

申請日期	91.2.8
案 號	91102640
類 別	C12N 1/20, 15/31, 15/63, A61K 39/102, 33/14, 607K 14/285, 16/12, C12Q 1/18, G01N 33/68

A4
C4

公告本

(以上各欄由本局填註)

發明專利說明書

一、發明名稱	中 文	抗細菌疫苗組合物
	英 文	"ANTI-BACTERIAL VACCINE COMPOSITIONS"
二、發明人	姓 名	1. 大衛 E. 洛利 DAVID E. LOWERY 2. 特洛伊 E. 富勒 TROY E. FULLER 3. 麥克 J. 甘乃迪 MICHAEL J. KENNEDY
	國 籍	均美國U.S.A.
三、申請人	住、居所	1. 美國密西根州波堤吉市林地路1207號 1207 WOODLAND DRIVE, PORTAGE, MICHIGAN 49024, U.S.A. 2. 美國密西根州戰役溪市夢區路111號 111 DREAMFIELD DRIVE BATTLE CREEK, MICHIGAN 49014, U.S.A. 3. 美國密西根州波堤吉市昆西大道2364號 2364 QUINCY AVENUE, PORTAGE, MICHIGAN 49024, U.S.A.
	代 表 人 姓 名	詹姆斯 D. 達恩利 二世 JAMES D. DARNLEY, JR.

(由本局填寫)

承辦人代碼：
大 類：
I P C 分類：

A6
B6

本案已向：

國（地區） 申請專利，申請日期： 案號： ，☐有 ☐無主張優先權

美國 2001年03月15日 09/809,665 ☒有 ☐無主張優先權

有關微生物已寄存於： 寄存日期： ，寄存號碼：

裝
訂
線

五、發明說明 (1)

本申請案是2000年4月6日建檔之美國專利申請案第09/545,199號的部份接續申請案，其聲言1999年9月10日建檔之美國臨時專利申請案第60/153,453號和1999年4月9日建檔之60/128,689號的益處。

發明範疇

本發明通常係關於確認引起巴斯德桿菌科(Pasteurellaceae)細菌之毒力的基因，藉此容許產製可用於疫苗之新穎的減毒突變種品系，並確認瞄準毒力基因及其產物的新穎抗-病毒劑。

發明背景

巴斯德桿菌科包括數種感染各種動物的重要病原。除了敗血性巴斯德桿菌(*P. multocida*)之外，該科的著名成員包括溶血性巴斯德桿菌(*Pasteurella (Mannheimia) haemolytica*)、胸膜肺炎放線桿菌(*Actinobacillus pleuropneumoniae*)和睡眠嗜血桿菌(*Haemophilus somnus*)。敗血性巴斯德桿菌是革蘭氏陰性、非活動性的球桿菌，其在許多野生動物和家畜的正常菌叢中找到，並已知在全世界的許多動物物種中引起疾病[Biberstein, 在 M. Kilian, W. Frederickson, 和 E.L. Biberstein(編輯), *Haemophilus, Pasteurella, 和 Actinobacillus*. Academic Press, London, 第61-73頁(1981)中]。在感染之後顯露的疾病包括敗血症、支氣管肺炎、鼻炎和創傷感染[在 Shewen等人, 在 C.L. Gyles和 C.O. Thoen(編輯), Pathogenesis of Bacterial Infections in Animals. Iowa State University Press, Ames, 第216-225頁

五、發明說明(2)

(1993)中回顧，以引用的方式併入本文中]。

敗血性巴斯德桿菌感染，通常起因於在緊迫期間的侵入，但亦可藉著空氣或接觸傳染，或經由蚤和蟲媒介者傳染。在家禽中，敗血性巴斯德桿菌感染引起急性至極急性的敗血症，在與過度擁擠、產卵、換羽或劇烈氣候改變有關的緊迫條件下，在馴養的火雞和野生水禽中是特別普遍的。在牛，在感染之後有類似的出血性敗血症，並顯露出包括高燒和抑鬱的病況，通常接著是很快地死亡。最可能是經由空氣接觸傳染，但亦可在明顯氣候變化的期間發生感染。在兔子，感染引起再發的化膿性鼻炎，通常接著是結膜炎、中耳炎、鼻竇炎、皮下膿腫和慢性支氣管肺炎。在嚴重感染時，兔子因為急性纖維蛋白性支氣管肺炎、敗血症或內毒素血症而致死。通常在緊迫期間產生疾病狀態。在豬，敗血性巴斯德桿菌之疾病狀態包括萎縮性鼻炎和細菌性肺炎。亦在狗、貓、山羊和綿羊中檢測到類似的肺炎病況。通常在許多動物的口腔菌叢中檢測到敗血性巴斯德桿菌，並因此通常是咬傷和抓傷的污染物。

