施例中，套組包含在一或多個容器中之抗體或抗原結合片段或一或多種多核苷酸的一或多個單位劑量。在一些實施例中，套組包含在單獨容器中之抗體或抗原結合片段及用於治療HIV感染之第二藥劑(例如一或多種另外藥劑)的一或多個單位劑量。在一些實施例中，套組進一步包含類鐸受體(TLR)激動劑之一或多個單位劑量。在一些實施例中，TLR激動劑係TLR7激動劑或TLR8激動劑。在一些實施例中，TLR7激動劑係選自由維沙莫特、咪喹莫特及雷西莫特組成之群。在一些實施例中，套組包含如本文所述之抗體或抗原結合片段之一或多個單位劑量及第二、第三或第四抗HIV抗體或其抗原結合片段之一或多個單位劑量，其中第二、第三或第四抗HIV抗體或其抗原結合片段結合至選自由以下組成之群之gp120之表位或區：(i) 第三可變環(V3)及/或包含N332寡甘露糖聚醣之高甘露糖區塊；(ii) 第二可變環(V2)及/或Env三聚體頂端；(iii) gp120/gp41界面；或(iv) gp120之沉默面。在一些實施例中，第二抗HIV抗體或其抗原結合片段結合至第三可變環(V3)及/或包含N332寡甘露糖聚醣之高甘露糖區塊。在一些實施例中，第二抗HIV抗體與選自由以下組成之群之抗體競爭或包含該抗體之VH及VL區　　：GS-9722、PGT-121、PGT-122、PGT-123、PGT-124、

PGT-125、PGT-126、PGT-128、PGT-130、PGT-133、PGT-134、PGT-135、PGT-136、PGT-137、PGT-138、PGT-139、10-1074、VRC24、2G12、BG18、354BG8、354BG18、354BG42、354BG33、354BG129、354BG188、354BG411、354BG426、DH270.1、DH270.6、PGDM12、VRC41.01、PGDM21、PCDN-33A、BF520.1及VRC29.03。在一些實施例中，第二抗HIV抗體或其抗原結合片段與選自由以下組成之群之抗體競爭或包含該抗體之VH及VL區：GS-9722及PGT-121。在一些實施例中，套組包含兩個或更多個單位劑量，其中單位劑量相同。在一些實施例中，套組包含兩個或更多個單位劑量，其中單位劑量不同。

【0267】視情況，該等容器可附帶有監管醫藥或生物產品之製造、使用或銷售之政府機構所規定形式之公告，該公告顯示政府機構已批准用於人類投與之製造、使用或銷售。

實例

【0268】提供以下實例以闡釋各種實施例，且不應解釋為限制本申請案之範圍。就提及具體材料而言，僅僅是出於闡釋目的且並不意欲限制本申請案。熟習此項技術者可在不運用創造能力且不脫離本申請案之範圍之情況下開發出等效之方式或反應物。

實例1：抗體A之ADCC活性

【0269】使用來自獨立健康供體之HIV感染CEM.NKr.CCR5^{+}Luc^{+}細胞及原代人類NK效應細胞在活體外分析由抗體對HIV感染靶CD4^{+} T細胞之ADCC。

【0270】該研究包括PGT121敏感性及PGT121抗性病毒及具有針對抗體A之Fc之修飾(Fc經修飾)的抗體。表1概述在5 mg/mL人類血清

IgG存在下且使用來自三個獨立人類供體之原代人類NK細胞及經病毒分離株92US712或92US657感染之CEM.NKr.CCR5^{+}Luc^{+}細胞分析時抗體A、A-1、A-2、A-3、A-4、A-5及A-6的殺死功效及效能。

【0271】 表1. ADCC活性

92US712感染細胞								
	ID:	**A**	**A-2**	**A-1**	**A-3**	**A-4**	**A-5**	**A-6**
Emax (%)	NK供體1	48	76	77	77	78	79	68
	NK供體2	7	60	62	59	61	61	54
	NK供體3	27	60	62	67	64	66	51
EC_{50} (μg/mL)	NK供體1	2.23	0.18	0.19	0.07	0.20	0.19	0.27
	NK供體2	>100	0.08	0.09	0.08	0.13	0.08	0.54
	NK供體3	3.63	0.20	0.16	0.20	0.40	0.09	0.18
92US657感染細胞								
	ID:	**A**	**A-2**	**A-1**	**A-3**	**A-4**	**A-5**	**A-6**
Emax (%)	NK供體1	2	59	58	49	52	58	54
	NK供體2	0	51	50	49	53	61	53
	NK供體3	0	56	52	56	50	61	52
EC_{50} (μg/mL)	NK供體1	>100	0.54	0.74	0.68	0.60	0.57	3.93
	NK供體2	>100	0.81	0.55	0.67	1.21	0.83	1.21
	NK供體3	>100	1.13	0.37	1.39	1.64	0.76	3.21

對於Emax < 10%之劑量反應，EC_{50}記錄為>100 μg/mL

【0272】 與抗體A相比，Fc修飾之抗體展現HIV-1感染之靶CD4 T細胞在活體外由來自獨立供體之原代人類NK細胞及經不同病毒分離株感染之靶細胞的增加殺死(表1)。抗體A利用來自一些供體之原代NK細胞介導最小殺死(Emax <10%)，而利用來自其他供體之NK細胞，殺死係可檢測的。與抗體A相比，Fc修飾之抗體展現HIV-1感染細胞之增加之功效(EC_{50})及最大殺死(Emax)，如利用來自三個獨立健康供體之原

代人類NK細胞實施的ADCC分析中所觀察到(表1)。觀察到之功效之增加範圍為約10至40倍，其中抗體A具有活性。藉由用對由PGT121.60中和(例如感染之細胞殺死)具有抗性之22個獨特病毒純系感染CEM.NKr.CCR5^{+}Luc^{+}細胞產生22個感染之靶細胞培養物之組(參見，WO 2017/106346)。在不存在競爭性血清IgG下使用來自健康供體之原代人類NK效應細胞針對此組感染之靶細胞評估抗體A-1及抗體PGT121.60之ADCC活性及寬度。由PGT121.60對ADCC有抗性之感染之靶細胞培養物的86% (19/22)由抗體A-1殺死(E_{max} >30%)。抗體A-1介導經對PGT121.60具有抗性之HIV株感染之細胞的ADCC。此評價之結果概述於表2中。

【0273】 表2. 由抗體A-1及抗體PGT121.60之PGT121.60抗性的感染之細胞殺死。數字繪示兩個抗體之ADCC Emax (%)平均值。

	ADCC Emax (%)	
病毒	**PGT121.60**	**抗體A-1**
VS001	1.0	26.8
VS002	2.0	22.9
VS003	3.0	44.4
VS004	4.0	31.7
VS007	9	45
VS008	22	60
VS010	10	69
VS011	8.0	34.6
VS017	9.0	40.5
VS023	10.0	0.8
VS026	11.0	31.3
VS029	12.0	1.5
VS030	13.0	39.3

	ADCC Emax (%)	
病毒	PGT121.60	抗體A-1
VS032	14.0	29.1
VS033	15.0	31.1
VS034	16.0	40.6
VS038	17.0	36.1
VS042	18.0	39.6
VS044	19.0	31.4
VS046	20.0	41.9
VS049	21.0	7.8
VS052	22.0	34.0

【0274】亦使用HIV感染原代$CD4^+$ T細胞作為靶細胞及自體原代NK細胞、單核球及嗜中性球作為效應細胞評估抗體依賴性細胞毒性。

【0275】自從健康供體獲得之PBMC分離NK細胞、單核球及$CD4^+$ T細胞，而自來自健康供體之全血分離嗜中性球。在不存在T細胞活化下對總$CD4^+$ T細胞進行旋染以維持低細胞表面抗原表現量且潛在地模擬潛伏感染之$CD4^+$ T細胞上之抗原表現量。使用之病毒分離株係8176及92US076 (抗體A中和敏感性)及8398 (抗體A中和抗性)。在1 mg/ml與效應物mAb競爭FcγR結合之非特異性人類血清IgG存在下實施分析。藉由使用流式細胞術之p24 + CD4 T細胞減少來量測抗體依賴性殺死。

【0276】將殺死AUC、EC_{50} (μg/mL)及Emax (%)值在表3-11中製表。

【0277】 表3. 由NK細胞之殺死AUC

病毒	供體	AUC (NK)			
		A	A-1	1.52.64-1	PGT121.60
8176	0117	49	108	103	168
	3594	18	142	139	205
302076	0117	26	116	78	18
	3594	28	76	101	26
8398	0117	20	4	0	203
	3594	0	6	15	211

【0278】 表4. 由NK細胞之殺死EC50

病毒	供體	EC50 (NK)			
		A	A-1	1.52.64-1	PGT121.60
8176	0117	>100	1.101	0.949	0.246
	3594	>100	0.518	1.350	0.051
302076	0117	>100	1.701	7.602	100.000
	3594	>100	2.613	3.114	72.050
8398	0117	>100	>100	>100	0.339
	3594	>100	>100	>100	0.220

【0279】 表5. 由NK細胞之殺死Emax

病毒	供體	Emax (NK)			
		A	A-1	1.52.64-1	PGT121.60
8176	0117	<20	56	54	65
	3594	<20	62	69	62
302076	0117	<20	68	69	20
	3594	<20	49	64	45
8398	0117	<20	<20	<20	79
	3594	<20	<20	<20	81

【0280】 表6. 由單核球之殺死AUC

病毒	供體	AUC (單核球)			
		A	A-1	1.52.64-1	PGT121.60
8176	0117	0	83	87	122
	3594	17	141	159	157
302076	0117	24	54	61	24
	3594	138	166	158	108
8398	0117	0	0	4	53
	3594	0	13	4	186

【0281】 表7. 由單核球之殺死EC50

病毒	供體	EC50 (單核球)			
		A	A-1	1.52.64-1	PGT121.60
8176	0117	>100	0.402	0.490	0.232
	3594	>100	0.309	0.202	0.010
302076	0117	10.570	6.514	7.236	>100
	3594	0.006	0.062	0.088	0.019
8398	0117	>100	>100	>100	0.728
	3594	>100	>100	>100	0.201

【0282】 表8. 由單核球之殺死Emax

病毒	供體	Emax (單核球)			
		A	A-1	1.52.64-1	PGT121.60
8176	0117	<20	34	35	44
	3594	<20	47	57	40
302076	0117	24	46	47	20
	3594	33	49	54	30
8398	0117	<20	<20	<20	25
	3594	<20	<20	<20	67

【0283】 表9. 由嗜中性球之殺死AUC

病毒	供體	AUC (嗜中性球)			
		A	A-1	1.52.64-1	PGT121.60
8176	92132	41	74	89	125
	92602	21	47	45	71

【0284】 表10. 由嗜中性球之殺死EC50

病毒	供體	EC50 (嗜中性球)			
		A	A-1	1.52.64-1	PGT121.60
8176	92132	>100	0.231	0.307	0.012
	92602	>100	1.097	0.199	0.232

【0285】 表11. 由嗜中性球之殺死Emax

病毒	供體	Emax (嗜中性球)			
		A	A-1	1.52.64-1	PGT121.60
8176	92132	<20	29	37	34
	92602	<20	23	<20	25

【0286】 表3-11中呈現之結果展現，與CEM細胞之NK介導之ADCC一致，Fc-工程化mAb(1.52.64-1、A-1及PGT121.60)亦展現與抗體A相比，HIV感染之原代CD4 T細胞由NK細胞、單核球及嗜中性球之殺死增加。

實例2：抗體活動

【0287】 將抗體A及抗體B之序列與人類種系進行比較，從而揭示CDR內部及外部二者之若干突變、插入及缺失。簡言之，在重鏈(HC)之72-78位鑑別到重鏈框架區3 (HC FR3)中之種系失配之鄰接區。在HC FR3中之74位與75位之間鑑別到四個胺基酸插入。在CDR L1中在輕鏈(LC)之27-30位鑑別到種系缺失。在輕鏈框架區3 (LC FR3)中在65-77位鑑別到種系失配之鄰接區。在LC FR3中在72-74位鑑別到N72

連接之共有醣基化基序。在92-95位鑑別到CDR L3中之種系缺失。在人類IgG輕鏈中高度保守之兩個殘基(F98及G99)在抗體A及抗體B二者中皆突變。

【0288】執行ExpiCHO表現之抗體A之質譜研究以確定在LC 72-74位處是否存在醣基化。執行加速之應力及功效分析以觀察抗體A或其變體中是否存在任何化學不利因素(例如氧化、去醯胺等)。由於高程度之體細胞超突變，執行一級序列之T細胞表位定位以鑑別潛在免疫原性基序。另外，執行迭代蛋白工程化活動以產生無N72醣基化基序及/或具有與人類種系更接近之整體匹配的新抗體。不受限於任何理論，此活動可產生具有期望性質之新抗體，該等性質包括(但不限於)降低之免疫原性風險、等於或優於抗體A或抗體B之HIV中和功效及寬度、及/或改良之生物物理及發展性質。

【0289】表12提供本文揭示之抗gp120抗體之VH及VL CDR的SEQ ID NO (根據Kabat定義)。

表12. 抗體之VH及VL CDR的SEQ ID NO

抗體名稱	VHCDR1	VHCDR2	VHCDR3	VLCDR1	VLCDR2	VLCDR3
A-1	**137**	**138**	139	**140**	**141**	**142**
A	137	138	139	140	141	142
1v2-1	137	138	139	140	141	142
1.2.1-1	137	138	139	140	141	142
1.1.2-1	137	138	139	140	141	142
1.2.2-1	137	138	139	140	141	142
1.3.1-1	137	138	139	140	141	142
1.4.1-1	137	138	139	140	141	142
1.5.1-1	137	138	139	140	141	142
1.6.1-1	137	138	139	140	141	142

表12. 抗體之VH及VL CDR的SEQ ID NO						
抗體名稱	VHCDR1	VHCDR2	VHCDR3	VLCDR1	VLCDR2	VLCDR3
1.7.1-1	137	138	139	140	141	142
1.8.1-1	137	138	139	140	141	142
1.9.1-1	137	138	139	140	141	142
1.10.1-1	159	138	139	140	141	142
1.11.1-1	159	138	139	140	141	142
1.15.1-1	137	160	139	140	141	142
1.16.1-1	137	161	139	140	141	142
1.17.1-1	137	162	139	140	141	142
1.18.1-1	137	163	139	140	141	142
1.19.1-1	137	138	139	140	141	142
1.20.1-1	137	138	139	140	141	142
1.21.1-1	137	138	139	140	141	142
1.22.1-1	137	138	139	140	141	142
1.24.1-1	137	138	139	140	141	142
1.25.1-1	137	138	139	140	141	142
1.26.1-1	137	138	139	140	141	142
1.27.1-1	137	138	164	140	141	142
1.28.1-1	137	138	164	140	141	142
1.29.1-1	137	138	139	140	141	142
1.30.1-1	137	138	139	140	141	142
1.1.3-1	137	138	139	140	141	142
1.1.4-1	137	138	139	140	141	142
1.1.5-1	137	138	139	140	141	142
1.1.6-1	137	138	139	140	165	142
1.1.7-1	137	138	139	140	166	142
1.1.8-1	137	138	139	140	168	142
1.1.9-1	137	138	139	140	167	142

表12. 抗體之VH及VL CDR的SEQ ID NO						
抗體名稱	VHCDR1	VHCDR2	VHCDR3	VLCDR1	VLCDR2	VLCDR3
1.1.10-1	137	138	139	140	141	142
1.1.11-1	137	138	139	140	141	142
1.1.12-1	137	138	139	140	141	142
1.1.13-1	137	138	139	140	141	142
1.1.14-1	137	138	139	140	141	142
1.1.15-1	137	138	139	140	141	142
1.1.16-1	137	138	139	140	141	142
1.1.17-1	137	138	139	140	141	142
1.1.18-1	137	138	139	140	141	142
1.1.19-1	137	138	139	140	141	142
1.1.20-1	137	138	139	140	141	142
1.1.21-1	137	138	139	140	141	142
1.1.22-1	137	138	139	140	141	142
1.1.23-1	137	138	139	140	141	142
1.1.24-1	137	138	139	140	141	142
1.1.25-1	137	138	139	140	141	142
1.1.26-1	137	138	139	140	141	142
1.1.27-1	137	138	139	140	141	142
1.1.28-1	137	138	139	140	141	142
1.1.29-1	137	138	139	140	141	142
1.1.30-1	137	138	139	140	141	142
1.12.15-1	137	138	139	140	141	142
1.13.15-1	137	138	139	140	141	142
1.14.15-1	137	138	139	140	141	142
1.12.17-1	137	138	139	140	141	142
1.13.17-1	137	138	139	140	141	142
1.14.17-1	137	138	139	140	141	142

表12. 抗體之VH及VL CDR的SEQ ID NO						
抗體名稱	VHCDR1	VHCDR2	VHCDR3	VLCDR1	VLCDR2	VLCDR3
1.31.1-1	137	138	139	140	141	142
1.32.1-1	137	138	139	140	141	142
1.33.1-1	137	138	139	140	141	142
1.34.1-1	137	138	164	140	141	142
1.35.1-1	159	138	164	140	141	142
1.36.1-1	159	138	164	140	141	142
1.1.31-1	137	138	139	140	141	142
1.31.31-1	137	138	139	140	141	142
1.32.31-1	137	138	139	140	141	142
1.33.31-1	137	138	139	140	141	142
1.34.31-1	137	138	164	140	141	142
1.35.31-1	159	138	164	140	141	142
1.36.31-1	159	138	164	140	141	142
1.1.32-1	137	138	139	140	141	142
1.31.32-1	137	138	139	140	141	142
1.32.32-1	137	138	139	140	141	142
1.33.32-1	137	138	139	140	141	142
1.34.32-1	137	138	164	140	141	142
1.35.32-1	159	138	164	140	141	142
1.36.32-1	159	138	164	140	141	142
1.1.33-1	137	138	139	140	166	142
1.31.33-1	137	138	139	140	166	142
1.32.33-1	137	138	139	140	166	142
1.33.33-1	137	138	139	140	166	142
1.34.33-1	137	138	164	140	166	142
1.35.33-1	159	138	164	140	166	142
1.36.33-1	159	138	164	140	166	142

表12. 抗體之VH及VL CDR的SEQ ID NO						
抗體名稱	VHCDR1	VHCDR2	VHCDR3	VLCDR1	VLCDR2	VLCDR3
1.1.34-1	137	138	139	140	166	142
1.31.34-1	137	138	139	140	166	142
1.32.34-1	137	138	139	140	166	142
1.33.34-1	137	138	139	140	166	142
1.34.34-1	137	138	164	140	166	142
1.35.34-1	159	138	164	140	166	142
1.36.34-1	159	138	164	140	166	142
1.1.35-1	137	138	139	140	166	142
1.31.35-1	137	138	139	140	166	142
1.32.35-1	137	138	139	140	166	142
1.33.35-1	137	138	139	140	166	142
1.34.35-1	137	138	164	140	166	142
1.35.35-1	159	138	164	140	166	142
1.36.35-1	159	138	164	140	166	142
1.1.36-1	137	138	139	140	166	142
1.31.36-1	137	138	139	140	166	142
1.32.36-1	137	138	139	140	166	142
1.33.36-1	137	138	139	140	166	142
1.34.36-1	137	138	164	140	166	142
1.35.36-1	159	138	164	140	166	142
1.36.36-1	159	138	164	140	166	142
1.1.37-1	137	138	139	140	141	142
1.1.38-1	137	138	139	140	141	142
1.1.39-1	137	138	139	140	141	142
1.1.40-1	137	138	139	140	141	142
1.1.41-1	137	138	139	140	141	142
1.1.42-1	137	138	139	140	141	142

表12. 抗體之VH及VL CDR的SEQ ID NO						
抗體名稱	VHCDR1	VHCDR2	VHCDR3	VLCDR1	VLCDR2	VLCDR3
1.1.43-1	137	138	139	140	141	142
1.1.44-1	137	138	139	140	141	142
1.1.45-1	137	138	139	140	141	142
1.1.46-1	137	138	139	140	141	142
1.1.47-1	137	138	139	140	141	142
1.1.48-1	137	138	139	140	141	142
1.1.49-1	137	138	139	140	141	142
1.37.51-1	137	138	139	140	141	142
1.8.52-1	137	138	139	140	141	142
1.1.54-1	137	138	139	140	141	142
A-2	137	138	139	140	141	142
B-1	153	138	154	140	141	142
2.1.2-1	153	138	154	140	141	142
1.1.64-1	137	138	139	140	141	142
1.1.67-1	137	138	139	140	141	142
1.1.72-1	137	138	139	140	141	142
1.1.75-1	137	138	139	140	141	142
1.1.78-1	137	138	139	140	141	142
A-3	137	138	139	140	141	142
A-4	137	138	139	140	141	142
A-5	137	138	139	140	141	142
A-6	137	138	139	140	141	142
1.41.5-1	137	138	139	140	141	142
1.41.81-1	137	138	139	140	141	142
1.1.82-1	137	138	139	140	141	142
1.41.83-1	137	138	139	140	141	142
1.1.84-1	137	138	139	140	141	142

表12. 抗體之VH及VL CDR的SEQ ID NO						
抗體名稱	VHCDR1	VHCDR2	VHCDR3	VLCDR1	VLCDR2	VLCDR3
1.41.85-1	137	138	139	140	141	142
1.41.86-1	137	138	139	140	141	142
1.41.87-1	137	138	139	140	141	142
1.1.88-1	137	138	139	140	141	142
1.41.89-1	137	138	139	140	141	142
1.1.90-1	137	138	139	140	141	142
1.41.91-1	137	138	139	140	141	142
1.41.92-1	137	138	139	140	141	142
1.41.93-1	137	138	139	140	141	142
1.1.94-1	137	138	139	140	141	142
1.41.95-1	137	138	139	140	141	142
1.1.96-1	137	138	139	140	141	142
1.41.97-1	137	138	139	140	141	142
1.41.98-1	137	138	139	140	141	142
1.41.99-1	137	138	139	140	141	142
1.1.100-1	137	138	139	140	141	142
1.41.101-1	137	138	139	140	141	142
1.1.102-1	137	138	139	140	141	142
1.41.103-1	137	138	139	140	141	142
1.1.110-1	137	138	139	140	141	142
1.1.111-1	137	138	139	140	141	142
1.1.112-1	137	138	139	140	141	142
1.1.113-1	137	138	139	140	141	142
2.1.3-1	153	138	154	140	141	142
2.1.4-1	153	138	154	140	141	142

表12. 抗體之VH及VL CDR的SEQ ID NO						
抗體名稱	VHCDR1	VHCDR2	VHCDR3	VLCDR1	VLCDR2	VLCDR3
2.2.1-1	137	138	139	140	141	142
2.3.1-1	153	138	139	140	141	142
3.1.8-1	137	138	139	140	141	142
2.2.8-1	137	138	139	140	141	142
2.3.8-1	153	138	139	140	141	142
3.1.9-1	137	138	139	140	141	142
2.2.9-1	137	138	139	140	141	142
2.3.9-1	153	138	139	140	141	142
1.1.115-1	137	138	139	140	141	142
3.1.10-1	137	138	139	140	141	142
2.2.10-1	137	138	139	140	141	142
2.3.10-1	153	138	139	140	141	142
1.1.116-1	137	138	139	140	141	142
3.1.11-1	137	138	139	140	141	142
2.2.11-1	137	138	139	140	141	142
2.3.11-1	153	138	139	140	141	142
1.1.117-1	137	138	139	140	141	142
3.1.12-1	137	138	139	140	141	142
2.2.12-1	137	138	139	140	141	142
2.3.12-1	153	138	139	140	141	142
1.1.118-1	137	138	139	140	141	142
3.1.13-1	137	138	139	140	141	142
2.2.13-1	137	138	139	140	141	142
2.3.13-1	153	138	139	140	141	142
3.1.14-1	137	138	139	140	141	142
2.2.14-1	137	138	139	140	141	142
2.3.14-1	153	138	139	140	141	142

表12. 抗體之VH及VL CDR的SEQ ID NO						
抗體名稱	VHCDR1	VHCDR2	VHCDR3	VLCDR1	VLCDR2	VLCDR3
3.1.5-1	137	138	139	140	141	142
2.2.5-1	137	138	139	140	141	142
2.3.5-1	153	138	139	140	141	142
3.1.15-1	137	138	139	140	141	142
2.2.15-1	137	138	139	140	141	142
2.3.15-1	153	138	139	140	141	142
1.1.119-1	137	138	139	140	141	142
3.1.7-1	137	138	139	140	141	142
2.2.7-1	137	138	139	140	141	142
2.3.7-1	153	138	139	140	141	142
3.1.2-1	137	138	139	140	141	142
2.2.2-1	137	138	139	140	141	142
2.3.2-1	153	138	139	140	141	142
3.1.16-1	137	138	139	140	141	142
2.2.16-1	137	138	139	140	141	142
2.3.16-1	153	138	139	140	141	142
3.1.17-1	137	138	139	140	141	142
2.2.17-1	137	138	139	140	141	142
2.3.17-1	153	138	139	140	141	142
3.1.18-1	137	138	139	140	141	142
2.2.18-1	137	138	139	140	141	142
2.3.18-1	153	138	139	140	141	142
1.1.120-1	137	138	139	140	141	142
3.1.19-1	137	138	139	140	141	142
2.2.19-1	137	138	139	140	141	142
2.3.19-1	153	138	139	140	141	142
1.1.121-1	137	138	139	140	141	142

表12. 抗體之VH及VL CDR的SEQ ID NO						
抗體名稱	VHCDR1	VHCDR2	VHCDR3	VLCDR1	VLCDR2	VLCDR3
3.1.20-1	137	138	139	140	141	142
2.2.20-1	137	138	139	140	141	142
2.3.20-1	153	138	139	140	141	142
1.1.122-1	137	138	139	140	141	142
1.1.123-1	137	138	139	140	141	142
1.1.124-1	137	138	139	140	141	142
1.1.125-1	137	138	139	140	141	142
1.1.126-1	137	138	139	140	141	142
1.1.127-1	137	138	139	140	141	142
1.1.128-1	137	138	139	140	141	142
1.1.129-1	137	138	139	140	141	142
1.1.130-1	137	138	139	140	141	142
1.1.131-1	137	138	139	140	141	142
1.1.132-1	137	138	139	140	141	142
1.1.133-1	137	138	139	140	141	142
1.1.134-1	137	138	139	140	141	142
1.1.135-1	137	138	139	140	141	142
1.1.138-1	137	138	139	570	141	142
1.42.1-1	137	138	139	140	141	142
1.43.1-1	137	138	139	140	141	142
1.44.1-1	137	138	139	140	141	142
1.45.1-1	137	138	139	140	141	142
1.46.1-1	153	138	139	140	141	142
1.47.1-1	137	138	139	140	141	142
1.49.1-1	137	138	139	140	141	142
1.50.1-1	137	138	139	140	141	142
1.51.1-1	137	138	154	140	141	142

表12. 抗體之VH及VL CDR的SEQ ID NO						
抗體名稱	VHCDR1	VHCDR2	VHCDR3	VLCDR1	VLCDR2	VLCDR3
1.1.104-1	137	138	139	140	141	142
3-1	137	138	139	140	141	142
1.52.1-1	137	138	139	140	141	142
1.52.64-1	137	138	139	140	141	142
1.52.90	137	138	139	140	141	142
2.4.1-1	153	138	139	140	141	142

【0290】 表13提供本文揭示之抗gp120抗體之VH、VL、重鏈及輕鏈的SEQ ID NO。

表13. 抗gp120抗體之VH、VL、重鏈(HC)及輕鏈(LC)的SEQ ID NO				
抗體名稱	VH	VL	HC	LC
B	181	222	1	48
A-1	182	223	2	49
A	182	223	3	49
C-1	183	224	4	50
1v2-1	184	223	5	49
1.2.1-1	185	223	6	49
1.1.2-1	182	225	2	50
1.2.2-1	185	225	6	50
1.3.1-1	186	223	7	49
1.4.1-1	187	223	8	49
1.5.1-1	188	223	9	49
1.6.1-1	189	223	10	49
1.7.1-1	190	223	11	49
1.8.1-1	191	223	12	49
1.9.1-1	192	223	13	49
1.10.1-1	193	223	14	49
1.11.1-1	194	223	15	49

表13. 抗gp120抗體之VH、VL、重鏈(HC)及輕鏈(LC)的SEQ ID NO				
抗體名稱	VH	VL	HC	LC
1.15.1-1	195	223	16	49
1.16.1-1	196	223	17	49
1.17.1-1	197	223	18	49
1.18.1-1	198	223	19	49
1.19.1-1	199	223	20	49
1.20.1-1	200	223	21	49
1.21.1-1	201	223	22	49
1.22.1-1	202	223	23	49
1.24.1-1	203	223	24	49
1.25.1-1	204	223	25	49
1.26.1-1	205	223	26	49
1.27.1-1	206	223	27	49
1.28.1-1	207	223	28	49
1.29.1-1	208	223	29	49
1.30.1-1	209	223	30	49
1.1.3-1	182	226	2	51
1.1.4-1	182	227	2	52
1.1.5-1	182	228	2	53
1.1.6-1	182	229	2	54
1.1.7-1	182	230	2	55
1.1.8-1	182	231	2	56
1.1.9-1	182	232	2	57
1.1.10-1	182	233	2	58
1.1.11-1	182	234	2	59
1.1.12-1	182	235	2	60
1.1.13-1	182	236	2	61
1.1.14-1	182	237	2	62
1.1.15-1	182	238	2	63

表13. 抗gp120抗體之VH、VL、重鏈(HC)及輕鏈(LC)的SEQ ID NO				
抗體名稱	VH	VL	HC	LC
1.1.16-1	182	239	2	64
1.1.17-1	182	240	2	65
1.1.18-1	182	241	2	66
1.1.19-1	182	242	2	67
1.1.20-1	182	243	2	68
1.1.21-1	182	244	2	69
1.1.22-1	182	245	2	70
1.1.23-1	182	246	2	71
1.1.24-1	182	247	2	72
1.1.25-1	182	248	2	73
1.1.26-1	182	249	2	74
1.1.27-1	182	250	2	75
1.1.28-1	182	251	2	76
1.1.29-1	182	252	2	77
1.1.30-1	182	253	2	78
1.12.15-1	210	238	31	63
1.13.15-1	211	238	32	63
1.14.15-1	212	238	33	63
1.12.17-1	210	240	31	65
1.13.17-1	211	240	32	65
1.14.17-1	212	240	33	65
1.31.1-1	213	223	34	49
1.32.1-1	214	223	35	49
1.33.1-1	215	223	36	49
1.34.1-1	216	223	37	49
1.35.1-1	217	223	38	49
1.36.1-1	218	223	39	49
1.1.31-1	182	254	2	79

表13. 抗gp120抗體之VH、VL、重鏈(HC)及輕鏈(LC)的SEQ ID NO				
抗體名稱	VH	VL	HC	LC
1.31.31-1	213	254	34	79
1.32.31-1	214	254	35	79
1.33.31-1	215	254	36	79
1.34.31-1	216	254	37	79
1.35.31-1	217	254	38	79
1.36.31-1	218	254	39	79
1.1.32-1	182	255	2	80
1.31.32-1	213	255	34	80
1.32.32-1	214	255	35	80
1.33.32-1	215	255	36	80
1.34.32-1	216	255	37	80
1.35.32-1	217	255	38	80
1.36.32-1	218	255	39	80
1.1.33-1	182	256	2	81
1.31.33-1	213	256	34	81
1.32.33-1	214	256	35	81
1.33.33-1	215	256	36	81
1.34.33-1	216	256	37	81
1.35.33-1	217	256	38	81
1.36.33-1	218	256	39	81
1.1.34-1	182	257	2	82
1.31.34-1	213	257	34	82
1.32.34-1	214	257	35	82
1.33.34-1	215	257	36	82
1.34.34-1	216	257	37	82
1.35.34-1	217	257	38	82
1.36.34-1	218	257	39	82
1.1.35-1	182	258	2	83

表13. 抗gp120抗體之VH、VL、重鏈(HC)及輕鏈(LC)的SEQ ID NO				
抗體名稱	VH	VL	HC	LC
1.31.35-1	213	258	34	83
1.32.35-1	214	258	35	83
1.33.35-1	215	258	36	83
1.34.35-1	216	258	37	83
1.35.35-1	217	258	38	83
1.36.35-1	218	258	39	83
1.1.36-1	182	259	2	84
1.31.36-1	213	259	34	84
1.32.36-1	214	259	35	84
1.33.36-1	215	259	36	84
1.34.36-1	216	259	37	84
1.35.36-1	217	259	38	84
1.36.36-1	218	259	39	84
1.1.37-1	182	260	2	85
1.1.38-1	182	261	2	86
1.1.39-1	182	262	2	87
1.1.40-1	182	263	2	88
1.1.41-1	182	264	2	89
1.1.42-1	182	265	2	90
1.1.43-1	182	266	2	91
1.1.44-1	182	267	2	92
1.1.45-1	182	268	2	93
1.1.46-1	182	269	2	94
1.1.47-1	182	270	2	95
1.1.48-1	182	271	2	96
1.1.49-1	182	272	2	97
1.37.51-1	219	273	40	98
1.8.52-1	191	274	12	99

表13. 抗gp120抗體之VH、VL、重鏈(HC)及輕鏈(LC)的SEQ ID NO				
抗體名稱	VH	VL	HC	LC
1.1.54-1	182	275	2	100
A-2	182	223	41	49
B-1	220	276	42	101
2.1.2-1	220	277	42	102
1.1.64-1	182	278	2	103
1.1.67-1	182	279	2	104
1.1.72-1	182	280	2	105
1.1.75-1	182	281	2	106
1.1.78-1	182	282	2	107
A-3	182	223	43	49
A-4	182	223	44	49
A-5	182	223	45	49
A-6	182	223	46	49
1.41.5-1	221	228	47	53
1.41.81-1	221	283	47	108
1.1.82-1	182	284	2	109
1.41.83-1	221	285	47	110
1.1.84-1	182	286	2	111
1.41.85-1	221	287	47	112
1.41.86-1	221	288	47	113
1.41.87-1	221	289	47	114
1.1.88-1	182	290	2	115
1.41.89-1	221	291	47	116
1.1.90-1	182	292	2	117
1.41.91-1	221	293	47	118
1.41.92-1	221	294	47	119
1.41.93-1	221	295	47	120
1.1.94-1	182	296	2	121

表13. 抗gp120抗體之VH、VL、重鏈(HC)及輕鏈(LC)的SEQ ID NO				
抗體名稱	VH	VL	HC	LC
1.41.95-1	221	297	47	122
1.1.96-1	182	298	2	123
1.41.97-1	221	299	47	124
1.41.98-1	221	300	47	125
1.41.99-1	221	301	47	126
1.1.100-1	182	302	2	127
1.41.101-1	221	303	47	128
1.1.102-1	182	304	2	129
1.41.103-1	221	305	47	130
1.1.110-1	182	306	2	131
1.1.111-1	182	307	2	132
1.1.112-1	182	308	2	133
1.1.113-1	182	309	2	134
2.1.3-1	220	310	42	135
2.1.4-1	220	311	42	136
2.2.1-1	465	276	517	101
2.3.1-1	466	276	518	101
3.1.8-1	182	479	2	531
2.2.8-1	465	479	517	531
2.3.8-1	466	479	518	531
3.1.9-1	182	480	2	532
2.2.9-1	465	480	517	532
2.3.9-1	466	480	518	532
1.1.115-1	182	481	2	533
3.1.10-1	182	482	2	534
2.2.10-1	465	482	517	534
2.3.10-1	466	482	518	534
1.1.116-1	182	483	2	535

表13. 抗gp120抗體之VH、VL、重鏈(HC)及輕鏈(LC)的SEQ ID NO				
抗體名稱	VH	VL	HC	LC
3.1.11-1	182	484	2	536
2.2.11-1	465	484	517	536
2.3.11-1	466	484	518	536
1.1.117-1	182	485	2	537
3.1.12-1	182	486	2	538
2.2.12-1	465	486	517	538
2.3.12-1	466	486	518	538
1.1.118-1	182	487	2	539
3.1.13-1	182	488	2	540
2.2.13-1	465	488	517	540
2.3.13-1	466	488	518	540
3.1.14-1	182	489	2	541
2.2.14-1	465	489	517	541
2.3.14-1	466	489	518	541
3.1.5-1	182	491	2	542
2.2.5-1	465	491	517	542
2.3.5-1	466	491	518	542
3.1.15-1	182	492	2	543
2.2.15-1	465	492	517	543
2.3.15-1	466	492	518	543
1.1.119-1	182	493	2	544
3.1.7-1	182	494	2	545
2.2.7-1	465	494	517	545
2.3.7-1	466	494	518	545
3.1.2-1	182	277	2	102
2.2.2-1	465	277	517	102
2.3.2-1	466	277	518	102
3.1.16-1	182	495	2	546

表13. 抗gp120抗體之VH、VL、重鏈(HC)及輕鏈(LC)的SEQ ID NO				
抗體名稱	VH	VL	HC	LC
2.2.16-1	465	495	517	546
2.3.16-1	466	495	518	546
3.1.17-1	182	496	2	547
2.2.17-1	465	496	517	547
2.3.17-1	466	496	518	547
3.1.18-1	182	497	2	548
2.2.18-1	465	497	517	548
2.3.18-1	466	497	518	548
1.1.120-1	182	498	2	549
3.1.19-1	182	499	2	550
2.2.19-1	465	499	517	550
2.3.19-1	466	499	518	550
1.1.121-1	182	500	2	551
3.1.20-1	182	501	2	552
2.2.20-1	465	501	517	552
2.3.20-1	466	501	518	552
1.1.122-1	182	502	2	553
1.1.123-1	182	503	2	554
1.1.124-1	182	504	2	555
1.1.125-1	182	505	2	556
1.1.126-1	182	506	2	557
1.1.127-1	182	507	2	558
1.1.128-1	182	508	2	559
1.1.129-1	182	509	2	560
1.1.130-1	182	510	2	561
1.1.131-1	182	511	2	562
1.1.132-1	182	512	2	563
1.1.133-1	182	513	2	564

表13. 抗gp120抗體之VH、VL、重鏈(HC)及輕鏈(LC)的SEQ ID NO				
抗體名稱	VH	VL	HC	LC
1.1.134-1	182	514	2	565
1.1.135-1	182	515	2	566
1.1.138-1	182	569	2	568
1.42.1-1	467	223	519	49
1.43.1-1	468	223	520	49
1.44.1-1	469	223	521	49
1.45.1-1	470	223	522	49
1.46.1-1	471	223	523	49
1.47.1-1	472	223	524	49
1.49.1-1	474	223	526	49
1.50.1-1	475	223	527	49
1.51.1-1	476	223	528	49
1.1.104-1	182	516	2	567
3-1	182	276	2	101
1.52.1-1	477	223	529	49
1.52.64-1	477	278	529	103
1.52.90	477	292	529	117
2.4.1-1	478	276	530	101

實例3：質譜分析

【0291】在使用標準方法純化之ExpiCHO細胞及蛋白-A中瞬時表現抗體A-1。藉由使用4 M胍鹽酸鹽及50 mM DTT (最終濃度)使樣品變性及還原，並在60℃下加熱20分鐘。將樣品在線脫鹽，同時在BEH C4反相層析管柱上分離還原之重鏈及輕鏈，之後注入Waters Synapt G2Si雜合飛行時間質譜儀之來源中。使用最大熵去卷積算法對多重帶電之蛋白峰包進行去卷積。結果顯示，抗體A輕鏈經醣基化。觀察到之輕鏈質譜揭示存在具有另外聚醣相關質量異質性之G0-聚醣修飾。此觀察結果

與抗體A VL結構域(NLT)中N72共有醣基化基序之存在一致，且抗體A之先前晶體結構在該位置顯示醣基化(Zhou等人，*Immunity*, 39:245-258 (2013)；Klein等人，*Cell*, 153:126-138 (2013))。

實例4：加速之應力誘發之功效損失

【0292】 為了鑑別化學不利因素，對A-1實施加速之熱穩定性研究(應力組)。抗體於25℃及37℃下於pH 5.9下(調配物樣應力)及於37℃下於pH 7.4下(模擬生理樣應力)經受應力。除了2、4及6週外亦在T0牽拉及冷凍樣品。在實施其他方法之前，針對應力誘發之功效損失篩選選擇樣品。用於經受應力之A-1樣品之功效分析係ADCC報導基因分析，其使用當其細胞表面上之FcγRIIIa受體經由功能性mAb之Fc及Fab結構域栓至靶細胞時表現螢光素酶之報導基因細胞。該分析中之靶細胞表現A-1 Fab結合之HIV Env醣蛋白。螢光素酶以化學計量轉化在分析中量測之過量發光產光受質。反應曲線指示抗體功效。

【0293】 如圖1中所示，A-1之最顯著功效損失發生在pH 5.9條件下。接下來對應力組執行肽圖譜分析以鑑別應力誘發之化學修飾，該修飾導致pH 5.9下之活性損失。另外對pH 7.4經受應力樣品執行肽圖分析，以鑑別可能在生理樣條件下易於發生之修飾。

【0294】 在用內蛋白酶Lys-C消化之前，將抗體A-1應力組樣品變性，還原，並用碘乙醯胺烷基化。隨後藉由反相LC-MS/MS在Thermo Q-Exactive HF質譜儀上分析蛋白消化物。使用Thermo Pepfinder及Xcalibur軟體分析肽圖，同時在Microsoft Excel中進一步分析離子列表。由於ADCC報導基因數據表明在pH 5.9條件下最顯著之功效損失，故在離子列表中檢索隨時間發生之修飾，但其對於pH 5.9條件係獨特的。對於pH 5.9條件獨特之最顯著之應力誘發之時間依賴性修飾係在肽

T_{55}GQPNNPRQFQGRVSLTRHASWDFDTFSFYMDLK$_{88}$ (T55-K88) (SEQ ID NO: 630)上觀察到之mAb重鏈中之色胺酸76的氧化，此乃因添加氧(+15.99 Da)且進一步轉化成犬尿胺酸(+3.99 Da)。對於該等轉化之相對量化，將來自兩個氧化變體之Pepfinder離子列表輸出之峰強度相加，且然後與所有經修飾及未修飾之T55-K88肽峰強度之總和進行比較。各種應力條件下之所得總計氧化肽輸出提供於圖2中。其係基於將W74a (Kabat，FR3插入)氧化鑑別為抗體A-1之醫藥穩定性之潛在風險的該等研究。

【0295】 除了在pH 5.9條件中觀察到之重鏈W74a之顯著氧化外，在T0時在構築體上觀察到輕鏈位置N26處約8-9%去醯胺，且在pH 7.4培育條件下進一步增加。所報告之去醯胺百分比反映去醯胺成天冬胺酸(+0.98 Da)、異天冬胺酸(+0.98)及天冬胺醯基琥珀醯亞胺(-17.03 Da)之天冬醯胺的組合且在輕鏈肽 D_1IQMTQSPSSLSASVGDTVTITCQANGYLNWYQQRRGK$_{38}$ (SEQ ID NO: 631)上觀察到。結果繪示於圖3中。

【0296】 儘管重鏈殘基W74a係抗體框架之一部分，但發現其在形成抗體互補位之一部分且因此直接接觸HIV gp120之不常見框架插入環內(Lee等人 2017. *Immunity* 46: 690-702)。輕鏈殘基N26係CDR1中NG去醯胺風險基序之一部分，其由抗體A-1中之不常見種系缺失形成。與W74a一樣，N26構成互補位之一部分，且預測會與HIV gp120之元件接觸。基於可用之結構模型，接下來設計一組15個經設計以去除W74a氧化位點及N26去醯胺基序的突變體。在HIV中和分析(參見實例10)中篩選突變以鑑別去除W74a、但對抗體A-1之中和功效或寬度具有最小影響的變體。

實例5：T細胞表位定位

【0297】為了評價免疫原性及鑑別免疫顯性T細胞表位，使用抗表位Epi-篩選T細胞表位定位分析篩選覆蓋整個抗體A LC及HC Fv序列之重疊15聚體肽。分析之背景供體反應(n = 50個供體)為8%，且反應>10%在此分析中被認為係陽性的。T細胞表位定位在鑑別之抗體A HC及LC上產生單一肽GDTVTITCQANGYLN (SEQ ID NO: 320)，其含有推定之T細胞表位- 抗體A輕鏈中之供體反應率為18%。

【0298】使用抗表位iTope算法之核9聚體之計算預測將VTITCQANG (SEQ ID NO: 321)鑑別為肽內之潛在MHCII結合9聚體核，其中殘基V19係P1錨固位置。此表位之C末端與CDR L1中已知接觸如共晶體結構中觀察到之gp120抗原的非種系殘基重疊。為了避免經由CDR L1之種系逆轉破壞抗原結合，藉由在P1錨固位置引入LC V19A突變去除此表位。

實例6：抗體表徵

【0299】使用掃描及組合誘變以產生另外抗體以評價種系逆轉及聚醣去除對抗體A之生物物理及功能影響。針對三種獨特HIV gp120抗原中之每一者以384孔格式執行抗體A-1之EC_{50}濃度下的單點ELISA分析，且針對板對照正規化。平行執行DSF分析以評價突變對Fab熔融溫度(Tm)之影響。結果示於表14中。

【0300】 表14. 藉由ELISA及DSF之抗體表徵

抗體	ELISA gp120 Bal (A_{450})	ELISA gp120 SHIV SF162 P3 (A_{450})	ELISA gp120 CAAN (A_{450})	ELISA BSA (A_{450})	DSF Fab Tm (℃)
A-1	0.91	0.94	1.06	0.06	79.69
1.2.2-1	0.91	0.97	0.80	0.06	79.65
1.2.1-1	0.93	1.02	1.01	0.07	79.35
1.3.1-1	0.97	1.13	0.94	0.06	77.85
1.4.1-1	1.04	1.19	0.96	0.06	78.90
1.5.1-1	0.92	1.15	1.07	0.06	82.02
1.6.1-1	0.95	1.10	0.90	0.06	78.27
1.7.1-1	0.98	1.08	1.04	0.06	79.56
1.8.1-1	0.86	0.94	0.90	0.06	78.77
1.9.1-1	1.08	1.23	0.98	0.06	82.40
1.10.1-1	0.95	1.03	0.94	0.06	78.23
1.11.1-1	0.93	0.57	0.75	0.09	71.14
1.15.1-1	0.87	1.24	1.38	0.06	71.14
1.16.1-1	0.92	0.90	0.87	0.07	72.77
1.17.1-1	0.84	0.31	0.70	0.06	71.27
1.18.1-1	0.97	1.36	1.18	0.07	71.39
1.19.1-1	0.85	0.96	0.93	0.06	80.03
1.20.1-1	0.89	0.91	0.80	0.06	77.78
1.21.1-1	0.87	0.82	0.77	0.07	78.28
1.22.1-1	1.03	0.78	0.87	0.06	77.15
1v2-1	1.03	1.29	1.00	0.08	79.28
1.24.1-1	0.98	1.09	0.90	0.06	75.02
1.25.1-1	1.07	1.03	1.16	0.06	77.16
1.26.1-1	0.81	0.94	1.00	0.06	78.54

抗體	ELISA gp120 Bal (A_{450})	ELISA gp120 SHIV SF162 P3 (A_{450})	ELISA gp120 CAAN (A_{450})	ELISA BSA (A_{450})	DSF Fab Tm (℃)
1.27.1-1	0.86	0.86	0.86	0.07	75.28
1.28.1-1	1.05	0.99	0.99	0.06	76.03
1.29.1-1	1.03	0.98	1.08	0.06	80.04
1.30.1-1	0.81	1.03	1.05	0.06	79.17
1.1.2-1	0.95	1.01	0.93	0.06	78.54
1.1.3-1	0.97	0.97	1.00	0.07	79.29
1.1.4-1	0.96	1.07	1.09	0.06	79.42
1.1.5-1	0.90	0.93	0.90	0.06	78.41
1.1.6-1	0.91	0.41	0.46	0.07	78.92
1.1.7-1	0.95	1.02	1.00	0.06	78.89
1.1.8-1	1.01	0.37	0.50	0.06	79.40
1.1.9-1	0.98	1.09	0.93	0.07	77.81
1.1.10-1	0.94	1.02	1.10	0.06	78.89
1.1.11-1	0.92	0.93	1.03	0.06	78.64
1.1.12-1	1.05	1.13	1.02	0.06	78.52
1.1.13-1	0.94	0.97	1.11	0.06	78.77
1.1.14-1	低產率/不表現				
1.1.15-1	0.93	0.79	0.79	0.06	79.02
1.1.16-1	1.06	1.05	0.99	0.06	80.77
1.1.17-1	1.02	1.07	0.90	0.06	85.20
1.1.18-1	0.92	0.94	0.92	0.06	80.66
1.1.19-1	1.03	1.12	1.05	0.06	80.36
1.1.20-1	0.94	1.01	0.95	0.07	77.90
1.1.21-1	0.98	1.03	0.99	0.06	81.78

