

發明專利說明書

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一、發明名稱：(中文/英文)

共軛方法

CONJUGATION PROCESS

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國 籍：(中文/英文)

1. 比利時 BELGIUM
2. 比利時 BELGIUM
3. 美國 U.S.A.

四、聲明事項：

☐ 主張專利法第二十二條第二項 ☐ 第一款或 ☐ 第二款規定之事實，其事實發生日期為：年 月 日。

☒ 申請前已向下列國家（地區）申請專利：

【格式請依：受理國家（地區）、申請日、申請案號 順序註記】

☒ 有主張專利法第二十七條第一項國際優先權：

1. 美國；2006年03月30日；60/787,587

2. 英國；2006年03月30日；0606416.6

3. 英國；2006年03月30日；0606417.4

4. 美國；2006年03月30日；60/787,249

☐ 無主張專利法第二十七條第一項國際優先權：

1.

2.

☐ 主張專利法第二十九條第一項國內優先權：

【格式請依：申請日、申請案號 順序註記】

☒ 主張專利法第三十條生物材料：

☐ 須寄存生物材料者：

國內生物材料 【格式請依：寄存機構、日期、號碼 順序註記】

國外生物材料 【格式請依：寄存國家、機構、日期、號碼 順序註記】

☒ 不須寄存生物材料者：

所屬技術領域中具有通常知識者易於獲得時，不須寄存。

五、中文發明摘要：

本申請案描述一種用於使N-乙醯化少於40%之PNAG與載體蛋白共軛之方法，該方法包含以下步驟：a)藉由添加包含順丁烯二醯亞胺基之鍵聯劑來活化該PNAG以形成活化之PNAG；b)藉由添加包含巯基之鍵聯劑來活化該載體蛋白以形成活化之載體蛋白；及c)使該活化之PNAG與該活化之載體蛋白反應以形成PNAG-載體蛋白共軛物。

六、英文發明摘要：

七、指定代表圖：

(一)本案指定代表圖為：(無)

(二)本代表圖之元件符號簡單說明：

八、本案若有化學式時，請揭示最能顯示發明特徵的化學式：

(無)

九、發明說明：

【發明所屬之技術領域】

本發明係關於共軛領域且提供一種使PNAG與載體蛋白共軛之方法。可進一步調配PNAG-載體蛋白共軛物以提供疫苗。本發明亦包括PNAG-載體蛋白共軛物、包含PNAG-載體蛋白共軛物之疫苗及其在治療中之用途。

【先前技術】

近年來，社區獲得性及醫院獲得性感染數量隨著血管內裝置使用增加而增加。醫院獲得性(醫院)感染為發病率及死亡率之主要因素，更尤其在美國，醫院獲得性感染每年感染兩百萬以上患者。根據大量研究，約6%之美國患者在其住院期間獲得感染。據估計，1992年美國之經濟負擔超過45億美元(Emori及Gaynes, 1993, Clin. Microbiol. Rev. 6; 428)。最常見感染為尿道感染(UTI佔感染之33%)、接著為肺炎(15.5%)、手術部位感染(14.8%)及原發性血流感染(13%)(Emori及Gaynes, 1993, Clin. Microbiol. Rev. 6; 428)。

金黃色葡萄球菌(*Staphylococcus aureus*)、凝固酶陰性葡萄球菌(Coagulase-negative Staphylococci，主要為表皮葡萄球菌(*Staphylococcus epidermidis*))、腸球菌(*enterococcus* spp)、大腸桿菌(*Escherichia coli*)及綠膿桿菌(*Pseudomonas aeruginosa*)為主要醫院病原體。雖然彼等病原體幾乎引起相同數量之感染，但其可產生之病症之嚴重程度與耐抗生素性分離物之頻率平衡了對金黃色葡萄球菌

及表皮葡萄球菌之此等級，其中金黃色葡萄球菌及表皮葡萄球菌為最顯著醫院病原體。

金黃色葡萄球菌為具有顯著發病率及死亡率之醫院感染的最常見原因 (Romero-Vivas 等人 1995, *Infect. Dis.* 21; 1417)。其為骨髓炎、心內膜炎、膿毒性關節炎、肺炎、膿腫及中毒性休克症候群之某些病例之起因。

表皮葡萄球菌為正常皮膚共生體，其亦為造成植入醫學裝置感染及外科手術部位感染之原因的重要伺機性病原體。經表皮葡萄球菌感染之醫學裝置包括心臟起搏器、腦脊髓液分流器、持續性攜帶式腹膜透析導管、矯形術裝置及人工心臟瓣膜。

用抗生素處理金黃色葡萄球菌及表皮葡萄球菌感染，其中盤尼西林 (penicillin) 為供選擇藥物，而萬古黴素 (vancomycin) 用於耐二甲氧苄青黴素分離物。自 20 世紀八十年代以來，顯示廣泛耐抗生素性之葡萄球菌株之百分比已日漸盛行 (Panlilo 等人 1992, *Infect. Control. Hosp. Epidemiol.* 13; 582)，此對有效抗菌治療構成威脅。此外，近來耐萬古黴素之金黃色葡萄球菌株之出現已引起耐二甲氧苄青黴素之表皮葡萄球菌出現且蔓延之恐慌，因為其無法得到有效治療。

已研究在陰性免疫療法中使用抗葡萄球菌抗原之抗體的另一種方法。包括投與多株抗血清之療法處於發展中 (WO 00/15238、WO 00/12132)，用抗脂磷壁酸之單株抗體處理亦在發展中 (WO 98/57994)。

另一種方法為使用活性疫苗接種以產生抗葡萄球菌之免疫反應。已鑑別包括為疫苗組份之若干候選物。此等包括聚N-乙醯化葡糖胺(PNAG)，其為在葡萄球菌(例如金黃色葡萄球菌及表皮葡萄球菌)中發現之表面多醣。此抗原尤其在呈去乙醯化形式(dPNAG)之情況下已顯示其產生調理素免疫反應(WO 04/43405)。WO 04/43405揭示使用有機氯化劑四氫硼酸1-氯基-4-二甲基胺基吡錠(CDAP)使PNAG與載體蛋白共軛及藉由用戊二醛活化載體蛋白接著還原胺化來使dPNAG與載體蛋白共軛。

所述CDAP共軛不適於與dPNAG共同使用，因為經活化之dPNAG可與dPNAG上之 NH_2 基團反應使得若使用CDAP化學處理則存在dPNAG交聯之風險。所述用於共軛dPNAG之方法具有缺點，其使用戊二醛處理作為第一步以將醛基引至載體蛋白上。因為戊二醛之不同分枝可導致不同結果，所以戊二醛處理往往使得再生不可靠。戊二醛處理亦可導致載體蛋白交聯。

需要避免使用戊二醛之使去乙醯化PNAG與載體蛋白共軛之其他方法以最大程度使用PNAG作為疫苗組份。

【發明內容】

本發明之第一態樣提供一種使N-乙醯化少於40%之PNAG與載體蛋白共軛之方法，該方法包含以下步驟：

- a) 藉由添加包含順丁烯二醯亞胺基之鍵聯劑來活化PNAG以形成活化之PNAG；
- b) 藉由添加包含巯基之鍵聯劑來活化載體蛋白以形成活

化之載體蛋白；及

c) 使活化之 PNAG 與活化之載體蛋白反應以形成 PNAG-載體蛋白共軛物；或

a) 藉由添加包含巰基之鍵聯劑來活化 PNAG 以形成活化之 PNAG；

b) 藉由添加包含順丁烯二醯亞胺基之鍵聯劑來活化載體蛋白以形成活化之載體蛋白；及

c) 使活化之 PNAG 與活化之載體蛋白反應以形成 PNAG-載體蛋白共軛物；或

a) 藉由添加包含巰基之鍵聯劑來活化 PNAG 以形成活化之 PNAG；

b) 藉由添加包含巰基之鍵聯劑來活化載體蛋白以形成活化之載體蛋白；及

c) 使活化之 PNAG 與活化之載體蛋白反應以形成 PNAG-載體蛋白共軛物。

本發明之第二態樣提供一種製造疫苗之方法，該方法包含進行本發明之共軛方法且添加合併 PNAG-載體蛋白共軛物與醫藥學上可接受之賦形劑之另一步驟。

本發明之第三態樣提供可藉由本發明之方法獲得之 PNAG-載體蛋白共軛物。

本發明之第四態樣提供 PNAG-載體蛋白共軛物，其中 PNAG 少於 40% N-乙醯化且 PNAG 與載體蛋白藉由包含鍵結硫原子之順丁烯二醯亞胺基或鍵結硫原子之硫原子的鍵聯劑接合。

本發明之第五態樣提供 N-乙醯化少於 40% 之活化 PNAG，其中 PNAG 共價鍵結包含順丁烯二醯亞胺基之鍵聯劑。

本發明之第六態樣提供包含可由本發明之方法獲得之 PNAG-載體蛋白共軛物之疫苗。

本發明之另一態樣提供用於治療或預防葡萄球菌疾病之本發明之 PNAG-載體蛋白共軛物。

本發明之另一態樣提供本發明之 PNAG-載體蛋白共軛物之用途，其係用於製備供治療或預防葡萄球菌疾病之疫苗。

本發明之另一態樣提供一種治療或預防葡萄球菌疾病之方法，其包含將本發明之疫苗投與人類或動物患者之步驟。

【實施方式】

本發明描述一種用於使 N-乙醯化少於 40、35、30、20、15、10 或 5% 之 PNAG 與載體蛋白共軛之方法，該方法包含以下步驟：

- a) 藉由添加包含順丁烯二醯亞胺基之鍵聯劑來活化 PNAG 以形成活化之 PNAG；
- b) 藉由添加包含巰基之鍵聯劑來活化載體蛋白以形成活化載體蛋白；及
- c) 使活化之 PNAG 與活化之載體蛋白反應以形成 PNAG-載體蛋白共軛物。

作為本發明之獨立態樣，本發明描述一種用於使 N-乙醯

化少於40、35、30、20、15、10或5%之PNAG與載體蛋白共軛之方法，該方法包含以下步驟：

- a) 藉由添加包含順丁烯二醯亞胺基之鍵聯劑來活化載體蛋白以形成活化之載體蛋白；
- b) 藉由添加包含巰基之鍵聯劑來活化PNAG以形成活化之PNAG；及
- c) 使活化之PNAG與活化之載體蛋白反應以形成PNAG-載體蛋白共軛物。

作為本發明之獨立態樣，本發明描述一種用於使N-乙醯化少於40、35、30、20、15、10或5%之PNAG與載體蛋白共軛之方法，該方法包含以下步驟：

- a) 藉由添加包含巰基之鍵聯劑來活化載體蛋白以形成活化之載體蛋白；
- b) 藉由添加包含巰基之鍵聯劑來活化PNAG以形成活化之PNAG；及
- c) 使活化之PNAG與活化之載體蛋白反應以形成PNAG-載體蛋白共軛物。

術語PNAG包含dPNAG及PNAG。PNAG少於40、35、30、25、20、15、10、5、2或1% N-乙醯化使得PNAG主要呈去乙醯形式。PNAG之去乙醯化抗原決定基可引起能介導調理素殺死革蘭氏陽性細菌(Gram positive bacteria)(例如金黃色葡萄球菌及/或表皮葡萄球菌)之抗體。在一實施例中，PNAG未經O-丁二醯化或在少於25、20、15、10、5、2、1或0.1%之殘基上經O-丁二醯化。

PNAG可為不同大小，自超過400 kDa至75與400 kDa之間、至10與75 kDa之間、至由最多30個重複單元構成之寡糖變化。任何大小之PNAG多糖或寡糖可用於本發明之方法中，例如超過40、50、60、80、100或200 kDa或在40-400 kDa、50-350 kDa、40-300 kDa、60-300 kDa、50-250 kDa、60-200 kDa、70-150 kDa或80-120 kDa之間。大小調整可藉由此項技術中已知之任何方法、例如藉由微流化、超音波照射或藉由化學分解(WO 03/53462、EP497524、EP497525)來達成。

在一實施例中，藉由化學處理天然多糖使PNAG去乙酰基化以形成dPNAG。例如，用鹼性溶液處理天然PNAG使得pH值升至10以上。例如，用0.1-5 M、0.2-4 M、0.3-3 M、0.5-2 M、0.75-1.5 M、約1.5 M、約2 M、約5 M或約1 M之NaOH、KOH或NH₄OH處理PNAG。在20-100、25-80、30-60或30-50或35-45°C之溫度下處理歷時至少10或30分鐘或1、2、3、4、5、10、15、20或24小時。dPNAG可如WO 04/43405中所述來製備。

共軛為PNAG與載體蛋白之共價偶合。其可為直接或間接的，併入與活化PNAG及活化載體蛋白之順丁烯二醯亞胺基及巰基反應之另一交聯化合物。

術語鍵聯劑係指在已完成之共軛物中共價連接PNAG與載體蛋白之分子。鍵聯劑可源於用於共軛反應中之兩個分子之共價鍵結。或者，鍵聯劑可來源於用於共軛反應(例如在來自載體蛋白之半胱胺酸殘基之巰基與活化PNAG上

之順丁烯二醯亞胺基或巯基反應之情況下)中之單個分子。

在第一實施例之一態樣中，在步驟a)期間包含順丁烯二醯亞胺基之鍵聯劑連接PNAG上之胺基。

在第二實施例之一態樣中，在步驟b)期間包含順丁烯二醯亞胺基之鍵聯劑連接載體蛋白上之胺基。

在一實施例中，鍵聯劑包含衍生自選自由BMPS、EMCS、GMBS、MBS、LC-SMCC、SMCC、SMPB、SMPH、磺基-EMCS、磺基-MBS、磺基-SMCC、磺基-GMBS及磺基-SMPB組成之群之化合物的順丁烯二醯亞胺基。

在一實施例中，包含順丁烯二醯亞胺基之鍵聯劑具有5-10、6-8、10-20、12-17、約7、約10或約15埃之間隔長度。

在一實施例中，在步驟a)期間，PNAG與包含順丁烯二醯亞胺基之鍵聯劑的重量/重量比率為1:20-20:1、1:20-1:1、1:10-1:1、1:5-5:1、1:2-2:1、1:1.5-1.5:1或約1:1或1:10。

約意謂數字應在所提供之數字之10%內。

在一實施例中，藉由添加包含順丁烯二醯亞胺基之鍵聯劑活化PNAG或載體蛋白的步驟在6.0-9.0、6.0-8.5、7.5-8.5、6.5-7.5或約7.0或8.0之pH值下進行。

在一實施例中，在步驟a)或b)期間，包含巯基之鍵聯劑連接載體蛋白上之胺基。在一實施例中，在步驟b)期間，

包含巯基之鍵聯劑連接PNAG上之胺基。

在一實施例中，鍵聯劑包含衍生自或可衍生自選自由 SPDP、LC-SPDP、SMPT、LC-SMPT、磺基-SPDP、磺基-SMPT、磺基-LC-SMPT、磺基-LC-SPDP及N-乙醯基同型半胱胺酸硫內酯組成之群之化合物的巯基。

在一實施例中，包含巯基之鍵聯劑具有4-25、5-10、6-8、10-20、13-17、5-20、約7或約15埃之間隔長度。

在PNAG藉由添加第一鍵聯劑來活化且載體蛋白藉由添加第二鍵聯劑來活化之實施例中，第一及第二鍵聯劑視情況分別衍生自或可衍生自GMBS及SPDP、GMBS及LC-SPDP、磺基-GMBS及SPDP、磺基-GMBS及LC-SPDP、SPDP及GMBS、SPDP及磺基-GMBS；LC-SPDP及GMBS；或LC-SPDP及磺基-GMBS。

在PNAG藉由添加包含巯基之第一鍵聯劑來活化且載體蛋白藉由添加包含巯基之第二鍵聯劑來活化之實施例中，第一及第二鍵聯劑可相同或不同。例如，第一及第二鍵聯劑可分別衍生自或可衍生自SPDP及SPDP；SPDP及LC-SPDP；SPDP及SMPT；SDPD及LC-SMPT、LC-SPDP及SDPD、LC-SPDP及LC-SPDP；LC-SPDP及SMPT、LC-SDPD及LC-SMPT；SMPT及SPDP；SMPT及LC-SPDP；SMPT及SMPT；SMPT及LC-SMPT；LC-SMPT及SPDP；LC-SMPT及LC-SDPD、LC-SMPT及SMPT或LC-SMPT及LC-SMPT。

在一實施例中，在藉由添加包含巯基之鍵聯劑來活化載

體蛋白之步驟期間，包含巰基之鍵聯劑與載體蛋白之重量/重量比率為 100:1-1:100、1:1-1:100、100:1-1:1、100:1-10:1、50:1-2:1、50:1-20:1、20:1-3:1、15:1-5:1 或約 10:1。

在一實施例中，藉由添加包含巰基之鍵聯劑來活化載體蛋白之步驟在 6.0-9.0、7.0-9.0、7.5-8.5 或約 8.0 之 pH 值下進行。

在一實施例中，在步驟 c) 期間，活化 PNAG 與活化載體蛋白之重量/重量比率為 10:1-1:10、9:1-1:5、8:1-1:2、7:1-1:1、5:1-1:1 或約 2:1。

在一實施例中，步驟 c) 在 6.0-9.0、6.0-8.0、6.5-7.5 或約 7.0 之 pH 值下進行。

在一實施例中，步驟 c) 完成後 PNAG 與載體蛋白之間的鍵聯劑長度為 5-40、10-30、12-25、10-15、15-25、20-25、20-30、25-30、30-40、約 14、約 23、約 28 或約 30 埃。

在一實施例中，本發明之方法包含用半胱胺酸阻斷過量順丁烯二醯亞胺基之另一步驟 d)。

在一實施例中，載體蛋白係選自由下列各物組成之群：破傷風類毒素、白喉類毒素、CRM197、rEPA、蛋白 D、SitC/MntC/唾液結合蛋白、EbhA、EbhB、彈性蛋白結合蛋白 (EbpS)、EFB(FIB)、SBI、ClfA、SdrC、SdrG、SdrH、脂肪酶 GehD、SasA、FnbA、FnbB、Cna、ClfB、FbpA、Npase、IsaA/PisA、SsaA、EPB、SSP-1、SSP-2、HBP、玻璃連接蛋白、血纖維蛋白原結合蛋白、凝固酶、Fig、MAP、IsdA、IsdB、HarA、SitC、 α 毒素 (Hla)、 α 毒素

H35R突變體、MRPII及自溶素或其片段。

目前用於偶合多醣或寡醣免疫原之載體蛋白之實例包括白喉及破傷風類毒素(DT、DT CRM197及TT)、透孔螺血藍蛋白(KLH)、綠膿桿菌外蛋白A(rEPA)及經純化之結核菌素蛋白衍生物(PPD)、自流行性感冒嗜血桿菌(*Haemophilus influenzae*)之蛋白D、肺炎球菌溶血素或以上之任一者之片段。適用片段包括包含T輔助抗原決定基之片段。詳言之，蛋白D片段較佳含有蛋白之N末端1/3。蛋白D為自流行性感冒嗜血桿菌之IgD結合蛋白(EP 0 594 610 B1)。

用於本發明之方法中之另一載體蛋白為單個葡萄球菌蛋白或其片段或包含至少或確切1、2、3或4個或4個以上葡萄球菌蛋白(例如選自以下所揭示之彼等或其片段)之融合蛋白。

在一實施例中， α 毒素用作載體蛋白。因為共軛方法大大減少或移除毒性，所以可使天然形式來與多醣共軛。因為殘餘毒性較低，所以經遺傳去毒之 α 毒素(諸如His35Leu或His 35 Arg變異體)較佳用作載體。或者藉由用交聯劑甲醛或戊二醛處理來化學上將 α 毒素去毒。經遺傳去毒之 α 毒素視情況較佳藉由用交聯劑甲醛或戊二醛處理來化學上去毒以進一步減少毒性。

在一實施例中，本發明之方法包含合併PNAG-載體蛋白共軛物與視情況包含佐劑之醫藥學上可接受之賦形劑的另一步驟。

雖然適合佐劑包括鋁鹽，諸如氫氧化鋁凝膠(礬)或磷酸

鋁，但亦可為鈣鹽、鎂鹽、鐵鹽或鋅鹽，或可為醃化酪胺酸或醃化糖、陽離子或陰離子衍生之多醣或聚磷腈之不溶懸浮液。

在一實施例中，佐劑為TH1或TH2型反應之較佳誘導劑。高含量之Th1型細胞因子傾向於促進細胞介導之對特定抗原之免疫反應的誘發，而高含量之Th2型細胞因子傾向於促進對該抗原之體液免疫反應之誘發。

重要的是記得Th1與Th2型免疫反應之區別並非絕對。事實上，個體忍受描述為主要Th1或主要Th2之免疫反應。然而，根據藉由Mosmann及Coffman(Mosmann, T.R. 及Coffman, R.L. (1989) TH1 and TH2 cells: different patterns of lymphokine secretion lead to different functional properties. Annual Review of Immunology, 7, 第145-173頁)在鼠科動物CD4 +ve T細胞純系中所述，常便於考慮細胞因子總科。傳統上，Th1型反應與藉由T-淋巴細胞產生INF- γ 及IL-2細胞因子相關。常與Th1型免疫反應之誘發直接相關的其他細胞因子未由T細胞產生，諸如IL-12。相比之下，Th2型反應與IL-4、IL-5、IL-6、IL-10之分泌相關。促進主要Th1反應之適合佐劑系統包括：單磷醃脂A或其衍生物，尤其3-去-O-醃化單磷醃脂A(3D-MPL)(其製備參見GB 2220211 A)；及單磷醃脂A(較佳3-去-O-醃化單磷醃脂A)與鋁鹽(例如磷酸鋁或氫氧化鋁)或水包油乳液之組合。在該等組合中，抗原及3D-MPL含於相同微粒結構中，使得抗原及免疫刺激信號更有效傳遞。研究表明3D-

MPL能進一步增強吸附巔之抗原的免疫原性[Thoelen等人.Vaccine (1998) 16:708-14; EP 689454-B1]。

增強系統包括單磷醯脂A與皂素衍生物之組合，尤其如WO 94/00153中所揭示之QS21與3D-MPL之組合，或如WO 96/33739中所揭示用膽固醇中止QS21之較少反應原性組合物。包括QS21、3D-MPL及生育酚於水包油之乳液中之尤其有效佐劑調配物描述於WO 95/17210中。視情況而言，疫苗額外包含皂素，更佳QS21。調配物亦可包含水包油乳液及生育酚(WO 95/17210)。本發明亦提供一種製造疫苗調配物之方法，該方法包含將本發明之PNAG共軛物與醫藥學上可接受之賦形劑(諸如3D-MPL)一起混合。含有寡核苷酸之未甲基化之CpG (WO 96/02555)亦為TH1反應之較佳誘發劑且適用於本發明。佐劑視情況形成脂質體結構或ISCOM結構。

QS21：固醇之重量比通常為約1:100至1:1。在一實施例中，存在過量固醇，QS21：固醇之重量比為至少1:2。對人類投藥而言，QS21及固醇通常以每次給藥約1 μ g至約100 μ g或約10 μ g至約50 μ g之範圍存在於疫苗中。

脂質體視情況含有中性脂質，例如磷脂醯膽鹼(視情況在室溫下為非結晶體)，例如蛋黃磷脂醯膽鹼、二油醯磷脂醯膽鹼或雙月桂醯基磷脂醯膽鹼。脂質體亦可含有帶電脂質，其增加脂質體由飽和脂質構成之脂質體-QS21結構的穩定性。在此等狀況下，帶電脂質之量視情況為1-20重量%，視情況為5-10重量%。固醇與磷脂之比率為1-50%

(mol/mol)，視情況為20-25%。

在一實施例中，佐劑含有MPL (3-去醯基之單磷醯脂A，亦稱為3D-MPL)。自GB 2 220 211 (Ribi)已知3D-MPL為具有4、5或6醯化鏈之3種類型去-O-醯化單磷醯脂A之混合物且其藉由Ribi Immunochem, Montana製造(WO 92/116556)。

在一實施例中，佐劑含有最初在無MPL下製備之脂質體，接著將MPL視情況以100 nm微粒添加至脂質體中。因此，MPL不含在微脂粒膜內(稱為MPL在外)。MPL含在微脂粒膜內(稱為MPL在內)之組合物亦形成本發明之態樣。抗原可含在微脂粒膜內或含在微脂粒膜外。視情況可溶抗原在外且疏水性或脂抗原含在膜內或膜外。

在一實施例中，本發明之方法包含合併PNAG-載體蛋白共軛物與額外抗原之另一步驟。在一實施例中，添加1、2、3、4、5、6、7、8、9或10個額外抗原。在一實施例中，額外抗原包含細菌多醣或寡醣。

該等抗原之實例包括來自5型及/或8型金黃色葡萄球菌之莢膜多醣或寡醣。

在人體中引起感染之大部分金黃色葡萄球菌株含有5型或8型多醣。約60%人類菌株為8型的且約30%為5型的。5型及8型莢膜多醣抗原之結構描述於Moreau等人Carbohydrate Res. 201; 285 (1990)及Fournier等人Infect. Immun. 45; 87 (1984)中。兩者在其重複單元中均具有FucNAcp以及可用以引入巰基之ManNAcA。

近來 (Jones Carbohydrate Research 340, 1097-1106 (2005)) NMR光譜分析修改了此等莢膜多醣之結構：

5型

$\rightarrow 4)$ - β -D-ManNAcA-($1 \rightarrow 4$)- α -L-FucNAc(3OAc)-($1 \rightarrow 3$)- β -D-FucNAc-($1 \rightarrow$

8型

$\rightarrow 3)$ - β -D-ManNAcA(4OAc)-($1 \rightarrow 3$)- α -L-FucNAc($1 \rightarrow 3$)- α -D-FucNAc($1 \rightarrow$

使用熟練技術者熟知之方法可自合適金黃色葡萄球菌株萃取多醣，例如 US 6294177 中所述。舉例而言，ATCC 12902 為 5 型金黃色葡萄球菌株，且 ATCC 12605 為 8 型金黃色葡萄球菌株。

多醣可為天然大小或可例如藉由微流化、超音波照射或藉由化學處理來調整大小。寡醣亦可用於本發明之方法中。

視情況使本發明之方法中所用之 5 型及 8 型多醣與可為以上所述之彼等載體蛋白的任何載體蛋白共軛(例如使用 US 4372945、US 4474757、US 4356170、US 4830852 或 WO 95/08348 之任一者中所揭示之方法)或其可為未經共軛的。

在一實施例中，額外抗原包含自 US 6294177 及 Fattom 及 Guidry Am. J. Vet. Res. 60: 530 (1999) 中所述之金黃色葡萄球菌之 336 抗原。

在一實施例中，336 抗原為天然大小或可例如藉由微流化、超音波照射或藉由化學處理調整大小之多醣。亦可使

用來源於336抗原之寡糖。使用任何已知之共軛方法(例如US 4372945、US 4474757、US 4356170、US 4830852或WO 95/08348中所述之彼等方法)使336抗原較佳與載體蛋白共軛或其可為未經共軛的。

表皮葡萄球菌之菌株ATCC-31432、SE-360及SE-10特徵在於三種不同莢膜類型，分別為I、II及III型(Ichiman及Yoshida 1981, J. Appl. Bacteriol. 51; 229)。萃取自表皮葡萄球菌之每一血清型之莢膜多醣構成I型、II型及III型多醣。多醣可藉由若干方法來萃取，該等方法包括US 4197290中所述或如Ichiman等人1991, J. Appl. Bacteriol. 71; 176中所述之方法。

在本發明之一實施例中，額外抗原包含自表皮葡萄球菌之I型及/或II型及/或III型多醣或寡糖。多醣可為天然大小或可(例如)藉由微流化、超音波照射或化學分解調整大小。額外抗原亦可包括自表皮葡萄球菌株萃取之寡糖。此等多醣或寡糖未經共軛或較佳使用任何已知之共軛方法(例如US 4372945、US 4474757、US 4356170、US 4830852或WO 95/08348中所述之方法)共軛。

在一實施例中，額外抗原包含葡萄球菌蛋白或其片段。例如自金黃色葡萄球菌或表皮葡萄球菌之蛋白。本發明之某些實施例含有自金黃色葡萄球菌及表皮葡萄球菌之蛋白。舉例而言，額外抗原為分離蛋白，其包含至少85%、較佳至少90%、更佳至少95%、最佳至少97-99%或準確與序列表中任一序列之胺基酸序列相同的胺基酸序列。

當蛋白在本文中特別提及之情況下，可提及天然或重組之全長蛋白或視情況任何信號序列已被移除之成熟蛋白。蛋白可直接自葡萄球菌株分離或藉由重組DNA技術產生。蛋白之免疫原性片段可併入本發明之免疫原性組合物。此等片段為包含連續取自蛋白之胺基酸序列之至少10個胺基酸、至少20個胺基酸、至少30個胺基酸、至少40個胺基酸、至少50個胺基酸或至少100個胺基酸之片段。此外，該等免疫原性片段通常與抵抗葡萄球菌蛋白而產生之抗體或與藉由經葡萄球菌感染之哺乳動物宿主所產生之抗體免疫反應或含有T細胞抗原決定基。免疫原性片段亦包括當以有效劑量投與時(單獨或作為結合載體之半抗原)引起抵抗葡萄球菌感染之保護免疫反應(視情況抵抗金黃色葡萄球菌及/或表皮葡萄球菌感染)之片段。該免疫原性片段可包括(例如)缺乏N末端前導序列及/或跨膜域及/或C末端錨定域之蛋白。在一實施例中，本發明之方法中所用之免疫原性片段實質上包含蛋白之所有胞外域，其與選自序列表序列之序列具有至少85%、至少90%、至少95%或至少97-99%全長片段序列同一性。

在一實施例中，額外抗原可含有葡萄球菌蛋白或葡萄球菌蛋白片段之融合蛋白。該等融合蛋白可重組製得且可包含至少2、3、4、5或6種葡萄球菌蛋白之一部分。或者，融合蛋白可包含至少2、3、4、5或6種葡萄球菌蛋白之多個部分。此等可合併不同葡萄球菌蛋白或其相同蛋白內之片段。或者本發明亦包括葡萄球菌蛋白或其片段之個別融

合蛋白作為具有異種序列之融合蛋白，諸如T細胞抗原決定基或純化標籤之供應者，例如 β -半乳糖甘酶、麩胱甘肽-S-轉移酶、綠色螢光蛋白(GFP)、抗原決定基標籤(諸如FLAG、myc標籤、聚組胺酸或諸如流感病毒紅血球凝集素之病毒表面蛋白)或細菌蛋白(諸如破傷風類毒素、白喉類毒素、CRM197)。

額外抗原視情況包含葡萄球菌胞外組份結合蛋白或葡萄球菌轉運體蛋白或葡萄球菌毒素或毒性調節劑。額外抗原視情況包含至少或確切1、2、3、4、5或6種葡萄球菌蛋白。胞外組份結合蛋白之實例為昆布胺酸(laminin)受體、SitC/MntC/唾液結合蛋白、EbhA、EbhB、彈性蛋白結合蛋白(EbpS)、EFB(FIB)、SBI、自溶素、ClfA、SdrC、SdrG、SdrH、脂肪酶GehD、SasA、FnbA、FnbB、Cna、ClfB、FbpA、Npase、IsaA/PisA、SsaA、EPB、SSP-1、SSP-2、HBP、玻璃連結蛋白、血纖維蛋白原結合蛋白、凝固酶、Fig及MAP。葡萄球菌轉運體蛋白之實例為免疫優勢ABC轉運體、IsdA、IsdB、Mg²⁺轉運體、SitC及Ni ABC轉運體。葡萄球菌毒素或毒性調控劑之實例為 α 毒素(HIa)、 α 毒素H35R突變體及RNA III活化蛋白(RAP)。

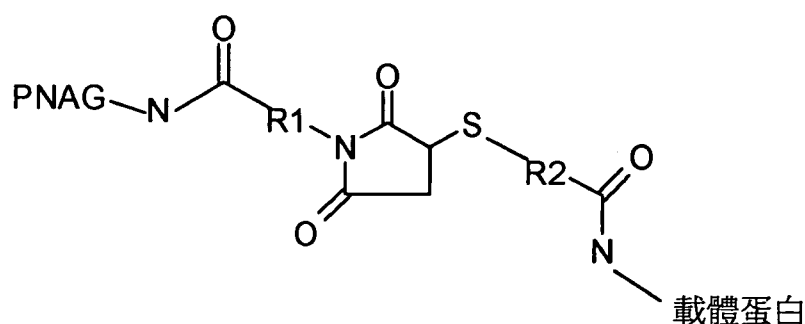
本發明之另一態樣為藉由本發明之方法可獲得或所獲得之PNAG-載體蛋白共軛物。

本發明之PNAG-載體蛋白共軛物包含N-乙醯化少於40%之PNAG，且PNAG與載體蛋白藉由包含鍵結硫原子之順丁

烯二醯亞胺基之鍵聯劑接合。

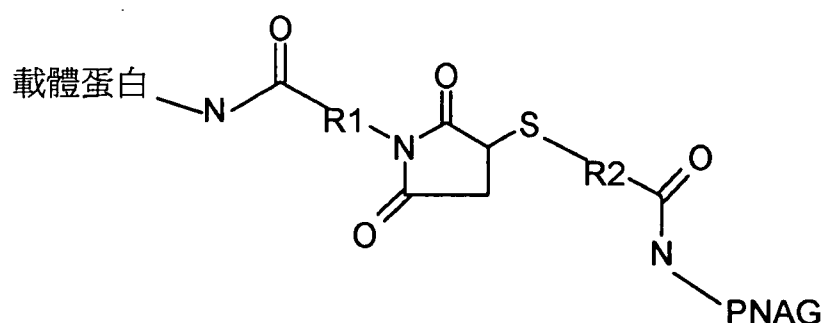
在一實施例中，順丁烯二醯亞胺基位於PNAG與硫原子之間。或者順丁烯二醯亞胺基位於載體蛋白與硫原子之間。

在一實施例中，PNAG-載體蛋白共軛物具有結構：



其中R1及R2獨立選自視情況經取代之芳族鏈或脂肪鏈或一鍵。在一實施例中，R1為C1-C6烷基、C2-C5烷基、C3-C4烷基、C2烷基、C3烷基、C4烷基或C5烷基。在一實施例中，R2為C1-C6烷基、C2-C5烷基、C3-C4烷基、C2烷基、C3烷基、C4烷基或C5烷基。

在一實施例中，本發明之PNAG-載體蛋白共軛物具有結構：

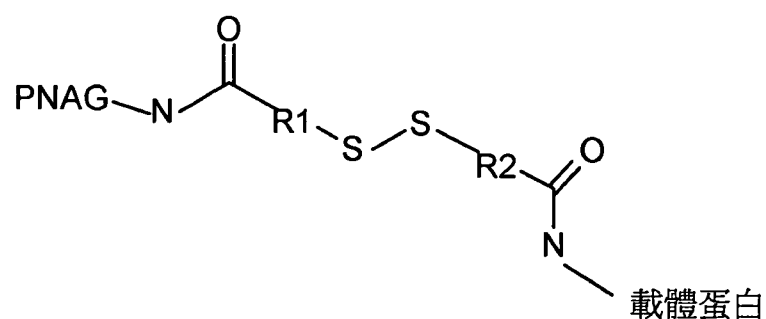


其中R1及R2獨立選自視情況經取代之芳族鏈或脂肪鏈或一鍵。在一實施例中，R1為C1-C6烷基、C2-C5烷基、C3-

C4烷基、C2烷基、C3烷基、C4烷基或C5烷基。在一實施例中，R2為C1-C6烷基、C2-C5烷基、C3-C4烷基、C2烷基、C3烷基、C4烷基或C5烷基。

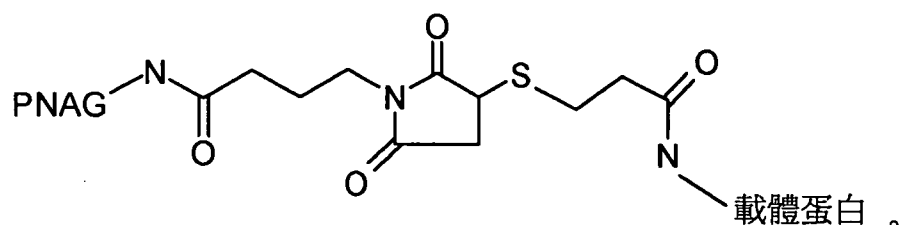
本發明之另一態樣為PNAG-載體蛋白共軛物，其中PNAG少於40% N-乙醯化，且PNAG與載體蛋白藉由包含鍵結硫原子之硫原子之鍵聯劑接合。

在一實施例中，PNAG-載體蛋白共軛物具有結構：



其中R1及R2獨立選自視情況經取代之芳族鏈或脂肪鏈或一鍵。在一實施例中，R1為C1-C6烷基、C2-C5烷基、C3-C4烷基、C2烷基、C3烷基、C4烷基或C5烷基。在一實施例中，R2為C1-C6烷基、C2-C5烷基、C3-C4烷基、C2烷基、C3烷基、C4烷基或C5烷基。

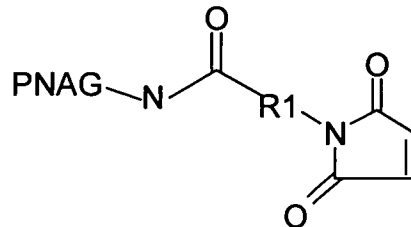
在一實施例中，PNAG-載體蛋白共軛物具有結構：



本發明之另一態樣為N-乙醯化少於40%之活化PNAG，其中PNAG共價鍵結包含順丁烯二醯亞胺基之鍵聯劑。在一實施例中，順丁烯二醯亞胺基鍵聯劑包含衍生自或可衍

生自選自由 BMPS、EMCS、GMBS、MBS、LC-SMCC、SMCC、SMPB、SMPH、磺基-EMCS、磺基-MBS、磺基-SMCC、磺基-GMBS及磺基-SMPB組成之群之化合物。

在一實施例中，活化PNAG具有結構：



其中R1係選自視情況經取代之芳族鏈或脂肪鏈或一鍵。在一實施例中，R1為C1-C6烷基、C2-C5烷基、C3-C4烷基、C2烷基、C3烷基、C4烷基或C5烷基。在一實施例中，鏈聯劑長5-40、10-30、12-25、10-15、15-25、20-25、20-30、25-30、30-40、約14、約23、約28或約30埃。

藉由本發明之方法製成之PNAG-載體蛋白共軛物及疫苗製劑可藉助於經由全身途徑或黏膜途徑投與該疫苗用以保護或治療易受感染之哺乳動物。此等投藥可包括經由肌肉內、腹膜內、皮內或皮下途徑注射；或經由黏膜投與口腔/食道、呼吸道、泌尿生殖道。雖然本發明之疫苗可以單一劑量投與，但其組份亦可在相同時間或不同時間共投藥。對共投藥而言，可選Th1佐劑可存在於任何或所有不同投藥中，然而若其與疫苗之細菌蛋白組份組合存在則較佳。除單一投藥途徑外，可使用兩種不同投藥途徑。例如，多醣可經肌肉內(或皮內)投與且細菌蛋白可鼻內(或皮內)投與。此外，對預致敏劑量而言本發明之疫苗可肌肉

內投與，且對加強劑量而言可鼻內投與。

選擇各疫苗中共軛抗原之量為誘發無典型疫苗中顯著、不利副作用之免疫保護反應之量。該量視使用何種特定免疫原及其如何呈現而變。一般而言，預期各劑量包含0.1-100 μg 多醣，較佳0.1-50 μg 多醣共軛物，較佳0.1-10 μg ，更佳1-10 μg ，其中1至5 μg 為更佳範圍。

疫苗中蛋白抗原含量通常在1-100 μg 、較佳5-50 μg 之範圍內，最通常在5-25 μg 之範圍內。在最初疫苗接種後，受檢者可接收一或若干次充分間隔之加強免疫。

疫苗製備一般描述於Vaccine Design ("The subunit and adjuvant approach" (Powell M.F. & Newman M.J.編)(1995) Plenum Press New York)中。用脂質體封裝係描述於Fullerton之美國專利第4,235,877號。

本發明之疫苗可儲存於溶液中或經凍乾。溶液較佳在糖(諸如蔗糖、海藻糖或乳糖)存在下凍乾。疫苗經凍乾且在使用前臨時再生仍更佳。凍乾可導致更穩定組合物(疫苗)且在3D-MPL存在下及以鋁為主之佐劑缺乏下可能導致更高抗體力價。

在各情況下本發明者期望本文之術語"包含"視情況可用術語"由...組成"代替。

本專利說明書內所引用之所有文獻或專利申請案均以引用的方式併入本文中。

為更好地理解本發明而提出以下實例。此等實例僅為達成說明之目的，且不應解釋為以任何方式限制本發明之範

疇。

實例

實例 1 PNAG-TT共軛物之製備

dPNAG如 WO 04/43405中所述來製備。在 Superose 6 管柱上進一步純化 dPNAG。

dPNAG活化

將 dPNAG(12 mg)溶於 300 μ l 5 M HCl+300 μ l 5 M NaOH+1700 μ l 1×PBS (pH值 7.0)中，且將 pH值調節至 7.0。經由 0.22 μ m過濾器過濾樣品且將 pH值再次調節至 7.0。將 12 mg GMBS添加於 200 μ l DMSO中，且在室溫下在黑暗中緩慢攪拌樣品 2 小時。用 0.5 M NaOH將 pH值保持在 7.0。使用經 1×PBS、10 mM EDTA (pH值 7.0)緩衝液平衡之脫鹽管柱(PD10管柱)移除過量 GMBS，且使用 Centricon 10 KDa MWCO濃縮裝置濃縮樣品。

TT活化

將破傷風類毒素(TT)(6.5 mg；195 μ l儲備溶液)添加至 1105 μ l含有 10 mM EDTA之 1×PBS (pH值 8.0)中。將 130 μ L SPDP (DMSO中 6.2 mg/ml)添加至蛋白溶液中，且在室溫下在黑暗中緩慢攪拌樣品 1 小時。使用 0.5 M NaOH將 pH值保持在 8.0。使用經 1×PBS、10 mM EDTA (pH值 8.0)緩衝液平衡之脫鹽管柱(PD10管柱)移除過量 SPDP，且使用 Centricon 10 KDa MWCO濃縮樣品至 1.3 ml。將 0.65 ml DTT (1×PBS、10 mM EDTA (pH值 8.0)緩衝液中 23 mg/ml)添加至 1.3 ml經 SPDP活化之 TT中。將樣品在室溫下黑暗中

培育30分鐘。使用0.5 M NaOH將pH值保持在8.0。使用經1×PBS、10 mM EDTA (pH值7.0)緩衝液平衡之脫鹽管柱(PD10管柱)移除過量DTT，且使用Centricon 10 KDa MWCO濃縮裝置濃縮樣品至0.6 ml。

將經GMBS活化之Dpnag (0.6 ml)+SH-SPDP-TT (0.6 ml)混合且在室溫下黑暗中緩慢攪拌2小時。在100 μl 1×PBS、10 mM EDTA (pH值7.0)中用3 mg半胱胺酸阻斷過量順丁烯二醯亞胺，歷時30分鐘。在以1×PBS、10 mM EDTA (pH值7.0)作為電泳緩衝液之1 ml/min之Superose 6管柱上層析樣品。使用Bradford檢定測試溶離份之蛋白。將含有共軛物之溶離份彙集且使用Spectra/gel吸附劑濃縮至25 ml。測試最終共軛物之多醣及蛋白組成。

dPNAG-TT組合物

dPNAG : 153.37 μg/ml(46.3%)

TT : 178.06 μg/ml(53.7%)

實例2

dPNAG之活化及偶合

dPNAG-TT共軛物

使用下文所述之方法產生以下共軛物：

dPNAG-TT010 : dPNAG-S-GMBS+經DTT處理之TT-LC-SPDP

dPNAG-TT011 : dPNAG-S-GMBS+經DTT處理之TT-LC-SPDP

dPNAG-TT012 : dPNAG-S-GMBS+經DTT處理之TT-SPDP

dPNAG-TT014 : dPNAG-SPDP+經 DTT 處理之 TT-SPDP

dPNAG-TT017 : 經 DTT 處理之 dPNAG-SPDP+TT-LC-SPDP

dPNAG-TT019 : dPNAG-S-GMBS+經 DTT 處理之 TT-SPDP

dPNAG-TT020 : dPNAG-S-GMBS+經 DTT 處理之 TT-SPDP

dPNAG

將 1 g PNAG 以 20 mg/ml 之濃度溶於 5 N HCl 中，且培育 1 小時。接著用 5 N NaOH 中和。在 5 μ m 膜上淨化溶液且在 Sephacryl S400HR 上純化。彙集對應於 "介質分子大小" (參見 Infection and Immunity, 70: 4433-4440 (2002)) 之相關溶離份且在去 N-乙醯化處理前濃縮。

將溶液在 1 M NaOH 下調節且在 37°C 下放置 24 小時。中和後，使產物經受透析及濃縮。

dPNAG 活化

將 S-GMBS(N-(γ -順丁烯二醯亞胺基丁醯氧基)磺基丁二醯亞胺，Pierce) 添加至 0.2 M NaCl 中之 dPNAG (S-GMBS/PS (w/w) 比率：1:1) 中且在室溫下於 pH 值 7.0 (使用 1 M NaOH 調節 pH 值) 下培育 2 h。藉由在使用 PBS、10 mM EDTA、50 mM NaCl (pH 值 7.2) 作為溶離緩衝液而流動速率固定在 60 ml/h 之 Toyopearl HW-40F 純化來移除過量 GMBS 及副產物。根據光學密度 (UV=206 nm) 選擇溶離池且接著在 Vivaspin 管 3000 MWCO 或 Amicon Ultra 10,000 MWCO 上濃縮。

偶合

混合經 GMBS 活化之 dPNAG 及經 DTT 還原之 TT-SPDP 且

在室溫下攪拌。根據所用條件，在20-120 min後藉由添加半胱胺酸(在pH值8.0之磷酸鈉緩衝液中4 mg/ml)來中止反應，歷時30分鐘。在5 μ m過濾器上淨化共軛物且注射於Sephacryl S300HR樹脂(XK16/100)上以供純化。在流動速率固定於30 ml/h之200 mM NaCl中實現溶離。藉由己醯胺及藉由蛋白劑量來分析溶離份。將相關溶離份彙集且在0.22 μ m Sterivex上過濾。測試最終共軛物之多醣(己醯胺劑量)及蛋白組合物(Lowry劑量)。

共軛物	N-乙醯化 程度%	[dPNAG] mg/ml	[TT] mg/ml	PS範圍 (mg)	偶合時間 (min)
dPNAG-TT 010	10*	15	15	30	120
dPNAG-TT 011	10*	12	24	20	120
dPNAG-TT 012	10*	17.5	35	22	80
dPNAG-TT 019	34	5	10	10	20
dPNAG-TT 020	34	2	2	10	20

*在共軛中所用之部分上未進行但在先前部分上藉由NMR使用相同去-N-乙醯化方法評估。

共軛物	In.TT/PS 比率(w/w)	F.TT/PS 比率(w/w)	產率 PS rec (%)	過濾 產率(%)
dPNAG-TT010	1/1	1.86/1	43	99
dPNAG-TT011	2/1	2.86/1	56	99
dPNAG-TT012	2/1	2.29/1	61	108
dPNAG-TT019	2/1	1.45/1	81	97
dPNAG-TT020	1/1	0.89/1	82	109

dPNAG-SPDP：

將溶於DMSO(二甲亞砜，Merck)中之5倍莫耳過量之SPDP (N-丁二醯亞胺基-3-(2-吡啶基二硫基)丙酸酯，MW：312.4，Pierce)添加至100 mg以5 mg/ml於100 mM磷酸鈉(pH

值 7.2) 中之 dPNAG 中。在 Sephacryl S100HR (XK16/40) 上純化前，在 Amicon Ultra 10,000 MWCO (以 3000 rpm 離心 28 min) 上將反應混合物濃縮至 ± 6 ml。在流動速率固定在 60 ml/h 之 pH 值 7.4 之磷酸鹽緩衝液中實現溶離。彙集相關溶離份 (在 206 nm 下讀出) 且在 Amicon Ultra 10,000 MWCO (以 3000 rpm 離心 30 分鐘) 上濃縮至 1.1 ml。

TT-SPDP :

將溶於 DMSO (二甲亞砜, Merck) 中之 15 倍莫耳過量之 SPDP (Pierce) 添加至 1 g 於 100 mM 磷酸鈉 (pH 值 7.2) 中之 TT (50 mg/ml) 中，且在室溫下培育 80 min。接著將產物注射至 Sephacryl S100HR (XK16/40) 上且在流動速率固定在 60 ml/h 之 100 mM 乙酸鈉 (pH 值 5.6)、100 mM NaCl、1 mM EDTA 中溶離。根據光學密度 (UV=280 nm) 選擇溶離池且接著在 Amicon Ultra 10,000 MWCO (以 3000 rpm 離心 75 min) 濃縮至 19.6 ml。

TT-LC-SPDP 產生為 TT-SPDP 但使用 LC-SPDP (丁二醯亞胺基 6-[3-(2-吡啶基二硫基)-丙醯胺基] 己酸酯, Pierce) 及 60 min 培育時間。

TT-SH 或 TT-LC-SH

將 DTT 添加至 TT-SPDP 或 TT-LC-SPDP 中，DTT/TT 比率 (mg/mg) 為 0.7/1。室溫下 2 h 後，釋放吡啶-2-硫酮接著為其在 343 nm 下之特徵吸收。藉由凝膠過濾 (PD-10, Amersham) 自過量 DTT 純化經硫醇化之蛋白。在 Amicon Ultra 10,000 MWCO 上濃縮後，藉由 Lowry 劑量評估蛋白含量。

dPNAG-SPDP+TT-SH或TT-LC-SH (dPNAG-TT014及016)

在室溫下在連續攪拌下且在最初TT/PS比率(w/w)為2/1下實施偶合。

將dPNAG與TT-SH混合以獲得20 mg/ml之最終PS濃度及40 mg/ml之最終蛋白濃度。30 min後，藉由添加2-碘代乙醯胺(Merck)來中止未經反應之巰基。

將dPNAG與TT-LC-SH混合以獲得10 mg/ml之最終PS濃度及20 mg/ml之最終蛋白濃度。75 min後，藉由添加2-碘代乙醯胺(Merck)來中止未經反應之巰基。

接著使用5 μ m Minisart過濾器淨化共軛物且將共軛物注射於Sephacryl S300HR (XK16/100)上。在流動速率固定於30 ml/h之200 mM NaCl中實現溶離。

藉由己醯胺及藉由蛋白劑量來分析溶離份。將相關溶離份彙集且在0.22 μ m Sterivex上過濾。

所得共軛物具有2.18 (TT-SH)及2.24 (TT-LC-SH)之最終TT/PS比率(w/w)。

dPNAG硫醇化

將11.6 mg DTT(1,4-二硫蘇糖醇，Boehringer Mannheim，MW：154.24)添加至16.5 mg dPNAG-SPDP中。在室溫下2 h後，釋放吡啶-2-硫酮接著為其在343 nm下之特徵吸收。藉由凝膠過濾(Toyopearl HW40F)自過量DTT純化經硫醇化之PS且接著在Amicon Ultra 10,000 MWCO上濃縮至860 μ l。

dPNAG-SH+TT-SPDP(dPNAG-TT017)

在室溫下在連續攪拌下且在最初TT/PS比率(w/w)為1.7/1下實施偶合。

將dPNAG與TT-SPDP混合以獲得7.73 mg/ml之最終PS濃度及13.3 mg/ml之最終蛋白濃度。90 min後，藉由添加2-碘代乙醯胺(Merck)來中止未經反應之巰基。

接著使用5 μ m Minisart過濾器淨化共軛物且將共軛物注射於Sephacryl S300HR(XK16/100)上。在流動速率固定於30 ml/h之200 mM NaCl中實現溶離。

藉由己醯胺及藉由蛋白劑量來分析溶離份。將相關溶離份彙集且在0.22 μ m Sterivex上過濾。

所得共軛物具有2.74之最終TT/PS比率(w/w)。

實例3

金黃色葡萄球菌dPNAG-TT共軛物之免疫原性

以0.3 μ g之醣劑量為30隻小鼠之組皮下預防注射無佐劑或與3D-MPL佐劑合併之金黃色葡萄球菌dPNAG-TT共軛物。在第0、14及28天，小鼠接收三種預防注射。在第41天，自小鼠收集血清，且藉由ELISA測試各血清樣品以分析抗PNAG之免疫反應。10隻小鼠之群用於對照組中且為此等小鼠預防注射生理食鹽水。

抗PNAG之ELISA：

將與稀釋於磷酸鹽緩衝生理食鹽水(PBS)中之甲基化HSA (2.5 μ g/ml)混合之經純化PNAG (2.5 μ g/ml)在高結合微量滴定盤(Nunc Maxisorp)上於4°C下塗佈隔夜。

室溫下，在攪動下將培養盤用1%之PBS-BSA阻斷30

min。將小鼠抗血清預先稀釋 1/100，接著進一步在微定量盤中進行兩倍稀釋且在 37°C 下培育 1 小時。洗滌後，使用 Jackson ImmunoLaboratories Inc 之在 PBS-BSA 0.2%-tween 0.05% 中稀釋 1:5000 倍之過氧化酶共軛之 affiniPure 山羊抗小鼠 IgG (H+L)(ref: 115-035-003) 來偵測結合鼠科動物抗體。在室溫下在攪動下培育偵測抗體歷時 30 min。在室溫下在黑暗中使用每 10 ml pH 值 4.5 0.1M 檸檬酸鹽緩衝液 4 mg OPD (Sigma)+5 µl H₂O₂ 歷時 15 分鐘形成顏色。用 50 µl HCl 中止反應，且相對於 650 nm 在 490 nm 下讀出光學密度。

結果(表 1 中所示)展示為彙集血清之中點力價。針對個別血清分析，在 30 個樣品(10 個為對照組)之中點力價上計算 GMT。

表 1

共軛物	抗PNAG中 點力價未吸收	抗PNAG中 點力價佐劑A
dPNAG-TT010	1371	28465
dPNAG-TT011	1133	40899
dPNAG-TT019	425	13429
dPNAG-TT020	656	10080
dPNAG-TT014	342	9806
dPNAG-TT017	203	8094
dPNAG-TT012	398	40509
dPNAG-TT016	719	7937
對照	50	50

序列表

<110> 1.比利時葛蘭素史密斯克藍生物品公司
2.美國布萊翰婦女醫院

<120> 共軛方法

<130> VB61918

<140> 096111419

<141> 2007-03-30

<150> 60/787,587 ; 0606416.6 ; 0606417.4 ; 60/787,249

<151> 2006-03-30 ; 2006-03-30 ; 2006-03-30 ; 2006-03-30

<160> 164

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 533

<212> PRT

<213> 葡萄球菌

<400> 1

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Met Leu Gln Val Thr Asp Val Ser Leu Arg Phe Gly Asp Arg Lys Leu
1      5      10      15
Phe Glu Asp Val Asn Ile Lys Phe Thr Glu Gly Asn Cys Tyr Gly Leu
20      25      30
Ile Gly Ala Asn Gly Ala Gly Lys Ser Thr Phe Leu Lys Ile Leu Ser
35      40      45
Gly Glu Leu Asp Ser Gln Thr Gly His Val Ser Leu Gly Lys Asn Glu
50      55      60
Arg Leu Ala Val Leu Lys Gln Asp His Tyr Ala Tyr Glu Asp Glu Arg
65      70      75      80
Val Leu Asp Val Val Ile Lys Gly His Glu Arg Leu Tyr Glu Val Met
85      90      95
Lys Glu Lys Asp Glu Ile Tyr Met Lys Pro Asp Phe Ser Asp Glu Asp
100     105     110
Gly Ile Arg Ala Ala Glu Leu Glu Gly Glu Phe Ala Glu Met Asn Gly
115     120     125
Trp Asn Ala Glu Ala Asp Ala Ala Asn Leu Leu Ser Gly Leu Gly Ile
130     135     140
Asp Pro Thr Leu His Asp Lys Lys Met Ala Glu Leu Glu Asn Asn Gln
145     150     155     160
Lys Ile Lys Val Leu Leu Ala Gln Ser Leu Phe Gly Glu Pro Asp Val
165     170     175
Leu Leu Leu Asp Glu Pro Thr Asn Gly Leu Asp Ile Pro Ala Ile Ser
180     185     190
Trp Leu Glu Asp Phe Leu Ile Asn Phe Asp Asn Thr Val Ile Val Val
195     200     205
Ser His Asp Arg His Phe Leu Asn Asn Val Cys Thr His Ile Ala Asp
210     215     220
Leu Asp Phe Gly Lys Ile Lys Val Tyr Val Gly Asn Tyr Asp Phe Trp
225     230     235     240
Tyr Gln Ser Ser Gln Leu Ala Gln Lys Met Ala Gln Glu Gln Asn Lys
245     250     255
Lys Lys Glu Glu Lys Met Lys Glu Leu Gln Asp Phe Ile Ala Arg Phe
260     265     270
Ser Ala Asn Ala Ser Lys Ser Lys Gln Ala Thr Ser Arg Lys Lys Gln
275     280     285
Leu Glu Lys Ile Glu Leu Asp Asp Ile Gln Pro Ser Ser Arg Arg Tyr
290     295     300
Pro Phe Val Lys Phe Thr Pro Glu Arg Glu Ile Gly Asn Asp Leu Leu
305     310     315     320
Ile Val Gln Asn Leu Ser Lys Thr Ile Asp Gly Glu Lys Val Leu Asp
325     330     335
Asn Val Ser Phe Thr Met Asn Pro Asn Asp Lys Ala Ile Leu Ile Gly
340     345     350
Asp Ser Glu Ile Ala Lys Thr Thr Leu Leu Lys Ile Leu Ala Gly Glu
355     360     365
Met Glu Pro Asp Glu Gly Ser Phe Lys Trp Gly Val Thr Thr Ser Leu
370     375     380
Ser Tyr Phe Pro Lys Asp Asn Ser Glu Phe Phe Glu Gly Val Asn Met
385     390     395     400
Asn Leu Val Asp Trp Leu Arg Gln Tyr Ala Pro Glu Asp Glu Gln Thr
405     410     415
Glu Thr Phe Leu Arg Gly Phe Leu Gly Arg Met Leu Phe Ser Gly Glu

```