敗血性巴斯德桿菌品系通常是藉著莢膜血清群和菌體血清型來命名。藉著特徵性的熱-穩定抗原的表現，來區別5個莢膜血清群(A、B、D、E和F)和16個菌體血清型。大多數的品系是宿主專一的，並很少感染一或兩種以上的動物。不同血清型的存在，提出關於接種疫苗的問題，因為傳統的完整死細胞細菌，通常僅提供血清型-專一的保護。然而，已經證實以一種血清型的自然感染，可導致對

五、發明說明 (3)

抗多種血清型的免疫學保護 [Shewen 等人, 在 C.L. Gyles 和 C.O. Thoen (編輯), Pathogenesis of Bacterial Infections in Animals, Iowa State University Press, Ames, 第 216-225 頁 (1993) 中], 且亦可藉著使用在活體內生長的失活細菌, 刺激交叉保護 [Rimler 等人, Am J Vet Res. 42:2117-2121 (1981)]。已經利用一種活的自然突變種敗血性巴斯德桿菌品系作為疫苗, 並已經顯示刺激強的免疫反應 [Davis, Poultry Digest. 20:430-434 (1987), Schlink 等人, Avian Dis. 31(1):13-21 (1987)]。然而, 已經顯示如果接受者受到緊迫, 該減毒品系便恢復成有毒力的狀態, 或引起死亡 [Davis, Poultry Digest. 20:430-434 (1987), Schlink 等人, Avian Dis. 31(1):13-21 (1987)]。

巴斯德桿菌科的其他成員, 胸膜肺炎放線桿菌, 對豬顯示出嚴格的宿主專一性, 且是高傳染性豬胸膜肺炎的病原體。感染通常產生激烈的出血病況, 並相信藉著直接傳染的方式發生。該疾病經常是致命的, 且結果在豬產業上導致嚴重的經濟損失。胸膜肺炎放線桿菌感染可以是慢性或急性的, 而感染的特徵為出血、壞死性支氣管肺炎, 伴隨有纖維蛋白性胸膜炎。迄今, 已經將細菌毒力歸因於結構蛋白質, 包括血清型-專一的莢膜多醣類、脂多醣和表面蛋白質, 以及細胞外的溶胞毒素。不管這些毒力因子的純化作用, 以及在許多情況下的選殖, 仍不瞭解在胸膜肺炎放線桿菌感染中, 這些毒力因素的正確角色。

以在莢膜多醣類中之抗原差異, 以及細胞外毒素的產製

五、發明說明 (4)

為基礎，已經確認出12個血清型的胸膜肺炎放線桿菌。血清型1、5和7與在美國的胸膜肺炎放線桿菌感染最有關聯，而血清型1、2、5、7和9則盛行於歐洲。有至少3個重要的胸膜肺炎放線桿菌細胞外毒素，其為溶血素(Haemolysin)家族的成員，並被稱為RTX毒素。RTX毒素由許多革蘭氏陰性細菌產製，包括大腸桿菌(*E. coli*)、普通變形桿菌(*Proteus vulgaris*)和溶血性巴斯德桿菌，而蛋白質通常共享結構和功能特徵。然而，得自各種血清型的毒素之差異在於宿主專一性、標靶細胞和生物學活性。

主要的胸膜肺炎放線桿菌RTX毒素包括ApxI、ApxII和ApxIII。ApxI和ApxII具有溶血活性，而ApxI是較有效的。ApxIII顯示無溶血活性，但對肺泡巨噬細胞和噬中性白血球是胞毒性的。大多數的胸膜肺炎放線桿菌血清型產生這三種毒素中的兩種。例如，血清型1、5、9和11表現ApxI和ApxII，而血清型2、3、4、6和8表現ApxII和ApxIII。然而血清型10僅產生ApxI，而血清型7和12僅表現ApxII。產生ApxI和ApxII的那些胸膜肺炎放線桿菌血清型是最強毒力品系的細菌。