抗體	ELISA gp120 Bal (A_{450})	ELISA gp120 SHIV SF162 P3 (A_{450})	ELISA gp120 CAAN (A_{450})	ELISA BSA (A_{450})	DSF Fab Tm (℃)
1.1.22-1	0.88	1.04	1.02	0.06	80.53
1.1.23-1	0.90	1.07	0.95	0.06	81.66
1.1.24-1	0.88	0.97	0.98	0.06	80.15
1.1.25-1	0.90	1.01	0.92	0.07	78.65
1.1.26-1	0.96	1.09	1.07	0.06	79.03
1.1.27-1	0.97	1.10	0.99	0.06	77.78
1.1.28-1	0.98	1.09	0.93	0.06	77.65
1.1.29-1	0.91	0.90	1.01	0.06	79.17
1.1.30-1	0.90	0.98	0.86	0.06	80.67
1.12.15-1	0.69	0.53	0.63	0.06	78.41
1.13.15-1	0.70	0.52	0.60	0.06	76.41
1.14.15-1	低產率/不表現				
1.12.17-1	0.90	0.75	0.84	0.06	82.67
1.13.17-1	1.02	0.69	0.78	0.06	79.04
1.14.17-1	0.89	0.24	0.43	0.10	73.15
1.31.1-1	0.82	0.87	0.92	0.06	79.67
1.32.1-1	0.93	0.91	0.83	0.06	75.03
1.33.1-1	0.88	0.96	0.98	0.06	83.28
1.34.1-1	0.83	0.79	0.90	0.07	79.15
1.35.1-1	0.84	0.80	0.87	0.07	75.77
1.36.1-1	1.13	0.59	0.75	0.18	69.63
1.1.31-1	0.87	0.87	0.96	0.06	78.64
1.31.31-1	0.98	0.97	1.02	0.07	79.15
1.32.31-1	0.95	0.66	0.90	0.07	75.01
1.33.31-1	0.92	0.89	1.18	0.07	82.44

抗體	ELISA gp120 Bal (A_{450})	ELISA gp120 SHIV SF162 P3 (A_{450})	ELISA gp120 CAAN (A_{450})	ELISA BSA (A_{450})	DSF Fab Tm (℃)
1.34.31-1	0.91	0.77	0.92	0.06	78.64
1.35.31-1	1.05	0.68	0.99	0.07	75.39
1.36.31-1	低產率/不表現				
1.1.32-1	0.93	0.89	1.04	0.06	81.07
1.31.32-1	0.98	0.91	1.04	0.06	81.40
1.32.32-1	0.89	0.70	0.90	0.08	77.52
1.33.32-1	0.98	0.98	1.13	0.07	85.42
1.34.32-1	0.93	0.69	0.97	0.06	81.78
1.35.32-1	0.96	0.58	1.01	0.06	77.27
1.36.32-1	0.96	0.18	0.50	0.07	71.26
1.1.33-1	0.87	0.84	0.94	0.07	78.40
1.31.33-1	0.89	0.74	0.86	0.06	78.27
1.32.33-1	0.93	0.71	0.68	0.06	74.27
1.33.33-1	1.09	0.97	1.06	0.07	81.78
1.34.33-1	1.10	0.82	1.04	0.06	77.15
1.35.33-1	0.90	0.65	0.91	0.06	74.64
1.36.33-1	低產率/不表現				
1.1.34-1	0.90	0.83	0.96	0.06	79.02
1.31.34-1	0.76	0.82	0.86	0.06	79.27
1.32.34-1	0.81	0.71	0.86	0.06	77.15
1.33.34-1	0.95	0.82	0.95	0.06	82.66
1.34.34-1	0.89	0.70	0.88	0.06	80.03
1.35.34-1	1.00	0.58	0.85	0.06	77.27
1.36.34-1	1.01	0.15	0.43	0.07	71.01
1.1.35-1	0.96	0.72	0.75	0.08	77.65

抗體	ELISA gp120 Bal (A_{450})	ELISA gp120 SHIV SF162 P3 (A_{450})	ELISA gp120 CAAN (A_{450})	ELISA BSA (A_{450})	DSF Fab Tm (℃)
1.31.35-1	0.90	0.61	0.77	0.06	78.14
1.32.35-1	0.89	0.50	0.59	0.06	74.46
1.33.35-1	1.03	0.71	0.81	0.07	82.03
1.34.35-1	0.94	0.56	0.77	0.06	78.02
1.35.35-1	0.88	0.42	0.67	0.06	74.51
1.36.35-1	0.89	0.16	0.36	0.06	66.88
1.1.36-1	0.93	0.72	0.88	0.06	79.02
1.31.36-1	1.06	0.93	0.90	0.06	79.40
1.32.36-1	0.92	0.62	0.64	0.06	75.51
1.33.36-1	0.94	0.88	0.82	0.06	83.15
1.34.36-1	0.94	0.77	0.71	0.07	77.69
1.35.36-1	0.85	0.56	0.67	0.06	75.39
1.36.36-1	1.12	0.14	0.34	0.06	68.38

【0301】結果指示，一些種系逆轉及組合修飾影響gp120結合及/或Fv熱穩定性。基於該等數據，執行多輪工程化。將V19A突變(其可去除上文所示之預測之T細胞表位)及在輕鏈位置N72 (Kabat編號)進行之突變(其可去除N72連接之Fv聚醣)與其他突變組合以鑑別具有改良之功能及生物物理性質的抗體。所得抗體藉由表現效價分析、多特異性分析及/或HIV中和分析來表徵。

實例7：無醣基化基序之抗體之表現效價分析

【0302】當表現及純化蛋白質以供ELISA及DSF篩選活動時，觀察到無醣基化基序之抗體之表現效價降低。產生進一步突變以鑑別具有改良之蛋白表現之抗體。

【0303】使用Expifectamine™293系統按照製造商之方案(ThermoFisher Scientific, MA)在Expi293F™細胞中表現抗體。在50 ml SeptaVent™ (Optimum Processing, CA)中以30 ml規模實施轉染。簡言之，每次轉染使用總共30 μg表現質體之重鏈及輕鏈(HC:LC之比率為 為2:3)。 將OptiMEM中 稀 釋 之DNA添 加 至 稀 釋 之Expifectamine™293試劑中以容許形成複合物。在室溫下培育20分鐘後，將試劑DNA複合物添至28 mL以2.5百萬/mL接種之細胞中。將培養物在37℃、8%CO_2下培育，同時以250 rpm振盪4天。藉由以500x g離心15分鐘收穫澄清之上清液。使用預先填充有160μL MaSelectSuRe樹脂(GE Healthcare, NJ)之Phytips (PhyNexus, CA)，藉由Hamilton STAR液體處置器(Hamilton, NV)純化抗體。使用3個Phytips純化30 mL轉染體積中之每一者。捕獲抗體後，用1 x PBS洗滌樹脂，之後用100 mM乙酸鈉pH3.5溶析。用1/10體積之1M Tris pH8.0中和溶析之樣品。樣品在4℃下儲存過夜。將溶析板以1000x g離心10分鐘以去除沈澱(若存在)。藉由量測其在A280之吸光度來測定澄清之溶析的濃度。每一抗體之效價表示如下(mg/L)：[濃度(mg/mL) × 溶析體積(mL) * 1000]/ 30mL。醣基化位點突變及表現效價概述於表15中。

【0304】表15. 醣基化位點突變及表現效價

抗體	效價(mg/L)
A-1	243
1.1.10-1	148
1.1.37-1	104
1.1.38-1	113
1.1.39-1	93

抗體	效價(mg/L)
1.1.40-1	133
1.1.41-1	104
1.1.42-1	158
1.1.43-1	124
1.1.44-1	70
1.1.45-1	77
1.1.46-1	136
1.1.47-1	45
1.1.48-1	65
1.1.49-1	27

【0305】 表15中之結果顯示，無「NLT」醣基化共有基序之所有抗體皆展現降低之表現效價。此表明去除N72連接之聚醣可能對蛋白表現具有負面效應。結果亦顯示，L73F種系逆轉系統地降低表現效價。在所測試之突變中，N72H、N72T及T74K具有最高之表現效價且繼續用於進一步分析。

實例8：哺乳動物展示

【0306】 為了鑑別在維持結合至HIV Env的同時消除Fab聚醣、改良表現效價及/或降低多特異性之突變，使用在6個位點(包括R65、W67、E70、N72、L73及T74)改變之一組三聚體寡核苷酸(GenScript)設計且構築組合輕鏈突變文庫。將擁有約18,000個抗體之合成輕鏈文庫亞選殖至經修飾pcDNA5/FRT載體(Invitrogen)中，該載體含有在C末端與人類PDGFR跨膜結構域融合之抗體A重鏈。

【0307】 為了在穩定轉染之細胞中展示抗體，按照製造商之說明書(R758-07, Invitrogen)將經構築之表現載體與pOG44共轉染至Flp-In-

CHO細胞。選擇轉染之細胞，且然後將其維持在補充潮黴素之培養基中。在抗人類IgG (Fcγ特異性)及HIV BG505.SOSSIP (*J. Virol.*, 89(10):5318-29 (2015))染色後，藉由FACS分析抗體展示及與HIV Env之結合。將FACS分選後收集之細胞擴增用於DNA提取並隨後進行PCR測序分析以鑑別回收之突變。在FACS分選之前及之後挑選超過100個純系用於測序。接下來檢查自連續兩輪FACS分選中回收之序列。

【0308】結果顯示，LC FR3區中具有TRRGQQYNLT (SEQ ID NO: 332)、RRWGQNYNFT (SEQ ID NO: 333)、TRRGQDYIFS (SEQ ID NO: 334)、RRRGQDYILA (SEQ ID NO: 335)、RRRGQNYTFT (SEQ ID NO: 336)、RRFGQDYILT (SEQ ID NO: 337)、TRFGQNYSLQ (SEQ ID NO: 338)、或TRRGQNYTLA (SEQ ID NO: 339)、TRRGQQYTLP (SEQ ID NO: 340)、TRRGQDYILA (SEQ ID NO: 341)或SRFGQKYQLS (SEQ ID NO: 342)之序列的抗體具有期望表現量且保留與HIV BG505.SOSSIP之結合親和力。將SEQ ID NO:334、SEQ ID NO:337及SEQ ID NO: 342之突變納入抗體1.1.110-1、1.1.111-1、1.1.113-1、2.1.3-1、2.1.4-1及1.1.112-1中。

實例9：多特異性評價

【0309】治療性抗體之多特異性可能對藥物動力學性質產生不利影響且存在潛在安全性問題。已顯示抗體A在四抗原組ELISA分析中對雙鏈DNA及脂多糖具有多反應性(*Science*, 333(6049):1633-1637 (2011))。在多個分析中測試本文評估之抗體之多特異性風險，該等分析包括抗核抗體(*Genes Immun.*, 13(5): 399-410 (2012))、抗心磷脂(*Hum Antibodies*, 14(3-4): 59-67 (2005))、抗桿狀病毒顆粒ELISA (*Proc. Natl. Acad. Sci. USA*, 114(5):944-949 (2017))及基於FACS之

HEK-293及HEp2細胞結合分析(*J. Virol.*, 88(21):12669-82 (2014))。為了比較多特異性，使用抗體C及抗體D兩種多特異性bNAb (*J. Virol.*, 88(21):12669-82 (2014))作為陽性對照；及使用利妥昔單抗之臨床樣品(Myoderm Medical Supply)作為多特異性之低風險之基準。在ELISA分析中將測試之製品稀釋至1 μM，並針對對照(無抗體)正規化OD_{450}值以計算倍數變化。在細胞結合分析中，對HEK293或HEp2細胞進行可滲透化處理，且然後與連續稀釋之測試製品一起培育。對染色之樣品進行FACS分析，並針對僅抗人類IgG-Fcγ二級抗體染色之對照正規化MFI(平均螢光強度)。將相對結合信號對抗體濃度作圖，並擬合至非線性反應曲線。每一測試抗體之非特異性細胞結合由結合AUC (曲線下面積)表示。

【0310】 去除N72聚醣(經由點誘變)之三個單突變體顯示最高之表現效價(表5)。為了評估其對A-1多特異性之貢獻，在如上所述之抗核抗體(ANA)及抗心磷脂ELISA分析中測試突變體。兩個獨立分析之結果示於表16中。該等結果表明，去除N72聚醣可能導致多特異性增加。在測試之突變中，N72T及N72H突變顯示最低之多特異性評分。

【0311】 表16：多特異性評價

mAb (1 μM)	**ANA (正規化OD_{450})**		**抗心磷脂(正規化OD_{450})**	
C	24.5	26.5	15.6	17.2
A-1	2.3	2.6	1.6	1.5
1.1.10-1	8.3	8.2	2.5	2.2
1.1.42-1	4.0	3.7	2.3	2.0
1.1.46-1	11.8	10.1	4.4	3.7
利妥昔單抗	1.5		1.3	

【0312】 在ANA及抗心磷脂ELISA分析中測試基於表14及表23中提供之功能分析選擇之具有N72T、V19A及其他突變的抗體用於多特異性評價。該等分析之結果示於表17中。

【0313】 表17. 具有N72T突變之抗體的多特異性評價

mAb (1 μM)	ANA (正規化OD_{450})	抗心磷脂 (正規化OD_{450})
A	1.9	1.2
A-1	2.7	1.4
1.1.10-1	5.7	1.7
1.33.32-1	4.9	7.7
1.1.54-1	3.0	1.6
1.37.51-1	4.0	6.2
1.8.52-1	5.6	1.7
C	22.5	4.4
D-1	14.6	7.7
利妥昔單抗	1.3	1.0

【0314】 表17中之結果顯示，與抗體A-1相比，無N72聚醣之所有抗體皆展現增加之多特異性。與僅含有N72T突變之抗體1.1.10相比，含有N72T及V19A突變之抗體1.1.54展現降低之多特異性。此表明，為了去除T細胞表位而引入之V19A突變可能在降低本文揭示之抗體之多特異性中具有意外的益處。

【0315】 為了鑑別具有降低之多特異性之抗體，在如上文所述之ANA、抗心磷脂ELISA、HEK293及HEp2結合分析中測試包括抗體A-1之5組突變(表18)的32員組合組。

【0316】 表18. 用於產生32員組合文庫之突變

突變組	HC突變	LC突變
組1	無	V19A
組2	無	N72H
組3	無	V98F、V99G
組4	無	T18R、R65S、N76S、N77S
組5	L5V、A10E、T12K、E23K、S105Q、Q108M	R39K、R40P

【0317】 使用多特異性評分(P-評分)總結及比較分析之結果，該等多特異性評分(P-評分)在每一分析中計算為每一測試抗體對利妥昔單抗之比率(表19)。平均P-評分值用於對測試抗體之多特異性風險進行排序。為了在統計上分析組合數據集中每一突變之貢獻，在存在或不存在表19中列出之突變組下對每一組合抗體進行配對比較。在本文測試之32員組合抗體組之背景下，對所測試之五個突變組中之每一者執行16次獨立比較。

【0318】 表19. 組合抗體之多特異性評分(P-評分)

mAb	ANA		抗心磷脂		HEK293結合		HEp2結合	平均值	stdev
A-1	2.8	3.2	1.3	1.5	3.7	2.2	3.5	2.6	1
1.1.17-1	1.8	1.8	1.2	1.1	2.5	1.6	2.7	1.8	0.5
1.1.42-1	n/a	4.3	n/a	1.9	6	n/a	5	4.3	1.5
1.1.64-1	2	1.9	1.2	1.1	2.4	1.6	2.5	1.8	0.5
1.1.67-1	2.3	2.5	1.2	1.4	2.8	1.9	2.6	2.1	0.6
1.1.72-1	n/a	4.7	n/a	1.4	4	n/a	3.9	3.5	1.2
1.1.75-1	3.2	3.3	1.7	1.7	3.8	2.3	4.4	2.9	1
1.1.78-1	3.4	3.5	1.8	1.4	2.9	2.6	3.4	2.7	0.8
1.41.5-1	n/a	5	n/a	3.7	7.2	n/a	4.9	5.2	1.3

mAb	ANA		抗心磷脂		HEK293結合		HEp2結合	平均值	stdev
1.41.81-1	4.3	4.5	2.7	3.4	6.1	2	4.6	3.9	1.3
1.1.82-1	3	2.9	1.2	1.2	3.7	1.6	2.9	2.4	0.9
1.41.83-1	4.2	4.5	4.1	5.3	4.9	2.1	3.9	4.1	0.9
1.1.84-1	2.2	2.4	1.3	1.2	2.3	1.7	2	1.9	0.5
1.41.85-1	3.3	3.5	3.3	3.2	3.7	1.6	3.2	3.1	0.6
1.41.86-1	5.1	6.2	3	3.8	4.1	1.8	4	4	1.3
1.41.87-1	3.3	3.4	3.5	3.7	3.2	1.9	2.9	3.1	0.6
1.1.88-1	1.6	1.8	1.2	1.2	3.7	1.5	2.4	1.9	0.8
1.41.89-1	1.9	1.9	1.9	2.2	6.3	1.7	4.4	2.9	1.6
1.1.90-1	1.5	1.2	1.2	0.9	3.7	1	2.3	1.7	0.9
1.41.91-1	2.9	3.1	3.6	6.2	2.5	2.1	2.9	3.3	1.2
1.41.92-1	n/a	15.7	n/a	11.2	5.8	n/a	5.4	9.5	4.2
1.41.93-1	n/a	9.5	n/a	9.8	5.1	n/a	5.4	7.4	2.2
1.1.94-1	6.2	7.7	4.7	4.9	3.4	3.2	3.3	4.8	1.6
1.41.95-1	10.2	14.8	8.9	9.2	6.5	3.8	5.4	8.4	3.4
1.1.96-1	4.7	6.1	2.4	2.7	2.4	2.8	2.8	3.4	1.3
1.41.97-1	5.4	6.5	5.4	7.3	4.5	3.9	4.1	5.3	1.2
1.41.98-1	5.9	8	4.6	5.9	3.9	3.3	4	5.1	1.5
1.41.99-1	6.4	6.9	6.1	9.2	7.8	3.2	4.6	6.3	1.9
1.1.100-1	4.6	4.2	2	2.1	4.7	1.7	2.7	3.1	1.2
1.41.101-1	5.6	7.2	5.5	6.8	8.7	3.2	4.8	6	1.7
1.1.102-1	3.3	4	1.8	1.7	4.5	2.8	2.6	3	1
1.41.103-1	3.6	4.6	5.9	5.3	6.8	4.4	4	5	1
C	17.6	14.7	3.8	8.3	13.1	8.6	6.9	10.4	4.5
D-1	8.7	10.4	1.9	3.3	7.3	7.1	4	6.1	2.8
利妥昔單抗	1	1	1	1	1	1	1.1	1	0

【0319】 對於16個配對組合中之每一者，使用配對T-測試比較表19中所示之七個分析之平均P-評分。結果顯示由於引入輕鏈N72H突變以及由於引入第5組突變而多特異性增加。結果顯示由於引入輕鏈V19A或V98F + V99G突變而多特異性降低。在引入第4組突變時觀察到多特異性之適度而非統計學上顯著之降低。與此統計分析一致，具有最低平均多特異性評分之抗體係抗體1.1.90，其納入V19A突變、V98F +V99G突變及第4組突變。

【0320】 接下來在多特異性分析中比較抗體A-1及B-1。另外，以各種組合測試具有以下突變之抗體：N72T、N72H、V19A、V98F+V99G、第4組突變、或SEQ ID NO: 37中鑑別之突變。在桿狀病毒顆粒(BVP) ELISA中測試抗體且結果概述於表20中。在每一實驗中以1 μM濃度一式兩份分析檢品，並將BVP評分計算為OD_{450}對無mAb背景之比率。

【0321】 表20. BVP評分

mAb	**平均值**	**SD**	**n**
A	10.9	1.1	2
A-1	9.4	0.7	6
1.1.10-1	13.9	n/a	1
1.1.42-1	9.7	1.1	2
1.1.111-1	22.1	2.0	4
1.1.113-1	11.9	n/a	1
1.1.90-1	2.5	0.6	2
B-1	2.7	0.9	3
2.1.2-1	47.1	n/a	1
2.1.3-1	8.2	n/a	1
2.1.4-1	7.7	n/a	1
D-1	29.2	9.7	4

mAb	平均值	SD	n
C	44.2	10.2	4
利妥昔單抗	4.0	0.5	4

【0322】 表20中之結果顯示，與抗體A-1相比，抗體B-1展現降低之多特異性。與抗體A一樣，使用抗體1.1.42或抗體2.1.2中之N72H突變去除N72聚醣導致多特異性增加。與N72H突變相比，將經由哺乳動物展示發現之突變納入抗體1.1.111中可增加多特異性，而將相同突變納入抗體2.1.3中可降低多特異性。添加V19A突變(例如抗體1.1.113或抗體2.1.4)在兩種情形下皆可系統地降低多特異性。

【0323】 產生另一組之96個抗體以鑑別具有改良之中和寬度及功效且理想地無N72連接之聚醣的抗體。此組在源自抗體A或抗體A及抗體B二者之組合元件之抗體可變結構域的情形中測試第1組、第3組及第4組突變(表18)及各種N72突變以及源自哺乳動物展示之突變的效應。文庫亦包括掃描誘變活動，其中在抗體A之背景下單獨測試抗體A與抗體B之間之每一胺基酸差異。該組係使用高通量方法產生，且使用正規化高通量BVP ELISA分析樣品濃度之變化。此分析之結果示於表21中。

【0324】 表21：BVP評分

mAb	正規化BVP評分
A-1	5.5
3-1	3.7
2.2.1-1	5.5
2.3.1-1	3.5
1.1.64-1	7.2
3.1.8-1	3.8
2.2.8-1	13.7

mAb	正規化BVP評分
2.3.8-1	10.8
1.1.67-1	5.0
3.1.9-1	8.2
2.2.9-1	15.7
2.3.9-1	9.0
1.1.115-1	15.0
3.1.10-1	6.0
2.2.10-1	25.8
2.3.10-1	13.6
1.1.116-1	27.1
3.1.11-1	14.6
2.2.11-1	34.4
2.3.11-1	19.1
1.1.117-1	18.7
3.1.12-1	15.2
2.2.12-1	35.7
2.3.12-1	24.3
1.1.118-1	13.1
3.1.13-1	19.4
2.2.13-1	15.2
2.3.13-1	12.5
1.1.10-1	10.8
3.1.14-1	12.5
2.2.14-1	26.4
2.3.14-1	6.0
1.1.54-1	8.3
3.1.5-1	7.0
2.2.5-1	13.2
2.3.5-1	6.3

mAb	正規化BVP評分
1.1.104-1	7.8
3.1.15-1	8.1
2.2.15-1	25.3
2.3.15-1	12.2
1.1.119-1	12.9
3.1.7-1	8.4
2.2.7-1	15.5
2.3.7-1	9.1
1.1.42-1	7.7
3.1.2-1	7.4
2.2.2-1	26.0
2.3.2-1	11.3
1.1.75-1	14.6
3.1.16-1	13.4
2.2.16-1	33.9
2.3.16-1	18.0
1.1.78-1	10.4
3.1.17-1	14.4
2.2.17-1	39.6
2.3.17-1	25.6
1.1.102-1	7.4
3.1.18-1	11.9
2.2.18-1	26.5
2.3.18-1	15.4
1.1.120-1	14.2
3.1.19-1	14.1
2.2.19-1	32.1
2.3.19-1	24.4
1.1.121-1	8.4

mAb	正規化BVP評分
3.1.20-1	6.7
2.2.20-1	22.7
2.3.20-1	13.2
1.1.122-1	12.5
1.1.123-1	10.0
1.1.124-1	8.9
1.1.125-1	8.6
1.1.126-1	9.8
1.1.127-1	13.9
1.1.128-1	12.0
1.1.129-1	16.8
1.1.130-1	13.8
1.1.131-1	8.3
1.1.111-1	17.1
B-1	7.0
1.1.90-1	7.2
1.1.132-1	12.3
1.1.133-1	12.1
1.1.134-1	7.1
1.1.135-1	11.3
1.42.1-1	13.9
1.43.1-1	12.6
1.44.1-1	22.2
1.45.1-1	1.8
1.46.1-1	10.0
1.47.1-1	8.8
1.49.1-1	11.9
1.50.1-1	8.0
1.51.1-1	8.1

mAb	正規化BVP評分
A-1	8.1

【0325】 表21之第一列及最後一列中所示之抗體A-1之兩次單獨產生運行之結果具有介於5.5與8.1之間之BVP評分。在N72處納入突變之抗體具有系統性更高之BVP評分，此與上述結果一致，展現去除N72連接之聚醣可導致多特異性增加。與抗體A-1相比，無N72且納入抗體B輕鏈或重鏈(或源自該等鏈之突變體)之所選抗體(例如抗體3.1.10-1、2.3.14-1、1.1.54-1、3.1.5-1及2.3.5-1)不顯示增加之BVP ELISA評分。

【0326】 產生另一組具有N72連接之聚醣或無聚醣之12個抗體，以進一步評估聚醣在多特異性中之作用。在Expi293及CHO-S細胞二者中產生一些抗體。將上述分析中鑑別之可降低多特異性之突變納入此組中。此分析之結果示於表22中。保留輕鏈N72連接之醣基化基序之抗體的BVP評分相對低於無N72連接之醣基化基序之抗體。

【0327】 表22：BVP評分. 對於每一抗體，N>=3

N72連接之聚醣	名稱	細胞系	BVP評分
是	A-1	Expi293	2.2
		CHO-S	7.7
	1.1.64-1	Expi293	2.0
		CHO-S	6.6
	1.52.64-1	Expi293	2.4
		CHO-S	2.6
	1.1.90-1	Expi293	1.7
	2.2.101	Expi293	12.8
	2.4.1-1	Expi293	5.2
	2.3.1-1	Expi293	5.3
否	1.1.104-1	ExpiCHO	8.8

N72連接之聚醣	名稱	細胞系	BVP評分
	1.1.119-1	ExpiCHO	6.0
	3.1.5-1	ExpiCHO	3.3
		CHO-S	12.0
	2.2.5-1	Expi293	32.5
	2.3.5-1	Expi293	3.6

實例10：HIV中和分析

【0328】為了評價抗體之抗原識別之寬度，使用各種病毒分離株及純系執行HIV中和分析。在基於CEM-NKr-CCR5-Luc報導基因細胞之分析中針對一組複製勝任亞型B病毒量測抗體之HIV中和功效(表示為IC_{50}，以μg/mL為單位)(Trkola等人，(1999), J. Virol., 73(11):8966-74)，該等複製勝任亞型B病毒包括自患者血漿樣品(NIH AIDS試劑程式)及實驗室適應之染色體HIV-1 BaL擴增之分離株及純系。

【0329】表23. HIV中和功效

抗體	*病毒中和功效(μg/mL)*			
	CHO77	**Bal**	**92US657**	**8320**
A-1	0.12	0.16	1.31	0.31
1.2.2-1	0.12	0.23	1.38	0.70
1.3.1-1	0.08	0.26	1.84	0.37
1.4.1-1	0.04	0.21	1.35	0.28
1.5.1-1	0.14	0.26	0.85	0.50
1.6.1-1	0.10	0.39	1.32	0.62
1.7.1-1	0.10	0.51	1.10	0.54
1.8.1-1	0.09	0.04	1.88	0.59
1.9.1-1	0.17	0.20	1.39	0.50
1.15.1-1	0.10	0.17	1.42	0.31
1.18.1-1	0.10	0.12	1.78	0.33
1.21.1-1	0.17	0.11	2.51	0.59

抗體	*病毒中和功效(μg/mL)*			
	CHO77	**Bal**	**92US657**	**8320**
1.22.1-1	0.95	>20	11.3	13.2
1v2-1	0.07	0.08	0.88	0.28
1.25.1-1	0.12	0.17	1.46	0.23
1.26.1-1	0.11	0.06	0.93	0.38
1.27.1-1	0.13	0.54	0.56	0.58
1.28.1-1	0.10	0.11	1.63	0.38
1.29.1-1	0.09	0.14	1.33	0.41
1.30.1-1	0.06	0.15	0.93	0.39
1.1.2-1	0.14	0.20	0.62	0.78
1.1.4-1	0.12	0.10	1.44	0.35
1.1.5-1	0.12	0.21	1.93	0.63
1.1.10-1	0.07	0.10	0.60	0.33
1.1.11-1	0.13	0.09	1.17	0.39
1.1.12-1	0.12	0.06	1.64	0.50
1.1.13-1	0.09	0.19	1.43	0.45
1.1.17-1	0.10	0.08	1.27	0.52
1.1.19-1	0.12	0.09	0.90	0.34
1.1.26-1	0.13	0.07	1.49	0.45
1.1.27-1	0.10	0.12	1.25	0.53
1.14.15-1	>20	>20	>20	>20
1.33.1-1	0.17	0.11	0.95	0.77
1.33.32-1	0.08	0.09	0.83	0.35
1.34.32-1	0.11	0.31	1.47	0.54
1.36.35-1	0.32	>20	5.37	3.82
1.36.36-1	0.30	>20	2.07	3.84

【0330】 一些抗體在ELISA分析(表14)中未展示功能損失，但在HIV中和分析(表23)中展現降低之功效。若干抗體顯示病毒中和活性無變化或展現中和功效微小增加。

【0331】 表24. 對納入突變之抗體的HIV中和功效

抗體	*病毒中和功效(ug/mL)*					
	BaL	**92US727**	**92HT593**	**92US657**	**92US712**	**302076**
A	0.063	7.81	0.019	2.63	0.104	0.183
A-1	0.037	6.08	0.013	2.160	0.085	0.145
1.1.10-1	0.021	>20	0.013	1.83	0.088	0.131
1.1.42-1	0.030	>20	0.046	2.14	0.078	0.157
1.33.32-1	0.063	>20	0.010	1.39	0.062	0.077
1.1.54-1	0.062	11.4	0.011	1.50	0.076	0.114
1.37.51-1	0.053	>20	0.014	2.58	0.149	0.112
1.8.52-1	0.076	>20	0.015	2.81	0.141	0.202

【0332】 如表24中所示，無N72聚醣之抗體在中和92US727病毒中展現降低之功效。與抗體1.1.10-1 (其含有N72T)相比，抗體1.1.54-1 (V19A +N72T)顯示對92US727病毒之中和功效增加。此表明，與N72T突變組合，V19A可降低多特異性並改良對選擇病毒之中和功效。

【0333】 表25. 使用擴展之病毒組對抗體之HIV中和功效

病毒	*病毒中和功效(ug/mL)*			
	A-1	**1.1.54-1**	**1.37.51-1**	**1.1.42-1**
7467	0.07	0.06	0.06	0.07
302076	0.10	0.08	0.06	0.09
CH058	0.10	0.14	0.09	0.1
92US712	0.11	0.09	0.13	0.09
92HT593	0.12	0.06	0.12	0.05
7015	0.14	0.14	0.10	0.11
BaL	0.15	0.13	0.82	0.07
RHPA	0.16	0.16	0.09	0.15
1489	0.16	0.22	0.26	0.21
WITO	0.26	0.22	0.11	0.07

病毒	*病毒中和功效(ug/mL)*			
	A-1	**1.1.54-1**	**1.37.51-1**	**1.1.42-1**
8176	0.28	0.18	0.18	0.16
8318	0.38	0.31	0.37	0.24
7576	0.46	0.32	0.34	0.4
8339	0.52	0.32	0.29	0.39
7051	0.61	0.52	0.49	0.29
8089	0.67	0.57	1.14	0.73
8106	1.03	0.82	0.97	0.92
8359	1.56	1.19	1.51	1.2
92US657	1.81	3.45	3.39	2.97
92US727	1.82	9.65	50.33	33.7
8117	1.93	1.12	0.92	1.17
CH077	2.45	1.63	2.29	1.80
CH106	2.71	3.05	2.8	1.30
REJO	2.88	1.93	3.04	2.82
THRO	3.1	1.81	1.28	2.33
1413	3.84	2.8	2.45	2.88
8320	4.07	2.61	4.09	2.55
7103	4.82	3.03	2.28	3.23
8134	5.08	7.19	6.97	8.71
7141	5.35	8.93	51.0	23.2
8110	7.09	5.29	4.14	5.97
7714	8.96	6.78	4.33	8.71
1003	23.0	15.35	12.6	17.7
7595	24.6	18.9	16.17	18.02
8339	>200	>200	>200	>200
8398	>200	>200	>200	>200
7406	>200	>200	>200	>200

病毒	*病毒中和功效(ug/mL)*			
	A-1	**1.1.54-1**	**1.37.51-1**	**1.1.42-1**
7552	>200	>200	>200	>200
7007	>200	>200	>200	>200

【0334】在此分析中描繪之抗體中，含有N72T及V19A突變之抗體1.1.54展現最高之中和功效(表25)。

【0335】表26. 選擇抗體之HIV中和功效

病毒	**A-1**	**1.1.110-1**	**1.1.111-1**	**1.1.112-1**	**1.1.90-1**	**1.1.64-1**
CH106	1.29	1.33	1.42	1.31	1.69	0.99
1413	2.04	3.69	2.79	2.05	3.55	2.35
BaL	0.05	0.11	0.13	0.12	0.13	0.08
92HT593	0.34	0.50	0.52	0.56	0.68	0.35
92US657	0.70	0.69	0.79	0.74	1.17	0.79
302076	0.13	0.25	0.18	0.28	0.16	0.15
7015	0.68	0.77	0.73	0.75	1.03	0.60
8117	1.13	1.35	1.09	1.45	1.14	1.13
8339	>50	>50	>50	31.4	>50	>50
92US727	1.62	>50	35.19	30.3	3.80	0.79
92US712	0.08	0.06	0.06		0.07	0.06
7141	2.10	>50	27.09		2.41	1.99
7007	>50	>50	>50		>50	>50
8134	0.36	1.29	0.87		1.05	0.29
8318	0.15	0.23	0.19		0.21	0.23
7596	15.9	14.9	11.6		11.54	16.19
7103	0.95	1.00	0.69		1.13	1.01
8359	0.40	0.35	0.41		0.58	0.48
8110	2.63	3.85	2.19		1.65	2.62
7595	4.38	3.97	3.59		3.71	4.48
REJO	0.03	0.03	0.05		0.07	0.04

病毒	A-1	1.1.110-1	1.1.111-1	1.1.112-1	1.1.90-1	1.1.64-1
CH058	0.04	0.04	0.04		0.05	0.03
CH077	0.03	0.03	0.05		0.10	0.03
RHPA	0.19	0.20	0.16		0.16	0.09
WITO	0.12	0.08	0.06		0.07	0.13
7714	4.20	2.65	3.78		3.76	7.48
THRO	6.84	6.77	6.20		7.42	9.60
CH040	4.86	6.86	16.1		9.57	18.59
8089	0.32	1.30	0.60		0.47	0.32
1489	0.09	0.08	0.10		0.24	0.13
7467	0.03	0.03	0.04		0.06	0.03
7352	>50	>50	>50		>50	40.1
8320	0.28	0.26	0.25		0.39	0.37
1003	1.25	1.35	1.17		1.92	1.25
1012	1.24	1.65	1.43		1.40	1.40
8398	>50	>50	>50		>50	>50
7576	0.38	0.50	0.32		0.36	0.41
7051	0.21	0.25	0.19		0.19	0.23
8176	0.18	0.18	0.19		0.24	0.24
8106	0.57	0.61	0.61		0.89	1.08
7552	27.24	>50	>50		>50	16.1

【0336】在經由哺乳動物展示鑑別之選擇抗體(抗體1.1.110、1.1.111及1.1.112)以及顯示降低之多特異性之彼等抗體(抗體1.1.90及1.1.64)上測試HIV中和功效。對於經由哺乳動物展示鑑別之抗體針對病毒92US727及7141觀察到功效損失(表26)。

【0337】 表27. 選擇抗體之HIV中和結果

病毒	B-1	2.1.3-1	2.1.4-1	A-1	1.1.54-1	1.1.90-1	1.1.111-1	1.1.113-1
92US712	0.10	0.20	0.11	0.10	0.07	0.09	0.08	0.07
8318	0.11	0.24	0.21	0.11	0.32	0.57	0.48	0.14
92HT593	0.35	0.30	0.33	0.41	0.26	0.39	0.29	0.24
RHPA	0.09	0.07	0.05	0.12	0.03	0.15	0.08	0.05
7051	0.41	0.42	0.46	0.52	0.23	0.44	0.32	0.41
8320	0.27	0.28	0.23	0.42	0.29	0.34	0.30	0.28
7576	0.24	0.49	0.55	0.34	0.48	0.41	0.26	0.28
7015	1.12	0.89	0.59	1.17	0.40	0.41	0.48	0.44
92US657	0.53	0.42	0.38	0.52	0.45	0.48	0.40	0.40
CH106	1.51	1.01	0.91	0.91	0.90	1.00	0.86	0.59
1413	2.51	2.78	2.16	2.17	1.72	1.94	2.33	3.67
7141	1.67	13.76	6.78	2.45	1.61	2.24	29.81	27.85
92US727	2.13	14.34	7.27	2.01	11.18	2.17	>50	>50
7595	1.24	1.35	1.19	1.73	1.62	1.76	1.31	1.78
CH040	0.14	0.47	0.36	0.57	>50	22.06	3.71	0.15
THRO	5.32	6.56	4.97	6.30	5.47	10.62	8.58	9.39
7552	26.02	>50	>50	16.55	6.22	27.82	>50	>50
8339	>50	>50	>50	>50	>50	>50	>50	>50
7007	>50	>50	>50	>50	>50	>50	>50	>50
8398	>50	>50	>50	>50	>50	>50	>50	>50

【0338】 表27中顯示之HIV中和結果表明，與保留N72聚醣之抗體(抗體B-1、A-1、1.1.90-1)相比，去除N72聚醣(2.1.3-1、2.1.4-1、1.1.54-1、1.1.111-1及1.1.113-1)可能導致對選擇病毒(即，7141、92US727)之中和敏感性損失。

【0339】 在HIV中和分析中針對4種病毒檢查表21中所示之高通

量BVP ELISA中測試之抗體。此研究之結果示於表28中。

【0340】 表28. HIV中和結果

	指示之病毒之中和IC50值(μg/mL)			
mAb	**92US712**	**92US727**	**7141**	**VS001**
A-1	0.13	3.8	3	0.18
3-1	0.11	3.92	4.03	0.1
2.2.1-1	0.05	~6-11	1.61	0.1
2.3.1-1	0.13	~4-12	2.65	0.2
1.1.64-1	0.05	0.55	0.64	0.05
3.1.8-1	0.12	1.15	3.51	0.11
2.2.8-1	0.07	3.38	1.6	0.07
2.3.8-1	0.07	1.72	1.64	0.15
1.1.67-1	0.1	8.1	3.76	0.15
3.1.9-1	0.11	3.54	4.35	0.16
2.2.9-1	0.06	13.1	1.75	0.15
2.3.9-1	0.09	11.1	2.56	0.22
1.1.115-1	0.08	>50	10.1	0.75
3.1.10-1	0.34	>50	44.8	2.24
2.2.10-1	0.05	>50	4.31	0.79
2.3.10-1	0.09	>50	15.3	0.94
1.1.116-1	0.12	>36	14.6	0.44
3.1.11-1	0.07	>44	8.7	0.57
2.2.11-1	0.04	>50	2.65	0.4
2.3.11-1	0.07	>50	11.2	0.83
1.1.117-1	0.09	>50	16.9	3.03
3.1.12-1	0.11	>41	24.5	2.41
2.2.12-1	0.04	>50	7.08	2.1
2.3.12-1	0.09	>50	23.8	1.92
1.1.118-1	0.18	>50	20.2	2.4
3.1.13-1	0.1	>21	13.2	0.56

	指示之病毒之中和IC50值(μg/mL)			
mAb	**92US712**	**92US727**	**7141**	**VS001**
2.2.13-1	0.08	>50	3.8	1.48
2.3.13-1	0.14	>38	15.5	1.5
1.1.10-1	0.12	45	5.43	0.17
3.1.14-1	0.12	>27	6.42	0.19
2.2.14-1	0.06	>50	2.26	0.21
2.3.14-1	0.11	35.3	5.23	0.21
1.1.54-1	0.16	>50	7.08	0.32
3.1.5-1	0.14	>17	9.8	0.23
2.2.5-1	0.05	>50	2.34	0.13
2.3.5-1	0.05	>50	3.52	0.19
1.1.104-1	0.12	>50	5.13	0.45
3.1.15-1	0.12	>33	9.1	0.49
2.2.15-1	0.03	>50	1.99	0.37
2.3.15-1	0.1	>50	5.93	0.85
1.1.119-1	0.08	>50	6.92	0.39
3.1.7-1	0.09	>50	5.65	0.3
2.2.7-1	0.04	>50	1.58	0.27
2.3.7-1	0.07	>50	5.08	0.47
1.1.42-1	0.29	>50	>50	0.9
3.1.2-1	0.09	>50	21.9	0.73
2.2.2-1	0.04	>50	2.06	0.44
2.3.2-1	0.1	>50	14.6	0.88
1.1.75-1	0.08	>50	11.3	0.5
3.1.16-1	0.29	>43	39	2.15
2.2.16-1	0.05	>50	3.38	0.78
2.3.16-1	0.09	>50	10.2	0.72
1.1.78-1	0.1	>50	29.5	3.3
3.1.17-1	0.1	>50	25.5	2.21

	指示之病毒之中和IC50值(μg/mL)			
mAb	**92US712**	**92US727**	**7141**	**VS001**
2.2.17-1	0.05	>50	6.28	4.38
2.3.17-1	0.08	>50	31.3	4.54
1.1.102-1	0.14	>50	22.7	3
3.1.18-1	0.24	>9.8	>9.8	3.52
2.2.18-1	0.09	>34	5.04	2.51
2.3.18-1	0.16	>23	>23	2.37
1.1.120-1	0.2	>32.9	17.8	0.88
3.1.19-1	0.1	>50	23.9	0.57
2.2.19-1	0.06	>50	4.83	1.04
2.3.19-1	0.09	>50	12	0.48
1.1.121-1	0.1	>37	28.7	1.3
3.1.20-1	0.06	>50	22.1	0.95
2.2.20-1	0.05	>50	4.01	1.25
2.3.20-1	0.08	>50	15.9	1.23
1.1.122-1	0.13	>42.4	6.79	0.32
1.1.123-1	0.09	>43.8	11.2	0.23
1.1.124-1	0.14	>25.4	9.87	0.3
1.1.125-1	0.12	>50	7.69	0.37
1.1.126-1	0.12	>50	6.49	0.35
1.1.127-1	0.16	>23	5.78	0.18
1.1.128-1	0.17	>28.3	9.5	0.67
1.1.129-1	0.15	>29.7	>29.7	2.09
1.1.130-1	0.21	>27.3	16.7	1.67
1.1.131-1	0.15	>31.9	16.4	0.57
1.1.111-1	0.13	>50	>50	3.24
B-1	0.13	2.57	1.43	0.29
1.1.90-1	0.12	8.72	2.65	0.2
1.1.132-1	0.12	2.26	3.39	0.14

	指示之病毒之中和IC50值(μg/mL)			
mAb	**92US712**	**92US727**	**7141**	**VS001**
1.1.133-1	0.14	2.27	3.38	0.16
1.1.134-1	0.14	4.23	3.15	0.22
1.1.135-1	0.22	5.61	4	0.31
1.42.1-1	0.13	0.98	2.34	0.11
1.43.1-1	0.08	3.35	2.42	0.1
1.44.1-1	0.06	~7-12	1.43	0.13
1.45.1-1	9.8	>50	>50	27.6
1.46.1-1	0.17	1.68	2.44	0.24
1.47.1-1	0.11	1.17	2.48	0.24
1.49.1-1	0.14	2.41	2.98	0.26
1.50.1-1	0.08	0.92	2.54	0.14
1.51.1-1	0.1	2.67	3.5	0.22
A-1	0.13	4.8	2.9	0.2

【0341】 在位置N72處攜帶突變之所有抗體皆展現對92US727病毒之功能損失。具有最高中值功效之抗體係抗體1.1.64。與抗體A-1相比，一些抗體顯示中值中和功效之改良。在含有具有降低之BVP ELISA評分之N72T突變之抗體中，抗體2.3.5在HIV中和分析中亦展現增加之功效。

【0342】 對經設計以去除A-1可變結構域中之重鏈W74a氧化基序及輕鏈N26去醯胺基序之一組變體執行另外中和分析。評價結果示於表29及30中。結果顯示，許多變體展現功能損失，而所選變體保留較類似於A-1之功能。

【0343】 表29：經設計以去除化學不利因素之A-1變體的HIV中和結果

		病毒							
解決之不利因素	**抗體名稱**	**VS003**	**VS046**	**VS001**	**VS026**	**VS052**	**US657**	**VS043**	**VS004**
無	**A-1**	0.03	0.03	0.08	0.26	0.38	0.86	1.47	3.42
輕鏈N26	1.1.136-1	0.03	0.04	0.20	0.76	0.38	0.92	1.57	>100
	1.1.137-1	0.03	0.05	0.16	0.43	0.35	0.78	1.65	>100
	1.1.138-1	0.06	0.04	0.18	0.35	0.46	0.54	1.41	39.24
	1.1.139-1	0.03	0.05	0.36	0.94	0.51	0.54	1.37	>100
	1.1.140-1	0.03	0.04	0.17	0.56	0.47	0.51	2.82	94.28
	1.1.141-1	0.02	0.04	0.25	0.69	0.51	0.38	1.30	>100
	1.1.142-1	0.02	0.03	0.20	0.48	0.56	0.44	1.42	>100
	1.1.143-1	0.05	0.05	0.40	3.85	0.92	0.82	2.05	89.88
	1.1.144-1	0.03	0.05	0.38	1.07	0.66	0.38	1.29	>100
重鏈W74a	1.52.1-1	0.05	0.06	0.21	0.48	0.54	0.69	1.39	9.90
	1.53.1-1	0.06	0.05	0.18	0.49	0.57	0.72	1.44	14.10
	1.54.1-1	0.08	0.06	0.55	0.59	0.75	1.27	1.94	36.15

		病毒							
解決之不利因素	抗體名稱	VS003	VS046	VS001	VS026	VS052	US657	VS043	VS004
	1.55.1-1	0.08	0.07	0.49	0.83	1.08	1.39	2.48	34.00
	1.56.1-1	0.09	0.07	0.49	0.72	0.87	1.28	1.51	21.80
	1.57.1-1	0.06	0.09	0.65	0.91	1.21	2.43	2.47	56.68

【0344】 表30：擴展病毒組上之選擇A-1變體的HIV中和結果

Avg.IC50 (μg/mL)	抗體 A-1	1.1.136-1	1.1.137-1	1.1.138-1	1.1.140-1	1.1.142-1	1.52.1-1	1.53.1-1
US657(1)	0.864	0.92	0.78	0.55	0.55	0.51	0.44	0.73
VS003	0.027	0.03	0.03	0.06	0.03	0.02	0.04	0.06
VS046	0.029	0.04	0.05	0.04	0.04	0.03	0.05	0.05
VS001	0.080	0.20	0.16	0.18	0.17	0.20	0.21	0.18
VS026	0.259	0.76	0.43	0.35	0.56	0.48	0.48	0.50
VS052	0.381	0.38	0.35	0.45	0.47	0.56	0.54	0.56
VS043	1.466	1.57	1.65	1.41	2.82	1.42	1.39	1.44
VS004	3.419	>100	>100	39.24	>100	>100	9.90	14.10
US657(2)	0.336	0.30	0.31	0.42	0.46	0.59	0.82	0.65
VS002	0.024	0.02	0.03	0.03	0.03	0.02	0.05	0.05
VS011	0.147	0.19	0.18	0.25	025	0.37	0.33	0.34
VS017	0.443	2.14	1.75	2.02	2.13	2.87	3.01	3.03
VS030	1.614	2.49	2.86	2.81	3.28	3.61	4.86	3.54
VS032	0.256	0.27	0.28	0.25	0.20	0.17	0.27	0.25
VS033	0.207	0.15	0.20	0.19	0.09	0.08	0.27	0.11
VS034	0.358	0.54	0.40	0.45	0.23	0.33	0.28	0.45