```

      420      425      430
Glu Val Lys Lys Lys Ala Ser Val Leu Ser Gly Gly Glu Lys Val Arg
      435      440      445
Cys Met Leu Ser Lys Met Met Leu Ser Ser Ala Asn Val Leu Leu Leu
      450      455      460
Asp Glu Pro Thr Asn His Leu Asp Leu Glu Ser Ile Thr Ala Val Asn
      465      470      475      480
Asp Gly Leu Lys Ser Phe Lys Gly Ser Ile Ile Phe Thr Ser Tyr Asp
      485      490      495
Phe Glu Phe Ile Asn Thr Ile Ala Asn Arg Val Ile Asp Leu Asn Lys
      500      505      510
Gln Gly Gly Val Ser Lys Glu Ile Pro Tyr Glu Glu Tyr Leu Gln Glu
      515      520      525
Ile Gly Val Leu Lys
      530

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<210> 2
 <211> 535
 <212> PRT
 <213> 葡萄球菌

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<400> 2
Met Leu Gln Val Thr Asp Val Ser Leu Arg Phe Gly Asp Arg Lys Leu
 1      5      10      15
Phe Glu Asp Val Asn Ile Lys Phe Thr Glu Gly Asn Cys Tyr Gly Leu
      20      25      30
Ile Gly Ala Asn Gly Ala Gly Lys Ser Thr Phe Leu Lys Ile Leu Ser
      35      40      45
Gly Glu Ile Asp Ser Gln Thr Gly His Val Ser Leu Gly Lys Asp Glu
      50      55      60
Arg Leu Ala Val Leu Lys Gln Asp His Phe Ala Tyr Glu Asp Glu Arg
      65      70      75      80
Val Leu Asp Val Val Ile Lys Gly His Glu Arg Leu Tyr Gln Val Met
      85      90      95
Lys Glu Lys Asp Glu Ile Tyr Met Lys Pro Asp Phe Ser Asp Glu Asp
      100      105      110
Gly Ile Arg Ala Ala Glu Leu Glu Gly Glu Phe Ala Glu Met Asn Gly
      115      120      125
Trp Asn Ala Glu Ala Asp Ala Ala Asn Leu Leu Ser Gly Leu Gly Ile
      130      135      140
Glu Pro Asp Leu His Asp Lys Asn Met Ser Glu Leu Glu Asn Asn Gln
      145      150      155      160
Lys Val Lys Val Leu Leu Ala Gln Ser Leu Phe Gly Asp Pro Asp Val
      165      170      175
Leu Leu Leu Asp Glu Pro Thr Asn Gly Leu Asp Ile Pro Ala Ile Ser
      180      185      190
Trp Leu Glu Asp Phe Leu Ile Asn Phe Glu Asn Thr Val Ile Val Val
      195      200      205
Ser His Asp Arg His Phe Leu Asn Asn Val Cys Thr His Ile Ala Asp
      210      215      220
Leu Asp Phe Gly Lys Ile Lys Leu Tyr Val Gly Asn Tyr Asp Phe Trp
      225      230      235      240
Tyr Gln Ser Ser Gln Leu Ala Gln Lys Met Ala Gln Glu Gln Asn Lys
      245      250      255
Lys Lys Glu Glu Lys Met Lys Glu Leu Gln Asp Phe Ile Ala Arg Phe
      260      265      270
Ser Ala Asn Ala Ser Lys Ser Lys Gln Ala Thr Ser Arg Lys Lys Gln
      275      280      285
Leu Glu Lys Ile Glu Leu Asp Asp Ile Gln Pro Ser Ser Arg Arg Tyr
      290      295      300
Pro Tyr Val Lys Phe Thr Pro Glu Arg Glu Ile Gly Asn Asp Leu Leu
      305      310      315      320
Thr Val Glu Asn Leu Ser Lys Thr Ile Asp Gly Glu Lys Val Leu Asp
      325      330      335
Asn Val Ser Phe Thr Met Asn Pro Asn Asp Lys Ala Ile Leu Val Gly
      340      345      350
Asp Ser Glu Ile Ala Lys Thr Thr Leu Leu Lys Ile Leu Ala Gly Glu
      355      360      365
Met Glu Pro Asp Glu Gly Thr Phe Lys Trp Gly Val Thr Thr Ser Leu
      370      375      380
Ser Tyr Phe Pro Lys Asp Asn Ser Glu Phe Phe Asp Gly Val Asp Met
      385      390      395      400
Asn Leu Val Glu Trp Leu Arg Gln Tyr Ala Pro Glu Asp Glu Gln Thr
      405      410      415

```

Glu Thr Phe Leu Arg Gly Phe Leu Gly Arg Met Leu Phe Ser Gly Glu
 420 425 430
 Glu Val Lys Lys Lys Ala Ser Val Leu Ser Gly Gly Glu Lys Val Arg
 435 440 445
 Cys Met Leu Ser Lys Met Met Leu Ser Ser Ala Asn Val Leu Leu Leu
 450 455 460
 Asp Glu Pro Thr Asn His Leu Asp Leu Glu Ser Ile Thr Ala Val Asn
 465 470 475 480
 Asp Gly Leu Lys Ser Phe Lys Gly Ser Ile Ile Phe Thr Ser Tyr Asp
 485 490 495
 Phe Glu Phe Ile Asn Thr Ile Ala Asn Arg Val Ile Asp Leu Asn Gln
 500 505 510
 Ala Gly Ala Leu Ser Lys Glu Val Pro Tyr Glu Glu Tyr Leu Gln Glu
 515 520 525
 Ile Gly Val Leu Gln Asn Asn
 530 535

<210> 3
 <211> 434
 <212> PRT
 <213> 葡萄球菌

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 Met Pro Ile Ile Thr Asp Val Tyr Ala Arg Glu Val Leu Asp Ser Arg
 1 5 10 15
 Gly Asn Pro Thr Val Glu Val Glu Val Leu Thr Glu Ser Gly Ala Phe
 20 25 30
 Gly Arg Ala Leu Val Pro Ser Gly Ala Ser Thr Gly Glu His Glu Ala
 35 40 45
 Val Glu Leu Arg Asp Gly Asp Lys Ser Arg Tyr Leu Gly Lys Gly Val
 50 55 60
 Thr Lys Ala Val Glu Asn Val Asn Glu Ile Ile Ala Pro Glu Ile Ile
 65 70 75 80
 Glu Gly Glu Phe Ser Val Leu Asp Gln Val Ser Ile Asp Lys Met Met
 85 90 95
 Ile Ala Leu Asp Gly Thr Pro Asn Lys Gly Lys Leu Gly Ala Asn Ala
 100 105 110
 Ile Leu Gly Val Ser Ile Ala Val Ala Arg Ala Ala Asp Leu Leu
 115 120 125
 Gly Gln Pro Leu Tyr Lys Tyr Leu Gly Gly Phe Asn Gly Lys Gln Leu
 130 135 140
 Pro Val Pro Met Met Asn Ile Val Asn Gly Gly Ser His Ser Asp Ala
 145 150 155 160
 Pro Ile Ala Phe Gln Glu Phe Met Ile Leu Pro Val Gly Ala Thr Thr
 165 170 175
 Phe Lys Glu Ser Leu Arg Trp Gly Thr Glu Ile Phe His Asn Leu Lys
 180 185 190
 Ser Ile Leu Ser Lys Arg Gly Leu Glu Thr Ala Val Gly Asp Glu Gly
 195 200 205
 Gly Phe Ala Pro Lys Phe Glu Gly Thr Glu Asp Ala Val Glu Thr Ile
 210 215 220
 Ile Gln Ala Ile Glu Ala Ala Gly Tyr Lys Pro Gly Glu Glu Val Phe
 225 230 235 240
 Leu Gly Phe Asp Cys Ala Ser Ser Glu Phe Tyr Glu Asn Gly Val Tyr
 245 250 255
 Asp Tyr Ser Lys Phe Glu Gly Glu His Gly Ala Lys Arg Thr Ala Ala
 260 265 270
 Glu Gln Val Asp Tyr Leu Glu Gln Leu Val Asp Lys Tyr Pro Ile Ile
 275 280 285
 Thr Ile Glu Asp Gly Met Asp Glu Asn Asp Trp Asp Gly Trp Lys Gln
 290 295 300
 Leu Thr Glu Arg Ile Gly Asp Arg Val Gln Leu Val Gly Asp Asp Leu
 305 310 315 320
 Phe Val Thr Asn Thr Glu Ile Leu Ala Lys Gly Ile Glu Asn Gly Ile
 325 330 335
 Gly Asn Ser Ile Leu Ile Lys Val Asn Gln Ile Gly Thr Leu Thr Glu
 340 345 350
 Thr Phe Asp Ala Ile Glu Met Ala Gln Lys Ala Gly Tyr Thr Ala Val
 355 360 365
 Val Ser His Arg Ser Gly Glu Thr Glu Asp Thr Thr Ile Ala Asp Ile
 370 375 380
 Ala Val Ala Thr Asn Ala Gly Gln Ile Lys Thr Gly Ser Leu Ser Arg
 385 390 395 400
 Thr Asp Arg Ile Ala Lys Tyr Asn Gln Leu Leu Arg Ile Glu Asp Glu

Leu Phe Glu Thr 405
 420 Ala Lys Tyr Asp Gly 410
 425 Ile Lys Ser Phe Tyr 415
 430 Asn Leu
 Asp Lys

<210> 4
 <211> 434
 <212> PRT
 <213> 葡萄球菌

<400> 4
 Met Pro Ile Ile Thr Asp Val Tyr Ala Arg Glu Val Leu Asp Ser Arg
 1 5 10 15
 Gly Asn Pro Thr Val Glu Val Glu Val Leu Thr Glu Ser Gly Ala Phe
 20 25 30
 Gly Arg Ala Leu Val Pro Ser Gly Ala Ser Thr Gly Glu His Glu Ala
 35 40 45
 Val Glu Leu Arg Asp Gly Asp Lys Ser Arg Tyr Leu Gly Lys Gly Val
 50 55 60
 Thr Lys Ala Val Glu Asn Val Asn Glu Met Ile Ala Pro Glu Ile Val
 65 70 75 80
 Glu Gly Glu Phe Ser Val Leu Asp Gln Val Ser Ile Asp Lys Met Met
 85 90 95
 Ile Gln Leu Asp Gly Thr His Asn Lys Gly Lys Leu Gly Ala Asn Ala
 100 105 110
 Ile Leu Gly Val Ser Ile Ala Val Ala Arg Ala Ala Asp Leu Leu
 115 120 125
 Gly Gln Pro Leu Tyr Lys Tyr Leu Gly Gly Phe Asn Gly Lys Gln Leu
 130 135 140
 Pro Val Pro Met Met Asn Ile Val Asn Gly Gly Ser His Ser Asp Ala
 145 150 155 160
 Pro Ile Ala Phe Gln Glu Phe Met Ile Leu Pro Val Gly Ala Glu Ser
 165 170 175
 Phe Lys Glu Ser Leu Arg Trp Gly Ala Glu Ile Phe His Asn Leu Lys

180 185 190
 Ser Ile Leu Ser Glu Arg Gly Leu Glu Thr Ala Val Gly Asp Glu Gly
 195 200 205
 Gly Phe Ala Pro Arg Phe Glu Gly Thr Glu Asp Ala Val Glu Thr Ile
 210 215 220
 Ile Lys Ala Ile Glu Lys Ala Gly Tyr Lys Pro Gly Glu Asp Val Phe
 225 230 235 240
 Leu Gly Phe Asp Cys Ala Ser Ser Glu Phe Tyr Glu Asn Gly Val Tyr
 245 250 255
 Asp Tyr Thr Lys Phe Glu Gly Glu His Gly Ala Lys Arg Ser Ala Ala
 260 265 270
 Glu Gln Val Asp Tyr Leu Glu Glu Leu Ile Gly Lys Tyr Pro Ile Ile
 275 280 285
 Thr Ile Glu Asp Gly Met Asp Glu Asn Asp Trp Glu Gly Trp Lys Gln
 290 295 300
 Leu Thr Asp Arg Ile Gly Asp Lys Val Gln Leu Val Gly Asp Asp Leu
 305 310 315 320
 Phe Val Thr Asn Thr Glu Ile Leu Ser Lys Gly Ile Glu Gln Gly Ile
 325 330 335
 Gly Asn Ser Ile Leu Ile Lys Val Asn Gln Ile Gly Thr Leu Thr Glu
 340 345 350
 Thr Phe Asp Ala Ile Glu Met Ala Gln Lys Ala Gly Tyr Thr Ala Val
 355 360 365
 Val Ser His Arg Ser Gly Glu Thr Glu Asp Thr Thr Ile Ala Asp Ile
 370 375 380
 Ala Val Ala Thr Asn Ala Gly Gln Ile Lys Thr Gly Ser Leu Ser Arg
 385 390 395 400
 Thr Asp Arg Ile Ala Lys Tyr Asn Gln Leu Leu Arg Ile Glu Asp Glu
 405 410 415
 Leu Tyr Glu Thr Ala Lys Phe Glu Gly Ile Lys Ser Phe Tyr Asn Leu
 420 425 430
 Asp Lys

<210> 5
 <211> 255
 <212> PRT

<213> 葡萄球菌

<400> 5

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Met Lys Lys Ile Val Thr Ala Thr Ile Ala Thr Ala Gly Leu Ala Thr
 1      5      10      15
Ile Ala Phe Ala Gly His Asp Ala Gln Ala Ala Glu Gln Asn Asn Asn
 20      25      30
Gly Tyr Asn Ser Asn Asp Ala Gln Ser Tyr Ser Tyr Thr Thr Ile
 35      40      45
Asp Ala Gln Gly Asn Tyr His Tyr Thr Trp Thr Gly Asn Trp Asn Pro
 50      55      60
Ser Gln Leu Thr Gln Asn Asn Thr Tyr Tyr Tyr Asn Asn Tyr Asn Thr
 65      70      75      80
Tyr Ser Tyr Asn Asn Ala Ser Tyr Asn Asn Tyr Tyr Asn His Ser Tyr
 85      90      95
Gln Tyr Asn Asn Tyr Thr Asn Asn Ser Gln Thr Ala Thr Asn Asn Tyr
100      105      110
Tyr Thr Gly Gly Ser Gly Ala Ser Tyr Ser Thr Thr Ser Asn Asn Val
115      120      125
His Val Thr Thr Thr Ala Ala Pro Ser Ser Asn Gly Arg Ser Ile Ser
130      135      140
Asn Gly Tyr Ala Ser Gly Ser Asn Leu Tyr Thr Ser Gly Gln Cys Thr
145      150      155      160
Tyr Tyr Val Phe Asp Arg Val Gly Gly Lys Ile Gly Ser Thr Trp Gly
165      170      175
Asn Ala Ser Asn Trp Ala Asn Ala Ala Ala Ser Ser Gly Tyr Thr Val
180      185      190
Asn Asn Thr Pro Lys Val Gly Ala Ile Met Gln Thr Thr Gln Gly Tyr
195      200      205
Tyr Gly His Val Ala Tyr Val Glu Gly Val Asn Ser Asn Gly Ser Val
210      215      220
Arg Val Ser Glu Met Asn Tyr Gly His Gly Ala Gly Val Val Thr Ser
225      230      235      240
Arg Thr Ile Ser Ala Asn Gln Ala Gly Ser Tyr Asn Phe Ile His
245      250      255

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<210> 6

<211> 267

<212> PRT

<213> 葡萄球菌

<400> 6

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Met Lys Lys Ile Ala Thr Ala Thr Ile Ala Thr Ala Gly Phe Ala Thr
 1      5      10      15
Ile Ala Ile Ala Ser Gly Asn Gln Ala His Ala Ser Glu Gln Asp Asn
 20      25      30
Tyr Gly Tyr Asn Pro Asn Asp Pro Thr Ser Tyr Ser Tyr Thr Thr
 35      40      45
Ile Asp Ala Gln Gly Asn Tyr His Tyr Thr Trp Lys Gly Asn Trp His
 50      55      60
Pro Ser Gln Leu Asn Gln Asp Asn Gly Tyr Tyr Ser Tyr Tyr Tyr
 65      70      75      80
Asn Gly Tyr Asn Asn Tyr Asn Asn Tyr Asn Asn Gly Tyr Ser Tyr Asn
 85      90      95
Asn Tyr Ser Arg Tyr Asn Asn Tyr Ser Asn Asn Asn Gln Ser Tyr Asn
100      105      110
Tyr Asn Asn Tyr Asn Ser Tyr Asn Thr Asn Ser Tyr Arg Thr Gly Gly
115      120      125
Leu Gly Ala Ser Tyr Ser Thr Ser Ser Asn Asn Val Gln Val Thr Thr
130      135      140
Thr Met Ala Pro Ser Ser Asn Gly Arg Ser Ile Ser Ser Gly Tyr Thr
145      150      155      160
Ser Gly Arg Asn Leu Tyr Thr Ser Gly Gln Cys Thr Tyr Tyr Val Phe
165      170      175
Asp Arg Val Gly Gly Lys Ile Gly Ser Thr Trp Gly Asn Ala Ser Asn
180      185      190
Trp Ala Asn Ala Ala Ala Arg Ala Gly Tyr Thr Val Asn Asn Thr Pro
195      200      205
Lys Ala Gly Ala Ile Met Gln Thr Thr Gln Gly Ala Tyr Gly His Val
210      215      220
Ala Tyr Val Glu Ser Val Asn Ser Asn Gly Ser Val Arg Val Ser Glu
225      230      235      240
Met Asn Tyr Gly Tyr Gly Pro Gly Val Val Thr Ser Arg Thr Ile Ser
245      250      255

```

Ala Ser Gln Ala Ala Gly Tyr Asn Phe Ile His
260 265

<210> 7
<211> 257
<212> PRT
<213> 葡萄球菌

<400> 7
Met Lys Lys Ile Ala Thr Ala Thr Ile Ala Thr Ala Gly Ile Ala Thr
1 5 10 15
Phe Ala Phe Ala His His Asp Ala Gln Ala Ala Glu Gln Asn Asn Asp
20 25 30
Gly Tyr Asn Pro Asn Asp Pro Tyr Ser Tyr Ser Tyr Thr Tyr Thr Ile
35 40 45
Asp Ala Glu Gly Asn Tyr His Tyr Thr Trp Lys Gly Asn Trp Ser Pro
50 55 60
Asp Arg Val Asn Thr Ser Tyr Asn Tyr Asn Asn Tyr Asn Asn Tyr Asn
65 70 75 80
Tyr Tyr Gly Tyr Asn Asn Tyr Ser Asn Tyr Asn Asn Tyr Ser Asn Tyr
85 90 95
Asn Asn Tyr Asn Asn Tyr Gln Ser Asn Asn Thr Gln Ser Gln Arg Thr
100 105 110
Thr Gln Pro Thr Gly Gly Leu Gly Ala Ser Tyr Ser Thr Ser Ser Ser
115 120 125
Asn Val His Val Thr Thr Thr Ser Ala Pro Ser Ser Asn Gly Val Ser
130 135 140
Leu Ser Asn Ala Arg Ser Ala Ser Gly Asn Leu Tyr Thr Ser Gly Gln
145 150 155 160
Cys Thr Tyr Tyr Val Phe Asp Arg Val Gly Gly Lys Ile Gly Ser Thr
165 170 175
Trp Gly Asn Ala Asn Asn Trp Ala Asn Ala Ala Arg Ser Gly Tyr
180 185 190
Thr Val Asn Asn Ser Pro Ala Lys Gly Ala Ile Leu Gln Thr Ser Gln
195 200 205
Gly Ala Tyr Gly His Val Ala Tyr Val Glu Gly Val Asn Ser Asn Gly
210 215 220
Ser Ile Arg Val Ser Glu Met Asn Tyr Gly His Gly Ala Gly Val Val
225 230 235 240
Thr Ser Arg Thr Ile Ser Ala Ser Gln Ala Ala Ser Tyr Asn Tyr Ile
245 250 255
His

<210> 8
<211> 309
<212> PRT
<213> 葡萄球菌

<400> 8
Met Lys Lys Leu Val Pro Leu Leu Leu Ala Leu Leu Leu Leu Val Ala
1 5 10 15
Ala Cys Gly Thr Gly Gly Lys Gln Ser Ser Asp Lys Ser Asn Gly Lys
20 25 30
Leu Lys Val Val Thr Thr Asn Ser Ile Leu Tyr Asp Met Ala Lys Asn
35 40 45
Val Gly Gly Asp Asn Val Asp Ile His Ser Ile Val Pro Val Gly Gln
50 55 60
Asp Pro His Glu Tyr Glu Val Lys Pro Lys Asp Ile Lys Lys Leu Thr
65 70 75 80
Asp Ala Asp Val Ile Leu Tyr Asn Gly Leu Asn Leu Glu Thr Gly Asn
85 90 95
Gly Trp Phe Glu Lys Ala Leu Glu Gln Ala Gly Lys Ser Leu Lys Asp
100 105 110
Lys Lys Val Ile Ala Val Ser Lys Asp Val Lys Pro Ile Tyr Leu Asn
115 120 125
Gly Glu Glu Gly Asn Lys Asp Lys Gln Asp Pro His Ala Trp Leu Ser
130 135 140
Leu Asp Asn Gly Ile Lys Tyr Val Lys Thr Ile Gln Gln Thr Phe Ile
145 150 155 160
Asp Asn Asp Lys Lys His Lys Ala Asp Tyr Glu Lys Gln Gly Asn Lys
165 170 175

Tyr Ile Ala Gln Leu Glu Lys Leu Asn Asn Asp Ser Lys Asp Lys Phe
 180 185 190
 Asn Asp Ile Pro Lys Glu Gln Arg Ala Met Ile Thr Ser Glu Gly Ala
 195 200 205
 Phe Lys Tyr Phe Ser Lys Gln Tyr Gly Ile Thr Pro Gly Tyr Ile Trp
 210 215 220
 Glu Ile Asn Thr Glu Lys Gln Gly Thr Pro Glu Gln Met Arg Gln Ala
 225 230 235 240
 Ile Glu Phe Val Lys Lys His Lys Leu Lys His Leu Leu Val Glu Thr
 245 250 255
 Ser Val Asp Lys Lys Ala Met Glu Ser Leu Ser Glu Glu Thr Lys Lys
 260 265 270
 Asp Ile Phe Gly Glu Val Tyr Thr Asp Ser Ile Gly Lys Glu Gly Thr
 275 280 285
 Lys Gly Asp Ser Tyr Tyr Lys Met Met Lys Ser Asn Ile Glu Thr Val
 290 295 300
 His Gly Ser Met Lys
 305

<210> 9
 <211> 309
 <212> PRT
 <213> 葡萄球菌

<400> 9
 Met Lys Lys Ile Leu Ala Leu Ala Ile Ala Phe Leu Ile Ile Leu Ala
 1 5 10 15
 Ala Cys Gly Asn His Ser Asn His Glu His His Ser His Glu Gly Lys
 20 25 30
 Leu Lys Val Val Thr Thr Asn Ser Ile Leu Tyr Asp Met Val Lys Arg
 35 40 45
 Val Gly Gly Asn Lys Val Asp Val His Ser Ile Val Pro Val Gly Gln
 50 55 60
 Asp Pro His Glu Tyr Glu Val Lys Pro Lys Asp Ile Lys Ala Leu Thr
 65 70 75 80
 Asp Ala Asp Val Val Phe Tyr Asn Gly Leu Asn Leu Glu Thr Gly Asn
 85 90 95
 Gly Trp Phe Glu Lys Ala Leu Asp Gln Ala Gly Lys Ser Thr Lys Asp
 100 105 110
 Lys Asn Val Ile Ala Ala Ser Asn Asn Val Lys Pro Ile Tyr Leu Asn
 115 120 125
 Gly Glu Glu Gly Asn Lys Asn Lys Gln Asp Pro His Ala Trp Leu Ser
 130 135 140
 Leu Glu Asn Gly Ile Lys Tyr Val Lys Thr Ile Gln Lys Ser Leu Glu
 145 150 155 160
 His His Asp Lys Lys Asp Lys Ser Thr Tyr Glu Lys Gln Gly Asn Ala
 165 170 175
 Tyr Ile Ser Lys Leu Glu Glu Leu Asn Lys Asp Ser Lys Asn Lys Phe
 180 185 190
 Asp Asp Ile Pro Lys Asn Gln Arg Ala Met Met Thr Ser Glu Gly Ala
 195 200 205
 Phe Lys Tyr Phe Ala Gln Gln Phe Asp Val Lys Pro Gly Tyr Ile Trp
 210 215 220
 Glu Ile Asn Thr Glu Lys Gln Gly Thr Pro Gly Gln Met Lys Gln Ala
 225 230 235 240
 Ile Lys Phe Val Lys Asp Asn His Leu Lys His Leu Leu Val Glu Thr
 245 250 255
 Ser Val Asp Lys Lys Ala Met Gln Ser Leu Ser Glu Glu Thr Lys Lys
 260 265 270
 Asp Ile Tyr Gly Glu Val Phe Thr Asp Ser Ile Gly Lys Glu Gly Thr
 275 280 285
 Lys Gly Asp Ser Tyr Tyr Lys Met Met Lys Ser Asn Ile Asp Thr Ile
 290 295 300
 His Gly Ser Met Lys
 305

<210> 10
 <211> 233
 <212> PRT
 <213> 葡萄球菌

<400> 10
 Met Lys Lys Thr Ile Met Ala Ser Ser Leu Ala Val Ala Leu Gly Val

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      1           5           10           15
Thr Gly Tyr Ala Ala Gly Thr Gly His Gln Ala His Ala Ala Glu Val
      20           25           30
Asn Val Asp Gln Ala His Leu Val Asp Leu Ala His Asn His Gln Asp
      35           40           45
Gln Leu Asn Ala Ala Pro Ile Lys Asp Gly Ala Tyr Asp Ile His Phe
      50           55           60
Val Lys Asp Gly Phe Gln Tyr Asn Phe Thr Ser Asn Gly Thr Thr Trp
      65           70           75           80
Ser Trp Ser Tyr Glu Ala Ala Asn Gly Gln Thr Ala Gly Phe Ser Asn
      85           90           95
Val Ala Gly Ala Asp Tyr Thr Thr Ser Tyr Asn Gln Gly Ser Asp Val
      100          105          110
Gln Ser Val Ser Tyr Asn Ala Gln Ser Ser Asn Ser Asn Val Glu Ala
      115          120          125
Val Ser Ala Pro Thr Tyr His Asn Tyr Ser Thr Ser Thr Thr Ser Ser
      130          135          140
Ser Val Arg Leu Ser Asn Gly Asn Thr Ala Gly Ala Thr Gly Ser Ser
      145          150          155          160
Ala Ala Gln Ile Met Ala Gln Arg Thr Gly Val Ser Ala Ser Thr Trp
      165          170          175
Ala Ala Ile Ile Ala Arg Glu Ser Asn Gly Gln Val Asn Ala Tyr Asn
      180          185          190
Pro Ser Gly Ala Ser Gly Leu Phe Gln Thr Met Pro Gly Trp Gly Pro
      195          200          205
Thr Asn Thr Val Asp Gln Gln Ile Asn Ala Ala Val Lys Ala Tyr Lys
      210          215          220
Ala Gln Gly Leu Gly Ala Trp Gly Phe
      225          230

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<210> 11
 <211> 235
 <212> PRT
 <213> 葡萄球菌

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<400> 11
Met Lys Lys Thr Val Ile Ala Ser Thr Leu Ala Val Ser Leu Gly Ile
      1           5           10           15
Ala Gly Tyr Gly Leu Ser Gly His Glu Ala His Ala Ser Glu Thr Thr
      20           25           30
Asn Val Asp Lys Ala His Leu Val Asp Leu Ala Gln His Asn Pro Glu
      35           40           45
Glu Leu Asn Ala Lys Pro Val Gln Ala Gly Ala Tyr Asp Ile His Phe
      50           55           60
Val Asp Asn Gly Tyr Gln Tyr Asn Phe Thr Ser Asn Gly Ser Glu Trp
      65           70           75           80
Ser Trp Ser Tyr Ala Val Ala Gly Ser Asp Ala Asp Tyr Thr Glu Ser
      85           90           95
Ser Ser Asn Gln Glu Val Ser Ala Asn Thr Gln Ser Ser Asn Thr Asn
      100          105          110
Val Gln Ala Val Ser Ala Pro Thr Ser Ser Glu Ser Arg Ser Tyr Ser
      115          120          125
Thr Ser Thr Thr Ser Tyr Ser Ala Pro Ser His Asn Tyr Ser Ser His
      130          135          140
Ser Ser Ser Val Arg Leu Ser Asn Gly Asn Thr Ala Gly Ser Val Gly
      145          150          155          160
Ser Tyr Ala Ala Ala Gln Met Ala Ala Arg Thr Gly Val Ser Ala Ser
      165          170          175
Thr Trp Glu His Ile Ile Ala Arg Glu Ser Asn Gly Gln Leu His Ala
      180          185          190
Arg Asn Ala Ser Gly Ala Ala Gly Leu Phe Gln Thr Met Pro Gly Trp
      195          200          205
Gly Ser Thr Gly Ser Val Asn Asp Gln Ile Asn Ala Ala Tyr Lys Ala
      210          215          220
Tyr Lys Ala Gln Gly Leu Ser Ala Trp Gly Met
      225          230          235

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<210> 12
 <211> 3890
 <212> PRT
 <213> 葡萄球菌

<400> 12

Met	Asn	Tyr	Arg	Asp	Lys	Ile	Gln	Lys	Phe	Ser	Ile	Arg	Lys	Tyr	Thr
1				5					10					15	
Val	Gly	Thr	Phe	Ser	Thr	Val	Ile	Ala	Thr	Leu	Val	Phe	Leu	Gly	Phe
			20					25					30		
Asn	Thr	Ser	Gln	Ala	His	Ala	Ala	Glu	Thr	Asn	Gln	Pro	Ala	Ser	Val
		35				40						45			
Val	Lys	Gln	Lys	Gln	Gln	Ser	Asn	Asn	Glu	Gln	Thr	Glu	Asn	Arg	Glu
	50					55					60				
Ser	Gln	Val	Gln	Asn	Ser	Gln	Asn	Ser	Gln	Asn	Ser	Gln	Ser	Leu	Ser
65				70					75					80	
Ala	Thr	His	Glu	Asn	Glu	Gln	Pro	Asn	Asn	Ser	Gln	Ala	Asn	Leu	Val
			85					90						95	
Asn	Gln	Lys	Val	Ala	Gln	Ser	Ser	Thr	Thr	Asn	Asp	Glu	Gln	Pro	Ala
		100						105						110	
Ser	Gln	Asn	Val	Asn	Thr	Lys	Lys	Asp	Ser	Ala	Thr	Ala	Ala	Thr	Thr
		115				120						125			
Gln	Pro	Asp	Lys	Glu	Glu	Ser	Lys	His	Lys	Gln	Asn	Glu	Ser	Gln	Ser
	130					135					140				
Ala	Asn	Lys	Asn	Gly	Asn	Asp	Asn	Arg	Ala	Ala	His	Val	Glu	Asn	His
145				150					155						160
Glu	Ala	Asn	Val	Val	Thr	Ala	Ser	Asp	Ser	Ser	Asp	Asn	Gly	Asn	Val
			165						170					175	
Gln	His	Asp	Arg	Asn	Glu	Leu	Gln	Ala	Phe	Phe	Asp	Ala	Asn	Tyr	His
		180				185								190	
Asp	Tyr	Arg	Phe	Ile	Asp	Arg	Glu	Asn	Ala	Asp	Ser	Gly	Thr	Phe	Asn
	195					200						205			
Tyr	Val	Lys	Gly	Ile	Phe	Asp	Lys	Ile	Asn	Thr	Leu	Leu	Gly	Ser	Asn
	210					215					220				
Asp	Pro	Ile	Asn	Asn	Lys	Asp	Leu	Gln	Leu	Ala	Tyr	Lys	Glu	Leu	Glu
225				230					235						240
Gln	Ala	Val	Ala	Leu	Ile	Arg	Thr	Met	Pro	Gln	Arg	Gln	Gln	Thr	Ser
			245					250						255	
Arg	Arg	Ser	Asn	Arg	Ile	Gln	Thr	Arg	Ser	Val	Glu	Ser	Arg	Ala	Ala
		260						265						270	
Glu	Pro	Arg	Ser	Val	Ser	Asp	Tyr	Gln	Asn	Ala	Asn	Ser	Ser	Tyr	Tyr
		275				280						285			
Val	Glu	Asn	Ala	Asn	Asp	Gly	Ser	Gly	Tyr	Pro	Val	Gly	Thr	Tyr	Ile
	290					295					300				
Asn	Ala	Ser	Ser	Lys	Gly	Ala	Pro	Tyr	Asn	Leu	Pro	Thr	Thr	Pro	Trp
305				310					315						320
Asn	Thr	Leu	Lys	Ala	Ser	Asp	Ser	Lys	Glu	Ile	Ala	Leu	Met	Thr	Ala
			325						330					335	
Lys	Gln	Thr	Gly	Asp	Gly	Tyr	Gln	Trp	Val	Ile	Lys	Phe	Asn	Lys	Gly
		340						345					350		
His	Ala	Pro	His	Gln	Asn	Met	Ile	Phe	Trp	Phe	Ala	Leu	Pro	Ala	Asp
		355				360						365			
Gln	Val	Pro	Val	Gly	Arg	Thr	Asp	Phe	Val	Thr	Val	Asn	Ser	Asp	Gly
	370					375					380				
Thr	Asn	Val	Gln	Trp	Ser	His	Gly	Ala	Gly	Ala	Gly	Ala	Asn	Lys	Pro
385				390					395						400
Leu	Gln	Gln	Met	Trp	Glu	Tyr	Gly	Val	Asn	Asp	Pro	Asp	Arg	Ser	His
			405						410					415	
Asp	Phe	Lys	Ile	Arg	Asn	Arg	Ser	Gly	Gln	Val	Ile	Tyr	Ser	Trp	Pro
		420						425					430		
Thr	Val	His	Val	Tyr	Ser	Leu	Glu	Asp	Leu	Ser	Arg	Ala	Ser	Asp	Tyr
		435				440						445			
Phe	Ser	Glu	Ala	Gly	Ala	Thr	Pro	Ala	Thr	Lys	Ala	Phe	Gly	Arg	Gln
	450					455					460				
Asn	Phe	Glu	Tyr	Ile	Asn	Gly	Gln	Lys	Pro	Ala	Glu	Ser	Pro	Gly	Val
465				470					475						480
Pro	Lys	Val	Tyr	Thr	Phe	Ile	Gly	Gln	Gly	Asp	Ala	Ser	Tyr	Thr	Ile
			485						490					495	
Ser	Phe	Lys	Thr	Gln	Gly	Pro	Thr	Val	Asn	Lys	Leu	Tyr	Tyr	Ala	Ala
		500						505						510	
Gly	Gly	Arg	Ala	Leu	Glu	Tyr	Asn	Gln	Leu	Phe	Met	Tyr	Ser	Gln	Leu
		515						520					525		
Tyr	Val	Glu	Ser	Thr	Gln	Asp	His	Gln	Gln	Arg	Leu	Asn	Gly	Leu	Arg
	530					535					540				
Gln	Val	Val	Asn	Arg	Thr	Tyr	Arg	Ile	Gly	Thr	Thr	Lys	Arg	Val	Glu
545				550					555						560
Val	Ser	Gln	Gly	Asn	Val	Gln	Thr	Lys	Lys	Val	Leu	Glu	Ser	Thr	Asn
			565						570					575	
Leu	Asn	Ile	Asp	Asp	Phe	Val	Asp	Asp	Pro	Leu	Ser	Tyr	Val	Lys	Thr
		580						585					590		
Pro	Ser	Asn	Lys	Val	Leu	Gly	Phe	Tyr	Pro	Thr	Asn	Ala	Asn	Thr	Asn

Ala	Phe	Arg	Pro	Gly	Gly	Val	Gln	Glu	Leu	Asn	Glu	Tyr	Gln	Leu	Ser
610						615					620				
Gln	Leu	Phe	Thr	Asp	Gln	Lys	Leu	Gln	Glu	Ala	Ala	Arg	Thr	Arg	Asn
625					630					635					640
Pro	Ile	Arg	Leu	Met	Ile	Gly	Phe	Asp	Tyr	Pro	Asp	Gly	Tyr	Gly	Asn
				645					650					655	
Ser	Glu	Thr	Leu	Val	Pro	Val	Asn	Leu	Thr	Val	Leu	Pro	Glu	Ile	Gln
			660					665					670		
His	Asn	Ile	Lys	Phe	Phe	Lys	Asn	Asp	Thr	Gln	Asn	Ile	Ala	Glu	
		675					680				685				
Lys	Pro	Phe	Ser	Lys	Gln	Ala	Gly	His	Pro	Val	Phe	Tyr	Val	Tyr	Ala
	690					695					700				
Gly	Asn	Gln	Gly	Asn	Ala	Ser	Val	Asn	Leu	Gly	Gly	Ser	Val	Thr	Ser
705					710					715					720
Ile	Gln	Pro	Leu	Arg	Ile	Asn	Leu	Thr	Ser	Asn	Glu	Asn	Phe	Thr	Asp
				725					730					735	
Lys	Asp	Trp	Gln	Ile	Thr	Gly	Ile	Pro	Arg	Thr	Leu	His	Ile	Glu	Asn
			740					745					750		
Ser	Thr	Asn	Arg	Thr	Asn	Asn	Ala	Arg	Glu	Arg	Asn	Ile	Glu	Leu	Val
		755					760					765			
Gly	Asn	Leu	Leu	Pro	Gly	Asp	Tyr	Phe	Gly	Thr	Ile	Arg	Phe	Gly	Arg
	770				775						780				
Lys	Glu	Gln	Leu	Phe	Glu	Ile	Arg	Val	Lys	Pro	His	Thr	Pro	Thr	Ile
785					790					795					800
Thr	Thr	Thr	Ala	Glu	Gln	Leu	Arg	Gly	Thr	Ala	Leu	Gln	Lys	Val	Pro
			805						810					815	
Val	Asn	Ile	Ser	Gly	Ile	Pro	Leu	Asp	Pro	Ser	Ala	Leu	Val	Tyr	Leu
			820					825					830		
Val	Ala	Pro	Thr	Asn	Gln	Thr	Thr	Asn	Gly	Gly	Ser	Glu	Ala	Asp	Gln
		835					840					845			
Ile	Pro	Ser	Gly	Tyr	Thr	Ile	Leu	Ala	Thr	Gly	Thr	Pro	Asp	Gly	Val
	850					855					860				
His	Asn	Thr	Ile	Thr	Ile	Arg	Pro	Gln	Asp	Tyr	Val	Val	Phe	Ile	Pro
865					870					875					880
Pro	Val	Gly	Lys	Gln	Ile	Arg	Ala	Val	Val	Tyr	Tyr	Asn	Lys	Val	Val
			885						890					895	
Ala	Ser	Asn	Met	Ser	Asn	Ala	Val	Thr	Ile	Leu	Pro	Asp	Asp	Ile	Pro
		900						905					910		
Pro	Thr	Ile	Asn	Asn	Pro	Val	Gly	Ile	Asn	Ala	Lys	Tyr	Tyr	Arg	Gly
		915					920					925			
Asp	Glu	Val	Asn	Phe	Thr	Met	Gly	Val	Ser	Asp	Arg	His	Ser	Gly	Ile
	930					935					940				
Lys	Asn	Thr	Thr	Ile	Thr	Leu	Pro	Ser	Gly	Trp	Thr	Ser	Asn	Leu	
945					950				955					960	
Thr	Lys	Ser	Asp	Asn	Lys	Asn	Gly	Ser	Leu	Ala	Ile	Thr	Gly	Arg	Val
			965						970					975	
Ser	Met	Asn	Gln	Ala	Phe	Asn	Ser	Asp	Ile	Thr	Phe	Lys	Val	Ser	Ala
		980						985					990		
Thr	Asp	Asn	Val	Asn	Asn	Thr	Thr	Asn	Asp	Ser	Gln	Ser	Lys	His	Val
		995					1000					1005			
Ser	Ile	His	Val	Gly	Lys	Ile	Ser	Glu	Asp	Ala	His	Pro	Ile	Val	Leu
	1010					1015						1020			
Gly	Asn	Thr	Glu	Lys	Val	Val	Val	Val	Asn	Pro	Thr	Ala	Val	Ser	Asn
1025					1030					1035					1040
Asp	Glu	Lys	Gln	Ser	Ile	Ile	Thr	Ala	Phe	Met	Asn	Lys	Asn	Gln	Asn
			1045						1050					1055	
Ile	Arg	Gly	Tyr	Leu	Ala	Ser	Thr	Asp	Pro	Val	Thr	Val	Asp	Asn	Asn
		1060						1065					1070		
Gly	Asn	Val	Thr	Leu	His	Tyr	Arg	Asp	Gly	Ser	Ser	Thr	Thr	Leu	Asp
		1075						1080				1085			
Ala	Thr	Asn	Val	Met	Thr	Tyr	Glu	Pro	Val	Val	Lys	Ser	Glu	Tyr	Gln
	1090					1095						1100			
Thr	Ala	Asn	Ala	Ala	Lys	Thr	Ala	Thr	Val	Thr	Ile	Ala	Lys	Gly	Gln
1105					1110						1115				1120
Ser	Phe	Asn	Ile	Gly	Asp	Ile	Lys	Gln	Tyr	Phe	Thr	Leu	Ser	Asn	Gly
			1125						1130					1135	
Gln	Ala	Ile	Pro	Asn	Gly	Thr	Phe	Thr	Asn	Ile	Thr	Ser	Asp	Arg	Thr
			1140					1145					1150		
Ile	Pro	Thr	Ala	Gln	Glu	Val	Ser	Gln	Met	Asn	Ala	Gly	Thr	Gln	Leu
		1155					1160					1165			
Tyr	His	Ile	Val	Ala	Ser	Asn	Ala	Tyr	His	Lys	Asp	Thr	Glu	Asp	Phe
	1170					1175						1180			
Tyr	Ile	Ser	Leu	Lys	Ile	Val	Asp	Val	Lys	Gln	Pro	Glu	Gly	Asp	Gln
1185					1190					1195					1200

Arg Val Tyr Arg Thr Ser Thr Tyr Asp Leu Thr Thr Asp Glu Ile Ser
1205 1210 1215
Lys Val Lys Gln Ala Phe Ile Asn Ala Asn Arg Asp Val Ile Thr Leu
1220 1225 1230
Ala Glu Gly Asp Ile Ser Val Thr Asn Thr Pro Asn Gly Ala Asn Val
1235 1240 1245
Ser Thr Ile Thr Val Asn Ile Asn Lys Gly Arg Leu Thr Lys Ser Phe
1250 1255 1260
Ala Ser Asn Leu Ala Asn Met Asn Phe Leu Arg Trp Val Asn Phe Pro
1265 1270 1275 1280
Gln Asp Tyr Thr Val Thr Trp Thr Asn Ala Lys Ile Ala Asn Arg Pro
1285 1290 1295
Thr Asp Gly Gly Leu Ser Trp Ser Asp Asp His Lys Ser Leu Ile Tyr
1300 1305 1310
Arg Tyr Asp Ala Thr Leu Gly Thr Gln Ile Thr Thr Asn Asp Ile Leu
1315 1320 1325
Thr Met Leu Lys Ala Thr Thr Val Pro Gly Leu Arg Asn Asn Ile
1330 1335 1340
Thr Gly Asn Glu Lys Ala Gln Ala Glu Ala Gly Gly Arg Pro Asn Tyr
1345 1350 1355 1360
Arg Thr Thr Gly Tyr Ser Gln Ser Asn Ala Thr Thr Asp Gly Gln Arg
1365 1370 1375
Gln Phe Thr Leu Asn Gly Gln Val Ile Gln Ile Leu Asp Ile Ile Asn
1380 1385 1390
Pro Ser Asn Gly Tyr Gly Gly Gln Pro Val Thr Asn Ser Asn Thr Arg
1395 1400 1405
Ala Asn His Ser Asn Ser Thr Val Val Asn Val Asn Glu Pro Ala Ala
1410 1415 1420
Asn Gly Ala Gly Ala Phe Thr Ile Asp His Val Val Lys Ser Asn Ser
1425 1430 1435 1440
Thr His Asn Ala Ser Asp Ala Val Tyr Lys Ala Gln Leu Tyr Leu Thr
1445 1450 1455
Pro Tyr Gly Pro Lys Gln Tyr Val Glu His Leu Asn Gln Asn Thr Gly
1460 1465 1470
Asn Thr Thr Asp Ala Ile Asn Ile Tyr Phe Val Pro Ser Asp Leu Val
1475 1480 1485
Asn Pro Thr Ile Ser Val Gly Asn Tyr Thr Asn His Gln Val Phe Ser
1490 1495 1500
Gly Glu Thr Phe Thr Asn Thr Ile Thr Ala Asn Asp Asn Phe Gly Val
1505 1510 1515 1520
Gln Ser Val Thr Val Pro Asn Thr Ser Gln Ile Thr Gly Thr Val Asp
1525 1530 1535
Asn Asn His Gln His Val Ser Ala Thr Ala Pro Asn Val Thr Ser Ala
1540 1545 1550
Thr Ser Lys Thr Ile Asn Leu Leu Ala Thr Asp Thr Ser Gly Asn Thr
1555 1560 1565
Ala Thr Thr Ser Phe Asn Val Thr Val Lys Pro Leu Arg Asp Lys Tyr
1570 1575 1580
Arg Val Gly Thr Ser Ser Thr Ala Ala Asn Pro Val Arg Ile Ala Asn
1585 1590 1595 1600
Ile Ser Asn Asn Ala Thr Val Ser Gln Ala Asp Gln Thr Thr Ile Ile
1605 1610 1615
Asn Ser Leu Thr Phe Thr Ser Asn Ala Pro Asn Arg Asn Tyr Ala Thr
1620 1625 1630
Ala Ser Ala Asn Glu Ile Thr Ser Lys Thr Val Ser Asn Val Ser Arg
1635 1640 1645
Thr Gly Asn Asn Ala Asn Val Thr Val Thr Val Thr His Gln Asp Gly
1650 1655 1660
Thr Thr Ser Thr Val Thr Val Pro Val Lys His Val Ile Pro Glu Ile
1665 1670 1675 1680
Val Ala His Ser His Tyr Thr Val Gln Gly Gln Asp Phe Pro Ala Gly
1685 1690 1695
Asn Gly Ser Ser Ala Ala Asp Tyr Phe Lys Leu Ser Asn Gly Ser Ala
1700 1705 1710
Ile Pro Asp Ala Thr Ile Thr Trp Val Ser Gly Gln Ala Pro Asn Lys
1715 1720 1725
Asp Asn Thr Arg Ile Gly Glu Asp Ile Thr Val Thr Ala His Ile Leu
1730 1735 1740
Ile Asp Gly Glu Thr Thr Pro Ile Thr Lys Thr Ala Thr Tyr Lys Val
1745 1750 1755 1760
Val Arg Thr Val Pro Lys His Val Phe Glu Thr Ala Arg Gly Val Leu
1765 1770 1775
Tyr Pro Gly Val Ser Asp Met Tyr Asp Ala Lys Gln Tyr Val Lys Pro
1780 1785 1790
Val Asn Asn Ser Trp Ser Thr Asn Ala Gln His Met Asn Phe Gln Phe

1795	1800	1805
Val Gly Thr Tyr Gly Pro Asn Lys Asp Val Val Gly Ile Ser Thr Arg		
1810	1815	1820
Leu Ile Arg Val Thr Tyr Asp Asn Arg Gln Thr Glu Asp Leu Thr Ile		
1825	1830	1835
Leu Ser Lys Val Lys Pro Asp Pro Pro Arg Ile Asp Ala Asn Ser Val		1840
1845	1850	1855
Thr Tyr Lys Ala Gly Leu Thr Asn Gln Glu Ile Lys Val Asn Asn Val		
1860	1865	1870
Leu Asn Asn Ser Ser Val Lys Leu Phe Lys Ala Asp Asn Thr Pro Leu		
1875	1880	1885
Asn Val Thr Asn Ile Thr His Gly Ser Gly Phe Ser Ser Val Val Thr		
1890	1895	1900
Val Ser Asp Ala Leu Pro Asn Gly Gly Ile Lys Ala Lys Ser Ser Ile		
1905	1910	1915
Ser Met Asn Asn Val Thr Tyr Thr Thr Gln Asp Glu His Gly Gln Val		1920
1925	1930	1935
Val Thr Val Thr Arg Asn Glu Ser Val Asp Ser Asn Asp Ser Ala Ser		
1940	1945	1950
Val Thr Val Thr Pro Gln Leu Gln Ala Thr Thr Glu Gly Ala Val Phe		
1955	1960	1965
Ile Lys Gly Gly Asp Gly Phe Asp Phe Gly His Val Glu Arg Phe Ile		
1970	1975	1980
Gln Asn Pro Pro His Gly Ala Thr Val Ala Trp His Asp Ser Pro Asp		
1985	1990	1995
Thr Trp Lys Asn Thr Val Gly Asn Thr His Lys Thr Ala Val Val Thr		2000
2005	2010	2015
Leu Pro Ser Gly Gln Gly Thr Arg Asn Val Glu Val Pro Val Lys Val		
2020	2025	2030
Tyr Pro Val Ala Asn Ala Lys Ala Pro Ser Arg Asp Val Lys Gly Gln		
2035	2040	2045
Asn Leu Thr His Gly Thr Asn Ala Ile Asp Tyr Ile Thr Phe Asp Pro		
2050	2055	2060
Asn Thr Asn Thr Asn Gly Ile Thr Ala Ala Trp Ala Asn Arg Gln Gln		
2065	2070	2075
Pro Asn Asn Gln Gln Ala Gly Val Gln His Leu Asn Val Asp Val Thr		2080
2085	2090	2095
Tyr Pro Gly Ile Ser Ala Ala Lys Arg Val Pro Val Thr Val Asn Val		
2100	2105	2110
Tyr Gln Phe Glu Phe Pro Gln Thr Thr Tyr Thr Thr Thr Val Gly Gly		
2115	2120	2125
Thr Leu Ala Ser Gly Thr Gln Ala Ser Gly Tyr Ala His Met Gln Asn		
2130	2135	2140
Ala Ser Gly Leu Pro Thr Asp Gly Phe Thr Tyr Lys Trp Asn Arg Asp		
2145	2150	2155
Thr Thr Gly Thr Asn Asp Ala Asn Trp Ala Ala Met Asn Lys Pro Asn		2160
2165	2170	2175
Thr Ala Gln Val Val Asn Ala Lys Tyr Asp Val Ile Tyr Asn Gly His		
2180	2185	2190
Thr Phe Ala Thr Ser Leu Pro Ala Lys Phe Val Val Lys Asp Val Gln		
2195	2200	2205
Pro Ala Lys Pro Thr Val Thr Glu Thr Ala Ala Gly Ala Ile Thr Ile		
2210	2215	2220
Ala Pro Gly Ala Asn Gln Thr Val Asn Thr His Ala Gly Asn Val Thr		
2225	2230	2235
Thr Tyr Ala Asp Lys Leu Val Ile Lys Arg Asn Gly Asn Val Val Thr		2240
2245	2250	2255
Thr Phe Thr Arg Arg Asn Asn Thr Ser Pro Trp Val Lys Glu Ala Ser		
2260	2265	2270
Ala Asp Asn Val Thr Gly Ile Val Gly Thr Asn Asn Gly Ile Thr Val		
2275	2280	2285
Ala Ala Gly Thr Phe Asn Pro Ala Asp Thr Ile Gln Val Val Ala Thr		
2290	2295	2300
Gln Gly Ser Gly Glu Thr Ile Ser Asp Glu Gln Arg Ser Asp Asp Phe		
2305	2310	2315
Thr Val Val Ala Pro Gln Pro Asn Gln Ala Thr Thr Lys Ile Trp Gln		2320
2325	2330	2335
Asn Gly His Ile Asp Ile Thr Pro Asn Asn Pro Ser Gly His Leu Ile		
2340	2345	2350
Asn Pro Thr Gln Ala Met Asp Ile Ala Tyr Thr Glu Lys Val Gly Asn		
2355	2360	2365
Gly Ala Glu His Ser Lys Thr Ile Asn Val Val Arg Gly Gln Asn Asn		
2370	2375	2380
Gln Trp Thr Ile Ala Asn Lys Pro Asp Tyr Val Thr Leu Asp Ala Gln		

2385	2390	2395	2400
Thr Gly Lys Val	Thr Phe Asn Ala Asn Thr	Ile Lys Pro Asn Ser Ser	
	2405	2410	2415
Ile Thr Ile Thr	Pro Lys Ala Gly Thr Gly His Ser Val Ser Ser Asn		
	2420	2425	2430
Pro Ser Thr Leu Thr	Ala Pro Ala Ala His Thr Val Asn Thr Thr Glu		
	2435	2440	2445
Ile Val Lys Asp Tyr Gly	Ser Asn Val Thr Ala Ala Glu Ile Asn Asn		
	2450	2455	2460
Ala Val Gln Val Ala	Asn Lys Arg Thr Ala Thr Ile Lys Asn Gly Thr		
	2465	2470	2475
Ala Met Pro Thr	Asn Leu Ala Gly Gly Ser Thr Thr Thr Ile Pro Val		
	2485	2490	2495
Thr Val Thr Tyr	Asn Asp Gly Ser Thr Glu Glu Val Gln Glu Ser Ile		
	2500	2505	2510
Phe Thr Lys Ala Asp	Lys Arg Glu Leu Ile Thr Ala Lys Asn His Leu		
	2515	2520	2525
Asp Asp Pro Val Ser	Thr Glu Gly Lys Lys Pro Gly Thr Ile Thr Gln		
	2530	2535	2540
Tyr Asn Asn Ala Met	His Asn Ala Gln Gln Gln Ile Asn Thr Ala Lys		
	2545	2550	2555
Thr Glu Ala Gln Gln	Val Ile Asn Asn Glu Arg Ala Thr Pro Gln Gln		
	2565	2570	2575
Val Ser Asp Ala Leu	Thr Lys Val Arg Ala Ala Gln Thr Lys Ile Asp		
	2580	2585	2590
Gln Ala Lys Ala Leu	Leu Gln Asn Lys Glu Asp Asn Ser Gln Leu Val		
	2595	2600	2605
Thr Ser Lys Asn Asn	Leu Gln Ser Ser Val Asn Gln Val Pro Ser Thr		
	2610	2615	2620
Ala Gly Met Thr Gln	Gln Ser Ile Asp Asn Tyr Asn Ala Lys Lys Arg		
	2625	2630	2635
Glu Ala Glu Thr Glu	Ile Thr Ala Ala Gln Arg Val Ile Asp Asn Gly		
	2645	2650	2655
Asp Ala Thr Ala Gln	Gln Ile Ser Asp Glu Lys His Arg Val Asp Asn		
	2660	2665	2670
Ala Leu Thr Ala Leu	Asn Gln Ala Lys His Asp Leu Thr Ala Asp Thr		
	2675	2680	2685
His Ala Leu Glu Gln	Ala Val Gln Gln Leu Asn Arg Thr Gly Thr Thr		
	2690	2695	2700
Thr Gly Lys Lys Pro	Ala Ser Ile Thr Ala Tyr Asn Asn Ser Ile Arg		
	2705	2710	2715
Ala Leu Gln Ser Asp	Leu Thr Ser Ala Lys Asn Ser Ala Asn Ala Ile		
	2725	2730	2735
Ile Gln Lys Pro Ile	Arg Thr Val Gln Glu Val Gln Ser Ala Leu Thr		
	2740	2745	2750
Asn Val Asn Arg Val	Asn Glu Arg Leu Thr Gln Ala Ile Asn Gln Leu		
	2755	2760	2765
Val Pro Leu Ala Asp	Asn Ser Ala Leu Arg Thr Ala Lys Thr Lys Leu		
	2770	2775	2780
Asp Glu Glu Ile Asn	Lys Ser Val Thr Thr Asp Gly Met Thr Gln Ser		
	2785	2790	2795
Ser Ile Gln Ala Tyr	Glu Asn Ala Lys Arg Ala Gly Gln Thr Glu Thr		
	2805	2810	2815
Thr Asn Ala Gln Asn	Val Ile Asn Asn Gly Asp Ala Thr Asp Gln Gln		
	2820	2825	2830
Ile Ala Ala Glu Lys	Thr Lys Val Glu Glu Lys Tyr Asn Ser Leu Lys		
	2835	2840	2845
Gln Ala Ile Ala Gly	Leu Thr Pro Asp Leu Ala Pro Leu Gln Thr Ala		
	2850	2855	2860
Lys Thr Gln Leu Gln	Asn Asp Ile Asp Gln Pro Thr Ser Thr Thr Gly		
	2865	2870	2875
Met Thr Ser Ala Ser	Val Ala Ala Phe Asn Asp Lys Leu Ser Ala Ala		
	2885	2890	2895
Arg Thr Lys Ile Gln	Glu Ile Asp Arg Val Leu Ala Ser His Pro Asp		
	2900	2905	2910
Val Ala Thr Ile Arg	Gln Asn Val Thr Ala Ala Asn Ala Ala Lys Thr		
	2915	2920	2925
Ala Leu Asp Gln Ala	Arg Asn Gly Leu Thr Val Asp Lys Ala Pro Leu		
	2930	2935	2940
Glu Asn Ala Lys Asn	Gln Leu Gln His Ser Ile Asp Thr Gln Thr Ser		
	2945	2950	2955
Thr Thr Gly Met Thr	Gln Asp Ser Ile Asn Ala Tyr Asn Ala Lys Leu		
	2965	2970	2975
Thr Ala Ala Arg Asn	Lys Val Gln Gln Ile Asn Gln Val Leu Ala Gly		