在老鼠模式和使用隨機突變之野外型細菌感染豬的實驗中，證實Apx毒素是毒力因子[Tascon等人, *Mol. Microbiol.* 14:207-216 (1994)]。亦已經利用瞄準的突變生成作用，使編碼AopA外膜毒力蛋白質的基因失活，產生其他的胸膜肺炎放線桿菌突變種[Mulks和Buysee, *Gene* 165:61-66 (1995)]。

五、發明說明 (5)

在溶血性巴斯德桿菌，巴斯德桿菌科物種中，已經證實至少11種血清型(1、2、5-9、12-14和16) [Angen等人, Vet Microbiol 65(4): 283-90 (1999)]，其為在新生的、斷奶的、生長中的和成年的羔羊、犏牛和山羊中爆發嚴重急性肺炎的原因 [Ackermann等人, Microbes Infect 2(9): 1079-88 (2000)]。運輸、病毒感染、過度擁擠和其他的緊迫狀況，使動物易罹患溶血性巴斯德桿菌感染 [Ackermann等人，在前]。咸相信溶血性巴斯德桿菌的害白血球毒素(Lkt)在發病原理中扮演重要的角色，引起細胞溶解和細胞凋零，其導致牛運輸熱的肺臟病理學特徵 [Highlander等人, Infect Immun 68(7): 3916-22 (2000)]，以及在牛肺炎性巴斯德桿菌症中的肺臟傷害 [Jeyaseelan等人, Microb Pathog 30(2): 59-69 (2001)]。Lkt是形成-孔隙的外毒素，其具有僅在反芻動物白血球和血小板中誘導細胞溶解的獨特性質 [Jeyaseelan等人，在前]。許多細胞類型的細胞溶解，是由花生四烯酸(AA)調節，而其藉著磷酸脂酶的產製作用則是由G-蛋白質-偶聯受體調節 [Jeyaseelan等人 (2001)，在前]。目前的研究指出溶血性巴斯德桿菌Lkt與牛CD18，所有 β 2整合素的共同亞單元結合 [Jeyaseelan等人, Infect Immun 68(1): 72-9 (2000)]。亦已經顯示LFA-1是Lkt受體，與LFA-1結合之Lkt並非標靶細胞專一的，Lkt與牛LFA-1結合，與鈣升高和細胞溶解有關，且牛LFA-1表現與Lkt-誘導之標靶細胞細胞溶解的等級有關 [Jeyaseelan等人, Infect Immun 68(1): 72-9 (2000)]。

五、發明說明(6)

當企圖產製疫苗組合物時，傳統的完整死細胞細菌僅提供血清型-專一的保護[MacInnes和Smart, 在前]，然而，已經證實利用高毒力的血清型自然感染，可刺激對多種血清型的強保護性免疫[Nielsen, Nord Vet Med. 31:407-13 (1979), Nielsen, Nord Vet Med. 36:221-234(1984), Nielsen, Can J Vet Res. 29:580-582(1988), Nielsen, ACTA Vet Scand. 15:80-89(1994)]。一種已限定之活-減毒疫苗品系，產生失活形式的ApxII毒素，已經顯示可望對豬提供交叉保護[Prideaux 等人，Infection & Immunity 67:1962-1966 (1999)]，而其他未限定之活-減毒突變種亦已經顯示承諾[Inzana等人，Infect Immun. 61:1682-6, (1993), Paltineanu等人，在International Pig Veterinary Society, 1992, 第214頁中，Utrera等人，在International Pig Veterinary Society, 1992, 第213頁中]。

因為與疫苗調配物有關的問題包括具有未限定、自然突變的細菌，故在此項技藝中需要合理地建構活的減毒細菌品系，以便在疫苗中使用，其將安全地刺激對抗同種或異種之巴斯德桿菌血清型的保護性免疫。尚需要確認減毒的細菌品系和細菌毒力所需的基因。藉此有助於確認抗-細菌劑之方法的發展。

發明概要

一般而言，本發明提供產製和使用包括減毒之革蘭氏陰性細菌的疫苗組合物的材料和方法。一方面，本發明之疫苗組合物包括在細菌之巴斯德桿菌科中的減毒物種，其為

五、發明說明 (7)