Avg.IC50 (μg/mL)	抗體 A-1	1.1.136 -1	1.1.137 -1	1.1.138 -1	1.1.140 -1	1.1.142 -1	1.52.1 -1	1.53.1 -1
VS038	0.210	0.22	0.18	0.12	0.28	0.34	0.40	0.18
VS039	0.121	0.10	0.07	0.07	0.05	0.07	0.17	0.15
VS042	3.171	3.37	2.23	1.73	2.01	1.72	4.54	3.42
VS044	0.312	0.73	0.39	0.36	0.06	0.07	0.16	0.12
VS053	0.530	1.83	0.88	1.52	1.61	1.17	1.07	0.87

【0345】接下來，使用PhenoSense™ HIV中和分析(Monogram Biosciences；亦參見Richman等人，*Proc Natl Acad Sci USA*. (2003) 100(7):4144-9, Whitcomb等人，Antimicrob Agents Chemother. (2007) 51(2):566-75)、使用經患者病毒源包膜假型化之報導基因病毒，對選擇A-1變體剖析突變對中和寬度及功效之影響(表31)。該組總共包含152個Env載體(每個患者一個載體)，其中133個純系載體及19個分離珠(代表所取樣血漿中之準種)。簡言之，將假病毒與5倍連續稀釋之抗體在37℃下一起培育1小時，且然後用於感染表現CD4、CCR5及CXCR4 (CD4+/CCR5+/CXCR4+/U87)之U87細胞。藉由在細胞與病毒一起培育後72小時量測螢光素酶活性評價抗體中和HIV感染性之能力。採用病毒及抗體對照來監測運行內之板對板性能且容許比較隨時間之各運行。針對由HIV-1 NL4.3 (CXCR4向性)、JRCSF (CCR5向性)及MLV (非HIV特異性對照)組成之病毒對照組篩選所有測試抗體。廣泛中和HIV +血漿樣品用作抗體對照。儘管一些突變對活性有更微妙之影響，從而誘導活性輕微減少或輕微增加，但其他突變誘導中和寬度之明顯損失(表31及圖4)。

【0346】表31：針對自前ART血漿獲得之152個患者源B亞型病毒剖析選擇抗體之中和功效及寬度。

名稱	寬度[a]	中值IC_{95}，μg/mL [b]	幾何平均值IC_{95}，μg/mL [b]
A-1	89 %	2.66	3.06
1.1.90-1	86 %	2.59	3.01
1.1.64-1	92 %	2.25	2.70
1.1.10-1	86 %	1.93	2.53
1.52.1-1	83 %	3.66	4.33
1.52.90-1	78 %	4.42	4.56
1.1.138-1	82 %	2.59	2.96

a寬度代表經中和之病毒%，其中IC95 ≤ 50 μg/mL

b僅使用IC95 ≤ 50 μg/mL之病毒計算之中值及幾何平均值IC95值

【0347】 將上文顯示之中和數據與多特異性篩選(實例9)及免疫原性篩選(實例11)之結果組合，以設計一組12個引導變體。接下來在針對擴展之病毒組之HIV中和分析中檢查表22中顯示之BVP ELISA中測試之12個Expi293表現之抗體之組。保留N72連接之聚醣之抗體的結果示於表32中，而無N72連接之聚醣之抗體之結果示於表33中。

【0348】 表32：使用擴展之病毒組測試之保留N72連接之聚醣的7種抗體之HIV中和功效

病毒	*病毒中和功效(μg/mL)*						
	A-1	**1.1.64-1**	**1.52.64-1**	**1.1.90-1**	**2.2.1-1**	**2.4.1-1**	**2.3.1-1**
1003	1.79	2.97	3.29	1.17	1.61	3.62	1.87
1012	1.41	1.41	1.71	2.92	3.70	3.38	1.55
1413	5.31	4.22	7.79	2.07	4.13	5.04	5.28
1489	0.12	0.16	0.17	0.22	0.26	0.16	0.18
7015	0.53	0.65	0.98	0.63	0.47	0.54	0.63
7051	0.79	2.05	0.82	0.83	0.97	1.18	0.52
7103	0.76	1.56	1.09	1.75	1.72	1.31	0.94

病毒	*病毒中和功效(μg/mL)*						
	A-1	**1.1.64-1**	**1.52.64-1**	**1.1.90-1**	**2.2.1-1**	**2.4.1-1**	**2.3.1-1**
7141	2.32	1.82	30.02	2.66	3.93	4.82	1.62
7467	0.04	0.06	0.07	0.05	0.03	0.05	0.06
7552	12.04	>80	50.05	>80	39.62	37.05	20.69
7576	0.69	0.39	1.46	1.42	0.70	1.40	0.92
7595	4.88	1.71	7.34	10.46	9.72	5.06	8.50
7714	4.20	ND	ND	ND	ND	ND	ND
8106	2.72	3.31	8.15	4.54	2.46	4.25	3.12
8110	3.64	6.74	7.04	3.16	3.62	5.14	3.48
8117	0.86	1.77	2.18	1.47	0.94	2.58	2.08
8134	1.57	0.60	3.66	3.78	1.52	1.05	2.27
8176	0.26	0.66	0.34	0.27	0.30	0.33	0.30
8318	0.27	0.33	0.42	0.39	0.36	0.40	0.31
8320	2.20	2.89	3.82	3.22	3.88	6.69	2.88
302076	0.08	0.08	0.11	0.08	0.07	0.13	0.10
92HT593	0.27	0.37	0.25	0.22	0.17	0.37	0.29
92US657	0.38	0.42	0.48	0.40	0.25	0.34	0.36
92US712	0.06	0.06	0.13	0.05	0.05	0.07	0.06
92US727	2.43	1.12	5.47	8.61	4.84	13.74	2.02
CHO77	0.04	0.04	0.12	0.06	0.02	0.08	0.03
REJO	0.01	0.02	0.02	0.04	0.01	0.02	0.02
THRO	2.80	3.87	3.11	2.04	2.17	4.17	3.96
VS001	0.06	0.06	0.11	0.10	0.08	0.18	0.07
VS004	2.66	2.43	4.74	3.21	2.84	6.08	1.92
VS017	0.70	0.91	2.01	1.08	0.84	3.91	0.88
VS026	0.11	0.17	0.23	0.20	0.13	0.27	0.13
VS030	2.04	2.60	7.98	7.40	2.51	5.20	6.38
VS039	0.12	0.09	0.27	0.14	0.03	0.11	0.06

病毒	*病毒中和功效(μg/mL)*						
	A-1	**1.1.64-1**	**1.52.64-1**	**1.1.90-1**	**2.2.1-1**	**2.4.1-1**	**2.3.1-1**
VS042	2.53	2.33	4.44	1.88	0.89	2.00	1.11
VS043	0.79	0.85	1.30	1.11	1.01	1.16	0.97
VS044	0.18	0.16	0.38	0.26	0.13	0.25	0.16
VS046	0.04	0.04	0.05	0.03	0.03	0.05	0.03
VS049	39.54	32.19	>100	>100	2.89	>100	4.86
VS052	0.28	0.45	0.61	0.64	0.24	0.50	0.33

【0349】 表33：使用擴展之病毒組之無N72聚醣的5種抗體之HIV中和功效

病毒	*病毒中和功效(μg/mL)*				
	1.1.104-1	**1.1.119-1**	**3.1.5-1**	**2.2.5-1**	**2.3.5-1**
1003	1.44	0.91	1.02	0.78	1.06
1012	2.87	1.06	1.19	0.98	1.63
1413	4.34	4.52	4.30	3.62	3.79
1489	0.28	0.17	0.16	0.11	0.14
7015	0.67	1.08	1.16	0.95	1.89
7051	1.32	1.89	1.27	3.51	4.46
7103	1.82	1.16	0.91	0.78	1.05
7141	6.57	4.98	3.31	1.75	2.41
7467	0.06	0.19	0.12	0.07	0.09
7552	>80	>80	>80	>80	>80
7576	1.10	0.60	0.55	0.58	0.61
7595	8.47	3.07	3.56	2.94	3.07
7714	ND	1.93	1.50	0.80	1.47
8106	2.80	1.44	1.45	0.94	1.44
8110	4.19	2.37	1.81	1.10	1.82
8117	1.22	1.66	1.02	0.75	1.06

病毒	*病毒中和功效(μg/mL)*				
	1.1.104-1	**1.1.119-1**	**3.1.5-1**	**2.2.5-1**	**2.3.5-1**
8134	6.07	3.44	2.78	1.74	1.52
8176	0.16	0.27	0.30	0.20	0.33
8318	0.32	0.42	0.36	0.33	0.41
8320	4.34	1.47	1.33	1.21	1.48
302076	0.10	0.08	0.06	0.06	0.06
92HT593	0.28	0.15	0.16	0.11	0.17
92US657	0.36	0.30	0.27	0.15	0.24
92US712	0.04	0.03	0.06	0.04	0.05
92US727	10.55	43.70	11.98	16.74	9.32
CHO77	0.03	0.02	0.04	0.02	0.04
REJO	0.02	0.03	0.02	0.01	0.02
THRO	4.27	2.80	2.70	1.22	2.34
VS001	0.34	0.37	0.10	0.10	0.13
VS004	4.80	6.02	1.55	3.22	2.77
VS017	2.33	2.75	1.03	0.77	0.70
VS026	0.19	0.14	0.10	0.06	0.10
VS030	7.90	4.96	6.86	4.22	6.23
VS039	0.10	0.13	0.12	0.06	0.15
VS042	2.33	2.19	1.94	1.21	1.56
VS043	1.49	0.81	0.54	0.41	0.79
VS044	0.28	0.20	0.16	0.12	0.17
VS046	0.03	0.03	0.03	0.03	0.04
VS049	>100	>100	20.37	10.85	36.15
VS052	0.27	0.39	0.31	0.20	0.31

【0350】 表32及33中之結果顯示，所測試之所有12種抗體在擴展之病毒組上具有相似之病毒中和功效值。亦使用經B亞型患者病毒源包膜假型化之一組141種報告基因病毒，經由phenosense中和分析剖析變

體亞組之中和寬度及功效(表34及圖5)。每一包膜載體包含自一個患者取樣之分離株。變體展現相當之中和功效及寬度。

【0351】表34：針對用來自B亞型血漿分離株之Env假型化的HIV-1d剖析之mAb變體的中和活性

	A	**A-1**	**1.52.64-1**
寬度[a]	87 %	87 %	86 %
中值IC_{95}，μg/mL [b]	1.72	1.93	2.00
幾何平均值IC_{95}，μg/mL [b]	2.26	2.23	2.94

a寬度代表經中和之病毒%，其中IC95 ≤ 50 μg/mL

b僅使用IC95 ≤ 50 μg/mL之病毒計算之中值及幾何平均值IC95值

實例11：活體外全分子T細胞增殖及IL2釋放

【0352】宿主藥物抗體(ADA)反應可對治療性抗體之效能及藥物動力學產生負面影響，且所得免疫複合物可能存在安全性問題(Pratt KP.2018. Antibodies. 7:19, Krishna M及Nadler SG. 2016.Front. Immunol. 7:21)。因此，活體外T細胞增殖及IL2釋放分析(例如EpiScreen™ (Abzena Ltd.))已被開發用於評價生物治療劑之總體免疫原性風險。EpiScreen™在自50個供體獲得之CD8+ T細胞耗盡之原代PMBC培養物中經由酶聯免疫吸附斑點(ELISpot)分析量測生物治療劑誘導之IL2釋放且經由3H-胸苷納入量測T細胞增殖，該50個供體經選擇以代表在世界群體中表現之HLA同種異型。高度免疫原性蛋白(例如鑰孔帽貝血藍蛋白(KLH))將在>80%之供體中誘導IL2釋放及T細胞增殖二者，具有高臨床免疫原性率之批准之生物治療劑(例如阿倫單抗(Alemtuzumab)及英利昔單抗(Infliximab))將在25%-40%之供體中誘導反應率，而具有低免疫原性風險之生物治療劑通常顯示供體反應率≤10%。已顯示EpiScreen™中之供體反應率與臨床ADA率相關(Baker及Jones 2007. Curr. Opin. Drug Discov. Devel. 10: 219-227)。

【0353】表35顯示在Expi293細胞中瞬時表現且使用蛋白A及粒徑篩分層析純化之一組抗gp120 bNAb之EpiScreen™分析的結果。亦顯示A33抗體及KLH作為陽性對照。與免疫原性陽性對照蛋白相反，包括A-1在內之許多測試之抗gp120抗體顯示異常高之T細胞增殖率，但具有相對低之IL2釋放率。該數據表明，在不存在靶標之情況下，A-1及其他抗gp120 bNAb可經由未知機制直接刺激活體外原代人類PBMC中之^{3}H-胸苷納入。此未知機制(下文稱為「脫靶活性」)若在活體內翻譯，則可能會出現安全性責任。

【0354】表35：在來自50個供體之PBMC上測試之10個Expi293™表現之抗gp120 Ab的EpiScreen™結果。

Ab名稱	批號	表現細胞系	^{3}H-胸苷納入 (%)	IL2釋放 (%)	^{3}H + IL2 (%)
E	3	Expi293™	16	6	4
A-1	3	Expi293™	32	6	6
F	4	Expi293™	60	10	10
G	4	Expi293™	60	8	8
H	4	Expi293™	50	14	12
I	3	Expi293™	56	16	10
J	4	Expi293™	6	14	4
K	4	Expi293™	16	6	2
E-7	2	Expi293™	14	10	2
E-6	2	Expi293™	10	8	2
A33	NA	NA	20	22	14
KLH	NA	NA	90	82	80

反應率(%)指示所指示分析中顯示反應之50個供體的百分比。

【0355】抗體E、F、G、H、I、J、K、L、L-1、E-6及E-7之重鏈及輕鏈提供於表36中。

表36 -比較/對照抗體		
Ab名稱	**重鏈(HC)胺基酸序列**	**輕鏈胺基酸序列**
E	EVQLVESGGGLVKAGGSLILSCGVSNFRISAHTMNWVRRV PGGGLEWVASISTSSTYRDYADAVKGRFTVSRDDLEDFVY LQMHKMRVEDTAIYYCARKGSDRLSDNDPFDAWGPGTVV TVSPASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVT VSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQ TYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLG GPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFN WYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWL NGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSR EEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTP PVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHN HYTQKSLSLSPGK (SEQ ID NO: 632)	DVVMTQSPSTLSASVGDTITITC RASQSIETWLAWYQQKPGKAP KLLIYKASTLKTGVPSRFSGSGS GTEFTLTISGLQFDDFATYHCQH YAGYSATFGQGTRVEIKRTVAAP SVFIFPPSDEQLKSGTASVVCLL NNFYPREAKVQWKVDNALQSG NSQESVTEQDSKDSTYSLSSTLT LSKADYEKHKVYACEVTHQGL SSPVTKSFNRGEC (SEQ ID NO: 643)

表36 -比較/對照抗體		
Ab名稱	**重鏈(HC)胺基酸序列**	**輕鏈胺基酸序列**
F	EVQLVQSGTQMKEPGASVTISCVTSGYEFVEILINWVRQVP GRGLEWMGWMNPRGGGVNYARQFQGKVTMTRDVYRDT AYLTLSGLTSGDTAKYFCVRGRSCCGGRRHCNGADCFNW DFQHWGQGTLVIVSPASTKGPSVFPLAPSSKSTSGGTAALG CLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSS VVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTH TCPPCPAPELLAGPDVFLFPPKPKDTLMISRTPEVTCVVVD VSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVS VLTVLHQDWLNGKEYKCKVSNKALPLPEEKTISKAKGQP REPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESN GQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFS CSVLHEALHSHYTQKSLSLSPGK (SEQ ID NO: 633)	YIGVTQSPAILSVSLGERVTLSC KTSQAITPRHLVWHRQKGGQAP SLVMTGTSERASGIPDRFIGSGS GTDFTLTITRLEAEDFAVYYCQC LEAFGQGTKLEIKRTVAAPSVFI FPPSDEQLKSGTASVVCLLNNF YPREAKVQWKVDNALQSGNSQ ESVTEQDSKDSTYSLSSTLTLSK ADYEKHKVYACEVTHQGLSSP VTKSFNRGEC (SEQ ID NO: 644)

表36 -比較/對照抗體		
Ab名稱	**重鏈(HC)胺基酸序列**	**輕鏈胺基酸序列**
G	EVQLVQSGTQMKEPGASVTISCVTSGYEFVEILINWVRQVP GRGLEWMGWMNPRGGGVNYARQFQGKVTMTRDVYRDT AYLTLSGLTSGDTAKYFCVRGKSCCAGRRFCGPTDCYNWD FAHWGQGTLVIVSPASTKGPSVFPLAPSSKSTSGGTAALGC LVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSV VTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHT CPPCPAPELLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDV SHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSV LTVLHQDWLNGKEYKCKVSNKALPLPEEKTISKAKGQPRE PQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNG QPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSC SVLHEALHSHYTQKSLSLSPGK (SEQ ID NO: 634)	EIVLTQSPGTLSLSPGETAIISCRT SQYGSLAWYQQRPGQAPRLVIY SGSTRAAGIPDRFSGSRWGPDY NLTISNLESGDFGVYYCQQYEFF GQGTKVQVDIKRTVAAPSVFIFP PSDEQLKSGTASVVCLLNNFYP REAKVQWKVDNALQSGNSQES VTEQDSKDSTYSLSSTLTLSKAD YEKHKVYACEVTHQGLSSPVTK SFNRGEC (SEQ ID NO: 645)

表36 -比較/對照抗體		
Ab名稱	**重鏈(HC)胺基酸序列**	**輕鏈胺基酸序列**
H	QVRLSQSGGQMKKPGDSMRISCRASGYEFINCPINWIRLAP GKRPEWMGWMKPRGGAVSYARQLQGRVTMTRDMYSETA FLELRSLTSDDTAVYFCTRGKYCTARDYYNWDFEHWGQG TPVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFP EPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSL GTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPE LLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVK FNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQD WLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLP PSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYK TTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEAL HSHYTQKSLSLSPGK (SEQ ID NO: 635)	EIVLTQSPGTLSLSPGETAIISCRT SQYGSLAWYQQRPGQAPRLVIY SGSTRAAGIPDRFSGSRWGPDY NLTISNLESGDFGVYYCQQYEFF GQGTKVQVDIKRTVAAPSVFIFP PSDEQLKSGTASVVCLLNNFYP REAKVQWKVDNALQSGNSQES VTEQDSKDSTYSLSSTLTLSKAD YEKHKVYACEVTHQGLSSPVTK SFNRGEC (SEQ ID NO: 646)

表36 -比較/對照抗體		
Ab名稱	**重鏈(HC)胺基酸序列**	**輕鏈胺基酸序列**
I	RVQLVESGGGVVQPGKSVRLSCVVSDFPFSKYPMYWVRQ APGKGLEWVAAISGDAWHVVYSNSVQGRFLVSRDNVKNT LYLEMNSLKIEDTAVYRCARMFQESGPPRLDRWSGRNYYY YSGMDVWGQGTTVTVSSASTKGPSVFPLAPSSKSTSGGTA ALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYS LSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCD KTHTCPPCPAPELLAGPDVFLFPPKPKDTLMISRTPEVTCVV VDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYR VVSVLTVLHQDWLNGKEYKCKVSNKALPLPEEKTISKAK GQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEW ESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGN VFSCSVLHEALHSHYTQKSLSLSPGK (SEQ ID NO: 636)	DIVMTQTPLSLSVTPGQPASISC KSSESLRQSNGKTSLYWYRQKP GQSPQLLVFEVSNRFSGVSDRF VGSGSGTDFTLRISRVEAEDVGF YYCMQSKDFPLTFGGGTKVDL KRTVAAPSVFIFPPSDEQLKSGT ASVVCLLNNFYPREAKVQWKV DNALQSGNSQESVTEQDSKDST YSLSSTLTLSKADYEKHKVYAC EVTHQGLSSPVTKSFNRGEC (SEQ ID NO: 647)

表36 -比較/對照抗體		
Ab名稱	**重鏈(HC)胺基酸序列**	**輕鏈胺基酸序列**
J	QEQLVESGGGVVQPGGSLRLSCLASGFTFHKYGMHWVRQAPGKGLEWVALISDDGMRKYHSDSMWGRVTISRDNSKNTLYLQFSSLKVEDTAMFFCAREAGGPIWHDDVKYYDFNDGYYNYHYMDVWGKGTTVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLAGPDVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPLPEEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEALHSHYTQKSLSLSPGK (SEQ ID NO: 637)	QSALTQPASVSGSPGQTITISCNGTSSDVGGFDSVSWYQQSPGKAPKVMVFDVSHRPSGISNRFSGSKSGNTASLTISGLHIEDEGDYFCSSLTDRSHRIFGGGTKVTVLGQPKAAPSVTLFPPSSEELQANKATLVCLISDFYPGAVTVAWKADSSPVKAGVETTTPSKQSNNKYAASSYLSLTPEQWKSHRSYSCQVTHEGSTVEKTVAPTECS (SEQ ID NO: 648)

表36 -比較/對照抗體		
Ab名稱	**重鏈(HC)胺基酸序列**	**輕鏈胺基酸序列**
K	QVQLVQSGAEVKKPGSSVKVSCKASGNSFSNHDVHWVRQ ATGQGLEWMGWMSHEGDKTGLAQKFQGRVTITRDSGAS TVYMELRGLTADDTAIYYCLTGSKHRLRDYFLYNEYGPNY EEWGDYLATLDVWGHGTAVTVSSASTKGPSVFPLAPSSKS TSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVL QSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKV EPKSCDKTHTCPPCPAPELLAGPDVFLFPPKPKDTLMISRTP EVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQ YNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPLPEEK TISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPS DIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSR WQQGNVFSCSVLHEALHSHYTQKSLSLSPGK (SEQ ID NO: 638)	EVVITQSPLFLPVTPGEAASLSC KCSHSLQHSTGANYLAWYLQR PGQTPRLLIHLATHRASGVPDRF SGSGSGTDFTLKISRVESDDVGT YYCMQGLHSPWTFGQGTKVEI KRTVAAPSVFIFPPSDEQLKSGT ASVVCLLNNFYPREAKVQWKV DNALQSGNSQESVTEQDSKDST YSLSSTLTLSKADYEKHKVYAC EVTHQGLSSPVTKSFNRGEC (SEQ ID NO: 649)

表36 -比較/對照抗體		
Ab名稱	**重鏈(HC)胺基酸序列**	**輕鏈胺基酸序列**
L	QVQLVQSGGQMKKPGESMRISCRASGYEFIDCTLNWIRLA PGKRPEWMGWLKPRGGAVNYARPLQGRVTMTRDVYSDT AFLELRSLTVDDTAVYFCTRGKNCDYNWDFEHWGRGTPVI VSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVT VSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQ TYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLG GPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFN WYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWL NGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSR EEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTP PVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHN HYTQKSLSLSPGK (SEQ ID NO: 639)	EIVLTQSPGTLSLSPGETAIISCRT SQYGSLAWYQQRPGQAPRLVIY SGSTRAAGIPDRFSGSRWGPDY NLTISNLESGDFGVYYCQQYEFF GQGTKVQVDIKRTVAAPSVFIFP PSDEQLKSGTASVVCLLNNFYP REAKVQWKVDNALQSGNSQES VTEQDSKDSTYSLSSTLTLSKAD YEKHKVYACEVTHQGLSSPVTK SFNRGEC (SEQ ID NO: 650)

表36 -比較/對照抗體		
Ab名稱	**重鏈(HC)胺基酸序列**	**輕鏈胺基酸序列**
L-1	QVQLVQSGGQMKKPGESMRISCRASGYEFIDCTLNWIRLA PGKRPEWMGWLKPRGGAVNYARPLQGRVTMTRDVYSDT AFLELRSLTVDDTAVYFCTRGKNCDYNWDFEHWGRGTPVI VSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVT VSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQ TYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLG GPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFN WYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWL NGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSR EEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTP PVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHN HYTQKSLSLSPGK (SEQ ID NO: 640)	EIVLTQSPGTLSLSPGETAIISCRT SQYGSLAWYQQRPGQAPRLVIY SGSTRAAGIPDRFSGSRWGPDY NLTISNLESGDFGVYYCQQYEFF GQGTKVQVDIKRTVAAPSVFIFP PSDEQLKSGTASVVCLLNNFYP REAKVQWKVDNALQSGNSQES VTEQDSKDSTYSLSSTLTLSKAD YEKHKVYACEVTHQGLSSPVTK SFNRGEC (SEQ ID NO: 651)

表36 -比較/對照抗體		
Ab名稱	**重鏈(HC)胺基酸序列**	**輕鏈胺基酸序列**
E-6	EVQLVESGGGLVKAGGSLILSCGVSNFRISAHTMNWVRRV PGGGLEWVASISTSSTYRDYADAVKGRFTVSRDDLEDFVY LQMHKMRVEDTAIYYCARKGSDRLSDNDPFDAWGPGTVV TVSPASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVT VSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQ TYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLG GPSVFLLPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFN WYVDGVEVHNAKTKPPEEQYNSTLRVVSILTVLHQDWLN GKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSRE EMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPL VLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEALHSHY TQKSLSLSPGK (SEQ ID NO: 641)	DVVMTQSPSTLSASVGDTITITC RASQSIETWLAWYQQKPGKAP KLLIYKASTLKTGVPSRFSGSGS GTEFTLTISGLQFDDFATYHCQH YAGYSATFGQGTRVEIKRTVAAP SVFIFPPSDEQLKSGTASVVCLL NNFYPREAKVQWKVDNALQSG NSQESVTEQDSKDSTYSLSSTLT LSKADYEKHKVYACEVTHQGL SSPVTKSFNRGEC (SEQ ID NO: 652)

表36 -比較/對照抗體		
Ab名稱	**重鏈(HC)胺基酸序列**	**輕鏈胺基酸序列**
E-7	EVQLVESGGGLVKAGGSLILSCGVSNFRISAHTMNWVRRV PGGGLEWVASISTSSTYRDYADAVKGRFTVSRDDLEDFVY LQMHKMRVEDTAIYYCARKGSDRLSDNDPFDAWGPGTVV TVSPASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVT VSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQ TYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELVG GPSVFLLPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFN WYVDGVEVHNAKTKPPEEQYNSTLRVVSVLTVLHQDWL NGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSR EEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTP LVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVLHEALHSH YTQKSLSLSPGK (SEQ ID NO: 642)	DVVMTQSPSTLSASVGDTITITC RASQSIETWLAWYQQKPGKAP KLLIYKASTLKTGVPSRFSGSGS GTEFTLTISGLQFDDFATYHCQH YAGYSATFGQGTRVEIKRTVAAP SVFIFPPSDEQLKSGTASVVCLL NNFYPREAKVQWKVDNALQSG NSQESVTEQDSKDSTYSLSSTLT LSKADYEKHKVYACEVTHQGL SSPVTKSFNRGEC (SEQ ID NO: 653)

【0356】為了更好地理解A-1之意外的脫靶活性，吾人對在A-1輕鏈中無N72連接之醣基化基序之A-1及本文所述變體執行第二EpiScreen分析。為了確定表現宿主依賴性N72連接之聚醣組成變化(實例14，下文)是否可能影響A-1之脫靶活性，在ExpiCHO™細胞系中而非在Expi293™細胞系中表現用於第二EpiScreen分析之蛋白質。此EpiScreen™分析之結果示於表37中。在ExpiCHO細胞系中表現之抗體A-1顯示T細胞增殖率(16%)比在Expi293細胞中表現之A-1 (32%)更低，此表明表現細胞系及相關之N72連接之聚醣組成變化可能對EpiScreen™中觀察到之假定脫靶活性有影響。意外的是，在抗體輕鏈中無N72連接之醣基化位點之抗體A-1的所有變體皆顯示高得多的T細胞增殖率。結果表明，N72連接之Fab聚醣之組成可能在調節脫靶T細胞增殖活性中起作用，但N72連接之Fab聚醣之去除增強脫靶活性。

【0357】表37：在來自50個供體之PBMC上測試之7個ExpiCHO™表現之抗gp120 Ab之EpiScreen™結果。

名稱	批號	表現細胞系	^{3}H-胸苷納入 (%)	IL2釋放 (%)	^{3}H + IL2 (%)
A-1	6	ExpiCHO™	16	6	4
1.1.10-1	2	ExpiCHO™	32	6	6
1.1.42-1	2	ExpiCHO™	60	10	10
1.33.32-1	3	ExpiCHO™	60	8	8
1.1.54-1	2	ExpiCHO™	50	14	12
1.37.51-1	2	ExpiCHO™	56	16	10
1.8.52-1	2	ExpiCHO™	6	14	4
A33	NA	NA	16	6	2
KLH	NA	NA	14	10	2

反應率(%)指示所指示分析中顯示反應之50個供體的百分比。

【0358】 由於EpiScreen™分析量測在原代PBMC培養物中^{3}H-胸苷納入，故在不存在IL2釋放之情況下，對於A-1及其變體觀察到之脫靶活性可能涉及PBMC中存在之任何細胞類型之增殖(例如B細胞增殖而非T細胞增殖)。為了確定無N72-聚醣之ExpiCHO™源A-1及其變體是否刺激T細胞之增殖，吾人接下來使用取自相同10個供體之CD8+ T細胞耗盡之PBMC或CD8+及CD4+ T細胞耗盡之PBMC執行EpiScreen™分析。對於陰性對照，吾人選擇Expi293源抗體L，其先前在EpiScreen™中顯示低供體反應率(例如，參見WO 2017/106346)。此分析之結果示於表38中。結果清楚地顯示，在不存在CD4+ T細胞之情況下，^{3}H-胸苷納入之納入率降低。此數據顯示，對於A-1及其變體觀察到之脫靶活性取決於T細胞之存在。由於HIV感染並在T細胞中建立潛伏之儲庫，故脫靶抗gp120抗體誘導之T細胞增殖可能潛在地擴展HIV-1儲庫，且因此作為意欲消耗HIV-1儲庫之HIV治癒策略之一部分係不合意的。

【0359】 表38：在CD4+ T細胞存在(+CD4)或不存在(-CD4)之情況下在來自10個供體之PBMC上測試的3個抗gp120 Ab之EpiScreen™結果。

名稱	批號	表現細胞系	^{3}H-胸苷納入 +CD4 (%)	^{3}H-胸苷納入 -CD4 (%)
A-1	6	ExpiCHO™	40	0
1.1.54-1	2	ExpiCHO™	40	10
L	3	Expi293™	0	0

反應率(%)指示所指示分析中顯示反應之10個供體的百分比。

【0360】 如稍後實例15中所述，A-1 N72連接之輕鏈聚醣之分子組成及所得藥物動力學可根據表現宿主及由此產生之輕鏈N72連接之Fab聚醣之唾液酸化含量而顯著改變。基於表35至38中報告之EpiScreen分析之

結果，吾人假設A-1 N72連接之輕鏈聚醣之分子組成可能影響本文所述觀察到之脫靶T細胞增殖活性。為了測試此想法，吾人接下來使用ExpiCHO或CHO-S源A-1或其變體執行量測T細胞增殖之10供體EpiScreen。如實例14及15中所述，CHO-S源A-1具有比Expi293 ™或ExpiCHO ™源材料顯著更高之N72-聚醣唾液酸化含量。此EpiScreen之結果示於表39中。在CHO-S細胞系中表現之抗體A-1及1.1.90-1不顯示脫靶T細胞增殖。儘管此篩選中之供體數量很少，但此數據表明，A-1表現細胞系及相關之N72連接之輕鏈聚醣組合不僅可調節藥物動力學，而且可調節EpiScreen™分析中觀察到之脫靶活性。

【0361】 表39：在來自10個供體之PBMC上測試之6個ExpiCHO™或CHO-S表現之抗gp120 Ab之EpiScreen™ T細胞增殖結果。

名稱	批號	表現細胞系	^{3}H-胸苷納入(%)
1.1.54-1	6	ExpiCHO™	40
L-1	2	CHO-S	20
1.1.111-1	2	CHO-S	30
1.1.90-1	3	CHO-S	0
B-1	2	CHO-S	20
A-1	18	CHO-S	0
艾塞那肽	NA	NA	40
KLH	NA	NA	60

反應率(%)指示所指示分析中顯示反應之50個供體的百分比。

【0362】 基於表39中所示之初步結果，吾人接下來對包括在ExpiCHO或CHO-S細胞系中表現之A-1及其變體在內的7個抗gp120抗體組執行50供體EpiScreen™。此篩選之結果示於表40中，且顯示當使用向N72連接之輕鏈醣基化位點中納入高含量之唾液酸時，A-1展現極低T細胞

增殖及IL2釋放(參見實例14-15)。結果進一步展現，當以相同方式產生及測試時，選擇之A-1變體具有進一步降低之T細胞增殖率。

【0363】 表40：在來自50個供體之PBMC上測試之7個抗gp120 Ab之EpiScreen™結果。

名稱	批號	表現細胞系	^{3}H -胸苷納入(%)	IL2釋放(%)	^{3}H + IL2(%)
1.1.64-1	5	CHO-S	36	6	2
A-1	27	CHO-S	10	0	0
1.52.64-1	3	CHO-S	4	4	0
3.1.5-1	3	CHO-S	28	6	4
2.3.5-1	3	CHO-S	28	2	0
1.1.10-1	3	ExpiCHO™	22	10	4
L-1	7	CHO-S	12	4	2
艾塞那肽	NA	NA	38	20	10
KLH	NA	NA	98	94	92

反應率(%)指示所指示分析中顯示反應之50個供體的百分比。

實例12：活體外結合分析

【0364】 抗體治療劑之藥物動力學(PK)及藥效學(PD)由經由可變結構域與靶蛋白之特異性結合及/或由與先天免疫細胞上之Fc-γ受體(FcγR)、內皮細胞上之新生Fc-受體(FcRn)及循環補體蛋白C1q的結合介導(Nimmerjahn及Ravetch. 2008. Nat. Rev. Immunol. 8:34-47, Rogers等人 2014. Immunol. Res. 59:203-210, Kuo TT及Aveson VG. 2011. MAbs 3:422-430)。抗體可變結構域或Fc結構域之基因工程可影響與該等受體之結合並影響PK及PD。因此，吾人使用各種常見活體外結合分析(包括表面電漿子共振(SPR)及酶聯免疫吸附分析(ELISA))來評價本文所述選擇抗體之相對親和力。

【0365】使用Biacore 4000表面電漿子共振(SPR)生物感測器及C1或CM4感測器晶片(GE Healthcare)測定本文所述選擇抗體對於人類及食蟹猴(cyno) Fc結合受體(FcγR、FcRn)之活體外結合解離常數(KD)。生物素化人類FcRn購自Immunitrack。生物素化食蟹猴FcRn及人類FcγRIIIB-NA1及FcγRIIIB-NA2購自Acro Biosystems。人類FcγRIIA-167H、FcγRIIA-167R、FcγRIIIA-176F、FcγRIIIA-176V、FcγRIIB/C、FcγRI及食蟹猴FcγRI、FcγRIIA、FcγRIIB及FcγRIII購自R&D系統。

【0366】對於人類FcRn結合分析，使用標準NHS/EDC偶聯將600 RU之鏈黴抗生物素蛋白與C1感測器晶片胺偶聯。固定緩衝液係PBS+ 0.005% Tween 20，pH 7.4。在10 mM NaAc pH 4.5中以50 μg/ml製備鏈黴抗生物素蛋白。將活化、偶聯及阻斷步驟各自以10 μl/min運行10分鐘。捕獲生物素化人類FcRn至約20個相對單位(RU)。使用最多1 μM之兩倍濃度系列測試mAb樣品A-1、A及1.52.64-1與FcRn表面之結合。在pH 6.0及pH 7.4下一式三份收集數據。將穩態下之反應數據擬合至簡單結合等溫線。

【0367】將人類FcγRIIA及FcγRIIIA以4種不同密度(約100 RU、約250 RU、約375 RU及約725 RU)在CM4感測器晶片上胺偶聯。測試三種mAb樣品在PBS pH 7.4 + Tween20 (0.005%)運行緩衝液中以最多1 μM之2倍稀釋系列的結合。在4個受體密度表面中之每一者上測試每一mAb濃度系列兩次，從而對於每一相互作用產生8個數據組。將穩態下之反應數據擬合至簡單結合等溫線。

【0368】將人類FcRIIB/C以三種不同含量(50、400及800 RU)與CM4感測器晶片胺偶聯。使用2 μM作為兩倍稀釋系列中之最高濃度測試

三種mAb。跨低、中及高密度受體表面對每一抗體一式三份運行濃度系列。將穩態下之反應數據擬合至簡單結合等溫線。

【0369】 為了測定人類FcγRIIIB結合親和力，將每一測試抗體以兩種密度(約100 RU及約800 RU)與CM4感測器晶片胺偶聯。使用最多0.5 μM之兩倍濃度系列測試人類FcγRIIIB樣品之結合。將穩態下之反應數據擬合至簡單結合等溫線。

【0370】 為了測定人類FcγRI結合親和力，將每一測試抗體以兩種密度(約100 RU及約800 RU)與CM4感測器晶片胺偶聯。使用兩步滴定系列(3 nM及30 nM)測試人類FcγRI之結合。將反應擬合至簡單動力學模型。

【0371】 為了測定食蟹猴FcRn結合親和力，使用標準NHS/EDC偶聯將600 RU之鏈黴抗生物素蛋白與C1感測器晶片胺偶聯。固定緩衝液係PBS+ 0.005% Tween 20，pH 7.4。在10 mM NaAc pH 4.5中以50 μg/ml製備鏈黴抗生物素蛋白。將活化、偶聯及阻斷步驟各自以10 μl/min運行10分鐘。捕獲生物素化cyno FcRn至約20 RU。使用最多1 μM之兩倍濃度系列測試抗體與FcRn表面之結合。在pH 6.0及pH 7.4下一式三份收集數據。將穩態下之反應數據擬合至簡單結合等溫線。

【0372】 為了測定食蟹猴FcγRIIA、FcγRIIB、FcγRIII及FcγRI結合親和力，將每一測試抗體以兩種密度(約100 RU及約800 RU)與CM4感測器晶片胺偶聯。以最多1 μM之兩倍濃度系列測試CynoFcγRIIA及FcγRIIB。以最多500 nM之兩倍濃度測試FcγRIII。使用兩步滴定(3 nM及30 nM)測試Cyno FcγRI之結合。將穩態下之FcγRIIA、FcγRIIB、FcγRIII之反應數據擬合至簡單結合等溫線。將FcγRI之反應擬合至簡單動

力學模型。

【0373】藉由表面電漿子共振(SPR)測定之全組結合常數示於表41中。數據顯示具有遺傳工程化Fc結構域之抗體A之變體對人類及cyno FcγR及FcRn蛋白皆具有增強之結合親和力。

【0374】表41：藉由SPR測定之Fc受體結合常數(KD)

Fc受體型等位基因	**A**	**A-1**	**1.52.64-1**
人類FcγRI	0.107 ± 0.040 nM	0.002 ± 0.002 nM	0.0012 ± 0.0005 nM
Cyno FcγRI	0.038 ± 0.016 nM	0.005 ± 0.004 nM	0.005 ± 0.003 nM
人類FcγRIIA-167H	1.8 ± 0.5 μM	131 ± 22 nM	221 ± 21 nM
人類FcγRIIA-167R	3 ± 1 μM	130 ± 9 nM	199 ± 21 nM
Cyno FcγRIIA	2000 ± 1000 nM	1100 ± 80 nM	1180 ± 60 nM
人類FcγRIIB	11 ± 0.8 μM	1.6 ± 0.2 μM	1.9 ± 0.2 μM
Cyno FcγRIIB	895 ± 50 nM	240 ± 9 nM	280 ± 32 nM
人類FcγRIIIA - 176V	670 ± 40 nM	59 ± 4 nM	67 ± 6 nM
人類FcγRIIIA - 176F	2.3 ± 0.6 μM	52 ± 4 nM	63 ± 5 nM
人類FcγRIIIB - NA1	2000 ± 1000 nM	59 ± 9 nM	64 ± 15 nM
人類FcγRIIIB - NA2	1500 ± 400 nM	56 ± 18 nM	55 ± 14 nM
Cyno FcγRIII	200 ± 70 nM	7.1 ± 0.7 nM	8 ± 2 nM
人類FcRn pH 7.4	42 ± 1 μM	1.7 ± 0.3 μM	1.12 ± 0.08 μM
人類FcRn pH 6.0	485 ± 43 nM	38 ± 3 nM	49 ± 5 nM
Cyno FcRn pH 7.4	12.8 ± 0.4 μM	4.3 ± 0.4 μM	5.3 ± 0.2 μM
Cyno FcRn pH 6.0	1100 ± 100 nM	16 ± 2 nM	22 ± 2 nM

【0375】執行劑量反應結合ELISA以測定本文所述抗體之相對C1q結合親和力。為了執行分析，將384孔Maxisorp板用5 μg/mL之25 μl抗體溶液在PBS pH 7.4中在4℃下塗覆過夜。然後將板用75 μL於PBS中之1%

BSA阻斷2小時，並用PBS + 0.05% Tween 20 (PBST)洗滌4次。接下來，將25 μL人類C1q蛋白在PBS + 5%BSA中之三倍連續稀釋液添加至板中。將板以600 rpm振盪培育1小時，用PBST洗滌4次，且然後將25 μL抗C1q-HRP結合之多株抗體添加於PBS + 5% BSA中。將板以600 rpm振盪培育15分鐘，用PBST洗滌8次，且然後用3,3′,5,5′-四甲基聯苯胺(TMB)受質顯色，並用HCl淬滅。使用spectramax m5讀板儀讀取450 nM之吸光度，並使用4參數劑量反應擬合測定EC50值。

【0376】 自三個獨立分析計算C1q結合ELISA之平均EC50值，並示於表42中。

表42：藉由ELISA測定之C1q結合EC50值(n=3個分析)

抗體	**C1q結合EC50 (nM)**
A	2.2 ± 1.2 nM
A-1	> 100 nM
1.52.64-1	> 100 nM

【0377】 結果顯示，抗體A之Fc工程化變體具有顯著降低之C1q結合親和力。

【0378】 執行劑量反應結合ELISA以測定本文所述抗體之相對gp120結合親和力。為了執行分析，將384孔Maxisorp板用25 μl之5 μg/ml gp120塗覆並在4℃下培育過夜。將板用PBS 0.05% Tween 20洗滌4次，且在室溫下用75 μl PBS 5% BSA阻斷1hr，同時以600 rpm振盪。阻斷後，吸出孔且添加25 μL一級抗體之3倍系列稀釋液，且在室溫下以600rpm振盪培育1hr。然後將板用PBS 0.05% Tween 20洗滌4次，且添加25 μl以1/10,000稀釋於PBS 1% BSA中之山羊抗人類IgG (H+L) HRP二級抗體，且在室溫、600 rpm振盪下培育30 min。接下來，將板用PBS

0.05%Tween 20洗滌4次，且添加25 μl新鮮TMB受質。將板在600rpm振盪下顯影90秒，然後用25 μl 1M HCl淬滅。在Spectramax m5讀板儀上在A450下讀取吸光度。

【0379】自三個獨立ELISA分析計算平均EC50值，且示於表43中。

【0380】表43：藉由ELISA測定之gp120結合EC50值

gp120蛋白	A	A-1	1.52.64-1
Bal	0.05 ± 0.02 nM	0.06 ± 0.01 nM	0.07 ± 0.02 nM
CAAN	1.84 ± 0.22 nM	2.17 ± 0.56 nM	3.79 ± 1.26 nM
REJO	2.21 ± 0.44 nM	2.37 ± 0.68 nM	4.02 ± 0.45 nM

【0381】結果表明，所有測試之抗體皆以相似之親和力結合HIV gp120蛋白。

實例13：Fc突變對血清半衰期之效應

【0382】在此實例中，評估增強效應細胞殺傷及/或增強FcRn結合之IgG1 Fc突變對血清半衰期的效應。該數據與以下結論一致：增強效應細胞殺死活性之IgG1 Fc之突變(例如根據EU編號(DEAL)在239位之天冬胺酸、在332位之麩胺酸、在236位之丙胺酸、在330位之白胺酸)可縮短活體內血清半衰期。該等縮短之血清半衰期可藉由亦納入增強FcRn結合之IgG1 Fc之突變(例如根據EU編號(LS)在428位之白胺酸及在434位之絲胺酸)部分或完全恢復。

【0383】將PGT121-WT、PGT121-DEAL、PGT121.60、PGT121-LS (例如WO 2017/106346中所述)及本申請案之A-1以10 mg/kg或0.5 mg/kg (A-1)經由單一靜脈內(IV)注射投與食蟹獼猴(Covance, TX)以表徵其基本藥物動力學(PK)特性。使用具有足夠選擇性及靈敏度之生物分析方

法分析自猴收集之血清樣品，以確定血清濃度-時間曲線並藉由非隔室PK分析(NCA)計算平均血清PK參數。生物分析方法利用分支B gp120抗原(Immune-tech, CA)作為捕獲試劑及生物素結合之山羊抗人類IgG抗體(Southern Biotech, AL)作為第二試劑，其中磺基-TAG標記之鏈黴抗生物素蛋白(MesoScale Discovery, MD)用於電化學檢測。

【0384】圖6中繪示之PGT121-WT、PGT121-DEAL、PGT121.60、PGT121-LS及A-1之量測之血清濃度對時間曲線用於計算表4中所繪示之平均值(± SD) PK參數。

【0385】表44：在幼稚食蟹猴(n=3)中IV投與後PGT121-WT、PGT121-DEAL、PGT121.60、PGT121-LS及A-1之藥物動力學參數。

檢品	劑量 (mg/kg IV)	$AUC_{0-\infty}$ (天*ug/mL)	Cl (mL/天/kg)	V_d (mL/kg)	$t_{1/2}$ (天)
PGT121-WT	10	1510 ± 470	7.0 ± 1.9	105 ± 17.6	10.6 ± 1.3
PGT121-DEAL	10	1020 ± 167	9.9 ± 1.5	109 ± 20	7.7 ± 1.3
PGT121.60	10	1490 ± 377	7.0 ± 1.9	96 ± 19	9.7 ± 0.8
PGT121-LS	10	3540 ± 463	2.9 ± 0.4	82 ± 11	19.9 ± 2.1
A-1	0.5	70 ± 7.0	7.2 ± 0.7	91 ± 14	8.7 ± 0.8

【0386】PK分析顯示，在PGT121-WT中包涵Fc突變(DEAL)藉由將對於PGT121-DEAL之清除率(Cl)增加至9.9 ± 1.5 mL/天/kg (相對於PGT121-WT為7.0 ± 1.9 mL/天/kg)負面地影響PK，且將半衰期(t1/2)減少至7.7 ± 1.3天，與之相比，PGT121-WT為10.6 ± 1.3天。在具有含有DEAL突變之Fc的抗體(PGT121.60及A-1)中包涵FcRn結合突變(LS)產生分別7.0 ± 1.9及7.2 ± 0.7 mL/天/kg之Cl值及9.7 ± 0.8及8.7 ± 0.8天之t1/2值，其與PGT121-WT之PK相當。但對於PGT121-LS，在PGT121-WT中包涵單獨LS將Cl減少至2.9 ± 0.4 mL/天/kg且將t1/2增加至19.9 ± 2.1天。