2980										2985										2990											
Ser	Pro	Thr	Val	Asp	Gln	Ile	Asn	Thr	Asn	Thr	Ser	Ala	Ala	Asn	Gln	Ser	Pro	Thr	Val	Asp	Gln	Ile	Asn	Thr	Asn	Thr	Ser	Ala	Ala	Asn	Gln
2995										3000										3005											
Ala	Lys	Ser	Asp	Leu	Asp	His	Ala	Arg	Gln	Ala	Leu	Thr	Pro	Asp	Lys	Ala	Lys	Ser	Asp	Leu	Asp	His	Ala	Arg	Gln	Ala	Leu	Thr	Pro	Asp	Lys
3010										3015										3020											
Ala	Pro	Leu	Gln	Asn	Ala	Lys	Thr	Gln	Leu	Glu	Gln	Ser	Ile	Asn	Gln	Ala	Pro	Leu	Gln	Asn	Ala	Lys	Thr	Gln	Leu	Glu	Gln	Ser	Ile	Asn	Gln
3025										3030										3035											
Pro	Thr	Asp	Thr	Thr	Gly	Met	Thr	Thr	Ala	Ser	Leu	Asn	Ala	Tyr	Asn	Pro	Thr	Asp	Thr	Thr	Gly	Met	Thr	Thr	Ala	Ser	Leu	Asn	Ala	Tyr	Asn
3045										3050										3055											
Gln	Lys	Leu	Gln	Ala	Ala	Arg	Gln	Lys	Leu	Thr	Glu	Ile	Asn	Gln	Val	Gln	Lys	Leu	Gln	Ala	Ala	Arg	Gln	Lys	Leu	Thr	Glu	Ile	Asn	Gln	Val
3060										3065										3070											
Leu	Asn	Gly	Asn	Pro	Thr	Val	Gln	Asn	Ile	Asn	Asp	Lys	Val	Ala	Glu	Leu	Asn	Gly	Asn	Pro	Thr	Val	Gln	Asn	Ile	Asn	Asp	Lys	Val	Ala	Glu
3075										3080										3085											
Ala	Asn	Gln	Ala	Lys	Asp	Gln	Leu	Asn	Thr	Ala	Arg	Gln	Gly	Leu	Thr	Ala	Asn	Gln	Ala	Lys	Asp	Gln	Leu	Asn	Thr	Ala	Arg	Gln	Gly	Leu	Thr
3090										3095										3100											
Leu	Asp	Arg	Gln	Pro	Ala	Leu	Thr	Thr	Leu	His	Gly	Ala	Ser	Asn	Leu	Leu	Asp	Arg	Gln	Pro	Ala	Leu	Thr	Thr	Leu	His	Gly	Ala	Ser	Asn	Leu
3105										3110										3115											
Asn	Gln	Ala	Gln	Gln	Asn	Asn	Phe	Thr	Gln	Gln	Ile	Asn	Ala	Ala	Gln	Asn	Gln	Ala	Gln	Gln	Asn	Asn	Phe	Thr	Gln	Gln	Ile	Asn	Ala	Ala	Gln
3125										3130										3135											
Asn	His	Ala	Ala	Leu	Glu	Thr	Ile	Lys	Ser	Asn	Ile	Thr	Ala	Leu	Asn	Asn	His	Ala	Ala	Leu	Glu	Thr	Ile	Lys	Ser	Asn	Ile	Thr	Ala	Leu	Asn
3140										3145										3150											
Thr	Ala	Met	Thr	Lys	Leu	Lys	Asp	Ser	Val	Ala	Asp	Asn	Asn	Thr	Ile	Thr	Ala	Met	Thr	Lys	Leu	Lys	Asp	Ser	Val	Ala	Asp	Asn	Asn	Thr	Ile
3155										3160										3165											
Lys	Ser	Gly	Gln	Asn	Tyr	Thr	Asp	Ala	Thr	Pro	Ala	Asn	Lys	Gln	Ala	Lys	Ser	Gly	Gln	Asn	Tyr	Thr	Asp	Ala	Thr	Pro	Ala	Asn	Lys	Gln	Ala
3170										3175										3180											
Tyr	Asp	Asn	Ala	Val	Asn	Ala	Ala	Lys	Gly	Val	Ile	Gly	Glu	Thr	Thr	Tyr	Asp	Asn	Ala	Val	Asn	Ala	Ala	Lys	Gly	Val	Ile	Gly	Glu	Thr	Thr
3185										3190										3195											
Asn	Pro	Thr	Met	Asp	Val	Asn	Thr	Val	Asn	Gln	Lys	Ala	Ala	Ser	Val	Asn	Pro	Thr	Met	Asp	Val	Asn	Thr	Val	Asn	Gln	Lys	Ala	Ala	Ser	Val
3205										3210										3215											
Lys	Ser	Thr	Lys	Asp	Ala	Leu	Asp	Gly	Gln	Gln	Asn	Leu	Gln	Arg	Ala	Lys	Ser	Thr	Lys	Asp	Ala	Leu	Asp	Gly	Gln	Gln	Asn	Leu	Gln	Arg	Ala
3220										3225										3230											
Lys	Thr	Glu	Ala	Thr	Asn	Ala	Ile	Thr	His	Ala	Ser	Asp	Leu	Asn	Gln	Lys	Thr	Glu	Ala	Thr	Asn	Ala	Ile	Thr	His	Ala	Ser	Asp	Leu	Asn	Gln
3235										3240										3245											
Ala	Gln	Lys	Asn	Ala	Leu	Thr	Gln	Gln	Val	Asn	Ser	Ala	Gln	Asn	Val	Ala	Gln	Lys	Asn	Ala	Leu	Thr	Gln	Gln	Val	Asn	Ser	Ala	Gln	Asn	Val
3250										3255										3260											
Gln	Ala	Val	Asn	Asp	Ile	Lys	Gln	Thr	Thr	Gln	Ser	Leu	Asn	Thr	Ala	Gln	Ala	Val	Asn	Asp	Ile	Lys	Gln	Thr	Thr	Gln	Ser	Leu	Asn	Thr	Ala
3265										3270										3275											
Met	Thr	Gly	Leu	Lys	Arg	Gly	Val	Ala	Asn	His	Asn	Gln	Val	Val	Gln	Met	Thr	Gly	Leu	Lys	Arg	Gly	Val	Ala	Asn	His	Asn	Gln	Val	Val	Gln
3285										3290										3295											
Ser	Asp	Asn	Tyr	Val	Asn	Ala	Asp	Thr	Asn	Lys	Lys	Asn	Asp	Tyr	Asn	Ser	Asp	Asn	Tyr	Val	Asn	Ala	Asp	Thr	Asn	Lys	Lys	Asn	Asp	Tyr	Asn
3300										3305										3310											
Asn	Ala	Tyr	Asn	His	Ala	Asn	Asp	Ile	Ile	Asn	Gly	Asn	Ala	Gln	His	Asn	Ala	Tyr	Asn	His	Ala	Asn	Asp	Ile	Ile	Asn	Gly	Asn	Ala	Gln	His
3315										3320										3325											
Pro	Val	Ile	Thr	Pro	Ser	Asp	Val	Asn	Asn	Ala	Leu	Ser	Asn	Val	Thr	Pro	Val	Ile	Thr	Pro	Ser	Asp	Val	Asn	Asn	Ala	Leu	Ser	Asn	Val	Thr
3330										3335										3340											
Ser	Lys	Glu	His	Ala	Leu	Asn	Gly	Glu	Ala	Lys	Leu	Asn	Ala	Ala	Lys	Ser	Lys	Glu	His	Ala	Leu	Asn	Gly	Glu	Ala	Lys	Leu	Asn	Ala	Ala	Lys
3345										3350										3355											
Gln	Glu	Ala	Asn	Thr	Ala	Leu	Gly	His	Leu	Asn	Asn	Leu	Asn	Val	Gln	Glu	Ala	Asn	Thr	Ala	Leu	Gly	His	Leu	Asn	Asn	Leu	Asn	Val		
3365										3370										3375											
Gln	Arg	Gln	Asn	Leu	Gln	Ser	Gln	Ile	Asn	Gly	Ala	His	Gln	Ile	Asp	Gln	Arg	Gln	Asn	Leu	Gln	Ser	Gln	Ile	Asn	Gly	Ala	His	Gln	Ile	Asp
3380										3385										3390											
Ala	Val	Asn	Thr	Ile	Lys	Gln	Asn	Ala	Thr	Asn	Leu	Asn	Ser	Ala	Met	Ala	Val	Asn	Thr	Ile	Lys	Gln	Asn	Ala	Thr	Asn	Leu	Asn	Ser	Ala	Met
3395										3400										3405											
Gly	Asn	Leu	Arg	Gln	Ala	Val	Ala	Asp	Lys	Asp	Gln	Val	Lys	Arg	Thr	Gly	Asn	Leu	Arg	Gln	Ala	Val	Ala	Asp	Lys	Asp	Gln	Val	Lys	Arg	Thr
3410										3415										3420											
Glu	Asp	Tyr	Ala	Asp	Ala	Asp	Thr	Ala	Lys	Gln	Asn	Ala	Tyr	Asn	Ser	Glu	Asp	Tyr	Ala	Asp	Ala	Asp	Thr	Ala	Lys	Gln	Asn	Ala	Tyr	Asn	Ser
3425										3430										3435											
Ala	Val	Ser	Ser	Ala	Glu	Thr	Ile	Ile	Asn	Gln	Thr	Ala	Asn	Pro	Thr	Ala	Val	Ser	Ser	Ala	Glu	Thr	Ile	Ile	Asn	Gln	Thr	Ala	Asn	Pro	Thr
3445										3450										3455											
Met	Ser	Val	Asp	Asp	Val	Asn	Arg	Ala	Thr	Ser	Ala	Val	Thr	Thr	Asn	Met	Ser	Val	Asp	Asp	Val	Asn	Arg	Ala	Thr	Ser	Ala	Val	Thr	Thr	Asn
3460										3465										3470											
Lys	Asn	Ala	Leu	Asn	Gly	Asp	Glu	Lys	Leu	Val	Gln	Ser	Lys	Thr	Asp	Lys	Asn	Ala	Leu	Asn	Gly	Asp	Glu	Lys	Leu	Val	Gln	Ser	Lys	Thr	Asp
3475										3480										3485											
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3490										3495										3500											
Ala	Asp	Val	Lys	Ser	Lys	Ile	Asn	Ala	Ala	Ser	Asn	Ile	Ala	Gly	Val	Ala	Asp	Val	Lys	Ser	Lys	Ile	Asn	Ala	Ala	Ser	Asn	Ile	Ala	Gly	Val
3505										3510										3515											
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3525										3530										3535											
Leu	Gln	Gly	Ala	Ile	Asn	Asp	Glu	Gln	Thr	Thr	Leu	Asn	Ser	Gln	Asn	Leu	Gln	Gly	Ala	Ile	Asn	Asp	Glu	Gln	Thr	Thr	Leu	Asn	Ser	Gln	Asn
3540										3545										3550											
Tyr	Gln	Asp	Ala	Thr	Pro	Ser	Lys	Lys	Thr	Ala	Tyr	Thr	Asn	Ala	Val	Tyr	Gln	Asp	Ala	Thr	Pro	Ser	Lys	Lys	Thr	Ala	Tyr	Thr	Asn	Ala	Val
3555										3560										3565											
Gln	Ala	Ala	Lys	Asp	Ile	Leu	Asn	Lys	Ser	Asn	Gly	Gln	Asn	Lys	Thr	Gln	Ala	Ala	Lys	Asp	Ile	Leu	Asn	Lys	Ser	Asn	Gly	Gln	Asn	Lys	Thr
3570										3575										3580											

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Lys Asp Gln Val Thr Glu Ala Met Asn Gln Val Asn Ser Ala Lys Asn
3585          3590          3595          3600
Asn Leu Asp Gly Thr Arg Leu Leu Asp Gln Ala Lys Gln Thr Ala Lys
          3605          3610          3615
Gln Gln Leu Asn Asn Met Thr His Leu Thr Thr Ala Gln Lys Thr Asn
          3620          3625          3630
Leu Thr Asn Gln Ile Asn Ser Gly Thr Thr Val Ala Gly Val His Thr
          3635          3640          3645
Val Gln Ser Asn Ala Asn Thr Leu Asp Gln Ala Met Asn Thr Leu Arg
          3650          3655          3660
Gln Ser Ile Ala Asn Asn Asp Ala Thr Lys Ala Ser Glu Asp Tyr Val
3665          3670          3675          3680
Asp Ala Asn Asn Asp Lys Gln Thr Ala Tyr Asn Asn Ala Val Ala Ala
          3685          3690          3695
Ala Glu Thr Ile Ile Asn Ala Asn Ser Asn Pro Glu Met Asn Pro Ser
          3700          3705          3710
Thr Ile Thr Gln Lys Ala Glu Gln Val Asn Ser Ser Lys Thr Ala Leu
          3715          3720          3725
Asn Gly Asp Glu Asn Leu Ala Thr Ala Lys Gln Asn Ala Lys Thr Tyr
          3730          3735          3740
Leu Asn Thr Leu Thr Ser Ile Thr Asp Ala Gln Lys Asn Asn Leu Ile
3745          3750          3755          3760
Ser Gln Ile Ser Ser Ala Thr Arg Val Ser Gly Val Asp Thr Val Lys
          3765          3770          3775
Gln Asn Ala Gln His Leu Asp Gln Ala Met Ala Asn Leu Gln Asn Gly
          3780          3785          3790
Ile Asn Asn Glu Ser Gln Val Lys Ser Ser Glu Lys Tyr Arg Asp Ala
          3795          3800          3805
Asp Thr Asn Lys Gln Gln Glu Tyr Asp Asn Ala Ile Thr Ala Ala Lys
          3810          3815          3820
Ala Ile Leu Asn Lys Ser Thr Gly Pro Asn Thr Ala Gln Asn Ala Val
3825          3830          3835          3840
Glu Ala Ala Leu Gln Arg Val Asn Thr Ala Lys Asp Ala Leu Asn Gly
          3845          3850          3855
Asp Ala Lys Leu Ile Ala Ala Gln Asn Ala Ala Lys Gln His Leu Gly
          3860          3865          3870
Thr Leu Thr His Ile Thr Thr Ala Gln Arg Asn Asp Leu Thr Asn Gln
          3875          3880          3885
Ile Ser
          3890

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<210> 13
 <211> 6713
 <212> PRT
 <213> 葡萄球菌

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Ser Gln Asn Phe Leu Asp Ala Asp Glu Gln Lys Arg Asn Ala Tyr Asn
          20      25      30
Gln Ala Ile Ser Ala Ala Glu Thr Ile Leu Asn Lys Gln Thr Gly Pro
          35      40      45
Asn Thr Ala Lys Thr Ala Val Glu Gln Ala Leu Asn Asn Val Asn Ser
          50      55      60
Ala Lys His Ala Leu Asn Gly Thr Gln Asn Leu Asn Asn Ala Lys Gln
65      70      75      80
Ala Ala Ile Thr Ala Ile Asn Gly Ala Ser Asp Leu Asn Gln Lys Gln
          85      90      95
Lys Asp Ala Leu Lys Ala Gln Ala Asn Gly Ala Gln Arg Val Ser Asn
          100     105     110
Ala Asn Asp Val Gln Arg Asn Ala Thr Glu Leu Asn Thr Ala Met Gly
          115     120     125
Gln Leu Gln His Ala Ile Ala Asp Lys Thr Asn Thr Leu Ala Ser Ser
          130     135     140
Lys Tyr Val Asn Ala Asp Ser Thr Lys Gln Asn Ala Tyr Thr Thr Lys
145     150     155     160
Val Thr Asn Ala Glu His Ile Ile Ser Gly Thr Pro Thr Val Val Thr
          165     170     175
Thr Pro Ser Glu Val Thr Ala Ala Ala Asn Gln Val Asn Ser Ala Lys
          180     185     190
Gln Glu Leu Asn Gly Asp Glu Arg Leu Arg Val Ala Lys Gln Asn Ala
          195     200     205
Asn Thr Ala Ile Asp Ala Leu Thr Gln Leu Asn Thr Pro Gln Lys Ala

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210	215	220
Lys Leu Lys Glu Gln Val Gly Gln Ala Asn Arg Leu Glu Asp Val Gln		
225	230	235
Ser Val Gln Thr Asn Gly Gln Ser Leu Asn Asn Ala Met Lys Gly Leu		
245	250	255
Arg Asp Ser Ile Ala Asn Glu Thr Thr Val Lys Ala Ser Gln Asn Tyr		
260	265	270
Thr Asp Ala Ser Pro Asn Asn Gln Ser Thr Tyr Asn Ser Ala Val Ser		
275	280	285
Asn Ala Lys Gly Ile Ile Asn Gln Thr Asn Asn Pro Thr Met Asp Thr		
290	295	300
Ser Ala Ile Thr Gln Ala Thr Thr Gln Val Asn Asn Ala Lys Asn Gly		
305	310	315
Leu Asn Gly Ala Glu Asn Leu Arg Asn Ala Gln Asn Thr Ala Lys Gln		
325	330	335
Asn Leu Asn Thr Leu Ser His Leu Thr Asn Asn Gln Lys Ser Ala Ile		
340	345	350
Ser Ser Gln Ile Asp Arg Ala Gly His Val Ser Glu Val Thr Ala Ala		
355	360	365
Lys Asn Ala Ala Thr Glu Leu Asn Ala Gln Met Gly Asn Leu Glu Gln		
370	375	380
Ala Ile His Asp Gln Asn Thr Val Lys Gln Gly Val Asn Phe Thr Asp		
385	390	395
Ala Asp Lys Ala Lys Arg Asp Ala Tyr Thr Asn Ala Val Ser Arg Ala		
405	410	415
Glu Thr Ile Leu Asn Lys Thr Gln Gly Ala Asn Thr Ser Lys Gln Asp		
420	425	430
Val Glu Ala Ala Ile Gln Asn Val Thr Ser Ala Lys Asn Ala Leu Asn		
435	440	445
Gly Asp Gln Asn Val Thr Asn Ala Lys Asn Ala Ala Lys Asn Ala Leu		
450	455	460
Asn Asn Leu Thr Ser Ile Asn Asn Ala Gln Lys Arg Asp Leu Thr Thr		
465	470	475
Lys Ile Asp Gln Ala Thr Thr Val Ala Gly Val Glu Ala Val Ser Asn		
485	490	495
Thr Gly Thr Gln Leu Asn Thr Ala Met Ala Asn Leu Gln Asn Gly Ile		
500	505	510
Asn Asp Lys Ala Asn Thr Leu Ala Ser Glu Asn Tyr His Asp Ala Asp		
515	520	525
Ser Asp Lys Lys Thr Ala Tyr Thr Gln Ala Val Thr Asn Ala Glu Asn		
530	535	540
Ile Leu Asn Lys Asn Ser Gly Ser Asn Leu Asp Lys Ala Ala Val Glu		
545	550	555
Asn Ala Leu Ser Gln Val Thr Asn Ala Lys Gly Ala Leu Asn Gly Asn		
565	570	575
His Asn Leu Glu Gln Ala Lys Ser Asn Ala Asn Thr Thr Ile Asn Gly		
580	585	590
Leu Gln His Leu Thr Thr Ala Gln Lys Asp Lys Leu Lys Gln Gln Val		
595	600	605
Gln Gln Ala Gln Asn Val Ala Gly Val Asp Thr Val Lys Ser Ser Ala		
610	615	620
Asn Thr Leu Asn Gly Ala Met Gly Thr Leu Arg Asn Ser Ile Gln Asp		
625	630	635
Asn Thr Ala Thr Lys Asn Gly Gln Asn Tyr Leu Asp Ala Thr Glu Arg		
645	650	655
Asn Lys Thr Asn Tyr Asn Asn Ala Val Asp Ser Ala Asn Gly Val Ile		
660	665	670
Asn Ala Thr Ser Asn Pro Asn Met Asp Ala Asn Ala Ile Asn Gln Ile		
675	680	685
Ala Thr Gln Val Thr Ser Thr Lys Asn Ala Leu Asp Gly Thr His Asn		
690	695	700
Leu Thr Gln Ala Lys Gln Thr Thr Ala Thr Asn Ala Ile Asp Gly Ala Thr		
705	710	715
Asn Leu Asn Lys Ala Gln Lys Asp Ala Leu Lys Ala Gln Val Thr Ser		
725	730	735
Ala Gln Arg Val Ala Asn Val Thr Ser Ile Gln Gln Thr Ala Asn Glu		
740	745	750
Leu Asn Thr Ala Met Gly Gln Leu Gln His Gly Ile Asp Asp Glu Asn		
755	760	765
Ala Thr Lys Gln Thr Gln Lys Tyr Arg Asp Ala Glu Gln Ser Lys Lys		
770	775	780
Thr Ala Tyr Asp Gln Ala Val Ala Ala Ala Lys Ala Ile Leu Asn Lys		
785	790	795
Gln Thr Gly Ser Asn Ser Asp Lys Ala Ala Val Asp Arg Ala Leu Gln		
805	810	815

Gln	Val	Thr	Ser	Thr	Lys	Asp	Ala	Leu	Asn	Gly	Asp	Ala	Lys	Leu	Ala
			820					825					830		
Glu	Ala	Lys	Ala	Ala	Ala	Arg	Gln	Asn	Leu	Gly	Thr	Leu	Asn	His	Ile
		835					840					845			
Thr	Asn	Ala	Gln	Arg	Thr	Ala	Leu	Glu	Gly	Gln	Ile	Asn	Gln	Ala	Thr
	850					855					860				
Thr	Val	Asp	Gly	Val	Asn	Thr	Val	Lys	Thr	Asn	Ala	Asn	Thr	Leu	Asp
865					870					875					880
Gly	Ala	Met	Asn	Ser	Leu	Gln	Gly	Ala	Ile	Asn	Asp	Lys	Asp	Ala	Thr
			885						890					895	
Leu	Arg	Asn	Gln	Asn	Tyr	Leu	Asp	Ala	Asp	Glu	Ser	Lys	Arg	Asn	Ala
			900					905					910		
Tyr	Thr	Gln	Ala	Val	Thr	Ala	Ala	Glu	Gly	Ile	Leu	Asn	Lys	Gln	Thr
		915					920					925			
Gly	Gly	Asn	Thr	Ser	Lys	Ala	Asp	Val	Asp	Asn	Ala	Leu	Asn	Ala	Val
	930					935					940				
Thr	Arg	Ala	Lys	Ala	Ala	Leu	Asn	Gly	Ala	Glu	Asn	Leu	Arg	Asn	Ala
945				950						955					960
Lys	Thr	Ser	Ala	Thr	Asn	Thr	Ile	Asn	Gly	Leu	Pro	Asn	Leu	Thr	Gln
			965						970					975	
Leu	Gln	Lys	Asp	Asn	Leu	Lys	His	Gln	Val	Glu	Gln	Ala	Gln	Asn	Val
			980					985					990		
Val	Gly	Val	Asn	Gly	Val	Lys	Asp	Lys	Gly	Asn	Thr	Leu	Asn	Thr	Ala
	995						1000					1005			
Met	Gly	Ala	Leu	Arg	Thr	Ser	Ile	Gln	Asn	Asp	Asn	Thr	Thr	Lys	Thr
	1010					1015						1020			
Ser	Gln	Asn	Tyr	Leu	Asp	Ala	Ser	Asp	Ser	Asn	Lys	Asn	Asn	Tyr	Asn
1025				1030						1035					1040
Thr	Ala	Val	Asn	Asn	Ala	Asn	Gly	Val	Ile	Asn	Ala	Thr	Asn	Asn	Pro
			1045						1050						1055
Asn	Met	Asp	Ala	Asn	Ala	Ile	Asn	Asp	Met	Ala	Asn	Gln	Val	Asn	Thr
			1060					1065					1070		
Thr	Lys	Ala	Ala	Leu	Asn	Gly	Ala	Gln	Asn	Leu	Ala	Gln	Ala	Lys	Thr
	1075					1080						1085			
Asn	Ala	Thr	Asn	Thr	Ile	Asn	Asn	Ala	Gln	Asp	Leu	Asn	Gln	Lys	Gln
	1090					1095					1100				
Lys	Asp	Ala	Leu	Lys	Thr	Gln	Val	Asn	Asn	Ala	Gln	Arg	Val	Ser	Asp
1105					1110					1115					1120
Ala	Asn	Asn	Val	Gln	His	Thr	Ala	Thr	Glu	Leu	Asn	Gly	Ala	Met	Thr
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Ala	Leu	Lys	Ala	Ala	Ile	Ala	Asp	Lys	Glu	Arg	Thr	Lys	Ala	Ser	Gly
		1140						1145					1150		
Asn	Tyr	Val	Asn	Ala	Asp	Gln	Glu	Lys	Arg	Gln	Ala	Tyr	Asp	Ser	Lys
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Val	Thr	Asn	Ala	Glu	Asn	Ile	Ile	Asn	Gly	Thr	Pro	Asn	Ala	Thr	Leu
	1170					1175					1180				
Thr	Val	Asn	Asp	Val	Asn	Ser	Ala	Ala	Ser	Gln	Val	Asn	Ala	Ala	Lys
1185					1190					1195					1200
Thr	Ala	Leu	Asn	Gly	Asp	Asn	Asn	Leu	Arg	Val	Ala	Lys	Glu	His	Ala
			1205					1210					1215		
Asn	Asn	Thr	Ile	Asp	Gly	Leu	Ala	Gln	Leu	Asn	Asn	Val	Gln	Lys	Ala
			1220					1225					1230		
Lys	Leu	Lys	Glu	Gln	Val	Gln	Ser	Ala	Thr	Thr	Leu	Asp	Gly	Val	Gln
	1235						1240					1245			
Thr	Val	Lys	Asn	Ser	Ser	Gln	Thr	Leu	Asn	Thr	Ala	Met	Lys	Gly	Leu
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Arg	Asp	Ser	Ile	Ala	Asn	Glu	Ala	Thr	Ile	Lys	Ala	Gly	Gln	Asn	Tyr
1265					1270					1275					1280
Thr	Asp	Ala	Ser	Pro	Asn	Asn	Arg	Asn	Glu	Tyr	Asp	Ser	Ala	Val	Thr
			1285						1290					1295	
Ala	Ala	Lys	Ala	Ile	Ile	Asn	Gln	Thr	Ser	Asn	Pro	Thr	Met	Glu	Pro
		1300						1305					1310		
Asn	Thr	Ile	Thr	Gln	Ala	Thr	Ser	Gln	Val	Thr	Thr	Lys	Glu	His	Ala
	1315					1320						1325			
Leu	Asn	Gly	Ala	Gln	Asn	Leu	Ala	Gln	Ala	Lys	Thr	Thr	Ala	Lys	Asn
	1330					1335					1340				
Asn	Leu	Asn	Asn	Leu	Thr	Ser	Ile	Asn	Asn	Ala	Gln	Lys	Asp	Ala	Leu
1345					1350					1355					1360
Thr	Arg	Asn	Ile	Asp	Gly	Ala	Thr	Thr	Val	Ala	Gly	Val	Asn	Gln	Glu
			1365					1370						1375	
Thr	Ala	Lys	Ala	Thr	Glu	Leu	Asn	Asn	Ala	Met	His	Ser	Leu	Gln	Asn
		1380						1385					1390		
Gly	Ile	Asn	Asp	Glu	Thr	Gln	Thr	Lys	Gln	Thr	Gln	Lys	Tyr	Leu	Asp
	1395					1400						1405			
Ala	Glu	Pro	Ser	Lys	Lys	Ser	Ala	Tyr	Asp	Gln	Ala	Val	Asn	Ala	Ala

1410	1415	1420
Lys Ala Ile Leu Thr	Lys Ala Ser Gly Gln Asn Val Asp Lys Ala Ala	
1425	1430	1435
Val Glu Gln Ala Leu Gln Asn Val Asn Ser Thr Lys Thr Ala Leu Asn		1440
	1445	1450
Gly Asp Ala Lys Leu Asn Glu Ala Lys Ala Ala Lys Gln Thr Leu		1455
	1460	1465
Gly Thr Leu Thr His Ile Asn Asn Ala Gln Arg Asn Ala Leu Asp Asn		1470
	1475	1480
Glu Ile Thr Gln Ala Thr Asn Val Glu Gly Val Asn Thr Val Lys Ala		1485
	1490	1495
Lys Ala Gln Gln Leu Asp Gly Ala Met Gly Gln Leu Glu Thr Ser Ile		1500
1505	1510	1515
Arg Asp Lys Asp Thr Thr Leu Gln Ser Gln Asn Tyr Gln Asp Ala Asp		1520
	1525	1530
Asp Ala Lys Arg Thr Ala Tyr Ser Gln Ala Val Asn Ala Ala Thr		1535
	1540	1545
Ile Leu Asn Lys Thr Ala Gly Gly Asn Thr Pro Lys Ala Asp Val Glu		1550
	1555	1560
Arg Ala Met Gln Ala Val Thr Gln Ala Asn Thr Ala Leu Asn Gly Ile		1565
	1570	1575
Gln Asn Leu Glu Arg Ala Lys Gln Ala Ala Asn Thr Ala Ile Thr Asn		1580
1585	1590	1595
Ala Ser Asp Leu Asn Thr Lys Gln Lys Glu Ala Leu Lys Ala Gln Val		1600
	1605	1610
Thr Ser Ala Gly Arg Val Ser Ala Ala Asn Gly Val Glu His Thr Ala		1615
	1620	1625
Thr Glu Leu Asn Thr Ala Met Thr Ala Leu Lys Arg Ala Ile Ala Asp		1630
	1635	1640
Lys Ala Asp Thr Lys Ala Ser Gly Asn Tyr Val Asn Ala Asp Ala Asn		1645
	1650	1655
Lys Arg Gln Ala Tyr Asp Glu Lys Val Thr Ala Ala Glu His Ile Val		1660
1665	1670	1675
Ser Gly Thr Pro Thr Pro Thr Leu Thr Pro Ser Asp Val Thr Asn Ala		1680
	1685	1690
Ala Thr Gln Val Thr Asn Ala Lys Thr Gln Leu Asn Gly Asn His Asn		1695
	1700	1705
Leu Glu Val Ala Lys Gln Asn Ala Asn Thr Ala Ile Asp Gly Leu Thr		1710
	1715	1720
Ser Leu Asn Gly Pro Gln Lys Ala Lys Leu Lys Glu Gln Val Gly Gln		1725
1730	1735	1740
Ala Thr Thr Leu Pro Asn Val Gln Thr Val Arg Asp Asn Ala Gln Thr		1745
	1750	1755
Leu Asn Thr Ala Met Lys Gly Leu Arg Asp Ser Ile Ala Asn Glu Ala		1760
	1765	1770
Thr Ile Lys Ala Gly Gln Asn Tyr Thr Asp Ala Ser Gln Asn Lys Gln		1775
	1780	1785
Asn Asp Tyr Asn Asn Ala Val Thr Ala Ala Lys Ala Ile Ile Gly Gln		1790
	1795	1800
Thr Thr Ser Pro Ser Met Ile Ala Gln Glu Ile Asn Gln Ala Lys Asp		1805
1810	1815	1820
Gln Val Thr Ala Lys Gln Gln Ala Leu Asn Gly Gln Glu Asn Leu Arg		1825
	1830	1835
Thr Ala Gln Thr Asn Ala Lys Gln His Leu Asn Gly Leu Ser Asp Leu		1840
	1845	1850
Thr Asn Ala Gln Lys Asp Ala Ala Lys Arg Gln Ile Glu Gly Ala Thr		1855
	1860	1865
His Val Asn Glu Val Thr Gln Ala Gln Asn Asn Ala Asp Ala Leu Asn		1870
	1875	1880
Thr Ala Met Thr Asn Leu Lys Asn Gly Ile Gln Asp Gln Asn Thr Ile		1885
	1890	1895
Lys Gln Gly Val Asn Phe Thr Asp Ala Asp Glu Ala Lys Arg Asn Ala		1900
1905	1910	1915
Tyr Thr Asn Ala Val Thr Gln Ala Glu Gln Ile Leu Asn Lys Ala Gln		1920
	1925	1930
Gly Pro Asn Thr Ala Lys Asp Gly Val Glu Thr Ala Leu Gln Asn Val		1935
	1940	1945
Gln Arg Ala Lys Asn Glu Leu Asn Gly Asn Gln Asn Val Ala Asn Ala		1950
	1955	1960
Lys Thr Thr Ala Lys Asn Ala Leu Asn Asn Leu Thr Ser Ile Asn Asn		1965
1970	1975	1980
Ala Gln Lys Ala Ala Leu Lys Ser Gln Ile Glu Gly Ala Thr Thr Val		
1985	1990	1995
Ala Gly Val Asn Gln Val Ser Thr Met Ala Ser Glu Leu Asn Thr Ala		2000

				2005					2010					2015	
Met	Ser	Asn	Leu	Gln	Arg	Gly	Ile	Asn	Asp	Glu	Ala	Ala	Thr	Lys	Ala
			2020					2025						2030	
Ala	Gln	Lys	Tyr	Thr	Glu	Ala	Asp	Arg	Asp	Lys	Gln	Thr	Ala	Tyr	Asn
		2035					2040						2045		
Asp	Ala	Val	Thr	Ala	Ala	Lys	Thr	Leu	Leu	Asp	Lys	Thr	Ala	Gly	Ser
	2050					2055					2060				
Asn	Asp	Asn	Lys	Val	Ala	Val	Glu	Gln	Ala	Leu	Gln	Arg	Val	Asn	Thr
2065				2070						2075					2080
Ala	Lys	Thr	Ala	Leu	Asn	Gly	Asp	Ala	Arg	Leu	Asn	Glu	Ala	Lys	Asn
			2085						2090					2095	
Thr	Ala	Lys	Gln	Gln	Leu	Ala	Thr	Met	Ser	His	Leu	Thr	Asn	Ala	Gln
		2100						2105					2110		
Lys	Ala	Asn	Leu	Thr	Glu	Gln	Ile	Glu	Arg	Gly	Thr	Thr	Val	Ala	Gly
	2115						2120					2125			
Val	Gln	Gly	Ile	Gln	Ala	Asn	Ala	Gly	Thr	Leu	Asn	Gln	Ala	Met	Asn
2130						2135					2140				
Gln	Leu	Arg	Gln	Ser	Ile	Ala	Ser	Lys	Asp	Ala	Thr	Lys	Ser	Ser	Glu
2145				2150						2155					2160
Asp	Tyr	Gln	Asp	Ala	Asn	Ala	Asp	Leu	Gln	Asn	Ala	Tyr	Asn	Asp	Ala
			2165						2170					2175	
Val	Thr	Asn	Ala	Glu	Gly	Ile	Ile	Ser	Ala	Thr	Asn	Asn	Pro	Glu	Met
		2180						2185					2190		
Asn	Pro	Asp	Thr	Ile	Asn	Gln	Lys	Ala	Ser	Gln	Val	Asn	Ser	Ala	Lys
	2195					2200						2205			
Ser	Ala	Leu	Asn	Gly	Asp	Glu	Lys	Leu	Ala	Ala	Val	Lys	Gln	Thr	Ala
	2210					2215					2220				
Lys	Ser	Asp	Ile	Gly	Arg	Leu	Thr	Asp	Leu	Asn	Asn	Ala	Gln	Arg	Thr
2225				2230						2235					2240
Ala	Ala	Asn	Ala	Glu	Val	Asp	Gln	Ala	Pro	Asn	Leu	Ala	Ala	Val	Thr
			2245						2250					2255	
Ala	Ala	Lys	Asn	Lys	Ala	Thr	Ser	Leu	Asn	Thr	Ala	Met	Gly	Asn	Leu
		2260						2265					2270		
Lys	His	Ala	Leu	Ala	Glu	Lys	Asp	Asn	Thr	Lys	Arg	Ser	Val	Asn	Tyr
	2275						2280					2285			
Thr	Asp	Ala	Asp	Gln	Pro	Lys	Gln	Gln	Ala	Tyr	Asp	Thr	Ala	Val	Thr
	2290					2295					2300				
Gln	Ala	Glu	Ala	Ile	Thr	Asn	Ala	Asn	Gly	Ser	Asn	Ala	Asn	Glu	Thr
2305				2310						2315				2320	
Gln	Val	Gln	Ala	Ala	Leu	Asn	Gln	Leu	Asn	Gln	Ala	Lys	Asn	Asp	Leu
			2325						2330					2335	
Asn	Gly	Asp	Asn	Lys	Val	Ala	Gln	Ala	Lys	Glu	Thr	Ala	Lys	Arg	Ala
			2340						2345				2350		
Leu	Ala	Ser	Tyr	Ser	Asn	Leu	Asn	Asn	Ala	Gln	Ser	Thr	Ala	Ala	Thr
		2355					2360						2365		
Ser	Gln	Ile	Asp	Asn	Ala	Thr	Thr	Val	Ala	Asp	Val	Thr	Ala	Ala	Gln
	2370					2375					2380				
Asn	Thr	Ala	Asn	Glu	Leu	Asn	Thr	Ala	Met	Gly	Gln	Leu	Gln	Asn	Gly
2385				2390						2395					2400
Ile	Asn	Asp	Gln	Asn	Thr	Val	Lys	Gln	Gln	Val	Asn	Phe	Thr	Asp	Ala
		2405							2410					2415	
Asp	Gln	Gly	Lys	Lys	Asp	Ala	Tyr	Thr	Asn	Ala	Val	Thr	Asn	Ala	Gln
		2420						2425					2430		
Gly	Ile	Leu	Asp	Lys	Ala	Asn	Gly	Gln	Asn	Met	Thr	Lys	Ala	Gln	Val
	2435					2440						2445			
Glu	Ala	Ala	Leu	Asn	Gln	Val	Thr	Thr	Ala	Lys	Asn	Ala	Leu	Asn	Gly
	2450					2455					2460				
Asp	Ala	Asn	Val	Arg	Gln	Ala	Lys	Ser	Asp	Ala	Lys	Ala	Asn	Leu	Gly
2465				2470						2475					2480
Thr	Leu	Thr	His	Leu	Asn	Asn	Ala	Gln	Lys	Lys	Asp	Leu	Thr	Ser	Gln
			2485						2490					2495	
Ile	Glu	Gly	Ala	Thr	Thr	Val	Asn	Gly	Val	Asn	Ser	Val	Lys	Thr	Lys
		2500						2505					2510		
Ala	Gln	Asp	Leu	Asp	Gly	Ala	Met	Gln	Arg	Leu	Glu	Ser	Ala	Ile	Ala
	2515						2520						2525		
Asn	Lys	Asp	Gln	Thr	Lys	Ala	Ser	Glu	Asn	Tyr	Ile	Asp	Ala	Asp	Pro
	2530					2535					2540				
Thr	Lys	Lys	Thr	Ala	Phe	Asp	Asn	Ala	Ile	Thr	Gln	Ala	Glu	Ser	Tyr
2545				2550						2555					2560
Leu	Asn	Lys	Asp	His	Gly	Thr	Asn	Lys	Asp	Lys	Gln	Ala	Val	Glu	Gln
			2565						2570					2575	
Ala	Ile	Gln	Ser	Val	Thr	Ser	Thr	Glu	Asn	Ala	Leu	Asn	Gly	Asp	Ala
	2580							2585					2590		
Asn	Leu	Gln	Cys	Ala	Lys	Thr	Glu	Ala	Thr	Gln	Ala	Ile	Asp	Asn	Leu

2595					2600					2605							
Thr	Gln	Leu	Asn	Thr	Pro	Gln	Lys	Thr	Ala	Leu	Lys	Gln	Gln	Val	Asn		
2610					2615					2620							
Ala	Ala	Gln	Arg	Val	Ser	Gly	Val	Thr	Asp	Leu	Lys	Asn	Ser	Ala	Thr		
2625					2630					2635					2640		
Ser	Leu	Asn	Asn	Ala	Met	Asp	Gln	Leu	Lys	Gln	Ala	Ile	Gly	Asp	His		
				2645					2650					2655			
Asp	Thr	Ile	Val	Ala	Gly	Gly	Asn	Tyr	Thr	Asn	Ala	Ser	Pro	Asp	Lys		
			2660					2665					2670				
Gln	Gly	Ala	Tyr	Thr	Asp	Ala	Tyr	Asn	Ala	Lys	Asn	Ile	Val	Asn			
		2675				2680					2685						
Gly	Ser	Pro	Asn	Val	Ile	Thr	Asn	Ala	Ala	Asp	Val	Thr	Ala	Ala	Thr		
	2690					2695					2700						
Gln	Arg	Val	Asn	Asn	Ala	Glu	Thr	Ser	Leu	Asn	Gly	Asp	Thr	Asn	Leu		
2705					2710					2715					2720		
Ala	Thr	Ala	Lys	Gln	Gln	Ala	Lys	Asp	Ala	Leu	Arg	Gln	Met	Thr	His		
				2725					2730					2735			
Leu	Ser	Asp	Ala	Gln	Lys	Gln	Ser	Ile	Thr	Gly	Gln	Ile	Asp	Ser	Ala		
			2740					2745					2750				
Thr	Gln	Val	Thr	Gly	Val	Gln	Ser	Val	Lys	Asp	Asn	Ala	Thr	Asn	Leu		
		2755				2760					2765						
Asp	Asn	Ala	Met	Asn	Gln	Leu	Arg	Asn	Ser	Ile	Ala	Asn	Lys	Asp	Glu		
	2770					2775					2780						
Val	Lys	Ala	Ser	Gln	Pro	Tyr	Val	Asp	Ala	Asp	Thr	Asp	Lys	Gln	Asn		
2785					2790					2795					2800		
Ala	Tyr	Asn	Thr	Ala	Val	Thr	Ser	Ala	Glu	Asn	Ile	Ile	Asn	Ala	Thr		
				2805					2810					2815			
Ser	Gln	Pro	Thr	Leu	Asp	Pro	Ser	Ala	Val	Thr	Gln	Ala	Ala	Asn	Gln		
			2820					2825					2830				
Val	Asn	Thr	Asn	Lys	Thr	Ala	Leu	Asn	Gly	Ala	Gln	Asn	Leu	Ala	Asn		
			2835			2840					2845						
Lys	Lys	Gln	Glu	Thr	Thr	Ala	Asn	Ile	Asn	Arg	Leu	Ser	His	Leu	Asn		
	2850					2855					2860						
Asn	Ala	Gln	Lys	Gln	Asp	Leu	Asn	Thr	Gln	Val	Thr	Asn	Ala	Pro	Asn		
2865					2870					2875					2880		
Ile	Ser	Thr	Val	Asn	Gln	Val	Lys	Thr	Lys	Ala	Glu	Gln	Leu	Asp	Gln		
				2885					2890					2895			
Ala	Met	Glu	Arg	Leu	Ile	Asn	Gly	Ile	Gln	Asp	Lys	Asp	Gln	Val	Lys		
			2900					2905					2910				
Gln	Ser	Val	Asn	Phe	Thr	Asp	Ala	Asp	Pro	Glu	Lys	Gln	Thr	Ala	Tyr		
		2915				2920					2925						
Asn	Asn	Ala	Val	Thr	Ala	Ala	Glu	Asn	Ile	Ile	Asn	Gln	Ala	Asn	Gly		
		2930				2935					2940						
Thr	Asn	Ala	Asn	Gln	Ser	Gln	Val	Glu	Ala	Ala	Leu	Ser	Thr	Val	Thr		
2945					2950					2955					2960		
Thr	Thr	Lys	Gln	Ala	Leu	Asn	Gly	Asp	Arg	Lys	Val	Thr	Asp	Ala	Lys		
			2965						2970				2975				
Asn	Asn	Ala	Asn	Gln	Thr	Leu	Ser	Thr	Leu	Asp	Asn	Leu	Asn	Asn	Ala		
			2980					2985					2990				
Gln	Lys	Gly	Ala	Val	Thr	Gly	Asn	Ile	Asn	Gln	Ala	His	Thr	Val	Ala		
		2995				3000					3005						
Glu	Val	Thr	Gln	Ala	Ile	Gln	Thr	Ala	Gln	Glu	Leu	Asn	Thr	Ala	Met		
	3010					3015					3020						
Gly	Asn	Leu	Lys	Asn	Ser	Leu	Asn	Asp	Lys	Asp	Thr	Thr	Leu	Gly	Ser		
3025					3030					3035				3040			
Gln	Asn	Phe	Ala	Asp	Ala	Asp	Pro	Glu	Lys	Lys	Asn	Ala	Tyr	Asn	Glu		
			3045					3050					3055				
Ala	Val	Arg	Asn	Ala	Glu	Asn	Ile	Leu	Asn	Lys	Ser	Thr	Gly	Thr	Asn		
			3060					3065					3070				
Val	Pro	Lys	Asp	Gln	Val	Glu	Ala	Ala	Met	Asn	Gln	Val	Asn	Thr	Thr		
			3075			3080					3085						
Lys	Ala	Ala	Leu	Asn	Gly	Thr	Gln	Asn	Leu	Glu	Lys	Ala	Lys	Gln	His		
		3090				3095					3100						
Ala	Asn	Thr	Ala	Ile	Asp	Gly	Leu	Ser	His	Leu	Thr	Asn	Ala	Gln	Lys		
3105					3110					3115					3120		
Glu	Ala	Leu	Lys	Gln	Leu	Val	Gln	Gln	Ser	Thr	Thr	Val	Ala	Glu	Ala		
			3125					3130					3135				
Gln	Gly	Asn	Glu	Gln	Lys	Ala	Asn	Asn	Val	Asp	Ala	Ala	Met	Asp	Lys		
			3140			3145					3150						
Leu	Arg	Gln	Ser	Ile	Ala	Asp	Asn	Ala	Thr	Thr	Lys	Gln	Asn	Gln	Asn		
			3155			3160					3165						
Tyr	Thr	Asp	Ala	Ser	Pro	Asn	Lys	Lys	Asp	Ala	Tyr	Asn	Asn	Ala	Val		
	3170					3175					3180						
Thr	Thr	Ala	Gln	Gly	Ile	Ile	Asp	Gln	Thr	Thr	Asn	Pro	Ser	Leu	Asp		
3185					3190					3195					3200		

Pro Thr Val Ile Asn Gln Ala Ala Gly Gln Val Ser Thr Ser Lys Asn
3205 3210 3215
Ala Leu Asn Gly Asn Glu Asn Leu Glu Ala Ala Lys Gln Gln Ala Thr
3220 3225 3230
Gln Ser Leu Gly Ser Leu Asp Asn Leu Asn Asn Ala Gln Lys Gln Ala
3235 3240 3245
Val Thr Asn Gln Ile Asn Gly Ala His Thr Val Asp Glu Ala Asn Gln
3250 3255 3260
Ile Lys Gln Asn Ala Gln Asn Leu Asn Thr Ala Met Gly Asn Leu Lys
3265 3270 3275 3280
Gln Ala Ile Ala Asp Lys Asp Ala Thr Lys Ala Thr Val Asn Phe Thr
3285 3290 3295
Asp Ala Asp Gln Ala Lys Gln Gln Ala Tyr Asn Thr Ala Val Thr Asn
3300 3305 3310
Ala Glu Asn Ile Ile Ser Lys Ala Asn Gly Gly Asn Ala Thr Gln Thr
3315 3320 3325
Glu Val Glu Gln Ala Ile Gln Gln Val Asn Ala Ala Lys Gln Ala Leu
3330 3335 3340
Asn Gly Asn Ala Asn Val Gln His Ala Lys Asp Glu Ala Thr Ala Leu
3345 3350 3355 3360
Ile Asn Asn Ser Asn Asp Leu Asn Gln Ala Gln Lys Asp Ala Leu Lys
3365 3370 3375
Gln Gln Val Gln Asn Ala Thr Thr Val Ala Gly Val Asn Asn Val Lys
3380 3385 3390
Gln Thr Ala Gln Glu Leu Asn Asn Ala Met Thr Gln Leu Lys Gln Gly
3395 3400 3405
Ile Ala Asp Lys Glu Gln Thr Lys Ala Asp Gly Asn Phe Val Asn Ala
3410 3415 3420
Asp Ser Asp Lys Gln Asn Ala Tyr Asn Gln Ala Val Ala Lys Ala Glu
3425 3430 3435 3440
Ala Leu Ile Ser Gly Thr Pro Asp Val Val Val Thr Pro Ser Glu Ile
3445 3450 3455
Thr Ala Ala Leu Asn Lys Val Thr Gln Ala Lys Asn Asp Leu Asn Gly
3460 3465 3470
Asn Thr Asn Leu Ala Thr Ala Lys Gln Asn Val Gln His Ala Ile Asp
3475 3480 3485
Gln Leu Pro Asn Leu Asn Gln Ala Gln Arg Asp Glu Tyr Ser Lys Gln
3490 3495 3500
Ile Thr Gln Ala Thr Leu Val Pro Asn Val Asn Ala Ile Gln Gln Ala
3505 3510 3515 3520
Ala Thr Thr Leu Asn Asp Ala Met Thr Gln Leu Lys Gln Gly Ile Ala
3525 3530 3535
Asn Lys Ala Gln Ile Lys Gly Ser Glu Asn Tyr His Asp Ala Asp Thr
3540 3545 3550
Asp Lys Gln Thr Ala Tyr Asp Asn Ala Val Thr Lys Ala Glu Glu Leu
3555 3560 3565
Leu Lys Gln Thr Thr Asn Pro Thr Met Asp Pro Asn Thr Ile Gln Gln
3570 3575 3580
Ala Leu Thr Lys Val Asn Asp Thr Asn Gln Ala Leu Asn Gly Asn Gln
3585 3590 3595 3600
Lys Leu Ala Asp Ala Lys Gln Asp Ala Lys Thr Thr Leu Gly Thr Leu
3605 3610 3615
Asp His Leu Asn Asp Ala Gln Lys Gln Ala Leu Thr Thr Gln Val Glu
3620 3625 3630
Gln Ala Pro Asp Ile Ala Thr Val Asn Asn Val Lys Gln Asn Ala Gln
3635 3640 3645
Asn Leu Asn Asn Ala Met Thr Asn Leu Asn Asn Ala Leu Gln Asp Lys
3650 3655 3660
Thr Glu Thr Leu Asn Ser Ile Asn Phe Thr Asp Ala Asp Gln Ala Lys
3665 3670 3675 3680
Lys Asp Asp Tyr Thr Asn Ala Val Ser His Ala Glu Gly Ile Leu Ser
3685 3690 3695
Lys Ala Asn Gly Ser Asn Ala Ser Gln Thr Glu Val Glu Gln Ala Met
3700 3705 3710
Gln Arg Val Asn Glu Ala Lys Gln Ala Leu Asn Gly Asn Asp Asn Val
3715 3720 3725
Gln Arg Ala Lys Asp Ala Ala Lys Gln Val Ile Thr Asn Ala Asn Asp
3730 3735 3740
Leu Asn Gln Ala Gln Lys Asp Ala Leu Lys Gln Gln Val Asp Ala Ala
3745 3750 3755 3760
Gln Thr Val Ala Asn Val Asn Thr Ile Lys Gln Thr Ala Gln Asp Leu
3765 3770 3775
Asn Gln Ala Met Thr Gln Leu Lys Gln Gly Ile Ala Asp Lys Asp Gln
3780 3785 3790
Thr Lys Ala Asn Gly Asn Phe Val Asn Ala Asp Thr Asp Lys Gln Asn

3795	3800	3805
Ala Tyr Asn Asn Ala Val	Ala His Ala Glu Gln Ile	Ile Ser Gly Thr
3810	3815	3820
Pro Asn Ala Asn Val Asp	Pro Gln Gln Val Ala	Gln Ala Leu Gln Gln
3825	3830	3835
Val Asn Gln Ala Lys Gly	Asp Leu Asn Gly Asn His	Asn Leu Gln Val
3845	3850	3855
Ala Lys Asp Asn Ala Asn Thr	Ala Ile Asp Gln Leu Pro	Asn Leu Asn
3860	3865	3870
Gln Pro Gln Lys Thr Ala Leu	Lys Asp Gln Val Ser His	Ala Glu Leu
3875	3880	3885
Val Thr Gly Val Asn Ala Ile	Lys Gln Asn Ala Asp	Ala Leu Asn Asn
3890	3895	3900
Ala Met Gly Thr Leu Lys Gln	Gln Ile Gln Ala Asn Ser	Gln Val Pro
3905	3910	3915
Gln Ser Val Asp Phe Thr	Gln Ala Asp Gln Asp Lys	Gln Gln Ala Tyr
3925	3930	3935
Asn Asn Ala Ala Asn Gln Ala	Gln Gln Ile Ala Asn Gly	Thr Pro Thr
3940	3945	3950
Pro Val Leu Ala Pro Asp Thr	Val Thr Lys Ala Val Thr	Thr Met Asn
3955	3960	3965
Gln Ala Lys Asp Ala Leu Asn	Gly Asp Glu Lys Leu Ala	Gln Ala Lys
3970	3975	3980
Gln Asp Ala Leu Ala Asn Leu	Asp Thr Leu Arg Asp Leu	Asn Gln Pro
3985	3990	3995
Gln Arg Asp Ala Leu Arg Asn	Gln Ile Asn Gln Ala Gln	Ala Leu Ala
4005	4010	4015
Thr Val Glu Gln Thr Lys Gln	Asn Ala Gln Asn Val Asn	Thr Ala Met
4020	4025	4030
Gly Asn Leu Lys Gln Gly Ile	Ala Asn Lys Asp Thr Val	Lys Ala Ser
4035	4040	4045
Glu Asn Tyr His Asp Ala Asp	Val Asp Lys Gln Thr Ala	Tyr Thr Asn
4050	4055	4060
Ala Val Ser Gln Ala Glu Gly	Ile Ile Asn Gln Thr Thr	Asn Pro Thr
4065	4070	4075
Leu Asn Pro Asp Asp Ile Thr	Arg Ala Leu Thr Gln Val	Thr Asp Ala
4085	4090	4095
Lys Asn Ser Leu Asn Gly Glu	Ala Lys Leu Ala Thr Glu	Lys Gln Asn
4100	4105	4110
Ala Lys Asp Ala Val Ser Gly	Met Thr His Leu Asn Asp	Ala Gln Lys
4115	4120	4125
Gln Ala Leu Lys Gly Gln Ile	Asp Gln Ser Pro Glu Ile	Ala Thr Val
4130	4135	4140
Asn Gln Val Lys Gln Thr Ala	Thr Ser Leu Asp Gln Ala	Met Asp Gln
4145	4150	4155
Leu Ser Gln Ala Ile Asn Asp	Lys Asp Gln Ile Leu Ala	Asp Gly Asn
4165	4170	4175
Tyr Leu Asn Ala Asp Pro Asp	Lys Gln Asn Ala Tyr Lys	Gln Ala Val
4180	4185	4190
Ala Lys Ala Glu Ala Leu Leu	Asn Lys Gln Ser Gly Thr	Asn Glu Val
4195	4200	4205
Gln Ala Gln Val Glu Ser Ile	Thr Asn Glu Val Asn Ala	Ala Lys Gln
4210	4215	4220
Ala Leu Asn Gly Asn Asp Asn	Leu Ala Asn Ala Lys Gln	Gln Ala Lys
4225	4230	4235
Gln Gln Leu Ala Asn Leu Thr	His Leu Asn Asp Ala Gln	Lys Gln Ser
4245	4250	4255
Phe Glu Ser Gln Ile Thr Gln	Ala Pro Leu Val Thr Asp	Val Thr Thr
4260	4265	4270
Ile Asn Gln Lys Ala Gln Thr	Leu Asp His Ala Met Glu	Leu Leu Arg
4275	4280	4285
Asn Ser Val Ala Asp Asn Gln	Thr Thr Leu Ala Ser Glu	Asp Tyr His
4290	4295	4300
Asp Ala Thr Ala Gln Arg Gln	Asn Asp Tyr Asn Lys Ala	Val Thr Ala
4305	4310	4315
Ala Asn Asn Ile Ile Asn Gln	Thr Thr Ser Pro Thr Met	Asn Pro Asp
4325	4330	4335
Asp Val Asn Gly Ala Thr Thr	Gln Val Asn Asn Thr Lys	Val Ala Leu
4340	4345	4350
Asp Gly Asp Glu Asn Leu Ala	Ala Ala Lys Gln Gln Ala	Asn Asn Arg
4355	4360	4365
Leu Asp Gln Leu Asp His Leu	Asn Asn Ala Gln Lys Gln	Gln Leu Gln
4370	4375	4380
Ser Gln Ile Thr Gln Ser Ser	Asp Ile Ala Ala Val Asn	Gly His Lys
4385	4390	4395
		4400

Gln Thr Ala Glu Ser Leu Asn Thr Ala Met Gly Asn Leu Ile Asn Ala
 4405 4410 4415
 Ile Ala Asp His Gln Ala Val Glu Gln Arg Gly Asn Phe Ile Asn Ala
 4420 4425 4430
 Asp Thr Asp Lys Gln Thr Ala Tyr Asn Thr Ala Val Asn Glu Ala Ala
 4435 4440 4445
 Ala Met Ile Asn Lys Gln Thr Gly Gln Asn Ala Asn Gln Thr Glu Val
 4450 4455 4460
 Glu Gln Ala Ile Thr Lys Val Gln Thr Thr Leu Gln Ala Leu Asn Gly
 4465 4470 4475 4480
 Asp His Asn Leu Gln Val Ala Lys Thr Asn Ala Thr Gln Ala Ile Asp
 4485 4490 4495
 Val Leu Thr Ser Leu Asn Asp Pro Gln Lys Thr Ala Leu Lys Asp Gln
 4500 4505 4510
 Val Thr Ala Ala Thr Leu Val Thr Ala Val His Gln Ile Glu Gln Asn
 4515 4520 4525
 Ala Asn Thr Leu Asn Gln Ala Met His Gly Leu Arg Gln Ser Ile Gln
 4530 4535 4540
 Asp Asn Ala Ala Thr Lys Ala Asn Ser Lys Tyr Ile Asn Glu Asp Gln
 4545 4550 4555 4560
 Pro Glu Gln Gln Asn Tyr Asp Gln Ala Val Gln Ala Ala Asn Asn Ile
 4565 4570 4575
 Ile Asn Glu Gln Thr Ala Thr Leu Asp Asn Asn Ala Ile Asn Gln Val
 4580 4585 4590
 Ala Ala Thr Val Asn Thr Thr Lys Ala Ala Leu His Gly Asp Val Lys
 4595 4600 4605
 Leu Gln Asn Asp Lys Asp His Ala Lys Gln Thr Val Ser Gln Leu Ala
 4610 4615 4620
 His Leu Asn Asn Ala Gln Lys His Met Glu Asp Thr Leu Ile Asp Ser
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 Glu Thr Thr Arg Thr Ala Val Lys Gln Asp Leu Thr Glu Val Gln Ala
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 Leu Asp Gln Leu Met Asp Ala Leu Gln Gln Ser Ile Ala Asp Lys Asp
 4660 4665 4670
 Ala Thr Arg Ala Ser Ser Ala Tyr Val Asn Ala Glu Pro Asn Lys Lys
 4675 4680 4685
 Gln Ala Tyr Asp Glu Ala Val Gln Asn Ala Glu Ser Ile Ile Ala Gly
 4690 4695 4700
 Leu Asn Asn Pro Thr Ile Asn Lys Gly Asn Val Ser Ser Ala Thr Gln
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 Ala Val Ile Ser Ser Lys Asn Ala Leu Asp Gly Val Glu Arg Leu Ala
 4725 4730 4735
 Gln Asp Lys Gln Thr Ala Gly Asn Ser Leu Asn His Leu Asp Gln Leu
 4740 4745 4750
 Thr Pro Ala Gln Gln Gln Ala Leu Glu Asn Gln Ile Asn Asn Ala Thr
 4755 4760 4765
 Thr Cys Asp Lys Val Ala Glu Ile Ile Ala Gln Ala Gln Ala Leu Asn
 4770 4775 4780
 Glu Ala Met Lys Ala Leu Lys Glu Ser Ile Lys Asp Gln Pro Gln Thr
 4785 4790 4795 4800
 Glu Ala Ser Ser Lys Phe Ile Asn Glu Asp Gln Ala Gln Lys Asp Ala
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 Tyr Thr Gln Ala Val Gln His Ala Lys Asp Leu Ile Asn Lys Thr Thr
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 Asp Pro Thr Leu Ala Lys Ser Ile Ile Asp Gln Ala Thr Gln Ala Val
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 Thr Asp Ala Lys Asn Asn Leu His Gly Asp Gln Lys Leu Ala Gln Asp
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 Lys Gln Arg Ala Thr Glu Thr Leu Asn Asn Leu Ser Asn Leu Asn Thr
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 Pro Gln Arg Gln Ala Leu Glu Asn Gln Ile Asn Asn Ala Ala Thr Arg
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 Gly Glu Val Ala Gln Lys Leu Thr Glu Ala Gln Ala Leu Asn Gln Ala
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 Met Glu Ala Leu Arg Asn Ser Ile Gln Asp Gln Gln Gln Thr Glu Ser
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 Gly Ser Lys Phe Ile Asn Glu Asp Lys Pro Gln Lys Asp Ala Tyr Gln
 4930 4935 4940
 Ala Ala Val Gln Asn Ala Lys Asp Leu Ile Asn Gln Thr Gly Asn Pro
 4945 4950 4955 4960
 Thr Leu Asp Lys Ala Gln Val Glu Gln Leu Thr His Ala Phe Lys Gln
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 Ala Lys Asp Asn Leu His Gly Asp Gln Lys Leu Ala Asp Asp Lys Gln
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 His Ala Val Thr Asp Leu Asn Gln Leu Asn Gly Leu Asn Asn Pro Gln