在此項技藝中已知的，且一部份描述在 Dewhirst 等人, J. Bacteriol. 174:2002-2013 (1992) 中，全部以引用的方式併入本文中。在該科中的物種，包括但不限於放線桿菌病伴隨放線桿菌 (*A. actinomycetemcomitans*)、莢膜放線桿菌 (*A. capsulatus*)、馬放線桿菌 (*A. equuli*)、木狀放線桿菌 (*A. lignieresii*)、胸膜肺炎放線桿菌 (胸膜肺炎嗜血桿菌 (*H. pleuropneumoniae*))、精子放線桿菌 (*A. seminis*)、豬放線桿菌 (*A. suis*) (豬嗜血桿菌 (*H. suis*))、璫放線桿菌 (*A. ureae*) (璫巴斯德桿菌 (*P. ureae*))、莢膜放線桿菌、比斯卡德分類 11 (Bisgaard taxon 11)、埃及嗜血桿菌 (*H. aegyptius*)、嗜沫嗜血桿菌 (*H. aphrophilus*)、嗜沫嗜血桿菌 (*H. aphrophilus*) (副流感嗜血桿菌 (*H. parainfluenzae*))、杜克雷氏嗜血桿菌 (*H. ducreyi*)、嗜血紅蛋白嗜血桿菌 (*H. haemoglobinophilus*)、溶血性嗜血桿菌 (*H. haemolyticus*)、流行性感感冒嗜血桿菌 (*H. influenzae*)、副隧道嗜血桿菌 (*H. paracuniculus*)、副雞嗜血桿菌 (*H. paragallinarum*)、副溶血性嗜血桿菌 (*H. parahaemolyticus*)、副流感嗜血桿菌、副嗜沫嗜血桿菌 (*H. paraphrophilus*)、副嗜沫溶血性嗜血桿菌 (*H. paraphrohaemolyticus*)、副嗜沫嗜血桿菌、副豬嗜血桿菌 (*H. parasuis*)、副豬嗜血桿菌第 5 型、賽格尼斯嗜血桿菌 (*H. segnis*)、睡眠嗜血桿菌、嗜血桿菌屬 (*Haemophilus*) 最小群、嗜血桿菌分類 C (*Haemophilus* taxon C)、產氣巴斯德桿菌 (*P. aerogenes*)、安納提斯巴斯德桿菌 (*P. anatis*)、禽巴斯德桿菌 (*P. avium*) (禽嗜血桿菌 (*H. avium*))、犬巴斯德桿菌 (*P.*

五、發明說明(8)

canis)、德格曼提斯巴斯德桿菌(*P. dagmatis*)、雞巴斯德桿菌(*P. gallinarum*)、溶血性巴斯德桿菌、蘭蜜糖巴斯德桿菌(*P. trehalosi*)((溶血性巴斯德桿菌生物型T))、蘭給巴斯德桿菌(*P. langaa*)、敗血性巴斯德桿菌、侵肺巴斯德桿菌(*P. pneumotropica*)、口炎巴斯德桿菌(*P. stomatis*)、佛倫提巴斯德桿菌(*P. volantium*)(副流感嗜血桿菌)、佛倫提巴斯德桿菌、巴斯德桿菌A種、巴斯德桿菌B種和副嗜沫溶血性嗜血桿菌。較佳的是，疫苗組合物包括減毒的溶血性巴斯德桿菌、胸膜肺炎放線桿菌、睡眠嗜血桿菌或敗血性巴斯德桿菌的細菌。在最佳的具體實施例中，本發明之疫苗組合物包括減毒的敗血性巴斯德桿菌和胸膜肺炎放線桿菌之細菌品系。

本發明的一項觀點，提供在以序列識別：1、3、7、9、11、13、15、17、19、21、23、25、29、31、33、37、39、41、51、53、55、57、58、60、68、70、72、74、76、78、80、82、84、100、102、104、106、108、110、112、114、116、118、120、122、124、126、128、130、132、134、135、136、138、140、142、144、146、148、150、152、154、156、158、160、162、163、164、166、168、170、172和174號中任一個代表的基因序列中，含有功能突變的革蘭氏陰性細菌生物，或其物種同系物，其中該突變抑制或廢止了編碼基因產物(也就是由該基因編碼之多肽)的表現及/或生物活性；該功能突變導致細菌品系的減弱毒力。調節(也就是增加或減少)基因產物之表現及/

五、發明說明(9)