PK分析支持Fc增強突變DEAL之引入減少抗體PK (可能由於增強之FcgR結合)，其可藉由包涵LS FcRn結合突變來恢復。

實例14. 輕鏈Fab聚醣特性評價

【0387】 在不存在潛在干擾重鏈Fc聚醣之情況下，使用兩種技術分離及分析輕鏈Fab聚醣特性。該等實驗之主要目標係瞭解以一或多個唾液酸基團為末端之輕鏈聚醣的相對百分比(下文稱為唾液酸化百分比)。第一方法(「方法1」)係還原之完整輕鏈之反相質譜。在此技術中，將去卷積之質譜中觀察到之質量轉移分配給自生物合成N-聚醣路徑已知之聚醣結構，以對應於質量轉移。唾液酸化形式之相對量化係藉由將唾液酸化物質之去卷積峰高度相加並將該值除以所有唾液酸化及非唾液酸化峰高度之總和而獲得。用於量化輕鏈fab聚醣上之唾液酸化之第二方法(「方法2」)依賴於在其餘蛋白質之分離及其餘輕鏈Fab聚醣之釋放之前的Fc聚醣之選擇性酶釋放(在純水條件下)。然後將對應於Fc及Fab聚醣之單獨等分試樣螢光標記(Waters RapiFluor)，並藉由HILIC層析分析、鑑別及量化。本文所述及藉由該等技術之一分析之多個抗體之Fab唾液酸化百分比值示於下表45A及45B中。

【0388】 表45A. 抗體A-1之輕鏈Fab聚醣評價

批次	14	10	7
表現系統	CHO-S	Tuna293™	ExpiCHO™
聚醣ID[1]	%峰面積	%峰面積	%峰面積
未知峰[2]	6.47	3.50	4.16
G0-GlcNAc	0.00	4.20	4.49
G0	0.91	55.97	52.43
G0F	0.00	1.25	1.52
G1F-GlcNAc	0.00	11.77	0.00

批次	14	10	7
表現系統	CHO-S	Tuna293™	ExpiCHO™
聚醣ID[1]	%峰面積	%峰面積	%峰面積
Man5	0.88	4.02	0.00
G1(a)	0.44	6.50	9.54
G1(b)	0.46	0.43	6.92
G1-GlcNAc	0.00	0.00	11.17
G1F(a)	0.27	0.00	0.00
G1F(b)	0.00	0.00	0.31
G1S	0.00	1.88	0.87
G2	0.00	7.42	8.59
G2F	6.14	0.00	0.00
G2S(a)	0.28	1.79	0.00
G2S(b)	38.65	1.30	0.00
G2FS	0.67	0.00	0.00
G2S2	39.13	0.00	0.00
G2FS2	0.69	0.00	0.00
G2S + 2 GlcNAc	2.60	0.00	0.00
G2S2+2GlcNAc(a)	0.82	0.00	0.00
G2S2+2GlcNAc(b)	1.60	0.00	0.00
唾液酸化聚醣之總和[3]	**84.44**	**4.97**	**0.87**

[1]鑑別及峰百分比源自選擇性fab聚醣(VL)釋放、標記及親水相互作用液相層析(HILIC)方法。所有鑑別皆係基於觀察到之單一同位素質量及已知生物合成路徑，然而對於一些條目，異構變體係可能的。

[2]未知的，系統及試劑峰總和。

[3] 唾液酸化聚醣之總和；在一或多個唾液酸(N-乙醯基神經胺酸)殘基(加下劃線)中終止之鑑別之N-聚醣。

【0389】 表45B. 比較抗體A-1及1.52.64-1之輕鏈Fab聚醣評價

名稱	批號	細胞系	唾液酸化百分比	方法
A-1	5	Expi293™	67/52	1/2
	7	ExpiCHO™	1/1	1/2
	10	Tuna293™	5	2
	14	CHO-S	84	2
	22	CHO起源	73	1
1.52.64-1	18-PP21	CHO起源	49	1
	14525-02	CHO起源	83	1

[1]還原之輕鏈LC/MS

[2]選擇性Fab聚醣釋放、標記及HILIC層析

實例15：Fv突變及Fv-醣基化特性對抗體藥物動力學之效應

【0390】向食蟹猴投與抗體A及本文所述若干工程化抗體以表徵其藥物動力學(PK)特性。在某些情形下，在不同表現細胞系中瞬時或穩定地產生抗體A-1變體，以評價N72連接之Fab聚醣唾液酸化對PK之影響。如實例14中所述使用LCMS測定Fab聚醣唾液酸化百分比。使用具有足夠選擇性及靈敏度之生物分析方法分析自猴收集之血清樣品，以藉由非隔室PK分析(NCA)確定血清濃度-時間曲線及平均血清PK參數。生物分析方法利用分支B gp120抗原(Immune-tech, CA)作為捕獲試劑及生物素結合之山羊抗人類IgG抗體(Southern Biotech, AL)作為第二試劑，其中磺基-TAG標記之鏈黴抗生物素蛋白(MesoScale Discovery, MD)用於電化學檢測。

【0391】在每組三隻(n=3)幼稚雄性食蟹猴(Covance, TX)中單一靜脈內(IV)投與後，表徵在不同細胞系中瞬時表現之抗體A及若干工程化變體之活體內配置。量測之平均值±標准偏差(SD)血清濃度-時間曲線繪示於圖7中。在以0.5 mg/kg IV給藥之Expi293™ (ThermoFisher Scientific,

MA)中瞬時表現之抗體A的藥物動力學分析顯示清除率(Cl)為17.9 ± 1.0，且相應之半衰期(t1/2)為8.9±1.7天，此與在相似條件下Expi293™中表達之抗體A-1批次3相當，其其中Cl為18.7 ± 2.3 mL/天/kg且t1/2為7.6 ± 0.3天(表46)。

【0392】 具有含有低唾液酸或高甘露糖之可變結構域Fab聚醣的抗體可具有改變之PK (Liu L. 2015. J. Pharm. Sci. 104:1866-1884)。由於蛋白表現條件，聚醣組成可被改變，因此，使用針對其Fab聚醣唾液酸化含量%表徵之另外瞬時表現之批次(即CHO-S (批次14)、CHO起源(批次22) (Sigma-Aldrich, MO)及Tuna293™ (批次10) (LakePharma, CA)及ExpiCHO™ (批次7) (ThermoFisher Scientific, MA))評估A-1之活體內配置。在幼稚雄性食蟹猴(Covance, TX)中0.5 mg/kg (批次14、22及10)或5.0 mg/kg (批次7)之單次IV劑量後，對抗體進行表徵。每批抗體A-1之量測之平均值(± SD)血清濃度-時間曲線繪示於圖7中。對批次7進行劑量正規化用於直接比較。測試之抗體A-1批次之藥物動力學分析顯示基於%Fab唾液酸化含量的可變PK (表46)。具有84% Fab聚醣唾液酸化之抗體A-1批次14具有7.2 ± 0.7 mL/天/kg之最低清除率(Cl)值，而Cl逐漸加快，其中抗體A-1批次22 (73%)之Cl為10.7 ± 1.7，抗體A-1批次3之Cl為18.7 ± 2.3 mL/天/kg，抗體A-1批次10 (5%)之Cl為68.7 ± 19.8 mL/天/kg，且抗體A-1批次7 (<1%)之Cl為120 ± 46.7 mL/天/kg。數據支持蛋白表現條件可影響Fab聚醣組成及所得PK。

【0393】 表46：抗體A及若干工程化變體在幼稚雄性食蟹猴(n=3)中IV投與後之藥物動力學。

檢品	表現系統	批次	IV劑量 (mg/kg)	Cl (mL/天/kg)	% Fab唾液酸化
A	Expi293™	5	0.5	17.9 ± 1.0	ND
A-1	Expi293™	3	0.5	18.7 ± 2.3	ND
A-1	CHO-S	14	0.5	7.2 ± 0.7	84
A-1	CHO起源	22	0.5	10.7 ± 1.7	73
A-1	Tuna293™	10	0.5	68.7 ± 20	5
A-1	ExpiCHO™	7	5	120 ± 47	<1
1.1.54-1	ExpiCHO™	3	5	12 ± 1	ND
1.37.51-1	ExpiCHO™	3	5	15 ± 12	ND

ND=未測定

【0394】為了評估旨在去除可變結構域N72連接之聚醣及多特異性之蛋白修飾的影響，評估1.1.54-1及1.37.51-1 (未去除N72連接之聚醣之兩種抗體)之活體內PK。兩種抗體在導致A-1 (上述批次7)之PK降低之相似條件下在ExpiCHO™哺乳動物細胞表現系統中瞬時表現。在向3隻幼稚雄性食蟹猴(Covance, TX)投用5 mg/kg之單次IV濃注劑量後表徵抗體。PK分析(表46)展現1.1.54-1及1.37.51-1之Cl係相當的(分別12 ± 1及15 ± 12 mL/天/kg)，但是比A-1批次7 (Cl為120 ± 47 mL/天/kg)顯著改良，此支持去除可變結構域N72連接之聚醣之蛋白修飾可改良本文所述抗體變體之PK。去除聚醣未獲得與高度唾液酸化批次相同之清除率，此支持可存在N72連接之聚醣以減少非特異性蛋白相互作用。

【0395】在幼稚雄性及雌性食蟹猴(n=3)中單次IV投與後研究源自CHO-S中之瞬時表現之1.52.64-1 (批次4)、或來自CHO起源細胞之穩定池(批次18-PP21)或來自選殖選擇之CHO起源細胞系(批次14525-32)之1.52.64-1的PK。第0-14天之平均值± SD血清濃度-時間曲線提供於圖8

中。NCA之結果繪示於表47中。1.52.64-1 (批次4)含有約75% Fab唾液酸化。以0.5 mg/kg IV緩慢濃注給藥之1.52.64-1批次4產生7.8 ± 0.6 mL/天/kg之食蟹猴清除率；等效於在相似條件下在CHO-S中表現之A-1批次14 (7.2 ± 0.7 mL/天/kg)。

【0396】 表47：在幼稚雄性及雌性食蟹猴(n=3)中IV投與後之三批1.52.64-1之藥物動力學參數。

表現系統	批次	IV劑量 (mg/kg)	Cl (mL/天/kg)	% Fab唾液酸化
CHO-S瞬時轉染	批次4	0.5	**7.8** ± 0.6	75
CHO起源穩定池	批次18-PP21	30	20.8 ± 9.5	49
CHO起源穩定純系	批次14525-32	30	7.9 ± 1.3	84

【0397】 1.52.64-1批次18-PP21產生具有約49% Fab唾液酸化之物質，而批次14525-32自CHO起源穩定表現系統產生具有約84% Fab唾液酸化之物質。1.52.64-1批次18-PP21及批次14525-32係經由30分鐘IV輸注以30 mg/kg投與。PK分析揭示，批次18-PP21相對於批次14525-32具有減少之暴露，此乃因清除率分別為20.8 ± 9.5 mL/天/kg及7.9 ± 1.3 mL/天/kg，與之相比增加。增加之清除率與降低之% Fab聚醣唾液酸化一致(49%對84%)。臨床前PK評價之總體展現，含有Fab聚醣結構之抗體A變體需要受控之蛋白產生條件，以產生具有高Fab聚醣唾液酸化(例如≥75%)之抗體，其將實現期望抗體藥物動力學。

實例16：高唾液酸化細胞系之選擇

【0398】 鑒於前述數據及分析，吾人分離細胞系以產生高度唾液酸化抗體。為了實現此，如本文所述，細胞系開發(CLD)偏向於鑑別表現高度唾液酸化抗gp120抗體之細胞系。簡言之，用編碼本文所述抗體變體之

重鏈及輕鏈之載體轉染基於CHO之開發細胞系。評價多個穩定池之生物反應器性能及產品品質(包括%唾液酸化)。選擇表現具有高唾液酸化程度(例如至少約75%唾液酸化)之抗體之穩定池用於純系生成。為了進一步使純系細胞系分離偏向於更高唾液酸化，自具有最高%唾液酸化(約95%唾液酸化)之母體穩定池產生之純系細胞系在整個純系生成工作流程中過表現。評價多個純系細胞系之生物反應器性能及產品品質(包括%唾液酸化)，且選擇表現高度唾液酸化抗體(> 85%)之純系細胞系作為種源細胞庫(MCB)製造之引導細胞系。

其他實施例

【0399】 儘管已結合詳細說明闡述本發明，但前述說明意欲闡釋本發明且不限制本發明範圍，本發明範圍係藉由所附申請專利範圍來限定。其他態樣、優點及修改均在以下申請專利範圍之範圍內。

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<151> 2019-02-25

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<151> 2018-07-03

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Pro Ile Asn Trp Ile Arg Leu Ala Pro Gly Lys Arg Pro Glu Trp Met
        35                  40                  45

Gly Trp Met Lys Pro Arg Trp Gly Ala Val Ser Tyr Ala Arg Gln Leu
    50                  55                  60

Gln Gly Arg Val Thr Met Thr Arg Asp Met Tyr Ser Glu Thr Ala Phe
65                  70                  75                  80
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Leu Glu Leu Arg Ser Leu Thr Ser Asp Asp Thr Ala Val Tyr Phe Cys
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Thr Arg Gly Lys Tyr Cys Thr Ala Arg Asp Tyr Tyr Asn Trp Asp Phe
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Glu His Trp Gly Gln Gly Thr Pro Val Thr Val Ser Ser Ala Ser Thr
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Lys Gly Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser
130 135 140

Gly Gly Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu
145 150 155 160

Pro Val Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His
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Thr Phe Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser
180 185 190

Val Val Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys
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Asn Val Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu
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Pro Lys Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro
225 230 235 240

Glu Leu Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys
245 250 255

Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val
260 265 270

Asp Val Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp
275 280 285

Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr
290 295 300

Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp
305 310 315 320

Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu
325 330 335

Pro Ala Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg
340 345 350

Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys
355 360 365

Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp
370 375 380

Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys
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Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser
405 410 415

Lys Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser
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Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
            20                  25                  30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
        35                  40                  45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
    50                  55                  60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65                  70                  75                  80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
                85                  90                  95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
            100                 105                 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser Ala Ser Thr Lys Gly
        115                 120                 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
    130                 135                 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145                 150                 155                 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
                165                 170                 175
```

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Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
            180                 185                 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
        195                 200                 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
    210                 215                 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225                 230                 235                 240

Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
                245                 250                 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
            260                 265                 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
        275                 280                 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
    290                 295                 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305                 310                 315                 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu
                325                 330                 335

Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
            340                 345                 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
        355                 360                 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
    370                 375                 380
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Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
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Leu Ser Pro Gly Lys
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20 25 30

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35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser Ala Ser Thr Lys Gly
115 120 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
130 135 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145 150 155 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
165 170 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
180 185 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
195 200 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
210 215 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225 230 235 240

Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
245 250 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
260 265 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
275 280 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
290 295 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305 310 315 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala
325 330 335

Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
340 345 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
355 360 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
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Leu Ser Pro Gly Lys
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Ser Met Arg Ile Ser Cys Arg Ala Ser Gly Tyr Glu Phe Ile Asn Cys
            20                  25                  30

Pro Ile Asn Trp Ile Arg Leu Ala Pro Gly Lys Arg Pro Glu Trp Met
        35                  40                  45

Gly Trp Met Lys Pro Arg His Gly Ala Val Ser Tyr Ala Arg Gln Leu
    50                  55                  60

Gln Gly Arg Val Thr Met Thr Arg Asp Met Tyr Ser Glu Thr Ala Phe
65                  70                  75                  80

Leu Glu Leu Arg Ser Leu Thr Ser Asp Asp Thr Ala Val Tyr Phe Cys
                85                  90                  95

Thr Arg Gly Lys Tyr Cys Thr Ala Arg Asp Tyr Tyr Asn Trp Asp Phe
            100                 105                 110

Glu His Trp Gly Gln Gly Thr Pro Val Thr Val Ser Ser Ala Ser Thr
        115                 120                 125

Lys Gly Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser
    130                 135                 140

Gly Gly Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu
145                 150                 155                 160

Pro Val Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His
                165                 170                 175
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Thr Phe Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser
180 185 190

Val Val Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys
195 200 205

Asn Val Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu
210 215 220

Pro Lys Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro
225 230 235 240

Glu Leu Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys
245 250 255

Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val
260 265 270

Asp Val Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp
275 280 285

Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr
290 295 300

Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp
305 310 315 320

Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu
325 330 335

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340 345 350

Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys
355 360 365

Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp
370 375 380

Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys
385 390 395 400

Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser
405 410 415

Lys Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser
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35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Tyr Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser Ala Ser Thr Lys Gly
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Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
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Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145 150 155 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
165 170 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
180 185 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
195 200 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
210 215 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225 230 235 240

Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
245 250 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
260 265 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
275 280 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
290 295 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
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Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu
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Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
340 345 350

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Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
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Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
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Leu Ser Pro Gly Lys
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Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
        35                  40                  45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
    50                  55                  60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65                  70                  75                  80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
                85                  90                  95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
            100                 105                 110

Trp Gly Ser Gly Thr Met Val Thr Val Ser Ser Ala Ser Thr Lys Gly
        115                 120                 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
    130                 135                 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145                 150                 155                 160
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Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
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Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
180 185 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
195 200 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
210 215 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225 230 235 240

Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
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Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
260 265 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
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Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
290 295 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
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Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu
325 330 335

Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
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Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
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Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
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35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
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Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser Ala Ser Thr Lys Gly
115 120 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
130 135 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145 150 155 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
165 170 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
180 185 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
195 200 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
210 215 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225 230 235 240

Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
245 250 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
260 265 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
275 280 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
290 295 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305 310 315 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu
325 330 335

Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
340 345 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
355 360 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

<210> 8
<211> 453
<212> PRT
<213> 人工序列

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<223> /注釋=「人工序列之說明：合成多肽」

<400> 8

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Gln Val Gln Leu Val Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1               5                  10                  15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
            20                  25                  30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
        35                  40                  45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
    50                  55                  60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65                  70                  75                  80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
                85                  90                  95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
            100                 105                 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser Ala Ser Thr Lys Gly
        115                 120                 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
    130                 135                 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145                 150                 155                 160
```

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
165 170 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
180 185 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
195 200 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
210 215 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225 230 235 240

Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
245 250 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
260 265 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
275 280 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
290 295 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305 310 315 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu
325 330 335

Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
340 345 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
355 360 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

<210> 9
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<212> PRT
<213> 人工序列

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<223> /注釋=「人工序列之說明：合成多肽」

<400> 9
Gln Val Gln Leu Val Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Lys Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

```
Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
    50                  55                  60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65                  70                  75                  80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
                85                  90                  95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
            100                 105                 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser Ala Ser Thr Lys Gly
        115                 120                 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
    130                 135                 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145                 150                 155                 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
                165                 170                 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
            180                 185                 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
        195                 200                 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
    210                 215                 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225                 230                 235                 240

Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
                245                 250                 255
```

```
Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
            260                 265                 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
        275                 280                 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
    290                 295                 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305                 310                 315                 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu
                325                 330                 335

Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
            340                 345                 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
        355                 360                 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
    370                 375                 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385                 390                 395                 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
                405                 410                 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
            420                 425                 430

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
        435                 440                 445
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Leu Ser Pro Gly Lys
450

<210> 10
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 10
Gln Val Gln Leu Leu Gln Ser Gly Ala Glu Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser Ala Ser Thr Lys Gly
115 120 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
130 135 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145 150 155 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
165 170 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
180 185 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
195 200 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
210 215 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225 230 235 240

Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
245 250 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
260 265 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
275 280 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
290 295 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305 310 315 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu
325 330 335

Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
340 345 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
355 360 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

<210> 11
<211> 453
<212> PRT
<213> 人工序列

<220>
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 11
Gln Val Gln Leu Leu Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

```
Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
    50                  55                  60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65                  70                  75                  80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
                85                  90                  95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
            100                 105                 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser Ala Ser Thr Lys Gly
        115                 120                 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
    130                 135                 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145                 150                 155                 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
                165                 170                 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
            180                 185                 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
        195                 200                 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
    210                 215                 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225                 230                 235                 240
```

Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
245 250 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
260 265 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
275 280 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
290 295 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305 310 315 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu
325 330 335

Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
340 345 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
355 360 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

<210> 12
<211> 453
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<213> 人工序列

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<223> /注釋=「人工序列之說明：合成多肽」

<400> 12
Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser Ala Ser Thr Lys Gly
115 120 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
130 135 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145 150 155 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
165 170 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
180 185 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
195 200 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
210 215 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225 230 235 240

Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
245 250 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
260 265 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
275 280 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
290 295 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305 310 315 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu
325 330 335

Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
340 345 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
355 360 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

<210> 13
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<212> PRT
<213> 人工序列

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<223> /注釋=「人工序列之說明：合成多肽」

<400> 13
Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Lys Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

```
Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
        35                  40                  45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
    50                  55                  60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65                  70                  75                  80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
                85                  90                  95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
            100                 105                 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser Ala Ser Thr Lys Gly
        115                 120                 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
    130                 135                 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145                 150                 155                 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
                165                 170                 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
            180                 185                 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
        195                 200                 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
    210                 215                 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225                 230                 235                 240
```

Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
245 250 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
260 265 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
275 280 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
290 295 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305 310 315 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu
325 330 335

Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
340 345 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
355 360 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

<210> 14
<211> 453
<212> PRT
<213> 人工序列

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<223> /注釋=「人工序列之說明：合成多肽」

<400> 14
Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Met His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser Ala Ser Thr Lys Gly
115 120 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
130 135 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145 150 155 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
165 170 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
180 185 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
195 200 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
210 215 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225 230 235 240

Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
245 250 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
260 265 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
275 280 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
290 295 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305 310 315 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu
325 330 335

Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
340 345 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
355 360 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

<210> 15
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<213> 人工序列

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<223> /注釋=「人工序列之說明：合成多肽」

<400> 15
Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Met His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Ala Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser Ala Ser Thr Lys Gly
115 120 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
130 135 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145 150 155 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
165 170 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
180 185 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
195 200 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
210 215 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225 230 235 240

Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
245 250 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
260 265 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
275 280 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
290 295 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305 310 315 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu
325 330 335

Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
340 345 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
355 360 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

<210> 16
<211> 453
<212> PRT
<213> 人工序列

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<223> /注釋=「人工序列之說明：合成多肽」

<400> 16
Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Trp Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser Ala Ser Thr Lys Gly
115 120 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
130 135 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145 150 155 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
165 170 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
180 185 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
195 200 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
210 215 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225 230 235 240

Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
245 250 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
260 265 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
275 280 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
290 295 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305 310 315 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu
325 330 335

Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
340 345 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
355 360 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

<210> 17
<211> 453
<212> PRT
<213> 人工序列

<220>
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 17
Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Gly Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser Ala Ser Thr Lys Gly
115 120 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
130 135 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145 150 155 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
165 170 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
180 185 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
195 200 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
210 215 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225 230 235 240

Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
245 250 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
260 265 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
275 280 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
290 295 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305 310 315 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu
325 330 335

Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
340 345 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
355 360 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

<210> 18
<211> 453
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 18
Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Ala Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser Ala Ser Thr Lys Gly
115 120 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
130 135 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145 150 155 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
165 170 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
180 185 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
195 200 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
210 215 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225 230 235 240

Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
245 250 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
260 265 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
275 280 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
290 295 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305 310 315 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu
325 330 335

Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
340 345 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
355 360 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

<210> 19
<211> 453
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 19
Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys His Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser Ala Ser Thr Lys Gly
115 120 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
130 135 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145 150 155 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
165 170 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
180 185 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
195 200 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
210 215 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225 230 235 240

Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
245 250 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
260 265 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
275 280 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
290 295 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305 310 315 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu
325 330 335

Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
340 345 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
355 360 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

<210> 20
<211> 453
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 20
Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Thr Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser Ala Ser Thr Lys Gly
115 120 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
130 135 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145 150 155 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
165 170 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
180 185 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
195 200 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
210 215 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225 230 235 240

Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
245 250 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
260 265 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
275 280 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
290 295 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305 310 315 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu
325 330 335

Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
340 345 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
355 360 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

<210> 21
<211> 453
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 21

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Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1               5                  10                  15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
            20                  25                  30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
        35                  40                  45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
    50                  55                  60

Gln Gly Arg Val Thr Met Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65                  70                  75                  80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
                85                  90                  95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
            100                 105                 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser Ala Ser Thr Lys Gly
        115                 120                 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
    130                 135                 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145                 150                 155                 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
                165                 170                 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
            180                 185                 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
        195                 200                 205
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Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
210 215 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225 230 235 240

Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
245 250 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
260 265 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
275 280 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
290 295 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305 310 315 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu
325 330 335

Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
340 345 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
355 360 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

<210> 22
<211> 453
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 22
Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg Asp Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser Ala Ser Thr Lys Gly
115 120 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
130 135 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145 150 155 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
165 170 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
180 185 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
195 200 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
210 215 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225 230 235 240

Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
245 250 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
260 265 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
275 280 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
290 295 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305 310 315 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu
325 330 335

Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
340 345 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
355 360 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

<210> 23
<211> 449
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 23

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Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1               5                  10                  15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
            20                  25                  30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
        35                  40                  45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
    50                  55                  60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Thr Phe Ser Phe Tyr
65                  70                  75                  80

Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala Val Tyr Phe Cys
                85                  90                  95

Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val Trp Gly Ser Gly
            100                 105                 110

Thr Gln Val Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe
        115                 120                 125

Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu
    130                 135                 140

Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp
145                 150                 155                 160

Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu
                165                 170                 175

Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser
            180                 185                 190
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Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro
        195                 200                 205

Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys
    210                 215                 220

Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Ala Gly Pro
225                 230                 235                 240

Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser
                245                 250                 255

Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp
            260                 265                 270

Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn
        275                 280                 285

Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val
    290                 295                 300

Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu
305                 310                 315                 320

Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu Pro Glu Glu Lys
                325                 330                 335

Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr
            340                 345                 350

Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr
        355                 360                 365

Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu
    370                 375                 380

Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu
385                 390                 395                 400
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Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys
405 410 415

Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val Leu His Glu
420 425 430

Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly
435 440 445

Lys

<210> 24
<211> 453
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 24
Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Ser Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser Ala Ser Thr Lys Gly
115 120 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
130 135 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145 150 155 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
165 170 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
180 185 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
195 200 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
210 215 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225 230 235 240

Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
245 250 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
260 265 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
275 280 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
290 295 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305 310 315 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu
325 330 335

Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
340 345 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
355 360 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

<210> 25
<211> 453
<212> PRT
<213> 人工序列

<220>

<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 25

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Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1               5                  10                  15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
            20                  25                  30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
        35                  40                  45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
    50                  55                  60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65                  70                  75                  80

Phe Ser Phe Tyr Met Asp Leu Ser Arg Leu Arg Ser Asp Asp Thr Ala
                85                  90                  95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
            100                 105                 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser Ala Ser Thr Lys Gly
        115                 120                 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
    130                 135                 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145                 150                 155                 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
                165                 170                 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
            180                 185                 190
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Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
195 200 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
210 215 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225 230 235 240

Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
245 250 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
260 265 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
275 280 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
290 295 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305 310 315 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu
325 330 335

Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
340 345 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
355 360 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

<210> 26
<211> 453
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 26
Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Thr Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser Ala Ser Thr Lys Gly
115 120 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
130 135 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145 150 155 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
165 170 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
180 185 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
195 200 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
210 215 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225 230 235 240

Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
245 250 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
260 265 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
275 280 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
290 295 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305 310 315 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu
325 330 335

Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
340 345 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
355 360 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

<210> 27
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<400> 27

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Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1               5                  10                  15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
            20                  25                  30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
        35                  40                  45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
    50                  55                  60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65                  70                  75                  80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
                85                  90                  95

Val Tyr Phe Cys Ala Arg Gln Arg Thr Asp Tyr Trp Asp Phe Asp Val
            100                 105                 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser Ala Ser Thr Lys Gly
        115                 120                 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
    130                 135                 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145                 150                 155                 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
                165                 170                 175
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Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
180 185 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
195 200 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
210 215 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225 230 235 240

Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
245 250 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
260 265 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
275 280 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
290 295 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305 310 315 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu
325 330 335

Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
340 345 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
355 360 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

<210> 28
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<400> 28
Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Thr Tyr Phe Cys Ala Arg Gln Arg Thr Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser Ala Ser Thr Lys Gly
115 120 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
130 135 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145 150 155 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
165 170 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
180 185 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
195 200 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
210 215 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225 230 235 240

Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
245 250 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
260 265 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
275 280 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
290 295 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305 310 315 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu
325 330 335

Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
340 345 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
355 360 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

<210> 29
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<400> 29

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Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1               5                  10                  15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
            20                  25                  30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
        35                  40                  45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
    50                  55                  60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65                  70                  75                  80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
                85                  90                  95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
            100                 105                 110

Trp Gly Gln Gly Thr Gln Val Thr Val Ser Ser Ala Ser Thr Lys Gly
        115                 120                 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
    130                 135                 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145                 150                 155                 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
                165                 170                 175
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Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
180 185 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
195 200 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
210 215 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225 230 235 240

Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
245 250 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
260 265 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
275 280 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
290 295 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305 310 315 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu
325 330 335

Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
340 345 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
355 360 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

<210> 30
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<400> 30
Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Met Val Thr Val Ser Ser Ala Ser Thr Lys Gly
115 120 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
130 135 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145 150 155 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
165 170 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
180 185 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
195 200 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
210 215 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225 230 235 240

Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
245 250 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
260 265 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
275 280 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
290 295 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305 310 315 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu
325 330 335

Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
340 345 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
355 360 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

<210> 31
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<400> 31
Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser Ala Ser Thr Lys Gly
115 120 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
130 135 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145 150 155 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
165 170 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
180 185 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
195 200 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
210 215 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225 230 235 240

Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
245 250 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
260 265 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
275 280 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
290 295 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305 310 315 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu
325 330 335

Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
340 345 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
355 360 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

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<400> 32
Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Met His Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser Ala Ser Thr Lys Gly
115 120 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
130 135 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145 150 155 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
165 170 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
180 185 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
195 200 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
210 215 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225 230 235 240

Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
245 250 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
260 265 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
275 280 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
290 295 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305 310 315 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu
325 330 335

Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
340 345 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
355 360 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

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<400> 33

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Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1               5                  10                  15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
            20                  25                  30

Phe Met His Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
        35                  40                  45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
    50                  55                  60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65                  70                  75                  80

Phe Ser Ala Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
                85                  90                  95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
            100                 105                 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser Ala Ser Thr Lys Gly
        115                 120                 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
    130                 135                 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145                 150                 155                 160
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Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
165 170 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
180 185 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
195 200 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
210 215 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225 230 235 240

Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
245 250 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
260 265 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
275 280 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
290 295 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305 310 315 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu
325 330 335

Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
340 345 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
355 360 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

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<400> 34
Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Thr Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser Ala Ser Thr Lys Gly
115 120 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
130 135 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145 150 155 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
165 170 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
180 185 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
195 200 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
210 215 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225 230 235 240

Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
245 250 255

```
Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
            260                 265                 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
        275                 280                 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
    290                 295                 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305                 310                 315                 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu
                325                 330                 335

Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
            340                 345                 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
        355                 360                 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
    370                 375                 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385                 390                 395                 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
                405                 410                 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
            420                 425                 430

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
        435                 440                 445
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Leu Ser Pro Gly Lys
450

<210> 35
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 35
Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Thr Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser Ala Ser Thr Lys Gly
115 120 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
130 135 140

```
Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145                 150                 155                 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
                165                 170                 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
            180                 185                 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
        195                 200                 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
    210                 215                 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225                 230                 235                 240

Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
                245                 250                 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
            260                 265                 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
        275                 280                 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
    290                 295                 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305                 310                 315                 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu
                325                 330                 335

Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
            340                 345                 350
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Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
355 360 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

<210> 36
<211> 453
<212> PRT
<213> 人工序列

<220>
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 36
Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Lys Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Thr Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Thr Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser Ala Ser Thr Lys Gly
115 120 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
130 135 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145 150 155 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
165 170 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
180 185 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
195 200 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
210 215 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225 230 235 240

Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
245 250 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
260 265 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
275 280 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
290 295 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305 310 315 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu
325 330 335

Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
340 345 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
355 360 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

<210> 37
<211> 453
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 37
Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Lys Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Thr Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Thr Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser Ala Ser Thr Lys Gly
115 120 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
130 135 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145 150 155 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
165 170 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
180 185 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
195 200 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
210 215 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225 230 235 240

Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
245 250 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
260 265 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
275 280 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
290 295 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305 310 315 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu
325 330 335

Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
340 345 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
355 360 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

<210> 38
<211> 453
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 38
Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Lys Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

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Phe Met His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
        35                  40                  45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
    50                  55                  60

Gln Gly Arg Val Thr Met Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65                  70                  75                  80

Phe Ser Phe Tyr Met Asp Leu Ser Arg Leu Arg Ser Asp Asp Thr Ala
                85                  90                  95

Thr Tyr Phe Cys Ala Arg Gln Arg Thr Asp Tyr Trp Asp Phe Asp Val
            100                 105                 110

Trp Gly Gln Gly Thr Met Val Thr Val Ser Ser Ala Ser Thr Lys Gly
        115                 120                 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
    130                 135                 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145                 150                 155                 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
                165                 170                 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
            180                 185                 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
        195                 200                 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
    210                 215                 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225                 230                 235                 240
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Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
245 250 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
260 265 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
275 280 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
290 295 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305 310 315 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu
325 330 335

Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
340 345 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
355 360 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

<210> 39
<211> 453
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 39
Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Lys Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Met His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Thr Met Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Ala Tyr Met Asp Leu Ser Arg Leu Arg Ser Asp Asp Thr Ala
85 90 95

Thr Tyr Phe Cys Ala Arg Gln Arg Thr Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Gln Gly Thr Met Val Thr Val Ser Ser Ala Ser Thr Lys Gly
115 120 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
130 135 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145 150 155 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
165 170 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
180 185 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
195 200 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
210 215 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225 230 235 240

Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
245 250 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
260 265 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
275 280 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
290 295 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305 310 315 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu
325 330 335

Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
340 345 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
355 360 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

<210> 40
<211> 453
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 40
Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Lys Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

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Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
        35                  40                  45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
    50                  55                  60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65                  70                  75                  80

Tyr Ser Phe Tyr Met Asp Leu Ser Arg Leu Arg Ser Asp Asp Thr Ala
                85                  90                  95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
            100                 105                 110

Trp Gly Gln Gly Thr Met Val Thr Val Ser Ser Ala Ser Thr Lys Gly
        115                 120                 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
    130                 135                 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145                 150                 155                 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
                165                 170                 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
            180                 185                 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
        195                 200                 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
    210                 215                 220
```

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225 230 235 240

Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
245 250 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
260 265 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
275 280 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
290 295 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305 310 315 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu
325 330 335

Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
340 345 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
355 360 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

<210> 41
<211> 453
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 41
Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser Ala Ser Thr Lys Gly
115 120 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
130 135 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145 150 155 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
165 170 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
180 185 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
195 200 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
210 215 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225 230 235 240

Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
245 250 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
260 265 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
275 280 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
290 295 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305 310 315 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu
325 330 335

Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
340 345 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
355 360 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

<210> 42
<211> 453
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 42
Gln Val His Leu Ser Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

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Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Lys Ile Ser Asp His
            20                  25                  30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
        35                  40                  45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
    50                  55                  60

Gln Gly Arg Val Ser Leu Thr Arg Gln Ala Ser Trp Asp Phe Asp Thr
65                  70                  75                  80

Tyr Ser Phe Tyr Met Asp Leu Lys Ala Val Arg Ser Asp Asp Thr Ala
                85                  90                  95

Ile Tyr Phe Cys Ala Arg Gln Arg Ser Asp Phe Trp Asp Phe Asp Val
            100                 105                 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser Ala Ser Thr Lys Gly
        115                 120                 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
    130                 135                 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145                 150                 155                 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
                165                 170                 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
            180                 185                 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
        195                 200                 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
    210                 215                 220
```

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225 230 235 240

Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
245 250 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
260 265 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
275 280 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
290 295 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305 310 315 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu
325 330 335

Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
340 345 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
355 360 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

<210> 43
<211> 453
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 43
Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser Ala Ser Thr Lys Gly
115 120 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
130 135 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145 150 155 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
165 170 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
180 185 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
195 200 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
210 215 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225 230 235 240

Leu Gly Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
245 250 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
260 265 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
275 280 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
290 295 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305 310 315 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala
325 330 335

Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
340 345 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
355 360 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

<210> 44
<211> 453
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 44
Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser Ala Ser Thr Lys Gly
115 120 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
130 135 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145 150 155 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
165 170 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
180 185 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
195 200 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
210 215 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225 230 235 240

Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
245 250 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
260 265 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
275 280 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
290 295 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305 310 315 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala
325 330 335

Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
340 345 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
355 360 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

<210> 45
<211> 453
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 45
Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser Ala Ser Thr Lys Gly
115 120 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
130 135 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145 150 155 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
165 170 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
180 185 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
195 200 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
210 215 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225 230 235 240

Leu Gly Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
245 250 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
260 265 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
275 280 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
290 295 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305 310 315 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu
325 330 335

Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
340 345 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
355 360 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

<210> 46
<211> 453
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 46

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Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1               5                  10                  15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
            20                  25                  30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
        35                  40                  45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
    50                  55                  60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65                  70                  75                  80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
                85                  90                  95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
            100                 105                 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser Ala Ser Thr Lys Gly
        115                 120                 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
    130                 135                 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145                 150                 155                 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
                165                 170                 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
            180                 185                 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
        195                 200                 205
```

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
210 215 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225 230 235 240

Leu Gly Gly Pro Ser Val Phe Leu Leu Pro Pro Lys Pro Lys Asp Thr
245 250 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
260 265 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
275 280 285

Glu Val His Asn Ala Lys Thr Lys Pro Pro Glu Glu Gln Tyr Asn Ser
290 295 300

Thr Leu Arg Val Val Ser Ile Leu Thr Val Leu His Gln Asp Trp Leu
305 310 315 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala
325 330 335

Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
340 345 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
355 360 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Leu Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

<210> 47
<211> 453
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 47
Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Lys Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Gln Gly Thr Met Val Thr Val Ser Ser Ala Ser Thr Lys Gly
115 120 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
130 135 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145 150 155 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
165 170 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
180 185 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
195 200 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
210 215 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225 230 235 240

Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
245 250 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
260 265 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
275 280 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
290 295 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305 310 315 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu
325 330 335

Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
340 345 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
355 360 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

<210> 48
<211> 210
<212> PRT
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 48

```
Glu Ile Val Leu Thr Gln Ser Pro Gly Thr Leu Ser Leu Ser Pro Gly
1               5                  10                  15

Glu Thr Ala Ile Ile Ser Cys Arg Thr Ser Gln Tyr Gly Ser Leu Ala
            20                  25                  30

Trp Tyr Gln Gln Arg Pro Gly Gln Ala Pro Arg Leu Val Ile Tyr Ser
        35                  40                  45

Gly Ser Thr Arg Ala Ala Gly Ile Pro Asp Arg Phe Ser Gly Ser Arg
    50                  55                  60

Trp Gly Pro Asp Tyr Asn Leu Thr Ile Ser Asn Leu Glu Ser Gly Asp
65                  70                  75                  80

Phe Gly Val Tyr Tyr Cys Gln Gln Tyr Glu Phe Phe Gly Gln Gly Thr
                85                  90                  95

Lys Val Gln Val Asp Ile Lys Arg Thr Val Ala Ala Pro Ser Val Phe
            100                 105                 110

Ile Phe Pro Pro Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val
        115                 120                 125

Val Cys Leu Leu Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp
    130                 135                 140

Lys Val Asp Asn Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr
145                 150                 155                 160

Glu Gln Asp Ser Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr
                165                 170                 175

Leu Ser Lys Ala Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val
            180                 185                 190
```

Thr His Gln Gly Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly
195 200 205

Glu Cys
210

<210> 49
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 49
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 50
<211> 208
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 50
Ser Leu Thr Gln Ser Pro Gly Thr Leu Ser Leu Ser Pro Gly Glu Thr
1 5 10 15

Ala Ile Ile Ser Cys Arg Thr Ser Gln Tyr Gly Ser Leu Ala Trp Tyr
20 25 30

Gln Gln Arg Pro Gly Gln Ala Pro Arg Leu Val Ile Tyr Ser Gly Ser
35 40 45

Thr Arg Ala Ala Gly Ile Pro Asp Arg Phe Ser Gly Ser Arg Trp Gly
50 55 60

Pro Asp Tyr Asn Leu Thr Ile Ser Asn Leu Glu Ser Gly Asp Phe Gly
65 70 75 80

Val Tyr Tyr Cys Gln Gln Tyr Glu Phe Phe Gly Gln Gly Thr Lys Val
85 90 95

Gln Val Asp Ile Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe
100 105 110

Pro Pro Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys
115 120 125

Leu Leu Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val
130 135 140

Asp Asn Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln
145 150 155 160

Asp Ser Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser
165 170 175

Lys Ala Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His
180 185 190

Gln Gly Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 51
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 51
Glu Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

```
Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
        35                  40                  45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
    50                  55                  60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65                  70                  75                  80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
                85                  90                  95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
            100                 105                 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
        115                 120                 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
    130                 135                 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145                 150                 155                 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
                165                 170                 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
            180                 185                 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
        195                 200                 205
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<210> 52
<211> 206
<212> PRT
<213> 人工序列

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<223> /注釋=「人工序列之說明：合成多肽」

<400> 52

```
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1               5                  10                  15

Asp Arg Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
            20                  25                  30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
        35                  40                  45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
    50                  55                  60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65                  70                  75                  80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
                85                  90                  95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
            100                 105                 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
        115                 120                 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
    130                 135                 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145                 150                 155                 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
                165                 170                 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
            180                 185                 190
```

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 53
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 53
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 54
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 54
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Ala Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 55
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 55
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Asn Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 56
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 56

```
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1               5                  10                  15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
            20                  25                  30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Ala Ser
        35                  40                  45

Asn Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
    50                  55                  60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65                  70                  75                  80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
                85                  90                  95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
            100                 105                 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
        115                 120                 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
    130                 135                 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145                 150                 155                 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
                165                 170                 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
            180                 185                 190
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Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 57
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 57
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Thr Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 58
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 58
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Thr Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 59
<211> 206
<212> PRT
<213> 人工序列

<220>
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 59
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Ser Arg Trp Gly
50 55 60

Gln Glu Tyr Thr Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 60
<211> 206
<212> PRT
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 60

```
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1               5                  10                  15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
            20                  25                  30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
        35                  40                  45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
    50                  55                  60

Gln Glu Tyr Asn Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Ile Ala
65                  70                  75                  80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
                85                  90                  95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
            100                 105                 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
        115                 120                 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
    130                 135                 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145                 150                 155                 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
                165                 170                 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
            180                 185                 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
        195                 200                 205
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<210> 61
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 61
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Ser Arg Trp Gly
50 55 60

Gln Glu Tyr Thr Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 62
<211> 206
<212> PRT
<213> 人工序列

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<223> /注釋=「人工序列之說明：合成多肽」

<400> 62
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Ser Gly Ser Gly
50 55 60

Thr Asp Phe Thr Phe Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 63
<211> 206
<212> PRT
<213> 人工序列

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<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 63
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Phe Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 64
<211> 206
<212> PRT
<213> 人工序列

<220>
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 64
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Gly Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 65
<211> 206
<212> PRT
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 65

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Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1               5                  10                  15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
            20                  25                  30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
        35                  40                  45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
    50                  55                  60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65                  70                  75                  80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Phe Gly Pro Gly Thr Arg Leu
                85                  90                  95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
            100                 105                 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
        115                 120                 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
    130                 135                 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145                 150                 155                 160
```

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 66
<211> 206
<212> PRT
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<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 66
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Ser Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 67
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 67
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

```
Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65                  70                  75                  80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Thr Pro Gly Thr Arg Leu
                85                  90                  95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
            100                 105                 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
        115                 120                 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
    130                 135                 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145                 150                 155                 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
                165                 170                 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
            180                 185                 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
        195                 200                 205
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<210> 68
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 68

```
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1               5                   10                  15
```

```
Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
            20                  25                  30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
        35                  40                  45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
    50                  55                  60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65                  70                  75                  80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Asn Leu
                85                  90                  95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
            100                 105                 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
        115                 120                 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
    130                 135                 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145                 150                 155                 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
                165                 170                 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
            180                 185                 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
        195                 200                 205
```

<210> 69
<211> 206

<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 69

```
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1               5                  10                  15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
            20                  25                  30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
        35                  40                  45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
    50                  55                  60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65                  70                  75                  80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Gly Pro Gly Thr Asn Leu
                85                  90                  95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
            100                 105                 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
        115                 120                 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
    130                 135                 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145                 150                 155                 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
                165                 170                 175
```

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 70
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 70
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Ser Pro Gly Thr Asn Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 71
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 71
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Thr Pro Gly Thr Asn Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 72
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 72
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Val
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 73
<211> 206
<212> PRT
<213> 人工序列

<220>
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 73

```
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1               5                  10                  15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
            20                  25                  30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
        35                  40                  45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
    50                  55                  60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65                  70                  75                  80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Asn Val
                85                  90                  95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
            100                 105                 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
        115                 120                 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
    130                 135                 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145                 150                 155                 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
                165                 170                 175
```

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 74
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 74
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Ile Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 75
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 75
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Val
85 90 95

Asp Ile Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 76
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 76
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Asn Val
85 90 95

Asp Ile Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 77
<211> 206
<212> PRT
<213> 人工序列

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<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 77

```
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1               5                  10                  15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
            20                  25                  30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
        35                  40                  45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
    50                  55                  60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65                  70                  75                  80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Gly Pro Gly Thr Asn Val
                85                  90                  95

Asp Ile Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
            100                 105                 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
        115                 120                 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
    130                 135                 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145                 150                 155                 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
                165                 170                 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
            180                 185                 190
```

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 78
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 78
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Thr Pro Gly Thr Asn Val
85 90 95

Asp Ile Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 79
<211> 206
<212> PRT
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 79
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Thr Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Asn Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 80
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 80
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Thr Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Thr Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 81
<211> 206
<212> PRT
<213> 人工序列

<220>
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 81

```
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1               5                  10                  15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
            20                  25                  30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
        35                  40                  45

Asn Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
    50                  55                  60

Gln Glu Tyr Thr Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Ile Ala
65                  70                  75                  80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Asn Leu
                85                  90                  95

Asp Ile Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
            100                 105                 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
        115                 120                 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
    130                 135                 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145                 150                 155                 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
                165                 170                 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
            180                 185                 190
```

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 82
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 82
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Asn Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Thr Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Thr Pro Gly Thr Arg Leu
85 90 95

Asp Ile Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 83
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 83
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Arg Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Asn Leu Glu Thr Gly Val Pro Ser Arg Phe Ser Gly Ser Arg Trp Gly
50 55 60

Gln Glu Tyr Thr Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Gly Pro Gly Thr Asn Leu
85 90 95

Asp Ile Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 84
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 84
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Arg Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Asn Leu Glu Thr Gly Val Pro Ser Arg Phe Ser Gly Ser Arg Trp Gly
50 55 60

Gln Glu Tyr Thr Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Thr Pro Gly Thr Asn Leu
85 90 95

Asp Ile Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 85
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 85

```
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1               5                  10                  15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
            20                  25                  30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
        35                  40                  45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
    50                  55                  60

Gln Glu Tyr Thr Phe Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65                  70                  75                  80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
                85                  90                  95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
            100                 105                 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
        115                 120                 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
    130                 135                 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145                 150                 155                 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
                165                 170                 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
            180                 185                 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
        195                 200                 205
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<210> 86
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 86

```
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1               5                  10                  15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
            20                  25                  30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
        35                  40                  45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
    50                  55                  60

Gln Glu Tyr Ser Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65                  70                  75                  80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
                85                  90                  95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
            100                 105                 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
        115                 120                 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
    130                 135                 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145                 150                 155                 160
```

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 87
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 87
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Ser Phe Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 88
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 88
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Ala Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 89
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 89
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

```
Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
            20                  25                  30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
        35                  40                  45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
    50                  55                  60

Gln Glu Tyr Ala Phe Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65                  70                  75                  80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
                85                  90                  95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
            100                 105                 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
        115                 120                 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
    130                 135                 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145                 150                 155                 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
                165                 170                 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
            180                 185                 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
        195                 200                 205
```

<210> 90
<211> 206
<212> PRT
<213> 人工序列

<220>
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 90

```
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1               5                  10                  15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
            20                  25                  30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
        35                  40                  45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
    50                  55                  60

Gln Glu Tyr His Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65                  70                  75                  80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
                85                  90                  95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
            100                 105                 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
        115                 120                 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
    130                 135                 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145                 150                 155                 160
```

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 91
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 91
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr His Phe Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 92
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 92
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

```
Gln Glu Tyr Gln Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65                  70                  75                  80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
                85                  90                  95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
            100                 105                 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
        115                 120                 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
    130                 135                 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145                 150                 155                 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
                165                 170                 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
            180                 185                 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
        195                 200                 205
```

<210> 93
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 93

```
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1               5                   10                  15
```

```
Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
            20                  25                  30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
        35                  40                  45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
    50                  55                  60

Gln Glu Tyr Gln Phe Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65                  70                  75                  80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
                85                  90                  95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
            100                 105                 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
        115                 120                 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
    130                 135                 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145                 150                 155                 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
                165                 170                 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
            180                 185                 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
        195                 200                 205
```