Arg	Gln	Ala	Leu	Glu	Ser	Gln	Ile	Asn	Asn	Ala	Ala	Thr	Arg	Gly	Glu
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Val	Ala	Gln	Lys	Leu	Ala	Glu	Ala	Lys	Ala	Leu	Asp	Gln	Ala	Met	Gln
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Ala	Leu	Arg	Asn	Ser	Ile	Gln	Asp	Gln	Gln	Gln	Thr	Glu	Ala	Gly	Ser
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Lys	Phe	Ile	Asn	Glu	Asp	Lys	Pro	Gln	Lys	Asp	Ala	Tyr	Gln	Ala	Ala
			5060					5065					5070		
Val	Gln	Asn	Ala	Lys	Asp	Leu	Ile	Asn	Gln	Thr	Gly	Asn	Pro	Thr	Leu
			5075				5080					5085			
Asp	Lys	Ser	Gln	Val	Glu	Gln	Leu	Thr	Gln	Ala	Val	Thr	Thr	Ala	Lys
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Asp	Asn	Leu	His	Gly	Asp	Gln	Lys	Leu	Ala	Arg	Asp	Gln	Gln	Gln	Ala
5105				5110						5115					5120
Val	Thr	Thr	Val	Asn	Ala	Leu	Pro	Asn	Leu	Asn	His	Ala	Gln	Gln	Gln
			5125						5130					5135	
Thr	Leu	Thr	Asp	Ala	Ile	Asn	Ala	Ala	Pro	Thr	Arg	Thr	Glu	Val	Ala
			5140					5145					5150		
Gln	His	Val	Gln	Thr	Ala	Thr	Glu	Leu	Asp	His	Ala	Met	Glu	Thr	Leu
			5155				5160					5165			
Lys	Asn	Lys	Val	Asp	Gln	Val	Asn	Thr	Asp	Lys	Ala	Gln	Pro	Asn	Tyr
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Thr	Glu	Ala	Ser	Thr	Asp	Lys	Lys	Glu	Ala	Val	Asp	Gln	Ala	Leu	Gln
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Ala	Ala	Gln	Ser	Ile	Thr	Asp	Pro	Thr	Asn	Gly	Ser	Asn	Ala	Asn	Lys
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Leu	Asn	Gly	Asn	Glu	Arg	Val	Ala	Glu	Ala	Lys	Thr	Gln	Ala	Lys	Gln
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Lys	Gln	Asn	Ile	Asp	Gln	Ala	Thr	Lys	Leu	Gln	Pro	Ile	Ala	Glu	Leu
5265				5270						5275					5280
Val	Asp	Gln	Ala	Thr	Gln	Leu	Asn	Gln	Ser	Met	Asp	Gln	Leu	Gln	Gln
			5285						5290					5295	
Ala	Val	Asn	Glu	His	Ala	Asn	Val	Glu	Gln	Thr	Ile	Asp	Tyr	Thr	Gln
			5300					5305					5310		
Ala	Asp	Ser	Asp	Lys	Gln	Lys	Ala	Tyr	Lys	Gln	Ala	Ile	Ala	Asp	Ala
			5315					5320					5325		
Glu	Asn	Val	Leu	Lys	Gln	Asn	Ala	Asn	Lys	Gln	Gln	Val	Asp	Gln	Ala
			5330			5335					5340				
Leu	Gln	Asn	Ile	Leu	Asn	Ala	Lys	Gln	Ala	Leu	Asn	Gly	Asp	Glu	Arg
5345				5350						5355					5360
Val	Ala	Leu	Ala	Lys	Thr	Asn	Gly	Lys	His	Asp	Ile	Asp	Gln	Leu	Asn
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Ala	Leu	Asn	Asn	Ala	Gln	Gln	Asp	Gly	Phe	Lys	Gly	Arg	Ile	Asp	Gln
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Ser	Asn	Asp	Leu	Asn	Gln	Ile	Gln	Gln	Ile	Val	Asp	Glu	Ala	Lys	Ala
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Leu	Asn	Arg	Ala	Met	Asp	Gln	Leu	Ser	Gln	Glu	Ile	Thr	Gly	Asn	Glu
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Gly	Arg	Thr	Lys	Gly	Ser	Thr	Asn	Tyr	Val	Asn	Ala	Asp	Thr	Gln	Val
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Lys	Gln	Val	Tyr	Asp	Glu	Ala	Val	Asp	Lys	Ala	Lys	Gln	Ala	Leu	Asp
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Lys	Ser	Ser	Gly	Gln	Asn	Leu	Thr	Ala	Glu	Gln	Val	Ile	Lys	Leu	Asn
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Asp	Ala	Val	Thr	Ala	Ala	Lys	Lys	Ala	Leu	Asn	Gly	Glu	Glu	Arg	Leu
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Val	Gln	Gly	Asn	Ala	Ile	Ala	Lys	Ala	Glu	Ala	Glu	Gln	Leu	Lys	Gln
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 Asn Ala Lys Asp Lys Ala Asn Ala Phe Val Asn Ser Leu Asn Gly Leu
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 Asn Gln Gln Gln Asp Leu Ala His Lys Ala Ile Asn Asn Ala Asp
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 Thr Val Ser Asp Val Thr Asp Ile Val Asn Asn Gln Ile Asp Leu Asn
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 Asp Ala Met Glu Thr Leu Lys His Leu Val Asp Asn Glu Ile Pro Asn
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 Ala Glu Gln Thr Val Asn Tyr Gln Asn Ala Asp Asp Asn Ala Lys Thr
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 Asn Phe Asp Asp Ala Lys Arg Leu Ala Asn Thr Leu Leu Asn Ser Asp
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 Asn Thr Asn Val Asn Asp Ile Asn Gly Ala Ile Gln Ala Val Asn Asp
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 Lys Ala Ile Gln Ser Ile Asn Gln Ala Leu Ala Asn Lys Leu Lys Glu
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 Ile Glu Ala Ser Asn Ala Thr Asp Gln Asp Lys Leu Ile Ala Lys Asn
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 Lys Ala Glu Glu Leu Ala Asn Ser Ile Ile Asn Asn Ile Asn Lys Ala
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 Thr Ser Asn Gln Ala Val Ser Gln Val Gln Thr Ala Gly Asn His Ala
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 Ile Glu Gln Val His Ala Asn Glu Ile Pro Lys Ala Lys Ile Asp Ala
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 Asn Lys Asp Val Asp Lys Gln Val Gln Ala Leu Ile Asp Glu Ile Asp
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 Thr Lys Glu Glu Ile Glu Gln Ala Lys Ala Gln Leu Ala Gln Ala Leu
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 Gln Asp Ile Lys Asp Leu Val Lys Ala Lys Glu Asp Ala Lys Gln Asp
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 Val Asp Lys Gln Val Gln Ala Leu Ile Asp Glu Ile Asp Gln Asn Pro
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 Gln Val Gln Ala Leu Ile Asp Glu Ile Asp Gln Asn Pro Asn Leu Thr
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 Asp Lys Glu Lys Gln Ala Leu Lys Asp Arg Ile Asn Gln Ile Leu Gln
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 Gln Ala Lys Ala Gln Leu Ala Gln Ala Leu Gln Asp Ile Lys Asp Leu
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 Asn Leu Gly Leu Asp Asp Ile Arg Asn Thr His Val Trp Glu Val Asp
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 Glu Gln Pro Ala Val Asn Glu Ile Phe Glu Ala Thr Pro Glu Gln Ile
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 Leu Val Asn Gly Glu Leu Ile Val His Arg Asp Asp Ile Ile Thr Glu
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 Gln Asp Ile Leu Ala His Ile Asn Leu Ile Asp Gln Leu Ser Ala Glu
 6165 6170 6175
 Val Ile Asp Thr Pro Ser Thr Ala Thr Ile Ser Asp Ser Leu Thr Ala
 6180 6185 6190

Lys Val Glu Val Thr Leu Leu Asp Gly Ser Lys Val Ile Val Asn Val
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 Pro Val Lys Val Val Glu Lys Glu Leu Ser Val Val Lys Gln Gln Ala
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 Val Asn Lys Leu Lys Gln Gln Ala Ile Asp His Val Asn Asn Ala Pro
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 Lys Ala Arg Thr Asp Leu Thr Asp Lys Glu Lys Gln Glu Ala Ile Ala
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 Lys Leu Asn Gln Leu Lys Glu Gln Ala Ile Gln Ala Ile Gln Arg Ala
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 Gln Ser Ile Ser Glu Ile Thr Glu Gln Leu Glu Gln Phe Lys Ala Gln
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 Met Lys Ala Ala Asn Pro Thr Ala Lys Glu Leu Ala Lys Arg Lys Gln
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 Glu Ala Ile Ser Arg Ile Lys Asp Phe Ser Asn Glu Lys Ile Asn Ser
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 Arg Ile Ser Ala Val Gln Ile Val Ile Ser Asp Arg Ala Lys Gln Ser
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 Thr Ala Asn His Pro Phe Asn Ser Ser Thr Ile Gly His Lys Lys Lys
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 Lys Lys Lys Ser Lys Lys Asn Lys Lys
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 <213> 葡萄球菌

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Asn	Thr	Asn	His	Ala	Ser	Ala	Asp	Glu	Leu	Asn	Gln	Asn	Gln	Lys	Leu
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Ile	Lys	Gln	Leu	Asn	Gln	Thr	Asp	Asp	Asp	Asp	Ser	Asn	Thr	His	Ser
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Gln	Glu	Ile	Glu	Asn	Asn	Lys	Gln	Asn	Ser	Ser	Gly	Gln	Thr	Glu	Ser
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Leu	Arg	Ser	Ser	Thr	Ser	Gln	Asn	Gln	Ala	Asn	Ala	Arg	Leu	Ser	Asp
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Gln	Phe	Lys	Asp	Thr	Asn	Glu	Thr	Ser	Gln	Gln	Leu	Pro	Thr	Asn	Val
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Ser	Asp	Asp	Ser	Ile	Asn	Gln	Ser	His	Ser	Glu	Ala	Asn	Met	Asn	Asn
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Glu	Pro	Leu	Lys	Val	Asp	Asn	Ser	Thr	Met	Gln	Ala	His	Ser	Lys	Ile
	130					135					140				
Val	Ser	Asp	Ser	Asp	Gly	Asn	Ala	Ser	Glu	Asn	Lys	His	His	Lys	Leu
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Thr	Glu	Asn	Val	Leu	Ala	Glu	Ser	Arg	Ala	Ser	Lys	Asn	Asp	Lys	Glu
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Lys	Glu	Asn	Leu	Gln	Glu	Lys	Asp	Lys	Ser	Gln	Gln	Val	His	Pro	Pro
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Leu	Asp	Lys	Asn	Ala	Leu	Gln	Ala	Phe	Phe	Asp	Ala	Ser	Tyr	His	Asn
		195					200					205			
Tyr	Arg	Met	Ile	Asp	Arg	Asp	Arg	Ala	Asp	Ala	Thr	Glu	Tyr	Gln	Lys
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Val	Lys	Ser	Thr	Phe	Asp	Tyr	Val	Asn	Asp	Leu	Leu	Gly	Asn	Asn	Gln
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Asn	Ile	Pro	Ser	Glu	Gln	Leu	Val	Ser	Ala	Tyr	Gln	Gln	Leu	Glu	Lys
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Ala	Leu	Glu	Leu	Ala	Arg	Thr	Leu	Pro	Gln	Gln	Ser	Thr	Thr	Glu	Lys
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Arg	Gly	Arg	Arg	Ser	Thr	Arg	Ser	Val	Val	Glu	Asn	Arg	Ser	Ser	Arg
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Ser	Asp	Tyr	Leu	Asp	Ala	Arg	Thr	Glu	Tyr	Tyr	Val	Ser	Lys	Asp	Asp
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Arg	Trp	Pro	Tyr	Asn	Leu	Pro	Arg	Ser	Arg	Asn	Ile	Leu	Arg	Ala	Ser
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Asp	Val	Gln	Gly	Asn	Ala	Tyr	Ile	Thr	Thr	Lys	Arg	Leu	Lys	Asp	Gly
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Tyr	Gln	Trp	Asp	Ile	Leu	Phe	Asn	Ser	Asn	His	Lys	Gly	His	Glu	Tyr
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Met	Tyr	Tyr	Trp	Phe	Gly	Leu	Pro	Ser	Asp	Gln	Thr	Pro	Thr	Gly	Pro
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Gly	Val	Gly	Phe	Gly	Ser	Gly	Ala	Pro	Leu	Pro	Gln	Phe	Trp	Arg	Ser
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Ala	Gly	Ala	Ile	Asn	Ser	Ser	Val	Ala	Asn	Asp	Phe	Lys	His	Gly	Ser
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Ala	Thr	Asn	Tyr	Ala	Phe	Tyr	Asp	Gly	Val	Asn	Asn	Phe	Ser	Asp	Phe
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Ala	Arg	Gly	Gly	Glu	Leu	Tyr	Phe	Asp	Arg	Glu	Gly	Ala	Thr	Gln	Thr
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Asn	Lys	Tyr	Tyr	Gly	Asp	Glu	Asn	Phe	Ala	Leu	Leu	Asn	Ser	Glu	Lys
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Pro	Asp	Gln	Ile	Arg	Gly	Leu	Asp	Thr	Ile	Tyr	Ser	Phe	Lys	Gly	Ser
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Gly	Asp	Val	Ser	Tyr	Arg	Ile	Ser	Phe	Lys	Thr	Gln	Gly	Ala	Pro	Thr
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Ala	Arg	Leu	Tyr	Tyr	Ala	Ala	Gly	Ala	Arg	Ser	Gly	Glu	Tyr	Lys	Gln
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Ala	Thr	Asn	Tyr	Asn	Gln	Leu	Tyr	Val	Glu	Pro	Tyr	Lys	Asn	Tyr	Arg
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Asn	Arg	Val	Gln	Ser	Asn	Val	Gln	Val	Lys	Asn	Arg	Thr	Leu	His	Leu
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Lys	Arg	Thr	Ile	Arg	Gln	Phe	Asp	Pro	Thr	Leu	Gln	Arg	Thr	Thr	Asp
				565					570					575	
Val	Pro	Ile	Leu	Asp	Ser	Asp	Gly	Ser	Gly	Ser	Ile	Asp	Ser	Val	Tyr

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Asp Pro Leu Ser Tyr Val Lys Asn Val Thr Gly Thr Val Leu Gly Ile
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Tyr Pro Ser Tyr Leu Pro Tyr Asn Gln Glu Arg Trp Gln Gly Ala Asn
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Ala Met Asn Ala Tyr Gln Ile Glu Glu Leu Phe Ser Gln Glu Asn Leu
625      630      635      640

Gln Asn Ala Ala Arg Ser Gly Arg Pro Ile Gln Phe Leu Val Gly Phe
      645      650      655
Asp Val Glu Asp Ser His His Asn Pro Glu Thr Leu Leu Pro Val Asn
      660      665      670
Leu Tyr Val Lys Pro Glu Leu Lys His Thr Ile Glu Leu Tyr His Asp
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Asn Glu Lys Gln Asp Arg Lys Glu Phe Ser Val Ser Lys
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Ser Glu Trp Ser Ile Thr Gly Tyr Pro Asn Thr Leu Thr Leu Gln Asn
      35      40      45
Ala Val Gly Arg Thr Asn Asn Ala Thr Glu Lys Asn Leu Ala Leu Val
      50      55      60
Gly His Ile Asp Pro Gly Asn Tyr Phe Ile Thr Val Lys Phe Gly Asp
      65      70      75      80
Lys Val Glu Gln Phe Glu Ile Arg Ser Lys Pro Thr Pro Pro Arg Ile
      85      90      95
Ile Thr Thr Ala Asn Glu Leu Arg Gly Asn Pro Asn His Lys Pro Glu
      100      105      110
Ile Arg Val Thr Asp Ile Pro Asn Asp Thr Thr Ala Lys Ile Lys Leu
      115      120      125
Val Met Gly Gly Thr Asp Gly Asp His Asp Pro Glu Ile Asn Pro Tyr
      130      135      140
Thr Val Pro Glu Asn Tyr Thr Val Val Ala Glu Ala Tyr His Asp Asn
      145      150      155      160
Asp Pro Ser Lys Asn Gly Val Leu Thr Phe Arg Ser Ser Asp Tyr Leu
      165      170      175
Lys Asp Leu Pro Leu Ser Gly Glu Leu Lys Ala Ile Val Tyr Tyr Asn
      180      185      190
Gln Tyr Val Gln Ser Asn Phe Ser Lys Ser Val Pro Phe Ser Ser Asp
      195      200      205
Thr Thr Pro Pro Thr Ile Asn Glu Pro Ala Gly Leu Val His Lys Tyr
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Tyr Arg Gly Asp His Val Glu Ile Thr Leu Pro Val Thr Asp Asn Thr
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Gly Gly Ser Gly Leu Arg Asp Val Asn Val Asn Leu Pro Gln Gly Trp
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Thr Lys Thr Phe Thr Ile Asn Pro Asn Asn Asn Thr Glu Gly Thr Leu
      260      265      270
Lys Leu Ile Gly Asn Ile Pro Ser Asn Glu Ala Tyr Asn Thr Thr Tyr
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His Phe Asn Ile Thr Ala Thr Asp Asn Ser Gly Asn Thr Thr Asn Pro
      290      295      300
Ala Lys Thr Phe Ile Leu Asn Val Gly Lys Leu Ala Asp Asp Leu Asn
      305      310      315      320
Pro Val Gly Leu Ser Arg Asp Gln Leu Gln Leu Val Thr Asp Pro Ser
      325      330      335
Ser Leu Ser Asn Ser Glu Arg Glu Glu Val Lys Arg Lys Ile Ser Glu
      340      345      350
Ala Asn Ala Asn Ile Arg Ser Tyr Leu Leu Gln Asn Asn Pro Ile Leu
      355      360      365

Ala Gly Val Asn Gly Asp Val Thr Phe Tyr Tyr Arg Asp Gly Ser Val
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Asp Val Ile Asp Ala Glu Asn Val Ile Thr Tyr Glu Pro Glu Arg Lys
      385      390      395      400

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Ser	Ile	Phe	Ser	Glu	Asn	Gly	Asn	Thr	Asn	Lys	Lys	Glu	Ala	Val	Ile
				405					410					415	
Thr	Ile	Ala	Arg	Gly	Gln	Asn	Tyr	Thr	Ile	Gly	Pro	Asn	Leu	Arg	Lys
			420					425					430		
Tyr	Phe	Ser	Leu	Ser	Asn	Gly	Ser	Asp	Leu	Pro	Asn	Arg	Asp	Phe	Thr
		435					440					445			
Ser	Ile	Ser	Ala	Ile	Gly	Ser	Leu	Pro	Ser	Ser	Ser	Glu	Ile	Ser	Arg
	450				455						460				
Leu	Asn	Val	Gly	Asn	Tyr	Asn	Tyr	Arg	Val	Asn	Ala	Lys	Asn	Ala	Tyr
465					470					475				480	
His	Lys	Thr	Gln	Gln	Glu	Leu	Asn	Leu	Lys	Leu	Lys	Ile	Val	Glu	Val
			485						490					495	
Asn	Ala	Pro	Thr	Gly	Asn	Asn	Arg	Val	Tyr	Arg	Val	Ser	Thr	Tyr	Asn
			500					505					510		
Leu	Thr	Asn	Asp	Glu	Ile	Asn	Lys	Ile	Lys	Gln	Ala	Phe	Lys	Ala	Ala
		515					520					525			
Asn	Ser	Gly	Leu	Asn	Leu	Asn	Asp	Asn	Asp	Ile	Thr	Val	Ser	Asn	Asn
	530					535					540				
Phe	Asp	His	Arg	Asn	Val	Ser	Ser	Val	Thr	Val	Thr	Ile	Arg	Lys	Gly
545				550						555				560	
Asp	Leu	Ile	Lys	Glu	Phe	Ser	Ser	Asn	Leu	Asn	Asn	Met	Asn	Phe	Leu
			565						570					575	
Arg	Trp	Val	Asn	Ile	Arg	Asp	Asp	Tyr	Thr	Ile	Ser	Trp	Thr	Ser	Ser
		580						585						590	
Lys	Ile	Gln	Gly	Arg	Asn	Thr	Asp	Gly	Gly	Leu	Glu	Trp	Ser	Pro	Asp
		595					600					605			
His	Lys	Ser	Leu	Ile	Tyr	Lys	Tyr	Asp	Ala	Thr	Leu	Gly	Arg	Gln	Ile
	610					615					620				
Asn	Thr	Asn	Asp	Val	Leu	Thr	Leu	Leu	Gln	Ala	Thr	Ala	Lys	Asn	Ser
625					630					635				640	
Asn	Leu	Arg	Ser	Asn	Ile	Asn	Ser	Asn	Glu	Lys	Gln	Leu	Ala	Glu	Arg
			645						650					655	
Gly	Ser	Asn	Gly	Tyr	Ser	Lys	Ser	Ile	Ile	Arg	Asp	Asp	Gly	Glu	Lys
		660						665					670		
Ser	Tyr	Leu	Leu	Asn	Ser	Asn	Pro	Ile	Gln	Val	Leu	Asp	Leu	Val	Glu
		675					680					685			
Pro	Asp	Asn	Gly	Tyr	Gly	Gly	Arg	Gln	Val	Ser	His	Ser	Asn	Val	Ile
	690					695					700				
Tyr	Asn	Glu	Lys	Asn	Ser	Ser	Ile	Val	Asn	Gly	Gln	Val	Pro	Glu	Ala
705					710					715					720
Asn	Gly	Ala	Ser	Ala	Phe	Asn	Ile	Asp	Lys	Val	Val	Lys	Ala	Asn	Ala
			725						730					735	
Ala	Asn	Asn	Gly	Ile	Met	Gly	Val	Ile	Tyr	Lys	Ala	Gln	Leu	Tyr	Leu
			740					745					750		
Ala	Pro	Tyr	Ser	Pro	Lys	Gly	Tyr	Ile	Glu	Lys	Leu	Gly	Gln	Asn	Leu
		755					760					765			
Ser	Asn	Thr	Asn	Asn	Val	Ile	Asn	Val	Tyr	Phe	Val	Pro	Ser	Asp	Lys
		770				775					780				
Val	Asn	Pro	Ser	Ile	Thr	Val	Gly	Asn	Tyr	Asp	His	His	Thr	Val	Tyr
785					790					795				800	
Ser	Gly	Glu	Thr	Phe	Lys	Asn	Thr	Ile	Asn	Val	Asn	Asp	Asn	Tyr	Gly
			805					810						815	
Leu	Asn	Thr	Val	Ala	Ser	Thr	Ser	Asp	Ser	Ala	Ile	Thr	Met	Thr	Arg
			820					825					830		
Asn	Asn	Asn	Glu	Leu	Val	Gly	Gln	Ala	Pro	Asn	Val	Thr	Asn	Ser	Ile
		835					840					845			
Asn	Lys	Ile	Val	Lys	Val	Lys	Ala	Thr	Asp	Lys	Ser	Gly	Asn	Glu	Ser
	850					855					860				
Ile	Val	Ser	Phe	Thr	Val	Asn	Ile	Lys	Pro	Leu	Asn	Glu	Lys	Tyr	Arg
865					870					875				880	
Ile	Thr	Thr	Ser	Ser	Ser	Asn	Gln	Thr	Pro	Val	Arg	Ile	Ser	Asn	Ile
			885						890					895	
Gln	Asn	Asn	Ala	Asn	Leu	Ser	Ile	Glu	Asp	Gln	Asn	Arg	Val	Lys	Ser
			900					905					910		
Ser	Leu	Ser	Met	Thr	Lys	Ile	Leu	Gly	Thr	Arg	Asn	Tyr	Val	Asn	Glu
		915						920					925		
Ser	Asn	Asn	Asp	Val	Arg	Ser	Gln	Val	Val	Ser	Lys	Val	Asn	Arg	Ser
		930				935					940				
Gly	Asn	Asn	Ala	Thr	Val	Asn	Val	Thr	Thr	Thr	Phe	Ser	Asp	Gly	Thr
945					950					955				960	
Thr	Asn	Thr	Ile	Thr	Val	Pro	Val	Lys	His	Val	Leu	Leu	Glu	Val	Val
			965						970					975	
Pro	Thr	Thr	Arg	Thr	Thr	Val	Arg	Gly	Gln	Gln	Phe	Pro	Thr	Gly	Lys
			980					985						990	

Gly Thr Ser Pro Asn Asp Phe Phe Ser Leu Arg Thr Gly Gly Pro Val
995 1000 1005
Asp Ala Arg Ile Val Trp Val Asn Asn Gln Gly Pro Asp Ile Asn Ser
1010 1015 1020
Asn Gln Ile Gly Arg Asp Leu Thr Leu His Ala Glu Ile Phe Phe Asp
1025 1030 1035 1040
Gly Glu Thr Thr Pro Ile Arg Lys Asp Thr Thr Tyr Lys Leu Ser Gln
1045 1050 1055
Ser Ile Pro Lys Gln Ile Tyr Glu Thr Thr Ile Asn Gly Arg Phe Asn
1060 1065 1070
Ser Ser Gly Asp Ala Tyr Pro Gly Asn Phe Val Gln Ala Val Asn Gln
1075 1080 1085
Tyr Trp Pro Glu His Met Asp Phe Arg Trp Ala Gln Gly Ser Gly Thr
1090 1095 1100
Pro Ser Ser Arg Asn Ala Gly Ser Phe Thr Lys Thr Val Thr Val Val
1105 1110 1115 1120
Tyr Gln Asn Gly Gln Thr Glu Asn Val Asn Val Leu Phe Lys Val Lys
1125 1130 1135
Pro Asn Lys Pro Val Ile Asp Ser Asn Ser Val Ile Ser Lys Gly Gln
1140 1145 1150
Leu Asn Gly Gln Gln Ile Leu Val Arg Asn Val Pro Gln Asn Ala Gln
1155 1160 1165
Val Thr Leu Tyr Gln Ser Asn Gly Thr Val Ile Pro Asn Thr Asn Thr
1170 1175 1180
Thr Ile Asp Ser Asn Gly Ile Ala Thr Val Thr Ile Gln Gly Thr Leu
1185 1190 1195 1200
Pro Thr Gly Asn Ile Thr Ala Lys Thr Ser Met Thr Asn Asn Val Thr
1205 1210 1215
Tyr Thr Lys Gln Asn Ser Ser Gly Ile Ala Ser Asn Thr Thr Glu Asp
1220 1225 1230
Ile Ser Val Phe Ser Glu Asn Ser Asp Gln Val Asn Val Thr Ala Gly
1235 1240 1245
Met Gln Ala Lys Asn Asp Gly Ile Lys Ile Ile Lys Gly Thr Asn Tyr
1250 1255 1260
Asn Phe Asn Asp Phe Asn Ser Phe Ile Ser Asn Ile Pro Ala His Ser
1265 1270 1275 1280
Thr Leu Thr Trp Asn Glu Glu Pro Asn Ser Trp Lys Asn Asn Ile Gly
1285 1290 1295
Thr Thr Thr Lys Thr Val Thr Val Thr Leu Pro Asn His Gln Gly Thr
1300 1305 1310
Arg Thr Val Asp Ile Pro Ile Thr Ile Tyr Pro Thr Val Thr Ala Lys
1315 1320 1325
Asn Pro Val Arg Asp Gln Lys Gly Arg Asn Leu Thr Asn Gly Thr Asp
1330 1335 1340
Val Tyr Asn Tyr Ile Ile Phe Glu Asn Asn Asn Arg Leu Gly Gly Thr
1345 1350 1355 1360
Ala Ser Trp Lys Asp Asn Arg Gln Pro Asp Lys Asn Ile Ala Gly Val
1365 1370 1375
Gln Asn Leu Ile Ala Leu Val Asn Tyr Pro Gly Ile Ser Thr Pro Leu
1380 1385 1390
Glu Val Pro Val Lys Val Trp Val Tyr Asn Phe Asp Phe Thr Gln Pro
1395 1400 1405
Ile Tyr Lys Ile Gln Val Gly Asp Thr Phe Pro Lys Gly Thr Trp Ala
1410 1415 1420
Gly Tyr Tyr Lys His Leu Glu Asn Gly Glu Gly Leu Pro Ile Asp Gly
1425 1430 1435 1440
Trp Lys Phe Tyr Trp Asn Gln Gln Ser Thr Gly Thr Thr Ser Asp Gln
1445 1450 1455
Trp Gln Ser Leu Ala Tyr Thr Arg Thr Pro Phe Val Lys Thr Gly Thr
1460 1465 1470
Tyr Asp Val Val Asn Pro Ser Asn Trp Gly Val Trp Gln Thr Ser Gln
1475 1480 1485
Ser Ala Lys Phe Ile Val Thr Asn Ala Lys Pro Asn Gln Pro Thr Ile
1490 1495 1500
Thr Gln Ser Lys Thr Gly Asp Val Thr Val Thr Pro Gly Ala Val Arg
1505 1510 1515 1520
Asn Ile Leu Ile Ser Gly Thr Asn Asp Tyr Ile Gln Ala Ser Ala Asp
1525 1530 1535
Lys Ile Val Ile Asn Lys Asn Gly Asn Lys Leu Thr Thr Phe Val Lys
1540 1545 1550
Asn Asn Asp Gly Arg Trp Thr Val Glu Thr Gly Ser Pro Asp Ile Asn
1555 1560 1565
Gly Ile Gly Pro Thr Asn Asn Gly Thr Ala Ile Ser Leu Ser Arg Leu
1570 1575 1580
Ala Val Arg Pro Gly Asp Ser Ile Glu Ala Ile Ala Thr Glu Gly Ser

1585	1590	1595	1600
Gly Glu Thr Ile Ser	Thr Ser Ala Thr Ser	Glu Ile Tyr Ile Val Lys	
1605	1610	1615	
Ala Pro Gln Pro Glu Gln Val Ala Thr His Thr Tyr Asp Asn Gly Thr			
1620	1625	1630	
Phe Asp Ile Leu Pro Asp Asn Ser Arg Asn Ser Leu Asn Pro Thr Glu			
1635	1640	1645	
Arg Val Glu Ile Asn Tyr Thr Glu Lys Leu Asn Gly Asn Glu Thr Gln			
1650	1655	1660	
Lys Ser Phe Thr Ile Thr Lys Asn Asn Asn Gly Lys Trp Thr Ile Asn			
1665	1670	1675	1680
Asn Lys Pro Asn Tyr Val Glu Phe Asn Gln Asp Asn Gly Lys Val Val			
1685	1690	1695	
Phe Ser Ala Asn Thr Ile Lys Pro Asn Ser Gln Ile Thr Ile Thr Pro			
1700	1705	1710	
Lys Ala Gly Gln Gly Asn Thr Glu Asn Thr Asn Pro Thr Val Ile Gln			
1715	1720	1725	
Ala Pro Ala Gln His Thr Leu Thr Ile Asn Glu Ile Val Lys Glu Gln			
1730	1735	1740	
Gly Gln Asn Val Thr Asn Asp Asp Ile Asn Asn Ala Val Gln Val Pro			
1745	1750	1755	1760
Asn Lys Asn Arg Val Ala Ile Lys Gln Gly Asn Ala Leu Pro Thr Asn			
1765	1770	1775	
Leu Ala Gly Gly Ser Thr Ser His Ile Pro Val Val Ile Tyr Tyr Ser			
1780	1785	1790	
Asp Gly Ser Ser Glu Glu Ala Thr Glu Thr Val Arg Thr Lys Val Asn			
1795	1800	1805	
Lys Thr Glu Leu Ile Asn Ala Arg Arg Arg Leu Asp Glu Glu Ile Ser			
1810	1815	1820	
Lys Glu Asn Lys Thr Pro Ser Ser Ile Arg Asn Phe Asp Gln Ala Met			
1825	1830	1835	1840
Asn Arg Ala Gln Ser Gln Ile Asn Thr Ala Lys Ser Asp Ala Asp Gln			
1845	1850	1855	
Val Ile Gly Thr Glu Phe Ala Thr Pro Gln Gln Val Asn Ser Ala Leu			
1860	1865	1870	
Ser Lys Val Gln Ala Ala Gln Asn Lys Ile Asn Glu Ala Lys Ala Leu			
1875	1880	1885	
Leu Gln Asn Lys Ala Asp Asn Ser Gln Leu Val Arg Ala Lys Glu Gln			
1890	1895	1900	
Leu Gln Gln Ser Ile Gln Pro Ala Ala Ser Thr Asp Gly Met Thr Gln			
1905	1910	1915	1920
Asp Ser Thr Arg Asn Tyr Asn Asn Lys Arg Gln Ala Ala Glu Gln Ala			
1925	1930	1935	
Ile Gln His Ala Asn Ser Val Ile Asn Asn Gly Asp Ala Thr Ser Gln			
1940	1945	1950	
Gln Ile Asn Asp Ala Lys Asn Thr Val Glu Gln Ala Gln Arg Asp Tyr			
1955	1960	1965	
Val Glu Ala Lys Ser Asn Leu Arg Ala Asp Lys Ser Gln Leu Gln Ser			
1970	1975	1980	
Ala Tyr Asp Thr Leu Asn Arg Asp Val Leu Thr Asn Asp Lys Lys Pro			
1985	1990	1995	2000
Ala Ser Val Arg Arg Tyr Asn Glu Ala Ile Ser Asn Ile Arg Lys Glu			
2005	2010	2015	
Leu Asp Thr Ala Lys Ala Asp Ala Ser Ser Thr Leu Arg Asn Thr Asn			
2020	2025	2030	
Pro Ser Val Glu Gln Val Arg Asp Ala Leu Asn Lys Ile Asn Thr Val			
2035	2040	2045	
Gln Pro Lys Val Asn Gln Ala Ile Ala Leu Leu Gln Pro Lys Glu Asn			
2050	2055	2060	
Asn Ser Glu Leu Val Gln Ala Lys Lys Arg Leu Gln Asp Ala Val Asn			
2065	2070	2075	2080
Asp Ile Pro Gln Thr Gln Gly Met Thr Gln Gln Thr Ile Asn Asn Tyr			
2085	2090	2095	
Asn Asp Lys Gln Arg Glu Ala Glu Arg Ala Leu Thr Ser Ala Gln Arg			
2100	2105	2110	
Val Ile Asp Asn Gly Asp Ala Thr Thr Gln Glu Ile Thr Ser Glu Lys			
2115	2120	2125	
Ser Lys Val Glu Gln Ala Met Gln Ala Leu Thr Asn Ala Lys Ser Asn			
2130	2135	2140	
Leu Arg Ala Asp Lys Asn Glu Leu Gln Thr Ala Tyr Asn Lys Leu Ile			
2145	2150	2155	2160
Glu Asn Val Ser Thr Asn Gly Lys Lys Pro Ala Ser Ile Arg Gln Tyr			
2165	2170	2175	
Glu Thr Ala Lys Ala Arg Ile Gln Asn Gln Ile Asn Asp Ala Lys Asn			
2180	2185	2190	

Glu Ala Glu Arg Ile Leu Gly Asn Asp Asn Pro Gln Val Ser Gln Val
 2195 2200 2205
 Thr Gln Ala Leu Asn Lys Ile Lys Ala Ile Gln Pro Lys Leu Thr Glu
 2210 2215 2220
 Ala Ile Asn Met Leu Gln Asn Lys Glu Asn Asn Thr Glu Leu Val Asn
 2225 2230 2235 2240
 Ala Lys Asn Arg Leu Glu Asn Ala Val Asn Asp Thr Asp Pro Thr His
 2245 2250 2255
 Gly Met Thr Gln Glu Thr Ile Asn Asn Tyr Asn Ala Lys Lys Arg Glu
 2260 2265 2270
 Ala Gln Asn Glu Ile Gln Lys Ala Asn Met Ile Ile Asn Asn Gly Asp
 2275 2280 2285
 Ala Thr Ala Gln Asp Ile Ser Ser Glu Lys Ser Lys Val Glu Gln Val
 2290 2295 2300
 Leu Gln Ala Leu Gln Asn Ala Lys Asn Asp Leu Arg Ala Asp Lys Arg
 2305 2310 2315 2320
 Glu Leu Gln Thr Ala Tyr Asn Lys Leu Ile Gln Asn Val Asn Thr Asn
 2325 2330 2335
 Gly Lys Lys Pro Ser Ser Ile Gln Asn Tyr Lys Ser Ala Arg Arg Asn
 2340 2345 2350
 Ile Glu Asn Gln Tyr Asn Thr Ala Lys Asn Glu Ala His Asn Val Leu
 2355 2360 2365
 Glu Asn Thr Asn Pro Thr Val Asn Ala Val Glu Asp Ala Leu Arg Lys
 2370 2375 2380
 Ile Asn Ala Ile Gln Pro Glu Val Thr Lys Ala Ile Asn Ile Leu Gln
 2385 2390 2395 2400
 Asp Lys Glu Asp Asn Ser Glu Leu Val Arg Ala Lys Glu Lys Leu Asp
 2405 2410 2415
 Gln Ala Ile Asn Ser Gln Pro Ser Leu Asn Gly Met Thr Gln Glu Ser
 2420 2425 2430
 Ile Asn Asn Tyr Thr Thr Lys Arg Arg Glu Ala Gln Asn Ile Ala Ser
 2435 2440 2445
 Ser Ala Asp Thr Ile Ile Asn Asn Gly Asp Ala Ser Ile Glu Gln Ile
 2450 2455 2460
 Thr Glu Asn Lys Ile Arg Val Glu Glu Ala Thr Asn Ala Leu Asn Glu
 2465 2470 2475 2480
 Ala Lys Gln His Leu Thr Ala Asp Thr Thr Ser Leu Lys Thr Glu Val
 2485 2490 2495
 Arg Lys Leu Ser Arg Arg Gly Asp Thr Asn Asn Lys Lys Pro Ser Ser
 2500 2505 2510
 Val Ser Ala Tyr Asn Asn Thr Ile His Ser Leu Gln Ser Glu Ile Thr
 2515 2520 2525
 Gln Thr Glu Asn Arg Ala Asn Thr Ile Ile Asn Lys Pro Ile Arg Ser
 2530 2535 2540
 Val Glu Glu Val Asn Asn Ala Leu His Glu Val Asn Gln Leu Asn Gln
 2545 2550 2555 2560
 Arg Leu Thr Asp Thr Ile Asn Leu Leu Gln Pro Leu Ala Asn Lys Glu
 2565 2570 2575
 Ser Leu Lys Glu Ala Arg Asn Arg Leu Glu Ser Lys Ile Asn Glu Thr
 2580 2585 2590
 Val Gln Thr Asp Gly Met Thr Gln Gln Ser Val Glu Asn Tyr Lys Gln
 2595 2600 2605
 Ala Lys Ile Lys Ala Gln Asn Glu Ser Ser Ile Ala Gln Thr Leu Ile
 2610 2615 2620
 Asn Asn Gly Asp Ala Ser Asp Gln Glu Val Ser Thr Glu Ile Glu Lys
 2625 2630 2635 2640
 Leu Asn Gln Lys Leu Ser Glu Leu Thr Asn Ser Ile Asn His Leu Thr
 2645 2650 2655
 Val Asn Lys Glu Pro Leu Glu Thr Ala Lys Asn Gln Leu Gln Ala Asn
 2660 2665 2670
 Ile Asp Gln Lys Pro Ser Thr Asp Gly Met Thr Gln Gln Ser Val Gln
 2675 2680 2685
 Ser Tyr Glu Arg Lys Leu Gln Glu Ala Lys Asp Lys Ile Asn Ser Ile
 2690 2695 2700
 Asn Asn Val Leu Ala Asn Asn Pro Asp Val Asn Ala Ile Arg Thr Asn
 2705 2710 2715 2720
 Lys Val Glu Thr Glu Gln Ile Asn Asn Glu Leu Thr Gln Ala Lys Gln
 2725 2730 2735
 Gly Leu Thr Val Asp Lys Lys Gln Pro Leu Ile Asn Ala Lys Thr Ala Leu
 2740 2745 2750
 Gln Gln Ser Leu Asp Asn Gln Pro Ser Thr Thr Gly Met Thr Glu Ala
 2755 2760 2765
 Thr Ile Gln Asn Tyr Asn Ala Lys Arg Gln Lys Ala Glu Gln Val Ile
 2770 2775 2780
 Gln Asn Ala Asn Lys Ile Ile Glu Asn Ala Gln Pro Ser Val Gln Gln

2785	2790	2795	2800
Val Ser Asp Glu Lys	Ser Lys Val Glu	Gln Ala Leu Ser Glu	Leu Asn
2805	2810	2815	
Asn Ala Lys Ser Ala	Leu Arg Ala Asp	Lys Gln Glu Leu	Gln Gln Ala
2820	2825	2830	
Tyr Asn Gln Leu Ile	Gln Pro Thr Asp	Leu Asn Asn Lys	Lys Pro Ala
2835	2840	2845	
Ser Ile Thr Ala Tyr	Asn Gln Arg Tyr	Gln Gln Phe Ser	Asn Glu Leu
2850	2855	2860	
Asn Ser Thr Lys Thr	Asn Thr Asp Arg	Ile Leu Lys Glu	Gln Asn Pro
2865	2870	2875	2880
Ser Val Ala Asp Val	Asn Asn Ala Leu	Asn Lys Val Arg	Glu Val Gln
2885	2890	2895	
Gln Lys Leu Asn Glu	Ala Arg Ala Leu	Leu Gln Asn Lys	Glu Asp Asn
2900	2905	2910	
Ser Ala Leu Val Arg	Ala Lys Glu	Gln Leu Gln Ala	Val Asp Gln
2915	2920	2925	
Val Pro Ser Thr Glu	Gly Met Thr Gln	Gln Thr Lys Asp	Asp Tyr Asn
2930	2935	2940	
Ser Lys Gln Gln Ala	Ala Gln Gln Glu	Ile Ser Lys Ala	Gln Gln Val
2945	2950	2955	2960
Ile Asp Asn Gly Asp	Ala Thr Thr Gln	Gln Ile Ser Asn	Ala Lys Thr
2965	2970	2975	
Asn Val Glu Arg Ala	Leu Glu Ala Leu	Asn Asn Ala Lys	Thr Gly Leu
2980	2985	2990	
Arg Ala Asp Lys Glu	Glu Leu Gln Asn	Ala Tyr Asn Gln	Leu Thr Gln
2995	3000	3005	
Asn Ile Asp Thr Ser	Gly Lys Thr Pro	Ala Ser Ile Arg	Lys Tyr Asn
3010	3015	3020	
Glu Ala Lys Ser Arg	Ile Gln Thr Gln	Ile Asp Ser Ala	Lys Asn Glu
3025	3030	3035	3040
Ala Asn Ser Ile Leu	Thr Asn Asp Asn	Pro Gln Val Ser	Gln Val Thr
3045	3050	3055	
Ala Ala Leu Asn Lys	Ile Lys Ala Val	Gln Pro Glu Leu	Asp Lys Ala
3060	3065	3070	
Ile Ala Met Leu Lys	Asn Lys Glu Asn	Asn Asn Ala Leu	Val Gln Ala
3075	3080	3085	
Lys Gln Gln Leu Gln	Gln Ile Val Asn	Glu Val Asp Pro	Thr Gln Gly
3090	3095	3100	
Met Thr Thr Asp Thr	Ala Asn Asn Tyr	Lys Ser Lys Lys	Arg Glu Ala
3105	3110	3115	3120
Glu Asp Glu Ile Gln	Lys Ala Gln Gln	Ile Ile Asn Asn	Gly Asp Ala
3125	3130	3135	
Thr Glu Gln Gln Ile	Thr Asn Glu Thr	Asn Arg Val Asn	Gln Ala Ile
3140	3145	3150	
Asn Ala Ile Asn Lys	Ala Lys Asn Asp	Leu Arg Ala Asp	Lys Ser Gln
3155	3160	3165	
Leu Glu Asn Ala Tyr	Asn Gln Leu Ile	Gln Asn Val Asp	Thr Asn Gly
3170	3175	3180	
Lys Lys Pro Ala Ser	Ile Gln Gln Tyr	Gln Ala Ala Arg	Gln Ala Ile
3185	3190	3195	3200
Glu Thr Gln Tyr Asn	Asn Ala Lys Ser	Glu Ala His Gln	Ile Leu Glu
3205	3210	3215	
Asn Ser Asn Pro Ser	Val Asn Glu Val	Ala Gln Ala Leu	Gln Lys Val
3220	3225	3230	
Glu Ala Val Gln Leu	Lys Val Asn Asp	Ala Ile His Ile	Leu Gln Asn
3235	3240	3245	
Lys Glu Asn Asn Ser	Ala Leu Val Thr	Ala Lys Asn Gln	Leu Gln Gln
3250	3255	3260	
Ser Val Asn Asp Gln	Pro Leu Thr Thr	Gly Met Thr Gln	Asp Ser Ile
3265	3270	3275	3280
Asn Asn Tyr Glu Ala	Lys Arg Asn Glu	Ala Gln Ser Ala	Ile Arg Asn
3285	3290	3295	
Ala Glu Ala Val Ile	Asn Asn Gly Asp	Ala Thr Ala Lys	Gln Ile Ser
3300	3305	3310	
Asp Glu Lys Ser Lys	Val Glu Gln Ala	Leu Ala His Leu	Asn Asp Ala
3315	3320	3325	
Lys Gln Gln Leu Thr	Ala Asp Thr Thr	Glu Leu Gln Thr	Ala Val Gln
3330	3335	3340	
Gln Leu Asn Arg Arg	Gly Asp Thr Asn	Asn Lys Lys Pro	Arg Ser Ile
3345	3350	3355	3360
Asn Ala Tyr Asn Lys	Ala Ile Gln Ser	Leu Glu Thr Gln	Ile Thr Ser
3365	3370	3375	
Ala Lys Asp Asn Ala	Asn Ala Val Ile	Gln Lys Pro Ile	Arg Thr Val
3380	3385	3390	

Gln Glu Val Asn Asn Ala Leu Gln Gln Val Asn Gln Leu Asn Gln Gln
 3395 3400 3405
 Leu Thr Glu Ala Ile Asn Gln Leu Gln Pro Leu Ser Asn Asn Asp Ala
 3410 3415 3420
 Leu Lys Ala Ala Arg Leu Asn Leu Glu Asn Lys Ile Asn Gln Thr Val
 3425 3430 3435 3440
 Gln Thr Asp Gly Met Thr Gln Gln Ser Ile Glu Ala Tyr Gln Asn Ala
 3445 3450 3455
 Lys Arg Val Ala Gln Asn Glu Ser Asn Thr Ala Leu Ala Leu Ile Asn
 3460 3465 3470
 Asn Gly Asp Ala Asp Glu Gln Gln Ile Thr Thr Glu Thr Asp Arg Val
 3475 3480 3485
 Asn Gln Gln Thr Thr Asn Leu Thr Gln Ala Ile Asn Gly Leu Thr Val
 3490 3495 3500
 Asn Lys Glu Pro Leu Glu Thr Ala Lys Thr Ala Leu Gln Asn Asn Ile
 3505 3510 3515 3520
 Asp Gln Val Pro Ser Thr Asp Gly Met Thr Gln Gln Ser Val Ala Asn
 3525 3530 3535
 Tyr Asn Gln Lys Leu Gln Ile Ala Lys Asn Glu Ile Asn Thr Ile Asn
 3540 3545 3550
 Asn Val Leu Ala Asn Asn Pro Asp Val Asn Ala Ile Lys Thr Asn Lys
 3555 3560 3565
 Ala Glu Ala Glu Arg Ile Ser Asn Asp Leu Thr Gln Ala Lys Asn Asn
 3570 3575 3580
 Leu Gln Val Asp Thr Gln Pro Leu Glu Lys Ile Lys Arg Gln Leu Gln
 3585 3590 3595 3600
 Asp Glu Ile Asp Gln Gly Thr Asn Thr Asp Gly Met Thr Gln Asp Ser
 3605 3610 3615
 Val Asp Asn Tyr Asn Asp Ser Leu Ser Ala Ala Ile Ile Glu Lys Gly
 3620 3625 3630
 Lys Val Asn Lys Leu Leu Lys Arg Asn Pro Thr Val Glu Gln Val Lys
 3635 3640 3645
 Glu Ser Val Ala Asn Ala Gln Gln Val Ile Gln Asp Leu Gln Asn Ala
 3650 3655 3660
 Arg Thr Ser Leu Val Pro Asp Lys Thr Gln Leu Gln Glu Ala Lys Asn
 3665 3670 3675 3680
 Arg Leu Glu Asn Ser Ile Asn Gln Gln Thr Asp Thr Asp Gly Met Thr
 3685 3690 3695
 Gln Asp Ser Leu Asn Asn Tyr Asn Asp Lys Leu Ala Lys Ala Arg Gln
 3700 3705 3710
 Asn Leu Glu Lys Ile Ser Lys Val Leu Gly Gly Gln Pro Thr Val Ala
 3715 3720 3725
 Glu Ile Arg Gln Asn Thr Asp Glu Ala Asn Ala His Lys Gln Ala Leu
 3730 3735 3740
 Asp Thr Ala Arg Ser Gln Leu Thr Leu Asn Arg Glu Pro Tyr Ile Asn
 3745 3750 3755 3760
 His Ile Asn Asn Glu Ser His Leu Asn Asn Ala Gln Lys Asp Asn Phe
 3765 3770 3775
 Lys Ala Gln Val Asn Ser Ala Pro Asn His Asn Thr Leu Glu Thr Ile
 3780 3785 3790
 Lys Asn Lys Ala Asp Thr Leu Asn Gln Ser Met Thr Ala Leu Ser Glu
 3795 3800 3805
 Ser Ile Ala Asp Tyr Glu Asn Gln Lys Gln Gln Glu Asn Tyr Leu Asp
 3810 3815 3820
 Ala Ser Asn Asn Lys Arg Gln Asp Tyr Asp Asn Ala Val Asn Ala Ala
 3825 3830 3835 3840
 Lys Gly Ile Leu Asn Gln Thr Gln Ser Pro Thr Met Ser Ala Asp Val
 3845 3850 3855
 Ile Asp Gln Lys Ala Glu Asp Val Lys Arg Thr Lys Thr Ala Leu Asp
 3860 3865 3870
 Gly Asn Gln Arg Leu Glu Val Ala Lys Gln Gln Ala Leu Asn His Leu
 3875 3880 3885
 Asn Thr Leu Asn Asp Leu Asn Asp Ala Gln Arg Gln Thr Leu Thr Asp
 3890 3895 3900
 Thr Ile Asn His Ser Pro Asn Ile Asn Ser Val Asn Gln Ala Lys Glu
 3905 3910 3915 3920
 Lys Ala Asn Thr Val Asn Thr Ala Met Thr Gln Leu Lys Gln Thr Ile
 3925 3930 3935
 Ala Asn Tyr Asp Asp Glu Leu His Asp Gly Asn Tyr Ile Asn Ala Asp
 3940 3945 3950
 Lys Asp Lys Lys Asp Ala Tyr Asn Asn Ala Val Asn Asn Ala Lys Gln
 3955 3960 3965
 Leu Ile Asn Gln Ser Asp Ala Asn Gln Ala Gln Leu Asp Pro Ala Glu
 3970 3975 3980
 Ile Asn Lys Val Thr Gln Arg Val Asn Thr Thr Lys Asn Asp Leu Asn

3985	3990	3995	4000
Gly Asn Asp Lys Leu Ala Glu Ala Lys Arg Asp Ala Asn Thr Thr Ile			
4005	4010	4015	
Asp Gly Leu Thr Tyr Leu Asn Glu Ala Gln Arg Asn Lys Ala Lys Glu			
4020	4025	4030	
Asn Val Gly Lys Ala Ser Thr Lys Thr Asn Ile Thr Ser Gln Leu Gln			
4035	4040	4045	
Asp Tyr Asn Gln Leu Asn Ile Ala Met Gln Ala Leu Arg Asn Ser Val			
4050	4055	4060	
Asn Asp Val Asn Asn Val Lys Ala Asn Ser Asn Tyr Ile Asn Glu Asp			
4065	4070	4075	4080
Asn Gly Pro Lys Glu Ala Tyr Asn Gln Ala Val Thr His Ala Gln Thr			
4085	4090	4095	
Leu Ile Asn Ala Gln Ser Asn Pro Glu Met Ser Arg Asp Val Val Asn			
4100	4105	4110	
Gln Lys Thr Gln Ala Val Asn Thr Ala His Gln Asn Leu His Gly Gln			
4115	4120	4125	
Gln Lys Leu Glu Gln Ala Gln Ser Ser Ala Asn Thr Glu Ile Gly Asn			
4130	4135	4140	
Leu Pro Asn Leu Thr Asn Thr Gln Lys Ala Lys Glu Lys Glu Leu Val			
4145	4150	4155	4160
Asn Ser Lys Gln Thr Arg Thr Glu Val Gln Glu Gln Leu Asn Gln Ala			
4165	4170	4175	
Lys Ser Leu Asp Ser Ser Met Gly Thr Leu Lys Ser Leu Val Ala Lys			
4180	4185	4190	
Gln Pro Thr Val Gln Lys Thr Ser Val Tyr Ile Asn Glu Asp Gln Pro			
4195	4200	4205	
Glu Gln Ser Ala Tyr Asn Asp Ser Ile Thr Met Gly Gln Thr Ile Ile			
4210	4215	4220	
Asn Lys Thr Ala Asp Pro Val Leu Asp Lys Thr Leu Val Asp Asn Ala			
4225	4230	4235	4240
Ile Ser Asn Ile Ser Thr Lys Glu Asn Ala Leu His Gly Glu Gln Lys			
4245	4250	4255	
Leu Thr Thr Ala Lys Thr Glu Ala Ile Asn Ala Leu Asn Thr Leu Ala			
4260	4265	4270	
Asp Leu Asn Thr Pro Gln Lys Glu Ala Ile Lys Thr Ala Ile Asn Thr			
4275	4280	4285	
Ala His Thr Arg Thr Asp Val Thr Ala Glu Gln Ser Lys Ala Asn Gln			
4290	4295	4300	
Ile Asn Ser Ala Met His Thr Leu Arg Gln Asn Ile Ser Asp Asn Glu			
4305	4310	4315	4320
Ser Val Thr Asn Glu Ser Asn Tyr Ile Asn Ala Glu Pro Glu Lys Gln			
4325	4330	4335	
His Ala Phe Thr Glu Ala Leu Asn Asn Ala Lys Glu Ile Val Asn Glu			
4340	4345	4350	
Gln Gln Ala Thr Leu Asp Ala Asn Ser Ile Asn Gln Lys Ala Gln Ala			
4355	4360	4365	
Ile Leu Thr Thr Lys Asn Ala Leu Asp Gly Glu Glu Gln Leu Arg Arg			
4370	4375	4380	
Ala Lys Glu Asn Ala Asp Gln Glu Ile Asn Thr Leu Asn Gln Leu Thr			
4385	4390	4395	4400
Asp Ala Gln Arg Asn Ser Glu Lys Gly Leu Val Asn Ser Ser Gln Thr			
4405	4410	4415	
Arg Thr Glu Val Ala Ser Gln Leu Ala Lys Ala Lys Glu Leu Asn Lys			
4420	4425	4430	
Val Met Glu Gln Leu Asn His Leu Ile Asn Gly Lys Asn Gln Met Ile			
4435	4440	4445	
Asn Ser Ser Lys Phe Ile Asn Glu Asp Ala Asn Gln Gln Gln Ala Tyr			
4450	4455	4460	
Ser Asn Ala Ile Ala Ser Ala Glu Ala Leu Lys Asn Lys Ser Gln Asn			
4465	4470	4475	4480
Pro Glu Leu Asp Lys Val Thr Ile Glu Gln Ala Ile Asn Asn Ile Asn			
4485	4490	4495	
Ser Ala Ile Asn Asn Leu Asn Gly Glu Ala Lys Leu Thr Lys Ala Lys			
4500	4505	4510	
Glu Asp Ala Val Ala Ser Ile Asn Asn Leu Ser Gly Leu Thr Asn Glu			
4515	4520	4525	
Gln Lys Thr Lys Glu Asn Gln Ala Val Asn Gly Ala Gln Thr Arg Asp			
4530	4535	4540	
Gln Val Ala Asn Lys Leu Arg Asp Ala Glu Ala Leu Asp Gln Ser Met			
4545	4550	4555	4560
Gln Thr Leu Arg Asp Leu Val Asn Asn Gln Asn Ala Ile His Ser Thr			
4565	4570	4575	
Ser Asn Tyr Phe Asn Glu Asp Ser Thr Gln Lys Asn Thr Tyr Asp Asn			