或生物活性的功能突變，包括在基因本身之蛋白質編碼區中，或在負責或涉及基因表現之控制的序列中的插入或刪除。刪除突變種包括其中刪除全部或部份特定基因序列的那些。亦企圖使組合物，較佳的是疫苗組合物，包括經過突變和減毒的革蘭氏陰性細菌生物，可視需要包括適當的佐劑及/或在藥學上可接受的稀釋劑或載劑。為了修改品系使其在疫苗調配物中是有效的，減毒必須明顯得足以防止病原誘發嚴重的臨床症狀，但亦不重要得足以容許細菌在宿主中有限地複製和生長。

本發明亦提供多核苷酸，其編碼在革蘭氏陰性細菌中對毒力而言必要的基因產物。本發明之多核苷酸包括DNA，像是互補DNA、基因組DNA，包括互補或反-義DNA，以及全部或部份合成的DNA；RNA，包括有意義和反義股；以及例如在Corey, TIBTECH 15:224-229(1997)中描述的肽核酸。本發明之毒力基因多核苷酸，包括在序列識別：1、3、7、9、11、13、15、17、19、21、23、25、29、31、33、37、39、41、51、53、55、57、58、60、68、70、72、74、76、78、80、82、84、100、102、104、106、108、110、112、114、116、118、120、122、124、126、128、130、132、134、135、136、138、140、142、144、146、148、150、152、154、156、158、160、162、163、164、166、168、170、172和174號中陳述的那些，或其物種同系物，編碼由序列識別：1、3、7、9、11、13、15、17、19、21、23、25、29、31、33、37、39、41、

五、發明說明(10)

51、53、55、57、58、60、68、70、72、74、76、78、80、82、84、100、102、104、106、108、110、112、114、116、118、120、122、124、126、128、130、132、134、135、136、138、140、142、144、146、148、150、152、154、156、158、160、162、163、164、166、168、170、172和174號之多核苷酸，或其物種同系物編碼之毒力基因產物的多核苷酸，以及在中等或高度嚴格的條件下，與在序列識別：1、3、7、9、11、13、15、17、19、21、23、25、29、31、33、37、39、41、51、53、55、57、58、60、68、70、72、74、76、78、80、82、84、100、102、104、106、108、110、112、114、116、118、120、122、124、126、128、130、132、134、135、136、138、140、142、144、146、148、150、152、154、156、158、160、162、163、164、166、168、170、172和174號中陳述之任一個多核苷酸，或其物種同系物之非編碼股(或互補物)雜交的多核苷酸。因此，本發明包括得自在序列識別：1、3、7、9、11、13、15、17、19、21、23、25、29、31、33、37、39、41、51、53、55、57、58、60、68、70、72、74、76、78、80、82、84、100、102、104、106、108、110、112、114、116、118、120、122、124、126、128、130、132、134、135、136、138、140、142、144、146、148、150、152、154、156、158、160、162、163、164、166、168、170、172和174號中陳述之巴斯德桿菌科的基因序列，以及得自其他革蘭氏陰性細菌生

五、發明說明 (11)

物的相關基因序列，包括其天然存在(也就是物種同系物)和人為誘導的變體。本發明亦包括編碼從在序列識別：1、3、7、9、11、13、15、17、19、21、23、25、29、31、33、37、39、41、51、53、55、57、58、60、68、70、72、74、76、78、80、82、84、100、102、104、106、108、110、112、114、116、118、120、122、124、126、128、130、132、134、135、136、138、140、142、144、146、148、150、152、154、156、158、160、164、166、168、170、172和174號中陳述之任一個多核苷酸，及其物種同系物推衍之多肽的多核苷酸。本發明之多核苷酸的序列知識，得以迅速地獲得該多核苷酸的每個可能的片段。因此本發明提供本發明之多核苷酸的片段。

本發明更包含包括本發明之多核苷酸的表現構築體。亦包括以本發明之多核苷酸轉化、轉移感染或電穿透的宿主細胞。本發明提供產製由本發明之多核苷酸編碼之多肽的方法，包括使本發明之宿主細胞在容許，且最好促進由該多核苷酸編碼之基因產物表現的條件下生長，並從該宿主細胞或其生長的培養基中分離基因產物的步驟。

確認本發明之多核苷酸，而得以獲得編碼的多肽。本發明之多肽包括全長和片段，或截短的蛋白質；其變體；融合或嵌合型蛋白質；以及類似物，包括其中已經將保留性胺基酸置換導入野外型多肽中的那些。亦提供專一地認出本發明之多肽的抗體，並包括單株和多株抗體、單鏈抗體、嵌合型抗體、人類化抗體、人類抗體和互補性決定區