<210> 94
<211> 206

<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 94

```
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1               5                  10                  15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
            20                  25                  30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
        35                  40                  45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
    50                  55                  60

Gln Glu Tyr Asn Leu Lys Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65                  70                  75                  80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
                85                  90                  95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
            100                 105                 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
        115                 120                 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
    130                 135                 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145                 150                 155                 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
                165                 170                 175
```

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 95
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 95
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Phe Lys Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 96
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 96
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Ala Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 97
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 97
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

```
Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
        35                  40                  45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
    50                  55                  60

Gln Glu Tyr Asn Phe Ala Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65                  70                  75                  80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
                85                  90                  95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
            100                 105                 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
        115                 120                 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
    130                 135                 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145                 150                 155                 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
                165                 170                 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
            180                 185                 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
        195                 200                 205
```

<210> 98
<211> 206
<212> PRT
<213> 人工序列

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<223> /注釋=「人工序列之說明：合成多肽」

<400> 98

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Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1               5                  10                  15

Asp Arg Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
            20                  25                  30

Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
        35                  40                  45

Lys Leu Glu Thr Gly Val Pro Ser Arg Phe Ser Gly Ser Arg Trp Gly
    50                  55                  60

Gln Glu Tyr Thr Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65                  70                  75                  80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Phe Gly Pro Gly Thr Arg Leu
                85                  90                  95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
            100                 105                 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
        115                 120                 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
    130                 135                 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145                 150                 155                 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
                165                 170                 175
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Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 99
<211> 206
<212> PRT
<213> 人工序列

<220>
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 99
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Arg Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Thr Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 100
<211> 206
<212> PRT
<213> 人工序列

<220>
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 100
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Thr Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 101
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<212> PRT
<213> 人工序列

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<223> /注釋=「人工序列之說明：合成多肽」

<400> 101
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Arg Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ala Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Val Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Ile Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 102
<211> 206
<212> PRT
<213> 人工序列

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<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 102

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Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Arg Val Gly
1               5                  10                  15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
            20                  25                  30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
        35                  40                  45

Lys Leu Glu Arg Gly Val Pro Ala Arg Phe Ser Gly Arg Arg Trp Gly
    50                  55                  60

Gln Glu Tyr His Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Val Ala
65                  70                  75                  80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Ile Val Pro Gly Thr Arg Leu
                85                  90                  95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
            100                 105                 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
        115                 120                 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
    130                 135                 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145                 150                 155                 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
                165                 170                 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
            180                 185                 190
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Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 103
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 103
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 104
<211> 206
<212> PRT
<213> 人工序列

<220>
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 104
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Phe Gly Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 105
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 105
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr His Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Phe Gly Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 106
<211> 206
<212> PRT
<213> 人工序列

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<223> /注釋=「人工序列之說明：合成多肽」

<400> 106

```
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1               5                  10                  15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
            20                  25                  30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
        35                  40                  45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
    50                  55                  60

Gln Glu Tyr His Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65                  70                  75                  80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
                85                  90                  95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
            100                 105                 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
        115                 120                 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
    130                 135                 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145                 150                 155                 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
                165                 170                 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
            180                 185                 190
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Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 107
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 107
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr His Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Phe Gly Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 108
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 108
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Phe Gly Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 109
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 109
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Arg Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Ser Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 110
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<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 110

```
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1               5                  10                  15

Asp Arg Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
            20                  25                  30

Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
        35                  40                  45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Ser Arg Trp Gly
    50                  55                  60

Gln Glu Tyr Asn Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Ile Ala
65                  70                  75                  80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
                85                  90                  95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
            100                 105                 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
        115                 120                 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
    130                 135                 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145                 150                 155                 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
                165                 170                 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
            180                 185                 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
        195                 200                 205
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<210> 111
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 111
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Arg Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Ser Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Phe Gly Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 112
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 112
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Arg Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Ser Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Phe Gly Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 113
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 113
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 114
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 114
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

```
Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
            20                  25                  30

Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
        35                  40                  45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
    50                  55                  60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65                  70                  75                  80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Phe Gly Pro Gly Thr Arg Leu
                85                  90                  95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
            100                 105                 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
        115                 120                 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
    130                 135                 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145                 150                 155                 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
                165                 170                 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
            180                 185                 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
        195                 200                 205
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<210> 115
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 115

```
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1               5                  10                  15

Asp Arg Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
            20                  25                  30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
        35                  40                  45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Ser Arg Trp Gly
    50                  55                  60

Gln Glu Tyr Asn Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Ile Ala
65                  70                  75                  80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
                85                  90                  95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
            100                 105                 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
        115                 120                 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
    130                 135                 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145                 150                 155                 160
```

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 116
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 116
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Arg Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Ser Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 117
<211> 206
<212> PRT
<213> 人工序列

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<400> 117
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Arg Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Ser Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Phe Gly Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 118
<211> 206
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<400> 118
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Arg Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Ser Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Phe Gly Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 119
<211> 206

<212> PRT
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 119

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Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1               5                  10                  15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
            20                  25                  30

Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
        35                  40                  45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
    50                  55                  60

Gln Glu Tyr His Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65                  70                  75                  80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
                85                  90                  95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
            100                 105                 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
        115                 120                 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
    130                 135                 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145                 150                 155                 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
                165                 170                 175
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Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 120
<211> 206
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<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 120
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr His Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Phe Gly Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 121
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 121
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Arg Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Ser Arg Trp Gly
50 55 60

Gln Glu Tyr His Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 122
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 122
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Arg Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Ser Arg Trp Gly
50 55 60

Gln Glu Tyr His Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 123
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 123

```
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1               5                  10                  15

Asp Arg Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
            20                  25                  30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
        35                  40                  45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Ser Arg Trp Gly
    50                  55                  60

Gln Glu Tyr His Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Ile Ala
65                  70                  75                  80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Phe Gly Pro Gly Thr Arg Leu
                85                  90                  95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
            100                 105                 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
        115                 120                 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
    130                 135                 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145                 150                 155                 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
                165                 170                 175
```

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 124
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 124
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Arg Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Ser Arg Trp Gly
50 55 60

Gln Glu Tyr His Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Phe Gly Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 125
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 125
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr His Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 126
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 126
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr His Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Phe Gly Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 127
<211> 206
<212> PRT
<213> 人工序列

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<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 127

```
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1               5                  10                  15

Asp Arg Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
            20                  25                  30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
        35                  40                  45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Ser Arg Trp Gly
    50                  55                  60

Gln Glu Tyr His Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Ile Ala
65                  70                  75                  80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
                85                  90                  95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
            100                 105                 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
        115                 120                 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
    130                 135                 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145                 150                 155                 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
                165                 170                 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
            180                 185                 190
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Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 128
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 128
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Arg Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Ser Arg Trp Gly
50 55 60

Gln Glu Tyr His Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 129
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 129
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Arg Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Ser Arg Trp Gly
50 55 60

Gln Glu Tyr His Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Phe Gly Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 130
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 130
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Arg Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Ser Arg Trp Gly
50 55 60

Gln Glu Tyr His Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Phe Gly Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 131
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 131

```
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1               5                  10                  15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
            20                  25                  30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
        35                  40                  45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Thr Arg Arg Gly
    50                  55                  60

Gln Asp Tyr Ile Phe Ser Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65                  70                  75                  80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
                85                  90                  95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
            100                 105                 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
        115                 120                 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
    130                 135                 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145                 150                 155                 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
                165                 170                 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
            180                 185                 190
```

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 132
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 132
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Phe Gly
50 55 60

Gln Asp Tyr Ile Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 133
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 133
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Ser Arg Phe Gly
50 55 60

Gln Lys Tyr Gln Leu Ser Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 134
<211> 206
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 134
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

```
Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Phe Gly
    50                  55                  60

Gln Asp Tyr Ile Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65                  70                  75                  80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
                85                  90                  95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
            100                 105                 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
        115                 120                 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
    130                 135                 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145                 150                 155                 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
                165                 170                 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
            180                 185                 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
        195                 200                 205
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<210> 135
<211> 206
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<220>
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 135

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Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Arg Val Gly
1               5                  10                  15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
            20                  25                  30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
        35                  40                  45

Lys Leu Glu Arg Gly Val Pro Ala Arg Phe Ser Gly Arg Arg Phe Gly
    50                  55                  60

Gln Asp Tyr Ile Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Val Ala
65                  70                  75                  80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Ile Val Pro Gly Thr Arg Leu
                85                  90                  95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
            100                 105                 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
        115                 120                 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
    130                 135                 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145                 150                 155                 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
                165                 170                 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
            180                 185                 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
        195                 200                 205
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<213> 人工序列

<220>
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 136
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Arg Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ala Arg Phe Ser Gly Arg Arg Phe Gly
50 55 60

Gln Asp Tyr Ile Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Val Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Ile Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

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<212> PRT
<213> 人工序列

<220>
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<223> /注釋=「人工序列之說明：合成肽」

<400> 137
Asp Tyr Phe Ile His
1 5

<210> 138
<211> 17
<212> PRT
<213> 人工序列

<220>
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<223> /注釋=「人工序列之說明：合成肽」

<400> 138
Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe Gln
1 5 10 15

Gly

<210> 139
<211> 10
<212> PRT
<213> 人工序列

<220>
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<223> /注釋=「人工序列之說明：合成肽」

<400> 139
Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
1 5 10

<210> 140
<211> 7
<212> PRT
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<223> /注釋=「人工序列之說明：合成肽」

<400> 140
Gln Ala Asn Gly Tyr Leu Asn
1 5

<210> 141
<211> 7
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<220>
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<223> /注釋=「人工序列之說明：合成肽」

<400> 141
Asp Gly Ser Lys Leu Glu Arg
1 5

<210> 142
<211> 5
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<223> /注釋=「人工序列之說明：合成肽」

<400> 142
Gln Val Tyr Glu Phe
1 5

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<223> /注釋=「人工序列之說明：合成肽」

<400> 143
Gly Tyr Asn Ile Arg Asp Tyr
1 5

<210> 144
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<220>
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<223> /注釋=「人工序列之說明：合成肽」

<400> 144
Pro Lys Thr Gly
1

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<211> 8
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<220>
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<223> /注釋=「人工序列之說明：合成肽」

<400> 145
Arg Ser Asp Tyr Trp Asp Phe Asp
1 5

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<400> 146
Asn Gly Tyr
1

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<400> 147
Asp Gly Ser
1

<210> 148
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<400> 148
Tyr Glu
1

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<211> 8
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<400> 149
Gly Tyr Asn Ile Arg Asp Tyr Phe
1   5

<210> 150
<211> 8
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<223> /注釋=「人工序列之說明：合成肽」

<400> 150
Ile Asn Pro Lys Thr Gly Gln Pro
1 5

<210> 151
<211> 12
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成肽」

<400> 151
Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
1 5 10

<210> 152
<211> 2
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<220>
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<223> /注釋=「人工序列之說明：合成肽」

<400> 152
Gly Tyr
1

<210> 153
<211> 5
<212> PRT
<213> 人工序列

<220>
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<223> /注釋=「人工序列之說明：合成肽」

<400> 153
Asp His Phe Ile His
1 5

<210> 154
<211> 10
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<220>
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<223> /注釋=「人工序列之說明：合成肽」

<400> 154
Gln Arg Ser Asp Phe Trp Asp Phe Asp Val
1 5 10

<210> 155
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<212> PRT
<213> 人工序列

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<223> /注釋=「人工序列之說明：合成肽」

<400> 155
Gly Tyr Lys Ile Ser Asp His
1 5

<210> 156
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<220>
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<223> /注釋=「人工序列之說明：合成肽」

<400> 156
Arg Ser Asp Phe Trp Asp Phe Asp
1 5

<210> 157
<211> 8

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<213> 人工序列

<220>
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<223> /注釋=「人工序列之說明：合成肽」

<400> 157
Gly Tyr Lys Ile Ser Asp His Phe
1 5

<210> 158
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<223> /注釋=「人工序列之說明：合成肽」

<400> 158
Ala Arg Gln Arg Ser Asp Phe Trp Asp Phe Asp Val
1 5 10

<210> 159
<211> 5
<212> PRT
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<220>
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<223> /注釋=「人工序列之說明：合成肽」

<400> 159
Asp Tyr Phe Met His
1 5

<210> 160
<211> 17
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<220>
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<223> /注釋=「人工序列之說明：合成肽」

<400> 160

Trp Ile Asn Pro Lys Trp Gly Gln Pro Asn Asn Pro Arg Gln Phe Gln
1 5 10 15

Gly

<210> 161
<211> 17
<212> PRT
<213> 人工序列

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<223> /注釋=「人工序列之說明：合成肽」

<400> 161
Trp Ile Asn Pro Lys Gly Gly Gln Pro Asn Asn Pro Arg Gln Phe Gln
1 5 10 15

Gly

<210> 162
<211> 17
<212> PRT
<213> 人工序列

<220>
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<223> /注釋=「人工序列之說明：合成肽」

<400> 162
Trp Ile Asn Pro Lys Ala Gly Gln Pro Asn Asn Pro Arg Gln Phe Gln
1 5 10 15

Gly

<210> 163
<211> 17
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<223> /注釋=「人工序列之說明：合成肽」

<400> 163
Trp Ile Asn Pro Lys His Gly Gln Pro Asn Asn Pro Arg Gln Phe Gln
1 5 10 15

Gly

<210> 164
<211> 10
<212> PRT
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<223> /注釋=「人工序列之說明：合成肽」

<400> 164
Gln Arg Thr Asp Tyr Trp Asp Phe Asp Val
1 5 10

<210> 165
<211> 7
<212> PRT
<213> 人工序列

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<223> /注釋=「人工序列之說明：合成肽」

<400> 165
Asp Ala Ser Lys Leu Glu Arg
1 5

<210> 166
<211> 7
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<220>
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<223> /注釋=「人工序列之說明：合成肽」

<400> 166

Asp Gly Ser Asn Leu Glu Arg
1 5

<210> 167
<211> 7
<212> PRT
<213> 人工序列

<220>
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<223> /注釋=「人工序列之說明：合成肽」

<400> 167
Asp Gly Ser Lys Leu Glu Thr
1 5

<210> 168
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<223> /注釋=「人工序列之說明：合成肽」

<400> 168
Asp Ala Ser Asn Leu Glu Arg
1 5

<210> 169
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<220>
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<223> /注釋=「人工序列之說明：合成肽」

<400> 169
Pro Lys Trp Gly
1

<210> 170
<211> 4
<212> PRT
<213> 人工序列

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<223> /注釋=「人工序列之說明：合成肽」

<400> 170
Pro Lys Gly Gly
1

<210> 171
<211> 4
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<213> 人工序列

<220>
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<223> /注釋=「人工序列之說明：合成肽」

<400> 171
Pro Lys Ala Gly
1

<210> 172
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<220>
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<223> /注釋=「人工序列之說明：合成肽」

<400> 172
Pro Lys His Gly
1

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<213> 人工序列

<220>
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<223> /注釋=「人工序列之說明：合成肽」

<400> 173
Arg Thr Asp Tyr Trp Asp Phe Asp
1   5

<210> 174
<211> 3
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<220>
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<223> /注釋=「人工序列之說明：合成肽」

<400> 174
Asp Ala Ser
1

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<213> 人工序列

<220>
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<223> /注釋=「人工序列之說明：合成肽」

<400> 175
Ile Asn Pro Lys Trp Gly Gln Pro
1 5

<210> 176
<211> 8
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<213> 人工序列

<220>
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<223> /注釋=「人工序列之說明：合成肽」

<400> 176
Ile Asn Pro Lys Gly Gly Gln Pro
1 5

<210> 177
<211> 8
<212> PRT
<213> 人工序列

<220>

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<223> /注釋=「人工序列之說明：合成肽」

<400> 177
Ile Asn Pro Lys Ala Gly Gln Pro
1 5

<210> 178
<211> 8
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成肽」

<400> 178
Ile Asn Pro Lys His Gly Gln Pro
1 5

<210> 179
<211> 12
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<213> 人工序列

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<223> /注釋=「人工序列之說明：合成肽」

<400> 179
Ala Arg Gln Arg Thr Asp Tyr Trp Asp Phe Asp Val
1 5 10

<210> 180
<211> 3
<212> PRT
<213> 人工序列

<220>
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<223> /注釋=「人工序列之說明：合成肽」

<400> 180
Asp Ala Ser
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<211> 125
<212> PRT
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<220>
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 181
Gln Val Arg Leu Ser Gln Ser Gly Gly Gln Met Lys Lys Pro Gly Asp
1 5 10 15

Ser Met Arg Ile Ser Cys Arg Ala Ser Gly Tyr Glu Phe Ile Asn Cys
20 25 30

Pro Ile Asn Trp Ile Arg Leu Ala Pro Gly Lys Arg Pro Glu Trp Met
35 40 45

Gly Trp Met Lys Pro Arg Trp Gly Ala Val Ser Tyr Ala Arg Gln Leu
50 55 60

Gln Gly Arg Val Thr Met Thr Arg Asp Met Tyr Ser Glu Thr Ala Phe
65 70 75 80

Leu Glu Leu Arg Ser Leu Thr Ser Asp Asp Thr Ala Val Tyr Phe Cys
85 90 95

Thr Arg Gly Lys Tyr Cys Thr Ala Arg Asp Tyr Tyr Asn Trp Asp Phe
100 105 110

Glu His Trp Gly Gln Gly Thr Pro Val Thr Val Ser Ser
115 120 125

<210> 182
<211> 123
<212> PRT
<213> 人工序列

<220>
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 182
Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser
115 120

<210> 183
<211> 125
<212> PRT
<213> 人工序列

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<223> /注釋=「人工序列之說明：合成多肽」

<400> 183
Gln Val Arg Leu Ser Gln Ser Gly Gly Gln Met Lys Lys Pro Gly Asp
1 5 10 15

Ser Met Arg Ile Ser Cys Arg Ala Ser Gly Tyr Glu Phe Ile Asn Cys
20 25 30

Pro Ile Asn Trp Ile Arg Leu Ala Pro Gly Lys Arg Pro Glu Trp Met
35 40 45

Gly Trp Met Lys Pro Arg His Gly Ala Val Ser Tyr Ala Arg Gln Leu
50 55 60

Gln Gly Arg Val Thr Met Thr Arg Asp Met Tyr Ser Glu Thr Ala Phe
65 70 75 80

Leu Glu Leu Arg Ser Leu Thr Ser Asp Asp Thr Ala Val Tyr Phe Cys
85 90 95

Thr Arg Gly Lys Tyr Cys Thr Ala Arg Asp Tyr Tyr Asn Trp Asp Phe
100 105 110

Glu His Trp Gly Gln Gly Thr Pro Val Thr Val Ser Ser
115 120 125

<210> 184
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<212> PRT
<213> 人工序列

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<223> /注釋=「人工序列之說明：合成多肽」

<400> 184
Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Tyr Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser
115 120

<210> 185
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<212> PRT
<213> 人工序列

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<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 185
Gln Val Gln Leu Leu Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Met Val Thr Val Ser Ser
115 120

<210> 186
<211> 123
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 186
Gln Val Ser Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser
115 120

<210> 187
<211> 123
<212> PRT
<213> 人工序列

<220>
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 187
Gln Val Gln Leu Val Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser
115 120

<210> 188
<211> 123
<212> PRT
<213> 人工序列

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<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 188
Gln Val Gln Leu Val Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Lys Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser
115 120

<210> 189
<211> 123
<212> PRT
<213> 人工序列

<220>
<221> source
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<400> 189
Gln Val Gln Leu Leu Gln Ser Gly Ala Glu Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser
115 120

<210> 190
<211> 123
<212> PRT
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<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 190
Gln Val Gln Leu Leu Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser
115 120

<210> 191
<211> 123
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 191
Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser
115 120

<210> 192
<211> 123
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<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 192
Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Lys Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser
115 120

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<400> 193
Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Met His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser
115 120

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<400> 194
Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Met His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Ala Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser
115 120

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<400> 195
Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Trp Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser
115 120

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<400> 196
Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Gly Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser
115 120

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<400> 197
Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Ala Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser
115 120

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<400> 198
Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys His Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser
115 120

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<400> 199
Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Thr Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser
115 120

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<400> 200
Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Thr Met Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser
115 120

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<400> 201

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Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1               5                  10                  15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
            20                  25                  30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
        35                  40                  45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
    50                  55                  60

Gln Gly Arg Val Ser Leu Thr Arg Asp Ala Ser Trp Asp Phe Asp Thr
65                  70                  75                  80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
                85                  90                  95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
            100                 105                 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser
        115                 120
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<400> 202

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Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1               5                  10                  15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
            20                  25                  30
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Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Thr Phe Ser Phe Tyr
65 70 75 80

Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala Val Tyr Phe Cys
85 90 95

Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val Trp Gly Ser Gly
100 105 110

Thr Gln Val Thr Val Ser Ser
115

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<400> 203
Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Ser Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser
115 120

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<400> 204
Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Ser Arg Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser
115 120

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<400> 205
Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Thr Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser
115 120

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<400> 206
Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Thr Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser
115 120

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<400> 207
Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Thr Tyr Phe Cys Ala Arg Gln Arg Thr Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser
115 120

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<400> 208
Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Gln Gly Thr Gln Val Thr Val Ser Ser
115 120

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<400> 209
Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Met Val Thr Val Ser Ser
115 120

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<400> 210
Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser
115 120

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<400> 211
Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Met His Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser
115 120

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<400> 212
Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Met His Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Ala Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser
115 120

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<400> 213
Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Thr Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser
115 120

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<400> 214
Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Thr Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser
115 120

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<400> 215
Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Lys Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Thr Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Thr Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser
115 120

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<400> 216
Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Lys Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Thr Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Thr Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser
115 120

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<400> 217
Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Lys Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Met His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Thr Met Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Ser Arg Leu Arg Ser Asp Asp Thr Ala
85 90 95

Thr Tyr Phe Cys Ala Arg Gln Arg Thr Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Gln Gly Thr Met Val Thr Val Ser Ser
115 120

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<400> 218
Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Lys Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Met His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Thr Met Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Ala Tyr Met Asp Leu Ser Arg Leu Arg Ser Asp Asp Thr Ala
85 90 95

Thr Tyr Phe Cys Ala Arg Gln Arg Thr Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Gln Gly Thr Met Val Thr Val Ser Ser
115 120

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<400> 219
Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Lys Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Tyr Ser Phe Tyr Met Asp Leu Ser Arg Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Gln Gly Thr Met Val Thr Val Ser Ser
115 120

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<400> 220
Gln Val His Leu Ser Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Lys Ile Ser Asp His
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg Gln Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Tyr Ser Phe Tyr Met Asp Leu Lys Ala Val Arg Ser Asp Asp Thr Ala
85 90 95

Ile Tyr Phe Cys Ala Arg Gln Arg Ser Asp Phe Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser
115 120

<210> 221
<211> 123
<212> PRT
<213> 人工序列

<220>
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 221
Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Lys Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Gln Gly Thr Met Val Thr Val Ser Ser
115 120

<210> 222
<211> 103
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<213> 人工序列

<220>
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<400> 222
Glu Ile Val Leu Thr Gln Ser Pro Gly Thr Leu Ser Leu Ser Pro Gly
1 5 10 15

Glu Thr Ala Ile Ile Ser Cys Arg Thr Ser Gln Tyr Gly Ser Leu Ala
20 25 30

Trp Tyr Gln Gln Arg Pro Gly Gln Ala Pro Arg Leu Val Ile Tyr Ser
35 40 45

Gly Ser Thr Arg Ala Ala Gly Ile Pro Asp Arg Phe Ser Gly Ser Arg
50 55 60

Trp Gly Pro Asp Tyr Asn Leu Thr Ile Ser Asn Leu Glu Ser Gly Asp
65 70 75 80

Phe Gly Val Tyr Tyr Cys Gln Gln Tyr Glu Phe Phe Gly Gln Gly Thr
85 90 95

Lys Val Gln Val Asp Ile Lys
100

<210> 223
<211> 99
<212> PRT
<213> 人工序列

<220>
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 223
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 224
<211> 101

<212> PRT
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<400> 224
Ser Leu Thr Gln Ser Pro Gly Thr Leu Ser Leu Ser Pro Gly Glu Thr
1 5 10 15

Ala Ile Ile Ser Cys Arg Thr Ser Gln Tyr Gly Ser Leu Ala Trp Tyr
20 25 30

Gln Gln Arg Pro Gly Gln Ala Pro Arg Leu Val Ile Tyr Ser Gly Ser
35 40 45

Thr Arg Ala Ala Gly Ile Pro Asp Arg Phe Ser Gly Ser Arg Trp Gly
50 55 60

Pro Asp Tyr Asn Leu Thr Ile Ser Asn Leu Glu Ser Gly Asp Phe Gly
65 70 75 80

Val Tyr Tyr Cys Gln Gln Tyr Glu Phe Phe Gly Gln Gly Thr Lys Val
85 90 95

Gln Val Asp Ile Lys
100

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<400> 225
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Lys Val
85 90 95

Asp Ile Lys

<210> 226
<211> 99
<212> PRT
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<400> 226
Glu Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 227
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<212> PRT
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<220>
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<400> 227
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Arg Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 228
<211> 99
<212> PRT
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<400> 228
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 229
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<212> PRT
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<400> 229
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Ala Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 230
<211> 99
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 230
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Asn Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 231
<211> 99
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 231
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Ala Ser
35 40 45

Asn Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 232
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 232
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Thr Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 233
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<400> 233

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Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1               5                  10                  15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
            20                  25                  30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
        35                  40                  45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
    50                  55                  60

Gln Glu Tyr Thr Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65                  70                  75                  80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
                85                  90                  95

Asp Leu Lys
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<210> 234
<211> 99
<212> PRT
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 234

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Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1               5                  10                  15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
            20                  25                  30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
        35                  40                  45
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Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Ser Arg Trp Gly
50 55 60

Gln Glu Tyr Thr Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 235
<211> 99
<212> PRT
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 235
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 236
<211> 99
<212> PRT
<213> 人工序列

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<223> /注釋=「人工序列之說明：合成多肽」

<400> 236
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Ser Arg Trp Gly
50 55 60

Gln Glu Tyr Thr Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 237
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 237
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Ser Gly Ser Gly
50 55 60

Thr Asp Phe Thr Phe Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 238
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 238
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Phe Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 239
<211> 99
<212> PRT
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 239
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Gly Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 240
<211> 99
<212> PRT
<213> 人工序列

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<223> /注釋=「人工序列之說明：合成多肽」

<400> 240
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Phe Gly Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 241
<211> 99
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 241
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Ser Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 242
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 242
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Thr Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 243
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 243
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Asn Leu
85 90 95

Asp Leu Lys

<210> 244
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 244
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Gly Pro Gly Thr Asn Leu
85 90 95

Asp Leu Lys

<210> 245
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 245
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Ser Pro Gly Thr Asn Leu
85 90 95

Asp Leu Lys

<210> 246
<211> 99
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 246
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Thr Pro Gly Thr Asn Leu
85 90 95

Asp Leu Lys

<210> 247
<211> 99
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 247
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Val
85 90 95

Asp Leu Lys

<210> 248
<211> 99
<212> PRT
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<400> 248
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Asn Val
85 90 95

Asp Leu Lys

<210> 249
<211> 99

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<223> /注釋=「人工序列之說明：合成多肽」

<400> 249
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Ile Lys

<210> 250
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 250
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Val
85 90 95

Asp Ile Lys

<210> 251
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<212> PRT
<213> 人工序列

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<223> /注釋=「人工序列之說明：合成多肽」

<400> 251
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Asn Val
85 90 95

Asp Ile Lys

<210> 252
<211> 99
<212> PRT
<213> 人工序列

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<223> /注釋=「人工序列之說明：合成多肽」

<400> 252
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Gly Pro Gly Thr Asn Val
85 90 95

Asp Ile Lys

<210> 253
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<400> 253
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Thr Pro Gly Thr Asn Val
85 90 95

Asp Ile Lys

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<400> 254
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Thr Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Asn Leu
85 90 95

Asp Leu Lys

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<400> 255
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Thr Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Thr Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

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<400> 256
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Asn Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Thr Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Asn Leu
85 90 95

Asp Ile Lys

<210> 257
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<400> 257
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Asn Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Thr Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Thr Pro Gly Thr Arg Leu
85 90 95

Asp Ile Lys

<210> 258
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<400> 258

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Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1               5                  10                  15

Asp Arg Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
            20                  25                  30

Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
        35                  40                  45

Asn Leu Glu Thr Gly Val Pro Ser Arg Phe Ser Gly Ser Arg Trp Gly
    50                  55                  60

Gln Glu Tyr Thr Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Ile Ala
65                  70                  75                  80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Gly Pro Gly Thr Asn Leu
                85                  90                  95

Asp Ile Lys
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<210> 259
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<400> 259

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Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1               5                  10                  15

Asp Arg Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
            20                  25                  30

Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
        35                  40                  45
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Asn Leu Glu Thr Gly Val Pro Ser Arg Phe Ser Gly Ser Arg Trp Gly
50 55 60

Gln Glu Tyr Thr Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Thr Pro Gly Thr Asn Leu
85 90 95

Asp Ile Lys

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<400> 260
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Thr Phe Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 261
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<400> 261
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Ser Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 262
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<400> 262
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Ser Phe Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 263
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<400> 263
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Ala Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 264
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<400> 264
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Ala Phe Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 265
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<400> 265
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr His Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg
100

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<400> 266
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr His Phe Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

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<400> 267
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Gln Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

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<400> 268
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Gln Phe Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

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<400> 269
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Lys Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

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<400> 270
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Phe Lys Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

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<400> 271
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Ala Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 272
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<400> 272
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Phe Ala Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 273
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<400> 273
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Arg Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Thr Gly Val Pro Ser Arg Phe Ser Gly Ser Arg Trp Gly
50 55 60

Gln Glu Tyr Thr Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Phe Gly Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 274
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<400> 274
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Arg Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Thr Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 275
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<400> 275
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Thr Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 276
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<400> 276
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Arg Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ala Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Val Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Ile Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 277
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<400> 277
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Arg Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ala Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr His Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Val Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Ile Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 278
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<400> 278
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 279
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<400> 279
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Phe Gly Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 280
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<400> 280
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr His Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Phe Gly Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 281
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<400> 281
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr His Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 282
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<400> 282
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr His Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Phe Gly Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 283
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<400> 283

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Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1               5                  10                  15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
            20                  25                  30

Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
        35                  40                  45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
    50                  55                  60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65                  70                  75                  80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Phe Gly Pro Gly Thr Arg Leu
                85                  90                  95

Asp Leu Lys
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<400> 284

```
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1               5                  10                  15

Asp Arg Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
            20                  25                  30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
        35                  40                  45
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Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Ser Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

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85 90 95

Asp Leu Lys

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Asp Arg Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Ser Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

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20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Ser Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Ile Ala
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Thr Tyr Phe Cys Gln Val Tyr Glu Phe Phe Gly Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

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Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Ser Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Ile Ala
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85 90 95

Asp Leu Lys

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Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
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85 90 95

Asp Leu Lys

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20 25 30

Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
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Asp Leu Lys

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Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Ser Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Ile Ala
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20 25 30

Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Ser Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Ile Ala
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85 90 95

Asp Leu Lys

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20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Ser Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Ile Ala
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85 90 95

Asp Leu Lys

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Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Ser Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Ile Ala
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85 90 95

Asp Leu Lys

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Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr His Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
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Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

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Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr His Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Phe Gly Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

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Asp Arg Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Ser Arg Trp Gly
50 55 60

Gln Glu Tyr His Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

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1 5 10 15

Asp Arg Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Ser Arg Trp Gly
50 55 60

Gln Glu Tyr His Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Ile Ala
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85 90 95

Asp Leu Lys

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1 5 10 15

Asp Arg Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Ser Arg Trp Gly
50 55 60

Gln Glu Tyr His Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

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85 90 95

Asp Leu Lys

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1 5 10 15

Asp Arg Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Ser Arg Trp Gly
50 55 60

Gln Glu Tyr His Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Ile Ala
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85 90 95

Asp Leu Lys

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Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr His Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
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Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

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1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr His Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Phe Gly Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

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1 5 10 15

Asp Arg Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Ser Arg Trp Gly
50 55 60

Gln Glu Tyr His Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

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<400> 303
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1 5 10 15

Asp Arg Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Ser Arg Trp Gly
50 55 60

Gln Glu Tyr His Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

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1 5 10 15

Asp Arg Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Ser Arg Trp Gly
50 55 60

Gln Glu Tyr His Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Phe Gly Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

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Asp Arg Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Ser Arg Trp Gly
50 55 60

Gln Glu Tyr His Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Ile Ala
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85 90 95

Asp Leu Lys

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Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Thr Arg Arg Gly
50 55 60

Gln Asp Tyr Ile Phe Ser Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
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85 90 95

Asp Leu Lys

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Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Phe Gly
50 55 60

Gln Asp Tyr Ile Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

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Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Ser Arg Phe Gly
50 55 60

Gln Lys Tyr Gln Leu Ser Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

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Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Phe Gly
50 55 60

Gln Asp Tyr Ile Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
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85 90 95

Asp Leu Lys

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Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ala Arg Phe Ser Gly Arg Arg Phe Gly
50 55 60

Gln Asp Tyr Ile Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Val Ala
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Thr Tyr Phe Cys Gln Val Tyr Glu Phe Ile Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

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1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ala Arg Phe Ser Gly Arg Arg Phe Gly
50 55 60

Gln Asp Tyr Ile Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Val Ala
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85 90 95

Asp Leu Lys

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<400> 332
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1 5 10

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<400> 333
Arg Arg Trp Gly Gln Asn Tyr Asn Phe Thr
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<400> 334
Thr Arg Arg Gly Gln Asp Tyr Ile Phe Ser
1 5 10

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<400> 335
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1 5 10

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<400> 339
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1 5 10

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<400> 340

Thr Arg Arg Gly Gln Gln Tyr Thr Leu Pro
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<400> 341
Thr Arg Arg Gly Gln Asp Tyr Ile Leu Ala
1 5 10

<210> 342
<211> 10
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成肽」

<400> 342
Ser Arg Phe Gly Gln Lys Tyr Gln Leu Ser
1 5 10

<210> 343
<211> 849
<212> PRT
<213> 人類免疫缺陷病毒1

<400> 343
Met Lys Val Met Gly Thr Lys Lys Asn Tyr Gln His Leu Trp Arg Trp
1 5 10 15

Gly Ile Met Leu Leu Gly Met Leu Met Met Ser Ser Ala Ala Glu Gln
20 25 30

Leu Trp Val Thr Val Tyr Tyr Gly Val Pro Val Trp Arg Glu Ala Asn
35 40 45

```
Thr Thr Leu Phe Cys Ala Ser Asp Ala Lys Ala Tyr Asp Thr Glu Val
    50                  55                  60

His Asn Val Trp Ala Thr His Ala Cys Val Pro Thr Asp Pro Asn Pro
65                  70                  75                  80

Gln Glu Val Val Met Gly Asn Val Thr Glu Asp Phe Asn Met Trp Lys
                85                  90                  95

Asn Asn Met Val Glu Gln Met His Glu Asp Ile Ile Ser Leu Trp Asp
            100                 105                 110

Gln Ser Leu Lys Pro Cys Val Lys Leu Thr Pro Leu Cys Val Thr Leu
        115                 120                 125

His Cys Thr Asn Val Thr Ile Ser Ser Thr Asn Gly Ser Thr Ala Asn
    130                 135                 140

Val Thr Met Arg Glu Glu Met Lys Asn Cys Ser Phe Asn Thr Thr Thr
145                 150                 155                 160

Val Ile Arg Asp Lys Ile Gln Lys Glu Tyr Ala Leu Phe Tyr Lys Leu
                165                 170                 175

Asp Ile Val Pro Ile Glu Gly Lys Asn Thr Asn Thr Ser Tyr Arg Leu
            180                 185                 190

Ile Asn Cys Asn Thr Ser Val Ile Thr Gln Ala Cys Pro Lys Val Ser
        195                 200                 205

Phe Glu Pro Ile Pro Ile His Tyr Cys Ala Pro Ala Gly Phe Ala Ile
    210                 215                 220

Leu Lys Cys Asn Asn Lys Thr Phe Asn Gly Lys Gly Pro Cys Arg Asn
225                 230                 235                 240

Val Ser Thr Val Gln Cys Thr His Gly Ile Lys Pro Val Val Ser Thr
                245                 250                 255
```

Gln Leu Leu Leu Asn Gly Ser Leu Ala Glu Glu Asp Ile Ile Ile Arg
260 265 270

Ser Glu Asn Phe Thr Asn Asn Gly Lys Asn Ile Ile Val Gln Leu Lys
275 280 285

Glu Pro Val Lys Ile Asn Cys Thr Arg Pro Gly Asn Asn Thr Arg Arg
290 295 300

Ser Ile Asn Ile Gly Pro Gly Arg Ala Phe Tyr Ala Thr Gly Ala Ile
305 310 315 320

Ile Gly Asp Ile Arg Lys Ala His Cys Asn Ile Ser Thr Glu Gln Trp
325 330 335

Asn Asn Thr Leu Thr Gln Ile Val Asp Lys Leu Arg Glu Gln Phe Gly
340 345 350

Asn Lys Thr Ile Ile Phe Asn Gln Ser Ser Gly Gly Asp Pro Glu Val
355 360 365

Val Met His Thr Phe Asn Cys Gly Gly Glu Phe Phe Tyr Cys Asn Ser
370 375 380

Thr Gln Leu Phe Asn Ser Thr Trp Phe Asn Asn Gly Thr Ser Thr Trp
385 390 395 400

Asn Ser Thr Ala Asp Asn Ile Thr Leu Pro Cys Arg Ile Lys Gln Val
405 410 415

Ile Asn Met Trp Gln Glu Val Gly Lys Ala Met Tyr Ala Pro Pro Ile
420 425 430

Arg Gly Gln Ile Asp Cys Ser Ser Asn Ile Thr Gly Leu Ile Leu Thr
435 440 445

```
Arg Asp Gly Gly Ser Asn Ser Ser Gln Asn Glu Thr Phe Arg Pro Gly
    450                 455                 460

Gly Gly Asn Met Lys Asp Asn Trp Arg Ser Glu Leu Tyr Lys Tyr Lys
465                 470                 475                 480

Val Val Lys Ile Glu Pro Leu Gly Ile Ala Pro Thr Arg Ala Lys Arg
                485                 490                 495

Arg Val Val Gln Arg Glu Lys Arg Ala Val Thr Leu Gly Ala Val Phe
            500                 505                 510

Leu Gly Phe Leu Gly Ala Ala Gly Ser Thr Met Gly Ala Ala Ser Leu
        515                 520                 525

Thr Leu Thr Val Gln Ala Arg Leu Leu Leu Ser Gly Ile Val Gln Gln
    530                 535                 540

Gln Ser Asn Leu Leu Arg Ala Ile Glu Ala Gln Gln His Met Leu Gln
545                 550                 555                 560

Leu Thr Val Trp Gly Ile Lys Gln Leu Gln Ala Arg Val Leu Ala Ile
                565                 570                 575

Glu Arg Tyr Leu Lys Asp Gln Gln Leu Leu Gly Ile Trp Gly Cys Ser
            580                 585                 590

Gly Lys Leu Ile Cys Thr Thr Thr Val Pro Trp Asn Thr Ser Trp Ser
        595                 600                 605

Asn Lys Ser Tyr Asp Tyr Ile Trp Asn Asn Met Thr Trp Met Gln Trp
    610                 615                 620

Glu Arg Glu Ile Asp Asn Tyr Thr Gly Phe Ile Tyr Thr Leu Ile Glu
625                 630                 635                 640

Glu Ser Gln Asn Gln Gln Glu Lys Asn Glu Leu Glu Leu Leu Glu Leu
                645                 650                 655
```

Asp Lys Trp Ala Ser Leu Trp Asn Trp Phe Asn Ile Thr Asn Trp Leu
660 665 670

Trp Tyr Ile Lys Leu Phe Ile Met Ile Ile Gly Gly Leu Val Gly Leu
675 680 685

Arg Ile Val Cys Ala Val Leu Ser Ile Val Asn Arg Val Arg Gln Gly
690 695 700

Tyr Ser Pro Leu Ser Phe Gln Thr Arg Leu Pro Asn Pro Arg Gly Pro
705 710 715 720

Asp Arg Pro Glu Glu Thr Glu Gly Glu Gly Gly Glu Arg Asp Arg Asp
725 730 735

Arg Ser Ala Arg Leu Val Asn Gly Phe Leu Ala Ile Ile Trp Asp Asp
740 745 750

Leu Arg Ser Leu Cys Leu Phe Ser Tyr His Arg Leu Arg Asp Leu Leu
755 760 765

Leu Ile Val Ala Arg Val Val Glu Ile Leu Gly Arg Arg Gly Trp Glu
770 775 780

Ile Leu Lys Tyr Trp Trp Asn Leu Leu Lys Tyr Trp Ser Gln Glu Leu
785 790 795 800

Lys Asn Ser Ala Val Ser Leu Leu Asn Val Thr Ala Ile Ala Val Ala
805 810 815

Glu Gly Thr Asp Arg Val Ile Glu Ile Val Gln Arg Ala Val Arg Ala
820 825 830

Ile Leu His Ile Pro Thr Arg Ile Arg Gln Gly Phe Glu Arg Ala Leu
835 840 845

Leu

<210> 344
<211> 475
<212> PRT
<213> 人類免疫缺陷病毒1

<400> 344

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Ala Glu Gln Leu Trp Val Thr Val Tyr Tyr Gly Val Pro Val Trp Arg
1               5                  10                  15

Glu Ala Asn Thr Thr Leu Phe Cys Ala Ser Asp Ala Lys Ala Tyr Asp
            20                  25                  30

Thr Glu Val His Asn Val Trp Ala Thr His Ala Cys Val Pro Thr Asp
        35                  40                  45

Pro Asn Pro Gln Glu Val Val Met Gly Asn Val Thr Glu Asp Phe Asn
    50                  55                  60

Met Trp Lys Asn Asn Met Val Glu Gln Met His Glu Asp Ile Ile Ser
65                  70                  75                  80

Leu Trp Asp Gln Ser Leu Lys Pro Cys Val Lys Leu Thr Pro Leu Cys
                85                  90                  95

Val Thr Leu His Cys Thr Asn Val Thr Ile Ser Ser Thr Asn Gly Ser
            100                 105                 110

Thr Ala Asn Val Thr Met Arg Glu Glu Met Lys Asn Cys Ser Phe Asn
        115                 120                 125

Thr Thr Thr Val Ile Arg Asp Lys Ile Gln Lys Glu Tyr Ala Leu Phe
    130                 135                 140

Tyr Lys Leu Asp Ile Val Pro Ile Glu Gly Lys Asn Thr Asn Thr Ser
145                 150                 155                 160
```

Tyr Arg Leu Ile Asn Cys Asn Thr Ser Val Ile Thr Gln Ala Cys Pro
165 170 175

Lys Val Ser Phe Glu Pro Ile Pro Ile His Tyr Cys Ala Pro Ala Gly
180 185 190

Phe Ala Ile Leu Lys Cys Asn Asn Lys Thr Phe Asn Gly Lys Gly Pro
195 200 205

Cys Arg Asn Val Ser Thr Val Gln Cys Thr His Gly Ile Lys Pro Val
210 215 220

Val Ser Thr Gln Leu Leu Leu Asn Gly Ser Leu Ala Glu Glu Asp Ile
225 230 235 240

Ile Ile Arg Ser Glu Asn Phe Thr Asn Asn Gly Lys Asn Ile Ile Val
245 250 255

Gln Leu Lys Glu Pro Val Lys Ile Asn Cys Thr Arg Pro Gly Asn Asn
260 265 270

Thr Arg Arg Ser Ile Asn Ile Gly Pro Gly Arg Ala Phe Tyr Ala Thr
275 280 285

Gly Ala Ile Ile Gly Asp Ile Arg Lys Ala His Cys Asn Ile Ser Thr
290 295 300

Glu Gln Trp Asn Asn Thr Leu Thr Gln Ile Val Asp Lys Leu Arg Glu
305 310 315 320

Gln Phe Gly Asn Lys Thr Ile Ile Phe Asn Gln Ser Ser Gly Gly Asp
325 330 335

Pro Glu Val Val Met His Thr Phe Asn Cys Gly Gly Glu Phe Phe Tyr
340 345 350

Cys Asn Ser Thr Gln Leu Phe Asn Ser Thr Trp Phe Asn Asn Gly Thr
355 360 365

Ser Thr Trp Asn Ser Thr Ala Asp Asn Ile Thr Leu Pro Cys Arg Ile
370 375 380

Lys Gln Val Ile Asn Met Trp Gln Glu Val Gly Lys Ala Met Tyr Ala
385 390 395 400

Pro Pro Ile Arg Gly Gln Ile Asp Cys Ser Ser Asn Ile Thr Gly Leu
405 410 415

Ile Leu Thr Arg Asp Gly Gly Ser Asn Ser Ser Gln Asn Glu Thr Phe
420 425 430

Arg Pro Gly Gly Gly Asn Met Lys Asp Asn Trp Arg Ser Glu Leu Tyr
435 440 445

Lys Tyr Lys Val Val Lys Ile Glu Pro Leu Gly Ile Ala Pro Thr Arg
450 455 460

Ala Lys Arg Arg Val Val Gln Arg Glu Lys Arg
465 470 475

<210> 345
<211> 481
<212> PRT
<213> 人類免疫缺陷病毒1

<400> 345
Thr Glu Lys Leu Trp Val Thr Val Tyr Tyr Gly Val Pro Val Trp Lys
1 5 10 15

Glu Ala Thr Thr Thr Leu Phe Cys Ala Ser Asp Ala Lys Ala Tyr Asp
20 25 30

Thr Glu Val His Asn Val Trp Ala Thr His Ala Cys Val Pro Thr Asp
35 40 45

Pro Asn Pro Gln Glu Val Val Leu Val Asn Val Thr Glu Asn Phe Asn
50 55 60

Met Trp Lys Asn Asp Met Val Glu Gln Met His Glu Asp Ile Ile Ser
65 70 75 80

Leu Trp Asp Gln Ser Leu Lys Pro Cys Val Lys Leu Thr Pro Leu Cys
85 90 95

Val Ser Leu Lys Cys Thr Asp Leu Lys Asn Asp Thr Asn Thr Asn Ser
100 105 110

Ser Ser Gly Arg Met Ile Met Glu Lys Gly Glu Ile Lys Asn Cys Ser
115 120 125

Phe Asn Ile Ser Thr Ser Ile Arg Gly Lys Val Gln Lys Glu Tyr Ala
130 135 140

Phe Phe Tyr Lys Leu Asp Ile Ile Pro Ile Asp Asn Asp Thr Thr Ser
145 150 155 160

Tyr Lys Leu Thr Ser Cys Asn Thr Ser Val Ile Thr Gln Ala Cys Pro
165 170 175

Lys Val Ser Phe Glu Pro Ile Pro Ile His Tyr Cys Ala Pro Ala Gly
180 185 190

Phe Ala Ile Leu Lys Cys Asn Asn Lys Thr Phe Asn Gly Thr Gly Pro
195 200 205

Cys Thr Asn Val Ser Thr Val Gln Cys Thr His Gly Ile Arg Pro Val
210 215 220

Val Ser Thr Gln Leu Leu Leu Asn Gly Ser Leu Ala Glu Glu Glu Val
225 230 235 240

Val Ile Arg Ser Val Asn Phe Thr Asp Asn Ala Lys Thr Ile Ile Val
245 250 255

Gln Leu Asn Thr Ser Val Glu Ile Asn Cys Thr Arg Pro Asn Asn Asn
260 265 270

Thr Arg Lys Arg Ile Arg Ile Gln Arg Gly Pro Gly Arg Ala Phe Val
275 280 285

Thr Ile Gly Lys Ile Gly Asn Met Arg Gln Ala His Cys Asn Ile Ser
290 295 300

Arg Ala Lys Trp Asn Asn Thr Leu Lys Gln Ile Ala Ser Lys Leu Arg
305 310 315 320

Glu Gln Phe Gly Asn Asn Lys Thr Ile Ile Phe Lys Gln Ser Ser Gly
325 330 335

Gly Asp Pro Glu Ile Val Thr His Ser Phe Asn Cys Gly Gly Glu Phe
340 345 350

Phe Tyr Cys Asn Ser Thr Gln Leu Phe Asn Ser Thr Trp Phe Asn Ser
355 360 365

Thr Trp Ser Thr Glu Gly Ser Asn Asn Thr Glu Gly Ser Asp Thr Ile
370 375 380

Thr Leu Pro Cys Arg Ile Lys Gln Ile Ile Asn Met Trp Gln Lys Val
385 390 395 400

Gly Lys Ala Met Tyr Ala Pro Pro Ile Ser Gly Gln Ile Arg Cys Ser
405 410 415

Ser Asn Ile Thr Gly Leu Leu Leu Thr Arg Asp Gly Gly Asn Ser Asn
420 425 430

Asn Glu Ser Glu Ile Phe Arg Pro Gly Gly Gly Asp Met Arg Asp Asn
435 440 445

Trp Arg Ser Glu Leu Tyr Lys Tyr Lys Val Val Lys Ile Glu Pro Leu
450 455 460

Gly Val Ala Pro Thr Lys Ala Lys Arg Arg Val Val Gln Arg Glu Lys
465 470 475 480

Arg

<210> 346
<211> 35
<212> PRT
<213> 人類免疫缺陷病毒1

<400> 346
Cys Thr Arg Pro Asn Asn Asn Thr Arg Lys Ser Ile His Ile Gly Pro
1 5 10 15

Gly Arg Ala Phe Tyr Thr Thr Gly Glu Ile Ile Gly Asp Ile Arg Gln
20 25 30

Ala His Cys
35

<210> 347
<211> 330
<212> PRT
<213> 智人

<400> 347
Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys
1 5 10 15

Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr
20 25 30

Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser
35 40 45

Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser
50 55 60