Ala	Ile	Asp	4580	Asn	Gly	Ser	Thr	Tyr	4585	Ile	Thr	Gly	Gln	His	Asn	Pro	Glu	4590
Leu	Asn	Lys	4595	Ser	Thr	Ile	Asp	Gln	4600	Thr	Ile	Ser	Arg	Ile	Asn	Thr	Ala	4605
Lys	Asn	Asp	4610	Leu	His	Gly	Val	Glu	4615	Lys	Leu	Gln	Arg	Asp	Lys	Gly	Thr	4620
Ala	Asn	Gln	4625	Glu	Ile	Gly	Gln	Leu	4630	Gly	Tyr	Leu	Asn	Asp	Pro	Gln	Lys	4635
Ser	Gly	Glu	4645	Glu	Ser	Leu	Val	Asn	4650	Gly	Ser	Asn	Thr	Arg	Ser	Glu	Val	4655
Glu	Glu	His	4660	Leu	Asn	Glu	Ala	Lys	4665	Ser	Leu	Asn	Asn	Ala	Met	Lys	Gln	4670
Leu	Arg	Asp	4675	Lys	Val	Ala	Glu	Lys	4680	Thr	Asn	Val	Lys	Gln	Ser	Ser	Asp	4685
Tyr	Ile	Asn	4690	Asp	Ser	Thr	Glu	His	4695	Gln	Arg	Gly	Tyr	Asp	Gln	Ala	Leu	4700
Gln	Glu	Ala	4705	Glu	Asn	Ile	Ile	Asn	4710	Glu	Ile	Gly	Asn	Pro	Thr	Leu	Asn	4715
Lys	Ser	Glu	4725	Ile	Glu	Gln	Lys	Leu	4730	Gln	Leu	Thr	Asp	Ala	Gln	Asn	4735	
Ala	Leu	Gln	4740	Gly	Ser	His	Leu	Leu	4745	Glu	Ala	Lys	Asn	Asn	Ala	Ile	4750	
Thr	Gly	Ile	4755	Asn	Lys	Leu	Thr	Ala	4760	Leu	Asn	Asp	Ala	Gln	Arg	Gln	Lys	4765
Ala	Ile	Glu	4770	Asn	Val	Gln	Ala	Gln	4775	Gln	Thr	Ile	Pro	Ala	Val	Asn	Gln	4780
Gln	Leu	Thr	4785	Leu	Asp	Arg	Glu	Ile	4790	Asn	Thr	Ala	Met	Gln	Ala	Leu	Arg	4795
Asp	Lys	Val	4805	Gly	Gln	Gln	Asn	Asn	4810	Val	His	Gln	Gln	Ser	Asn	Tyr	Phe	4815
Asn	Glu	Asp	4820	Glu	Gln	Pro	Lys	His	4825	Asn	Tyr	Asp	Asn	Ser	Val	Gln	Ala	4830
Gly	Gln	Thr	4835	Ile	Ile	Asp	Lys	Leu	4840	Gln	Asp	Pro	Ile	Met	Asn	Lys	Asn	4845
Glu	Ile	Glu	4850	Gln	Ala	Ile	Asn	Gln	4855	Ile	Asn	Thr	Thr	Gln	Thr	Ala	Leu	4860
Ser	Gly	Glu	4865	Asn	Lys	Leu	His	Thr	4870	Asp	Gln	Glu	Ser	Thr	Asn	Arg	Gln	4875
Ile	Glu	Gly	4885	Leu	Ser	Ser	Leu	Asn	4890	Thr	Ala	Gln	Ile	Asn	Ala	Glu	Lys	4895
Asp	Leu	Val	4900	Asn	Gln	Ala	Lys	Thr	4905	Arg	Thr	Asp	Val	Ala	Gln	Lys	Leu	4910
Ala	Ala	Ala	4915	Lys	Glu	Ile	Asn	Ser	4920	Ala	Met	Ser	Asn	Leu	Arg	Asp	Gly	4925
Ile	Gln	Asn	4930	Lys	Glu	Asp	Ile	Lys	4935	Arg	Ser	Ser	Ala	Tyr	Ile	Asn	Ala	4940
Asp	Pro	Thr	4945	Lys	Val	Thr	Ala	Tyr	4950	Asp	Gln	Ala	Leu	Gln	Asn	Ala	Glu	4955
Asn	Ile	Ile	4965	Asn	Ala	Thr	Pro	Asn	4970	Val	Glu	Leu	Asn	Lys	Ala	Thr	Ile	4975
Glu	Gln	Ala	4980	Leu	Ser	Arg	Val	Gln	4985	Gln	Ala	Gln	Gln	Asp	Leu	Asp	Gly	4990
Val	Gln	Gln	4995	Leu	Ala	Asn	Ala	Lys	5000	Gln	Gln	Ala	Thr	Gln	Thr	Val	Asn	5005
Gly	Leu	Asn	5010	Ser	Leu	Asn	Asp	Gly	5015	Gln	Lys	Arg	Glu	Leu	Asn	Leu	Leu	5020
Ile	Asn	Ser	5025	Ala	Asn	Thr	Arg	Thr	5030	Lys	Val	Gln	Glu	Glu	Leu	Asn	Lys	5035
Ala	Thr	Glu	5045	Leu	Asn	His	Ala	Met	5050	Glu	Ala	Leu	Arg	Asn	Ser	Val	Gln	5055
Asn	Val	Asp	5060	Gln	Val	Lys	Gln	Ser	5065	Ser	Asn	Tyr	Val	Asn	Glu	Asp	Gln	5070
Pro	Glu	Gln	5075	His	Asn	Tyr	Asp	Asn	5080	Ala	Val	Asn	Glu	Ala	Gln	Ala	Thr	5085
Ile	Asn	Asn	5090	Asn	Ala	Gln	Pro	Val	5095	Leu	Asp	Lys	Leu	Ala	Ile	Glu	Arg	5100
Leu	Thr	Gln	5105	Thr	Val	Asn	Thr	Thr	5110	Lys	Asp	Ala	Leu	His	Gly	Ala	Gln	5115
Lys	Leu	Thr	5125	Gln	Asp	Gln	Gln	Ala	5130	Ala	Glu	Thr	Gly	Ile	Arg	Gly	Leu	5135
Thr	Ser	Leu	5140	Asn	Glu	Pro	Gln	Lys	5145	Asn	Ala	Glu	Val	Ala	Lys	Val	Thr	5150
Ala	Ala	Thr	5155	Thr	Arg	Asp	Glu	Val	5160	Arg	Asn	Ile	Arg	Gln	Glu	Ala	Thr	5165

5170	5175	5180
Thr Leu Asp Thr Ala Met Leu Gly Leu Arg Lys Ser Ile Lys Asp Lys		
5185	5190	5195
Asn Asp Thr Lys Asn Ser Ser Lys Tyr Ile Asn Glu Asp His Asp Gln		5200
	5205	5210
Gln Gln Ala Tyr Asp Asn Ala Val Asn Asn Ala Gln Gln Val Ile Asp		5215
	5220	5225
Glu Thr Gln Ala Thr Leu Ser Ser Asp Thr Ile Asn Gln Leu Ala Asn		5230
	5235	5240
Ala Val Thr Gln Ala Lys Ser Asn Leu His Gly Asp Thr Lys Leu Gln		5245
	5250	5255
His Asp Lys Asp Ser Ala Lys Gln Thr Ile Ala Gln Leu Gln Asn Leu		5260
5265	5270	5275
Asn Ser Ala Gln Lys His Met Glu Asp Ser Leu Ile Asp Asn Glu Ser		5280
	5285	5290
Thr Arg Thr Gln Val Gln His Asp Leu Thr Glu Ala Gln Ala Leu Asp		5295
	5300	5305
Gly Leu Met Gly Ala Leu Lys Glu Ser Ile Lys Asp Tyr Thr Asn Ile		5310
	5315	5320
Val Ser Asn Gly Asn Tyr Ile Asn Ala Glu Pro Ser Lys Lys Gln Ala		5325
	5330	5335
Tyr Asp Ala Ala Val Gln Asn Ala Gln Asn Ile Ile Asn Gly Thr Asn		5340
5345	5350	5355
Gln Pro Thr Ile Asn Lys Gly Asn Val Thr Thr Ala Thr Gln Thr Val		5360
	5365	5370
Lys Asn Thr Lys Asp Ala Leu Asp Gly Asp His Arg Leu Glu Glu Ala		5375
	5380	5385
Lys Asn Asn Ala Asn Gln Thr Ile Arg Asn Leu Ser Asn Leu Asn Asn		5390
	5395	5400
Ala Gln Lys Asp Ala Glu Lys Asn Leu Val Asn Ser Ala Ser Thr Leu		5405
	5410	5415
Glu Gln Val Gln Gln Asn Leu Gln Thr Ala Gln Gln Leu Asp Asn Ala		5420
5425	5430	5435
Met Gly Glu Leu Arg Gln Ser Ile Ala Lys Lys Asp Gln Val Lys Ala		5440
	5445	5450
Asp Ser Lys Tyr Leu Asn Glu Asp Pro Gln Ile Lys Gln Asn Tyr Asp		5455
	5460	5465
Asp Ala Val Gln Arg Val Glu Thr Ile Ile Asn Glu Thr Gln Asn Pro		5470
	5475	5480
Glu Leu Leu Lys Ala Asn Ile Asp Gln Ala Thr Gln Ser Val Gln Asn		5485
	5490	5495
Ala Glu Gln Ala Leu His Gly Ala Glu Lys Leu Asn Gln Asp Lys Gln		5500
5505	5510	5515
Thr Ser Ser Thr Glu Leu Asp Gly Leu Thr Asp Leu Thr Asp Ala Gln		5520
	5525	5530
Arg Glu Lys Leu Arg Glu Gln Ile Asn Thr Ser Asn Ser Arg Asp Asp		5535
	5540	5545
Ile Lys Gln Lys Ile Glu Gln Ala Lys Ala Leu Asn Asp Ala Met Lys		5550
	5555	5560
Lys Leu Lys Glu Gln Val Ala Gln Lys Asp Gly Val His Ala Asn Ser		5565
	5570	5575
Asp Tyr Thr Asn Glu Asp Ser Ala Gln Lys Asp Ala Tyr Asn Asn Ala		5580
5585	5590	5595
Leu Lys Gln Ala Glu Asp Ile Ile Asn Asn Ser Ser Asn Pro Asn Leu		5600
	5605	5610
Asn Ala Gln Asp Ile Thr Asn Ala Leu Asn Asn Ile Lys Gln Ala Gln		5615
	5620	5625
Asp Asn Leu His Gly Ala Gln Lys Leu Gln Gln Asp Lys Asn Thr Thr		5630
	5635	5640
Asn Gln Ala Ile Gly Asn Leu Asn His Leu Asn Gln Pro Gln Lys Asp		5645
	5650	5655
Ala Leu Ile Gln Ala Ile Asn Gly Ala Thr Ser Arg Asp Gln Val Ala		5660
5665	5670	5675
Glu Lys Leu Lys Glu Ala Glu Ala Leu Asp Glu Ala Met Lys Gln Leu		5680
	5685	5690
Glu Asp Gln Val Asn Gln Asp Asp Gln Ile Ser Asn Ser Ser Pro Phe		5695
	5700	5705
Ile Asn Glu Asp Ser Asp Lys Gln Lys Thr Tyr Asn Asp Lys Ile Gln		5710
	5715	5720
Ala Ala Lys Glu Ile Ile Asn Gln Thr Ser Asn Pro Thr Leu Asp Lys		5725
	5730	5735
Gln Lys Ile Ala Asp Thr Leu Gln Asn Ile Lys Asp Ala Val Asn Asn		5740
5745	5750	5755
Leu His Gly Asp Gln Lys Leu Ala Gln Ser Lys Gln Asp Ala Asn Asn		5760
	5765	5770
		5775

Gln Leu Asn His Leu Asp Asp Leu Thr Glu Glu Gln Lys Asn His Phe
5780 5785 5790
Lys Pro Leu Ile Asn Asn Ala Asp Thr Arg Asp Glu Val Asn Lys Gln
5795 5800 5805
Leu Glu Ile Ala Lys Gln Leu Asn Gly Asp Met Ser Thr Leu His Lys
5810 5815 5820
Val Ile Asn Asp Lys Asp Gln Ile Gln His Leu Ser Asn Tyr Ile Asn
5825 5830 5835 5840
Ala Asp Asn Asp Lys Lys Gln Asn Tyr Asp Asn Ala Ile Lys Glu Ala
5845 5850 5855
Glu Asp Leu Ile His Asn His Pro Asp Thr Leu Asp His Lys Ala Leu
5860 5865 5870
Gln Asp Leu Leu Asn Lys Ile Asp Gln Ala His Asn Glu Leu Asn Gly
5875 5880 5885
Glu Ser Arg Phe Lys Gln Ala Leu Asp Asn Ala Leu Asn Asp Ile Asp
5890 5895 5900
Ser Leu Asn Ser Leu Asn Val Pro Gln Arg Gln Thr Val Lys Asp Asn
5905 5910 5915 5920
Ile Asn His Val Thr Thr Leu Glu Ser Leu Ala Gln Glu Leu Gln Lys
5925 5930 5935
Ala Lys Glu Leu Asn Asp Ala Met Lys Ala Met Arg Asp Ser Ile Met
5940 5945 5950
Asn Gln Glu Gln Ile Arg Lys Asn Ser Asn Tyr Thr Asn Glu Asp Leu
5955 5960 5965
Ala Gln Gln Asn Ala Tyr Asn His Ala Val Asp Lys Ile Asn Asn Ile
5970 5975 5980
Ile Gly Glu Asp Asn Ala Thr Met Asp Pro Gln Ile Ile Lys Gln Ala
5985 5990 5995 6000
Thr Gln Asp Ile Asn Thr Ala Ile Asn Gly Leu Asn Gly Asp Gln Lys
6005 6010 6015
Leu Gln Asp Ala Lys Thr Asp Ala Lys Gln Gln Ile Thr Asn Phe Thr
6020 6025 6030
Gly Leu Thr Glu Pro Gln Lys Gln Ala Leu Glu Asn Ile Ile Asn Gln
6035 6040 6045
Gln Thr Ser Arg Ala Asn Val Ala Lys Gln Leu Ser His Ala Lys Phe
6050 6055 6060
Leu Asn Gly Lys Met Glu Glu Leu Lys Val Ala Val Ala Lys Ala Ser
6065 6070 6075 6080
Leu Val Arg Gln Asn Ser Asn Tyr Ile Asn Glu Asp Val Ser Glu Lys
6085 6090 6095
Glu Ala Tyr Glu Gln Ala Ile Ala Lys Gly Gln Glu Ile Ile Asn Ser
6100 6105 6110
Glu Asn Asn Pro Thr Ile Ser Ser Thr Asp Ile Asn Arg Thr Ile Gln
6115 6120 6125
Glu Ile Asn Asp Ala Glu Gln Asn Leu His Gly Asp Asn Lys Leu Arg
6130 6135 6140
Gln Ala Gln Glu Ile Ala Lys Asn Glu Ile Gln Asn Leu Asp Gly Leu
6145 6150 6155 6160
Asn Ser Ala Gln Ile Thr Lys Leu Ile Gln Asp Ile Gly Arg Thr Thr
6165 6170 6175
Thr Lys Pro Ala Val Thr Gln Lys Leu Glu Glu Ala Lys Ala Ile Asn
6180 6185 6190
Gln Ala Met Gln Gln Leu Lys Gln Ser Ile Ala Asp Lys Asp Ala Thr
6195 6200 6205
Leu Asn Ser Ser Asn Tyr Leu Asn Glu Asp Ser Glu Lys Lys Leu Ala
6210 6215 6220
Tyr Asp Asn Ala Val Ser Gln Ala Glu Gln Leu Ile Asn Gln Leu Asn
6225 6230 6235 6240
Asp Pro Thr Met Asp Ile Ser Asn Ile Gln Ala Ile Thr Gln Lys Val
6245 6250 6255
Ile Gln Ala Lys Asp Ser Leu His Gly Ala Asn Lys Leu Ala Gln Asn
6260 6265 6270
Gln Ala Asp Ser Asn Leu Ile Ile Asn Gln Ser Thr Asn Leu Asn Asp
6275 6280 6285
Lys Gln Lys Gln Ala Leu Asn Asp Leu Ile Asn His Ala Gln Thr Lys
6290 6295 6300
Gln Gln Val Ala Glu Ile Ile Ala Gln Ala Asn Lys Leu Asn Asn Glu
6305 6310 6315 6320
Met Gly Thr Leu Lys Thr Leu Val Glu Glu Gln Ser Asn Val His Gln
6325 6330 6335
Gln Ser Lys Tyr Ile Asn Glu Asp Pro Gln Val Gln Asn Ile Tyr Asn
6340 6345 6350
Asp Ser Ile Gln Lys Gly Arg Glu Ile Leu Asn Gly Thr Thr Asp Asp
6355 6360 6365
Val Leu Asn Asn Asn Lys Ile Ala Asp Ala Ile Gln Asn Ile His Leu

6370	6375	6380
Thr Lys Asn Asp Leu His Gly Asp Gln Lys Leu Gln Lys Ala Gln Gln		
6385	6390	6395
Asp Ala Thr Asn Glu Leu Asn Tyr Leu Thr Asn Leu Asn Asn Ser Gln		6400
	6405	6410
Arg Gln Ser Glu His Asp Glu Ile Asn Ser Ala Pro Ser Arg Thr Glu		6415
	6420	6425
Val Ser Asn Asp Leu Asn His Ala Lys Ala Leu Asn Glu Ala Met Arg		6430
	6435	6440
Gln Leu Glu Asn Glu Val Ala Leu Glu Asn Ser Val Lys Lys Leu Ser		6445
	6450	6455
Asp Phe Ile Asn Glu Asp Glu Ala Ala Gln Asn Glu Tyr Ser Asn Ala		6460
6465	6470	6475
Leu Gln Lys Ala Lys Asp Ile Ile Asn Gly Val Pro Ser Ser Thr Leu		6480
	6485	6490
Asp Lys Ala Thr Ile Glu Asp Ala Leu Leu Glu Leu Gln Asn Ala Arg		6495
	6500	6505
Glu Ser Leu His Gly Glu Gln Lys Leu Gln Glu Ala Lys Asn Gln Ala		6510
	6515	6520
Val Ala Glu Ile Asp Asn Leu Gln Ala Leu Asn Pro Gly Gln Val Leu		6525
	6530	6535
Ala Glu Lys Thr Leu Val Asn Gln Ala Ser Thr Lys Pro Glu Val Gln		6540
6545	6550	6555
Glu Ala Leu Gln Lys Ala Lys Glu Leu Asn Glu Ala Met Lys Ala Leu		6560
	6565	6570
Lys Thr Glu Ile Asn Lys Lys Glu Gln Ile Lys Ala Asp Ser Arg Tyr		6575
	6580	6585
Val Asn Ala Asp Ser Gly Leu Gln Ala Asn Tyr Asn Ser Ala Leu Asn		6590
	6595	6600
Tyr Gly Ser Gln Ile Ile Ala Thr Thr Gln Pro Pro Glu Leu Asn Lys		6605
	6610	6615
Asp Val Ile Asn Arg Ala Thr Gln Thr Ile Lys Thr Ala Glu Asn Asn		6620
6625	6630	6635
Leu Asn Gly Gln Ser Lys Leu Ala Glu Ala Lys Ser Asp Gly Asn Gln		6640
	6645	6650
Ser Ile Glu His Leu Gln Gly Leu Thr Gln Ser Gln Lys Asp Lys Gln		6655
	6660	6665
His Asp Leu Ile Asn Gln Ala Gln Thr Lys Gln Gln Val Asp Asp Ile		6670
	6675	6680
Val Asn Asn Ser Lys Gln Leu Asp Asn Ser Met Asn Gln Leu Gln Gln		6685
	6690	6695
Ile Val Asn Asn Asp Asn Thr Val Lys Gln Asn Ser Asp Phe Ile Asn		6700
6705	6710	6715
Glu Asp Ser Ser Gln Gln Asp Ala Tyr Asn His Ala Ile Gln Ala Ala		6720
	6725	6730
Lys Asp Leu Ile Thr Ala His Pro Thr Ile Met Asp Lys Asn Gln Ile		6735
	6740	6745
Asp Gln Ala Ile Glu Asn Ile Lys Gln Ala Leu Asn Asp Leu His Gly		6750
	6755	6760
Ser Asn Lys Leu Ser Glu Asp Lys Lys Glu Ala Ser Glu Gln Leu Gln		6765
	6770	6775
Asn Leu Asn Ser Leu Thr Asn Gly Gln Lys Asp Thr Ile Leu Asn His		6780
6785	6790	6795
Ile Phe Ser Ala Pro Thr Arg Ser Gln Val Gly Glu Lys Ile Ala Ser		6800
	6805	6810
Ala Lys Gln Leu Asn Asn Thr Met Lys Ala Leu Arg Asp Ser Ile Ala		6815
	6820	6825
Asp Asn Asn Glu Ile Leu Gln Ser Ser Lys Tyr Phe Asn Glu Asp Ser		6830
	6835	6840
Glu Gln Gln Asn Ala Tyr Asn Gln Ala Val Asn Lys Ala Lys Asn Ile		6845
	6850	6855
Ile Asn Asp Gln Pro Thr Pro Val Met Ala Asn Asp Glu Ile Gln Ser		6860
6865	6870	6875
Val Leu Asn Glu Val Lys Gln Thr Lys Asp Asn Leu His Gly Asp Gln		6880
	6885	6890
Lys Leu Ala Asn Asp Lys Thr Asp Ala Gln Ala Thr Leu Asn Ala Leu		6895
	6900	6905
Asn Tyr Leu Asn Gln Ala Gln Arg Gly Asn Leu Glu Thr Lys Val Gln		6910
	6915	6920
Asn Ser Asn Ser Arg Pro Glu Val Gln Lys Val Val Gln Leu Ala Asn		6925
	6930	6935
Gln Leu Asn Asp Ala Met Lys Lys Leu Asp Asp Ala Leu Thr Gly Asn		6940
6945	6950	6955
Asp Ala Ile Lys Gln Thr Ser Asn Tyr Ile Asn Glu Asp Thr Ser Gln		6960
	6965	6970
		6975

Gln Val Asn Phe Asp Glu Tyr Thr Asp Arg Gly Lys Asn Ile Val Ala
6980 6985 6990
Glu Gln Thr Asn Pro Asn Met Ser Pro Thr Asn Ile Asn Thr Ile Ala
6995 7000 7005
Asp Lys Ile Thr Glu Ala Lys Asn Asp Leu His Gly Val Gln Lys Leu
7010 7015 7020
Lys Gln Ala Gln Gln Ser Ile Asn Thr Ile Asn Gln Met Thr Gly
7025 7030 7035 7040
Leu Asn Gln Ala Gln Lys Glu Gln Leu Asn Gln Glu Ile Gln Gln Thr
7045 7050 7055
Gln Thr Arg Ser Glu Val His Gln Val Ile Asn Lys Ala Gln Ala Leu
7060 7065 7070
Asn Asp Ser Met Asn Thr Leu Arg Gln Ser Ile Thr Asp Glu His Glu
7075 7080 7085
Val Lys Gln Thr Ser Asn Tyr Ile Asn Glu Thr Val Gly Asn Gln Thr
7090 7095 7100
Ala Tyr Asn Asn Ala Val Asp Arg Val Lys Gln Ile Ile Asn Gln Thr
7105 7110 7115 7120
Ser Asn Pro Thr Met Asn Pro Leu Glu Val Glu Arg Ala Thr Ser Asn
7125 7130 7135
Val Lys Ile Ser Lys Asp Ala Leu His Gly Glu Arg Glu Leu Asn Asp
7140 7145 7150
Asn Lys Asn Ser Lys Thr Phe Ala Val Asn His Leu Asp Asn Leu Asn
7155 7160 7165
Gln Ala Gln Lys Glu Ala Leu Thr His Glu Ile Glu Gln Ala Thr Ile
7170 7175 7180
Val Ser Gln Val Asn Asn Ile Tyr Asn Lys Ala Lys Ala Leu Asn Asn
7185 7190 7195 7200
Asp Met Lys Lys Leu Lys Asp Ile Val Ala Gln Gln Asp Asn Val Arg
7205 7210 7215
Gln Ser Asn Asn Tyr Ile Asn Glu Asp Ser Thr Pro Gln Asn Met Tyr
7220 7225 7230
Asn Asp Thr Ile Asn His Ala Gln Ser Ile Ile Asp Gln Val Ala Asn
7235 7240 7245
Pro Thr Met Ser His Asp Glu Ile Glu Asn Ala Ile Asn Asn Ile Lys
7250 7255 7260
His Ala Ile Asn Ala Leu Asp Gly Glu His Lys Leu Gln Gln Ala Lys
7265 7270 7275 7280
Glu Asn Ala Asn Leu Leu Ile Asn Ser Leu Asn Asp Leu Asn Ala Pro
7285 7290 7295
Gln Arg Asp Ala Ile Asn Arg Leu Val Asn Glu Ala Gln Thr Arg Glu
7300 7305 7310
Lys Val Ala Glu Gln Leu Gln Ser Ala Gln Ala Leu Asn Asp Ala Met
7315 7320 7325
Lys His Leu Arg Asn Ser Ile Gln Asn Gln Ser Ser Val Arg Gln Glu
7330 7335 7340
Ser Lys Tyr Ile Asn Ala Ser Asp Ala Lys Lys Glu Gln Tyr Asn His
7345 7350 7355 7360
Ala Val Arg Glu Val Glu Asn Ile Ile Asn Glu Gln His Pro Thr Leu
7365 7370 7375
Asp Lys Glu Ile Ile Lys Gln Leu Thr Asp Gly Val Asn Gln Ala Asn
7380 7385 7390
Asn Asp Leu Asn Gly Val Glu Leu Leu Asp Ala Asp Lys Gln Asn Ala
7395 7400 7405
His Gln Ser Ile Pro Thr Leu Met His Leu Asn Gln Ala Gln Gln Asn
7410 7415 7420
Ala Leu Asn Glu Lys Ile Asn Asn Ala Val Thr Arg Thr Glu Val Ala
7425 7430 7435 7440
Ala Ile Ile Gly Gln Ala Lys Leu Leu Asp His Ala Met Glu Asn Leu
7445 7450 7455
Glu Glu Ser Ile Lys Asp Lys Glu Gln Val Lys Gln Ser Ser Asn Tyr
7460 7465 7470
Ile Asn Glu Asp Ser Asp Val Gln Glu Thr Tyr Asp Asn Ala Val Asp
7475 7480 7485
His Val Thr Glu Ile Leu Asn Gln Thr Val Asn Pro Thr Leu Ser Ile
7490 7495 7500
Glu Asp Ile Glu His Ala Ile Asn Glu Val Asn Gln Ala Lys Lys Gln
7505 7510 7515 7520
Leu Arg Gly Lys Gln Lys Leu Tyr Gln Thr Ile Asp Leu Ala Asp Lys
7525 7530 7535
Glu Leu Ser Lys Leu Asp Asp Leu Thr Ser Gln Gln Ser Ser Ile
7540 7545 7550
Ser Asn Gln Ile Tyr Thr Ala Lys Thr Arg Thr Glu Val Ala Gln Ala
7555 7560 7565
Ile Glu Lys Ala Lys Ser Leu Asn His Ala Met Lys Ala Leu Asn Lys

7570	7575	7580
Val Tyr Lys Asn Ala Asp Lys Val Leu Asp Ser Ser Arg Phe Ile Asn		
7585	7590	7595
Glu Asp Gln Pro Glu Lys Lys Ala Tyr Gln Gln Ala Ile Asn His Val		7600
	7605	7610
Asp Ser Ile Ile His Arg Gln Thr Asn Pro Glu Met Asp Pro Thr Val		7615
	7620	7625
Ile Asn Ser Ile Thr His Glu Leu Glu Thr Ala Gln Asn Asn Leu His		7630
	7635	7640
Gly Asp Gln Lys Leu Ala His Ala Gln Gln Asp Ala Ala Asn Val Ile		7645
	7650	7655
Asn Gly Leu Ile His Leu Asn Val Ala Gln Arg Glu Val Met Ile Asn		7660
7665	7670	7675
Thr Asn Thr Asn Ala Thr Thr Arg Glu Lys Val Ala Lys Asn Leu Asp		7680
	7685	7690
Asn Ala Gln Ala Leu Asp Lys Ala Met Glu Thr Leu Gln Gln Val Val		7695
	7700	7705
Ala His Lys Asn Asn Ile Leu Asn Asp Ser Lys Tyr Leu Asn Glu Asp		7710
	7715	7720
Ser Lys Tyr Gln Gln Gln Tyr Asp Arg Val Ile Ala Asp Ala Glu Gln		7725
	7730	7735
Leu Leu Asn Gln Thr Thr Asn Pro Thr Leu Glu Pro Tyr Lys Val Asp		7740
7745	7750	7755
Ile Val Lys Asp Asn Val Leu Ala Asn Glu Lys Ile Leu Phe Gly Ala		7760
	7765	7770
Glu Lys Leu Ser Tyr Asp Lys Ser Asn Ala Asn Asp Glu Ile Lys His		7775
	7780	7785
Met Asn Tyr Leu Asn Asn Ala Gln Lys Gln Ser Ile Lys Asp Met Ile		7790
	7795	7800
Ser His Ala Ala Leu Arg Thr Glu Val Lys Gln Leu Leu Gln Gln Ala		7805
	7810	7815
Lys Ile Leu Asp Glu Ala Met Lys Ser Leu Glu Asp Lys Thr Gln Val		7820
7825	7830	7835
Val Ile Thr Asp Thr Thr Leu Pro Asn Tyr Thr Glu Ala Ser Glu Asp		7840
	7845	7850
Lys Lys Glu Lys Val Asp Gln Thr Val Ser His Ala Gln Ala Ile Ile		7855
	7860	7865
Asp Lys Ile Asn Gly Ser Asn Val Ser Leu Asp Gln Val Arg Gln Ala		7870
	7875	7880
Leu Glu Gln Leu Thr Gln Ala Ser Glu Asn Leu Asp Gly Asp Gln Arg		7885
	7890	7895
Val Glu Glu Ala Lys Val His Ala Asn Gln Thr Ile Asp Gln Leu Thr		7900
7905	7910	7915
His Leu Asn Ser Leu Gln Gln Gln Thr Ala Lys Glu Ser Val Lys Asn		7920
	7925	7930
Ala Thr Lys Leu Glu Glu Ile Ala Thr Val Ser Asn Asn Ala Gln Ala		7935
	7940	7945
Leu Asn Lys Val Met Gly Lys Leu Glu Gln Phe Ile Asn His Ala Asp		7950
	7955	7960
Ser Val Glu Asn Ser Asp Asn Tyr Arg Gln Ala Asp Asp Asp Lys Ile		7965
	7970	7975
Ile Ala Tyr Asp Glu Ala Leu Glu His Gly Gln Asp Ile Gln Lys Thr		7980
7985	7990	7995
Asn Ala Thr Gln Asn Glu Thr Lys Gln Ala Leu Gln Gln Leu Ile Tyr		8000
	8005	8010
Ala Glu Thr Ser Leu Asn Gly Phe Glu Arg Leu Asn His Ala Arg Pro		8015
	8020	8025
Arg Ala Leu Glu Tyr Ile Lys Ser Leu Glu Lys Ile Asn Asn Ala Gln		8030
	8035	8040
Lys Ser Ala Leu Glu Asp Lys Val Thr Gln Ser His Asp Leu Leu Glu		8045
	8050	8055
Leu Glu His Ile Val Asn Glu Gly Thr Asn Leu Asn Asp Ile Met Gly		8060
8065	8070	8075
Glu Leu Ala Asn Ala Ile Val Asn Asn Tyr Ala Pro Thr Lys Ala Ser		8080
	8085	8090
Ile Asn Tyr Ile Asn Ala Asp Asn Leu Arg Lys Asp Asn Phe Thr Gln		8095
	8100	8105
Ala Ile Asn Asn Ala Arg Asp Ala Leu Asn Lys Thr Gln Gly Gln Asn		8110
	8115	8120
Leu Asp Phe Asn Ala Ile Asp Thr Phe Lys Asp Asp Ile Phe Lys Thr		8125
	8130	8135
Lys Asp Ala Leu Asn Gly Ile Glu Arg Leu Thr Ala Ala Lys Ser Lys		8140
8145	8150	8155
Ala Glu Lys Leu Ile Asp Ser Leu Lys Phe Ile Asn Lys Ala Gln Phe		8160
	8165	8170
		8175

Thr	His	Ala	Asn	Asp	Glu	Ile	Met	Asn	Thr	Asn	Ser	Ile	Ala	Gln	Leu	8180	8185	8190
Ser	Arg	Ile	Val	Asn	Gln	Ala	Phe	Asp	Leu	Asn	Asp	Ala	Met	Lys	Ser	8195	8200	8205
Leu	Arg	Asp	Glu	Leu	Asn	Asn	Gln	Ala	Phe	Pro	Val	Gln	Ala	Ser	Ser	8210	8215	8220
Asn	Tyr	Ile	Asn	Ser	Asp	Glu	Asp	Leu	Lys	Gln	Gln	Phe	Asp	His	Ala	8225	8230	8235
Leu	Ser	Asn	Ala	Arg	Lys	Val	Leu	Ala	Lys	Glu	Asn	Gly	Lys	Asn	Leu	8245	8250	8255
Asp	Glu	Lys	Gln	Ile	Gln	Gly	Leu	Lys	Gln	Val	Ile	Glu	Asp	Thr	Lys	8260	8265	8270
Asp	Ala	Leu	Asn	Gly	Ile	Gln	Arg	Leu	Ser	Lys	Ala	Lys	Ala	Lys	Ala	8275	8280	8285
Ile	Gln	Tyr	Val	Gln	Ser	Leu	Ser	Tyr	Ile	Asn	Asp	Ala	Gln	Arg	His	8290	8295	8300
Ile	Ala	Glu	Asn	Asn	Ile	His	Asn	Ser	Asp	Asp	Leu	Ser	Ser	Leu	Ala	8305	8310	8315
Asn	Thr	Leu	Ser	Lys	Ala	Ser	Asp	Leu	Asp	Asn	Ala	Met	Lys	Asp	Leu	8325	8330	8335
Arg	Asp	Thr	Ile	Glu	Ser	Asn	Ser	Thr	Ser	Val	Pro	Asn	Ser	Val	Asn	8340	8345	8350
Tyr	Ile	Asn	Ala	Asp	Lys	Asn	Leu	Gln	Ile	Glu	Phe	Asp	Glu	Ala	Leu	8355	8360	8365
Gln	Gln	Ala	Ser	Ala	Thr	Ser	Ser	Lys	Thr	Ser	Glu	Asn	Pro	Ala	Thr	8370	8375	8380
Ile	Glu	Glu	Val	Leu	Gly	Leu	Ser	Gln	Ala	Ile	Tyr	Asp	Thr	Lys	Asn	8385	8390	8395
Ala	Leu	Asn	Gly	Glu	Gln	Arg	Leu	Ala	Thr	Glu	Lys	Ser	Lys	Asp	Leu	8405	8410	8415
Lys	Leu	Ile	Lys	Gly	Leu	Lys	Asp	Leu	Asn	Lys	Ala	Gln	Leu	Glu	Asp	8420	8425	8430
Val	Thr	Asn	Lys	Val	Asn	Ser	Ala	Asn	Thr	Leu	Thr	Glu	Leu	Ser	Gln	8435	8440	8445
Leu	Thr	Gln	Ser	Thr	Leu	Glu	Leu	Asn	Asp	Lys	Met	Lys	Leu	Leu	Arg	8450	8455	8460
Asp	Lys	Leu	Lys	Thr	Leu	Val	Asn	Pro	Val	Lys	Ala	Ser	Leu	Asn	Tyr	8465	8470	8475
Arg	Asn	Ala	Asp	Tyr	Asn	Leu	Lys	Arg	Gln	Phe	Asn	Lys	Ala	Leu	Lys	8485	8490	8495
Glu	Ala	Lys	Gly	Val	Leu	Asn	Lys	Asn	Ser	Gly	Thr	Asn	Val	Asn	Ile	8500	8505	8510
Asn	Asp	Ile	Gln	His	Leu	Leu	Thr	Gln	Ile	Asp	Asn	Ala	Lys	Asp	Gln	8515	8520	8525
Leu	Asn	Gly	Glu	Arg	Arg	Leu	Lys	Glu	His	Gln	Gln	Lys	Ser	Glu	Val	8530	8535	8540
Phe	Ile	Ile	Lys	Glu	Leu	Asp	Ile	Leu	Asn	Asn	Ala	Gln	Lys	Ala	Ala	8545	8550	8555
Ile	Ile	Asn	Gln	Ile	Arg	Ala	Ser	Lys	Asp	Ile	Lys	Ile	Ile	Asn	Gln	8565	8570	8575
Ile	Val	Asp	Asn	Ala	Ile	Glu	Leu	Asn	Asp	Ala	Met	Gln	Gly	Leu	Lys	8580	8585	8590
Glu	His	Val	Ala	Gln	Leu	Thr	Ala	Thr	Thr	Lys	Asp	Asn	Ile	Glu	Tyr	8595	8600	8605
Leu	Asn	Ala	Asp	Glu	Asp	His	Lys	Leu	Gln	Tyr	Asp	Tyr	Ala	Ile	Asn	8610	8615	8620
Leu	Ala	Asn	Asn	Val	Leu	Asp	Lys	Glu	Asn	Gly	Thr	Asn	Lys	Asp	Ala	8625	8630	8635
Asn	Ile	Ile	Ile	Gly	Met	Ile	Gln	Asn	Met	Asp	Asp	Ala	Arg	Ala	Leu	8645	8650	8655
Leu	Asn	Gly	Ile	Glu	Arg	Leu	Lys	Asp	Ala	Gln	Thr	Lys	Ala	His	Asn	8660	8665	8670
Asp	Ile	Lys	Asp	Thr	Leu	Lys	Arg	Gln	Leu	Asp	Glu	Ile	Glu	His	Ala	8675	8680	8685
Asn	Ala	Thr	Ser	Asn	Ser	Lys	Ala	Gln	Ala	Lys	Gln	Met	Val	Asn	Glu	8690	8695	8700
Glu	Ala	Arg	Lys	Ala	Leu	Ser	Asn	Ile	Asn	Asp	Ala	Thr	Ser	Asn	Asp	8705	8710	8715
Leu	Val	Asn	Gln	Ala	Lys	Asp	Glu	Gly	Gln	Ser	Ala	Ile	Glu	His	Ile	8725	8730	8735
His	Ala	Asp	Glu	Leu	Pro	Lys	Ala	Lys	Leu	Asp	Ala	Asn	Gln	Met	Ile	8740	8745	8750
Asp	Gln	Lys	Val	Glu	Asp	Ile	Asn	His	Leu	Ile	Ser	Gln	Asn	Pro	Asn	8755	8760	8765

Leu Ser Asn Glu Glu Lys Asn Lys Leu Ile Ser Gln Ile Asn Lys Leu
 8770 8775 8780
 Val Asn Gly Ile Lys Asn Glu Ile Gln Gln Ala Ile Asn Lys Gln Gln
 8785 8790 8795 8800
 Ile Glu Asn Ala Thr Thr Lys Leu Asp Glu Val Ile Glu Thr Thr Lys
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 Lys Leu Ile Ile Ala Lys Ala Glu Ala Lys Gln Met Ile Lys Glu Leu
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 Ser Gln Lys Lys Arg Asp Ala Ile Asn Asn Asn Thr Asp Leu Thr Pro
 8835 8840 8845
 Ser Gln Lys Ala His Ala Leu Ala Asp Ile Asp Lys Thr Glu Lys Asp
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 Ala Leu Gln His Ile Glu Asn Ser Asn Ser Ile Asp Asp Ile Asn Asn
 8865 8870 8875 8880
 Asn Lys Glu His Ala Phe Asn Thr Leu Ala His Ile Ile Ile Trp Asp
 8885 8890 8895
 Thr Asp Gln Gln Pro Leu Val Phe Glu Leu Pro Glu Leu Ser Leu Gln
 8900 8905 8910
 Asn Ala Leu Val Thr Ser Glu Val Val Val His Arg Asp Glu Thr Ile
 8915 8920 8925
 Ser Leu Glu Ser Ile Ile Gly Ala Met Thr Leu Thr Asp Glu Leu Lys
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 Val Asn Ile Val Ser Leu Pro Asn Thr Asp Lys Val Ala Asp His Leu
 8945 8950 8955 8960
 Thr Ala Lys Val Lys Val Ile Leu Ala Asp Gly Ser Tyr Val Thr Val
 8965 8970 8975
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 Ala Glu Ile Glu Arg Leu Lys Lys Gln Ala Ile Asp Lys Val Asn His
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 Ser Lys Ser Ile Lys Asp Ile Glu Thr Val Lys Arg Thr Asp Phe Glu
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 Glu Ile Asp Gln Phe Asp Pro Lys Arg Phe Thr Leu Asn Lys Ala Lys
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 Lys Asp Ile Ile Thr Asp Val Asn Thr Gln Ile Gln Asn Gly Phe Lys
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 Glu Ile Glu Thr Ile Lys Gly Leu Thr Ser Asn Glu Lys Thr Gln Phe
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 Asp Lys Gln Leu Thr Ala Leu Gln Lys Glu Phe Leu Glu Lys Val Glu
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 His Ala His Asn Leu Val Glu Leu Asn Gln Leu Gln Gln Glu Phe Asn
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 Asn Arg Tyr Lys His Ile Leu Asn Gln Ala His Leu Leu Gly Glu Lys
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 His Ile Ala Glu His Lys Leu Gly Tyr Val Val Val Asn Lys Thr Gln
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 Gln Ile Leu Asn Asn Gln Ser Ala Ser Tyr Phe Ile Lys Gln Trp Ala
 9170 9175 9180
 Leu Asp Arg Ile Lys Gln Ile Gln Leu Glu Thr Met Asn Ser Ile Arg
 9185 9190 9195 9200
 Gly Ala His Thr Val Gln Asp Val His Lys Ala Leu Leu Gln Gly Ile
 9205 9210 9215
 Glu Gln Ile Leu Lys Val Asn Val Ser Ile Ile Asn Gln Ser Phe Asn
 9220 9225 9230
 Asp Ser Leu His Asn Phe Asn Tyr Leu His Ser Lys Phe Asp Ala Arg
 9235 9240 9245
 Leu Arg Glu Lys Asp Val Ala Asn His Ile Val Gln Thr Glu Thr Phe
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 Lys Glu Val Leu Lys Gly Thr Gly Val Glu Pro Gly Lys Ile Asn Lys
 9265 9270 9275 9280
 Glu Thr Gln Gln Pro Lys Leu His Lys Asn Asp Asn Asp Ser Leu Phe
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 Lys His Leu Val Asp Asn Phe Gly Lys Thr Val Gly Val Ile Thr Leu
 9300 9305 9310
 Thr Gly Leu Leu Ser Ser Phe Trp Leu Val Leu Ala Lys Arg Arg Lys
 9315 9320 9325
 Lys Glu Glu Glu Glu Lys Gln Ser Ile Lys Asn His His Lys Asp Ile
 9330 9335 9340
 Arg Leu Ser Asp Thr Asp Lys Ile Asp Pro Ile Val Ile Thr Lys Arg
 9345 9350 9355 9360

Lys Ile Asp Lys Glu Glu Gln Ile Gln Asn Asp Asp Lys His Ser Ile
 9365 9370 9375
 Pro Val Ala Lys His Lys Lys Ser Lys Glu Lys Gln Leu Ser Glu Glu
 9380 9385 9390
 Asp Ile His Ser Ile Pro Val Val Lys Arg Lys Gln Asn Ser Asp Asn
 9395 9400 9405
 Lys Asp Thr Lys Gln Lys Lys Val Thr Ser Lys Lys Lys Lys Thr Pro
 9410 9415 9420
 Gln Ser Thr Lys Lys Val Val Lys Thr Lys Lys Arg Ser Lys Lys
 9425 9430 9435

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 Ser Ile Leu Ile Gly Ser Leu Met Tyr Leu Gly Thr Gln Gln Glu Ala
 35 40 45
 Glu Ala Ala Glu Asn Asn Ile Glu Asn Pro Thr Thr Leu Lys Asp Asn
 50 55 60
 Val Gln Ser Lys Glu Val Lys Ile Glu Glu Val Thr Asn Lys Asp Thr
 65 70 75 80
 Ala Pro Gln Gly Val Glu Ala Lys Ser Glu Val Thr Ser Asn Lys Asp
 85 90 95
 Thr Ile Glu His Glu Ala Ser Val Lys Ala Glu Asp Ile Ser Lys Lys
 100 105 110
 Glu Asp Thr Pro Lys Glu Val Ala Asn Val Ala Glu Val Gln Pro Lys
 115 120 125
 Ser Ser Val Thr His Asn Ala Glu Ala Pro Lys Val Arg Lys Ala Arg
 130 135 140
 Ser Val Asp Glu Gly Ser Phe Asp Ile Thr Arg Asp Ser Lys Asn Val
 145 150 155 160
 Val Glu Ser Thr Pro Ile Thr Ile Gln Gly Lys Glu His Phe Glu Gly
 165 170 175
 Tyr Gly Ser Val Asp Ile Gln Lys Asn Pro Thr Asp Leu Gly Val Ser
 180 185 190
 Glu Val Thr Arg Phe Asn Val Gly Asn Glu Ser Asn Gly Leu Ile Gly
 195 200 205
 Ala Leu Gln Leu Lys Asn Lys Ile Asp Phe Ser Lys Asp Phe Asn Phe
 210 215 220
 Lys Val Arg Val Ala Asn Asn His Gln Ser Asn Thr Thr Gly Ala Asp
 225 230 235 240
 Gly Trp Gly Phe Leu Phe Ser Lys Gly Asn Ala Glu Glu Tyr Leu Thr
 245 250 255
 Asn Gly Gly Ile Leu Gly Asp Lys Gly Leu Val Asn Ser Gly Gly Phe
 260 265 270
 Lys Ile Asp Thr Gly Tyr Ile Tyr Thr Ser Ser Met Asp Lys Thr Glu
 275 280 285
 Lys Gln Ala Gly Gln Gly Tyr Arg Gly Tyr Gly Ala Phe Val Lys Asn
 290 295 300
 Asp Ser Ser Gly Asn Ser Gln Met Val Gly Glu Asn Ile Asp Lys Ser
 305 310 315 320
 Lys Thr Asn Phe Leu Asn Tyr Ala Asp Asn Ser Thr Asn Thr Ser Asp
 325 330 335
 Gly Lys Phe His Gly Gln Arg Leu Asn Asp Val Ile Leu Thr Tyr Val
 340 345 350
 Ala Ser Thr Gly Lys Met Arg Ala Glu Tyr Ala Gly Lys Thr Trp Glu
 355 360 365
 Thr Ser Ile Thr Asp Leu Gly Leu Ser Lys Asn Gln Ala Tyr Asn Phe
 370 375 380
 Leu Ile Thr Ser Ser Gln Arg Trp Gly Leu Asn Gln Gly Ile Asn Ala
 385 390 395 400
 Asn Gly Trp Met Arg Thr Asp Leu Lys Gly Ser Glu Phe Thr Phe Thr
 405 410 415
 Pro Glu Ala Pro Lys Thr Ile Thr Glu Leu Glu Lys Lys Val Glu Glu
 420 425 430
 Ile Pro Phe Lys Lys Glu Arg Lys Phe Asn Pro Asp Leu Ala Pro Gly

Thr	Glu	Lys	Val	Thr	Arg	Glu	Gly	Gln	Lys	Gly	Glu	Lys	Thr	Ile	Thr
435	450					440					445				
Thr	Pro	Thr	Leu	Lys	Asn	Pro	Leu	Thr	Gly	Glu	Ile	Ile	Ser	Lys	Gly
465					470					475					480
Glu	Ser	Lys	Glu	Glu	Ile	Thr	Lys	Asp	Pro	Ile	Asn	Glu	Leu	Thr	Glu
			485						490					495	
Tyr	Gly	Pro	Glu	Thr	Ile	Ala	Pro	Gly	His	Arg	Asp	Glu	Phe	Asp	Pro
			500					505					510		
Lys	Leu	Pro	Thr	Gly	Glu	Lys	Glu	Glu	Val	Pro	Gly	Lys	Pro	Gly	Ile
		515					520					525			
Lys	Asn	Pro	Glu	Thr	Gly	Asp	Val	Val	Arg	Pro	Pro	Val	Asp	Ser	Val
530					535						540				
Thr	Lys	Tyr	Gly	Pro	Val	Lys	Gly	Asp	Ser	Ile	Val	Glu	Lys	Glu	Glu
545					550					555					560
Ile	Pro	Phe	Glu	Lys	Glu	Arg	Lys	Phe	Asn	Pro	Asp	Leu	Ala	Pro	Gly
			565						570					575	
Thr	Glu	Lys	Val	Thr	Arg	Glu	Gly	Gln	Lys	Gly	Glu	Lys	Thr	Ile	Thr
			580					585					590		
Thr	Pro	Thr	Leu	Lys	Asn	Pro	Leu	Thr	Gly	Glu	Ile	Ile	Ser	Lys	Gly
		595					600					605			
Glu	Ser	Lys	Glu	Glu	Ile	Thr	Lys	Asp	Pro	Ile	Asn	Glu	Leu	Thr	Glu
610					615						620				
Tyr	Gly	Pro	Glu	Thr	Ile	Ala	Pro	Gly	His	Arg	Asp	Glu	Phe	Asp	Pro
625					630					635					640
Lys	Leu	Pro	Thr	Gly	Glu	Lys	Glu	Glu	Val	Pro	Gly	Lys	Pro	Gly	Ile
			645						650					655	
Lys	Asn	Pro	Glu	Thr	Gly	Asp	Val	Val	Arg	Pro	Pro	Val	Asp	Ser	Val
		660					665						670		
Thr	Lys	Tyr	Gly	Pro	Val	Lys	Gly	Asp	Ser	Ile	Val	Glu	Lys	Glu	Glu
		675					680					685			
Ile	Pro	Phe	Lys	Lys	Glu	Arg	Lys	Phe	Asn	Pro	Asp	Leu	Ala	Pro	Gly
690					695						700				
Thr	Glu	Lys	Val	Thr	Arg	Glu	Gly	Gln	Lys	Gly	Glu	Lys	Thr	Ile	Thr
705					710					715					720
Thr	Pro	Thr	Leu	Lys	Asn	Pro	Leu	Thr	Gly	Glu	Ile	Ile	Ser	Lys	Gly
			725						730					735	
Glu	Ser	Lys	Glu	Glu	Ile	Thr	Lys	Asp	Pro	Ile	Asn	Glu	Leu	Thr	Glu
			740					745					750		
Tyr	Gly	Pro	Glu	Thr	Ile	Thr	Pro	Gly	His	Arg	Asp	Glu	Phe	Asp	Pro
		755					760					765			
Lys	Leu	Pro	Thr	Gly	Glu	Lys	Glu	Glu	Val	Pro	Gly	Lys	Pro	Gly	Ile
		770					775				780				
Lys	Asn	Pro	Glu	Thr	Gly	Asp	Val	Val	Arg	Pro	Pro	Val	Asp	Ser	Val
785					790					795					800
Thr	Lys	Tyr	Gly	Pro	Val	Lys	Gly	Asp	Ser	Ile	Val	Glu	Lys	Glu	Glu
			805						810					815	
Ile	Pro	Phe	Glu	Lys	Glu	Arg	Lys	Phe	Asn	Pro	Asp	Leu	Ala	Pro	Gly
		820						825					830		
Thr	Glu	Lys	Val	Thr	Arg	Glu	Gly	Gln	Lys	Gly	Glu	Lys	Thr	Ile	Thr
		835					840					845			
Thr	Pro	Thr	Leu	Lys	Asn	Pro	Leu	Thr	Gly	Glu	Ile	Ile	Ser	Lys	Gly
		850					855					860			
Glu	Ser	Lys	Glu	Glu	Ile	Thr	Lys	Asp	Pro	Val	Asn	Glu	Leu	Thr	Glu
865					870					875					880
Phe	Gly	Gly	Glu	Lys	Ile	Pro	Gln	Gly	His	Lys	Asp	Ile	Phe	Asp	Pro
			885						890					895	
Asn	Leu	Pro	Thr	Asp	Gln	Thr	Glu	Lys	Val	Pro	Gly	Lys	Pro	Gly	Ile
		900						905					910		
Lys	Asn	Pro	Asp	Thr	Gly	Lys	Val	Ile	Glu	Glu	Pro	Val	Asp	Asp	Val
		915					920					925			
Ile	Lys	His	Gly	Pro	Lys	Thr	Gly	Thr	Pro	Glu	Thr	Lys	Thr	Val	Glu
		930					935					940			
Ile	Pro	Phe	Glu	Thr	Lys	Arg	Glu	Phe	Asn	Pro	Lys	Leu	Gln	Pro	Gly
945					950					955					960
Glu	Glu	Arg	Val	Lys	Gln	Glu	Gly	Gln	Pro	Gly	Ser	Lys	Thr	Ile	Thr
			965						970					975	
Thr	Pro	Ile	Thr	Val	Asn	Pro	Leu	Thr	Gly	Glu	Lys	Val	Gly	Glu	Gly
			980					985					990		
Gln	Pro	Thr	Glu	Glu	Ile	Thr	Lys	Gln	Pro	Val	Asp	Lys	Ile	Val	Glu
		995					1000					1005			
Phe	Gly	Gly	Glu	Lys	Pro	Lys	Asp	Pro	Lys	Gly	Pro	Glu	Asn	Pro	Glu
1010						1015						1020			
Lys	Pro	Ser	Arg	Pro	Thr	His	Pro	Ser	Gly	Pro	Val	Asn	Pro	Asn	Asn
1025					1030					1035					1040

Pro Gly Leu Ser Lys Asp Arg Ala Lys Pro Asn Gly Pro Val His Ser
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 Met Asp Lys Asn Asp Lys Val Lys Lys Ser Lys Ile Ala Lys Glu Ser
 1060 1065 1070
 Val Ala Asn Gln Glu Lys Lys Arg Ala Glu Leu Pro Lys Thr Gly Leu
 1075 1080 1085
 Glu Ser Thr Gln Lys Gly Leu Ile Phe Ser Ser Ile Ile Gly Ile Ala
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 Gly Leu Met Leu Leu Ala Arg Arg Arg Lys Asn
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 Met Gly Lys Arg Arg Gln Gly Pro Ile Asn Lys Lys Val Asp Phe Leu
 1 5 10 15
 Pro Asn Lys Leu Asn Lys Tyr Ser Ile Arg Lys Phe Thr Val Gly Thr
 20 25 30
 Ala Ser Ile Leu Leu Gly Ser Thr Leu Ile Phe Gly Ser Ser Ser His
 35 40 45
 Glu Ala Lys Ala Ala Glu Glu Lys Gln Val Asp Pro Ile Thr Gln Ala
 50 55 60
 Asn Gln Asn Asp Ser Ser Glu Arg Ser Leu Glu Asn Thr Asn Gln Pro
 65 70 75 80
 Thr Val Asn Asn Glu Ala Pro Gln Met Ser Ser Thr Leu Gln Ala Glu
 85 90 95
 Glu Gly Ser Asn Ala Glu Ala Pro Asn Val Pro Thr Ile Lys Ala Asn
 100 105 110
 Ser Asp Asn Asp Thr Gln Thr Gln Phe Ser Glu Ala Pro Thr Arg Asn
 115 120 125
 Asp Leu Ala Arg Lys Glu Asp Ile Pro Ala Val Ser Lys Asn Glu Glu
 130 135 140
 Leu Gln Ser Ser Gln Pro Asn Thr Asp Ser Lys Ile Glu Pro Thr Thr
 145 150 155 160
 Ser Glu Pro Val Asn Leu Asn Tyr Ser Ser Pro Phe Met Ser Leu Leu
 165 170 175
 Ser Met Pro Ala Asp Ser Ser Ser Asn Asn Thr Lys Asn Thr Ile Asp
 180 185 190
 Ile Pro Pro Thr Thr Val Lys Gly Arg Asp Asn Tyr Asp Phe Tyr Gly
 195 200 205
 Arg Val Asp Ile Gln Ser Asn Pro Thr Asp Leu Asn Ala Thr Asn Leu
 210 215 220
 Thr Arg Tyr Asn Tyr Gly Gln Pro Pro Gly Thr Thr Ala Gly Ala
 225 230 235 240
 Val Gln Phe Lys Asn Gln Val Ser Phe Asp Lys Asp Phe Asp Phe Asn
 245 250 255
 Ile Arg Val Ala Asn Asn Arg Gln Ser Asn Thr Thr Gly Ala Asp Gly
 260 265 270
 Trp Gly Phe Met Phe Ser Lys Lys Asp Gly Asp Asp Phe Leu Lys Asn
 275 280 285
 Gly Gly Ile Leu Arg Glu Lys Gly Thr Pro Ser Ala Ala Gly Phe Arg
 290 295 300
 Ile Asp Thr Gly Tyr Tyr Asn Asn Asp Pro Leu Asp Lys Ile Gln Lys
 305 310 315 320
 Gln Ala Gly Gln Gly Tyr Arg Gly Tyr Gly Thr Phe Val Lys Asn Asp
 325 330 335
 Ser Gln Gly Asn Thr Ser Lys Val Gly Ser Gly Thr Pro Ser Thr Asp
 340 345 350
 Phe Leu Asn Tyr Ala Asp Asn Thr Thr Asn Asp Leu Asp Gly Lys Phe
 355 360 365
 His Gly Gln Lys Leu Asn Asn Val Asn Leu Lys Tyr Asn Ala Ser Asn
 370 375 380
 Gln Thr Phe Thr Ala Thr Tyr Ala Gly Lys Thr Trp Thr Ala Thr Leu
 385 390 395 400
 Ser Glu Leu Gly Leu Ser Pro Thr Asp Ser Tyr Asn Phe Leu Val Thr
 405 410 415
 Ser Ser Gln Tyr Gly Asn Gly Asn Ser Gly Thr Tyr Ala Asp Gly Val
 420 425 430
 Met Arg Ala Asp Leu Asp Gly Ala Thr Leu Thr Tyr Thr Pro Lys Ala
 435 440 445
 Val Asp Gly Asp Pro Ile Thr Ser Thr Lys Glu Ile Pro Phe Asn Lys