五、發明說明 (12)

(CDR)-移植的抗體，以及包括專一地認出本發明之多肽的 CDR 序列的化合物。本發明亦提供對本發明之抗體具有免疫專一性的抗-遺傳性型抗體。

根據本發明另一項觀點，提供確認新穎的抗-細菌劑的方法，該新穎的抗-細菌劑調節革蘭氏陰性細菌毒力基因的功能，或基因產物。本發明之方法，包括針對干擾由在序列識別：1、3、7、9、11、13、15、17、19、21、23、25、29、31、33、37、39、41、51、53、55、57、58、60、68、70、72、74、76、78、80、82、84、100、102、104、106、108、110、112、114、116、118、120、122、124、126、128、130、132、134、135、136、138、140、142、144、146、148、150、152、154、156、158、160、162、163、164、166、168、170、172和174號之任一個中陳述之DNA序列，或其物種同系物編碼的毒力基因產物表現的能力，來篩選可能的製劑，或針對干擾全部或部份由在序列識別：1、3、7、9、11、13、15、17、19、21、23、25、29、31、33、37、39、41、51、53、55、57、58、60、68、70、72、74、76、78、80、82、84、100、102、104、106、108、110、112、114、116、118、120、122、124、126、128、130、132、134、135、136、138、140、142、144、146、148、150、152、154、156、158、160、162、163、164、166、168、170、172和174號之任一個中陳述之DNA序列，其物種同系物，或其互補股編碼的細菌基因產物之生物功能的能力，來篩選可能的製劑，接

五、發明說明 (13)

著確認在這類篩選測定中提供正面結果的製劑。特定而言，干擾毒力基因產物表現的製劑包括反-義多核苷酸，以及與該毒力基因序列互補的核酶(ribozyme)。本發明更包括經由使用寡核苷酸-指揮之三股螺旋形成，調節本發明之基因產物轉錄的方法。

干擾毒力基因產物之功能的製劑，包括毒力基因產物的變體、毒力基因產物的結合夥伴，以及這類結合夥伴的變體，和酵素抑制劑(其中產物為酵素)。

提供藉著在本文中描述之方法確認出的新穎抗-細菌劑，以及治療罹患革蘭氏陰性細菌感染之個體的方法，其涉及以有效降低細菌存在之含量，投與這類新穎的抗-細菌劑。

在考量下列的發明詳細說明時，對熟諳此藝者而言，本發明許多額外的觀點和益處將變得更明顯，它將描述其製備之具體實施例。

發明詳細說明

在本文中使用的"毒力基因"，為其功能或產物，對於成功地在宿主動物中建立及/或維持細菌感染而言是必要的基因。因此，毒力基因及/或藉此編碼之蛋白質，涉及宿主生物的發病原理，但對生長可能不是必要的。

在本文中使用的"附加簽名的突變生成作用(STM)"，是在國際專利出版物第WO 96/17951號中普遍描述的方法，以引用的方式併入本文中，並包括，例如在菌血症之老鼠模式中確認毒力必要之細菌基因的方法。在該方法中，使

五、發明說明 (14)

用轉因子整合，產製在基因組中分別具有隨機突變的細菌品系；每個插入突變帶有不同的DNA簽名標籤，其容許彼此區別突變種。標籤包括40個鹼基對的可變中心區，位在20個鹼基對之不變"臂"的側面，其容許藉著聚合酶連鎖反應(PCR)共同-擴大中心部份。在微量滴定盤上裝配附加標籤的突變種品系，然後混合形成"接種物集合"，以供感染研究使用。在接種之後的適當時間，從動物中分離細菌，並集合形成"回收集合"。分別擴大、標示在回收集合中的標籤和在接種物集合中的標籤，然後用來探測濾紙，其已帶有在接種物中代表突變種之所有不同標籤排成的陣列。具有減弱毒力的突變種品系，是不能從被感染動物中回收的那些，也就是說，帶有當以得自接種物集合之標籤探測時，提供雜交信號，但當以得自回收集合之標籤探測時，不提供信號之標籤的品系。在該方法的變化中，可使用非-放射性的檢測方法，像是化學發光。