```
Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr
65                  70                  75                  80

Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys
                85                  90                  95

Arg Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys
            100                 105                 110

Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro
        115                 120                 125

Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys
    130                 135                 140

Val Val Val Asp Val Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp
145                 150                 155                 160

Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu
                165                 170                 175

Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu
            180                 185                 190

His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn
        195                 200                 205

Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly
    210                 215                 220

Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu
225                 230                 235                 240

Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr
                245                 250                 255

Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn
            260                 265                 270
```

Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe
275 280 285

Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn
290 295 300

Val Phe Ser Cys Ser Val Met His Glu Ala Leu His Asn His Tyr Thr
305 310 315 320

Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
325 330

<210> 348
<211> 330
<212> PRT
<213> 智人

<400> 348
Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys
1 5 10 15

Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr
20 25 30

Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser
35 40 45

Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser
50 55 60

Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr
65 70 75 80

Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys
85 90 95

Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys
100 105 110

Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro
115 120 125

Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys
130 135 140

Val Val Val Asp Val Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp
145 150 155 160

Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu
165 170 175

Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu
180 185 190

His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn
195 200 205

Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly
210 215 220

Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu
225 230 235 240

Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr
245 250 255

Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn
260 265 270

Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe
275 280 285

Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn
290 295 300

Val Phe Ser Cys Ser Val Met His Glu Ala Leu His Asn His Tyr Thr
305 310 315 320

Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
325 330

<210> 349
<211> 107
<212> PRT
<213> 智人

<400> 349
Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro Ser Asp Glu
1 5 10 15

Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu Asn Asn Phe
20 25 30

Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn Val Leu Gln
35 40 45

Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser Lys Asp Ser
50 55 60

Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala Asp Tyr Glu
65 70 75 80

Lys His Lys Leu Tyr Ala Cys Glu Val Thr His Gln Gly Leu Ser Ser
85 90 95

Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
100 105

<210> 350
<211> 107
<212> PRT
<213> 智人

<400> 350
Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro Ser Asp Glu
1 5 10 15

Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu Asn Asn Phe
20 25 30

Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn Ala Leu Gln
35 40 45

Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser Lys Asp Ser
50 55 60

Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala Asp Tyr Glu
65 70 75 80

Lys His Lys Leu Tyr Ala Cys Glu Val Thr His Gln Gly Leu Ser Ser
85 90 95

Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
100 105

<210> 351
<211> 107
<212> PRT
<213> 智人

<400> 351
Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro Ser Asp Glu
1 5 10 15

Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu Asn Asn Phe
20 25 30

Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn Ala Leu Gln
35 40 45

Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser Lys Asp Ser
50 55 60

Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala Asp Tyr Glu
65 70 75 80

Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly Leu Ser Ser
85 90 95

Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
100 105

<210> 352
<211> 106
<212> PRT
<213> 智人

<400> 352
Gly Gln Pro Lys Ala Asn Pro Thr Val Thr Leu Phe Pro Pro Ser Ser
1 5 10 15

Glu Glu Leu Gln Ala Asn Lys Ala Thr Leu Val Cys Leu Ile Ser Asp
20 25 30

Phe Tyr Pro Gly Ala Val Thr Val Ala Trp Lys Ala Asp Gly Ser Pro
35 40 45

Val Lys Ala Gly Val Glu Thr Thr Lys Pro Ser Lys Gln Ser Asn Asn
50 55 60

Lys Tyr Ala Ala Ser Ser Tyr Leu Ser Leu Thr Pro Glu Gln Trp Lys
65 70 75 80

Ser His Arg Ser Tyr Ser Cys Gln Val Thr His Glu Gly Ser Thr Val
85 90 95

Glu Lys Thr Val Ala Pro Thr Glu Cys Ser
100 105

<210> 353
<211> 106
<212> PRT
<213> 智人

<400> 353

Gly Gln Pro Lys Ala Ala Pro Ser Val Thr Leu Phe Pro Pro Ser Ser
1 5 10 15

Glu Glu Leu Gln Ala Asn Lys Ala Thr Leu Val Cys Leu Ile Ser Asp
20 25 30

Phe Tyr Pro Gly Ala Val Thr Val Ala Trp Lys Ala Asp Ser Ser Pro
35 40 45

Val Lys Ala Gly Val Glu Thr Thr Thr Pro Ser Lys Gln Ser Asn Asn
50 55 60

Lys Tyr Ala Ala Ser Ser Tyr Leu Ser Leu Thr Pro Glu Gln Trp Lys
65 70 75 80

Ser His Arg Ser Tyr Ser Cys Gln Val Thr His Glu Gly Ser Thr Val
85 90 95

Glu Lys Thr Val Ala Pro Thr Glu Cys Ser
100 105

<210> 354
<211> 106
<212> PRT
<213> 智人

<400> 354
Gly Gln Pro Lys Ala Ala Pro Ser Val Thr Leu Phe Pro Pro Ser Ser
1 5 10 15

Glu Glu Leu Gln Ala Asn Lys Ala Thr Leu Val Cys Leu Ile Ser Asp
20 25 30

Phe Tyr Pro Gly Ala Val Thr Val Ala Trp Lys Ala Asp Ser Ser Pro
35 40 45

Ala Lys Ala Gly Val Glu Thr Thr Thr Pro Ser Lys Gln Ser Asn Asn
50 55 60

Lys Tyr Ala Ala Ser Ser Tyr Leu Ser Leu Thr Pro Glu Gln Trp Lys
65 70 75 80

Ser His Lys Ser Tyr Ser Cys Gln Val Thr His Glu Gly Ser Thr Val
85 90 95

Glu Lys Thr Val Ala Pro Thr Glu Cys Ser
100 105

<210> 355
<211> 106
<212> PRT
<213> 智人

<400> 355
Gly Gln Pro Lys Ala Ala Pro Ser Val Thr Leu Phe Pro Pro Ser Ser
1 5 10 15

Glu Glu Leu Gln Ala Asn Lys Ala Thr Leu Val Cys Leu Val Ser Asp
20 25 30

Phe Tyr Pro Gly Ala Val Thr Val Ala Trp Lys Ala Asp Gly Ser Pro
35 40 45

Val Lys Val Gly Val Glu Thr Thr Lys Pro Ser Lys Gln Ser Asn Asn
50 55 60

Lys Tyr Ala Ala Ser Ser Tyr Leu Ser Leu Thr Pro Glu Gln Trp Lys
65 70 75 80

Ser His Arg Ser Tyr Ser Cys Arg Val Thr His Glu Gly Ser Thr Val
85 90 95

Glu Lys Thr Val Ala Pro Ala Glu Cys Ser
100 105

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<213> 人工序列

<220>
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<223> /注釋=「人工序列之說明：合成肽」

<400> 427
Gly Gly Gly Ser
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<210> 428
<211> 4
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成肽」

<400> 428
Ser Gly Gly Gly
1

<210> 429
<211> 5
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成肽」

<400> 429
Gly Gly Gly Gly Ser
1 5

<210> 430
<211> 5
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成肽」

<400> 430
Ser Gly Gly Gly Gly
1 5

<210> 431
<211> 6
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成肽」

<400> 431
Gly Gly Gly Gly Gly Ser
1 5

<210> 432
<211> 6
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成肽」

<400> 432
Ser Gly Gly Gly Gly Gly
1 5

<210> 433
<211> 7
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成肽」

<400> 433
Gly Gly Gly Gly Gly Gly Ser
1 5

<210> 434
<211> 7
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成肽」

<400> 434
Ser Gly Gly Gly Gly Gly Gly
1 5

<210> 435
<211> 5
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成肽」

<400> 435
Gly Gly Gly Gly Ser
1 5

<210> 436
<211> 5

<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成肽」

<400> 436
Ser Gly Gly Gly Gly
1 5

<210> 437
<211> 330
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 437
Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys
1 5 10 15

Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr
20 25 30

Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser
35 40 45

Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser
50 55 60

Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr
65 70 75 80

Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys
85 90 95

Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys
100 105 110

```
Pro Ala Pro Glu Leu Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro
        115                 120                 125

Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys
    130                 135                 140

Val Val Val Asp Val Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp
145                 150                 155                 160

Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu
                165                 170                 175

Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu
            180                 185                 190

His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn
        195                 200                 205

Lys Ala Leu Pro Leu Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly
    210                 215                 220

Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu
225                 230                 235                 240

Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr
                245                 250                 255

Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn
            260                 265                 270

Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe
        275                 280                 285

Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn
    290                 295                 300

Val Phe Ser Cys Ser Val Met His Glu Ala Leu His Asn His Tyr Thr
305                 310                 315                 320
```

Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
325 330

<210> 438
<211> 330
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 438
Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys
1 5 10 15

Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr
20 25 30

Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser
35 40 45

Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser
50 55 60

Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr
65 70 75 80

Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys
85 90 95

Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys
100 105 110

Pro Ala Pro Glu Leu Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro
115 120 125

Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys
130 135 140

Val Val Val Asp Val Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp
145 150 155 160

Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu
165 170 175

Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu
180 185 190

His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn
195 200 205

Lys Ala Leu Pro Leu Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly
210 215 220

Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu
225 230 235 240

Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr
245 250 255

Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn
260 265 270

Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe
275 280 285

Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn
290 295 300

Val Phe Ser Cys Ser Val Leu His Glu Ala Leu His Ser His Tyr Thr
305 310 315 320

Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
325 330

<210> 439
<211> 330
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 439
Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys
1 5 10 15

Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr
20 25 30

Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser
35 40 45

Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser
50 55 60

Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr
65 70 75 80

Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys
85 90 95

Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys
100 105 110

Pro Ala Pro Glu Leu Leu Gly Gly Pro Asp Val Phe Leu Phe Pro Pro
115 120 125

Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys
130 135 140

Val Val Val Asp Val Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp
145 150 155 160

Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu
165 170 175

Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu
180 185 190

His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn
195 200 205

Lys Ala Leu Pro Ala Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly
210 215 220

Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu
225 230 235 240

Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr
245 250 255

Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn
260 265 270

Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe
275 280 285

Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn
290 295 300

Val Phe Ser Cys Ser Val Leu His Glu Ala Leu His Ser His Tyr Thr
305 310 315 320

Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
325 330

<210> 440
<211> 330
<212> PRT
<213> 人工序列

<220>

<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 440

```
Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys
1               5                  10                  15

Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr
            20                  25                  30

Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser
        35                  40                  45

Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser
    50                  55                  60

Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr
65                  70                  75                  80

Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys
                85                  90                  95

Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys
            100                 105                 110

Pro Ala Pro Glu Leu Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro
        115                 120                 125

Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys
    130                 135                 140

Val Val Val Asp Val Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp
145                 150                 155                 160

Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu
                165                 170                 175

Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu
            180                 185                 190
```

His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn
195 200 205

Lys Ala Leu Pro Ala Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly
210 215 220

Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu
225 230 235 240

Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr
245 250 255

Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn
260 265 270

Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe
275 280 285

Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn
290 295 300

Val Phe Ser Cys Ser Val Leu His Glu Ala Leu His Ser His Tyr Thr
305 310 315 320

Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
325 330

<210> 441
<211> 330
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 441
Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys
1 5 10 15

Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr
20 25 30

Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser
35 40 45

Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser
50 55 60

Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr
65 70 75 80

Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys
85 90 95

Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys
100 105 110

Pro Ala Pro Glu Leu Leu Gly Gly Pro Asp Val Phe Leu Phe Pro Pro
115 120 125

Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys
130 135 140

Val Val Val Asp Val Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp
145 150 155 160

Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu
165 170 175

Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu
180 185 190

His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn
195 200 205

```
Lys Ala Leu Pro Leu Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly
    210                 215                 220

Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu
225                 230                 235                 240

Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr
                245                 250                 255

Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn
            260                 265                 270

Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe
        275                 280                 285

Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn
    290                 295                 300

Val Phe Ser Cys Ser Val Leu His Glu Ala Leu His Ser His Tyr Thr
305                 310                 315                 320

Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
                325                 330
```

<210> 442
<211> 330
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 442

```
Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys
1               5                   10                  15

Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr
            20                  25                  30
```

Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser
35 40 45

Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser
50 55 60

Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr
65 70 75 80

Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys
85 90 95

Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys
100 105 110

Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe Leu Leu Pro Pro
115 120 125

Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys
130 135 140

Val Val Val Asp Val Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp
145 150 155 160

Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Pro Glu
165 170 175

Glu Gln Tyr Asn Ser Thr Leu Arg Val Val Ser Ile Leu Thr Val Leu
180 185 190

His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn
195 200 205

Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly
210 215 220

Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu
225 230 235 240

Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr
245 250 255

Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn
260 265 270

Asn Tyr Lys Thr Thr Pro Leu Val Leu Asp Ser Asp Gly Ser Phe Phe
275 280 285

Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn
290 295 300

Val Phe Ser Cys Ser Val Leu His Glu Ala Leu His Ser His Tyr Thr
305 310 315 320

Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
325 330

<210> 443
<211> 462
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 443
Gln Met Gln Leu Gln Glu Ser Gly Pro Gly Leu Val Lys Pro Ser Glu
1 5 10 15

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Asn Pro Ser Leu Lys
50 55 60

Ser Arg Val His Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

Ser Leu Thr Gly Val Thr Ala Ala Asp Ser Gly Lys Tyr Tyr Cys Ala
85 90 95

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Thr Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Ala Gly Pro Asp Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Leu Pro Glu Glu Lys Thr Ile Ser
340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Leu His Glu Ala Leu His
435 440 445

Ser His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
450 455 460

<210> 444
<211> 5
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成肽」

<400> 444
Asp Ser Tyr Trp Ser
1 5

<210> 445
<211> 16
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成肽」

<400> 445
Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Asn Pro Ser Leu Lys Ser
1 5 10 15

<210> 446
<211> 24
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成肽」

<400> 446
Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu Trp
1 5 10 15

Phe Thr Tyr Phe Tyr Met Asp Val
20

<210> 447
<211> 211

<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 447

```
Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1               5                  10                  15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
            20                  25                  30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
        35                  40                  45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Arg Pro Gly Thr
    50                  55                  60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65                  70                  75                  80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
                85                  90                  95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
            100                 105                 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
        115                 120                 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
    130                 135                 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145                 150                 155                 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
                165                 170                 175
```

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
195 200 205

Glu Cys Ser
210

<210> 448
<211> 11
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成肽」

<400> 448
Gly Glu Lys Ser Leu Gly Ser Arg Ala Val Gln
1 5 10

<210> 449
<211> 7
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成肽」

<400> 449
Asn Asn Gln Asp Arg Pro Ser
1 5

<210> 450
<211> 12
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成肽」

<400> 450
His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val
1 5 10

<210> 451
<211> 462
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 451
Gln Met Gln Leu Gln Glu Ser Gly Pro Gly Leu Val Lys Pro Ser Glu
1 5 10 15

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Asn Pro Ser Leu Lys
50 55 60

Ser Arg Val His Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

Ser Leu Ser Ser Val Thr Ala Ala Asp Ser Gly Lys Tyr Tyr Cys Ala
85 90 95

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Lys Gly Thr Gln Val
115 120 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Ala Gly Pro Asp Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Leu Pro Glu Glu Lys Thr Ile Ser
340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Leu His Glu Ala Leu His
435 440 445

Ser His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
450 455 460

<210> 452
<211> 211
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 452
Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Ser Pro Phe Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
195 200 205

Glu Cys Ser
210

<210> 453
<211> 4

<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成肽」

<400> 453
Trp Asp Phe Asp
1

<210> 454
<211> 462
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 454
Gln Met Gln Leu Gln Glu Ser Gly Pro Gly Leu Val Lys Pro Ser Glu
1 5 10 15

Thr Leu Ser Leu Thr Cys Ser Val Ser Gly Ala Ser Ile Ser Asp Ser
20 25 30

Tyr Trp Ser Trp Ile Arg Arg Ser Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Tyr Val His Lys Ser Gly Asp Thr Asn Tyr Asn Pro Ser Leu Lys
50 55 60

Ser Arg Val His Leu Ser Leu Asp Thr Ser Lys Asn Gln Val Ser Leu
65 70 75 80

Ser Leu Thr Gly Val Thr Ala Ala Asp Ser Gly Lys Tyr Tyr Cys Ala
85 90 95

Arg Thr Leu His Gly Arg Arg Ile Tyr Gly Ile Val Ala Phe Asn Glu
100 105 110

```
Trp Phe Thr Tyr Phe Tyr Met Asp Val Trp Gly Thr Gly Thr Gln Val
        115                 120                 125

Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
    130                 135                 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145                 150                 155                 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
                165                 170                 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
            180                 185                 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
        195                 200                 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
    210                 215                 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225                 230                 235                 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Ala Gly Pro Asp Val Phe
                245                 250                 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
            260                 265                 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
        275                 280                 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
    290                 295                 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
305                 310                 315                 320
```

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Leu Pro Glu Glu Lys Thr Ile Ser
340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Leu His Glu Ala Leu His
435 440 445

Ser His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
450 455 460

<210> 455
<211> 211
<212> PRT
<213> 人工序列

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<400> 455
Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

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Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
            20                  25                  30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
        35                  40                  45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Tyr Arg Pro Gly Thr
    50                  55                  60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65                  70                  75                  80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
                85                  90                  95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
            100                 105                 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
        115                 120                 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
    130                 135                 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145                 150                 155                 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
                165                 170                 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
            180                 185                 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
        195                 200                 205
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Glu Cys Ser
210

<210> 456
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<400> 456
Ser Asp Ile Ser Val Ala Pro Gly Glu Thr Ala Arg Ile Ser Cys Gly
1 5 10 15

Glu Lys Ser Leu Gly Ser Arg Ala Val Gln Trp Tyr Gln His Arg Ala
20 25 30

Gly Gln Ala Pro Ser Leu Ile Ile Tyr Asn Asn Gln Asp Arg Pro Ser
35 40 45

Gly Ile Pro Glu Arg Phe Ser Gly Ser Pro Asp Phe Arg Pro Gly Thr
50 55 60

Thr Ala Thr Leu Thr Ile Thr Ser Val Glu Ala Gly Asp Glu Ala Asp
65 70 75 80

Tyr Tyr Cys His Ile Trp Asp Ser Arg Val Pro Thr Lys Trp Val Phe
85 90 95

Gly Gly Gly Thr Thr Leu Thr Val Leu Gly Gln Pro Lys Ala Ala Pro
100 105 110

Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln Ala Asn Lys
115 120 125

Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val Thr
130 135 140

Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly Val Glu Thr
145 150 155 160

Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala Ser Ser Tyr
165 170 175

Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser Tyr Ser Cys
180 185 190

Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val Ala Pro Thr
195 200 205

Glu Cys Ser
210

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<400> 457
Gly Tyr Lys Ile Arg Asp His
1 5

<210> 458
<211> 8
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<220>
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<400> 458
Gly Tyr Lys Ile Arg Asp His Phe
1 5

<210> 459
<211> 7

<212> PRT
<213> 人工序列

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<400> 459
Gly Tyr Lys Ile Arg Asp Tyr
1 5

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<400> 460
Gly Tyr Asn Ile Ser Asp Tyr
1 5

<210> 461
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<400> 461
Gly Tyr Asn Ile Arg Asp His
1 5

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<400> 462

Gly Tyr Lys Ile Arg Asp Tyr Phe
1 5

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<400> 463
Gly Tyr Asn Ile Ser Asp Tyr Phe
1 5

<210> 464
<211> 8
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<213> 人工序列

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<400> 464
Gly Tyr Asn Ile Arg Asp His Phe
1 5

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<211> 123
<212> PRT
<213> 人工序列

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<400> 465
Gln Val His Leu Ser Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Lys Ile Arg Asp His
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Val Arg Ser Asp Asp Thr Ala
85 90 95

Ile Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser
115 120

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<400> 466
Gln Val His Leu Ser Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Val Arg Ser Asp Asp Thr Ala
85 90 95

Ile Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser
115 120

<210> 467
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<400> 467
Gln Val His Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser
115 120

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<400> 468
Gln Val Gln Leu Ser Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser
115 120

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<400> 469
Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Lys Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser
115 120

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<400> 470
Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Ser Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser
115 120

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<400> 471
Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp His
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser
115 120

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<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 472
Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg Gln Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser
115 120

<210> 473

<400> 473
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<210> 474
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<400> 474
Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Val Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser
115 120

<210> 475
<211> 123
<212> PRT
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<220>
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<400> 475
Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Ile Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser
115 120

<210> 476
<211> 123
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<213> 人工序列

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<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 476
Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Phe Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser
115 120

<210> 477
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<212> PRT
<213> 人工序列

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<400> 477
Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Phe Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser
115 120

<210> 478
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<400> 478
Gln Val His Leu Ser Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Lys Ile Arg Asp His
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Phe Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Val Arg Ser Asp Asp Thr Ala
85 90 95

Ile Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser
115 120

<210> 479
<211> 99
<212> PRT
<213> 人工序列

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<223> /注釋=「人工序列之說明：合成多肽」

<400> 479
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Arg Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ala Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Val Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Ile Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 480
<211> 99
<212> PRT
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 480
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Arg Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ala Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Val Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Phe Gly Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 481
<211> 99
<212> PRT
<213> 人工序列

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<400> 481
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Ile Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 482
<211> 99

<212> PRT
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 482
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Arg Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ala Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Ile Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Val Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Ile Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 483
<211> 99
<212> PRT
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<220>
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 483
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Ile Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 484
<211> 99
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 484
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Arg Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ala Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Ile Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Val Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Ile Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 485
<211> 99
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 485
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Ile Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Phe Gly Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 486
<211> 99
<212> PRT
<213> 人工序列

<220>
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<400> 486
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Arg Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ala Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Ile Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Val Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Phe Gly Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 487
<211> 99
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<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 487
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Arg Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Ser Arg Trp Gly
50 55 60

Gln Glu Tyr Ile Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Phe Gly Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 488
<211> 99
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<400> 488
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Arg Val Gly
1 5 10 15

Asp Arg Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ala Arg Phe Ser Gly Ser Arg Trp Gly
50 55 60

Gln Glu Tyr Ile Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Val Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Phe Gly Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 489
<211> 99
<212> PRT
<213> 人工序列

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<223> /注釋=「人工序列之說明：合成多肽」

<400> 489
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Arg Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ala Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Thr Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Val Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Ile Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 490

<400> 490
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<220>
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 491
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Arg Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ala Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Thr Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Val Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Ile Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

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<400> 492
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Arg Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ala Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Thr Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Val Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Phe Gly Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 493
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<400> 493
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Arg Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Ser Arg Trp Gly
50 55 60

Gln Glu Tyr Thr Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Phe Gly Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

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<223> /注釋=「人工序列之說明：合成多肽」

<400> 494
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Arg Val Gly
1 5 10 15

Asp Arg Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ala Arg Phe Ser Gly Ser Arg Trp Gly
50 55 60

Gln Glu Tyr Thr Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Val Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Phe Gly Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 495
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<400> 495
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Arg Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ala Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr His Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Val Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Ile Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 496
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<400> 496
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Arg Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ala Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr His Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Val Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Phe Gly Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 497
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<400> 497
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Arg Val Gly
1 5 10 15

Asp Arg Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ala Arg Phe Ser Gly Ser Arg Trp Gly
50 55 60

Gln Glu Tyr His Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Val Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Phe Gly Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 498
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<400> 498
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Asp Tyr Ile Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 499
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<400> 499
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Arg Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ala Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Asp Tyr Ile Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Val Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Ile Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 500
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<400> 500
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Phe Gly
50 55 60

Gln Glu Tyr Ile Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 501
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<212> PRT
<213> 人工序列

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<400> 501
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Arg Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ala Arg Phe Ser Gly Arg Arg Phe Gly
50 55 60

Gln Glu Tyr Ile Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Val Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Ile Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 502
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<400> 502
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Val Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 503
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 503
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Leu Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 504
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 504
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Met Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 505
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 505

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Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1               5                  10                  15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
            20                  25                  30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
        35                  40                  45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
    50                  55                  60

Gln Glu Tyr Ala Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65                  70                  75                  80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
                85                  90                  95

Asp Leu Lys
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<210> 506
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<213> 人工序列

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<223> /注釋=「人工序列之說明：合成多肽」

<400> 506

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Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1               5                  10                  15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
            20                  25                  30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
        35                  40                  45
```

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Ser Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 507
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<213> 人工序列

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<223> /注釋=「人工序列之說明：合成多肽」

<400> 507
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Phe Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 508
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 508
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Thr Arg Trp Gly
50 55 60

Gln Glu Tyr Ile Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 509
<211> 99
<212> PRT
<213> 人工序列

<220>
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 509
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Arg Gly
50 55 60

Gln Glu Tyr Ile Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 510
<211> 99
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<213> 人工序列

<220>
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 510
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Tyr Gly
50 55 60

Gln Glu Tyr Ile Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 511
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<220>
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 511
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Thr Arg Trp Gly
50 55 60

Gln Asp Tyr Ile Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 512
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 512
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Arg Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 513
<211> 99
<212> PRT
<213> 人工序列

<220>

<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 513
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ala Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 514
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<213> 人工序列

<220>
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 514
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Val Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 515
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<212> PRT
<213> 人工序列

<220>
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 515
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Ile Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 516
<211> 99
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<213> 人工序列

<220>
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 516
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Thr Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Phe Gly Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 517
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 517

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Gln Val His Leu Ser Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1               5                  10                  15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Lys Ile Arg Asp His
            20                  25                  30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
        35                  40                  45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
    50                  55                  60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65                  70                  75                  80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Val Arg Ser Asp Asp Thr Ala
                85                  90                  95

Ile Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
            100                 105                 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser Ala Ser Thr Lys Gly
        115                 120                 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
    130                 135                 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145                 150                 155                 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
                165                 170                 175
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Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
            180                 185                 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
        195                 200                 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
    210                 215                 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225                 230                 235                 240

Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
                245                 250                 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
            260                 265                 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
        275                 280                 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
    290                 295                 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305                 310                 315                 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu
                325                 330                 335

Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
            340                 345                 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
        355                 360                 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
    370                 375                 380
```

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

<210> 518
<211> 453
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 518
Gln Val His Leu Ser Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Val Arg Ser Asp Asp Thr Ala
85 90 95

Ile Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser Ala Ser Thr Lys Gly
115 120 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
130 135 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145 150 155 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
165 170 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
180 185 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
195 200 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
210 215 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225 230 235 240

Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
245 250 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
260 265 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
275 280 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
290 295 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305 310 315 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu
325 330 335

Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
340 345 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
355 360 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

<210> 519
<211> 453

<212> PRT
<213> 人工序列

<220>
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 519

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Gln Val His Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1               5                  10                  15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
            20                  25                  30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
        35                  40                  45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
    50                  55                  60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65                  70                  75                  80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
                85                  90                  95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
            100                 105                 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser Ala Ser Thr Lys Gly
        115                 120                 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
    130                 135                 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145                 150                 155                 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
                165                 170                 175
```

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Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
            180                 185                 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
        195                 200                 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
    210                 215                 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225                 230                 235                 240

Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
                245                 250                 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
            260                 265                 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
        275                 280                 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
    290                 295                 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305                 310                 315                 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu
                325                 330                 335

Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
            340                 345                 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
        355                 360                 365
```

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

<210> 520
<211> 453
<212> PRT
<213> 人工序列

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<223> /注釋=「人工序列之說明：合成多肽」

<400> 520
Gln Val Gln Leu Ser Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

```
Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65                  70                  75                  80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
                85                  90                  95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
            100                 105                 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser Ala Ser Thr Lys Gly
        115                 120                 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
    130                 135                 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145                 150                 155                 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
                165                 170                 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
            180                 185                 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
        195                 200                 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
    210                 215                 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225                 230                 235                 240

Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
                245                 250                 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
            260                 265                 270
```

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
275 280 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
290 295 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305 310 315 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu
325 330 335

Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
340 345 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
355 360 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

<210> 521
<211> 453
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 521
Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Lys Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser Ala Ser Thr Lys Gly
115 120 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
130 135 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145 150 155 160

```
Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
                165                 170                 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
            180                 185                 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
        195                 200                 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
    210                 215                 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225                 230                 235                 240

Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
                245                 250                 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
            260                 265                 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
        275                 280                 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
    290                 295                 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305                 310                 315                 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu
                325                 330                 335

Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
            340                 345                 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
        355                 360                 365
```

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

<210> 522
<211> 453
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 522
Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Ser Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser Ala Ser Thr Lys Gly
115 120 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
130 135 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145 150 155 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
165 170 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
180 185 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
195 200 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
210 215 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225 230 235 240

Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
245 250 255

```
Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
            260                 265                 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
        275                 280                 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
    290                 295                 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305                 310                 315                 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu
                325                 330                 335

Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
            340                 345                 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
        355                 360                 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
    370                 375                 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385                 390                 395                 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
                405                 410                 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
            420                 425                 430

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
        435                 440                 445

Leu Ser Pro Gly Lys
    450
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<210> 523
<211> 453
<212> PRT
<213> 人工序列

<220>
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 523

```
Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1               5                  10                  15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp His
            20                  25                  30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
        35                  40                  45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
    50                  55                  60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65                  70                  75                  80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
                85                  90                  95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
            100                 105                 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser Ala Ser Thr Lys Gly
        115                 120                 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
    130                 135                 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145                 150                 155                 160
```

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
165 170 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
180 185 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
195 200 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
210 215 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225 230 235 240

Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
245 250 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
260 265 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
275 280 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
290 295 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305 310 315 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu
325 330 335

Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
340 345 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
355 360 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

<210> 524
<211> 453
<212> PRT
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 524
Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

```
Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
    50                  55                  60

Gln Gly Arg Val Ser Leu Thr Arg Gln Ala Ser Trp Asp Phe Asp Thr
65                  70                  75                  80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
                85                  90                  95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
            100                 105                 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser Ala Ser Thr Lys Gly
        115                 120                 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
    130                 135                 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145                 150                 155                 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
                165                 170                 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
            180                 185                 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
        195                 200                 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
    210                 215                 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225                 230                 235                 240

Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
                245                 250                 255
```

```
Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
            260                 265                 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
        275                 280                 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
    290                 295                 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305                 310                 315                 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu
                325                 330                 335

Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
            340                 345                 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
        355                 360                 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
    370                 375                 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385                 390                 395                 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
                405                 410                 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
            420                 425                 430

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
        435                 440                 445
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Leu Ser Pro Gly Lys
450

<210> 525

<400> 525
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<210> 526
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<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 526
Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Val Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser Ala Ser Thr Lys Gly
115 120 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
130 135 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145 150 155 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
165 170 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
180 185 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
195 200 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
210 215 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225 230 235 240

Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
245 250 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
260 265 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
275 280 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
290 295 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305 310 315 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu
325 330 335

Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
340 345 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
355 360 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

<210> 527
<211> 453
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 527
Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Ile Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser Ala Ser Thr Lys Gly
115 120 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
130 135 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145 150 155 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
165 170 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
180 185 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
195 200 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
210 215 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225 230 235 240

Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
245 250 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
260 265 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
275 280 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
290 295 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305 310 315 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu
325 330 335

Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
340 345 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
355 360 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

<210> 528
<211> 453
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<213> 人工序列

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<223> /注釋=「人工序列之說明：合成多肽」

<400> 528
Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
85 90 95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Phe Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser Ala Ser Thr Lys Gly
115 120 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
130 135 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145 150 155 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
165 170 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
180 185 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
195 200 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
210 215 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225 230 235 240

Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
245 250 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
260 265 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
275 280 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
290 295 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305 310 315 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu
325 330 335

Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
340 345 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
355 360 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

<210> 529
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<400> 529
Gln Val Gln Leu Leu Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

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Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Asn Ile Arg Asp Tyr
            20                  25                  30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
        35                  40                  45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
    50                  55                  60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Phe Asp Phe Asp Thr
65                  70                  75                  80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala
                85                  90                  95

Val Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
            100                 105                 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser Ala Ser Thr Lys Gly
        115                 120                 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
    130                 135                 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145                 150                 155                 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
                165                 170                 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
            180                 185                 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
        195                 200                 205
```

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
210 215 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225 230 235 240

Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
245 250 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
260 265 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
275 280 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
290 295 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305 310 315 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu
325 330 335

Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
340 345 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
355 360 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

<210> 530
<211> 453
<212> PRT
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 530
Gln Val His Leu Ser Gln Ser Gly Ala Ala Val Thr Lys Pro Gly Ala
1 5 10 15

Ser Val Arg Val Ser Cys Glu Ala Ser Gly Tyr Lys Ile Arg Asp His
20 25 30

Phe Ile His Trp Trp Arg Gln Ala Pro Gly Gln Gly Leu Gln Trp Val
35 40 45

Gly Trp Ile Asn Pro Lys Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe
50 55 60

Gln Gly Arg Val Ser Leu Thr Arg His Ala Ser Phe Asp Phe Asp Thr
65 70 75 80

Phe Ser Phe Tyr Met Asp Leu Lys Ala Val Arg Ser Asp Asp Thr Ala
85 90 95

Ile Tyr Phe Cys Ala Arg Gln Arg Ser Asp Tyr Trp Asp Phe Asp Val
100 105 110

Trp Gly Ser Gly Thr Gln Val Thr Val Ser Ser Ala Ser Thr Lys Gly
115 120 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
130 135 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145 150 155 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
165 170 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
180 185 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
195 200 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
210 215 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225 230 235 240

Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
245 250 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
260 265 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
275 280 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
290 295 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305 310 315 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu
325 330 335

Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
340 345 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
355 360 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

<210> 531
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 531

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Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Arg Val Gly
1               5                  10                  15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
            20                  25                  30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
        35                  40                  45

Lys Leu Glu Arg Gly Val Pro Ala Arg Phe Ser Gly Arg Arg Trp Gly
    50                  55                  60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Val Ala
65                  70                  75                  80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Ile Val Pro Gly Thr Arg Leu
                85                  90                  95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
            100                 105                 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
        115                 120                 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
    130                 135                 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145                 150                 155                 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
                165                 170                 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
            180                 185                 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
        195                 200                 205
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<400> 532
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Arg Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ala Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Val Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Phe Gly Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

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<400> 533
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Ile Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 534
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<400> 534
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Arg Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ala Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Ile Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Val Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Ile Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

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<400> 535
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

```
Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
            20                  25                  30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
        35                  40                  45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
    50                  55                  60

Gln Glu Tyr Ile Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65                  70                  75                  80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
                85                  90                  95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
            100                 105                 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
        115                 120                 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
    130                 135                 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145                 150                 155                 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
                165                 170                 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
            180                 185                 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
        195                 200                 205
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<400> 536
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Arg Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ala Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Ile Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Val Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Ile Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 537
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<400> 537
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Ile Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Phe Gly Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 538
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 538
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Arg Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ala Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Ile Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Val Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Phe Gly Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 539
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<400> 539
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

```
Asp Arg Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
            20                  25                  30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
        35                  40                  45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Ser Arg Trp Gly
    50                  55                  60

Gln Glu Tyr Ile Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Ile Ala
65                  70                  75                  80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Phe Gly Pro Gly Thr Arg Leu
                85                  90                  95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
            100                 105                 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
        115                 120                 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
    130                 135                 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145                 150                 155                 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
                165                 170                 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
            180                 185                 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
        195                 200                 205
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<210> 540
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<400> 540

```
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Arg Val Gly
1               5                  10                  15

Asp Arg Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
            20                  25                  30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
        35                  40                  45

Lys Leu Glu Arg Gly Val Pro Ala Arg Phe Ser Gly Ser Arg Trp Gly
    50                  55                  60

Gln Glu Tyr Ile Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Val Ala
65                  70                  75                  80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Phe Gly Pro Gly Thr Arg Leu
                85                  90                  95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
            100                 105                 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
        115                 120                 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
    130                 135                 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145                 150                 155                 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
                165                 170                 175
```

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

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<400> 541
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Arg Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ala Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Thr Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Val Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Ile Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 542
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 542
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Arg Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ala Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Thr Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Val Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Ile Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 543
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 543
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Arg Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

```
Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
        35                  40                  45

Lys Leu Glu Arg Gly Val Pro Ala Arg Phe Ser Gly Arg Arg Trp Gly
    50                  55                  60

Gln Glu Tyr Thr Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Val Ala
65                  70                  75                  80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Phe Gly Pro Gly Thr Arg Leu
                85                  90                  95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
            100                 105                 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
        115                 120                 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
    130                 135                 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145                 150                 155                 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
                165                 170                 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
            180                 185                 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
        195                 200                 205
```

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<400> 544

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Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1               5                  10                  15

Asp Arg Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
            20                  25                  30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
        35                  40                  45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Ser Arg Trp Gly
    50                  55                  60

Gln Glu Tyr Thr Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Ile Ala
65                  70                  75                  80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Phe Gly Pro Gly Thr Arg Leu
                85                  90                  95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
            100                 105                 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
        115                 120                 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
    130                 135                 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145                 150                 155                 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
                165                 170                 175
```

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 545
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 545
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Arg Val Gly
1 5 10 15

Asp Arg Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ala Arg Phe Ser Gly Ser Arg Trp Gly
50 55 60

Gln Glu Tyr Thr Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Val Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Phe Gly Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 546
<211> 206
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<220>
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 546
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Arg Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ala Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr His Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Val Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Ile Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

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<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 547
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Arg Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

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Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
        35                  40                  45

Lys Leu Glu Arg Gly Val Pro Ala Arg Phe Ser Gly Arg Arg Trp Gly
    50                  55                  60

Gln Glu Tyr His Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Val Ala
65                  70                  75                  80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Phe Gly Pro Gly Thr Arg Leu
                85                  90                  95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
            100                 105                 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
        115                 120                 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
    130                 135                 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145                 150                 155                 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
                165                 170                 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
            180                 185                 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
        195                 200                 205
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<210> 548
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 548

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Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Arg Val Gly
1               5                  10                  15

Asp Arg Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
            20                  25                  30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
        35                  40                  45

Lys Leu Glu Arg Gly Val Pro Ala Arg Phe Ser Gly Ser Arg Trp Gly
    50                  55                  60

Gln Glu Tyr His Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Val Ala
65                  70                  75                  80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Phe Gly Pro Gly Thr Arg Leu
                85                  90                  95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
            100                 105                 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
        115                 120                 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
    130                 135                 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145                 150                 155                 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
                165                 170                 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
            180                 185                 190
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Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 549
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<212> PRT
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 549
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Asp Tyr Ile Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

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<220>
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<400> 550
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Arg Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ala Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Asp Tyr Ile Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Val Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Ile Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 551
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<212> PRT
<213> 人工序列

<220>
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 551
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Phe Gly
50 55 60

Gln Glu Tyr Ile Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 552
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 552

```
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Arg Val Gly
1               5                  10                  15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
            20                  25                  30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
        35                  40                  45

Lys Leu Glu Arg Gly Val Pro Ala Arg Phe Ser Gly Arg Arg Phe Gly
    50                  55                  60

Gln Glu Tyr Ile Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Val Ala
65                  70                  75                  80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Ile Val Pro Gly Thr Arg Leu
                85                  90                  95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
            100                 105                 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
        115                 120                 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
    130                 135                 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145                 150                 155                 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
                165                 170                 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
            180                 185                 190
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Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 553
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 553
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Val Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 554
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<212> PRT
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<220>
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<400> 554
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Leu Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 555
<211> 206
<212> PRT
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<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 555
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Met Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 556
<211> 206
<212> PRT
<213> 人工序列

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<223> /注釋=「人工序列之說明：合成多肽」

<400> 556

```
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1               5                  10                  15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
            20                  25                  30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
        35                  40                  45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
    50                  55                  60

Gln Glu Tyr Ala Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65                  70                  75                  80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
                85                  90                  95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
            100                 105                 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
        115                 120                 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
    130                 135                 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145                 150                 155                 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
                165                 170                 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
            180                 185                 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
        195                 200                 205
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<210> 557
<211> 206
<212> PRT
<213> 人工序列

<220>
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 557
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Ser Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 558
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 558
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Phe Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 559
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 559
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Thr Arg Trp Gly
50 55 60

Gln Glu Tyr Ile Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 560
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 560
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

```
Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
            20                  25                  30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
        35                  40                  45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Arg Gly
    50                  55                  60

Gln Glu Tyr Ile Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65                  70                  75                  80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
                85                  90                  95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
            100                 105                 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
        115                 120                 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
    130                 135                 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145                 150                 155                 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
                165                 170                 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
            180                 185                 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
        195                 200                 205
```

<210> 561
<211> 206
<212> PRT
<213> 人工序列

<220>
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 561

```
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1               5                  10                  15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
            20                  25                  30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
        35                  40                  45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Tyr Gly
    50                  55                  60

Gln Glu Tyr Ile Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65                  70                  75                  80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
                85                  90                  95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
            100                 105                 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
        115                 120                 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
    130                 135                 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145                 150                 155                 160
```

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 562
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 562
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Thr Arg Trp Gly
50 55 60

Gln Asp Tyr Ile Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 563
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 563
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Arg Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

```
Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65                  70                  75                  80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
                85                  90                  95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
            100                 105                 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
        115                 120                 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
    130                 135                 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145                 150                 155                 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
                165                 170                 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
            180                 185                 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
        195                 200                 205
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<210> 564
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 564

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Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1               5                   10                  15
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Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ala Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 565
<211> 206

<212> PRT
<213> 人工序列

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<223> /注釋=「人工序列之說明：合成多肽」

<400> 565

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Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1               5                  10                  15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
            20                  25                  30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
        35                  40                  45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
    50                  55                  60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Val Ala
65                  70                  75                  80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
                85                  90                  95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
            100                 105                 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
        115                 120                 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
    130                 135                 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145                 150                 155                 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
                165                 170                 175
```

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 566
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 566
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Ile Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 567
<211> 206
<212> PRT
<213> 人工序列

<220>
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 567
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Ala Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Thr Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Phe Gly Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 568
<211> 206
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 568
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Thr Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro
100 105 110

Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu
115 120 125

Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn
130 135 140

Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser
145 150 155 160

Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala
165 170 175

Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly
180 185 190

Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
195 200 205

<210> 569
<211> 99
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 569
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Thr Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys Ala Pro Lys Leu Leu Ile Tyr Asp Gly Ser
35 40 45

Lys Leu Glu Arg Gly Val Pro Ser Arg Phe Ser Gly Arg Arg Trp Gly
50 55 60

Gln Glu Tyr Asn Leu Thr Ile Asn Asn Leu Gln Pro Glu Asp Ile Ala
65 70 75 80

Thr Tyr Phe Cys Gln Val Tyr Glu Phe Val Val Pro Gly Thr Arg Leu
85 90 95

Asp Leu Lys

<210> 570
<211> 7
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成肽」

<400> 570
Gln Ala Thr Gly Tyr Leu Asn
1 5

<210> 571
<211> 511

<212> PRT
<213> 人類免疫缺陷病毒1

<400> 571

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Met Arg Val Lys Glu Lys Tyr Gln His Leu Trp Arg Trp Gly Trp Arg
1               5                  10                  15

Trp Gly Thr Met Leu Leu Gly Met Leu Met Ile Cys Ser Ala Thr Glu
            20                  25                  30

Lys Leu Trp Val Thr Val Tyr Tyr Gly Val Pro Val Trp Lys Glu Ala
        35                  40                  45

Thr Thr Thr Leu Phe Cys Ala Ser Asp Ala Lys Ala Tyr Asp Thr Glu
    50                  55                  60

Val His Asn Val Trp Ala Thr His Ala Cys Val Pro Thr Asp Pro Asn
65                  70                  75                  80

Pro Gln Glu Val Val Leu Val Asn Val Thr Glu Asn Phe Asn Met Trp
                85                  90                  95

Lys Asn Asp Met Val Glu Gln Met His Glu Asp Ile Ile Ser Leu Trp
            100                 105                 110

Asp Gln Ser Leu Lys Pro Cys Val Lys Leu Thr Pro Leu Cys Val Ser
        115                 120                 125

Leu Lys Cys Thr Asp Leu Lys Asn Asp Thr Asn Thr Asn Ser Ser Ser
    130                 135                 140

Gly Arg Met Ile Met Glu Lys Gly Glu Ile Lys Asn Cys Ser Phe Asn
145                 150                 155                 160

Ile Ser Thr Ser Ile Arg Gly Lys Val Gln Lys Glu Tyr Ala Phe Phe
                165                 170                 175

Tyr Lys Leu Asp Ile Ile Pro Ile Asp Asn Asp Thr Thr Ser Tyr Lys
            180                 185                 190
```

```
Leu Thr Ser Cys Asn Thr Ser Val Ile Thr Gln Ala Cys Pro Lys Val
        195                 200                 205

Ser Phe Glu Pro Ile Pro Ile His Tyr Cys Ala Pro Ala Gly Phe Ala
    210                 215                 220

Ile Leu Lys Cys Asn Asn Lys Thr Phe Asn Gly Thr Gly Pro Cys Thr
225                 230                 235                 240

Asn Val Ser Thr Val Gln Cys Thr His Gly Ile Arg Pro Val Val Ser
                245                 250                 255

Thr Gln Leu Leu Leu Asn Gly Ser Leu Ala Glu Glu Glu Val Val Ile
            260                 265                 270

Arg Ser Val Asn Phe Thr Asp Asn Ala Lys Thr Ile Ile Val Gln Leu
        275                 280                 285

Asn Thr Ser Val Glu Ile Asn Cys Thr Arg Pro Asn Asn Asn Thr Arg
    290                 295                 300

Lys Arg Ile Arg Ile Gln Arg Gly Pro Gly Arg Ala Phe Val Thr Ile
305                 310                 315                 320

Gly Lys Ile Gly Asn Met Arg Gln Ala His Cys Asn Ile Ser Arg Ala
                325                 330                 335

Lys Trp Asn Asn Thr Leu Lys Gln Ile Ala Ser Lys Leu Arg Glu Gln
            340                 345                 350

Phe Gly Asn Asn Lys Thr Ile Ile Phe Lys Gln Ser Ser Gly Gly Asp
        355                 360                 365

Pro Glu Ile Val Thr His Ser Phe Asn Cys Gly Gly Glu Phe Phe Tyr
    370                 375                 380
```

Cys Asn Ser Thr Gln Leu Phe Asn Ser Thr Trp Phe Asn Ser Thr Trp
385 390 395 400

Ser Thr Glu Gly Ser Asn Asn Thr Glu Gly Ser Asp Thr Ile Thr Leu
405 410 415

Pro Cys Arg Ile Lys Gln Ile Ile Asn Met Trp Gln Lys Val Gly Lys
420 425 430

Ala Met Tyr Ala Pro Pro Ile Ser Gly Gln Ile Arg Cys Ser Ser Asn
435 440 445

Ile Thr Gly Leu Leu Leu Thr Arg Asp Gly Gly Asn Ser Asn Asn Glu
450 455 460

Ser Glu Ile Phe Arg Pro Gly Gly Gly Asp Met Arg Asp Asn Trp Arg
465 470 475 480

Ser Glu Leu Tyr Lys Tyr Lys Val Val Lys Ile Glu Pro Leu Gly Val
485 490 495

Ala Pro Thr Lys Ala Lys Arg Arg Val Val Gln Arg Glu Lys Arg
500 505 510

<210> 572
<211> 369
<212> DNA
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多核苷酸」

<400> 572
caggtgcagt tgttgcagtc tggcgccgct gttacaaagc ctggcgcttc tgttagagtg 60

tcctgcgagg cctccggcta caacatcaga gactacttca tccactggtg gcggcaggct 120

ccaggacagg gattgcaatg ggtcggatgg atcaacccta agaccggcca gcctaacaac 180

cctagacagt tccagggcag agtgtccctg accagacacg cctcttggga cttcgacacc 240

ttcagcttct acatggacct gaaggccctg agatccgacg ataccgccgt gtacttctgc 300

gccagacaga gaagcgacta ctgggatttc gatgtgtggg gctctggcac ccaagtgacc 360

gtgtcctct 369

<210> 573
<211> 369
<212> DNA
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多核苷酸」

<400> 573
caggtgcagc tgctgcagtc tggcgccgct gtgacaaaac caggcgcttc tgtgcgggtg 60

tcctgcgagg ccagcggcta caacatccgg gactacttca ttcactggtg gcgccaggcc 120

cctggacagg gactgcagtg ggtgggatgg atcaacccca agaccggcca gcccaacaac 180

cccagacagt tccagggcag agtgtccctg accagacacg ccagctggga cttcgacacc 240

ttcagcttct acatggacct gaaggccctg cggagcgacg ataccgccgt gtacttctgc 300

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gtgtcatct 369

<210> 574
<211> 369
<212> DNA
<213> 人工序列

<220>
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<223> /注釋=「人工序列之說明：合成多核苷酸」