450	Lys	Arg	Glu	Phe	Asp	Pro	Asn	Leu	Ala	Pro	Gly	Thr	Glu	Lys	Val	Val
465	Gln	Lys	Gly	Glu	Pro	Gly	Ile	Glu	Thr	Thr	Thr	Thr	Pro	Thr	Tyr	Val
485	Asn	Pro	Asn	Thr	Gly	Glu	Lys	Val	Gly	Glu	Gly	Thr	Pro	Thr	Thr	Lys
500	Ile	Thr	Lys	Gln	Pro	Val	Asp	Glu	Ile	Val	His	Tyr	Gly	Gly	Glu	Glu
515	Ile	Lys	Pro	Gly	His	Lys	Asp	Glu	Phe	Asp	Pro	Asn	Ala	Pro	Lys	Gly
530	Ser	Gln	Thr	Thr	Gln	Pro	Gly	Lys	Pro	Gly	Val	Lys	Asn	Pro	Asp	Thr
545	Gly	Glu	Val	Val	Thr	Pro	Pro	Val	Asp	Asp	Val	Thr	Lys	Tyr	Gly	Pro
565	Val	Asp	Gly	Asp	Pro	Ile	Thr	Ser	Thr	Glu	Glu	Ile	Pro	Phe	Asp	Lys
580	Lys	Arg	Glu	Phe	Asn	Pro	Asp	Leu	Lys	Pro	Gly	Glu	Glu	Arg	Val	Lys
595	Gln	Lys	Gly	Glu	Pro	Gly	Thr	Lys	Thr	Ile	Thr	Thr	Pro	Thr	Thr	Lys
610	Asn	Pro	Leu	Thr	Gly	Glu	Lys	Val	Gly	Glu	Gly	Glu	Pro	Thr	Glu	Lys
625	Ile	Thr	Lys	Gln	Pro	Val	Asp	Glu	Ile	Thr	Glu	Tyr	Gly	Gly	Glu	Glu
645	Ile	Lys	Pro	Gly	His	Lys	Asp	Glu	Phe	Asp	Pro	Asn	Ala	Pro	Lys	Gly
660	Ser	Gln	Glu	Asp	Val	Pro	Gly	Lys	Pro	Gly	Val	Lys	Asn	Pro	Asp	Thr
675	Gly	Glu	Val	Val	Thr	Pro	Pro	Val	Asp	Asp	Val	Thr	Lys	Tyr	Gly	Pro
690	Val	Asp	Gly	Asp	Pro	Ile	Thr	Ser	Thr	Glu	Glu	Ile	Pro	Phe	Asp	Lys
705	Lys	Arg	Glu	Phe	Asp	Pro	Asn	Leu	Ala	Pro	Gly	Thr	Glu	Lys	Val	Val
725	Gln	Lys	Gly	Glu	Pro	Gly	Thr	Lys	Thr	Ile	Thr	Thr	Pro	Thr	Thr	Lys
740	Asn	Pro	Leu	Thr	Gly	Glu	Lys	Val	Gly	Glu	Gly	Glu	Pro	Thr	Glu	Lys
755	Ile	Thr	Lys	Gln	Pro	Val	Asp	Glu	Ile	Val	His	Tyr	Gly	Gly	Glu	Glu
770	Ile	Lys	Pro	Gly	His	Lys	Asp	Glu	Phe	Asp	Pro	Asn	Ala	Pro	Lys	Gly
785	Ser	Gln	Glu	Asp	Val	Pro	Gly	Lys	Pro	Gly	Val	Lys	Asn	Pro	Asp	Thr
805	Gly	Glu	Val	Val	Thr	Pro	Pro	Val	Asp	Asp	Val	Thr	Lys	Tyr	Gly	Pro
820	Val	Asp	Gly	Asp	Pro	Ile	Thr	Ser	Thr	Glu	Glu	Ile	Pro	Phe	Asp	Lys
835	Lys	Arg	Glu	Phe	Asn	Pro	Asp	Leu	Lys	Pro	Gly	Glu	Glu	Arg	Val	Lys
850	Gln	Lys	Gly	Glu	Pro	Gly	Thr	Lys	Thr	Ile	Thr	Thr	Pro	Thr	Thr	Lys
865	Asn	Pro	Leu	Thr	Gly	Glu	Lys	Val	Gly	Glu	Gly	Glu	Pro	Thr	Glu	Lys
885	Val	Thr	Lys	Gln	Pro	Val	Asp	Glu	Ile	Val	His	Tyr	Gly	Gly	Glu	Glu
900	Ile	Lys	Pro	Gly	His	Lys	Asp	Glu	Phe	Asp	Pro	Asn	Ala	Pro	Lys	Gly
915	Ser	Gln	Glu	Asp	Val	Pro	Gly	Lys	Pro	Gly	Val	Lys	Asn	Pro	Asp	Thr
930	Gly	Glu	Val	Val	Thr	Pro	Pro	Val	Asp	Asp	Val	Thr	Lys	Tyr	Gly	Pro
945	Val	Asp	Gly	Asp	Pro	Ile	Thr	Ser	Thr	Glu	Glu	Ile	Pro	Phe	Asp	Lys
965	Lys	Arg	Glu	Phe	Asp	Pro	Asn	Leu	Ala	Pro	Gly	Thr	Glu	Lys	Val	Val
980	Gln	Lys	Gly	Glu	Pro	Gly	Thr	Lys	Thr	Ile	Thr	Thr	Pro	Thr	Thr	Lys
995	Asn	Pro	Leu	Thr	Gly	Glu	Lys	Val	Gly	Glu	Gly	Glu	Pro	Thr	Glu	Lys
1010	Ile	Thr	Lys	Gln	Pro	Val	Asp	Glu	Ile	Val	His	Tyr	Gly	Gly	Glu	Glu
1025	Ile	Lys	Pro	Gly	His	Lys	Asp	Glu	Phe	Asp	Pro	Asn	Ala	Pro	Lys	Gly
1045																
1050																
1055																

Ser Gln Thr Thr Gln Pro Gly Lys Pro Gly Val Lys Asn Pro Asp Thr
1060 1065 1070
Gly Glu Val Val Thr Pro Pro Val Asp Asp Val Thr Lys Tyr Gly Pro
1075 1080 1085
Val Asp Gly Asp Pro Ile Thr Ser Thr Glu Glu Ile Pro Phe Asp Lys
1090 1095 1100
Lys Arg Glu Phe Asp Pro Asn Leu Ala Pro Gly Thr Glu Lys Val Val
1105 1110 1115 1120
Gln Lys Gly Glu Pro Gly Thr Lys Thr Ile Thr Thr Pro Thr Thr Lys
1125 1130 1135
Asn Pro Leu Thr Gly Glu Lys Val Gly Glu Gly Glu Pro Thr Glu Lys
1140 1145 1150
Ile Thr Lys Gln Pro Val Asp Glu Ile Val His Tyr Gly Gly Glu Gln
1155 1160 1165
Ile Pro Gln Gly His Lys Asp Glu Phe Asp Pro Asn Ala Pro Val Asp
1170 1175 1180
Ser Lys Thr Glu Val Pro Gly Lys Pro Gly Val Lys Asn Pro Asp Thr
1185 1190 1195 1200
Gly Glu Val Val Thr Pro Pro Val Asp Asp Val Thr Lys Tyr Gly Pro
1205 1210 1215
Lys Val Gly Asn Pro Ile Thr Ser Thr Glu Glu Ile Pro Phe Asp Lys
1220 1225 1230
Lys Arg Val Phe Asn Pro Asp Leu Lys Pro Gly Glu Glu Arg Val Lys
1235 1240 1245
Gln Lys Gly Glu Pro Gly Thr Lys Thr Ile Thr Thr Pro Ile Leu Val
1250 1255 1260
Asn Pro Ile Thr Gly Glu Lys Val Gly Glu Gly Lys Ser Thr Glu Lys
1265 1270 1275 1280
Val Thr Lys Gln Pro Val Asp Glu Ile Val Glu Tyr Gly Pro Thr Lys
1285 1290 1295
Ala Glu Pro Gly Lys Pro Ala Glu Pro Gly Lys Pro Ala Glu Pro Gly
1300 1305 1310
Lys Pro Ala Glu Pro Gly Lys Pro Ala Glu Pro Gly Thr Pro Ala Glu
1315 1320 1325
Pro Gly Lys Pro Ala Glu Pro Gly Lys Pro Ala Glu Pro Gly Lys Pro
1330 1335 1340
Ala Glu Pro Gly Lys Pro Ala Glu Pro Gly Lys Pro Ala Glu Pro Gly
1345 1350 1355 1360
Thr Pro Ala Glu Pro Gly Lys Pro Ala Glu Pro Gly Lys Pro Ala Glu
1365 1370 1375
Pro Gly Lys Pro Ala Glu Pro Gly Thr Pro Ala Glu Pro Gly Lys Pro
1380 1385 1390
Ala Glu Pro Gly Thr Pro Ala Glu Pro Gly Lys Pro Ala Glu Pro Gly
1395 1400 1405
Thr Pro Thr Gln Ser Gly Ala Pro Glu Gln Pro Asn Arg Ser Met His
1410 1415 1420
Ser Thr Asp Asn Lys Asn Gln Leu Pro Asp Thr Gly Glu Asn Arg Gln
1425 1430 1435 1440
Ala Asn Glu Gly Thr Leu Val Gly Ser Leu Leu Ala Ile Val Gly Ser
1445 1450 1455
Leu Phe Ile Phe Gly Arg Arg Lys Lys Gly Asn Glu Lys
1460 1465

<210> 18
<211> 167
<212> PRT
<213> 葡萄球菌

<400> 18
Met Lys Lys Leu Tyr Thr Ser Tyr Gly Thr Tyr Gly Phe Leu His Gln
1 5 10 15
Ile Lys Ile Asn Asn Pro Thr His Gln Leu Phe Gln Phe Ser Ala Ser
20 25 30
Asp Thr Ser Val Ile Phe Glu Glu Thr Asp Gly Glu Thr Val Leu Lys
35 40 45
Ser Pro Ser Ile Tyr Glu Val Ile Lys Glu Ile Gly Glu Phe Ser Glu
50 55 60
His His Phe Tyr Cys Ala Ile Phe Ile Pro Ser Thr Glu Asp His Ala
65 70 75 80
Tyr Gln Leu Glu Lys Lys Leu Ile Ser Val Asp Asp Asn Phe Arg Asn
85 90 95
Phe Gly Gly Phe Lys Ser Tyr Arg Leu Leu Arg Pro Ala Lys Gly Thr
100 105 110
Thr Tyr Lys Ile Tyr Phe Gly Phe Ala Asp Arg His Ala Tyr Glu Asp

Phe	Lys	Gln	Ser	Asp	Ala	Phe	Asn	Asp	His	Phe	Ser	Lys	Asp	Ala	Leu
130						135					140				
Ser	His	Tyr	Phe	Gly	Ser	Ser	Gly	Gln	His	Ser	Ser	Tyr	Phe	Glu	Arg
145					150					155					160
Tyr	Leu	Tyr	Pro	Ile	Lys	Glu									
				165											

<210> 19

<211> 167

<212> PRT

<213> 葡萄球菌

<400> 19

Met	Tyr	Leu	Tyr	Thr	Ser	Tyr	Gly	Thr	Tyr	Gln	Phe	Leu	Asn	Gln	Ile
1				5					10					15	
Lys	Leu	Asn	His	Gln	Glu	Arg	Ser	Leu	Phe	Gln	Phe	Ser	Thr	Asn	Asp
			20					25					30		
Ser	Ser	Ile	Ile	Leu	Glu	Glu	Ser	Glu	Gly	Lys	Ser	Ile	Leu	Lys	His
		35					40					45			
Pro	Ser	Ala	Tyr	Gln	Val	Ile	Asp	Ser	Thr	Gly	Glu	Phe	Asn	Glu	His
	50					55					60				
His	Phe	Tyr	Ser	Ala	Ile	Phe	Val	Pro	Thr	Ser	Glu	Asp	His	Arg	Gln
65				70					75					80	
Gln	Leu	Glu	Lys	Lys	Leu	Leu	Leu	Val	Asp	Val	Pro	Leu	Arg	Asn	Phe
			85					90					95		
Gly	Gly	Phe	Lys	Ser	Tyr	Arg	Leu	Leu	Lys	Pro	Thr	Glu	Gly	Ser	Thr
		100					105						110		
Tyr	Lys	Ile	Tyr	Phe	Gly	Phe	Ala	Asn	Arg	Thr	Ala	Tyr	Glu	Asp	Phe
	115					120					125				
Lys	Ala	Ser	Asp	Ile	Phe	Asn	Glu	Asn	Phe	Ser	Lys	Asp	Ala	Leu	Ser
	130					135					140				
Gln	Tyr	Phe	Gly	Ala	Ser	Gly	Gln	His	Ser	Ser	Tyr	Phe	Glu	Arg	Tyr
145					150				155						160
Leu	Tyr	Pro	Ile	Glu	Asp	His									
				165											

<210> 20

<211> 1141

<212> PRT

<213> 葡萄球菌

<400> 20

Met	Ile	Asn	Arg	Asp	Asn	Lys	Lys	Ala	Ile	Thr	Lys	Lys	Gly	Met	Ile
1				5				10						15	
Ser	Asn	Arg	Leu	Asn	Lys	Phe	Ser	Ile	Arg	Lys	Tyr	Thr	Val	Gly	Thr
			20					25					30		
Ala	Ser	Ile	Leu	Val	Gly	Thr	Thr	Leu	Ile	Phe	Gly	Leu	Gly	Asn	Gln
		35				40						45			
Glu	Ala	Lys	Ala	Ala	Glu	Asn	Thr	Ser	Thr	Glu	Asn	Ala	Lys	Gln	Asp
	50					55					60				
Asp	Ala	Thr	Thr	Ser	Asp	Asn	Lys	Glu	Val	Val	Ser	Glu	Thr	Glu	Asn
65				70					75					80	
Asn	Ser	Thr	Thr	Glu	Asn	Asp	Ser	Thr	Asn	Pro	Ile	Lys	Lys	Glu	Thr
			85					90					95		
Asn	Thr	Asp	Ser	Gln	Pro	Glu	Ala	Lys	Glu	Glu	Ser	Thr	Thr	Ser	Ser
		100					105						110		
Thr	Gln	Gln	Gln	Gln	Asn	Asn	Val	Thr	Ala	Thr	Thr	Glu	Thr	Lys	Pro
	115					120						125			
Gln	Asn	Ile	Glu	Lys	Glu	Asn	Val	Lys	Pro	Ser	Thr	Asp	Lys	Thr	Ala
	130					135					140				
Thr	Glu	Asp	Thr	Ser	Val	Ile	Leu	Glu	Glu	Lys	Lys	Ala	Pro	Asn	Tyr
145				150					155					160	
Thr	Asn	Asn	Asp	Val	Thr	Thr	Lys	Pro	Ser	Thr	Ser	Glu	Ile	Gln	Thr
			165					170					175		
Lys	Pro	Thr	Thr	Pro	Gln	Glu	Ser	Thr	Asn	Ile	Glu	Asn	Ser	Gln	Pro
		180						185					190		
Gln	Pro	Thr	Pro	Ser	Lys	Val	Asp	Asn	Gln	Val	Thr	Asp	Ala	Thr	Asn
	195					200						205			
Pro	Lys	Glu	Pro	Val	Asn	Val	Ser	Lys	Glu	Glu	Leu	Lys	Asn	Asn	Pro
	210				215						220				
Glu	Lys	Leu	Lys	Glu	Leu	Val	Arg	Asn	Asp	Asn	Asn	Thr	Asp	Arg	Ser

225	Thr	Lys	Pro	Val	Ala	Thr	Ala	Pro	Thr	Ser	Val	Ala	Pro	Lys	Arg	Leu
	Asn	Ala	Lys	Met	Arg	Phe	Ala	Val	Ala	Gln	Pro	Ala	Ala	Val	Ala	Ser
	Asn	Asn	Val	Asn	Asp	Leu	Ile	Thr	Val	Thr	Lys	Gln	Thr	Ile	Lys	Val
	Gly	Asp	Gly	Lys	Asp	Asn	Val	Ala	Ala	Ala	His	Asp	Gly	Lys	Asp	Ile
	Glu	Tyr	Asp	Thr	Glu	Phe	Thr	Ile	Asp	Asn	Lys	Val	Lys	Lys	Gly	Asp
	Thr	Met	Thr	Ile	Asn	Tyr	Asp	Lys	Asn	Val	Ile	Pro	Ser	Asp	Leu	Thr
	Asp	Lys	Asn	Asp	Pro	Ile	Asp	Ile	Thr	Asp	Pro	Ser	Gly	Glu	Val	Ile
	Ala	Lys	Gly	Thr	Phe	Asp	Lys	Ala	Thr	Lys	Gln	Ile	Thr	Tyr	Thr	Phe
	Thr	Asp	Tyr	Val	Asp	Lys	Tyr	Glu	Asp	Ile	Lys	Ala	Arg	Leu	Thr	Leu
	Tyr	Ser	Tyr	Ile	Asp	Lys	Gln	Ala	Val	Pro	Asn	Glu	Thr	Ser	Leu	Asn
	Leu	Thr	Phe	Ala	Thr	Ala	Gly	Lys	Glu	Thr	Ser	Gln	Asn	Val	Ser	Val
	Asp	Tyr	Gln	Asp	Pro	Met	Val	His	Gly	Asp	Ser	Asn	Ile	Gln	Ser	Ile
	Phe	Thr	Lys	Leu	Asp	Glu	Asn	Lys	Gln	Thr	Ile	Glu	Gln	Gln	Ile	Tyr
	Val	Asn	Pro	Leu	Lys	Lys	Thr	Ala	Thr	Asn	Thr	Lys	Val	Asp	Ile	Ala
	Gly	Ser	Gln	Val	Asp	Asp	Tyr	Gly	Asn	Ile	Lys	Leu	Gly	Asn	Gly	Ser
	Thr	Ile	Ile	Asp	Gln	Asn	Thr	Glu	Ile	Lys	Val	Tyr	Lys	Val	Asn	Pro
	Asn	Gln	Gln	Leu	Pro	Gln	Ser	Asn	Arg	Ile	Tyr	Asp	Phe	Ser	Gln	Tyr
	Glu	Asp	Val	Thr	Ser	Gln	Phe	Asp	Asn	Lys	Lys	Ser	Phe	Ser	Asn	Asn
	Val	Ala	Thr	Leu	Asp	Phe	Gly	Asp	Ile	Asn	Ser	Ala	Tyr	Ile	Ile	Lys
	Val	Val	Ser	Lys	Tyr	Thr	Pro	Thr	Ser	Asp	Gly	Glu	Leu	Asp	Ile	Ala
	Gln	Gly	Thr	Ser	Met	Arg	Thr	Thr	Asp	Lys	Tyr	Gly	Tyr	Tyr	Asn	Tyr
	Ala	Gly	Tyr	Ser	Asn	Phe	Ile	Val	Thr	Ser	Asn	Asp	Thr	Gly	Gly	Gly
	Asp	Gly	Thr	Val	Lys	Pro	Glu	Glu	Lys	Leu	Tyr	Lys	Ile	Gly	Asp	Tyr
	Val	Trp	Glu	Asp	Val	Asp	Lys	Asp	Gly	Val	Gln	Gly	Thr	Asp	Ser	Lys
	Glu	Lys	Pro	Met	Ala	Asn	Val	Leu	Val	Thr	Leu	Thr	Tyr	Pro	Asp	Gly
	Thr	Thr	Lys	Ser	Val	Arg	Thr	Asp	Ala	Asn	Gly	His	Tyr	Glu	Phe	Gly
	Gly	Leu	Lys	Asp	Gly	Glu	Thr	Tyr	Thr	Val	Lys	Phe	Glu	Thr	Pro	Ala
	Gly	Tyr	Leu	Pro	Thr	Lys	Val	Asn	Gly	Thr	Thr	Asp	Gly	Glu	Lys	Asp
	Ser	Asn	Gly	Ser	Ser	Ile	Thr	Val	Lys	Ile	Asn	Gly	Lys	Asp	Asp	Met
	Ser	Leu	Asp	Thr	Gly	Phe	Tyr	Lys	Glu	Pro	Lys	Tyr	Asn	Leu	Gly	Asp
	Tyr	Val	Trp	Glu	Asp	Thr	Asn	Lys	Asp	Gly	Ile	Gln	Asp	Ala	Asn	Glu
	Pro	Gly	Ile	Lys	Asp	Val	Lys	Val	Thr	Leu	Lys	Asp	Ser	Thr	Gly	Lys
	Val	Ile	Gly	Thr	Thr	Thr	Thr	Asp	Ala	Ser	Gly	Lys	Tyr	Lys	Phe	Thr
	Asp	Leu	Asp	Asn	Gly	Asn	Tyr	Thr	Val	Glu	Phe	Glu	Thr	Pro	Ala	Gly
	Tyr	Thr	Pro	Thr	Val	Lys	Asn	Thr	Thr	Ala	Glu	Asp	Lys	Asp	Ser	Asn
	Gly	Leu	Thr	Thr	Thr	Gly	Val	Ile	Lys	Asp	Ala	Asp	Asn	Met	Thr	Leu
	Asp	Ser	Gly	Phe	Tyr	Lys	Thr	Pro	Lys	Tyr	Ser	Leu	Gly	Asp	Tyr	Val

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Trp Tyr Asp Ser Asn Lys Asp Gly Lys Gln Asp Ser Thr Glu Lys Gly
835      840      845
Ile Lys Asp Val Lys Val Thr Leu Leu Asn Glu Lys Gly Glu Val Ile
850      855      860
Gly Thr Thr Lys Thr Asp Glu Asn Gly Lys Tyr Arg Phe Asp Asn Leu
865      870      875      880
Asp Ser Gly Lys Tyr Lys Val Ile Phe Glu Lys Pro Ala Gly Leu Thr
885      890      895
Gln Thr Val Thr Asn Thr Thr Glu Asp Asp Lys Asp Ala Asp Gly Gly
900      905      910
Glu Val Asp Val Thr Ile Thr Asp His Asp Asp Phe Ile Leu Asp Asn
915      920      925
Gly Tyr Phe Glu Glu Asp Thr Ser Asp Ser Asp Ser Asp Ser Asp Ser
930      935      940
Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser
945      950      955      960
Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser
965      970      975
Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser
980      985      990
Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser
995      1000      1005
Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser
1010      1015      1020
Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser
1025      1030      1035      1040
Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser
1045      1050      1055
Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser
1060      1065      1070
Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ala Gly Lys His Thr Pro Val
1075      1080      1085
Lys Pro Met Ser Thr Thr Lys Asp His His Asn Lys Ala Lys Ala Leu
1090      1095      1100
Pro Glu Thr Gly Ser Glu Asn Asn Gly Ser Asn Asn Ala Thr Leu Phe
1105      1110      1115      1120
Gly Gly Leu Phe Ala Ala Leu Gly Ser Leu Leu Leu Phe Gly Arg Arg
1125      1130      1135
Lys Lys Gln Asn Lys
1140

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<210> 21
 <211> 1056
 <212> PRT
 <213> 葡萄球菌

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<400> 21
Met Ile Asn Lys Lys Asn Asn Leu Leu Thr Lys Lys Lys Pro Ile Ala
1      5      10      15
Asn Lys Ser Asn Lys Tyr Ala Ile Arg Lys Phe Thr Val Gly Thr Ala
20      25      30
Ser Ile Val Ile Gly Ala Thr Leu Leu Phe Gly Leu Gly His Asn Glu
35      40      45
Ala Lys Ala Glu Glu Asn Ser Val Gln Asp Val Lys Asp Ser Asn Thr
50      55      60
Asp Asp Glu Leu Ser Asp Ser Asn Asp Gln Ser Ser Asp Glu Glu Lys
65      70      75      80
Asn Asp Val Ile Asn Asn Asn Gln Ser Ile Asn Thr Asp Asp Asn Asn
85      90      95
Gln Ile Ile Lys Lys Glu Glu Thr Asn Asn Tyr Asp Gly Ile Glu Lys
100      105      110
Arg Ser Glu Asp Arg Thr Glu Ser Thr Thr Asn Val Asp Glu Asn Glu
115      120      125
Ala Thr Phe Leu Gln Lys Thr Pro Gln Asp Asn Thr His Leu Thr Glu
130      135      140
Glu Glu Val Lys Glu Ser Ser Val Glu Ser Ser Asn Ser Ser Ile
145      150      155      160
Asp Thr Ala Gln Gln Pro Ser His Thr Thr Ile Asn Arg Glu Glu Ser
165      170      175
Val Gln Thr Ser Asp Asn Val Glu Asp Ser His Val Ser Asp Phe Ala
180      185      190
Asn Ser Lys Ile Lys Glu Ser Asn Thr Glu Ser Gly Lys Glu Glu Asn
195      200      205
Thr Ile Glu Gln Pro Asn Lys Val Lys Glu Asp Ser Thr Thr Ser Gln

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210	215	220
Pro Ser Gly Tyr Thr	Asn Ile Asp Glu Lys	Ile Ser Asn Gln Asp Glu
225	230	235
Leu Leu Asn Leu Pro	Ile Asn Glu Tyr Glu	Asn Lys Ala Arg Pro Leu
245	250	255
Ser Thr Thr Ser Ala	Gln Pro Ser Ile	Lys Arg Val Thr Val Asn Gln
260	265	270
Leu Ala Ala Glu Gln	Gly Ser Asn Val Asn	His Leu Ile Lys Val Thr
275	280	285
Asp Gln Ser Ile Thr	Glu Gly Tyr Asp Asp	Ser Glu Gly Val Ile Lys
290	295	300
Ala His Asp Ala Glu	Asn Leu Ile Tyr Asp	Val Thr Phe Glu Val Asp
305	310	315
Asp Lys Val Lys Ser	Gly Asp Thr Met Thr	Val Asp Ile Asp Lys Asn
325	330	335
Thr Val Pro Ser Asp	Leu Thr Asp Ser Phe	Thr Ile Pro Lys Ile Lys
340	345	350
Asp Asn Ser Gly Glu	Ile Ile Ala Thr Gly	Thr Tyr Asp Asn Lys Asn
355	360	365
Lys Gln Ile Thr Tyr	Thr Phe Thr Asp Tyr	Val Asp Lys Tyr Glu Asn
370	375	380
Ile Lys Ala His Leu	Lys Leu Thr Ser Tyr	Ile Asp Lys Ser Lys Val
385	390	395
Pro Asn Asn Asn Thr	Lys Leu Asp Val Glu	Tyr Lys Thr Ala Leu Ser
405	410	415
Ser Val Asn Lys Thr	Ile Thr Val Glu Tyr	Gln Arg Pro Asn Glu Asn
420	425	430
Arg Thr Ala Asn Leu	Gln Ser Met Phe Thr	Asn Ile Asp Thr Lys Asn
435	440	445
His Thr Val Glu Gln	Thr Ile Tyr Ile Asn	Pro Leu Arg Tyr Ser Ala
450	455	460
Lys Glu Thr Asn Val	Asn Ile Ser Gly Asn	Gly Asp Glu Gly Ser Thr
465	470	475
Ile Ile Asp Asp Ser	Thr Ile Ile Lys Val	Tyr Lys Val Gly Asp Asn
485	490	495
Gln Asn Leu Pro Asp	Ser Asn Arg Ile Tyr	Asp Tyr Ser Glu Tyr Glu
500	505	510
Asp Val Thr Asn Asp	Asp Tyr Ala Gln	Leu Gly Asn Asn Asp Val
515	520	525
Asn Ile Asn Phe Gly	Asn Ile Asp Ser Pro	Tyr Ile Ile Lys Val Ile
530	535	540
Ser Lys Tyr Asp Pro	Asn Lys Asp Asp Tyr	Thr Thr Ile Gln Gln Thr
545	550	555
Val Thr Met Gln Thr	Thr Ile Asn Glu Tyr	Thr Gly Glu Phe Arg Thr
565	570	575
Ala Ser Tyr Asp Asn	Thr Ile Ala Phe Ser	Thr Ser Ser Gly Gln Gly
580	585	590
Gln Gly Asp Leu Pro	Pro Glu Lys Thr Tyr	Lys Ile Gly Asp Tyr Val
595	600	605
Trp Glu Asp Val Asp	Lys Asp Gly Ile Gln	Asn Thr Asn Asp Asn Glu
610	615	620
Lys Pro Leu Ser Asn	Val Leu Val Thr Leu	Thr Tyr Pro Asp Gly Thr
625	630	635
Ser Lys Ser Val Arg	Thr Asp Glu Asp Gly	Lys Tyr Gln Phe Asp Gly
645	650	655
Leu Lys Asn Gly Leu	Thr Tyr Lys Ile Thr	Phe Glu Thr Pro Glu Gly
660	665	670
Tyr Thr Pro Thr Leu	Lys His Ser Gly Thr	Asn Pro Ala Leu Asp Ser
675	680	685
Glu Gly Asn Ser Val	Trp Val Thr Ile Asn	Gly Gln Asp Asp Met Thr
690	695	700
Ile Asp Ser Gly Phe	Tyr Gln Thr Pro Lys	Tyr Ser Leu Gly Asn Tyr
705	710	715
Val Trp Tyr Asp Thr	Asn Lys Asp Gly Ile	Gln Gly Asp Asp Glu Lys
725	730	735
Gly Ile Ser Gly Val	Lys Val Thr Leu Lys	Asp Glu Asn Gly Asn Ile
740	745	750
Ile Ser Thr Thr Thr	Asp Glu Asn Gly Lys	Tyr Gln Phe Asp Asn
755	760	765
Leu Asn Ser Gly Asn	Tyr Ile Val His Phe	Asp Lys Pro Ser Gly Met
770	775	780
Thr Gln Thr Thr Thr	Asp Ser Gly Asp Asp	Asp Glu Gln Asp Ala Asp
785	790	795
Gly Glu Glu Val His	Val Thr Ile Thr Asp	His Asp Asp Phe Ser Ile
805	810	815

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Asp Asn Gly Tyr Tyr Asp Asp Glu Ser Asp Ser Asp Ser Asp Ser Asp
      820      825      830
Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp
      835      840      845
Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp
      850      855      860
Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp
      865      870      875      880
Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp
      885      890      895
Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp
      900      905      910
Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp
      915      920      925
Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp
      930      935      940
Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp
      945      950      955      960
Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp
      965      970      975
Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp
      980      985      990
Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp
      995      1000      1005
Ser Asp Lys Ser Thr Lys Asp Lys Leu Pro Asp Thr Gly Ala Asn Glu
      1010      1015      1020
Asp Tyr Gly Ser Lys Gly Thr Leu Leu Gly Thr Leu Phe Ala Gly Leu
      1025      1030      1035      1040
Gly Ala Leu Leu Leu Gly Lys Arg Arg Lys Asn Arg Lys Asn Lys Asn
      1045      1050      1055

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<210> 22
 <211> 486
 <212> PRT
 <213> 葡萄球菌

```

<400> 22
Met Ser Asn Asn Phe Lys Asp Asp Phe Glu Lys Asn Arg Gln Ser Ile
  1      5      10      15
Asp Thr Asn Ser His Gln Asp His Thr Glu Asp Val Glu Lys Asp Gln
      20      25      30
Ser Glu Leu Glu His Gln Asp Thr Ile Glu Asn Thr Glu Gln Gln Phe
      35      40      45
Pro Pro Arg Asn Ala Gln Arg Arg Lys Arg Arg Arg Asp Leu Ala Thr
      50      55      60
Asn His Asn Lys Gln Val His Asn Glu Ser Gln Thr Ser Glu Asp Asn
      65      70      75      80
Val Gln Asn Glu Ala Gly Thr Ile Asp Asp Arg Gln Val Glu Ser Ser
      85      90      95
His Ser Thr Glu Ser Gln Glu Pro Ser His Gln Asp Ser Thr Pro Gln
      100      105      110
His Glu Glu Glu Tyr Tyr Asn Lys Asn Ala Phe Ala Met Asp Lys Ser
      115      120      125
His Pro Glu Pro Ile Glu Asp Asn Asp Lys His Glu Thr Ile Lys Asp
      130      135      140
Ala Glu Asn Asn Thr Glu His Ser Thr Val Ser Asp Lys Ser Ile Ala
      145      150      155      160
Glu Gln Ser Gln Gln Pro Lys Pro Tyr Phe Ala Thr Gly Ala Asn Gln
      165      170      175
Ala Asn Thr Ser Lys Asp Lys His Asp Asp Val Thr Val Lys Gln Asp
      180      185      190
Lys Asp Glu Ser Lys Asp His His Ser Gly Lys Lys Gly Ala Ala Ile
      195      200      205
Gly Ala Gly Thr Ala Gly Val Ala Gly Ala Ala Gly Ala Met Gly Val
      210      215      220
Ser Lys Ala Lys Lys His Ser Asn Asp Ala Gln Asn Lys Ser Asn Ser
      225      230      235      240
Asp Lys Ser Asn Asn Ser Thr Glu Asp Lys Ala Ser Gln Asp Lys Ser
      245      250      255
Lys Asp His His Asn Gly Lys Lys Gly Ala Ala Ile Gly Ala Gly Thr
      260      265      270
Ala Gly Leu Ala Gly Gly Ala Ala Ser Lys Ser Ala Ser Ala Ala Ser
      275      280      285
Lys Pro His Ala Ser Asn Asn Ala Ser Gln Asn His Asp Glu His Asp

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      290              295              300
Asn His Asp Arg Asp Lys Glu Arg Lys Lys Gly Gly Met Ala Lys Val
305              310              315              320
Leu Leu Pro Leu Ile Ala Ala Val Leu Ile Ile Gly Ala Leu Ala Ile
      325              330              335
Phe Gly Gly Met Ala Leu Asn Asn His Asn Asn Gly Thr Lys Glu Asn
      340              345              350
Lys Ile Ala Asn Thr Asn Lys Asn Asn Ala Asp Glu Ser Lys Asp Lys
      355              360              365
Asp Thr Ser Lys Asp Ala Ser Lys Asp Lys Ser Lys Ser Thr Asp Ser
      370              375              380
Asp Lys Ser Lys Glu Asp Gln Asp Lys Ala Thr Lys Asp Glu Ser Asp
385              390              395              400
Asn Asp Gln Asn Asn Ala Asn Gln Ala Asn Asn Gln Ala Gln Asn Asn
      405              410              415
Gln Asn Gln Gln Gln Ala Asn Gln Asn Gln Gln Gln Gln Gln Arg
      420              425              430
Gln Gly Gly Gly Gln Arg His Thr Val Asn Gly Gln Glu Asn Leu Tyr
      435              440              445
Arg Ile Ala Ile Gln Tyr Tyr Gly Ser Gly Ser Pro Glu Asn Val Glu
      450              455              460
Lys Ile Arg Arg Ala Asn Gly Leu Ser Gly Asn Asn Ile Arg Asn Gly
465              470              475              480
Gln Gln Ile Val Ile Pro
      485

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<210> 23
 <211> 472
 <212> PRT
 <213> 葡萄球菌

```

<400> 23
Met Ile Glu Leu Ile Lys Met Glu Gly Met Ile Val Val Ser Asn Asn
1              5              10              15
Asn Phe Lys Asp Asp Phe Glu Lys Asn Arg Gln Ser Ile Asn Pro Asp
      20              25              30
Glu Gln Gln Thr Glu Leu Lys Glu Asp Asp Lys Thr Asn Glu Asn Lys
      35              40              45
Lys Glu Ala Asp Ser Gln Asn Ser Leu Ser Asn Asn Ser Asn Gln Gln
      50              55              60
Phe Pro Pro Arg Asn Ala Gln Arg Arg Lys Arg Arg Arg Glu Thr Ala
65              70              75              80
Thr Asn Gln Ser Lys Gln Gln Asp Asp Lys His Gln Lys Asn Ser Asp
      85              90              95
Ala Lys Thr Thr Glu Gly Ser Leu Asp Asp Arg Tyr Asp Glu Ala Gln
      100              105              110
Leu Gln Gln Gln His Asp Lys Ser Gln Gln Gln Asn Lys Thr Glu Lys
      115              120              125
Gln Ser Gln Asp Asn Arg Met Lys Asp Gly Lys Asp Ala Ala Ile Val
      130              135              140
Asn Gly Thr Ser Glu Ser Pro Glu His Lys Ser Lys Ser Thr Gln Asn
145              150              155              160
Arg Pro Gly Pro Lys Ala Gln Gln Gln Lys Arg Lys Ser Glu Ser Thr
      165              170              175
Gln Ser Lys Pro Ser Thr Asn Lys Asp Lys Lys Ala Ala Thr Gly Ala
      180              185              190
Gly Ile Ala Gly Ala Ala Gly Val Ala Gly Ala Ala Glu Thr Ser Lys
      195              200              205
Arg His His Asn Lys Lys Asp Lys Gln Asp Ser Lys His Ser Asn His
      210              215              220
Glu Asn Asp Glu Lys Ser Val Lys Asn Asp Asp Gln Lys Gln Ser Lys
225              230              235              240
Lys Gly Lys Lys Ala Ala Val Gly Ala Gly Ala Ala Ala Gly Val Gly
      245              250              255
Ala Ala Gly Val Ala His His Asn Asn Gln Asn Lys His His Asn Glu
      260              265              270
Glu Lys Asn Ser Asn Gln Asn Asn Gln Tyr Asn Asp Gln Ser Glu Gly
      275              280              285
Lys Lys Lys Gly Gly Phe Met Lys Ile Leu Leu Pro Leu Ile Ala Ala
      290              295              300
Ile Leu Ile Leu Gly Ala Ile Ala Ile Phe Gly Gly Met Ala Leu Asn
305              310              315              320
Asn His Asn Asp Ser Lys Ser Asp Asp Gln Lys Ile Ala Asn Gln Ser
      325              330              335

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Lys Lys Asp Ser Asp Lys Lys Asp Gly Ala Gln Ser Glu Asp Asn Lys
 340 345 350
 Asp Lys Lys Ser Asp Ser Asn Lys Asp Lys Lys Ser Asp Ser Asp Lys
 355 360 365
 Asn Ala Asp Asp Asp Ser Asp Asn Ser Ser Ser Asn Pro Asn Ala Thr
 370 375 380
 Ser Thr Asn Asn Asn Asp Asn Val Ala Asn Asn Asn Ser Asn Tyr Thr
 385 390 395 400
 Asn Gln Asn Gln Gln Asp Asn Ala Asn Gln Asn Ser Asn Asn Gln Gln
 405 410 415
 Ala Thr Gln Gly Gln Gln Ser His Thr Val Tyr Gly Gln Glu Asn Leu
 420 425 430
 Tyr Arg Ile Ala Ile Gln Tyr Tyr Gly Glu Gly Thr Gln Ala Asn Val
 435 440 445
 Asp Lys Ile Lys Arg Ala Asn Gly Leu Ser Ser Asn Asn Ile His Asn
 450 455 460
 Gly Gln Thr Leu Val Ile Pro Gln
 465 470

<210> 24
 <211> 165
 <212> PRT
 <213> 葡萄球菌

<400> 24
 Met Lys Asn Lys Leu Ile Ala Lys Ser Leu Leu Thr Ile Ala Ala Ile
 1 5 10 15
 Gly Ile Thr Thr Thr Ile Ala Ser Thr Ala Asp Ala Ser Glu Gly
 20 25 30
 Tyr Gly Pro Arg Glu Lys Lys Pro Val Ser Ile Asn His Asn Ile Val
 35 40 45
 Glu Tyr Asn Asp Gly Thr Phe Lys Tyr Gln Ser Arg Pro Lys Phe Asn
 50 55 60
 Ser Thr Pro Lys Tyr Ile Lys Phe Lys His Asp Tyr Asn Ile Leu Glu
 65 70 75 80
 Phe Asn Asp Gly Thr Phe Glu Tyr Gly Ala Arg Pro Gln Phe Asn Lys
 85 90 95
 Pro Ala Ala Lys Thr Asp Ala Thr Ile Lys Lys Glu Gln Lys Leu Ile
 100 105 110
 Gln Ala Gln Asn Leu Val Arg Glu Phe Glu Lys Thr His Thr Val Ser
 115 120 125
 Ala His Arg Lys Ala Gln Lys Ala Val Asn Leu Val Ser Phe Glu Tyr
 130 135 140
 Lys Val Lys Lys Met Val Leu Gln Glu Arg Ile Asp Asn Val Leu Lys
 145 150 155 160
 Gln Gly Leu Val Arg
 165

<210> 25
 <211> 319
 <212> PRT
 <213> 葡萄球菌

<400> 25
 Met Lys Thr Arg Ile Val Ser Ser Val Thr Thr Thr Leu Leu Leu Gly
 1 5 10 15
 Ser Ile Leu Met Asn Pro Val Ala Asn Ala Ala Asp Ser Asp Ile Asn
 20 25 30
 Ile Lys Thr Gly Thr Thr Asp Ile Gly Ser Asn Thr Thr Val Lys Thr
 35 40 45
 Gly Asp Leu Val Thr Tyr Asp Lys Glu Asn Gly Met His Lys Lys Val
 50 55 60
 Phe Tyr Ser Phe Ile Asp Asn Lys Asn His Asn Lys Lys Leu Leu Val
 65 70 75 80
 Ile Arg Thr Lys Gly Thr Ile Ala Gly Gln Tyr Arg Val Tyr Ser Glu
 85 90 95
 Glu Gly Ala Asn Lys Ser Gly Leu Ala Trp Pro Ser Ala Phe Lys Val
 100 105 110
 Gln Leu Gln Leu Pro Asp Asn Glu Val Ala Gln Ile Ser Asp Tyr Tyr
 115 120 125
 Pro Arg Asn Ser Ile Asp Thr Lys Glu Tyr Met Ser Thr Leu Thr Tyr
 130 135 140
 Gly Phe Asn Gly Asn Val Thr Gly Asp Asp Thr Gly Lys Ile Gly Gly

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145      150      155      160
Leu Ile Gly Ala Asn Val Ser Ile Gly His Thr Leu Lys Tyr Val Gln
165      170      175
Pro Asp Phe Lys Thr Ile Leu Glu Ser Pro Thr Asp Lys Lys Val Gly
180      185      190
Trp Lys Val Ile Phe Asn Asn Met Val Asn Gln Asn Trp Gly Pro Tyr
195      200      205
Asp Arg Asp Ser Trp Asn Pro Val Tyr Gly Asn Gln Leu Phe Met Lys
210      215      220
Thr Arg Asn Gly Ser Met Lys Ala Ala Glu Asn Phe Leu Asp Pro Asn
225      230      235      240
Lys Ala Ser Ser Leu Leu Ser Ser Gly Phe Ser Pro Asp Phe Ala Thr
245      250      255
Val Ile Thr Met Asp Arg Lys Ala Ser Lys Gln Gln Thr Asn Ile Asp
260      265      270
Val Ile Tyr Glu Arg Val Arg Asp Asp Tyr Gln Leu His Trp Thr Ser
275      280      285
Thr Asn Trp Lys Gly Thr Asn Thr Lys Asp Lys Trp Thr Asp Arg Ser
290      295      300
Ser Glu Arg Tyr Lys Ile Asp Trp Glu Lys Glu Glu Met Thr Asn
305      310      315

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<210> 26
<211> 428
<212> PRT
<213> 葡萄球菌

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<400> 26
Met His Met Lys Asn Lys Tyr Ile Ser Lys Leu Leu Val Gly Ala Ala
1      5      10      15
Thr Ile Thr Leu Ala Thr Met Ile Ser Asn Gly Glu Ala Lys Ala Ser
20      25      30
Glu Asn Thr Gln Gln Thr Ser Thr Lys His Gln Thr Thr Gln Asn Asn
35      40      45
Tyr Val Thr Asp Gln Gln Lys Ala Phe Tyr Gln Val Leu His Leu Lys
50      55      60
Gly Ile Thr Glu Glu Gln Arg Asn Gln Tyr Ile Lys Thr Leu Arg Glu
65      70      75      80
His Pro Glu Arg Ala Gln Glu Val Phe Ser Glu Ser Leu Lys Asp Ser
85      90      95
Lys Asn Pro Asp Arg Arg Val Ala Gln Gln Asn Ala Phe Tyr Asn Val
100      105      110
Leu Lys Asn Asp Asn Leu Thr Glu Gln Glu Lys Asn Asn Tyr Ile Ala
115      120      125
Gln Ile Lys Glu Asn Pro Asp Arg Ser Gln Gln Val Trp Val Glu Ser
130      135      140
Val Gln Ser Ser Lys Ala Lys Glu Arg Gln Asn Ile Glu Asn Ala Asp
145      150      155      160
Lys Ala Ile Lys Asp Phe Gln Asp Asn Lys Ala Pro His Asp Lys Ser
165      170      175
Ala Ala Tyr Glu Ala Asn Ser Lys Leu Pro Lys Asp Leu Arg Asp Lys
180      185      190
Asn Asn Arg Phe Val Glu Lys Val Ser Ile Glu Lys Ala Ile Val Arg
195      200      205
His Asp Glu Arg Val Lys Ser Ala Asn Asp Ala Ile Ser Lys Leu Asn
210      215      220
Glu Lys Asp Ser Ile Glu Asn Arg Arg Leu Ala Gln Arg Glu Val Asn
225      230      235      240
Lys Ala Pro Met Asp Val Lys Glu His Leu Gln Lys Gln Leu Asp Ala
245      250      255
Leu Val Ala Gln Lys Asp Ala Glu Lys Lys Val Ala Pro Lys Val Glu
260      265      270
Ala Pro Gln Ile Gln Ser Pro Gln Ile Glu Lys Pro Lys Ala Glu Ser
275      280      285
Pro Lys Val Glu Val Pro Gln Ser Lys Leu Leu Gly Tyr Tyr Gln Ser
290      295      300
Leu Lys Asp Ser Phe Asn Tyr Gly Tyr Lys Tyr Leu Thr Asp Thr Tyr
305      310      315      320
Lys Ser Tyr Lys Glu Lys Tyr Asp Thr Ala Lys Tyr Tyr Tyr Asn Thr
325      330      335
Tyr Tyr Lys Tyr Lys Gly Ala Ile Asp Gln Thr Val Leu Thr Val Leu
340      345      350
Gly Ser Gly Ser Lys Ser Tyr Ile Gln Pro Leu Lys Val Asp Asp Lys
355      360      365

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Asn Gly Tyr Leu Ala Lys Ser Tyr Ala Gln Val Arg Asn Tyr Val Thr
370 375 380
Glu Ser Ile Asn Thr Gly Lys Val Leu Tyr Thr Phe Tyr Gln Asn Pro
385 390 395 400
Thr Leu Val Lys Thr Ala Ile Lys Ala Gln Glu Thr Ala Ser Ser Ile
405 410 415
Lys Asn Thr Leu Ser Asn Leu Leu Ser Phe Trp Lys
420 425