附加簽名之突變生成作用容許在單一的動物中，就毒力的喪失，同時篩選大量的插入突變種品系。篩選突變種敗血性巴斯德桿菌品系的19個集合，結果確認出60個以上降低毒力的品系，藉著後續決定個別突變種的約略LD₅₀，證實其中許多在毒力上是減弱的。篩選胸膜肺炎放線桿菌突變種，結果確認出超過100個品系，其在35個不同的基因中有突變作用。在這些之中，在22個基因中的突變作用，產生明顯減毒的胸膜肺炎放線桿菌品系。藉著定序兩股，並推衍編碼的胺基酸序列，判定藉著轉因插入而瓦解了開

五、發明說明 (15)

放編閱架構的核苷酸序列。藉著將該序列與DNA和蛋白質資料庫序列相比較，定出新奇的多核苷酸和胺基酸序列兩者。在這些物種中毒力基因的知識，容許確認在溶血性巴斯德桿菌中的物種同系物。

細菌，更特定而言是敗血性巴斯德桿菌、胸膜肺炎放線桿菌和溶血性巴斯德桿菌之毒力基因的確認，提供了顯示出降低毒力的微生物(也就是減毒品系)，其在疫苗中是有用的。這類微生物包括含有至少一個功能突變，使由序列識別：1、3、7、9、11、13、15、17、19、21、23、25、29、31、33、37、39、41、51、53、55、57、58、60、68、70、72、74、76、78、80、82、84、100、102、104、106、108、110、112、114、116、118、120、122、124、126、128、130、132、134、135、136、138、140、142、144、146、148、150、152、154、156、158、160、162、163、164、166、168、170、172和174號中任一個代表之基因失活的巴斯德桿菌科突變種。熟諳此藝者將瞭解"功能突變"可發生在本發明之基因的蛋白質編碼區，以及在調節毒力基因RNA轉錄的調節區中。

熟諳此藝者亦知曉本發明之減毒的敗血性巴斯德桿菌、胸膜肺炎放線桿菌和溶血性巴斯德桿菌品系，包括帶有一個以上功能突變的那些。一個以上的突變可能導致加成或協同的減毒程度。可藉著設計來製備多個突變，或可偶然地起因於最初企圖導入單一突變的刪除事件。帶有多個刪除之減毒品系的實例為鼠傷寒沙門氏桿菌(*Salmonella*

五、發明說明 (16)

typhimurium)品系，其中在功能上刪除了cya和crp基因。該突變種鼠傷寒沙門氏桿菌已經顯示可望作為活疫苗。

在敗血性巴斯德桿菌、胸膜肺炎放線桿菌和溶血性巴斯德桿菌中確認毒力基因，可提供在其他病原性物種中關於類似基因的資訊。舉例來說，aroA基因的確認，引導在多種數目的病原中，包括親水性產氣單孢菌(*Aeromonas hydrophila*)、殺鮭產氣單孢菌(*Aeromonas salmonicida*)、鼠傷寒沙門氏桿菌、腸炎沙門氏桿菌(*Salmonella enteritidis*)、都伯林沙門氏桿菌(*Salmonella dublin*)、雞沙門氏桿菌(*Salmonella gallanarum*)、百日咳球桿菌(*Bordella pertussis*)、小腸結腸型耶爾森氏菌(*Yersinia enterocolitica*)、淋病雙球菌(*Neisseria gonorrhoeae*)和炭疽芽孢桿菌(*Bacillus anthracis*)，確認被保留的基因。在許多的這些物種中，已經證實在aroA基因中帶有突變的減毒細菌品系，在疫苗調配上是有效的。使用在敗血性巴斯德桿菌中確認的毒力基因序列，可在其他生物中確認類似或同系的基因，特別是在巴斯德桿菌科中，以及胸膜肺炎放線桿菌、溶血性巴斯德桿菌和睡眠嗜血桿菌。同樣地，胸膜肺炎放線桿菌毒力基因的確認，可容許在其他生物中之相關基因的確認。使用敗血性巴斯德桿菌、胸膜肺炎放線桿菌和溶血性巴斯德桿菌基因作為探針的南方雜交作用，可在衍生自其他生物的染色體庫中，確認這些相關的基因。或者，在跨越物種界限的基因確認中，PCR可能是同樣有效的。作為另一種選擇，亦可使用例如敗血性巴斯德桿菌

五、發明說明 (17)

突變種與得自其他物種之染色體庫的互補作用，來確認具有類似或相關毒力活性的基因。因此，相關毒力基因的確認可引導其他生物之減毒品系的產製，其在作為其他疫苗調配物上可能是有用的。已經證實存在於其他物種(例如溶血性巴斯德桿菌、胸膜肺炎放線桿菌和睡眠嗜血桿菌)中之敗血性巴斯德桿菌基因的實例，包括基因 *exbB*、*atpG*、*pnp*、*guaB*和 *yjgF*。