<400> 574
caggtgcagt tgttgcagtc tggcgccgct gttacaaagc ctggcgcttc tgttagagtg 60

tcctgcgagg cctccggcta caacatcaga gactacttca tccactggtg gcggcaggct 120

ccaggacagg gattgcaatg ggtcggatgg atcaacccta agaccggcca gcctaacaac 180

cctagacagt tccagggcag agtgtccctg accagacacg cctctttcga cttcgacacc 240

ttcagcttct acatggacct gaaggccctg agatccgacg ataccgccgt gtacttctgc 300

gccagacaga gaagcgacta ctgggacttc gatgtgtggg gctctggcac ccaagtgacc 360

gtgtcctct 369

<210> 575
<211> 369
<212> DNA
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多核苷酸」

<400> 575
caggtgcagc tgctgcagtc tggcgccgct gtgacaaaac caggcgcttc tgtgcgggtg 60

tcctgcgagg ccagcggcta caacatccgg gactacttca ttcactggtg gcgccaggcc 120

cctggacagg gactgcagtg ggtgggatgg atcaacccca agaccggcca gcccaacaac 180

cccagacagt tccagggcag agtgtccctg accagacacg ccagcttcga cttcgacacc 240

ttcagcttct acatggacct gaaggccctg cggagcgacg ataccgccgt gtacttctgc 300

gccagacaga gaagcgacta ctgggatttc gacgtgtggg gcagcggcac ccaagtgacc 360

gtgtcatct 369

<210> 576
<211> 369
<212> DNA
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多核苷酸」

<400> 576
caggtccact tgtctcaatc tggcgccgct gtgacaaagc ctggcgcttc tgtcagagtg 60

tcttgcgagg cctctggcta caagatccgg gaccacttta tccactggtg gcgacaggct 120

ccaggacagg gattgcagtg ggtcggatgg atcaacccta agaccggcca gcctaacaac 180

cctagacagt tccagggcag agtgtccctg accagacacg cctcttggga cttcgacacc 240

ttcagcttct acatggacct gaaggccgtg cggagcgacg acaccgctat ctacttttgc 300

gccagacaga gatccgacta ctgggatttc gatgtgtggg gctctggcac ccaagtgacc 360

gtgtcctct 369

<210> 577
<211> 369
<212> DNA
<213> 人工序列

<220>
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<223> /注釋=「人工序列之說明：合成多核苷酸」

<400> 577
caggtccacc tgtctcaatc tggcgccgct gttacaaaac caggcgcctc tgttagagtg 60

tcttgcgagg ccagcggcta caagatcagg gaccacttta ttcactggtg gcgccaggct 120

ccaggacagg gacttcaatg ggtcggatgg atcaacccta agaccggcca gcctaacaac 180

cccagacagt tccagggcag agtgtctctg acaagacacg ccagctggga cttcgacacc 240

ttcagcttct acatggacct gaaggccgtg cggagcgacg acaccgccat ctatttttgc 300

gccagacaga gaagcgacta ctgggatttc gatgtgtggg gcagcggcac ccaagtgaca 360

gtctcttct 369

<210> 578
<211> 369
<212> DNA
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多核苷酸」

<400> 578
caggtccact tgtctcaatc tggcgccgct gtgacaaagc ctggcgcttc tgtcagagtg 60

tcttgcgagg cctctggcta caagatccgg gaccacttta tccactggtg gcgacaggct 120

ccaggacagg gattgcagtg ggtcggatgg atcaacccta agaccggcca gcctaacaac 180

cctagacagt tccagggcag agtgtccctg accagacacg cctctttcga cttcgacacc 240

ttcagcttct acatggacct gaaggccgtg cggagcgacg acaccgctat ctacttttgc 300

gccagacaga gatccgacta ctgggacttc gatgtgtggg gctctggcac ccaagtgacc 360

gtgtcctct 369

<210> 579
<211> 369
<212> DNA
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多核苷酸」

<400> 579
caggtccacc tgtctcaatc tggcgccgct gttacaaaac caggcgcctc tgttagagtg 60

tcttgcgagg ccagcggcta caagatcagg gaccacttta ttcactggtg gcgccaggct 120

ccaggacagg gacttcaatg ggtcggatgg atcaacccta agaccggcca gcctaacaac 180

cccagacagt tccagggcag agtgtctctg acaagacacg ccagcttcga cttcgacacc 240

ttcagcttct acatggacct gaaggccgtg cggagcgacg acaccgccat ctatttttgc 300

gccagacaga gaagcgacta ctgggatttc gatgtgtggg gcagcggcac ccaagtgaca 360

gtctcttct 369

<210> 580
<211> 369
<212> DNA
<213> 人工序列

<220>
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<223> /注釋=「人工序列之說明：合成多核苷酸」

<400> 580
caggtccact tgtctcaatc tggcgccgct gtgacaaagc ctggcgcttc tgtcagagtg 60

tcttgcgagg cctccggcta caacatccgg gactacttta tccactggtg gcggcaggct 120

ccaggacagg gattgcaatg ggtcggatgg atcaacccta agaccggcca gcctaacaac 180

cctagacagt tccagggcag agtgtccctg accagacacg cctcttggga cttcgacacc 240

ttcagcttct acatggacct gaaggccgtg cggagcgacg acaccgctat ctacttttgc 300

gccagacaga gatccgacta ctgggatttc gatgtgtggg gctctggcac ccaagtgacc 360

gtgtcctct 369

<210> 581
<211> 369
<212> DNA
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多核苷酸」

<400> 581
caggtccacc tgtctcaatc tggcgccgct gttacaaaac caggcgcctc tgttagagtg 60

tcttgcgagg ccagcggcta caacatccgg gactacttta ttcactggtg gcgccaggct 120

ccaggacagg gacttcaatg ggtcggatgg atcaacccta agaccggcca gcctaacaac 180

cccagacagt tccagggcag agtgtctctg acaagacacg ccagctggga cttcgacacc 240

ttcagcttct acatggacct gaaggccgtg cggagcgacg acaccgccat ctatttttgc 300

gccagacaga gaagcgacta ctgggatttc gatgtgtggg gcagcggcac ccaagtgaca 360

gtctcttct 369

<210> 582
<211> 297
<212> DNA
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多核苷酸」

<400> 582
gacatccaga tgacccagag cccttcctct ttatccgcta gcgtcggcga taccgtgacc 60

atcacatgcc aagctaacgg ctacctcaac tggtaccagc agcggagggg aaaggccccc 120

aagctgctga tctacgacgg ctccaagctg gagaggggag tgccttcccg gttcagcgga 180

aggaggtggg gacaagaata caatttaacc atcaacaatt tacagcccga ggacatcgct 240

acctacttct gccaagttta cgagttcgtg gtgcccggca ctcgtctgga tctgaag 297

<210> 583
<211> 297
<212> DNA
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多核苷酸」

<400> 583
gacatccaga tgacccagag ccctagcagc ctgagcgcca gcgtgggcga taccgtgacc 60

attacctgcc aggccaacgg ctacctgaac tggtatcagc agcggagagg caaggccccc 120

aagctgctga tctacgacgg cagcaagctg gaaagaggcg tgcccagcag attcagcggc 180

agaagatggg gccaggagta caacctgacc atcaacaacc tgcagcccga ggatatcgcc 240

acatactttt gccaggtgta cgagttcgtg gtgcccggca cacggctgga cctgaaa 297

<210> 584
<211> 297
<212> DNA
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多核苷酸」

<400> 584
gacatccaga tgacccagtc tccatcctct ctgtctgcct ctgtgggcga taccgctacc 60

atcacctgtc aggccaacgg ctacctgaac tggtatcagc agagaagagg caaggccccct 120

aagctgctga tctacgacgg ctccaaactg gaaagaggcg tgccctctcg gttctctggc 180

agaagatggg gccaagagta caacctgacc atcaacaacc tgcagcctga ggatatcgcc 240

acatactttt gccaggtgta cgagttcgtg gtgcctggca caagactgga cctgaag 297

<210> 585
<211> 297
<212> DNA
<213> 人工序列

<220>
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<223> /注釋=「人工序列之說明：合成多核苷酸」

<400> 585
gatattcaga tgacacagag ccccagtagc ctgagcgcca gcgtgggcga caccgcaacc 60

atcacctgtc aggccaacgg ctatctgaac tggtatcaac agaggagggg caaggccccc 120

aagctcctga tatacgacgg cagcaagctg gagaggggcg ttcccagccg cttcagcggc 180

aggaggtggg gccaggagta caaccttaca atcaacaacc tgcagcccga ggacatcgcc 240

acctatttct gccaagttta cgagttcgtg gtgcccggca ccaggctgga cctgaag 297

<210> 586
<211> 297
<212> DNA
<213> 人工序列

<220>
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<223> /注釋=「人工序列之說明：合成多核苷酸」

<400> 586
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atcacctgtc aggccaacgg ctacctgaac tggtatcagc agagaagagg caaggccccc 120

aagctgctga tctacgacgg ctccaaactg gaaagaggcg tgccctccag attctccggc 180

tctagatggg gccaagagta caacctgacc atctccagcc tccagcctga ggatatcgcc 240

acatactttt gccaggtgta cgagttcttc ggccctggca ccagactgga cctgaag 297

<210> 587
<211> 297
<212> DNA
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多核苷酸」

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atcacctgtc aggccaacgg ctacctgaac tggtatcagc agagaagagg caaggcccct 120

aagctgctga tctacgacgg ctccaaactg gaaagaggcg tgcccgctag attctccggc 180

agaagatggg gccaagagta caccctgacc atcaacaacc tgcagcctga ggacgtggcc 240

acatactttt gccaggtgta cgagttcatc gtgcccggca ccagactgga cctgaagaga 300

acagttgccg ctccttccgt gttcatcttc ccaccttccg acgagcagct gaagtctggc 360

acagcttctg tcgtgtgcct gctgaacaac ttctaccctc gggaagccaa ggtgcagtgg 420

aaggtggaca atgccctgca gtccggcaac tcccaagagt ctgtgaccga gcaggactcc 480

aaggactcta cctacagcct gtcctccaca ctgaccctgt ctaaggccga ctacgagaag 540

cacaaggtgt acgcctgcga agtgacccat cagggactgt ctagccccgt gaccaagtcc 600

ttcaacagag gcgagtgt 618

<210> 619
<211> 618
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<213> 人工序列

<220>
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<223> /注釋=「人工序列之說明：合成多核苷酸」

<400> 619
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atcacctgtc aggccaacgg ctatctgaac tggtatcaac agaggagggg caaggccccc 120

aagctcctga tatacgacgg cagcaagctg gagaggggcg ttcccgcacg cttcagcggc 180

aggaggtggg gccaggagta cacccttaca atcaacaacc tgcagcccga ggacgtcgcc 240

acctatttct gccaagttta cgagttcatc gtgcccggca ccaggctgga cctgaagcgg 300

accgtggccg cccccagcgt gttcatcttc cctcccagcg acgagcagct gaagtctggc 360

accgccagcg tggtgtgcct gctgaacaac ttctaccccc gcgaggccaa ggtgcagtgg 420

aaggtggaca acgccctgca gagcggcaac agccaggaga gcgtgaccga gcaggactcc 480

aaggacagca cctacagcct gagcagcacc ctgaccctga gcaaggccga ctacgagaag 540

cacaaggtgt acgcctgcga ggtgacccac cagggactgt ctagccccgt gaccaagagc 600

ttcaaccggg gcgagtgc 618

<210> 620
<211> 17
<212> PRT
<213> 未知

<220>
<221> source
<223> /注釋=「未知之說明：信號肽」

<400> 620
Lys Trp Val Thr Phe Ile Ser Leu Leu Phe Leu Phe Ser Ser Ala Tyr
1 5 10 15

Ser

<210> 621
<211> 24
<212> PRT
<213> 未知

<220>
<221> source
<223> /注釋=「未知之說明：信號肽」

<400> 621
Met Asp Pro Lys Gly Ser Leu Ser Trp Arg Ile Leu Leu Phe Leu Ser
1 5 10 15

Leu Ala Phe Glu Leu Ser Tyr Gly
20

<210> 622
<211> 20
<212> PRT
<213> 未知

<220>

<221> source
<223> /注釋=「未知之說明：信號肽」

<400> 622
Met Ser Val Pro Thr Gln Val Leu Gly Leu Leu Leu Leu Trp Leu Thr
1 5 10 15

Asp Ala Arg Cys
20

<210> 623
<211> 20
<212> PRT
<213> 未知

<220>
<221> source
<223> /注釋=「未知之說明：信號肽」

<400> 623
Met Glu Thr Asp Thr Leu Leu Leu Trp Val Leu Leu Leu Trp Val Pro
1 5 10 15

Gly Ser Thr Gly
20

<210> 624
<211> 18
<212> PRT
<213> 未知

<220>
<221> source
<223> /注釋=「未知之說明：信號肽」

<400> 624
Met Lys Trp Val Thr Phe Ile Ser Leu Leu Phe Leu Phe Ser Ser Ala
1 5 10 15

Tyr Ser

<210> 625
<211> 20

<212> PRT
<213> 未知

<220>
<221> source
<223> /注釋=「未知之說明：信號肽」

<400> 625
Met Arg Cys Leu Ala Glu Phe Leu Gly Leu Leu Val Leu Trp Ile Pro
1 5 10 15

Gly Ala Ile Gly
20

<210> 626
<211> 24
<212> PRT
<213> 未知

<220>
<221> source
<223> /注釋=「未知之說明：信號肽」

<400> 626
Met Asp Pro Lys Gly Ser Leu Ser Trp Arg Ile Leu Leu Phe Leu Ser
1 5 10 15

Leu Ala Phe Glu Leu Ser Tyr Gly
20

<210> 627
<211> 4
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成肽」

<400> 627
Phe Asp Phe Asp
1

<210> 628
<211> 36

<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 628
Arg Val Ser Leu Thr Arg His Ala Ser Trp Asp Phe Asp Thr Phe Ser
1 5 10 15

Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala Val Tyr
20 25 30

Phe Cys Ala Arg
35

<210> 629
<211> 36
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 629
Arg Val Ser Leu Thr Arg His Ala Ser Phe Asp Phe Asp Thr Phe Ser
1 5 10 15

Phe Tyr Met Asp Leu Lys Ala Leu Arg Ser Asp Asp Thr Ala Val Tyr
20 25 30

Phe Cys Ala Arg
35

<210> 630
<211> 34
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 630
Thr Gly Gln Pro Asn Asn Pro Arg Gln Phe Gln Gly Arg Val Ser Leu
1 5 10 15

Thr Arg His Ala Ser Trp Asp Phe Asp Thr Phe Ser Phe Tyr Met Asp
20 25 30

Leu Lys

<210> 631
<211> 38
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 631
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Val Thr Ile Thr Cys Gln Ala Asn Gly Tyr Leu Asn Trp Tyr
20 25 30

Gln Gln Arg Arg Gly Lys
35

<210> 632
<211> 453
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 632
Glu Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val Lys Ala Gly Gly
1 5 10 15

```
Ser Leu Ile Leu Ser Cys Gly Val Ser Asn Phe Arg Ile Ser Ala His
            20                  25                  30

Thr Met Asn Trp Val Arg Arg Val Pro Gly Gly Gly Leu Glu Trp Val
        35                  40                  45

Ala Ser Ile Ser Thr Ser Ser Thr Tyr Arg Asp Tyr Ala Asp Ala Val
    50                  55                  60

Lys Gly Arg Phe Thr Val Ser Arg Asp Asp Leu Glu Asp Phe Val Tyr
65                  70                  75                  80

Leu Gln Met His Lys Met Arg Val Glu Asp Thr Ala Ile Tyr Tyr Cys
                85                  90                  95

Ala Arg Lys Gly Ser Asp Arg Leu Ser Asp Asn Asp Pro Phe Asp Ala
            100                 105                 110

Trp Gly Pro Gly Thr Val Val Thr Val Ser Pro Ala Ser Thr Lys Gly
        115                 120                 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
    130                 135                 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145                 150                 155                 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
                165                 170                 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
            180                 185                 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
        195                 200                 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
    210                 215                 220
```

```
Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225                 230                 235                 240

Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
                245                 250                 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
            260                 265                 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
        275                 280                 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
    290                 295                 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305                 310                 315                 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala
                325                 330                 335

Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
            340                 345                 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
        355                 360                 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
    370                 375                 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385                 390                 395                 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
                405                 410                 415
```

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

<210> 633
<211> 462
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 633
Glu Val Gln Leu Val Gln Ser Gly Thr Gln Met Lys Glu Pro Gly Ala
1 5 10 15

Ser Val Thr Ile Ser Cys Val Thr Ser Gly Tyr Glu Phe Val Glu Ile
20 25 30

Leu Ile Asn Trp Val Arg Gln Val Pro Gly Arg Gly Leu Glu Trp Met
35 40 45

Gly Trp Met Asn Pro Arg Gly Gly Gly Val Asn Tyr Ala Arg Gln Phe
50 55 60

Gln Gly Lys Val Thr Met Thr Arg Asp Val Tyr Arg Asp Thr Ala Tyr
65 70 75 80

Leu Thr Leu Ser Gly Leu Thr Ser Gly Asp Thr Ala Lys Tyr Phe Cys
85 90 95

Val Arg Gly Arg Ser Cys Cys Gly Gly Arg Arg His Cys Asn Gly Ala
100 105 110

```
Asp Cys Phe Asn Trp Asp Phe Gln His Trp Gly Gln Gly Thr Leu Val
        115                 120                 125

Ile Val Ser Pro Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
    130                 135                 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145                 150                 155                 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
                165                 170                 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
            180                 185                 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
        195                 200                 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
    210                 215                 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225                 230                 235                 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Ala Gly Pro Asp Val Phe
                245                 250                 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
            260                 265                 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
        275                 280                 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
    290                 295                 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
305                 310                 315                 320
```

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Leu Pro Glu Glu Lys Thr Ile Ser
340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Leu His Glu Ala Leu His
435 440 445

Ser His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
450 455 460

<210> 634
<211> 462
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 634
Glu Val Gln Leu Val Gln Ser Gly Thr Gln Met Lys Glu Pro Gly Ala
1 5 10 15

Ser Val Thr Ile Ser Cys Val Thr Ser Gly Tyr Glu Phe Val Glu Ile
20 25 30

Leu Ile Asn Trp Val Arg Gln Val Pro Gly Arg Gly Leu Glu Trp Met
35 40 45

Gly Trp Met Asn Pro Arg Gly Gly Gly Val Asn Tyr Ala Arg Gln Phe
50 55 60

Gln Gly Lys Val Thr Met Thr Arg Asp Val Tyr Arg Asp Thr Ala Tyr
65 70 75 80

Leu Thr Leu Ser Gly Leu Thr Ser Gly Asp Thr Ala Lys Tyr Phe Cys
85 90 95

Val Arg Gly Lys Ser Cys Cys Ala Gly Arg Arg Phe Cys Gly Pro Thr
100 105 110

Asp Cys Tyr Asn Trp Asp Phe Ala His Trp Gly Gln Gly Thr Leu Val
115 120 125

Ile Val Ser Pro Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala
130 135 140

Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu
145 150 155 160

Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly
165 170 175

Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser
180 185 190

Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu
195 200 205

Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr
210 215 220

Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr
225 230 235 240

Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Ala Gly Pro Asp Val Phe
245 250 255

Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
260 265 270

Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
275 280 285

Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
290 295 300

Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
305 310 315 320

Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
325 330 335

Lys Val Ser Asn Lys Ala Leu Pro Leu Pro Glu Glu Lys Thr Ile Ser
340 345 350

Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
355 360 365

Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
370 375 380

Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
385 390 395 400

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
405 410 415

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
420 425 430

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Leu His Glu Ala Leu His
435 440 445

Ser His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
450 455 460

<210> 635
<211> 455
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 635
Gln Val Arg Leu Ser Gln Ser Gly Gly Gln Met Lys Lys Pro Gly Asp
1 5 10 15

Ser Met Arg Ile Ser Cys Arg Ala Ser Gly Tyr Glu Phe Ile Asn Cys
20 25 30

Pro Ile Asn Trp Ile Arg Leu Ala Pro Gly Lys Arg Pro Glu Trp Met
35 40 45

Gly Trp Met Lys Pro Arg Gly Gly Ala Val Ser Tyr Ala Arg Gln Leu
50 55 60

Gln Gly Arg Val Thr Met Thr Arg Asp Met Tyr Ser Glu Thr Ala Phe
65 70 75 80

Leu Glu Leu Arg Ser Leu Thr Ser Asp Asp Thr Ala Val Tyr Phe Cys
85 90 95

Thr Arg Gly Lys Tyr Cys Thr Ala Arg Asp Tyr Tyr Asn Trp Asp Phe
100 105 110

Glu His Trp Gly Gln Gly Thr Pro Val Thr Val Ser Ser Ala Ser Thr
115 120 125

Lys Gly Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser
130 135 140

Gly Gly Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu
145 150 155 160

Pro Val Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His
165 170 175

Thr Phe Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser
180 185 190

Val Val Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys
195 200 205

Asn Val Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu
210 215 220

Pro Lys Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro
225 230 235 240

Glu Leu Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys
245 250 255

Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val
260 265 270

Asp Val Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp
275 280 285

Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr
290 295 300

```
Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp
305                 310                 315                 320

Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu
                325                 330                 335

Pro Leu Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg
            340                 345                 350

Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys
        355                 360                 365

Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp
    370                 375                 380

Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys
385                 390                 395                 400

Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser
                405                 410                 415

Lys Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser
            420                 425                 430

Cys Ser Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser
        435                 440                 445

Leu Ser Leu Ser Pro Gly Lys
    450                 455
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<210> 636
<211> 465
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 636

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Arg Val Gln Leu Val Glu Ser Gly Gly Gly Val Val Gln Pro Gly Lys
1               5                  10                  15

Ser Val Arg Leu Ser Cys Val Val Ser Asp Phe Pro Phe Ser Lys Tyr
            20                  25                  30

Pro Met Tyr Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
        35                  40                  45

Ala Ala Ile Ser Gly Asp Ala Trp His Val Val Tyr Ser Asn Ser Val
    50                  55                  60

Gln Gly Arg Phe Leu Val Ser Arg Asp Asn Val Lys Asn Thr Leu Tyr
65                  70                  75                  80

Leu Glu Met Asn Ser Leu Lys Ile Glu Asp Thr Ala Val Tyr Arg Cys
                85                  90                  95

Ala Arg Met Phe Gln Glu Ser Gly Pro Pro Arg Leu Asp Arg Trp Ser
            100                 105                 110

Gly Arg Asn Tyr Tyr Tyr Tyr Ser Gly Met Asp Val Trp Gly Gln Gly
        115                 120                 125

Thr Thr Val Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe
    130                 135                 140

Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu
145                 150                 155                 160

Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp
                165                 170                 175

Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu
            180                 185                 190

Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser
        195                 200                 205
```

Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro
210 215 220

Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys
225 230 235 240

Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Ala Gly Pro
245 250 255

Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser
260 265 270

Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp
275 280 285

Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn
290 295 300

Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val
305 310 315 320

Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu
325 330 335

Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu Pro Glu Glu Lys
340 345 350

Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr
355 360 365

Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr
370 375 380

Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu
385 390 395 400

Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu
405 410 415

Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys
420 425 430

Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val Leu His Glu
435 440 445

Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly
450 455 460

Lys
465

<210> 637
<211> 467
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 637
Gln Glu Gln Leu Val Glu Ser Gly Gly Gly Val Val Gln Pro Gly Gly
1 5 10 15

Ser Leu Arg Leu Ser Cys Leu Ala Ser Gly Phe Thr Phe His Lys Tyr
20 25 30

Gly Met His Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
35 40 45

Ala Leu Ile Ser Asp Asp Gly Met Arg Lys Tyr His Ser Asp Ser Met
50 55 60

Trp Gly Arg Val Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr
65 70 75 80

Leu Gln Phe Ser Ser Leu Lys Val Glu Asp Thr Ala Met Phe Phe Cys
85 90 95

Ala Arg Glu Ala Gly Gly Pro Ile Trp His Asp Asp Val Lys Tyr Tyr
100 105 110

Asp Phe Asn Asp Gly Tyr Tyr Asn Tyr His Tyr Met Asp Val Trp Gly
115 120 125

Lys Gly Thr Thr Val Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser
130 135 140

Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala
145 150 155 160

Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val
165 170 175

Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala
180 185 190

Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val
195 200 205

Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His
210 215 220

Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys
225 230 235 240

Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Ala
245 250 255

Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met
260 265 270

Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser His
275 280 285

Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val
290 295 300

His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr
305 310 315 320

Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly
325 330 335

Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Leu Pro Glu
340 345 350

Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val
355 360 365

Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser
370 375 380

Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu
385 390 395 400

Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro
405 410 415

Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val
420 425 430

Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val Leu
435 440 445

His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser Leu Ser
450 455 460

Pro Gly Lys
465

<210> 638
<211> 470
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 638

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Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ser
1               5                  10                  15

Ser Val Lys Val Ser Cys Lys Ala Ser Gly Asn Ser Phe Ser Asn His
            20                  25                  30

Asp Val His Trp Val Arg Gln Ala Thr Gly Gln Gly Leu Glu Trp Met
        35                  40                  45

Gly Trp Met Ser His Glu Gly Asp Lys Thr Gly Leu Ala Gln Lys Phe
    50                  55                  60

Gln Gly Arg Val Thr Ile Thr Arg Asp Ser Gly Ala Ser Thr Val Tyr
65                  70                  75                  80

Met Glu Leu Arg Gly Leu Thr Ala Asp Asp Thr Ala Ile Tyr Tyr Cys
                85                  90                  95

Leu Thr Gly Ser Lys His Arg Leu Arg Asp Tyr Phe Leu Tyr Asn Glu
            100                 105                 110

Tyr Gly Pro Asn Tyr Glu Glu Trp Gly Asp Tyr Leu Ala Thr Leu Asp
        115                 120                 125

Val Trp Gly His Gly Thr Ala Val Thr Val Ser Ser Ala Ser Thr Lys
    130                 135                 140

Gly Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly
145                 150                 155                 160
```

Gly Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro
165 170 175

Val Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr
180 185 190

Phe Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val
195 200 205

Val Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn
210 215 220

Val Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro
225 230 235 240

Lys Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu
245 250 255

Leu Leu Ala Gly Pro Asp Val Phe Leu Phe Pro Pro Lys Pro Lys Asp
260 265 270

Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp
275 280 285

Val Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly
290 295 300

Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn
305 310 315 320

Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp
325 330 335

Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro
340 345 350

Leu Pro Glu Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu
355 360 365

Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn
370 375 380

Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile
385 390 395 400

Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr
405 410 415

Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys
420 425 430

Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys
435 440 445

Ser Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu
450 455 460

Ser Leu Ser Pro Gly Lys
465 470

<210> 639
<211> 451
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 639
Gln Val Gln Leu Val Gln Ser Gly Gly Gln Met Lys Lys Pro Gly Glu
1 5 10 15

Ser Met Arg Ile Ser Cys Arg Ala Ser Gly Tyr Glu Phe Ile Asp Cys
20 25 30

Thr Leu Asn Trp Ile Arg Leu Ala Pro Gly Lys Arg Pro Glu Trp Met
35 40 45

Gly Trp Leu Lys Pro Arg Gly Gly Ala Val Asn Tyr Ala Arg Pro Leu
50 55 60

Gln Gly Arg Val Thr Met Thr Arg Asp Val Tyr Ser Asp Thr Ala Phe
65 70 75 80

Leu Glu Leu Arg Ser Leu Thr Val Asp Asp Thr Ala Val Tyr Phe Cys
85 90 95

Thr Arg Gly Lys Asn Cys Asp Tyr Asn Trp Asp Phe Glu His Trp Gly
100 105 110

Arg Gly Thr Pro Val Ile Val Ser Ser Ala Ser Thr Lys Gly Pro Ser
115 120 125

Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala
130 135 140

Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val
145 150 155 160

Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala
165 170 175

Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val
180 185 190

Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His
195 200 205

Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys
210 215 220

Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly
225 230 235 240

Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met
245 250 255

Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser His
260 265 270

Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val
275 280 285

His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr
290 295 300

Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly
305 310 315 320

Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile
325 330 335

Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val
340 345 350

Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser
355 360 365

Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu
370 375 380

Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro
385 390 395 400

Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val
405 410 415

Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met
420 425 430

His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser
435 440 445

Pro Gly Lys
450

<210> 640
<211> 451
<212> PRT
<213> 人工序列

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<223> /注釋=「人工序列之說明：合成多肽」

<400> 640
Gln Val Gln Leu Val Gln Ser Gly Gly Gln Met Lys Lys Pro Gly Glu
1 5 10 15

Ser Met Arg Ile Ser Cys Arg Ala Ser Gly Tyr Glu Phe Ile Asp Cys
20 25 30

Thr Leu Asn Trp Ile Arg Leu Ala Pro Gly Lys Arg Pro Glu Trp Met
35 40 45

Gly Trp Leu Lys Pro Arg Gly Gly Ala Val Asn Tyr Ala Arg Pro Leu
50 55 60

Gln Gly Arg Val Thr Met Thr Arg Asp Val Tyr Ser Asp Thr Ala Phe
65 70 75 80

Leu Glu Leu Arg Ser Leu Thr Val Asp Asp Thr Ala Val Tyr Phe Cys
85 90 95

Thr Arg Gly Lys Asn Cys Asp Tyr Asn Trp Asp Phe Glu His Trp Gly
100 105 110

Arg Gly Thr Pro Val Ile Val Ser Ser Ala Ser Thr Lys Gly Pro Ser
115 120 125

Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala
130 135 140

Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val
145 150 155 160

Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala
165 170 175

Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val
180 185 190

Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His
195 200 205

Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys
210 215 220

Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly
225 230 235 240

Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met
245 250 255

Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser His
260 265 270

Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val
275 280 285

His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr
290 295 300

Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly
305 310 315 320

Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile
325 330 335

Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val
340 345 350

Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln Val Ser
355 360 365

Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu
370 375 380

Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro
385 390 395 400

Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val
405 410 415

Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met
420 425 430

His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser
435 440 445

Pro Gly Lys
450

<210> 641
<211> 453
<212> PRT
<213> 人工序列

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<400> 641
Glu Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val Lys Ala Gly Gly
1 5 10 15

Ser Leu Ile Leu Ser Cys Gly Val Ser Asn Phe Arg Ile Ser Ala His
20 25 30

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Thr Met Asn Trp Val Arg Arg Val Pro Gly Gly Gly Leu Glu Trp Val
        35                  40                  45

Ala Ser Ile Ser Thr Ser Ser Thr Tyr Arg Asp Tyr Ala Asp Ala Val
    50                  55                  60

Lys Gly Arg Phe Thr Val Ser Arg Asp Asp Leu Glu Asp Phe Val Tyr
65                  70                  75                  80

Leu Gln Met His Lys Met Arg Val Glu Asp Thr Ala Ile Tyr Tyr Cys
                85                  90                  95

Ala Arg Lys Gly Ser Asp Arg Leu Ser Asp Asn Asp Pro Phe Asp Ala
            100                 105                 110

Trp Gly Pro Gly Thr Val Val Thr Val Ser Pro Ala Ser Thr Lys Gly
        115                 120                 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
    130                 135                 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145                 150                 155                 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
                165                 170                 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
            180                 185                 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
        195                 200                 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
    210                 215                 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225                 230                 235                 240
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Leu Gly Gly Pro Ser Val Phe Leu Leu Pro Pro Lys Pro Lys Asp Thr
245 250 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
260 265 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
275 280 285

Glu Val His Asn Ala Lys Thr Lys Pro Pro Glu Glu Gln Tyr Asn Ser
290 295 300

Thr Leu Arg Val Val Ser Ile Leu Thr Val Leu His Gln Asp Trp Leu
305 310 315 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala
325 330 335

Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
340 345 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
355 360 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Leu Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

<210> 642
<211> 453
<212> PRT
<213> 人工序列

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<223> /注釋=「人工序列之說明：合成多肽」

<400> 642
Glu Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val Lys Ala Gly Gly
1 5 10 15

Ser Leu Ile Leu Ser Cys Gly Val Ser Asn Phe Arg Ile Ser Ala His
20 25 30

Thr Met Asn Trp Val Arg Arg Val Pro Gly Gly Gly Leu Glu Trp Val
35 40 45

Ala Ser Ile Ser Thr Ser Ser Thr Tyr Arg Asp Tyr Ala Asp Ala Val
50 55 60

Lys Gly Arg Phe Thr Val Ser Arg Asp Asp Leu Glu Asp Phe Val Tyr
65 70 75 80

Leu Gln Met His Lys Met Arg Val Glu Asp Thr Ala Ile Tyr Tyr Cys
85 90 95

Ala Arg Lys Gly Ser Asp Arg Leu Ser Asp Asn Asp Pro Phe Asp Ala
100 105 110

Trp Gly Pro Gly Thr Val Val Thr Val Ser Pro Ala Ser Thr Lys Gly
115 120 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
130 135 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145 150 155 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
165 170 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
180 185 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
195 200 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
210 215 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225 230 235 240

Val Gly Gly Pro Ser Val Phe Leu Leu Pro Pro Lys Pro Lys Asp Thr
245 250 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
260 265 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
275 280 285

Glu Val His Asn Ala Lys Thr Lys Pro Pro Glu Glu Gln Tyr Asn Ser
290 295 300

Thr Leu Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305 310 315 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala
325 330 335

Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
340 345 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
355 360 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Leu Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Leu His Glu Ala Leu His Ser His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

<210> 643
<211> 214
<212> PRT
<213> 人工序列

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<223> /注釋=「人工序列之說明：合成多肽」

<400> 643
Asp Val Val Met Thr Gln Ser Pro Ser Thr Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Ile Thr Ile Thr Cys Arg Ala Ser Gln Ser Ile Glu Thr Trp
20 25 30

Leu Ala Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile
35 40 45

Tyr Lys Ala Ser Thr Leu Lys Thr Gly Val Pro Ser Arg Phe Ser Gly
50 55 60

Ser Gly Ser Gly Thr Glu Phe Thr Leu Thr Ile Ser Gly Leu Gln Phe
65 70 75 80

Asp Asp Phe Ala Thr Tyr His Cys Gln His Tyr Ala Gly Tyr Ser Ala
85 90 95

Thr Phe Gly Gln Gly Thr Arg Val Glu Ile Lys Arg Thr Val Ala Ala
100 105 110

Pro Ser Val Phe Ile Phe Pro Pro Ser Asp Glu Gln Leu Lys Ser Gly
115 120 125

Thr Ala Ser Val Val Cys Leu Leu Asn Asn Phe Tyr Pro Arg Glu Ala
130 135 140

Lys Val Gln Trp Lys Val Asp Asn Ala Leu Gln Ser Gly Asn Ser Gln
145 150 155 160

Glu Ser Val Thr Glu Gln Asp Ser Lys Asp Ser Thr Tyr Ser Leu Ser
165 170 175

Ser Thr Leu Thr Leu Ser Lys Ala Asp Tyr Glu Lys His Lys Val Tyr
180 185 190

Ala Cys Glu Val Thr His Gln Gly Leu Ser Ser Pro Val Thr Lys Ser
195 200 205

Phe Asn Arg Gly Glu Cys
210

<210> 644
<211> 211
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<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 644
Tyr Ile Gly Val Thr Gln Ser Pro Ala Ile Leu Ser Val Ser Leu Gly
1 5 10 15

Glu Arg Val Thr Leu Ser Cys Lys Thr Ser Gln Ala Ile Thr Pro Arg
20 25 30

His Leu Val Trp His Arg Gln Lys Gly Gly Gln Ala Pro Ser Leu Val
35 40 45

Met Thr Gly Thr Ser Glu Arg Ala Ser Gly Ile Pro Asp Arg Phe Ile
50 55 60

Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Thr Arg Leu Glu
65 70 75 80

Ala Glu Asp Phe Ala Val Tyr Tyr Cys Gln Cys Leu Glu Ala Phe Gly
85 90 95

Gln Gly Thr Lys Leu Glu Ile Lys Arg Thr Val Ala Ala Pro Ser Val
100 105 110

Phe Ile Phe Pro Pro Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser
115 120 125

Val Val Cys Leu Leu Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln
130 135 140

Trp Lys Val Asp Asn Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val
145 150 155 160

Thr Glu Gln Asp Ser Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu
165 170 175

Thr Leu Ser Lys Ala Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu
180 185 190

Val Thr His Gln Gly Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg
195 200 205

Gly Glu Cys
210

<210> 645
<211> 210
<212> PRT
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<400> 645
Glu Ile Val Leu Thr Gln Ser Pro Gly Thr Leu Ser Leu Ser Pro Gly
1 5 10 15

Glu Thr Ala Ile Ile Ser Cys Arg Thr Ser Gln Tyr Gly Ser Leu Ala
20 25 30

Trp Tyr Gln Gln Arg Pro Gly Gln Ala Pro Arg Leu Val Ile Tyr Ser
35 40 45

Gly Ser Thr Arg Ala Ala Gly Ile Pro Asp Arg Phe Ser Gly Ser Arg
50 55 60

Trp Gly Pro Asp Tyr Asn Leu Thr Ile Ser Asn Leu Glu Ser Gly Asp
65 70 75 80

Phe Gly Val Tyr Tyr Cys Gln Gln Tyr Glu Phe Phe Gly Gln Gly Thr
85 90 95

Lys Val Gln Val Asp Ile Lys Arg Thr Val Ala Ala Pro Ser Val Phe
100 105 110

Ile Phe Pro Pro Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val
115 120 125

Val Cys Leu Leu Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp
130 135 140

Lys Val Asp Asn Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr
145 150 155 160

Glu Gln Asp Ser Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr
165 170 175

Leu Ser Lys Ala Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val
180 185 190

Thr His Gln Gly Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly
195 200 205

Glu Cys
210

<210> 646
<211> 210
<212> PRT
<213> 人工序列

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<223> /注釋=「人工序列之說明：合成多肽」

<400> 646
Glu Ile Val Leu Thr Gln Ser Pro Gly Thr Leu Ser Leu Ser Pro Gly
1 5 10 15

Glu Thr Ala Ile Ile Ser Cys Arg Thr Ser Gln Tyr Gly Ser Leu Ala
20 25 30

Trp Tyr Gln Gln Arg Pro Gly Gln Ala Pro Arg Leu Val Ile Tyr Ser
35 40 45

Gly Ser Thr Arg Ala Ala Gly Ile Pro Asp Arg Phe Ser Gly Ser Arg
50 55 60

Trp Gly Pro Asp Tyr Asn Leu Thr Ile Ser Asn Leu Glu Ser Gly Asp
65 70 75 80

Phe Gly Val Tyr Tyr Cys Gln Gln Tyr Glu Phe Phe Gly Gln Gly Thr
85 90 95

Lys Val Gln Val Asp Ile Lys Arg Thr Val Ala Ala Pro Ser Val Phe
100 105 110

Ile Phe Pro Pro Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val
115 120 125

Val Cys Leu Leu Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp
130 135 140

Lys Val Asp Asn Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr
145 150 155 160

Glu Gln Asp Ser Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr
165 170 175

Leu Ser Lys Ala Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val
180 185 190

Thr His Gln Gly Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly
195 200 205

Glu Cys
210

<210> 647
<211> 219

<212> PRT
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 647
Asp Ile Val Met Thr Gln Thr Pro Leu Ser Leu Ser Val Thr Pro Gly
1 5 10 15

Gln Pro Ala Ser Ile Ser Cys Lys Ser Ser Glu Ser Leu Arg Gln Ser
20 25 30

Asn Gly Lys Thr Ser Leu Tyr Trp Tyr Arg Gln Lys Pro Gly Gln Ser
35 40 45

Pro Gln Leu Leu Val Phe Glu Val Ser Asn Arg Phe Ser Gly Val Ser
50 55 60

Asp Arg Phe Val Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Arg Ile
65 70 75 80

Ser Arg Val Glu Ala Glu Asp Val Gly Phe Tyr Tyr Cys Met Gln Ser
85 90 95

Lys Asp Phe Pro Leu Thr Phe Gly Gly Gly Thr Lys Val Asp Leu Lys
100 105 110

Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro Ser Asp Glu
115 120 125

Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu Asn Asn Phe
130 135 140

Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn Ala Leu Gln
145 150 155 160

Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser Lys Asp Ser
165 170 175

Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala Asp Tyr Glu
180 185 190

Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly Leu Ser Ser
195 200 205

Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
210 215

<210> 648
<211> 216
<212> PRT
<213> 人工序列

<220>
<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 648
Gln Ser Ala Leu Thr Gln Pro Ala Ser Val Ser Gly Ser Pro Gly Gln
1 5 10 15

Thr Ile Thr Ile Ser Cys Asn Gly Thr Ser Ser Asp Val Gly Gly Phe
20 25 30

Asp Ser Val Ser Trp Tyr Gln Gln Ser Pro Gly Lys Ala Pro Lys Val
35 40 45

Met Val Phe Asp Val Ser His Arg Pro Ser Gly Ile Ser Asn Arg Phe
50 55 60

Ser Gly Ser Lys Ser Gly Asn Thr Ala Ser Leu Thr Ile Ser Gly Leu
65 70 75 80

His Ile Glu Asp Glu Gly Asp Tyr Phe Cys Ser Ser Leu Thr Asp Arg
85 90 95

Ser His Arg Ile Phe Gly Gly Gly Thr Lys Val Thr Val Leu Gly Gln
100 105 110

Pro Lys Ala Ala Pro Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu
115 120 125

Leu Gln Ala Asn Lys Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr
130 135 140

Pro Gly Ala Val Thr Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys
145 150 155 160

Ala Gly Val Glu Thr Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr
165 170 175

Ala Ala Ser Ser Tyr Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His
180 185 190

Arg Ser Tyr Ser Cys Gln Val Thr His Glu Gly Ser Thr Val Glu Lys
195 200 205

Thr Val Ala Pro Thr Glu Cys Ser
210 215

<210> 649
<211> 219
<212> PRT
<213> 人工序列

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<223> /注釋=「人工序列之說明：合成多肽」

<400> 649
Glu Val Val Ile Thr Gln Ser Pro Leu Phe Leu Pro Val Thr Pro Gly
1 5 10 15

Glu Ala Ala Ser Leu Ser Cys Lys Cys Ser His Ser Leu Gln His Ser
20 25 30

Thr Gly Ala Asn Tyr Leu Ala Trp Tyr Leu Gln Arg Pro Gly Gln Thr
35 40 45

Pro Arg Leu Leu Ile His Leu Ala Thr His Arg Ala Ser Gly Val Pro
50 55 60

Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Lys Ile
65 70 75 80

Ser Arg Val Glu Ser Asp Asp Val Gly Thr Tyr Tyr Cys Met Gln Gly
85 90 95

Leu His Ser Pro Trp Thr Phe Gly Gln Gly Thr Lys Val Glu Ile Lys
100 105 110

Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro Ser Asp Glu
115 120 125

Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu Asn Asn Phe
130 135 140

Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn Ala Leu Gln
145 150 155 160

Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser Lys Asp Ser
165 170 175

Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala Asp Tyr Glu
180 185 190

Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly Leu Ser Ser
195 200 205

Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
210 215

<210> 650
<211> 210
<212> PRT
<213> 人工序列

<220>
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 650

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Glu Ile Val Leu Thr Gln Ser Pro Gly Thr Leu Ser Leu Ser Pro Gly
1               5                  10                  15

Glu Thr Ala Ile Ile Ser Cys Arg Thr Ser Gln Tyr Gly Ser Leu Ala
            20                  25                  30

Trp Tyr Gln Gln Arg Pro Gly Gln Ala Pro Arg Leu Val Ile Tyr Ser
        35                  40                  45

Gly Ser Thr Arg Ala Ala Gly Ile Pro Asp Arg Phe Ser Gly Ser Arg
    50                  55                  60

Trp Gly Pro Asp Tyr Asn Leu Thr Ile Ser Asn Leu Glu Ser Gly Asp
65                  70                  75                  80

Phe Gly Val Tyr Tyr Cys Gln Gln Tyr Glu Phe Phe Gly Gln Gly Thr
                85                  90                  95

Lys Val Gln Val Asp Ile Lys Arg Thr Val Ala Ala Pro Ser Val Phe
            100                 105                 110

Ile Phe Pro Pro Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val
        115                 120                 125

Val Cys Leu Leu Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp
    130                 135                 140

Lys Val Asp Asn Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr
145                 150                 155                 160

Glu Gln Asp Ser Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr
                165                 170                 175
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Leu Ser Lys Ala Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val
180 185 190

Thr His Gln Gly Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly
195 200 205

Glu Cys
210

<210> 651
<211> 210
<212> PRT
<213> 人工序列

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<223> /注釋=「人工序列之說明：合成多肽」

<400> 651
Glu Ile Val Leu Thr Gln Ser Pro Gly Thr Leu Ser Leu Ser Pro Gly
1 5 10 15

Glu Thr Ala Ile Ile Ser Cys Arg Thr Ser Gln Tyr Gly Ser Leu Ala
20 25 30

Trp Tyr Gln Gln Arg Pro Gly Gln Ala Pro Arg Leu Val Ile Tyr Ser
35 40 45

Gly Ser Thr Arg Ala Ala Gly Ile Pro Asp Arg Phe Ser Gly Ser Arg
50 55 60

Trp Gly Pro Asp Tyr Asn Leu Thr Ile Ser Asn Leu Glu Ser Gly Asp
65 70 75 80

Phe Gly Val Tyr Tyr Cys Gln Gln Tyr Glu Phe Phe Gly Gln Gly Thr
85 90 95

Lys Val Gln Val Asp Ile Lys Arg Thr Val Ala Ala Pro Ser Val Phe
100 105 110

Ile Phe Pro Pro Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val
115 120 125

Val Cys Leu Leu Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp
130 135 140

Lys Val Asp Asn Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr
145 150 155 160

Glu Gln Asp Ser Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr
165 170 175

Leu Ser Lys Ala Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val
180 185 190

Thr His Gln Gly Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly
195 200 205

Glu Cys
210

<210> 652
<211> 214
<212> PRT
<213> 人工序列

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<221> source
<223> /注釋=「人工序列之說明：合成多肽」

<400> 652
Asp Val Val Met Thr Gln Ser Pro Ser Thr Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Thr Ile Thr Ile Thr Cys Arg Ala Ser Gln Ser Ile Glu Thr Trp
20 25 30

Leu Ala Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile
35 40 45

Tyr Lys Ala Ser Thr Leu Lys Thr Gly Val Pro Ser Arg Phe Ser Gly
50 55 60

Ser Gly Ser Gly Thr Glu Phe Thr Leu Thr Ile Ser Gly Leu Gln Phe
65 70 75 80

Asp Asp Phe Ala Thr Tyr His Cys Gln His Tyr Ala Gly Tyr Ser Ala
85 90 95

Thr Phe Gly Gln Gly Thr Arg Val Glu Ile Lys Arg Thr Val Ala Ala
100 105 110

Pro Ser Val Phe Ile Phe Pro Pro Ser Asp Glu Gln Leu Lys Ser Gly
115 120 125

Thr Ala Ser Val Val Cys Leu Leu Asn Asn Phe Tyr Pro Arg Glu Ala
130 135 140

Lys Val Gln Trp Lys Val Asp Asn Ala Leu Gln Ser Gly Asn Ser Gln
145 150 155 160

Glu Ser Val Thr Glu Gln Asp Ser Lys Asp Ser Thr Tyr Ser Leu Ser
165 170 175

Ser Thr Leu Thr Leu Ser Lys Ala Asp Tyr Glu Lys His Lys Val Tyr
180 185 190

Ala Cys Glu Val Thr His Gln Gly Leu Ser Ser Pro Val Thr Lys Ser
195 200 205

Phe Asn Arg Gly Glu Cys
210

<210> 653
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<223> /注釋=「人工序列之說明：合成多肽」

<400> 653

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1               5                  10                  15

Asp Thr Ile Thr Ile Thr Cys Arg Ala Ser Gln Ser Ile Glu Thr Trp
            20                  25                  30

Leu Ala Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile
        35                  40                  45

Tyr Lys Ala Ser Thr Leu Lys Thr Gly Val Pro Ser Arg Phe Ser Gly
    50                  55                  60

Ser Gly Ser Gly Thr Glu Phe Thr Leu Thr Ile Ser Gly Leu Gln Phe
65                  70                  75                  80

Asp Asp Phe Ala Thr Tyr His Cys Gln His Tyr Ala Gly Tyr Ser Ala
                85                  90                  95

Thr Phe Gly Gln Gly Thr Arg Val Glu Ile Lys Arg Thr Val Ala Ala
            100                 105                 110

Pro Ser Val Phe Ile Phe Pro Pro Ser Asp Glu Gln Leu Lys Ser Gly
        115                 120                 125

Thr Ala Ser Val Val Cys Leu Leu Asn Asn Phe Tyr Pro Arg Glu Ala
    130                 135                 140

Lys Val Gln Trp Lys Val Asp Asn Ala Leu Gln Ser Gly Asn Ser Gln
145                 150                 155                 160

Glu Ser Val Thr Glu Gln Asp Ser Lys Asp Ser Thr Tyr Ser Leu Ser
                165                 170                 175

Ser Thr Leu Thr Leu Ser Lys Ala Asp Tyr Glu Lys His Lys Val Tyr
            180                 185                 190
```