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<210> 27
 <211> 350
 <212> PRT
 <213> 葡萄球菌

```

<400> 27
Met Thr Lys His Tyr Leu Asn Ser Lys Tyr Gln Ser Glu Gln Arg Ser
1 5 10 15
Ser Ala Met Lys Lys Ile Thr Met Gly Thr Ala Ser Ile Ile Leu Gly
20 25 30
Ser Leu Val Tyr Ile Gly Ala Asp Ser Gln Gln Val Asn Ala Ala Thr
35 40 45
Glu Ala Thr Asn Ala Thr Asn Asn Gln Ser Thr Gln Val Ser Gln Ala
50 55 60
Thr Ser Gln Pro Ile Asn Phe Gln Val Gln Lys Asp Gly Ser Ser Glu
65 70 75 80
Lys Ser His Met Asp Asp Tyr Met Gln His Pro Gly Lys Val Ile Lys
85 90 95
Gln Asn Asn Lys Tyr Tyr Phe Gln Thr Val Leu Asn Asn Ala Ser Phe
100 105 110
Trp Lys Glu Tyr Lys Phe Tyr Asn Ala Asn Asn Gln Glu Leu Ala Thr
115 120 125
Thr Val Val Asn Asp Asn Lys Lys Ala Asp Thr Arg Thr Ile Asn Val
130 135 140
Ala Val Glu Pro Gly Tyr Lys Ser Leu Thr Thr Lys Val His Ile Val
145 150 155 160
Val Pro Gln Ile Asn Tyr Asn His Arg Tyr Thr Thr His Leu Glu Phe
165 170 175
Glu Lys Ala Ile Pro Thr Leu Ala Asp Ala Ala Lys Pro Asn Asn Val
180 185 190
Lys Pro Val Gln Pro Lys Pro Ala Gln Pro Lys Thr Pro Thr Glu Gln
195 200 205
Thr Lys Pro Val Gln Pro Lys Val Glu Lys Val Lys Pro Thr Val Thr
210 215 220
Thr Thr Ser Lys Val Glu Asp Asn His Ser Thr Lys Val Val Ser Thr
225 230 235 240
Asp Thr Thr Lys Asp Gln Thr Lys Thr Gln Thr Ala His Thr Val Lys
245 250 255
Thr Ala Gln Thr Ala Gln Glu Gln Asn Lys Val Gln Thr Pro Val Lys
260 265 270
Asp Val Ala Thr Ala Lys Ser Glu Ser Asn Asn Gln Ala Val Ser Asp
275 280 285
Asn Lys Ser Gln Gln Thr Asn Lys Val Thr Lys His Asn Glu Thr Pro
290 295 300
Lys Gln Ala Ser Lys Ala Lys Glu Leu Pro Lys Thr Gly Leu Thr Ser
305 310 315 320
Val Asp Asn Phe Ile Ser Thr Val Ala Phe Ala Thr Leu Ala Leu Leu
325 330 335
Gly Ser Leu Ser Leu Leu Leu Phe Lys Arg Lys Glu Ser Lys
340 345 350

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<210> 28
 <211> 645
 <212> PRT
 <213> 葡萄球菌

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<400> 28
Met Asn Lys Gln Gln Lys Glu Phe Lys Ser Phe Tyr Ser Ile Arg Lys
1 5 10 15
Ser Ser Leu Gly Val Ala Ser Val Ala Ile Ser Thr Leu Leu Leu
20 25 30
Met Ser Asn Gly Glu Ala Gln Ala Ala Glu Glu Thr Gly Gly Thr
35 40 45
Asn Thr Glu Ala Gln Pro Lys Thr Glu Ala Val Ala Ser Pro Thr Thr

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50	Thr	Ser	Glu	Lys	Ala	Pro	55	Glu	Thr	Lys	Pro	60	Val	Ala	Asn	Ala	Val	Ser
65	Val	Ser	Asn	Lys	Glu	Val	70	Glu	Ala	Pro	Thr	75	Ser	Glu	Thr	Lys	Glu	Ala
	Lys	Glu	Val	Lys	Glu	Val	85	Lys	Ala	Pro	Lys	90	Glu	Thr	Lys	Ala	Val	Lys
	Pro	Ala	Ala	Lys	Ala	Thr	100	Asn	Asn	Thr	Tyr	105	Pro	Ile	Leu	Asn	Gln	Glu
	Leu	Arg	Glu	Ala	Ile	Lys	115	Asn	Pro	Ala	Ile	120	Lys	Asp	Lys	Asp	His	Ser
	Ala	Pro	Asn	Ser	Arg	Pro	130	Ile	Asp	Phe	Glu	135	Met	Lys	Lys	Glu	Asn	Gly
	Glu	Gln	Gln	Phe	Tyr	His	145	Tyr	Ala	Ser	Ser	150	Val	Lys	Pro	Ala	Arg	Val
	Ile	Phe	Thr	Asp	Ser	Lys	165	Pro	Glu	Ile	Glu	170	Leu	Gly	Leu	Gln	Ser	Gly
	Gln	Phe	Trp	Arg	Lys	Phe	180	Glu	Val	Tyr	Glu	185	Gly	Asp	Lys	Lys	Leu	Pro
	Ile	Lys	Leu	Val	Ser	Tyr	195	Asp	Thr	Val	Lys	200	Asp	Tyr	Ala	Tyr	Ile	Arg
	Phe	Ser	Val	Ser	Asn	Gly	210	Thr	Lys	Ala	Val	215	Lys	Ile	Val	Ser	Ser	Thr
	His	Phe	Asn	Asn	Lys	Glu	225	Glu	Lys	Tyr	Asp	230	Tyr	Thr	Leu	Met	Glu	Phe
	Ala	Gln	Pro	Ile	Tyr	Asn	245	Ser	Ala	Asp	Lys	250	Phe	Lys	Thr	Glu	Glu	Asp
	Tyr	Lys	Ala	Glu	Lys	Leu	260	Leu	Ala	Pro	Tyr	265	Lys	Lys	Ala	Lys	Thr	Leu
	Glu	Arg	Gln	Val	Tyr	Glu	275	Leu	Asn	Lys	Ile	280	Gln	Asp	Lys	Leu	Pro	Glu
	Lys	Leu	Lys	Ala	Glu	Tyr	290	Lys	Lys	Lys	Leu	295	Glu	Asp	Thr	Lys	Lys	Ala
	Leu	Asp	Glu	Gln	Val	Lys	305	Ser	Ala	Ile	Thr	310	Glu	Phe	Gln	Asn	Val	Gln
	Pro	Thr	Asn	Glu	Lys	Met	325	Thr	Asp	Leu	Gln	330	Asp	Thr	Lys	Tyr	Val	Val
	Tyr	Glu	Ser	Val	Glu	Asn	340	Asn	Glu	Ser	Met	345	Met	Met	Asp	Thr	Phe	Val
	His	Pro	Ile	Lys	Thr	Gly	355	Met	Leu	Asn	Gly	360	Lys	Lys	Tyr	Met	Val	Met
	Glu	Thr	Thr	Asn	Asp	Asp	370	Tyr	Trp	Lys	Asp	375	Phe	Met	Val	Glu	Gly	Gln
	Arg	Val	Arg	Thr	Ile	Ser	385	Lys	Asp	Ala	Lys	390	Asn	Asn	Thr	Arg	Thr	Ile
	Ile	Phe	Pro	Tyr	Val	Glu	405	Gly	Lys	Thr	Leu	410	Tyr	Asp	Ala	Ile	Val	Lys
	Val	His	Val	Lys	Thr	Ile	420	Asp	Tyr	Asp	Gly	425	Gln	Tyr	His	Val	Arg	Ile
	Val	Asp	Lys	Glu	Ala	Phe	435	Thr	Lys	Ala	Asn	440	Thr	Asp	Lys	Ser	Asn	Lys
	Lys	Glu	Gln	Gln	Asp	Asn	450	Ser	Ala	Lys	Lys	455	Glu	Ala	Thr	Pro	Ala	Thr
	Pro	Ser	Lys	Pro	Thr	Pro	465	Ser	Pro	Val	Glu	470	Lys	Glu	Ser	Gln	Lys	Gln
	Asp	Ser	Gln	Lys	Asp	Asn	485	Lys	Gln	Leu	Pro	490	Ser	Val	Glu	Lys	Glu	
	Asn	Asp	Ala	Ser	Ser	Glu	500	Ser	Gly	Lys	Asp	505	Lys	Thr	Pro	Ala	Thr	Lys
	Pro	Thr	Lys	Gly	Glu	Val	515	Glu	Ser	Ser	Ser	520	Thr	Thr	Pro	Thr	Lys	Val
	Val	Ser	Thr	Thr	Gln	Asn	530	Val	Ala	Lys	Pro	535	Thr	Thr	Ala	Ser	Ser	Lys
	Thr	Thr	Lys	Asp	Val	Gln	545	Thr	Ser	Ala	Gly	550	Ser	Ser	Glu	Ala	Lys	
	Asp	Ser	Ala	Pro	Leu	Gln	555	Lys	Ala	Asn	Ile	565	Lys	Asn	Thr	Asn	Asp	Gly
	His	Thr	Gln	Ser	Gln	Asn	580	Asn	Lys	Asn	Thr	585	Gln	Glu	Asn	Lys	Ala	Lys
	Ser	Leu	Pro	Gln	Thr	Gly	595	Glu	Glu	Ser	Asn	600	Lys	Asp	Met	Thr	Leu	Pro
	Leu	Met	Ala	Leu	Leu	Ala	610	Leu	Ser	Ser	Ile	615	Val	Ala	Phe	Val	Leu	Pro
	Arg	Lys	Arg	Lys	Asn		625					630						
							645					635						

<210> 29
<211> 953
<212> PRT
<213> 葡萄球菌

<400> 29

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Met Asn Asn Lys Lys Thr Ala Thr Asn Arg Lys Gly Met Ile Pro Asn
1      5      10      15
Arg Leu Asn Lys Phe Ser Ile Arg Lys Tyr Ser Val Gly Thr Ala Ser
20      25      30
Ile Leu Val Gly Thr Thr Leu Ile Phe Gly Leu Ser Gly His Glu Ala
35      40      45
Lys Ala Ala Glu His Thr Asn Gly Glu Leu Asn Gln Ser Lys Asn Glu
50      55      60
Thr Thr Ala Pro Ser Glu Asn Lys Thr Thr Glu Lys Val Asp Ser Arg
65      70      75      80
Gln Leu Lys Asp Asn Thr Gln Thr Ala Thr Ala Asp Gln Pro Lys Val
85      90      95
Thr Met Ser Asp Ser Ala Thr Val Lys Glu Thr Ser Ser Asn Met Gln
100     105     110
Ser Pro Gln Asn Ala Thr Ala Ser Gln Ser Thr Thr Gln Thr Ser Asn
115     120     125
Val Thr Thr Asn Asp Lys Ser Ser Thr Thr Tyr Ser Asn Glu Thr Asp
130     135     140
Lys Ser Asn Leu Thr Gln Ala Lys Asn Val Ser Thr Thr Pro Lys Thr
145     150     155     160
Thr Thr Ile Lys Gln Arg Ala Leu Asn Arg Met Ala Val Asn Thr Val
165     170     175
Ala Ala Pro Gln Gln Gly Thr Asn Val Asn Asp Lys Val His Phe Thr
180     185     190
Asn Ile Asp Ile Ala Ile Asp Lys Gly His Val Asn Lys Thr Thr Gly
195     200     205
Asn Thr Glu Phe Trp Ala Thr Ser Ser Asp Val Leu Lys Leu Lys Ala
210     215     220
Asn Tyr Thr Ile Asp Asp Ser Val Lys Glu Gly Asp Thr Phe Thr Phe
225     230     235     240
Lys Tyr Gly Gln Tyr Phe Arg Pro Gly Ser Val Arg Leu Pro Ser Gln
245     250     255
Thr Gln Asn Leu Tyr Asn Ala Gln Gly Asn Ile Ile Ala Lys Gly Ile
260     265     270
Tyr Asp Ser Lys Thr Asn Thr Thr Thr Tyr Thr Phe Thr Asn Tyr Val
275     280     285
Asp Gln Tyr Thr Asn Val Ser Gly Ser Phe Glu Gln Val Ala Phe Ala
290     295     300
Lys Arg Glu Asn Ala Thr Thr Asp Lys Thr Ala Tyr Lys Met Glu Val
305     310     315     320
Thr Leu Gly Asn Asp Thr Tyr Ser Lys Asp Val Ile Val Asp Tyr Gly
325     330     335
Asn Gln Lys Gly Gln Gln Leu Ile Ser Ser Thr Asn Tyr Ile Asn Asn
340     345     350
Glu Asp Leu Ser Arg Asn Met Thr Val Tyr Val Asn Gln Pro Lys Lys
355     360     365
Thr Tyr Thr Lys Glu Thr Phe Val Thr Asn Leu Thr Gly Tyr Lys Phe
370     375     380
Asn Pro Asp Ala Lys Asn Phe Lys Ile Tyr Glu Val Thr Asp Gln Asn
385     390     395     400
Gln Phe Val Asp Ser Phe Thr Pro Asp Thr Ser Lys Leu Lys Asp Val
405     410     415
Thr Gly Gln Phe Asp Val Ile Tyr Ser Asn Asp Asn Lys Thr Ala Thr
420     425     430
Val Asp Leu Leu Asn Gly Gln Ser Ser Ser Asp Lys Gln Tyr Ile Ile
435     440     445
Gln Gln Val Ala Tyr Pro Asp Asn Ser Ser Thr Asp Asn Gly Lys Ile
450     455     460
Asp Tyr Thr Leu Glu Thr Gln Asn Gly Lys Ser Ser Trp Ser Asn Ser
465     470     475     480
Tyr Ser Asn Val Asn Gly Ser Ser Thr Ala Asn Gly Asp Gln Lys Lys
485     490     495
Tyr Asn Leu Gly Asp Tyr Val Trp Glu Asp Thr Asn Lys Asp Gly Lys
500     505     510
Gln Asp Ala Asn Glu Lys Gly Ile Lys Gly Val Tyr Val Ile Leu Lys
515     520     525
Asp Ser Asn Gly Lys Glu Leu Asp Arg Thr Thr Thr Asp Glu Asn Gly

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      530      535      540
Lys Tyr Gln Phe Thr Gly Leu Ser Asn Gly Thr Tyr Ser Val Glu Phe
545      550      555      560
Ser Thr Pro Ala Gly Tyr Thr Pro Thr Thr Ala Asn Ala Gly Thr Asp
      565      570      575
Asp Ala Val Asp Ser Asp Gly Leu Thr Thr Thr Gly Val Ile Lys Asp
      580      585      590
Ala Asp Asn Met Thr Leu Asp Ser Gly Phe Tyr Lys Thr Pro Lys Tyr
      595      600      605
Ser Leu Gly Asp Tyr Val Trp Tyr Asp Ser Asn Lys Asp Gly Lys Gln
      610      615      620
Asp Ser Thr Glu Lys Gly Ile Lys Gly Val Lys Val Thr Leu Gln Asn
      625      630      635      640
Glu Lys Gly Glu Val Ile Gly Thr Thr Glu Thr Asp Glu Asn Gly Lys
      645      650      655
Tyr Arg Phe Asp Asn Leu Asp Ser Gly Lys Tyr Lys Val Ile Phe Glu
      660      665      670
Lys Pro Ala Gly Leu Thr Gln Thr Gly Thr Asn Thr Thr Glu Asp Asp
      675      680      685
Lys Asp Ala Asp Gly Gly Glu Val Asp Val Thr Ile Thr Asp His Asp
      690      695      700
Asp Phe Thr Leu Asp Asn Gly Tyr Tyr Glu Glu Glu Thr Ser Asp Ser
      705      710      715      720
Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser
      725      730      735
Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser
      740      745      750
Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser
      755      760      765
Asp Ser Asp Ser Glu Ser Asp Ser Asp Ser Asp Ser Asp Ser
      770      775      780
Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser
      785      790      795      800
Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser
      805      810      815
Asp Ser Asp Ser Asp Ser Asp Asn Asp Ser Asp Ser Asp Ser
      820      825      830
Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser
      835      840      845
Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser
      850      855      860
Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser
      865      870      875      880
Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Ala Gly Lys
      885      890      895
His Thr Pro Thr Lys Pro Met Ser Thr Val Lys Asp Gln His Lys Thr
      900      905      910
Ala Lys Ala Leu Pro Glu Thr Gly Ser Glu Asn Asn Asn Ser Asn Asn
      915      920      925
Gly Thr Leu Phe Gly Gly Leu Phe Ala Ala Leu Gly Ser Leu Leu Leu
      930      935      940
Phe Gly Arg Arg Lys Lys Gln Asn Lys
      945      950

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<210> 30
 <211> 935
 <212> PRT
 <213> 葡萄球菌

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<400> 30
Met Asn Met Lys Lys Lys Glu Lys His Ala Ile Arg Lys Lys Ser Ile
1      5      10      15
Gly Val Ala Ser Val Leu Val Gly Thr Leu Ile Gly Phe Gly Leu Leu
      20      25      30
Ser Ser Lys Glu Ala Asp Ala Ser Glu Asn Ser Val Thr Gln Ser Asp
      35      40      45
Ser Ala Ser Asn Glu Ser Lys Ser Asn Asp Ser Ser Val Ser Ala
      50      55      60
Ala Pro Lys Thr Asp Asp Thr Asn Val Ser Asp Thr Lys Thr Ser Ser
      65      70      75      80
Asn Thr Asn Asn Gly Glu Thr Ser Val Ala Gln Asn Pro Ala Gln Gln
      85      90      95
Glu Thr Thr Gln Ser Ser Ser Thr Asn Ala Thr Thr Glu Glu Thr Pro
      100      105      110

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Val	Thr	Gly	Glu	Ala	Thr	Thr	Thr	Thr	Thr	Asn	Gln	Ala	Asn	Thr	Pro
		115					120					125			
Ala	Thr	Thr	Gln	Ser	Ser	Asn	Thr	Asn	Ala	Glu	Glu	Leu	Val	Asn	Gln
		130				135					140				
Thr	Ser	Asn	Glu	Thr	Thr	Ser	Asn	Asp	Thr	Asn	Thr	Val	Ser	Ser	Val
		145				150				155					160
Asn	Ser	Pro	Gln	Asn	Ser	Thr	Asn	Ala	Glu	Asn	Val	Ser	Thr	Thr	Gln
			165						170						175
Asp	Thr	Ser	Thr	Glu	Ala	Thr	Pro	Ser	Asn	Asn	Glu	Ser	Ala	Pro	Gln
			180					185					190		
Asn	Thr	Asp	Ala	Ser	Asn	Lys	Asp	Val	Val	Ser	Gln	Ala	Val	Asn	Pro
		195					200					205			
Ser	Thr	Pro	Arg	Met	Arg	Ala	Phe	Ser	Leu	Ala	Ala	Val	Ala	Ala	Asp
		210				215					220				
Ala	Pro	Ala	Ala	Gly	Thr	Asp	Ile	Thr	Asn	Gln	Leu	Thr	Asp	Val	Lys
		225				230				235					240
Val	Thr	Ile	Asp	Ser	Gly	Thr	Thr	Val	Tyr	Pro	His	Gln	Ala	Gly	Tyr
			245						250					255	
Val	Lys	Leu	Asn	Tyr	Gly	Phe	Ser	Val	Pro	Asn	Ser	Ala	Val	Lys	Gly
		260						265					270		
Asp	Thr	Phe	Lys	Ile	Thr	Val	Pro	Lys	Glu	Leu	Asn	Leu	Asn	Gly	Val
		275					280					285			
Thr	Ser	Thr	Ala	Lys	Val	Pro	Pro	Ile	Met	Ala	Gly	Asp	Gln	Val	Leu
		290				295					300				
Ala	Asn	Gly	Val	Ile	Asp	Ser	Asp	Gly	Asn	Val	Ile	Tyr	Thr	Phe	Thr
		305			310				315						320
Asp	Tyr	Val	Asp	Asn	Lys	Glu	Asn	Val	Thr	Ala	Asn	Ile	Thr	Met	Pro
			325						330					335	
Ala	Tyr	Ile	Asp	Pro	Glu	Asn	Val	Thr	Lys	Thr	Gly	Asn	Val	Thr	Leu
		340					345						350		
Thr	Thr	Gly	Ile	Gly	Thr	Asn	Thr	Ala	Ser	Lys	Thr	Val	Leu	Ile	Asp
		355				360						365			
Tyr	Glu	Lys	Tyr	Gly	Gln	Phe	His	Asn	Leu	Ser	Ile	Lys	Gly	Thr	Ile
		370				375					380				
Asp	Gln	Ile	Asp	Lys	Thr	Asn	Asn	Thr	Tyr	Arg	Gln	Thr	Ile	Tyr	Val
		385			390					395					400
Asn	Pro	Ser	Gly	Asp	Asn	Val	Val	Leu	Pro	Ala	Leu	Thr	Gly	Asn	Leu
			405						410					415	
Ile	Pro	Asn	Thr	Lys	Ser	Asn	Ala	Leu	Ile	Asp	Ala	Lys	Asn	Thr	Asp
		420					425						430		
Ile	Lys	Val	Tyr	Arg	Val	Asp	Asn	Ala	Asn	Asp	Leu	Ser	Glu	Ser	Tyr
		435				440						445			
Tyr	Val	Asn	Pro	Ser	Asp	Phe	Glu	Asp	Val	Thr	Asn	Gln	Val	Arg	Ile
		450				455					460				
Ser	Phe	Pro	Asn	Ala	Asn	Gln	Tyr	Lys	Val	Glu	Phe	Pro	Thr	Asp	Asp
		465			470					475					480
Asp	Gln	Ile	Thr	Thr	Pro	Tyr	Ile	Val	Val	Val	Asn	Gly	His	Ile	Asp
			485						490					495	
Pro	Ala	Ser	Thr	Gly	Asp	Leu	Ala	Leu	Arg	Ser	Thr	Phe	Tyr	Gly	Tyr
			500				505						510		
Asp	Ser	Asn	Phe	Ile	Trp	Arg	Ser	Met	Ser	Trp	Asp	Asn	Glu	Val	Ala
		515					520					525			
Phe	Asn	Asn	Gly	Ser	Gly	Ser	Gly	Asp	Gly	Ile	Asp	Lys	Pro	Val	Val
		530				535					540				
Pro	Glu	Gln	Pro	Asp	Glu	Pro	Gly	Glu	Ile	Glu	Pro	Ile	Pro	Glu	Asp
		545			550					555					560
Ser	Asp	Ser	Asp	Pro	Gly	Ser	Asp	Ser	Gly	Ser	Asp	Ser	Asn	Ser	Asp
			565						570				575		
Ser	Gly	Ser	Asp	Ser	Gly	Ser	Asp	Ser	Thr	Ser	Asp	Ser	Gly	Ser	Asp
			580				585						590		
Ser	Ala	Ser	Asp	Ser	Asp	Ser	Ala	Ser	Asp	Ser	Asp	Ser	Ala	Ser	Asp
		595					600					605			
Ser	Asp	Ser	Ala	Ser	Asp	Ser	Asp	Ser	Ala	Ser	Asp	Ser	Asp	Ser	Ala
		610				615					620				
Ser	Asp	Ser	Asp	Ser	Ala	Ser	Asp	Ser	Asp	Ser	Ala	Ser	Asp	Ser	Asp
		625			630				635						640
Ser	Ala	Ser	Asp	Ser	Asp	Ser	Ala	Ser	Asp	Ser	Asp	Ser	Ala	Ser	Asp
			645						650					655	
Ser	Asp	Ser	Ala	Ser	Asp	Ser	Asp	Ser	Ala	Ser	Asp	Ser	Asp	Ser	Asp
			660				665						670		
Ser	Asp	Ser	Asp	Ser	Asp	Ser	Asp	Ser	Asp	Ser	Asp	Ser	Asp	Ser	Asp
		675					680					685			
Ser	Asp	Ser	Asp	Ser	Asp	Ser	Asp	Ser	Asp	Ser	Asp	Ser	Asp	Ser	Asp
		690				695					700				
Ser	Asp	Ser	Asp	Ser	Asp	Ser	Asp	Ser	Asp	Ser	Asp	Ser	Asp	Ser	Asp

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705          710          715          720
Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp
Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp
Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Ala
Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Glu Ser Asp Ser Asp Ser Asp
Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp
Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp
Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Glu Ser Asp
Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Ala Ser Asp Ser Asp
Ser Gly Ser Asp Ser Asp Ser Ser Ser Asp Ser Asp Ser Asp Ser Asp Ser Thr
Ser Asp Thr Gly Ser Asp Asn Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp
Ser Glu Ser Gly Ser Asn Asn Asn Val Val Pro Pro Asn Ser Pro Lys
Asn Gly Thr Asn Ala Ser Asn Lys Asn Glu Ala Lys Asp Ser Lys Glu
Pro Leu Pro Asp Thr Gly Ser Glu Asp Glu Ala Asn Thr Ser Leu Ile
Trp Gly Leu Leu Ala Ser Leu Gly Ser Leu Leu Leu Phe Arg Arg Lys
Lys Glu Asn Lys Asp Lys Lys
930          935

```

<210> 31
 <211> 1038
 <212> PRT
 <213> 葡萄球菌

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<400> 31
Met Lys Asn Asn Leu Arg Tyr Gly Ile Arg Lys His Lys Leu Gly Ala
1      5      10      15
Ala Ser Val Phe Leu Gly Thr Met Ile Val Val Gly Met Gly Gln Asp
20      25      30
Lys Glu Ala Ala Ala Ser Glu Gln Lys Thr Thr Thr Val Glu Glu Asn
35      40      45
Gly Asn Ser Ala Thr Asp Asn Lys Thr Ser Glu Thr Gln Thr Thr Ala
50      55      60
Thr Asn Val Asn His Ile Glu Glu Thr Gln Ser Tyr Asn Ala Thr Val
65      70      75      80
Thr Glu Gln Pro Ser Asn Ala Thr Gln Val Thr Thr Glu Glu Ala Pro
85      90      95
Lys Ala Val Gln Ala Pro Gln Thr Ala Gln Pro Ala Asn Val Glu Thr
100     105     110
Val Lys Glu Glu Lys Pro Gln Val Lys Glu Thr Thr Gln Pro Gln
115     120     125
Asp Asn Ser Gly Asn Gln Arg Gln Val Asp Leu Thr Pro Lys Lys Val
130     135     140
Thr Gln Asn Gln Gly Thr Glu Thr Gln Val Glu Val Ala Gln Pro Arg
145     150     155     160
Thr Ala Ser Glu Ser Lys Pro Arg Val Thr Arg Ser Ala Asp Val Ala
165     170     175
Glu Ala Lys Glu Ala Ser Asp Val Ser Glu Val Lys Gly Thr Asp Val
180     185     190
Thr Ser Lys Val Thr Val Glu Ser Gly Ser Ile Glu Ala Pro Gln Gly
195     200     205
Asn Lys Val Glu Pro His Ala Gly Gln Arg Val Val Leu Lys Tyr Lys
210     215     220
Leu Lys Phe Ala Asp Gly Leu Lys Arg Gly Asp Tyr Phe Asp Phe Thr
225     230     235     240
Leu Ser Asn Asn Val Asn Thr Tyr Gly Val Ser Thr Ala Arg Lys Val
245     250     255
Pro Glu Ile Lys Asn Gly Ser Val Val Met Ala Thr Gly Glu Ile Leu
260     265     270
Gly Asn Gly Asn Ile Arg Tyr Thr Phe Thr Asn Glu Ile Glu His Lys
275     280     285
Val Glu Val Thr Ala Asn Leu Glu Ile Asn Leu Phe Ile Asp Pro Lys
290     295     300

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Thr	Val	Gln	Ser	Asn	Gly	Glu	Gln	Lys	Ile	Thr	Ser	Lys	Leu	Asn	Gly
305					310					315					320
Glu	Glu	Thr	Glu	Lys	Thr	Ile	Pro	Val	Val	Tyr	Asn	Pro	Gly	Val	Ser
				325						330					335
Asn	Ser	Tyr	Thr	Asn	Val	Asn	Gly	Ser	Ile	Glu	Thr	Phe	Asn	Lys	Glu
				340						345					350
Ser	Asn	Lys	Phe	Thr	His	Ile	Ala	Tyr	Ile	Lys	Pro	Met	Asn	Gly	Asn
				355											365
Gln	Ser	Asn	Thr	Val	Ser	Val	Thr	Gly	Thr	Leu	Thr	Glu	Gly	Ser	Asn
				370											380
Leu	Ala	Gly	Gly	Gln	Pro	Thr	Val	Lys	Val	Tyr	Glu	Tyr	Leu	Gly	Lys
385					390					395					400
Lys	Asp	Glu	Leu	Pro	Gln	Ser	Val	Tyr	Ala	Asn	Thr	Ser	Asp	Thr	Asn
				405						410					415
Lys	Phe	Lys	Asp	Val	Thr	Lys	Glu	Met	Asn	Gly	Lys	Leu	Ser	Val	Gln
				420						425					430
Asp	Asn	Gly	Ser	Tyr	Ser	Leu	Asn	Leu	Asp	Lys	Leu	Asp	Lys	Thr	Tyr
				435						440					445
Val	Ile	His	Tyr	Thr	Gly	Glu	Tyr	Leu	Gln	Gly	Ser	Asp	Gln	Val	Asn
				450											460
Phe	Arg	Thr	Glu	Leu	Tyr	Gly	Tyr	Pro	Glu	Arg	Ala	Tyr	Lys	Ser	Tyr
465					470					475					480
Tyr	Val	Tyr	Gly	Gly	Tyr	Arg	Leu	Thr	Trp	Asp	Asn	Gly	Leu	Val	Leu
				485						490					495
Tyr	Ser	Asn	Lys	Ala	Asp	Gly	Asn	Gly	Lys	Asn	Gly	Gln	Ile	Ile	Gln
				500						505					510
Asp	Asn	Asp	Phe	Glu	Tyr	Lys	Glu	Asp	Thr	Ala	Lys	Gly	Thr	Met	Ser
				515						520					525
Gly	Gln	Tyr	Asp	Ala	Lys	Gln	Ile	Ile	Glu	Thr	Glu	Glu	Asn	Gln	Asp
				530											540
Asn	Thr	Pro	Leu	Asp	Ile	Asp	Tyr	His	Thr	Ala	Ile	Asp	Gly	Glu	Gly
545					550					555					560
Gly	Tyr	Val	Asp	Gly	Tyr	Ile	Glu	Thr	Ile	Glu	Glu	Thr	Asp	Ser	Ser
				565						570					575
Ala	Ile	Asp	Ile	Asp	Tyr	His	Thr	Ala	Val	Asp	Ser	Glu	Val	Gly	His
				580						585					590
Val	Gly	Gly	Tyr	Thr	Glu	Ser	Ser	Glu	Glu	Ser	Asn	Pro	Ile	Asp	Phe
				595											605
Glu	Glu	Ser	Thr	His	Glu	Asn	Ser	Lys	His	His	Ala	Asp	Val	Val	Glu
				610											620
Tyr	Glu	Glu	Asp	Thr	Asn	Pro	Gly	Gly	Gly	Gln	Val	Thr	Thr	Glu	Ser
625					630					635					640
Asn	Leu	Val	Glu	Phe	Asp	Glu	Glu	Ser	Thr	Lys	Gly	Ile	Val	Thr	Gly
				645						650					655
Ala	Val	Ser	Asp	His	Thr	Thr	Ile	Glu	Asp	Thr	Lys	Glu	Tyr	Thr	Thr
				660						665					670
Glu	Ser	Asn	Leu	Ile	Glu	Leu	Val	Asp	Glu	Leu	Pro	Glu	Glu	His	Gly
				675						680					685
Gln	Ala	Gln	Gly	Pro	Ile	Glu	Glu	Ile	Thr	Glu	Asn	Asn	His	His	Ile
				690											700
Ser	His	Ser	Gly	Leu	Gly	Thr	Glu	Asn	Gly	His	Gly	Asn	Tyr	Gly	Val
705					710					715					720
Ile	Glu	Glu	Ile	Glu	Glu	Asn	Ser	His	Val	Asp	Ile	Lys	Ser	Glu	Leu
				725						730					735
Gly	Tyr	Glu	Gly	Gly	Gln	Asn	Ser	Gly	Asn	Gln	Ser	Phe	Glu	Glu	Asp
				740						745					750
Thr	Glu	Glu	Asp	Lys	Pro	Lys	Tyr	Glu	Gln	Gly	Gly	Asn	Ile	Val	Asp
				755						760					765
Ile	Asp	Phe	Asp	Ser	Val	Pro	Gln	Ile	His	Gly	Gln	Asn	Lys	Gly	Asp
				770						775					780
Gln	Ser	Phe	Glu	Glu	Asp	Thr	Glu	Lys	Asp	Lys	Pro	Lys	Tyr	Glu	His
785					790					795					800
Gly	Gly	Asn	Ile	Ile	Asp	Ile	Asp	Phe	Asp	Ser	Val	Pro	Gln	Ile	His
				805						810					815
Gly	Phe	Asn	Lys	His	Asn	Glu	Ile	Ile	Glu	Glu	Asp	Thr	Asn	Lys	Asp
				820						825					830
Lys	Pro	Asn	Tyr	Gln	Phe	Gly	Gly	His	Asn	Ser	Val	Asp	Phe	Glu	Glu
				835						840					845
Asp	Thr	Leu	Pro	Lys	Val	Ser	Gly	Gln	Asn	Glu	Gly	Gln	Gln	Thr	Ile
				850						855					860
Glu	Glu	Asp	Thr	Thr	Pro	Pro	Thr	Pro	Pro	Thr	Pro	Glu	Val	Pro	Ser
865					870					875					880
Glu	Pro	Glu	Thr	Pro	Met	Pro	Pro	Thr	Pro	Glu	Val	Pro	Ser	Glu	Pro
				885						890					895
Glu	Thr	Pro	Thr	Pro	Pro	Thr	Pro	Glu	Val	Pro	Ser	Glu	Pro	Glu	Thr

Pro	Thr	Pro	900	Pro	Thr	Pro	Glu	Val	Pro	905	Ser	Glu	Pro	Glu	910	Thr	Pro	Thr
		915							920					925				
Pro	Pro	Thr	Pro	Glu	Val	Pro	Ser	Glu	Pro	Glu	Thr	Pro	Thr	Pro	Pro			
	930					935				940								
Thr	Pro	Glu	Val	Pro	Ala	Glu	Pro	Gly	Lys	Pro	Val	Pro	Pro	Ala	Lys			
945					950					955					960			
Glu	Glu	Pro	Lys	Lys	Pro	Ser	Lys	Pro	Val	Glu	Gln	Gly	Lys	Val	Val			
			965						970					975				
Thr	Pro	Val	Ile	Glu	Ile	Asn	Glu	Lys	Val	Lys	Ala	Val	Ala	Pro	Thr			
			980					985					990					
Lys	Lys	Ala	Gln	Ser	Lys	Lys	Ser	Glu	Leu	Pro	Glu	Thr	Gly	Gly	Glu			
		995					1000					1005						
Glu	Ser	Thr	Asn	Lys	Gly	Met	Leu	Phe	Gly	Gly	Leu	Phe	Ser	Ile	Leu			
	1010					1015				1020								
Gly	Leu	Ala	Leu	Leu	Arg	Arg	Asn	Lys	Lys	Asn	Asn	Lys	Ala					
1025					1030					1035								

<210> 32
 <211> 877
 <212> PRT
 <213> 葡萄球菌

Met	Lys	Lys	Arg	Ile	Asp	Tyr	Leu	Ser	Asn	Lys	Gln	Asn	Lys	Tyr	Ser
1				5					10					15	
Ile	Arg	Arg	Phe	Thr	Val	Gly	Thr	Thr	Ser	Val	Ile	Val	Gly	Ala	Thr
			20					25					30		
Ile	Leu	Phe	Gly	Ile	Gly	Asn	His	Gln	Ala	Gln	Ala	Ser	Glu	Gln	Ser
		35				40					45				
Asn	Asp	Thr	Thr	Gln	Ser	Ser	Lys	Asn	Asn	Ala	Ser	Ala	Asp	Ser	Glu
	50					55				60					
Lys	Asn	Asn	Met	Ile	Glu	Thr	Pro	Gln	Leu	Asn	Thr	Thr	Ala	Asn	Asp
65					70				75					80	
Thr	Ser	Asp	Ile	Ser	Ala	Asn	Thr	Asn	Ser	Ala	Asn	Val	Asp	Ser	Thr
			85					90					95		
Thr	Lys	Pro	Met	Ser	Thr	Gln	Thr	Ser	Asn	Thr	Thr	Thr	Thr	Glu	Pro
			100					105					110		
Ala	Ser	Thr	Asn	Glu	Thr	Pro	Gln	Pro	Thr	Ala	Ile	Lys	Asn	Gln	Ala
		115					120					125			
Thr	Ala	Ala	Lys	Met	Gln	Asp	Gln	Thr	Val	Pro	Gln	Glu	Ala	Asn	Ser
		130				135					140				
Gln	Val	Asp	Asn	Lys	Thr	Thr	Asn	Asp	Ala	Asn	Ser	Ile	Ala	Thr	Asn
					150				155					160	
Ser	Glu	Leu	Lys	Asn	Ser	Gln	Thr	Leu	Asp	Leu	Pro	Gln	Ser	Ser	Pro
			165						170					175	
Gln	Thr	Ile	Ser	Asn	Ala	Gln	Gly	Thr	Ser	Lys	Pro	Ser	Val	Arg	Thr
			180					185					190		
Arg	Ala	Val	Arg	Ser	Leu	Ala	Val	Ala	Glu	Pro	Val	Val	Asn	Ala	Ala
			195				200					205			
Asp	Ala	Lys	Gly	Thr	Asn	Val	Asn	Asp	Lys	Val	Thr	Ala	Ser	Asn	Phe
		210				215					220				
Lys	Leu	Glu	Lys	Thr	Thr	Phe	Asp	Pro	Asn	Gln	Ser	Gly	Asn	Thr	Phe
					230				235					240	
Met	Ala	Ala	Asn	Phe	Thr	Val	Thr	Asp	Lys	Val	Lys	Ser	Gly	Asp	Tyr
				245					250					255	
Phe	Thr	Ala	Lys	Leu	Pro	Asp	Ser	Leu	Thr	Gly	Asn	Gly	Asp	Val	Asp
			260					265					270		
Tyr	Ser	Asn	Ser	Asn	Asn	Thr	Met	Pro	Ile	Ala	Asp	Ile	Lys	Ser	Thr
			275				280					285			
Asn	Gly	Asp	Val	Val	Ala	Lys	Ala	Thr	Tyr	Asp	Ile	Leu	Thr	Lys	Thr
						295					300				
Tyr	Thr	Phe	Val	Phe	Thr	Asp	Tyr	Val	Asn	Asn	Lys	Glu	Asn	Ile	Asn
						310					315			320	
Gly	Gln	Phe	Ser	Leu	Pro	Leu	Phe	Thr	Asp	Arg	Ala	Lys	Ala	Pro	Lys
						325				330				335	
Ser	Gly	Thr	Tyr	Asp	Ala	Asn	Ile	Asn	Ile	Ala	Asp	Glu	Met	Phe	Asn
			340					345					350		
Asn	Lys	Ile	Thr	Tyr	Asn	Tyr	Ser	Ser	Pro	Ile	Ala	Gly	Ile	Asp	Lys
			355				360					365			
Pro	Asn	Gly	Ala	Asn	Ile	Ser	Ser	Gln	Ile	Ile	Gly	Val	Asp	Thr	Ala
			370			375					380				
Ser	Gly	Gln	Asn	Thr	Tyr	Lys	Gln	Thr	Val	Phe	Val	Asn	Pro	Lys	Gln
					390					395					400

Arg Val Leu Gly Asn Thr Trp Val Tyr Ile Lys Gly Tyr Gln Asp Lys
 405 410 415
 Ile Glu Glu Ser Ser Gly Lys Val Ser Ala Thr Asp Thr Lys Leu Arg
 420 425 430
 Ile Phe Glu Val Asn Asp Thr Ser Lys Leu Ser Asp Ser Tyr Tyr Ala
 435 440 445
 Asp Pro Asn Asp Ser Asn Leu Lys Glu Val Thr Asp Gln Phe Lys Asn
 450 455 460
 Arg Ile Tyr Tyr Glu His Pro Asn Val Ala Ser Ile Lys Phe Gly Asp
 465 470 475 480
 Ile Thr Lys Thr Tyr Val Val Leu Val Glu Gly His Tyr Asp Asn Thr
 485 490 495
 Gly Lys Asn Leu Lys Thr Gln Val Ile Gln Glu Asn Val Asp Pro Val
 500 505 510
 Thr Asn Arg Asp Tyr Ser Ile Phe Gly Trp Asn Asn Glu Asn Val Val
 515 520 525
 Arg Tyr Gly Gly Gly Ser Ala Asp Gly Asp Ser Ala Val Asn Pro Lys
 530 535 540
 Asp Pro Thr Pro Gly Pro Pro Val Asp Pro Glu Pro Ser Pro Asp Pro
 545 550 555 560
 Glu Pro Glu Pro Thr Pro Asp Pro Glu Pro Ser Pro Asp Pro Glu Pro
 565 570 575
 Glu Pro Ser Pro Asp Pro Asp Pro Asp Ser Asp Ser Asp Ser Asp Ser
 580 585 590
 Gly Ser Asp Ser Asp Ser Gly Ser Asp Ser Asp Ser Glu Ser Asp Ser
 595 600 605
 Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Glu Ser
 610 615 620
 Asp Ser Asp Ser Glu Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser
 625 630 635 640
 Asp Ser Asp Ser Asp Ser Glu Ser Asp Ser Asp Ser Asp Ser Asp Ser
 645 650 655
 Asp Ser Asp Ser Asp Ser Asp Ser Glu Ser Asp Ser Asp Ser Glu Ser
 660 665 670
 Asp Ser Glu Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser
 675 680 685
 Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser
 690 695 700
 Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Glu Ser Asp Ser Asp Ser
 705 710 715 720
 Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser
 725 730 735
 Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser
 740 745 750
 Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser
 755 760 765
 Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser
 770 775 780
 Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser
 785 790 795 800
 Asp Ser Asp Ser Arg Val Thr Pro Pro Asn Asn Glu Gln Lys Ala Pro
 805 810 815
 Ser Asn Pro Lys Gly Glu Val Asn His Ser Asn Lys Val Ser Lys Gln
 820 825 830
 His Lys Thr Asp Ala Leu Pro Glu Thr Gly Asp Lys Ser Glu Asn Thr
 835 840 845
 Asn Ala Thr Leu Phe Gly Ala Met Met Ala Leu Leu Gly Ser Leu Leu
 850 855 860
 Leu Phe Arg Lys Arg Lys Gln Asp His Lys Glu Lys Ala
 865 870 875

<210> 33
 <211> 658
 <212> PRT
 <213> 葡萄球菌

<400> 33
 Met Lys Lys Gln Ile Ile Ser Leu Gly Ala Leu Ala Val Ala Ser Ser
 1 5 10 15
 Leu Phe Thr Trp Asp Asn Lys Ala Asp Ala Ile Val Thr Lys Asp Tyr
 20 25 30
 Ser Lys Glu Ser Arg Val Asn Glu Lys Ser Lys Lys Gly Ala Thr Val
 35 40 45
 Ser Asp Tyr Tyr Tyr Trp Lys Ile Ile Asp Ser Leu Glu Ala Gln Phe

50	55	60
Thr Gly Ala Ile Asp Leu	Leu Glu Asp Tyr Lys	Tyr Gly Asp Pro Ile
65	70	75
Tyr Lys Glu Ala Lys Asp Arg Leu Met Thr Arg Val Leu Gly Glu Asp		80
	85	90
Gln Tyr Leu Leu Lys Lys Lys Ile Asp Glu Tyr Glu Leu Tyr Lys Lys		95
	100	105
Trp Tyr Lys Ser Ser Asn Lys Asn Thr Asn Met Leu Thr Phe His Lys		110
	115	120
Tyr Asn Leu Tyr Asn Leu Thr Met Asn Glu Tyr Asn Asp Ile Phe Asn		125
	130	135
Ser Leu Lys Asp Ala Val Tyr Gln Phe Asn Lys Glu Val Lys Glu Ile		140
	145	150
Glu His Lys Asn Val Asp Leu Lys Gln Phe Asp Lys Asp Gly Glu Asp		155
	160	165
Lys Ala Thr Lys Glu Val Tyr Asp Leu Val Ser Glu Ile Asp Thr Leu		170
	175	180
Val Val Thr Tyr Tyr Ala Asp Lys Asp Tyr Gly Glu His Ala Lys Glu		185
	190	195
Leu Arg Ala Lys Leu Asp Leu Ile Leu Gly Asp Thr Asp Asn Pro His		200
	205	210
Lys Ile Thr Asn Glu Arg Ile Lys Lys Glu Met Ile Asp Asp Leu Asn		215
	220	225
Ser Ile Ile Asp Asp Phe Phe Met Glu Thr Lys Gln Asn Arg Pro Asn		230
	235	240
Ser Ile Thr Lys Tyr Asp Pro Thr Lys His Asn Phe Lys Glu Lys Ser		245
	250	255
Glu Asn Lys Pro Asn Phe Asp Lys Leu Val Glu Glu Thr Lys Lys Ala		260
	265	270
Val Lys Glu Ala Asp Glu Ser Trp Lys Asn Lys Thr Val Lys Lys Tyr		275
	280	285
Glu Glu Thr Val Thr Lys Ser Pro Val Val Lys Glu Glu Lys Lys Val		290
	295	300
Glu Glu Pro Gln Leu Pro Lys Val Gly Asn Gln Gln Glu Val Lys Thr		305
	310	315
Thr Ala Gly Lys Ala Glu Glu Thr Thr Gln Pro Val Ala Gln Pro Leu		320
	325	330
Val Lys Ile Pro Gln Glu Thr Ile Tyr Gly Glu Thr Val Lys Gly Pro		335
	340	345
Glu Tyr Pro Thr Met Glu Asn Lys Thr Leu Gln Gly Glu Ile Val Gln		350
	355	360
Gly Pro Asp Phe Leu Thr Met Glu Gln Asn Arg Pro Ser Leu Ser Asp		365
	370	375
Asn Tyr Thr Gln Pro Thr Thr Pro Asn Pro Ile Leu Glu Gly Leu Glu		380
	385	390
Gly Ser Ser Ser Lys Leu Glu Ile Lys Pro Gln Gly Thr Glu Ser Thr		395
	400	405
Leu Lys Gly Ile Gln Gly Glu Ser Ser Asp Ile Glu Val Lys Pro Gln		410
	415	420
Ala Thr Glu Thr Thr Glu Ala Ser Gln Tyr Gly Pro Arg Pro Gln Phe		425
	430	435
Asn Lys Thr Pro Lys Tyr Val Lys Tyr Arg Asp Ala Gly Thr Gly Ile		440
	445	450
Arg Glu Tyr Asn Asp Gly Thr Phe Gly Tyr Glu Ala Arg Pro Arg Phe		455
	460	465
Asn Lys Pro Ser Glu Thr Asn Ala Tyr Asn Val Thr Thr Asn Gln Asp		470
	475	480
Gly Thr Val Ser Tyr Gly Ala Arg Pro Thr Gln Asn Lys Pro Ser Glu		485
	490	495
Thr Asn Ala Tyr Asn Val Thr Thr His Ala Asn Gly Gln Val Ser Tyr		500
	505	510
Gly Ala Arg Pro Thr Gln Lys Lys Pro Ser Lys Thr Asn Ala Tyr Asn		515
	520	525
Val Thr Thr His Ala Asn Gly Gln Val Ser Tyr Gly Ala Arg Pro Thr		530
	535	540
Gln Lys Lys Pro Ser Lys Thr Asn Ala Tyr Asn Val Thr Thr His Ala		545
	550	555
Asn Gly Gln Val Ser Tyr Gly Ala Arg Pro Thr Tyr Lys Lys Pro Ser		560
	565	570
Glu Thr Asn Ala Tyr Asn Val Thr Thr His Ala Asn Gly Gln Val Ser		575
	580	585
Tyr Gly Ala Arg Pro Thr Gln Lys Lys Pro Ser Glu Thr Asn Ala Tyr		590
	595	600
Asn Val Thr Thr His Ala Asp Gly Thr Ala Thr Tyr Gly Pro Arg Val		605
	610	615
	620	625
	630	635
	640	645
	650	655

Thr Lys

<210> 67
<211> 961
<212> PRT
<213> 葡萄球菌

<400> 67
Met Lys Ser Asn Leu Arg Tyr Gly Ile Arg Lys His Lys Leu Gly Ala
1 5 10 15
Ala Ser Val Phe Leu Gly Thr Met Ile Val Val Gly Met Gly Gln Glu
20 25 30
Lys Glu Ala Ala Ala Ser Glu Gln Asn Asn Thr Thr Val Glu Glu Ser
35 40 45
Gly Ser Ser Ala Thr Glu Ser Lys Ala Ser Glu Thr Gln Thr Thr Thr
50 55 60
Asn Asn Val Asn Thr Ile Asp Glu Thr Gln Ser Tyr Ser Ala Thr Ser
65 70 75 80
Thr Glu Gln Pro Ser Lys Ser Thr Gln Val Thr Thr Glu Glu Ala Pro
85 90 95
Thr Thr Val Gln Ala Pro Lys Val Glu Thr Glu Met Lys Ser Gln Glu
100 105 110
Asp Leu Pro Ser Glu Lys Val Ala Asp Lys Glu Thr Thr Gly Thr Gln
115 120 125
Val Asp Ile Ala Gln Pro Ser Asn Val Ser Glu Ile Lys Pro Arg Met
130 135 140
Lys Arg Ser Ala Asp Val Thr Ala Val Ser Glu Lys Glu Val Ala Glu
145 150 155 160
Glu Ala Lys Ala Thr Gly Thr Asp Val Thr Asn Lys Val Glu Val Thr
165 170 175
Glu Ser Ser Leu Glu Gly His Asn Lys Asp Ser Asn Ile Val Asn Pro
180 185 190
His Asn Ala Gln Arg Val Thr Leu Lys Tyr Lys Trp Lys Phe Gly Glu
195 200 205
Gly Ile Lys Ala Gly Asp Tyr Phe Asp Phe Thr Leu Ser Asp Asn Val
210 215 220
Glu Thr His Gly Ile Ser Thr Leu Arg Lys Val Pro Glu Ile Lys Ser
225 230 235 240
Ser Thr Glu Asp Lys Val Met Ala Asn Gly Gln Val Ile Asn Glu Arg
245 250 255
Thr Ile Arg Tyr Thr Phe Thr Asp Tyr Ile Asn Asn Lys Lys Asp Leu
260 265 270
Thr Ala Glu Leu Asn Leu Asn Leu Phe Ile Asp Pro Thr Thr Val Thr
275 280 285
Lys Gln Gly Ser Gln Lys Val Glu Val Thr Leu Gly Gln Asn Lys Val
290 295 300
Ser Lys Glu Phe Asp Ile Lys Tyr Leu Asp Gly Val Lys Asp Arg Met
305 310 315 320
Gly Val Thr Val Asn Gly Arg Ile Asp Thr Leu Asn Lys Glu Glu Gly
325 330 335
Lys Phe Ser His Phe Ala Tyr Val Lys Pro Asn Asn Gln Ser Leu Thr
340 345 350
Ser Val Thr Val Thr Gly Gln Val Thr Ser Gly Tyr Lys Gln Ser Ala
355 360 365
Asn Asn Pro Thr Val Lys Val Tyr Lys His Ile Gly Ser Asp Glu Leu
370 375 380
Ala Glu Ser Val Tyr Ala Lys Leu Asp Asp Thr Ser Lys Phe Glu Asp
385 390 395 400
Val Thr Glu Lys Val Asn Leu Ser Tyr Thr Ser Asn Gly Gly Tyr Thr
405 410 415
Leu Asn Leu Gly Asp Leu Asp Asn Ser Lys Asp Tyr Val Ile Lys Tyr
420 425 430
Glu Gly Glu Tyr Asp Gln Asn Ala Lys Asp Leu Asn Phe Arg Thr His
435 440 445
Leu Ser Gly Tyr His Lys Tyr Tyr Pro Tyr Tyr Pro Tyr Pro Tyr
450 455 460
Tyr Pro Val Gln Leu Thr Trp Asn Asn Gly Val Ala Phe Tyr Ser Asn
465 470 475 480
Asn Ala Lys Gly Asp Gly Lys Asp Lys Pro Asn Asp Pro Ile Ile Glu
485 490 495
Lys Ser Glu Pro Ile Asp Leu Asp Ile Lys Ser Glu Pro Pro Val Glu
500 505 510
Lys His Glu Leu Thr Gly Thr Ile Glu Glu Ser Asn Asp Ser Lys Pro

Ile	Asp	Phe	Glu	Tyr	His	Thr	Ala	Val	Glu	Gly	Ala	Glu	Gly	His	Ala
530															
Glu	Gly	Ile	Ile	Glu	Thr	Glu	Glu	Asp	Ser	Ile	His	Val	Asp	Phe	Glu
545															
Glu	Ser	Thr	His	Glu	Asn	Ser	Lys	His	His	Ala	Asp	Val	Val	Glu	Tyr
Glu	Glu	Asp	Thr	Asn	Pro	Gly	Gly	Gly	Gln	Val	Thr	Thr	Glu	Ser	Asn
Leu	Val	Glu	Phe	Asp	Glu	Glu	Ser	Thr	Lys	Gly	Ile	Val	Thr	Gly	Ala
Val	Ser	Asp	His	Thr	Thr	Val	Glu	Asp	Thr	Lys	Glu	Tyr	Thr	Thr	Glu
Ser	Asn	Leu	Ile	Glu	Leu	Val	Asp	Glu	Leu	Pro	Glu	Glu	His	Gly	Gln
625															
Ala	Gln	Gly	Pro	Ile	Glu	Glu	Ile	Thr	Glu	Asn	Asn	His	His	Ile	Ser
His	Ser	Gly	Leu	Gly	Thr	Glu	Asn	Gly	His	Gly	Asn	Tyr	Gly	Val	Ile
Asp	Glu	Ile	Glu	Glu	Asn	Ser	His	Val	Asp	Ile	Lys	Ser	Glu	Leu	Gly
Tyr	Glu	Gly	Gly	Gln	Asn	Ser	Gly	Asn	Gln	Ser	Phe	Glu	Glu	Asp	Thr
Glu	Glu	Asp	Lys	Pro	Lys	Tyr	Glu	Gln	Gly	Gly	Asn	Ile	Val	Asp	Ile
705															
Asp	Phe	Asp	Ser	Val	Pro	Gln	Ile	His	Gly	Gln	Asn	Asn	Gly	Asn	Gln
Ser	Phe	Glu	Glu	Asp	Thr	Glu	Glu	Asp	Lys	Pro	Lys	Tyr	Glu	Gln	Gly
Gly	Asn	Ile	Ile	Asp	Ile	Asp	Phe	Asp	Ser	Val	Pro	Gln	Ile	His	Gly
Phe	Asn	Lys	His	Asn	Glu	Ile	Ile	Glu	Glu	Asp	Thr	Asn	Lys	Asp	Lys
Pro	Asn	Tyr	Gln	Phe	Gly	Gly	His	Asn	Ser	Val	Asp	Phe	Glu	Glu	Asp
785															
Thr	Leu	Pro	Lys	Val	Ser	Gly	Gln	Asn	Glu	Gly	Gln	Gln	Thr	Ile	Glu
Glu	Asp	Thr	Thr	Pro	Pro	Thr	Pro	Pro	Thr	Pro	Glu	Val	Pro	Ser	Glu
Pro	Glu	Thr	Pro	Thr	Pro	Pro	Thr	Pro	Glu	Val	Pro	Ser	Glu	Pro	Gly
Glu	Pro	Thr	Pro	Pro	Lys	Pro	Glu	Val	Pro	Ser	Glu	Pro	Glu	Thr	Pro
Val	Pro	Pro	Thr	Pro	Glu	Val	Pro	Ser	Glu	Pro	Gly	Lys	Pro	Val	Pro
865															
Pro	Ala	Lys	Glu	Glu	Pro	Lys	Lys	Pro	Ser	Lys	Pro	Val	Glu	Gln	Gly
Lys	Val	Val	Thr	Pro	Val	Ile	Glu	Ile	Asn	Glu	Lys	Val	Lys	Ala	Val
Ala	Pro	Thr	Lys	Gln	Lys	Gln	Ser	Lys	Lys	Ser	Glu	Leu	Pro	Glu	Thr
Gly	Gly	Glu	Glu	Ser	Thr	Asn	Lys	Gly	Met	Leu	Phe	Gly	Gly	Leu	Phe
Ser	Ile	Leu	Gly	Leu	Val	Leu	Leu	Arg	Arg	Asn	Lys	Lys	Asn	Asn	Lys
945															
Ala															

<210> 68
 <211> 578
 <212> PRT
 <213> 葡萄球菌

Met	Lys	Phe	Lys	Ser	Leu	Ile	Thr	Thr	Thr	Leu	Ala	Leu	Gly	Val	Ile
1															
Ala	Ser	Thr	Gly	Ala	Asn	Phe	Asn	Thr	Asn	Glu	Ala	Ser	Ala	Ala	Ala
Lys	Pro	Leu	Asp	Lys	Ser	Ser	Ser	Thr	Leu	His	His	Gly	His	Ser	Asn
Ile	Gln	Ile	Pro	Tyr	Thr	Ile	Thr	Val	Asn	Gly	Thr	Ser	Gln	Asn	Ile
Leu	Ser	Ser	Leu	Thr	Phe	Asn	Lys	Asn	Gln	Asn	Ile	Ser	Tyr	Lys	Asp
65															

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Ile Glu Asn Lys Val Lys Ser Val Leu Tyr Phe Asn Arg Gly Ile Ser
      85      90      95
Asp Ile Asp Leu Arg Leu Ser Lys Gln Ala Glu Tyr Thr Val His Phe
      100      105      110
Lys Asn Gly Thr Lys Arg Val Ile Asp Leu Lys Ser Gly Ile Tyr Thr
      115      120      125
Ala Asp Leu Ile Asn Thr Ser Asp Ile Lys Ala Ile Ser Val Asn Val
      130      135      140
Asp Thr Lys Lys Gln Pro Lys Asp Lys Ala Lys Ala Asn Val Gln Val
      145      150      155      160
Pro Tyr Thr Ile Thr Val Asn Gly Thr Ser Gln Asn Ile Leu Ser Asn
      165      170      175
Leu Thr Phe Asn Lys Asn Gln Asn Ile Ser Tyr Lys Asp Leu Glu Gly
      180      185      190
Lys Val Lys Ser Val Leu Glu Ser Asn Arg Gly Ile Thr Asp Val Asp
      195      200      205
Leu Arg Leu Ser Lys Gln Ala Lys Tyr Thr Val Asn Phe Lys Asn Gly
      210      215      220
Thr Lys Lys Val Ile Asp Leu Lys Ser Gly Ile Tyr Thr Ala Asn Leu
      225      230      235      240
Ile Asn Ser Ser Asp Ile Lys Ser Ile Asn Ile Asn Val Asp Thr Lys
      245      250      255
Lys His Ile Glu Asn Lys Ala Lys Arg Asn Tyr Gln Val Pro Tyr Ser
      260      265      270
Ile Asn Leu Asn Gly Thr Ser Thr Asn Ile Leu Ser Asn Leu Ser Phe
      275      280      285
Ser Asn Lys Pro Trp Thr Asn Tyr Lys Asn Leu Thr Ser Gln Ile Lys
      290      295      300
Ser Val Leu Lys His Asp Arg Gly Ile Ser Glu Gln Asp Leu Lys Tyr
      305      310      315      320
Ala Lys Lys Ala Tyr Tyr Thr Val Tyr Phe Lys Asn Gly Gly Lys Arg
      325      330      335
Ile Leu Gln Leu Asn Ser Lys Asn Tyr Thr Ala Asn Leu Val His Ala
      340      345      350
Lys Asp Val Lys Arg Ile Glu Ile Thr Val Lys Thr Gly Thr Lys Ala
      355      360      365
Lys Ala Asp Arg Tyr Val Pro Tyr Thr Ile Ala Val Asn Gly Thr Ser
      370      375      380
Thr Pro Ile Leu Ser Lys Leu Lys Ile Ser Asn Lys Gln Leu Ile Ser
      385      390      395      400
Tyr Lys Tyr Leu Asn Asp Lys Val Lys Ser Val Leu Lys Ser Glu Arg
      405      410      415
Gly Ile Ser Asp Leu Asp Leu Lys Phe Ala Lys Gln Ala Lys Tyr Thr
      420      425      430
Val Tyr Phe Lys Asn Gly Lys Lys Gln Val Val Asn Leu Lys Ser Asp
      435      440      445
Ile Phe Thr Pro Asn Leu Phe Ser Ala Lys Asp Ile Lys Lys Ile Asp
      450      455      460
Ile Asp Val Lys Gln Tyr Thr Lys Ser Lys Lys Ile Asn Lys Ser
      465      470      475      480
Asn Asn Val Lys Phe Pro Val Thr Ile Asn Lys Phe Glu Asn Ile Val
      485      490      495
Ser Asn Glu Phe Val Phe Tyr Asn Ala Ser Lys Ile Thr Ile Asn Asp
      500      505      510
Leu Ser Ile Lys Leu Lys Ser Ala Met Ala Asn Asp Gln Gly Ile Thr
      515      520      525
Lys His Asp Ile Gly Leu Ala Glu Arg Ala Val Tyr Lys Val Tyr Phe
      530      535      540
Lys Asn Gly Ser Ser Lys Tyr Val Asp Leu Lys Thr Glu Tyr Lys Asp
      545      550      555      560
Glu Arg Val Phe Lys Ala Thr Asp Ile Lys Lys Val Asp Ile Glu Leu
      565      570      575
Lys Phe

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<210> 69
 <211> 895
 <212> PRT
 <213> 葡萄球菌

<400> 69
 Met Asn Lys His His Pro Lys Leu Arg Ser Phe Tyr Ser Ile Arg Lys
 1 5 10 15
 Ser Thr Leu Gly Val Ala Ser Val Ile Val Ser Thr Leu Phe Leu Ile

				20						25				30				
Thr	Ser	Gln	His	Gln	Ala	Gln	Ala	Ala	Glu	Asn	Thr	Asn	Thr	Asp				
		35					40					45						
Lys	Ile	Ser	Glu	Asn	Gln	Asn	Asn	Asn	Ala	Thr	Thr	Thr	Gln	Pro	Pro			
	50					55					60							
Lys	Asp	Thr	Asn	Gln	Thr	Gln	Pro	Ala	Thr	Gln	Pro	Ala	Asn	Thr	Ala			
65				70					75						80			
Lys	Asn	Tyr	Pro	Ala	Asp	Glu	Ser	Leu	Lys	Asp	Ala	Ile	Lys	Asp				
			85					90					95					
Pro	Ala	Leu	Glu	Asn	Lys	Glu	His	Asp	Ile	Gly	Pro	Arg	Glu	Gln	Val			
		100						105					110					
Asn	Phe	Gln	Leu	Leu	Asp	Lys	Asn	Asn	Glu	Thr	Gln	Tyr	Tyr	His	Phe			
		115					120						125					
Phe	Ser	Ile	Lys	Asp	Pro	Ala	Asp	Val	Tyr	Tyr	Thr	Lys	Lys	Lys	Ala			
	130					135					140							
Glu	Val	Glu	Leu	Asp	Ile	Asn	Thr	Ala	Ser	Thr	Trp	Lys	Lys	Phe	Glu			
145				150						155					160			
Val	Tyr	Glu	Asn	Asn	Gln	Lys	Leu	Pro	Val	Arg	Leu	Val	Ser	Tyr	Ser			
			165					170					175					
Pro	Val	Pro	Glu	Asp	His	Ala	Tyr	Ile	Arg	Phe	Pro	Val	Ser	Asp	Gly			
		180						185					190					
Thr	Gln	Glu	Leu	Lys	Ile	Val	Ser	Ser	Thr	Gln	Ile	Asp	Asp	Gly	Glu			
		195				200						205						
Glu	Thr	Asn	Tyr	Asp	Tyr	Thr	Lys	Leu	Val	Phe	Ala	Lys	Pro	Ile	Tyr			
	210					215					220							
Asn	Asp	Pro	Ser	Leu	Val	Lys	Ser	Asp	Thr	Asn	Asp	Ala	Val	Val	Thr			
225				230						235				240				
Asn	Asp	Gln	Ser	Ser	Ser	Val	Ala	Ser	Asn	Gln	Thr	Asn	Thr	Asn	Thr			
			245						250					255				
Ser	Asn	Gln	Asn	Ile	Ser	Thr	Ile	Asn	Asn	Ala	Asn	Asn	Gln	Pro	Gln			
		260						265					270					
Ala	Thr	Thr	Asn	Met	Ser	Gln	Pro	Ala	Gln	Pro	Lys	Ser	Ser	Thr	Asn			
		275					280						285					
Ala	Asp	Gln	Ala	Ser	Ser	Gln	Pro	Ala	His	Glu	Thr	Asn	Ser	Asn	Gly			
	290					295					300							
Asn	Thr	Asn	Asp	Lys	Thr	Asn	Glu	Ser	Ser	Asn	Gln	Ser	Asp	Val	Asn			
305				310						315				320				
Gln	Gln	Tyr	Pro	Pro	Ala	Asp	Glu	Ser	Leu	Gln	Asp	Ala	Ile	Lys	Asn			
			325						330				335					
Pro	Ala	Ile	Ile	As														

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Asp Lys Ala Val Tyr Asn Ala Ile Val Lys Val Val Val Ala Asn Ile
625          630          635          640
Gly Tyr Glu Gly Gln Tyr His Val Arg Ile Ile Asn Gln Asp Ile Asn
        645          650          655
Thr Lys Asp Asp Asp Thr Ser Gln Asn Asn Thr Ser Glu Pro Leu Asn
        660          665          670
Val Gln Thr Gly Gln Glu Gly Lys Val Ala Asp Thr Asp Val Ala Glu
        675          680          685
Asn Ser Ser Thr Ala Thr Asn Pro Lys Asp Ala Ser Asp Lys Ala Asp
        690          695          700
Val Ile Glu Pro Glu Ser Asp Val Val Lys Asp Ala Asp Asn Asn Ile
705          710          715          720
Asp Lys Asp Val Gln His Asp Val Asp His Leu Ser Asp Met Ser Asp
        725          730          735
Asn Asn His Phe Asp Lys Tyr Asp Leu Lys Glu Met Asp Thr Gln Ile
        740          745          750
Ala Lys Asp Thr Asp Arg Asn Val Asp Lys Asp Ala Asp Asn Ser Val
        755          760          765
Gly Met Ser Ser Asn Val Asp Thr Asp Lys Asp Ser Asn Lys Asn Lys
        770          775          780
Asp Lys Val Ile Gln Leu Asn His Ile Ala Asp Lys Asn Asn His Thr
785          790          795          800
Gly Lys Ala Ala Lys Leu Asp Val Val Lys Gln Asn Tyr Asn Asn Thr
        805          810          815
Asp Lys Val Thr Asp Lys Lys Thr Thr Glu His Leu Pro Ser Asp Ile
        820          825          830
His Lys Thr Val Asp Lys Thr Val Lys Thr Lys Glu Lys Ala Gly Thr
        835          840          845
Pro Ser Lys Glu Asn Lys Leu Ser Gln Ser Lys Met Leu Pro Lys Thr
        850          855          860
Gly Glu Thr Thr Ser Ser Gln Ser Trp Trp Gly Leu Tyr Ala Leu Leu
865          870          875          880
Gly Met Leu Ala Leu Phe Ile Pro Lys Phe Arg Lys Glu Ser Lys
        885          890          895

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<210> 70
 <211> 747
 <212> PRT
 <213> 葡萄球菌

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<400> 70
Met Ala Glu Thr Thr Gln Asp Gln Thr Thr Asn Lys Asn Val Leu Asp
1          5          10          15
Ser Asn Lys Val Lys Ala Thr Thr Glu Gln Ala Lys Ala Glu Val Lys
        20          25          30
Asn Pro Thr Gln Asn Ile Ser Gly Thr Gln Val Tyr Gln Asp Pro Ala
        35          40          45
Ile Val Gln Pro Lys Thr Ala Asn Asn Lys Thr Gly Asn Ala Gln Val
        50          55          60
Ser Gln Lys Val Asp Thr Ala Gln Val Asn Gly Asp Thr Arg Ala Asn
65          70          75          80
Gln Ser Ala Thr Thr Asn Asn Thr Gln Pro Val Ala Lys Ser Thr Ser
        85          90          95
Thr Thr Ala Pro Lys Thr Asn Thr Asn Val Thr Asn Ala Gly Tyr Ser
        100          105          110
Leu Val Asp Asp Glu Asp Asp Asn Ser Glu Asn Gln Ile Asn Pro Glu
        115          120          125
Leu Ile Lys Ser Ala Ala Lys Pro Ala Ala Leu Glu Thr Gln Tyr Lys
        130          135          140
Thr Ala Ala Pro Lys Ala Ala Thr Thr Ser Ala Pro Lys Ala Lys Thr
145          150          155          160
Glu Ala Thr Pro Lys Val Thr Thr Phe Ser Ala Ser Ala Gln Pro Arg
        165          170          175
Ser Val Ala Ala Thr Pro Lys Thr Ser Leu Pro Lys Tyr Lys Pro Gln
        180          185          190
Val Asn Ser Ser Ile Asn Asp Tyr Ile Cys Lys Asn Asn Leu Lys Ala
195          200          205          210
Pro Lys Ile Glu Glu Asp Tyr Thr Ser Tyr Phe Pro Lys Tyr Ala Tyr
        215          220          225
Arg Asn Gly Val Gly Arg Pro Glu Gly Ile Val Val His Asp Thr Ala
225          230          235          240
Asn Asp Arg Ser Thr Ile Asn Gly Glu Ile Ser Tyr Met Lys Asn Asn
        245          250          255
Tyr Gln Asn Ala Phe Val His Ala Phe Val Asp Gly Asp Arg Ile Ile