Ala Cys Glu Val Thr His Gln Gly Leu Ser Ser Pro Val Thr Lys Ser
195 200 205

Phe Asn Arg Gly Glu Cys
210

【發明申請專利範圍】

【請求項1】

一種結合至人類免疫缺陷病毒-1 (HIV-1)包膜醣蛋白gp120之抗體或其抗原結合片段，該抗體或其抗原結合片段包含(i) 包含VH互補決定區1-3 (CDR 1-3)之重鏈可變區(VH)及(ii) 包含VL CDR 1-3之輕鏈可變區(VL)，其中該等VH CDR 1-3及VL CDR 1-3分別具有以下中所述之序列：

SEQ ID NO.: 137、138、139、140、141及142，且其中該VL中至少50%之N-連接之醣基化位點經唾液酸化。

【請求項2】

如請求項1之抗體或其抗原結合片段，其中該VL中至少60%之N-連接之醣基化位點經唾液酸化。

【請求項3】

如請求項1之抗體或其抗原結合片段，其中該VL中至少70%之N-連接之醣基化位點經唾液酸化。

【請求項4】

如請求項1之抗體或其抗原結合片段，其中該VL中至少80%之N-連接之醣基化位點經唾液酸化。

【請求項5】

如請求項1之抗體或其抗原結合片段，其包含重鏈可變區(VH)及輕鏈可變區(VL)，其中該VH及VL分別包含以下所述胺基酸序列：

(1) SEQ ID NO.: 182及223；或

(2) SEQ ID NO.: 477及278。

【請求項6】

如請求項1至5中任一項之抗體或其抗原結合片段，其包含重鏈可變區(VH)及輕鏈可變區(VL)，其中該VH及VL分別包含SEQ ID NO.: 182及223之胺基酸序列。

【請求項7】

如請求項1至5中任一項之抗體或其抗原結合片段，其中根據Kabat編號在VL胺基酸位置72之天冬醯胺酸(N72)經唾液酸化。

【請求項8】

如請求項1至5中任一項之抗體或其抗原結合片段，其中在該VL中之唾液酸化N-連接之醣基化位點包含1至5個唾液酸殘基。

【請求項9】

如請求項1至5中任一項之抗體或其抗原結合片段，其中該VL經N-乙醯基神經胺酸(NANA)唾液酸化。

【請求項10】

如請求項8之抗體或其抗原結合片段，其中該等唾液酸殘基存在於二天線(biantennary)結構中。

【請求項11】

如請求項8之抗體或其抗原結合片段，其中該等唾液酸殘基存在於複雜N-連接之聚醣結構中。

【請求項12】

如請求項8之抗體或其抗原結合片段，其中該等唾液酸殘基存在於雜合N-連接之聚醣結構中。

【請求項13】

如請求項11之抗體或其抗原結合片段，其中該等聚醣末端經唾液酸化。

【請求項14】

一種醫藥組合物，其包含如請求項1至13中任一項之抗體或其抗原結合片段及醫藥上可接受之載劑。

【請求項15】

如請求項14之醫藥組合物，其進一步包含用於治療HIV感染之第二藥劑。

【請求項16】

如請求項14或15之醫藥組合物，其進一步包含類鐸受體(toll-like receptor，TLR)激動劑。

【請求項17】

如請求項16之醫藥組合物，其中該TLR激動劑係TLR2激動劑、TLR3激動劑、TLR7激動劑、TLR8激動劑或TLR9激動劑。

【請求項18】

如請求項14或15之醫藥組合物，其進一步包含TLR7激動劑。

【請求項19】

如請求項18之醫藥組合物，其中該TLR7激動劑係選自由以下組成之群：維沙莫特(vesatolimod)、咪喹莫特(imiquimod)及雷西莫特(resiquimod)。

【請求項20】

如請求項14或15之醫藥組合物，其進一步包含結合、抑制及/或中和HIV之抗體或其抗原結合片段。

【請求項21】

如請求項20之醫藥組合物，其進一步包含結合、抑制及/或中和HIV之第二抗體或其抗原結合片段，其中該第二抗體或其抗原結合片段不與如請求項1至13中任一項之抗體或其抗原結合片段競爭結合至gp120。

【請求項22】

如請求項21之醫藥組合物，其中結合、抑制及/或中和HIV之該第二抗體或其抗原結合片段與針對HIV之廣泛中和抗體(bNAb)競爭，或包含該廣泛中和抗體之VH及VL可變結構域。

【請求項23】

如請求項21之醫藥組合物，其中結合、抑制及/或中和HIV之該第二抗體或其抗原結合片段結合至一個選自由以下組成之群之gp120的表位或區：

i. 第三可變環(V3)及/或包含N332寡甘露糖聚醣之高甘露糖區塊(patch)；

ii. 第二可變環(V2)及/或Env三聚體頂端；

iii. gp120/gp41界面；或

iv. gp120之沉默面。

【請求項24】

如請求項23之醫藥組合物，其中結合、抑制及/或中和HIV之該第二抗體或其抗原結合片段結合至gp120之該第三可變環(V3)及/或包含N332寡甘露糖聚醣之高甘露糖區塊中之一個表位或區，且與選自由以下組成之群之抗體競爭或包含該抗體之VH及VL區：GS-9722、PGT-121、PGT-122、PGT-123、PGT-124、PGT-125、PGT-126、PGT-128、PGT-

130、PGT-133、PGT-134、PGT-135、PGT-136、PGT-137、PGT-138、PGT-139、10-1074、VRC24、2G12、BG18、354BG8、354BG18、354BG42、354BG33、354BG129、354BG188、354BG411、354BG426、DH270.1、DH270.6、PGDM12、VRC41.01、PGDM21、PCDN-33A、BF520.1及VRC29.03。

【請求項25】

如請求項23之醫藥組合物，其中結合、抑制及/或中和HIV之該第二抗體或其抗原結合片段結合至gp120之第二可變環(V2)及/或Env三聚體頂端中之一個表位或區，且與選自由以下組成之群之抗體競爭或包含該抗體之VH及VL區　：PG9、PG16、PGC14、PGG14、PGT-142、PGT-143、PGT-144、PGT-145、CH01、CH59、PGDM1400、CAP256、CAP256-VRC26.08、CAP256-VRC26.09、CAP256-VRC26.25、PCT64-24E及VRC38.01。

【請求項26】

如請求項23之醫藥組合物，其中該第二抗體或其抗原結合片段結合至該gp120/gp41界面中gp120之一個表位或區，且與選自由以下組成之群之抗體競爭或包含該抗體之VH及VL區 ：PGT-151、CAP248-2B、35O22、8ANC195、ACS202、VRC34及VRC34.01。

【請求項27】

如請求項23之醫藥組合物，其中結合、抑制及/或中和HIV之該第二抗體或其抗原結合片段結合至該gp120沉默面之一個表位或區，且與選自由以下組成之群之抗體競爭或包含該抗體之VH及VL區：VRC-PG05及SF12。

【請求項28】

如請求項21之醫藥組合物，其中結合、抑制及/或中和HIV之該第二抗體或其抗原結合片段結合至近膜區(MPER)中gp41之一個表位或區。

【請求項29】

如請求項28之醫藥組合物，其中結合、抑制及/或中和HIV之該第二抗體或其抗原結合片段結合至該近膜區(MPER)中gp41之一個表位或區，且與選自由以下組成之群之抗體競爭或包含該抗體之VH及VL區：10E8、10E8v4、10E8-5R-100cF、4E10、DH511.11P、2F5、7b2及LN01。

【請求項30】

如請求項21之醫藥組合物，其中結合、抑制及/或中和HIV之該第二抗體或其抗原結合片段結合至gp41融合肽之一個表位或區，且與選自由以下組成之群之抗體競爭或包含該抗體之VH及VL區：VRC34及ACS202。

【請求項31】

如請求項21之醫藥組合物，其中結合、抑制及/或中和HIV之該第二抗體或其抗原結合片段包含PGT121.60或PGT121.66之VH及VL。

【請求項32】

如請求項21之醫藥組合物，其中結合、抑制及/或中和HIV之該抗體或其抗原結合片段包含SEQ ID NO:454內之VH及SEQ ID NO:455內之VL。

【請求項33】

如請求項21之醫藥組合物，其中結合、抑制及/或中和HIV之該抗體或其抗原結合片段包含SEQ ID NO:454內之VH及SEQ ID NO:456內之

VL。

【請求項34】

一種編碼如請求項1至13中任一項之抗體或其抗原結合片段的核酸。

【請求項35】

如請求項34之核酸，其中該核酸包含DNA或mRNA。

【請求項36】

一種表現載體，其包含如請求項34或35之核酸，該核酸可操作地連接至調節序列。

【請求項37】

如請求項36之表現載體，其中該表現載體包含質體載體或病毒載體。

【請求項38】

一種醫藥組合物，其包含如請求項34或35之核酸或如請求項36或37之表現載體及醫藥上可接受之載劑。

【請求項39】

一種脂質奈米粒子(LNP)，其包含如請求項34或35之核酸或如請求項36或37之表現載體。

【請求項40】

一種嵌合抗原受體(CAR)，其包含如請求項1至13中任一項所載之抗原結合片段。

【請求項41】

一種CAR T細胞，其包含如請求項40之CAR。

【請求項42】

一種宿主細胞或細胞群體，其包含如請求項34或35之核酸或如請求項36或37之表現載體。

【請求項43】

如請求項42之宿主細胞或細胞群體，其中該細胞或細胞群體包含真核細胞。

【請求項44】

如請求項42或43之宿主細胞或細胞群體，其中該細胞或細胞群體包含哺乳動物細胞、昆蟲細胞、植物細胞或酵母細胞。

【請求項45】

如請求項42或43之宿主細胞或細胞群體，其中該哺乳動物細胞係中國倉鼠卵巢(CHO)細胞。

【請求項46】

如請求項42或43之宿主細胞或細胞群體，其中該哺乳動物細胞係人類細胞。

【請求項47】

如請求項46之宿主細胞或細胞群體，其中該細胞係人類胚腎細胞或人類B細胞。

【請求項48】

如請求項42或43之宿主細胞或細胞群體，其中該細胞主要唾液酸化所表現之抗體或其抗原結合片段之可變結構域(Fv)中之N-連接之醣基化位點。

【請求項49】

如請求項42或43之宿主細胞或細胞群體，其中所表現之抗體或其抗

原結合片段之可變結構域(Fv)中之至少50%之N-連接之醣基化位點經唾液酸化。

【請求項50】

如請求項42或43之宿主細胞或細胞群體，其中VL中之至少50%之N-連接之醣基化位點經唾液酸化。

【請求項51】

如請求項42或43之宿主細胞或細胞群體，其中VL中之至少60%之N-連接之醣基化位點經唾液酸化。

【請求項52】

如請求項42或43之宿主細胞或細胞群體，其中VL中之至少70%之N-連接之醣基化位點經唾液酸化。

【請求項53】

如請求項42或43之宿主細胞或細胞群體，其中VL中之至少80%之N-連接之醣基化位點經唾液酸化。

【請求項54】

如請求項42或43之宿主細胞或細胞群體，其中根據Kabat編號在VL胺基酸位置72之天冬醯胺酸(N72)經唾液酸化。

【請求項55】

如請求項42或43之宿主細胞或細胞群體，其中該VL中之唾液酸化N-連接之醣基化位點包含1至5個唾液酸殘基。

【請求項56】

如請求項42或43之宿主細胞或細胞群體，其中該VL經N-乙醯基神經胺酸(NANA)唾液酸化。

【請求項57】

如請求項55之宿主細胞或細胞群體，其中該等唾液酸殘基存在於二天線結構中。

【請求項58】

如請求項55之宿主細胞或細胞群體，其中該等唾液酸殘基存在於複雜N-連接之聚醣結構中。

【請求項59】

如請求項55之宿主細胞或細胞群體，其中該等唾液酸殘基存在於雜合N-連接之聚醣結構中。

【請求項60】

如請求項58之宿主細胞或細胞群體，其中該等聚醣末端經唾液酸化。

【請求項61】

一種產生抗體或其抗原結合片段之方法，該方法包含：

在細胞培養基中培養如請求項42至60中任一項之宿主細胞；及

自該細胞培養基分離該抗體或其抗原結合片段。

【請求項62】

如請求項61之方法，其進一步包含將該抗體或其抗原結合片段調配成適於投與人類個體之無菌醫藥組合物。

【請求項63】

一種如請求項1至13中任一項之抗體或其抗原結合片段之用途，其係用以製備治療或預防HIV的醫藥品。

【請求項64】

如請求項63之用途，其中該醫藥品進一步包含用於治療HIV感染之第二藥劑或與其併用。

【請求項65】

如請求項64之用途，其中該醫藥品進一步包含類鐸受體(TLR)激動劑或與其併用。

【請求項66】

如請求項65之用途，其中該TLR激動劑係TLR2激動劑、TLR3激動劑、TLR7激動劑、TLR8激動劑或TLR9激動劑。

【請求項67】

如請求項66之用途，其中該TLR激動劑係TLR7激動劑。

【請求項68】

如請求項67之用途，其中該TLR7激動劑係選自由以下組成之群：維沙莫特、咪喹莫特及雷西莫特。

【請求項69】

如請求項64之用途，其中該醫藥品進一步包含結合、抑制及/或中和HIV之額外抗體或其抗原結合片段或與其併用。

【請求項70】

如請求項69之用途，其中該醫藥品進一步包含結合、抑制及/或中和HIV之第二抗體或其抗原結合片段或與其併用，其中該第二抗體或其抗原結合片段不與如請求項1至13中任一項之抗體或其抗原結合片段競爭結合至gp120。

【請求項71】

如請求項69或70之用途，其中結合、抑制及/或中和HIV之該第二抗

體或其抗原結合片段與針對HIV之廣泛中和抗體(bNAb)競爭或包含該廣泛中和抗體之VH及VL可變結構域。

【請求項72】

如請求項69或70之用途，其中結合、抑制及/或中和HIV之該第二抗體或其抗原結合片段結合至一個選自由以下組成之群之gp120的表位或區：

i. 第三可變環(V3)及/或包含N332寡甘露糖聚醣之高甘露糖區塊；

ii. 第二可變環(V2)及/或Env三聚體頂端；

iii. gp120/gp41界面；或

iv. gp120之沉默面。

【請求項73】

如請求項72之用途，其中結合、抑制及/或中和HIV之該第二抗體或其抗原結合片段結合至gp120之該第三可變環(V3)及/或包含N332寡甘露糖聚醣之高甘露糖區塊中之一個表位或區，且與選自由以下組成之群之抗體競爭或包含該抗體之VH及VL區：GS-9722、PGT-121、PGT-122、PGT-123、PGT-124、PGT-125、PGT-126、PGT-128、PGT-130、PGT-133、PGT-134、PGT-135、PGT-136、PGT-137、PGT-138、PGT-139、10-1074、VRC24、2G12、BG18、354BG8、354BG18、354BG42、354BG33、354BG129、354BG188、354BG411、354BG426、DH270.1、DH270.6、PGDM12、VRC41.01、PGDM21、PCDN-33A、BF520.1及VRC29.03。

【請求項74】

如請求項72之用途，其中結合、抑制及/或中和HIV之該第二抗體或其抗原結合片段結合至gp120之第二可變環(V2)及/或Env三聚體頂端中之一個表位或區，且與選自由以下組成之群之抗體競爭或包含該抗體之VH及VL區　：PG9、PG16、PGC14、PGG14、PGT-142、PGT-143、PGT-144、PGT-145、CH01、CH59、PGDM1400、CAP256、CAP256-VRC26.08、CAP256-VRC26.09、CAP256-VRC26.25、PCT64-24E及VRC38.01。

【請求項75】

如請求項72之用途，其中該第二抗體或其抗原結合片段結合至該gp120/gp41界面中gp120之一個表位或區，且與選自由以下組成之群之抗體競爭或包含該抗體之VH及VL區：PGT-151、CAP248-2B、35O22、8ANC195、ACS202、VRC34及VRC34.01。

【請求項76】

如請求項72之用途，其中結合、抑制及/或中和HIV之該第二抗體或其抗原結合片段結合至該gp120沉默面之一個表位或區，且與選自由以下組成之群之抗體競爭或包含該抗體之VH及VL區：VRC-PG05及SF12。

【請求項77】

如請求項69或70之用途，其中結合、抑制及/或中和HIV之該第二抗體或其抗原結合片段結合至近膜區(MPER)中gp41之一個表位或區。

【請求項78】

如請求項77之用途，其中結合、抑制及/或中和HIV之該第二抗體或其抗原結合片段結合至近膜區(MPER)中gp41之一個表位或區，且與選自由以下組成之群之抗體競爭或包含該抗體之VH及VL區：10E8、

10E8v4、10E8-5R-100cF、4E10、DH511.11P、2F5、7b2及LN01。

【請求項79】

如請求項69或70之用途，其中結合、抑制及/或中和HIV之該第二抗體或其抗原結合片段結合至gp41融合肽之一個表位或區，且與選自由以下組成之群之抗體競爭或包含該抗體之VH及VL區：VRC34及ACS202。

【請求項80】

如請求項69或70之用途，其中該醫藥品進一步包含結合、抑制及/或中和HIV之抗體或其抗原結合片段或與其併用，該抗體或其抗原結合片段包含PGT121.60或PGT121.66之VH及VL。

【請求項81】

如請求項69或70之用途，其中該醫藥品進一步包含結合、抑制及/或中和HIV之抗體或其抗原結合片段或與其併用，該抗體或其抗原結合片段包含SEQ ID NO:454內之VH及SEQ ID NO:455內之VL。

【請求項82】

如請求項69或70之用途，其中該醫藥品進一步包含結合、抑制及/或中和HIV之抗體或其抗原結合片段或與其併用，該抗體或其抗原結合片段包含SEQ ID NO:454內之VH及SEQ ID NO:456內之VL。

【請求項83】

如請求項63之用途，其中該醫藥品進一步包含抗HIV疫苗或與其併用。

【請求項84】

如請求項83之用途，其中該抗HIV疫苗為病毒疫苗。

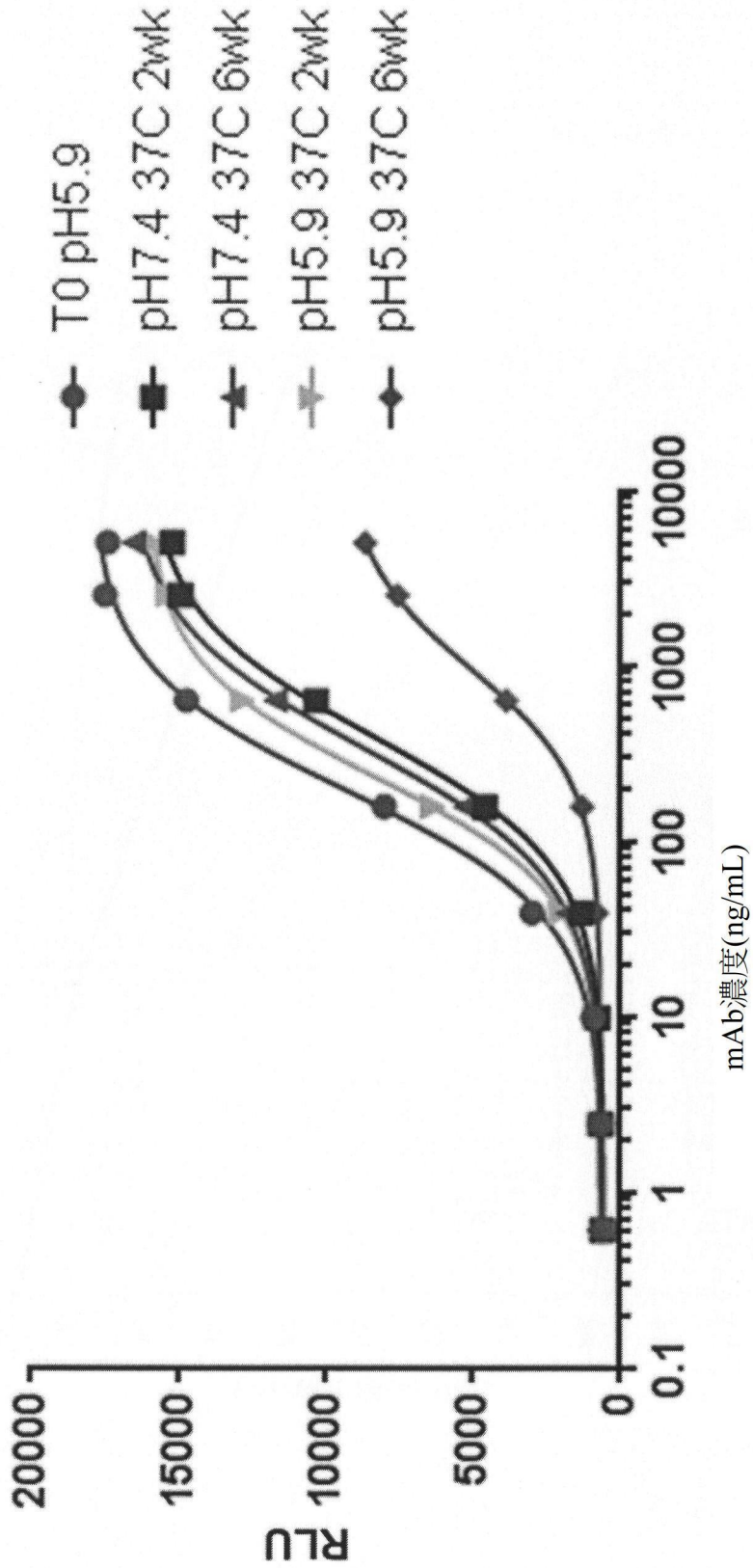
【請求項85】

如請求項83或84之用途，其中該抗HIV疫苗為病毒疫苗，該病毒疫苗係來自選自由以下組成之群之病毒：沙粒狀病毒、腺病毒、痘病毒及棒狀病毒。

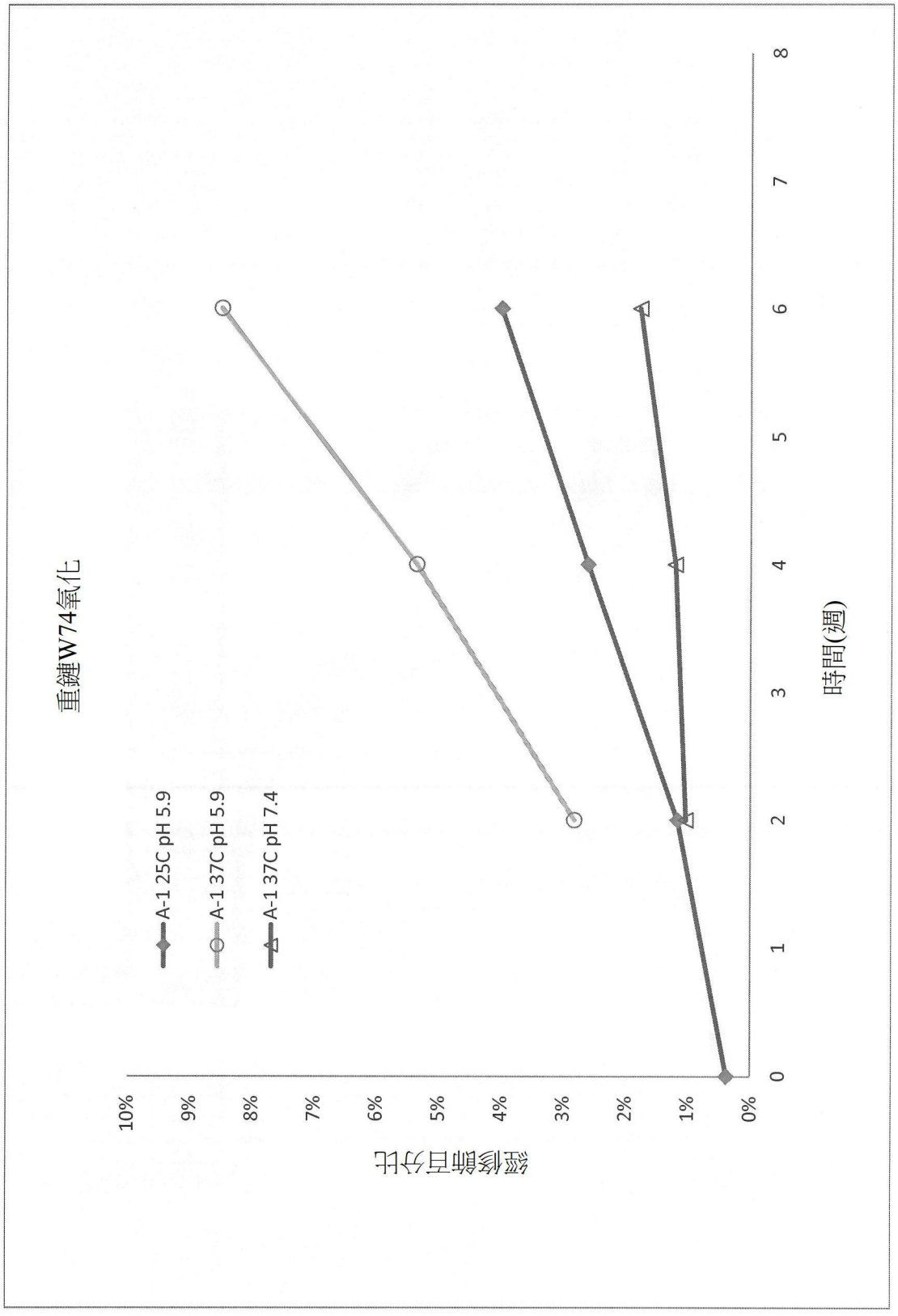
【請求項86】

一種如請求項1至13中任一項之抗體或其抗原結合片段之用途，其係用以製備抑制HIV的醫藥品。

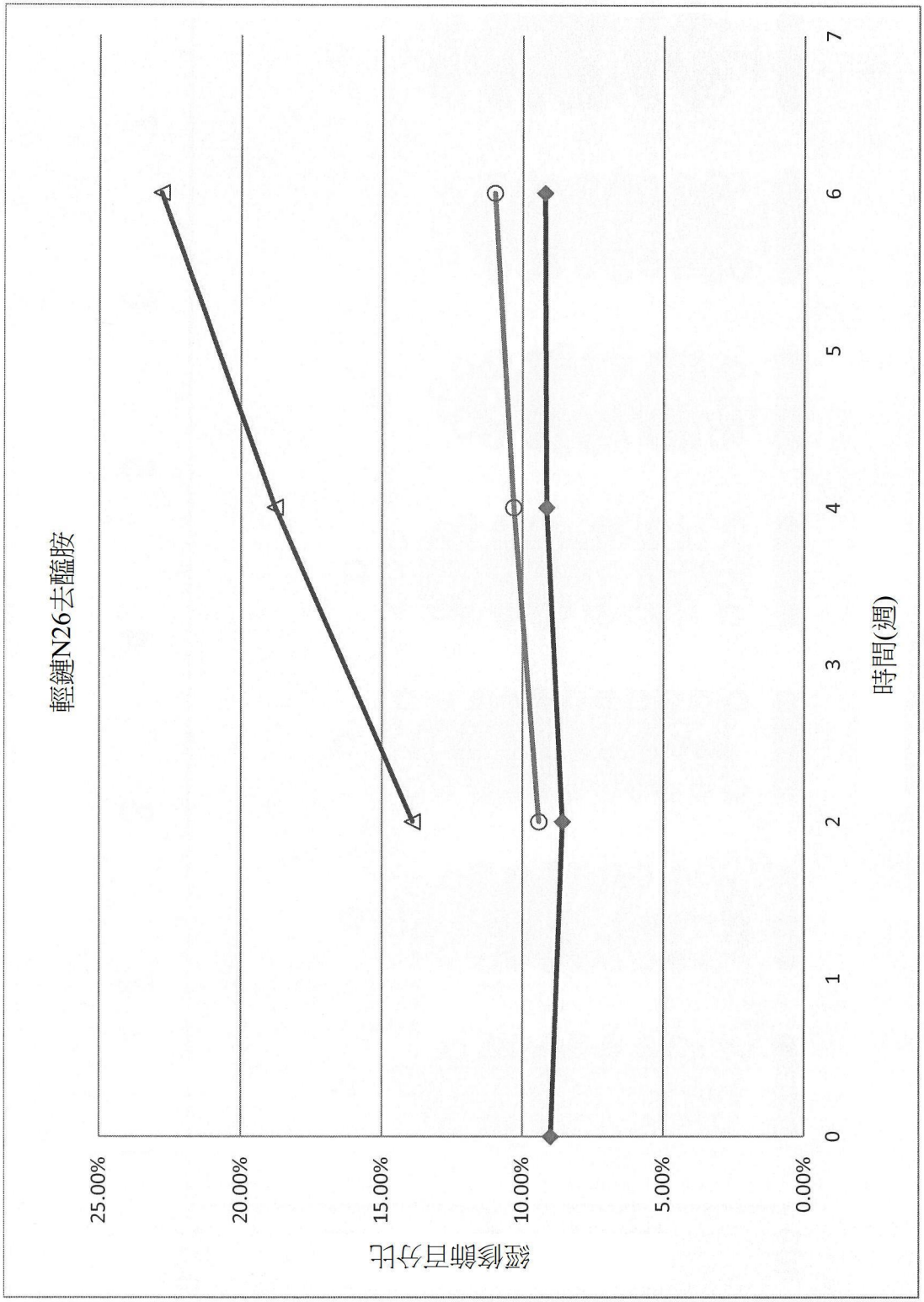
【發明圖式】


T0 pH5.9
pH7.4 37C 2wk
pH7.4 37C 6wk
pH5.9 37C 2wk
pH5.9 37C 6wk
RLU
20000
15000
10000
5000
0
0.1
1
10
100
1000
10000
mAb濃度(ng/mL)

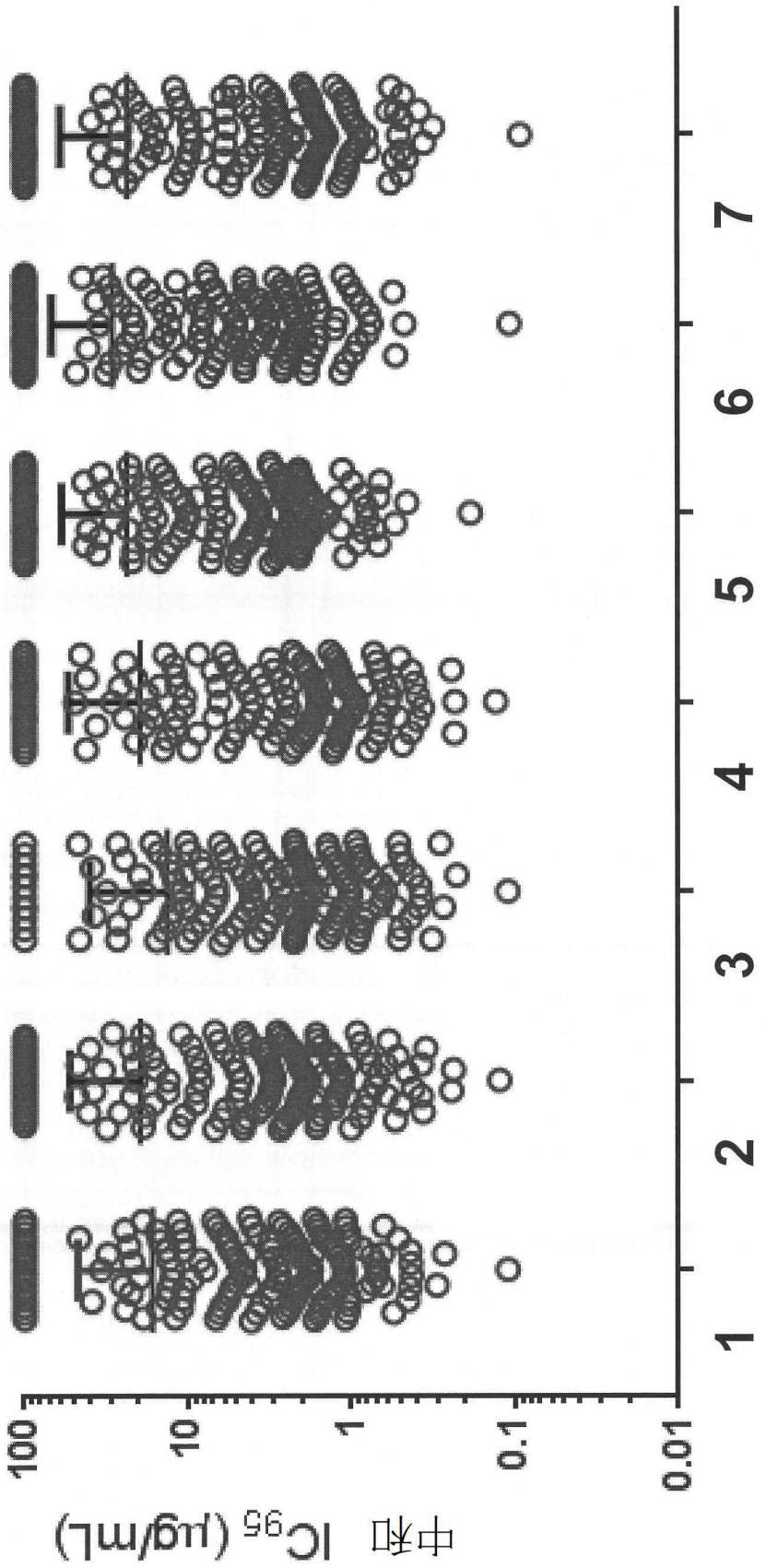
【圖1】


重鏈W74氧化
A-1 25C pH 5.9
A-1 37C pH 5.9
A-1 37C pH 7.4
經修飾百分比
10%
9%
8%
7%
6%
5%
4%
3%
2%
1%
0%
0
1
2
3
4
5
6
7
8
時間(週)

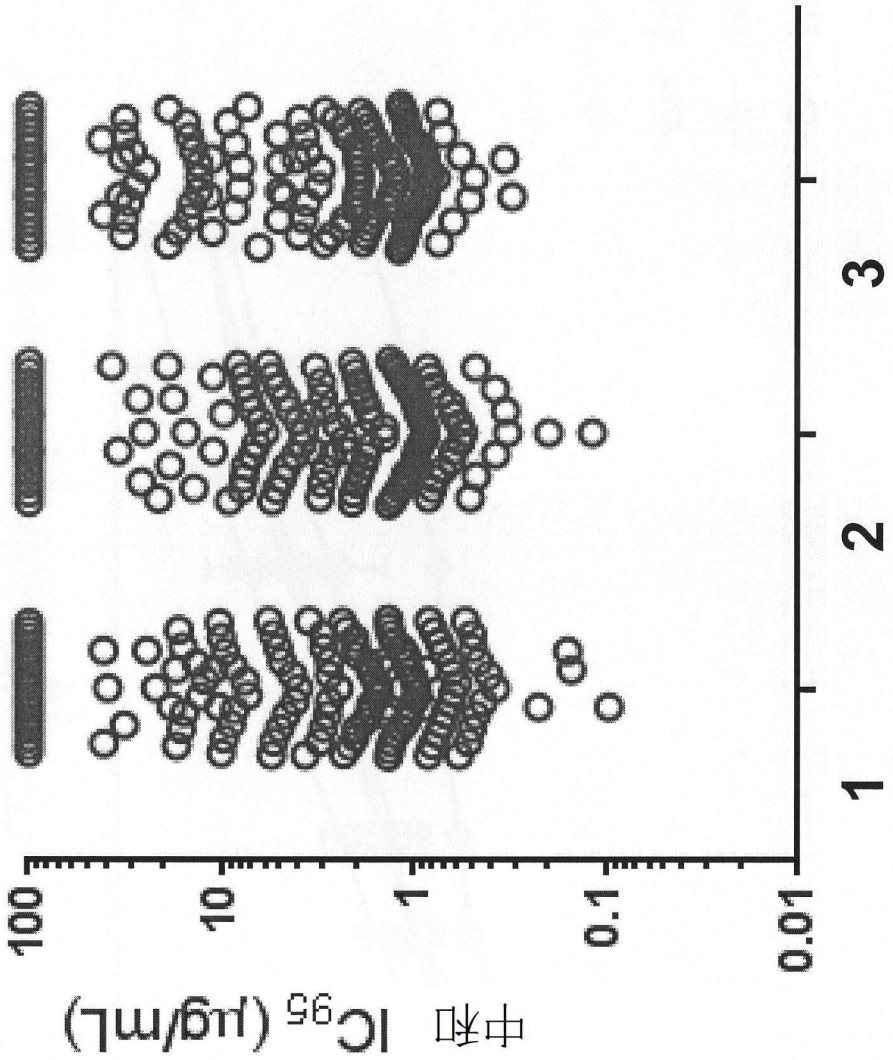
【圖2】



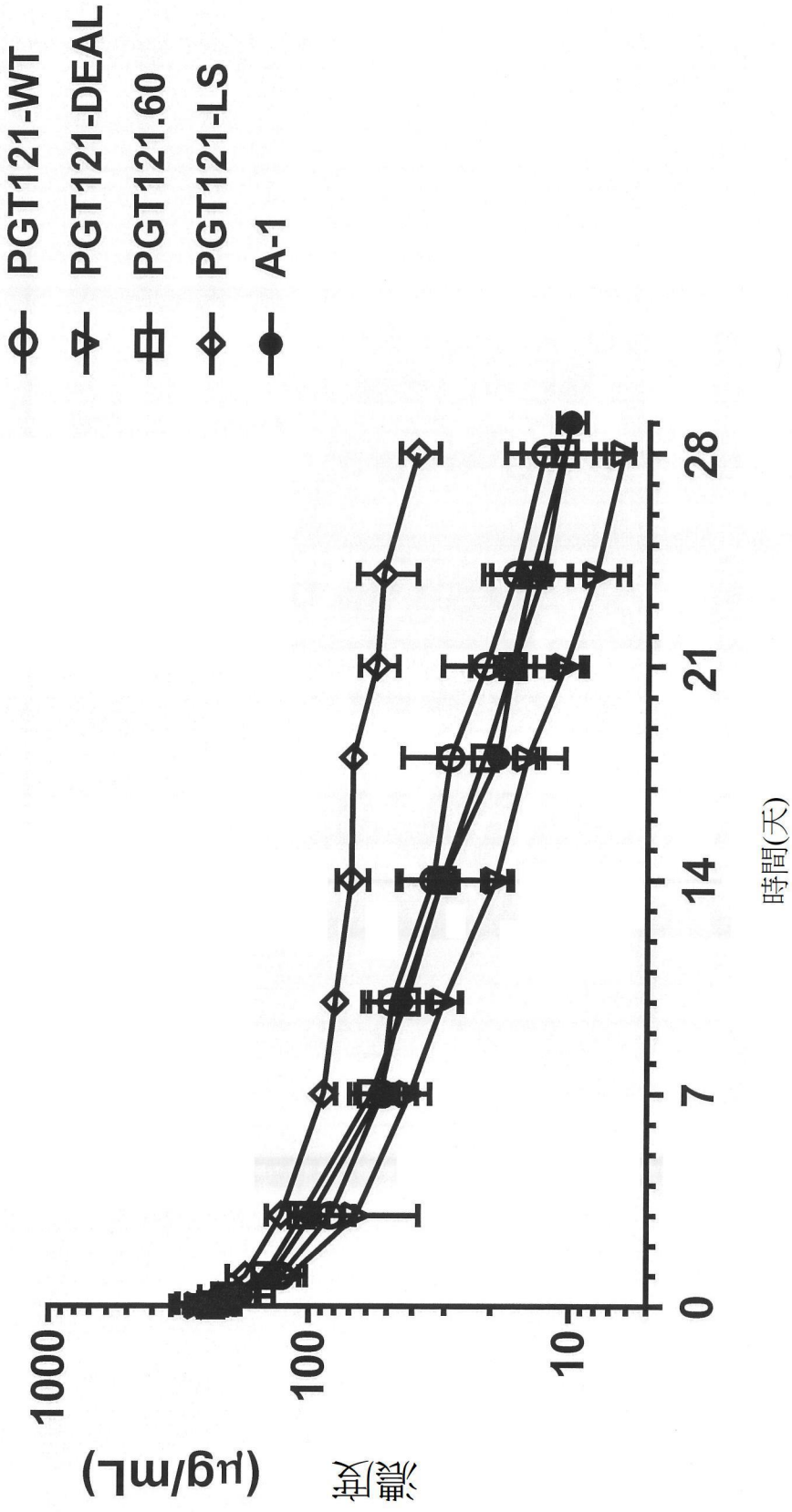
【圖3】



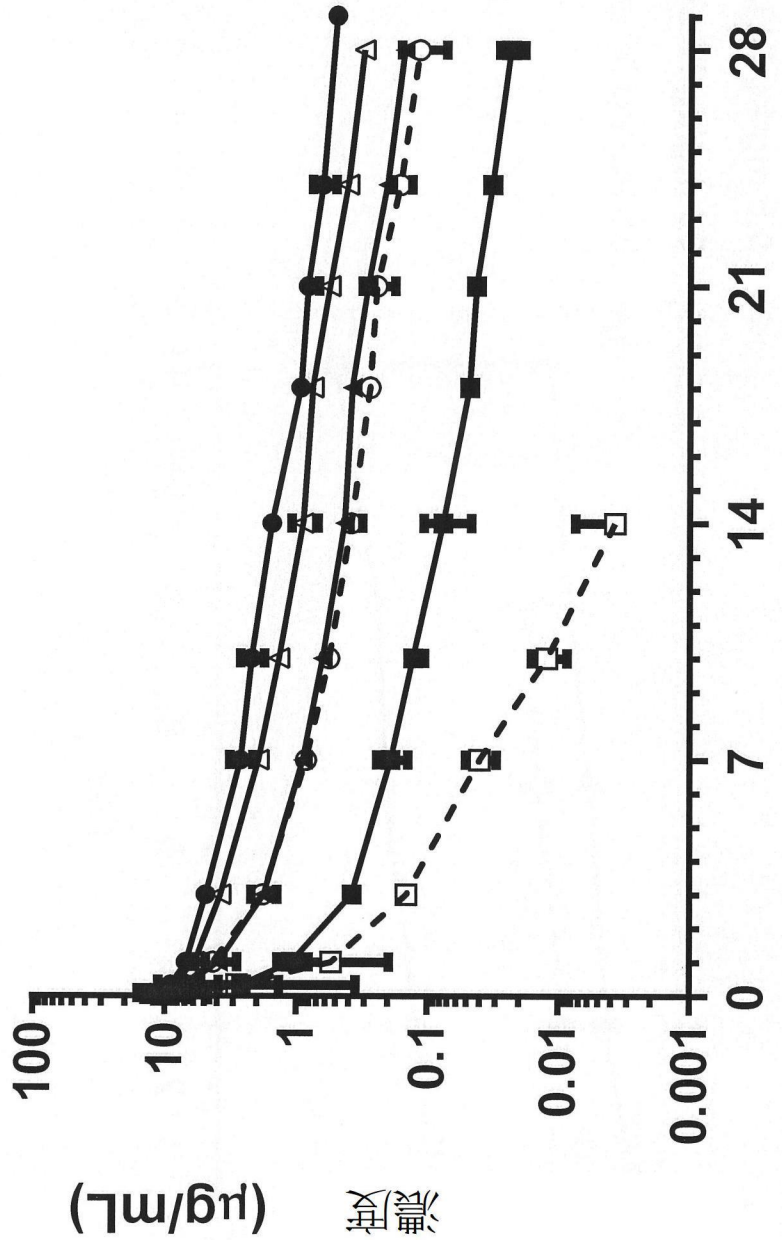
【圖4】



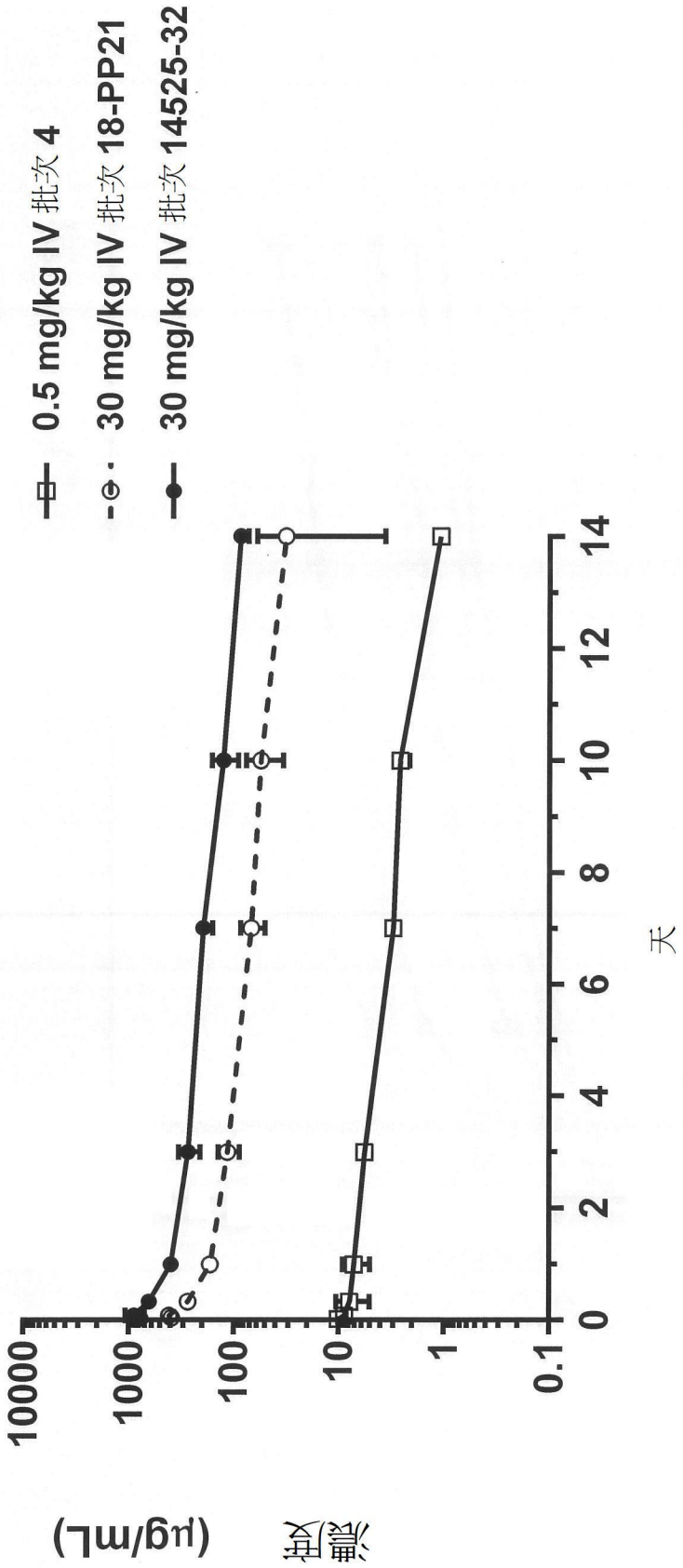
【圖5】


PGT121-WT
PGT121-DEAL
PGT121.60
PGT121-LS
A-1
濃度 (μg/mL)
1000
100
10
0
7
14
21
28
時間(天)

【圖6】



【圖7】


0.5 mg/kg IV 批次 4
30 mg/kg IV 批次 18-PP21
30 mg/kg IV 批次 14525-32
濃度 (μg/mL)
10000
1000
100
10
1
0.1
0
2
4
6
8
10
12
14
天

【圖8】