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Glu Thr Ala	260	Pro Thr Asp Tyr	265	Leu Ser Trp Gly Val	270	Gly Ala Val Gly
Asn Pro Arg Phe Ile Asn Val	275	Glu Ile Val His Thr	280	His Asp Tyr Ala	285	
Ser Phe Ala Arg Ser Met Asn Asn Tyr Ala Asp Tyr Ala Ala Thr Gln	290	310	315	300	315	320
Leu Gln Tyr Tyr Gly Leu Lys Pro Asp Ser Ala Glu Tyr Asp Gly Asn	325	330	335	340	345	350
Gly Thr Val Trp Thr His Tyr Ala Val Ser Lys Tyr Leu Gly Gly Thr	355	360	365	370	375	380
Asp His Ala Asp Pro His Gly Tyr Leu Arg Ser His Asn Tyr Ser Tyr	385	390	395	400	405	410
Lys Val Ala Pro Trp Gly Thr Gln Ser Thr Thr Pro Thr Thr Pro	415	420	425	430	435	440
Ser Lys Pro Thr Thr Pro Ser Lys Pro Ser Thr Gly Lys Leu Thr Val	445	450	455	460	465	470
Ala Ala Asn Asn Gly Val Ala Gln Ile Lys Pro Thr Asn Ser Gly Leu	475	480	485	490	495	500
Tyr Thr Thr Val Tyr Asp Lys Thr Gly Lys Ala Thr Asn Glu Val Gln	505	510	515	520	525	530
Lys Thr Phe Ala Val Ser Lys Thr Ala Thr Leu Gly Asn Gln Lys Phe	535	540	545	550	555	560
Tyr Leu Val Gln Asp Tyr Asn Ser Gly Asn Lys Phe Gly Trp Val Lys	565	570	575	580	585	590
Glu Gly Asp Val Val Tyr Asn Thr Ala Lys Ser Pro Val Asn Val Asn	595	600	605	610	615	620
Gln Ser Tyr Ser Ile Lys Pro Gly Thr Lys Leu Tyr Thr Val Pro Trp	625	630	635	640	645	650
Gly Thr Ser Lys Gln Val Ala Gly Ser Val Ser Gly Ser Gly Asn Gln	655	660	665	670	675	680
Thr Phe Lys Ala Ser Lys Gln Gln Gln Ile Asp Lys Ser Ile Tyr Leu	685	690	695	700	705	710
Tyr Gly Ser Val Asn Gly Lys Ser Gly Trp Val Ser Lys Ala Tyr Leu	715	720	725	730	735	740
Val Asp Thr Ala Lys Pro Thr Pro Thr Pro Thr Pro Lys Pro Ser Thr	745	750	755	760	765	770
Pro Thr Thr Asn Asn Lys Leu Thr Val Ser Ser Leu Asn Gly Val Ala	775	780	785	790	795	800
Gln Ile Asn Ala Lys Asn Asn Gly Leu Phe Thr Thr Val Tyr Asp Lys	805	810	815	820	825	830
Thr Gly Lys Pro Thr Lys Glu Val Gln Lys Thr Phe Ala Val Thr Lys	835	840	845	850	855	860
Glu Ala Ser Leu Gly Gly Asn Lys Phe Tyr Leu Val Lys Asp Tyr Asn	865	870	875	880	885	890
Ser Pro Thr Leu Ile Gly Trp Val Lys Gln Gly Asp Val Ile Tyr Asn	895	900	905	910	915	920
Asn Ala Lys Ser Pro Val Asn Val Met Gln Thr Tyr Thr Val Lys Pro	925	930	935	940	945	950
Gly Thr Lys Leu Tyr Ser Val Pro Trp Gly Thr Tyr Lys Gln Glu Ala	955	960	965	970	975	980
Gly Ala Val Ser Gly Thr Gly Asn Gln Thr Phe Lys Ala Thr Lys Gln	985	990	995	1000		
Gln Gln Ile Asp Lys Ser Ile Tyr Leu Phe Gly Thr Val Asn Gly Lys						
Ser Gly Trp Val Ser Lys Ala Tyr Leu Ala Val Pro Ala Ala Pro Lys						
Lys Ala Val Ala Gln Pro Lys Thr Ala Val Lys						

<210> 71
 <211> 482
 <212> PRT
 <213> 葡萄球菌

<400> 71
 Met Ala Tyr Thr Val Thr Lys Pro Gln Thr Thr Gln Thr Val Ser Lys
 1 5 10 15
 Ile Ala Gln Val Lys Pro Asn Asn Thr Gly Ile Arg Ala Ser Val Tyr
 20 25 30
 Glu Lys Thr Ala Lys Asn Gly Ala Lys Tyr Ala Asp Arg Thr Phe Tyr
 35 40 45

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Val Thr Lys Glu Arg Ala His Gly Asn Glu Thr Tyr Val Leu Leu Asn
 50      55      60
Asn Thr Ser His Asn Ile Pro Leu Gly Trp Phe Asn Val Lys Asp Leu
 65      70      75      80
Asn Val Gln Asn Leu Gly Lys Glu Val Lys Thr Thr Gln Lys Tyr Thr
      85      90      95
Val Asn Lys Ser Asn Asn Gly Leu Ser Met Val Pro Trp Gly Thr Lys
      100      105      110
Asn Gln Val Ile Leu Thr Gly Asn Asn Ile Ala Gln Gly Thr Phe Asn
      115      120      125
Ala Thr Lys Gln Val Ser Val Gly Lys Asp Val Tyr Leu Tyr Gly Thr
      130      135      140
Ile Asn Asn Arg Thr Gly Trp Val Asn Ala Lys Asp Leu Thr Ala Pro
      145      150      155      160
Thr Ala Val Lys Pro Thr Thr Ser Ala Ala Lys Asp Tyr Asn Tyr Thr
      165      170      175
Tyr Val Ile Lys Asn Gly Asn Gly Tyr Tyr Tyr Val Thr Pro Asn Ser
      180      185      190
Asp Thr Ala Lys Tyr Ser Leu Lys Ala Phe Asn Glu Gln Pro Phe Ala
      195      200      205
Val Val Lys Glu Gln Val Ile Asn Gly Gln Thr Trp Tyr Tyr Gly Lys
      210      215      220
Leu Ser Asn Gly Lys Leu Ala Trp Ile Lys Ser Thr Asp Leu Ala Lys
      225      230      235      240
Glu Leu Ile Lys Tyr Asn Gln Thr Gly Met Thr Leu Asn Gln Val Ala
      245      250      255
Gln Ile Gln Ala Gly Leu Gln Tyr Lys Pro Gln Val Gln Arg Val Pro
      260      265      270
Gly Lys Trp Thr Asp Ala Lys Phe Asn Asp Val Lys His Ala Met Asp
      275      280      285
Thr Lys Arg Leu Ala Gln Asp Pro Ala Leu Lys Tyr Gln Phe Leu Arg
      290      295      300
Leu Asp Gln Pro Gln Asn Ile Ser Ile Asp Lys Ile Asn Gln Phe Leu
      305      310      315      320
Lys Gly Lys Gly Val Leu Glu Asn Gln Gly Ala Ala Phe Asn Lys Ala
      325      330      335
Ala Gln Met Tyr Gly Ile Asn Glu Val Tyr Leu Ile Ser His Ala Leu
      340      345      350
Leu Glu Thr Gly Asn Gly Thr Ser Gln Leu Ala Lys Gly Ala Asp Val
      355      360      365
Val Asn Asn Lys Val Val Thr Asn Ser Asn Thr Lys Tyr His Asn Val
      370      375      380
Phe Gly Ile Ala Ala Tyr Asp Asn Asp Pro Leu Arg Glu Gly Ile Lys
      385      390      395      400
Tyr Ala Lys Gln Ala Gly Trp Asp Thr Val Ser Lys Ala Ile Val Gly
      405      410      415
Gly Ala Lys Phe Ile Gly Asn Ser Tyr Val Lys Ala Gly Gln Asn Thr
      420      425      430
Leu Tyr Lys Met Arg Trp Asn Pro Ala His Pro Gly Thr His Gln Tyr
      435      440      445
Ala Thr Asp Val Asp Trp Ala Asn Ile Asn Ala Lys Ile Ile Lys Gly
      450      455      460
Tyr Tyr Asp Lys Ile Gly Glu Val Gly Lys Tyr Phe Asp Ile Pro Gln
      465      470      475      480
Tyr Lys

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<210> 72
 <211> 706
 <212> PRT
 <213> 葡萄球菌

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<400> 72
Asp Arg Val Leu Ala Ser His Pro Asp Val Ala Thr Ile Arg Gln Asn
 1      5      10      15
Val Thr Ala Ala Asn Ala Ala Lys Ser Ala Leu Asp Gln Ala Arg Asn
      20      25      30
Gly Leu Thr Val Asp Lys Ala Pro Leu Glu Asn Ala Lys Asn Gln Leu
      35      40      45
Gln His Ser Ile Asp Thr Gln Thr Ser Thr Thr Gly Met Thr Gln Asp
      50      55      60
Ser Ile Asn Ala Tyr Asn Ala Lys Leu Thr Ala Ala Arg Asn Lys Ile
      65      70      75      80
Gln Gln Ile Asn Gln Val Leu Ala Gly Ser Pro Thr Val Glu Gln Ile

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Asn	Thr	Asn	Thr	85	Thr	Ala	Asn	Gln	90	Ala	Lys	Ser	Asp	Leu	95	Asp	His
			100					105						110			
Ala	Arg	Gln	Ala	Leu	Thr	Pro	Asp	Lys	Ala	Pro	Leu	Gln	Thr	Ala	Lys		
		115					120						125				
Thr	Gln	Leu	Glu	Gln	Ser	Ile	Asn	Gln	Pro	Thr	Asp	Thr	Thr	Gly	Met		
		130				135					140						
Thr	Thr	Ala	Ser	Leu	Asn	Ala	Tyr	Asn	Gln	Lys	Leu	Gln	Ala	Ala	Arg		
145					150					155					160		
Gln	Lys	Leu	Thr	Glu	Ile	Asn	Gln	Val	Leu	Asn	Gly	Asn	Pro	Thr	Val		
		165						170						175			
Gln	Asn	Ile	Asn	Asp	Lys	Val	Thr	Glu	Ala	Asn	Gln	Ala	Lys	Asp	Gln		
		180						185					190				
Leu	Asn	Thr	Ala	Arg	Gln	Gly	Leu	Thr	Leu	Asp	Arg	Gln	Pro	Ala	Leu		
		195					200					205					
Thr	Thr	Leu	His	Gly	Ala	Ser	Asn	Leu	Asn	Gln	Ala	Gln	Gln	Asn	Asn		
		210				215					220						
Phe	Thr	Gln	Gln	Ile	Asn	Ala	Ala	Gln	Asn	His	Ala	Ala	Leu	Glu	Thr		
225				230					235					240			
Ile	Lys	Ser	Asn	Ile	Thr	Ala	Leu	Asn	Thr	Ala	Met	Thr	Lys	Leu	Lys		
		245						250					255				
Asp	Ser	Val	Ala	Asp	Asn	Asn	Thr	Ile	Lys	Ser	Asp	Gln	Asn	Tyr	Thr		
		260					265						270				
Asp	Ala	Thr	Pro	Ala	Asn	Lys	Gln	Ala	Tyr	Asp	Asn	Ala	Val	Asn	Ala		
		275					280					285					
Ala	Lys	Gly	Val	Ile	Gly	Glu	Thr	Thr	Asn	Pro	Thr	Met	Asp	Val	Asn		
		290				295					300						
Thr	Val	Asn	Gln	Lys	Ala	Ser	Val	Lys	Ser	Thr	Lys	Asp	Ala	Leu			
305				310				315						320			
Asp	Gly	Gln	Gln	Asn	Leu	Gln	Arg	Ala	Lys	Thr	Glu	Ala	Thr	Asn	Ala		
		325						330					335				
Ile	Thr	His	Ala	Ser	Asp	Leu	Asn	Gln	Ala	Gln	Lys	Asn	Ala	Leu	Thr		
		340					345						350				
Gln	Gln	Val	Asn	Ser	Ala	Gln	Asn	Val	Gln	Ala	Val	Asn	Asp	Ile	Lys		
		355				360						365					
Gln	Thr	Thr	Gln	Ser	Leu	Asn	Thr	Ala	Met	Thr	Gly	Leu	Lys	Arg	Gly		
		370				375					380						
Val	Ala	Asn	His	Asn	Gln	Val	Val	Gln	Ser	Asp	Asn	Tyr	Val	Asn	Ala		
385				390					395					400			
Asp	Thr	Asn	Lys	Lys	Asn	Asp	Tyr	Asn	Asn	Ala	Tyr	Asn	His	Ala	Asn		
		405						410					415				
Asp	Ile	Ile	Asn	Gly	Asn	Ala	Gln	His	Pro	Val	Ile	Thr	Pro	Ser	Asp		
		420					425						430				
Val	Asn	Asn	Ala	Leu	Ser	Asn	Val	Thr	Ser	Lys	Glu	His	Ala	Leu	Asn		
		435					440					445					
Gly	Glu	Ala	Lys	Leu	Asn	Ala	Ala	Lys	Gln	Glu	Ala	Asn	Thr	Ala	Leu		
		450				455					460						
Gly	His	Leu	Asn	Asn	Leu	Asn	Ala	Gln	Arg	Gln	Asn	Leu	Gln	Ser			
465				470					475					480			
Gln	Ile	Asn	Gly	Ala	His	Gln	Ile	Asp	Ala	Val	Asn	Thr	Ile	Lys	Gln		
		485						490					495				
Asn	Ala	Thr	Asn	Leu	Asn	Ser	Ala	Met	Gly	Asn	Leu	Arg	Gln	Ala	Val		
		500					505						510				
Ala	Asp	Lys	Asp	Gln	Val	Lys	Arg	Thr	Glu	Asp	Tyr	Ala	Asp	Ala	Asp		
		515					520					525					
Thr	Ala	Lys	Gln	Asn	Ala	Tyr	Asn	Ser	Ala	Val	Ser	Ser	Ala	Glu	Thr		
		530				535						540					
Ile	Ile	Asn	Gln	Thr	Thr	Asn	Pro	Thr	Met	Ser	Val	Asp	Asp	Val	Asn		
545				550					555					560			
Arg	Ala	Thr	Ser	Ala	Val	Thr	Ser	Asn	Lys	Asn	Ala	Leu	Asn	Gly	Tyr		
		565						570					575				
Glu	Lys	Leu	Ala	Gln	Ser	Lys	Thr	Asp	Ala	Ala	Arg	Ala	Ile	Asp	Ala		
		580					585					590					
Leu	Pro	His	Leu	Asn	Asn	Ala	Gln	Lys	Ala	Asp	Val	Lys	Ser	Lys	Ile		
		595				600					605						
Asn	Ala	Ala	Ser	Asn	Ile	Ala	Gly	Val	Asn	Thr	Val	Lys	Gln	Gln	Gly		
		610				615					620						
Thr	Asp	Leu	Asn	Thr	Ala	Met	Gly	Asn	Leu	Gln	Gly	Ala	Ile	Asn	Asp		
625				630					635					640			
Glu	Gln	Thr	Thr	Leu	Asn	Ser	Gln	Asn	Tyr	Gln	Asp	Ala	Thr	Pro	Ser		
		645						650					655				
Lys	Lys	Thr	Ala	Tyr	Thr	Asn	Ala	Val	Gln	Ala	Ala	Lys	Asp	Ile	Leu		
		660					665					670					
Asn	Lys	Ser	Asn	Gly	Gln	Asn	Lys	Thr	Lys	Asp	Gln	Val	Thr	Glu	Ala		
		675				680						685					

Met Asn Gln Val Asn Ser Ala Lys Asn Asn Leu Asp Gly Thr Arg Leu
690 695 700
Leu Asp
705

<210> 73
<211> 241
<212> PRT
<213> 葡萄球菌

<400> 73
Ala Ser Thr Gln His Thr Val Gln Ser Gly Glu Ser Leu Trp Ser Ile
1 5 10 15
Ala Gln Lys Tyr Asn Thr Ser Val Glu Ser Ile Lys Gln Asn Asn Gln
20 25 30
Leu Asp Asn Asn Leu Val Phe Pro Gly Gln Val Ile Ser Val Gly Gly
35 40 45
Ser Asp Ala Gln Asn Thr Ser Asn Thr Ser Pro Gln Ala Gly Ser Ala
50 55 60
Ser Ser His Thr Val Gln Ala Gly Glu Ser Leu Asn Ile Ile Ala Ser
65 70 75 80
Arg Tyr Gly Val Ser Val Asp Gln Leu Met Ala Ala Asn Asn Leu Arg
85 90 95
Gly Tyr Leu Ile Met Pro Asn Gln Thr Leu Gln Ile Pro Asn Gly Gly
100 105 110
Ser Gly Gly Thr Thr Pro Thr Ala Thr Thr Gly Ser Asn Gly Asn Ala
115 120 125
Ser Ser Phe Asn His Gln Asn Leu Tyr Thr Ala Gly Gln Cys Thr Trp
130 135 140
Tyr Val Phe Asp Arg Arg Ala Gln Ala Gly Ser Pro Ile Ser Thr Tyr
145 150 155 160
Trp Ser Asp Ala Lys Tyr Trp Ala Gly Asn Ala Ala Asn Asp Gly Tyr
165 170 175
Gln Val Asn Asn Thr Pro Ser Val Gly Ser Ile Met Gln Ser Thr Pro
180 185 190
Gly Pro Tyr Gly His Val Ala Tyr Val Glu Arg Val Asn Gly Asp Gly
195 200 205
Ser Ile Leu Ile Ser Glu Met Asn Tyr Thr Tyr Gly Pro Tyr Asn Met
210 215 220
Asn Tyr Arg Thr Ile Pro Ala Ser Glu Val Ser Ser Tyr Ala Phe Ile
225 230 235 240
His

<210> 74
<211> 995
<212> PRT
<213> 葡萄球菌

<400> 74
Met Asn Asn Lys Lys Thr Ala Thr Asn Arg Lys Gly Met Ile Pro Asn
1 5 10 15
Arg Leu Asn Lys Phe Ser Ile Arg Lys Tyr Ser Val Gly Thr Ala Ser
20 25 30
Ile Leu Val Gly Thr Thr Leu Ile Phe Gly Leu Ser Gly His Glu Ala
35 40 45
Lys Ala Ala Glu His Thr Asn Gly Glu Leu Asn Gln Ser Lys Asn Glu
50 55 60
Thr Thr Ala Pro Ser Glu Asn Lys Thr Thr Lys Lys Val Asp Ser Arg
65 70 75 80
Gln Leu Lys Asp Asn Thr Gln Thr Ala Thr Ala Asp Gln Pro Lys Val
85 90 95
Thr Met Ser Asp Ser Ala Thr Val Lys Glu Thr Ser Ser Asn Met Gln
100 105 110
Ser Pro Gln Asn Ala Thr Ala Asn Gln Ser Thr Thr Lys Thr Ser Asn
115 120 125
Val Thr Thr Asn Asp Lys Ser Ser Thr Thr Tyr Ser Asn Glu Thr Asp
130 135 140
Lys Ser Asn Leu Thr Gln Ala Lys Asp Val Ser Thr Thr Pro Lys Thr
145 150 155 160
Thr Thr Ile Lys Pro Arg Thr Leu Asn Arg Met Ala Val Asn Thr Val
165 170 175
Ala Ala Pro Gln Gln Gly Thr Asn Val Asn Asp Lys Val His Phe Ser

Asn	Ile	Asp	Ile	Ala	Ile	Asp	Lys	Gly	His	Val	Asn	Gln	Thr	Thr	Gly
		180													
Lys	Thr	Glu	Phe	Trp	Ala	Thr	Ser	Ser	Asp	Val	Leu	Lys	Leu	Lys	Ala
		195													
Asn	Tyr	Thr	Ile	Asp	Asp	Ser	Val	Lys	Glu	Gly	Asp	Thr	Phe	Thr	Phe
		210													
Lys	Tyr	Gly	Gln	Tyr	Phe	Arg	Pro	Gly	Ser	Val	Arg	Leu	Pro	Ser	Gln
		225													
Thr	Gln	Asn	Leu	Tyr	Asn	Ala	Gln	Gly	Asn	Ile	Ile	Ala	Lys	Gly	Ile
		240													
Tyr	Asp	Ser	Thr	Thr	Asn	Thr	Thr	Thr	Tyr	Thr	Phe	Thr	Asn	Tyr	Val
		255													
Asp	Gln	Tyr	Thr	Asn	Val	Arg	Gly	Ser	Phe	Glu	Gln	Val	Ala	Phe	Ala
		270													
Lys	Arg	Lys	Asn	Ala	Thr	Thr	Asp	Lys	Thr	Ala	Tyr	Lys	Met	Glu	Val
		285													
Thr	Leu	Gly	Asn	Asp	Thr	Tyr	Ser	Glu	Glu	Ile	Ile	Val	Asp	Tyr	Gly
		300													
Asn	Lys	Lys	Ala	Gln	Pro	Leu	Ile	Ser	Ser	Thr	Asn	Tyr	Ile	Asn	Asn
		315													
Glu	Asp	Leu	Ser	Arg	Asn	Met	Thr	Ala	Tyr	Val	Asn	Gln	Pro	Lys	Asn
		330													
Thr	Tyr	Thr	Lys	Gln	Thr	Phe	Val	Thr	Asn	Leu	Thr	Gly	Tyr	Lys	Phe
		345													
Asn	Pro	Asn	Ala	Lys	Asn	Phe	Lys	Ile	Tyr	Glu	Val	Thr	Asp	Gln	Asn
		360													
Gln	Phe	Val	Asp	Ser	Phe	Thr	Pro	Asp	Thr	Ser	Lys	Leu	Lys	Asp	Val
		375													
Thr	Asp	Gln	Phe	Asp	Val	Ile	Tyr	Ser	Asn	Asp	Asn	Lys	Thr	Ala	Thr
		390													
Val	Asp	Leu	Met	Lys	Gly	Gln	Thr	Ser	Ser	Asn	Lys	Gln	Tyr	Ile	Ile
		405													
Gln	Gln	Val	Ala	Tyr	Pro	Asp	Asn	Ser	Ser	Thr	Asp	Asn	Gly	Lys	Ile
		420													
Asp	Tyr	Thr	Leu	Asp	Thr	Asp	Lys	Thr	Lys	Tyr	Ser	Trp	Ser	Asn	Ser
		435													
Tyr	Ser	Asn	Val	Asn	Gly	Ser	Ser	Thr	Ala	Asn	Gly	Asp	Gln	Lys	Lys
		450													
Tyr	Asn	Leu	Gly	Asp	Tyr	Val	Trp	Glu	Asp	Thr	Asn	Lys	Asp	Gly	Lys
		465													
Gln	Asp	Ala	Asn	Glu	Lys	Gly	Ile	Lys	Gly	Val	Tyr	Val	Ile	Leu	Lys
		480													
Asp	Ser	Asn	Gly	Lys	Glu	Leu	Asp	Arg	Thr	Thr	Thr	Asp	Glu	Asn	Gly
		495													
Lys	Tyr	Gln	Phe	Thr	Gly	Leu	Ser	Asn	Gly	Thr	Tyr	Ser	Val	Glu	Phe
		510													
Ser	Thr	Pro	Ala	Gly	Tyr	Thr	Pro	Thr	Thr	Ala	Asn	Val	Gly	Thr	Asp
		525													
Asp	Ala	Val	Asp	Ser	Asp	Gly	Leu	Thr	Thr	Thr	Gly	Val	Ile	Lys	Asp
		540													
Ala	Asp	Asn	Met	Thr	Leu	Asp	Ser	Gly	Phe	Tyr	Lys	Thr	Pro	Lys	Tyr
		555													
Ser	Leu	Gly	Asp	Tyr	Val	Trp	Tyr	Asp	Ser	Asn	Lys	Asp	Gly	Lys	Gln
		570													
Asp	Ser	Thr	Glu	Lys	Gly	Ile	Lys	Gly	Val	Lys	Val	Thr	Leu	Gln	Asn
		585													
Glu	Lys	Gly	Glu	Val	Ile	Gly	Thr	Thr	Glu	Thr	Asp	Glu	Asn	Gly	Lys
		600													
Tyr	Arg	Phe	Asp	Asn	Leu	Asp	Ser	Gly	Lys	Tyr	Lys	Val	Ile	Phe	Glu
		615													
Lys	Pro	Ala	Gly	Leu	Thr	Gln	Thr	Gly	Thr	Asn	Thr	Thr	Glu	Asp	Asp
		630													
Lys	Asp	Ala	Asp	Gly	Gly	Glu	Val	Asp	Val	Thr	Ile	Thr	Asp	His	Asp
		645													
Asp	Phe	Thr	Leu	Asp	Asn	Gly	Tyr	Tyr	Glu	Glu	Glu	Thr	Ser	Asp	Ser
		660													
Asp	Ser	Asp	Ser	Asp	Ser	Asp	Ser	Asp	Ser	Asp	Ser	Asp	Ser	Asp	Ser
		675													
Asp	Ser	Asp	Ser	Asp	Ser	Asp	Ser	Asp	Ser	Asp	Ser	Asp	Ser	Asp	Ser
		690													
Asp	Ser	Asp	Ser	Asp	Ser	Asp	Ser	Asp	Ser	Asp	Ser	Asp	Ser	Asp	Ser
		705													
Asp	Ser	Asp	Ser	Asp	Ser	Asp	Ser	Asp	Ser	Asp	Ser	Asp	Ser	Asp	Ser
		720													
Asp	Ser	Asp	Ser	Asp	Ser	Asp	Ser	Asp	Ser	Asp	Ser	Asp	Ser	Asp	Ser
		735													
Asp	Ser	Asp	Ser	Asp	Ser	Asp	Ser	Asp	Ser	Asp	Ser	Asp	Ser	Asp	Ser
		750													
Asp	Ser	Asp	Ser	Asp	Ser	Asp	Ser	Asp	Ser	Asp	Ser	Asp	Ser	Asp	Ser
		765													
Asp	Ser	Asp	Ser	Asp	Ser	Asp	Ser	Asp	Ser	Asp	Ser	Asp	Ser	Asp	Ser
		780													

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Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser
785      790      795      800
Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser
      805      810      815
Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser
      820      825      830
Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser
      835      840      845
Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser
      850      855      860
Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser
865      870      875      880
Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser
      885      890      895
Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser
      900      905      910
Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser Asp Ser
      915      920      925
Asp Ser Asp Ser Asp Ser Asp Ala Gly Lys His Thr Pro Ala Lys Pro
      930      935      940
Met Ser Thr Val Lys Asp Gln His Lys Thr Ala Lys Ala Leu Pro Glu
945      950      955      960
Thr Gly Ser Glu Asn Asn Asn Ser Asn Asn Gly Thr Leu Phe Gly Gly
      965      970      975
Leu Phe Ala Ala Leu Gly Ser Leu Leu Phe Gly Arg Arg Lys Lys
      980      985      990
Gln Asn Lys
      995

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<210> 75
 <211> 2186
 <212> PRT
 <213> 葡萄球菌

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<400> 75
Met Asn Leu Leu Lys Lys Asn Lys Tyr Ser Ile Arg Lys Tyr Lys Val
1      5      10      15
Gly Ile Phe Ser Thr Leu Ile Gly Thr Val Leu Leu Leu Ser Asn Pro
      20      25      30
Asn Gly Ala Gln Ala Leu Thr Thr Asp Asn Asn Val Gln Ser Asp Thr
      35      40      45
Asn Gln Ala Thr Pro Val Asn Ser Gln Asp Lys Asp Val Ala Asn Asn
      50      55      60
Arg Gly Leu Ala Asn Ser Ala Gln Asn Thr Pro Asn Gln Ser Ala Thr
65      70      75      80
Thr Asn Gln Ala Thr Asn Gln Ala Leu Val Asn His Asn Asn Gly Ser
      85      90      95
Ile Val Asn Gln Ala Thr Pro Thr Ser Val Gln Ser Ser Thr Pro Ser
      100      105      110
Ala Gln Asn Asn Asn His Thr Asp Gly Asn Thr Thr Ala Thr Glu Thr
      115      120      125
Val Ser Asn Ala Asn Asn Asn Asp Val Val Ser Asn Asn Thr Ala Leu
      130      135      140
Asn Val Pro Thr Lys Thr Asn Glu Asn Gly Ser Gly Gly His Leu Thr
145      150      155      160
Leu Lys Glu Ile Gln Glu Asp Val Arg His Ser Ser Asn Lys Pro Glu
      165      170      175
Leu Val Ala Ile Ala Glu Pro Ala Ser Asn Arg Pro Lys Lys Arg Ser
      180      185      190
Arg Arg Ala Ala Pro Ala Asp Pro Asn Ala Thr Pro Ala Asp Pro Ala
      195      200      205
Ala Ala Ala Val Gly Asn Gly Gly Ala Pro Val Ala Ile Thr Ala Pro
      210      215      220
Tyr Thr Pro Thr Thr Asp Pro Asn Ala Asn Asn Ala Gly Gln Asn Ala
225      230      235      240
Pro Asn Glu Val Leu Ser Phe Asp Asp Asn Gly Ile Arg Pro Ser Thr
      245      250      255
Asn Arg Ser Val Pro Thr Val Asn Val Val Asn Asn Leu Pro Gly Phe
      260      265      270
Thr Leu Ile Asn Gly Gly Lys Val Gly Val Phe Ser His Ala Met Val
      275      280      285
Arg Thr Ser Met Phe Asp Ser Gly Asp Asn Lys Asn Tyr Gln Ala Gln
290      295      300
Gly Asn Val Ile Ala Leu Gly Arg Ile His Gly Thr Asp Thr Asn Asp

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305	His	Gly	Asp	Phe	Asn	310	Gly	Ile	Glu	Lys	Ala	315	Leu	Thr	Val	Asn	320	Pro	Asn
					325							330					335		
Ser	Glu	Leu	Ile	Phe	Glu	Phe	Asn	Thr	Met	Thr	Thr	Lys	Asn	Gly	Gln				
				340								345				350			
Gly	Ala	Thr	Asn	Val	Ile	Ile	Lys	Asn	Ala	Asp	Thr	Asn	Asp	Thr	Ile				
				355								360				365			
Ala	Glu	Lys	Thr	Val	Glu	Gly	Gly	Pro	Thr	Leu	Arg	Leu	Phe	Lys	Val				
				370								380							
Pro	Asp	Asn	Val	Arg	Asn	Leu	Lys	Ile	Gln	Phe	Val	Pro	Lys	Asn	Asp				
385					390							395				400			
Ala	Ile	Thr	Asp	Ala	Arg	Gly	Ile	Tyr	Gln	Leu	Lys	Asp	Gly	Tyr	Lys				
				405								410				415			
Tyr	Tyr	Ser	Phe	Val	Asp	Ser	Ile	Gly	Leu	His	Ser	Gly	Ser	His	Val				
				420								425				430			
Phe	Val	Glu	Arg	Arg	Thr	Met	Asp	Pro	Thr	Ala	Thr	Asn	Asn	Lys	Glu				
				435								440				445			
Phe	Thr	Val	Thr	Thr	Ser	Leu	Lys	Asn	Asn	Gly	Asn	Ser	Gly	Ala	Ser				
				450								460							
Leu	Asp	Thr	Asn	Asp	Phe	Val	Tyr	Gln	Val	Gln	Leu	Pro	Glu	Gly	Val				
465					470							475				480			
Glu	Tyr	Val	Asn	Asn	Ser	Leu	Thr	Lys	Asp	Phe	Pro	Ser	Asn	Asn	Ser				
				485								490				495			
Gly	Val	Asp	Val	Asn	Asp	Met	Asn	Val	Thr	Tyr	Asp	Ala	Ala	Asn	Arg				
				500								505				510			
Val	Ile	Thr	Ile	Lys	Ser	Thr	Gly	Gly	Gly	Thr	Ala	Asn	Ser	Pro	Ala				
				515								520				525			
Arg	Leu	Met	Pro	Asp	Lys	Ile	Leu	Asp	Leu	Arg	Tyr	Lys	Leu	Arg	Val				
				530								535				540			
Asn	Asn	Val	Pro	Thr	Pro	Arg	Thr	Val	Thr	Phe	Asn	Glu	Thr	Leu	Thr				
545					550							555				560			
Tyr	Lys	Thr	Tyr	Thr	Gln	Asp	Phe	Ile	Asn	Ser	Ala	Ala	Glu	Ser	His				
				565								570				575			
Thr	Val	Ser	Thr	Asn	Pro	Tyr	Thr	Ile	Asp	Ile	Ile	Met	Asn	Lys	Asp				
				580								585				590			
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Gln	Ala	Tyr	Ile	Asp	Ser	Leu	Thr	Asn	Gln	Met	Gln	His	Thr	Leu	Ile				
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Arg	Ser	Val	Asp	Ala	Glu	Asn	Ala	Val	Asn	Lys	Lys	Val	Asp	Gln	Met				
				660								665				670			
Glu	Asp	Leu	Val	Asn	Gln	Asn	Asp	Glu	Leu	Thr	Asp	Glu	Glu	Lys	Gln				
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Ala	Ala	Ile	Gln	Val	Ile	Glu	Glu	His	Lys	Asn	Glu	Ile	Ile	Gly	Asn				
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Ile	Gly	Asp	Gln	Thr	Thr	Asp	Asp	Gly	Val	Thr	Arg	Ile	Lys	Asp	Gln				
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Pro	Ile	Ala	Pro	Val	Thr	Val	Val	Lys	Gln	Ala	Ala	Arg	Asp	Ala	Val				
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Val	Glu	Gln	Val	Lys	Thr	Asn	Ala	Ile	Gln	Gly	Ile	Gln	Ala	Ile	Thr
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Pro	Ala	Thr	Lys	Val	Lys	Thr	Asp	Ala	Lys	Asn	Ala	Ile	Asp	Lys	Ser
			965					970						975	
Ala	Glu	Thr	Gln	His	Asn	Thr	Ile	Phe	Asn	Asn	Asn	Asp	Ala	Thr	Leu
			980					985					990		
Glu	Glu	Gln	Gln	Ala	Ala	Gln	Gln	Leu	Leu	Asp	Gln	Ala	Val	Ala	Thr
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Ala	Lys	Gln	Asn	Ile	Asn	Ala	Ala	Asp	Thr	Asn	Gln	Glu	Val	Ala	Gln
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Ala	Lys	Asp	Gln	Gly	Thr	Gln	Asn	Ile	Val	Val	Ile	Gln	Pro	Ala	Thr
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Gln	Val	Lys	Thr	Asp	Thr	Arg	Asn	Val	Val	Asn	Asp	Lys	Ala	Arg	Glu
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Ala	Ile	Thr	Asn	Ile	Asn	Ala	Thr	Thr	Gly	Ala	Thr	Arg	Glu	Glu	Lys
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Gln	Glu	Ala	Ile	Asn	Arg	Val	Asn	Thr	Leu	Lys	Asn	Arg	Ala	Leu	Thr
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Asp	Ile	Gly	Val	Thr	Ser	Thr	Thr	Ala	Met	Val	Asn	Ser	Ile	Arg	Asp
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Asp	Ala	Val	Asn	Gln	Ile	Gly	Ala	Val	Gln	Pro	His	Val	Thr	Lys	Lys
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Gln	Thr	Ala	Thr	Gly	Val	Leu	Asn	Asp	Leu	Ala	Thr	Ala	Lys	Lys	Gln
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Glu	Ile	Asn	Gln	Asn	Thr	Asn	Ala	Thr	Thr	Glu	Glu	Lys	Gln	Val	Ala
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Leu	Asn	Gln	Val	Asp	Gln	Glu	Leu	Ala	Thr	Ala	Ile	Asn	Asn	Ile	Asn
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Gln	Ala	Asp	Thr	Asn	Ala	Glu	Val	Asp	Gln	Ala	Gln	Gln	Leu	Gly	Thr
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Lys	Ala	Ile	Asn	Ala	Ile	Gln	Pro	Asn	Ile	Val	Lys	Lys	Pro	Ala	Ala
			1185				1190				1195				1200
Leu	Ala	Gln	Ile	Asn	Gln	His	Tyr	Asn	Ala	Lys	Leu	Ala	Glu	Ile	Asn
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Leu	Asn	Gln	Asp	Arg	Gln	Gln	Ala	Ile	Glu	Ser	Ile	Lys	Gln	Ala	Asn
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Leu	Lys	Asp	Gln	Ala	Ile	Asn	Gln	Ile	Asn	Gln	Asn	Gln	Thr	Asn	Asp
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Gln	Val	Asp	Thr	Thr	Thr	Asn	Gln	Ala	Val	Asn	Ala	Ile	Asp	Asn	Val
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Glu	Ala	Glu	Val	Val	Ile	Lys	Thr	Lys	Ala	Ile	Ala	Asp	Ile	Glu	Lys
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Ala	Val	Lys	Glu	Lys	Gln	Gln	Gln	Ile	Asp	Asn	Ser	Leu	Asp	Ser	Thr
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Asp	Asn	Glu	Lys	Glu	Val	Ala	Ser	Gln	Ala	Leu	Ala	Lys	Glu	Lys	Glu
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Lys	Ala	Leu	Ala	Ala	Ile	Asp	Gln	Ala	Gln	Thr	Asn	Ser	Gln	Val	Asn
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Gln	Ala	Ala	Thr	Asn	Gly	Val	Ser	Ala	Ile	Lys	Ile	Ile	Gln	Pro	Glu
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Glu	Leu	Arg	Ala	Lys	Ile	Asn	Gln	Asp	Lys	Glu	Ala	Thr	Ala	Glu	Glu
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Arg	Gln	Val	Ala	Leu	Asp	Lys	Ile	Asn	Glu	Phe	Val	Asn	Gln	Ala	Met
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Thr	Asp	Ile	Thr	Asn	Asn	Arg	Thr	Asn	Gln	Gln	Val	Asp	Asp	Thr	Thr
			1475				1480					1485			
Ser	Gln	Ala	Leu	Asp	Ser	Ile	Ala	Leu	Val	Thr	Pro	Asp	His	Ile	Val

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Arg Ala Ala Arg Asp Ala Val Lys Gln Gln Tyr Glu Ala Lys Lys		
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Arg Glu Ile Glu Gln Ala Glu His Ala Thr Asp Glu Glu Lys Gln Val		1520
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Ala Leu Asn Gln Leu Ala Asn Asn Glu Lys Arg Ala Leu Gln Asn Ile		1535
	1540	1545
Asp Gln Ala Ile Ala Asn Asn Asp Val Lys Arg Val Glu Thr Asn Gly		1550
	1555	1560
Ile Ala Thr Leu Lys Gly Val Gln Pro His Ile Val Ile Lys Pro Glu		1565
	1570	1575
Ala Gln Gln Ala Ile Lys Ala Ser Ala Glu Asn Gln Val Glu Ser Ile		1580
1585	1590	1595
Lys Asp Thr Pro His Ala Thr Val Asp Glu Leu Asp Glu Ala Asn Gln		1600
	1605	1610
Leu Ile Ser Asp Thr Leu Lys Gln Ala Gln Gln Glu Ile Glu Asn Thr		1615
	1620	1625
Asn Gln Asp Ala Ala Val Thr Asp Val Arg Asn Gln Thr Ile Lys Ala		1630
	1635	1640
Ile Glu Gln Ile Lys Pro Lys Val Arg Arg Lys Arg Ala Ala Leu Asp		1645
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Ser Ile Glu Glu Asn Asn Lys Asn Gln Leu Asp Ala Ile Arg Asn Thr		1665
1665	1670	1675
Leu Asp Thr Thr Gln Asp Glu Arg Asp Val Ala Ile Asp Thr Leu Asn		1680
	1685	1690
Lys Ile Val Asn Thr Ile Lys Asn Asp Ile Ala Gln Asn Lys Thr Asn		1695
	1700	1705
Ala Glu Val Asp Arg Thr Glu Thr Asp Gly Asn Asp Asn Ile Lys Val		1710
	1715	1720
Ile Leu Pro Lys Val Gln Val Lys Pro Ala Ala Arg Gln Ser Val Gly		1725
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Val Lys Ala Glu Ala Gln Asn Ala Leu Ile Asp Gln Ser Asp Leu Ser		1745
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Thr Glu Glu Glu Arg Leu Ala Ala Lys His Leu Val Glu Gln Ala Leu		1760
	1765	1770
Asn Gln Ala Ile Asp Gln Ile Asn His Ala Asp Lys Thr Ala Gln Val		1775
	1780	1785
Asn Gln Asp Ser Ile Asn Ala Gln Asn Ile Ile Ser Lys Ile Lys Pro		1790
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Ala Thr Thr Val Lys Ala Thr Ala Leu Gln Gln Ile Gln Asn Ile Ala		1805
1810	1815	1820
Thr Asn Lys Ile Asn Leu Ile Lys Ala Asn Asn Glu Ala Thr Asp Glu		1825
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Glu Gln Asn Ile Ala Ile Ala Gln Val Glu Lys Glu Leu Ile Lys Ala		1840
	1845	1850
Lys Gln Gln Ile Ala Ser Ala Val Thr Asn Ala Asp Val Ala Tyr Leu		1855
	1860	1865
Leu His Asp Glu Lys Asn Glu Ile Arg Glu Ile Glu Pro Val Ile Asn		1870
	1875	1880
Arg Lys Ala Ser Ala Arg Glu Gln Leu Thr Thr Leu Phe Asn Asp Lys		1885
1890	1895	1900
Lys Gln Ala Ile Glu Ala Asn Ile Gln Ala Thr Val Glu Glu Arg Asn		1905
1905	1910	1915
Ser Ile Leu Ala Gln Leu Gln Asn Ile Tyr Asp Thr Ala Ile Gly Gln		1920
	1925	1930
Ile Asp Gln Asp Arg Ser Asn Ala Gln Val Asp Lys Thr Ala Ser Leu		1935
	1940	1945
Asn Leu Gln Thr Ile His Asp Leu Asp Val His Pro Ile Lys Lys Pro		1950
	1955	1960
Asp Ala Glu Lys Thr Ile Asn Asp Asp Leu Ala Arg Val Thr Ala Leu		1965
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Val Gln Asn Tyr Arg Lys Val Ser Asn Arg Asn Lys Ala Asp Ala Leu		1985
1985	1990	1995
Lys Ala Ile Thr Ala Leu Lys Leu Gln Met Asp Glu Glu Leu Lys Thr		2000
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Ala Arg Thr Asn Ala Asp Val Asp Ala Val Leu Lys Arg Phe Asn Val		2015
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Ala Leu Ser Asp Ile Glu Ala Val Ile Thr Glu Lys Glu Asn Ser Leu		2030
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2065	2070	2075
Tyr Val Ala Asp Gly Asn Arg Met Ile Asp Glu Asp Ala Thr Leu Asn		2080
	2085	2090
		2095

Asp Ile Lys Gln His Thr Gln Phe Ile Val Asp Glu Ile Leu Ala Ile
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 Lys Leu Pro Ala Glu Ala Thr Lys Val Ser Pro Lys Glu Ile Gln Pro
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 Lys Lys Glu Glu Thr Asn Asn Tyr Asp Gly Ile Glu Lys Arg Ser Glu
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 Asp Arg Thr Glu Ser Thr Thr Asn Val Asp Glu Asn Glu Ala Thr Phe
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 85 90 95
 Lys Glu Ser Ser Ser Val Glu Ser Ser Asn Ser Ser Ile Asp Thr Ala
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 Gln Gln Pro Ser His Thr Thr Ile Asn Arg Glu Glu Ser Val Gln Thr
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 Ser Asp Asn Val Glu Asp Ser His Val Ser Asp Phe Ala Asn Ser Lys
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 Ile Lys Glu Ser Asn Thr Glu Ser Gly Lys Glu Glu Asn Thr Ile Glu
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 Gln Pro Asn Lys Val Lys Glu Asp Ser Thr Thr Ser Gln Pro Ser Gly
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 Tyr Thr Asn Ile Asp Glu Lys Ile Ser Asn Gln Asp Glu Leu Leu Asn
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 Leu Pro Ile Asn Glu Tyr Glu Asn Lys Ala Arg Pro Leu Ser Thr Thr
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 Ser Ala Gln Pro Ser Ile Lys Arg Val Thr Val Asn Gln Leu Ala Ala
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 Glu Gln Gly Ser Asn Val Asn His Leu Ile Lys Val Thr Asp Gln Ser
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 Ile Thr Glu Gly Tyr Asp Asp Ser Glu Gly Val Ile Lys Ala His Asp
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 Ala Glu Asn Leu Ile Tyr Asp Val Thr Phe Glu Val Asp Asp Lys Val
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 Lys Ser Gly Asp Thr Met Thr Val Asp Ile Asp Lys Asn Thr Val Pro
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 Ser Asp Leu Thr Asp Ser Phe Thr Ile Pro Lys Ile Lys Asp Asn Ser
 290 295 300
 Gly Glu Ile Ile Ala Thr Gly Thr Tyr Asp Asn Lys Asn Lys Gln Ile
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 Thr Tyr Thr Phe Thr Asp Tyr Val Asp Lys Tyr Glu Asn Ile Lys Ala
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 His Leu Lys Leu Thr Ser Tyr Ile Asp Lys Ser Lys Val Pro Asn Asn
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 Glu Gln Thr Ile Tyr Ile Asn Pro Leu Arg Tyr Ser Ala Lys Glu Thr
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 Asn Val Asn Ile Ser Gly Asn Gly Asp Glu Gly Ser Thr Ile Ile Asp
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 Asp Ser Thr Ile Ile Lys Val Tyr Lys Val Gly Asp Asn Gln Asn Leu

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Pro Asp Ser Asn Arg Ile Tyr Asp Tyr Ser Glu Tyr Glu Asp Val Thr
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Asn Asp Asp Tyr Ala Gln Leu Gly Asn Asn Asn Asp Val Asn Ile Asn
465      470      475      480
Phe Gly Asn Ile Asp Ser Pro Tyr Ile Ile Lys Val Ile Ser Lys Tyr
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Asp Pro Asn Lys Asp Asp Tyr Thr Thr Ile Gln Gln Thr Val Thr Met
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Gln Thr Thr Ile Asn Glu Tyr Thr Gly Glu Phe Arg Thr Ala Ser Tyr
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Leu Pro Pro Glu Lys Thr Tyr Lys Ile Gly Asp Tyr Val Trp Glu Asp
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Gly Leu Thr Tyr Lys Ile Thr Phe Glu Thr Pro Glu Gly Tyr Thr Pro
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Ser Val Trp Val Thr Ile Asn Gly Gln Asp Asp Met Thr Ile Asp Ser
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Gly Phe Tyr Gln Thr Pro Lys Tyr Ser Leu Gly Asn Tyr Val Trp Tyr
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Asp Thr Asn Lys Asp Gly Ile Gln Gly Asp Asp Glu Lys Gly Ile Ser
      675      680      685
Gly Val Lys Val Thr Leu Lys Asp Glu Asn Gly Asn Ile Ile Ser Thr
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Thr Thr Thr Asp Glu Asn Gly Lys Tyr Gln Phe Asp Asn Leu Asn Ser
705      710      715      720
Gly Asn Tyr Ile Val His Phe Asp Lys Pro Ser Gly Met Thr Gln Thr
      725      730      735
Thr Thr Asp Ser Gly Asp Asp Asp Glu Gln Asp Ala Asp Gly Glu Glu
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Val His Val Thr Ile Thr Asp His Asp Asp Phe Ser Ile Asp Asn Gly
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Val Ile Asn Asn Asn Gln Ser Ile Asn Thr Asp Asp Asn Asn Gln Ile
      35      40      45
Ile Lys Lys Glu Glu Thr Asn Asn Tyr Asp Gly Ile Glu Lys Arg Ser
      50      55      60
Glu Asp Arg Thr Glu Ser Thr Thr Asn Val Asp Glu Asn Glu Ala Thr
65      70      75      80
Phe Leu Gln Lys Thr Pro Gln Asp Asn Thr His Leu Thr Glu Glu Glu
      85      90      95

Val Lys Glu Ser Ser Ser Val Glu Ser Ser Asn Ser Ser Ile Asp Thr
      100      105      110
Ala Gln Gln Pro Ser His Thr Thr Ile Asn Arg Glu Glu Ser Val Gln
      115      120      125
Thr Ser Asp Asn Val Glu Asp Ser His Val Ser Asp Phe Ala Asn Ser
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Lys Ile Lys Glu Ser Asn Thr Glu Ser Gly Lys Glu Glu Asn Thr Ile
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Glu Gln Pro Asn Lys Val Lys Glu Asp Ser Thr Thr Ser Gln Pro Ser
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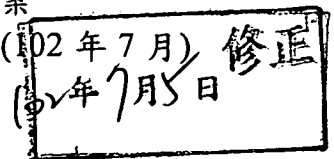
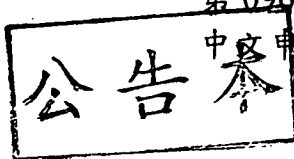
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		595					600					605			
Asn	Gly	Leu	Thr	Tyr	Lys	Ile	Thr	Phe	Glu	Thr	Pro	Glu	Gly	Tyr	Thr
		610				615					620				
Pro	Thr	Leu	Lys	His	Ser	Gly	Thr	Asn	Pro	Ala	Leu	Asp	Ser	Glu	Gly
		625			630					635					640
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			645						650					655	
Ser	Gly	Phe	Tyr	Gln	Thr	Pro	Lys	Tyr	Ser	Leu	Gly	Asn	Tyr	Val	Trp
			660					665					670		
Tyr	Asp	Thr	Asn	Lys	Asp	Gly	Ile	Gln	Gly	Asp	Asp	Glu	Lys	Gly	Ile
		675					680					685			
Ser	Gly	Val	Lys	Val	Thr	Leu	Lys	Asp	Glu	Asn	Gly	Asn	Ile	Ile	Ser
		690				695					700				
Thr	Thr	Thr	Thr	Asp	Glu	Asn	Gly	Lys	Tyr	Gln	Phe	Asp	Asn	Leu	Asn
					710					715					720
Ser	Gly	Asn	Tyr	Ile	Val	His	Phe	Asp	Lys	Pro	Ser	Gly	Met	Thr	Gln
			725						730					735	
Thr	Thr	Thr	Asp	Ser	Gly	Asp	Asp	Asp	Glu	Gln	Asp	Ala	Asp	Gly	Glu
			740					745					750		
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35 40 45
Asn Ala Leu Thr Gln Gln Val Asn Ser Ala Gln Asn Val His Ala Val
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Asn Asp Ile Lys Gln Thr Thr Gln Ser Leu Asn Thr Ala Met Thr Gly
65 70 75 80
Leu Lys Arg Gly Val Ala Asn His Asn Gln Val Val Gln Ser Asp Asn
85 90 95
Tyr Val Asn Ala Asp Thr Asn Lys Lys Asn Asp Tyr Asn Asn Ala Tyr
100 105 110
Asn His Ala Asn Asp Ile Ile Asn Gly Asn Ala Gln His Pro Val Ile
115 120 125

十、申請專利範圍：



1. 一種用於使 N-乙醯化少於 40% 之聚 N-乙醯化葡萄糖胺 (PNAG) 與載體蛋白共軛之方法，其包含以下步驟：

a) 藉由添加包含順丁烯二醯亞胺基 (maleimide) 之鍵聯劑來活化該 PNAG 以形成活化之 PNAG，其中該 PNAG 與該包含順丁烯二醯亞胺基之鍵聯劑之重量/重量比率為 1:2-2:1；

b) 藉由添加包含巰基 (Sulphydryl) 之鍵聯劑來活化該載體蛋白以形成活化之載體蛋白，其中該載體蛋白與該包含巰基之鍵聯劑之重量/重量比率為 50:1-2:1，且其中該包含巰基之鍵聯劑具 10-25 埃 (Angstroms) 之間隔長度；及

c) 使該活化之 PNAG 與該活化之載體蛋白反應以形成 PNAG-載體蛋白共軛物，其中活化之 PNAG 與該活化之載體蛋白之重量/重量比率為 4:1-1:4。

2. 一種用於使 N-乙醯化少於 40% 之 PNAG 與載體蛋白共軛之方法，其包含以下步驟：

a) 藉由添加包含巰基之鍵聯劑來活化該 PNAG 以形成活化之 PNAG，其中該 PNAG 與該包含巰基之鍵聯劑之重量/重量比率為 50:1-2:1，且其中該包含巰基之鍵聯劑具 10-25 埃之間隔長度；

b) 藉由添加包含順丁烯二醯亞胺基之鍵聯劑來活化該載體蛋白以形成活化之載體蛋白，其中該載體蛋白與該包含順丁烯二醯亞胺基之鍵聯劑之重量/重量比率為 1:2-2:1；及

c)使該活化之PNAG與該活化之載體蛋白反應以形成PNAG-載體蛋白共軛物，其中活化之PNAG與該活化之載體蛋白之重量/重量比率為4:1-1:4。

3. 一種用於使N-乙醯化少於40%之PNAG與載體蛋白共軛之方法，其包含以下步驟：

a)藉由添加包含巯基之鍵聯劑來活化該PNAG以形成活化之PNAG，其中該PNAG與該包含巯基之鍵聯劑之重量/重量比率為50:1-2:1，且其中該包含巯基之鍵聯劑具10-25埃之間隔長度；

b)藉由添加包含巯基之鍵聯劑來活化該載體蛋白以形成活化之載體蛋白，其中該載體蛋白與該包含巯基之鍵聯劑之重量/重量比率為50:1-2:1，且其中該包含巯基之鍵聯劑具10-25埃之間隔長度；及

c)使該活化之PNAG與該活化之載體蛋白反應以形成PNAG-載體蛋白共軛物，其中活化之PNAG與該活化之載體蛋白之重量/重量比率為4:1-1:4。

4. 如請求項1或2之方法，其中在步驟a)或步驟b)中該包含順丁烯二醯亞胺基之鍵聯劑連接至PNAG上之胺基。
5. 如請求項1或2之方法，其中該包含順丁烯二醯亞胺基之鍵聯劑係選自由 β -馬來醯亞胺丙基琥珀醯亞胺酯(BMPS)、 ϵ -馬來醯亞胺己醯基氧基琥珀醯亞胺酯(EMCS)、N-(γ -馬來醯亞胺丁醯基氧基)琥珀醯亞胺酯(GMBS)、m-馬來醯亞胺苯甲醯基-N-羥基琥珀醯亞胺酯(MBS)、長鏈4-(N-馬來醯亞胺甲基)環己烷-1-羧酸琥珀

醯亞胺酯(LC-SMCC)、4-(N-馬來醯亞胺甲基)環己烷-1-羧酸琥珀醯亞胺酯(SMCC)、6-(4-疊氮-2-硝基苯基胺基)己酸琥珀醯亞胺酯(SMPB)、6- β -馬來醯亞胺-丙醯胺基)己酸琥珀醯亞胺酯(SMPH)、磺基-EMCS、磺基-MBS、磺基-SMCC、磺基-GMBS及磺基-SMPB組成之群。

6. 如請求項1之方法，其中在步驟b)中該包含巰基之鍵聯劑連接至該載體蛋白上之胺基。
7. 如請求項1之方法，其中該包含巰基之鍵聯劑係選自由長鏈3-(2-吡啶基二硫)丙酸琥珀醯亞胺酯(LC-SPDP)、琥珀醯亞胺基氧基羧基-(2-吡啶基二硫)甲苯(SMPT)、長鏈琥珀醯亞胺基氧基羧基-(2-吡啶基二硫)甲苯(LC-SMPT)、磺基-SMPT、磺基-LC-SMPT及磺基-LC-SPDP組成之群。
8. 如請求項1或2之方法，其中該載體蛋白係選自由以下組成之群：破傷風類毒素、白喉類毒素、白喉類毒素CRM197、重組外蛋白(exprotein)A(rEPA)、蛋白D、SitC/錳運輸蛋白C(MntC)/唾液結合蛋白、胞外基質結合蛋白A(EbhA)、胞外基質結合蛋白B(EbhB)、彈性蛋白結合蛋白(EbpS)、胞外血纖維蛋白元(fibrinogen)結合蛋白(EFB)/血纖維蛋白元結合蛋白(FIB)、葡萄球菌免疫球蛋白結合蛋白(SBI)、凝集(clumping)因子A(ClfA)、富含Ser-Asp血纖維蛋白元/骨涎蛋白(sialoprotein)結合蛋白C(SdrC)、富含Ser-Asp血纖維蛋白元/骨涎蛋白結合蛋白G(SdrG)、富含Ser-Asp血纖維蛋白元/骨涎蛋白結合蛋白

H(SdrH)、脂肪酶甘油酯水解酶(GehD)、分泌抗原A(SasA)、血纖維蛋白元結合蛋白A(FnbA)、血纖維蛋白元結合蛋白B(FnbB)、膠原蛋白結合蛋白(Cna)、凝集因子B(ClfB)、纖維蛋白原(fibrogen)結合蛋白A(FbpA)、中性磷酸酶(Npase)、免疫優勢(immunodominant)葡萄球菌抗原A(IsaA/PisA)、金黃色葡萄球菌表面蛋白A(SsaA)、EPB、葡萄球菌表面蛋白1(SSP-1)、葡萄球菌表面蛋白2(SSP-2)、肝素結合蛋白(HBP)、玻璃連接蛋白、血纖維蛋白原結合蛋白、凝固酶、Fig、微管活化蛋白(MAP)、鐵調節表面決定子A(IsdA)、鐵調節表面決定子B(IsdB)、鐵調節表面決定子H(HarA)、鐵運輸SitABC之C次單元(SitC)、 α 毒素(Hla)、 α 毒素H35R突變體、MRPII及自溶素或其片段。

9. 一種用於製造疫苗之方法，其包含進行如請求項1-8中任一項之方法及合併該PNAG-載體蛋白共軛物與醫藥學上可接受之賦形劑及視情況額外抗原之另一步驟。
10. 一種PNAG-載體蛋白共軛物，其可藉由如請求項1-9中任一項之方法獲得。
11. 一種疫苗，其包含如請求項10之PNAG-載體蛋白共軛物及醫藥學上可接受之賦形劑。