使用STM確認的減毒敗血性巴斯德桿菌品系是插入突變種，其中已經經由將轉因子序列插入開放編碼架構或調節DNA序列中，而使毒力基因成為無功能的。這些插入突變物仍含有所有細菌毒力所需的遺傳資訊，並有可能藉著刪除被插入的轉因子而恢復為病原狀態。因此，在製備疫苗調配物時，希望取得蒐集自減毒品系的資訊，並創造出其中移除一些、大部份或全部毒力基因序列的刪除突變種品系，藉此排除細菌將恢復成毒力狀態的可能性。

預期使用STM確認之減毒插入突變種的疫苗特性，是與攜帶相同基因刪除之細菌的那些相同或類似的。然而，插入突變種有可能對鄰接的基因序列，發揮"極性"的影響，而結果使插入突變種可能具有與刪除相同基因序列之突變品系不同的特徵。可使用任何在此項技藝中已熟知和慣用的許多技術，來建構刪除突變種。

在一個實例中，可使用利用逆可選擇標記的策略，已經普遍地在許多細菌中使用該策略來刪除基因。關於回顧，參見例如 Rey rat 等人，*Infection and Immunity* 66:4011-4017

五、發明說明 (18)

(1998)，以引用的方式併入本文中。在該技術中，經常使用雙重選擇策略，其中利用衍生自想要之刪除兩側的側面DNA序列，建構編碼可選擇和逆可選擇標記兩者的質體。使用可選擇標記，選擇其中以適當的位置和方式，已經將該質體整合到基因組內的適當細菌。使用逆可選擇標記，選擇極少百分比之自發地排除被整合之質體的細菌。這些細菌的溶離份將僅含有想要的刪除，而無其他的外來DNA存在。使用該技術的關鍵，是適當之逆可選擇標記的便利性。

在其他的技術中，對於DNA之指定位置重組作用使用cre-lox系統。該系統由34個鹼基對的lox序列所組成，其可被細菌cre重組酶基因認出。如果lox位置以適當的方位出現在DNA中，則位在lox位置側面的序列將會被cre重組酶切除，結果刪除了所有的序列，除了一個lox序列的剩餘副本。使用標準重組技術，有可能在敗血性巴斯德桿菌、胸膜肺炎放線桿菌或溶血性巴斯德桿菌基因組中刪除感興趣的標靶基因，並以位在lox位置側面的可選擇標記(例如編碼康徵素抗藥性的基因)置換之。cre重組酶的暫時性表現(藉著在敗血性巴斯德桿菌、胸膜肺炎放線桿菌或溶血性巴斯德桿菌中有功能之啟動基因的控制之下，含有cre基因之自殺質體的電穿透作用)，應導致lox側面標記的有效排除。該過程將產生含有想要之刪除突變，和一個lox序列副本的突變種。

在另外的方法中，有可能以標記基因，像是綠螢光蛋白

五、發明說明 (19)

質(GFP)、 β -半乳糖苷酶或蟲螢光素酶，直接置換在敗血性巴斯德桿菌、胸膜肺炎放線桿菌或溶血性巴斯德桿菌基因組中想要刪除的序列。在該技術中，藉著PCR製備位在想要刪除側面的DNA斷片，並選殖到敗血性巴斯德桿菌、胸膜肺炎放線桿菌或溶血性巴斯德桿菌的自殺(非-複製)載體內。在側面序列之間選殖表現卡匣，其含有在敗血性巴斯德桿菌、胸膜肺炎放線桿菌或溶血性巴斯德桿菌中有作用的啟動基因，以及適當的標記基因。將該質體導入野外型敗血性巴斯德桿菌、胸膜肺炎放線桿菌或溶血性巴斯德桿菌內。分離併入並表現該標記基因(或許以極低之頻率)的細菌，並檢查適當的重組事件(也就是以該標記基因置換野外型基因)。

可藉著將其投與易感受的動物，來證實這些生物降低的毒力，及其免疫原性。雖然有可能單獨投與本發明之無毒力的微生物，但最好是以含有適當佐劑(們)和在藥學上可接受之稀釋劑(們)或載劑(們)的疫苗組合物之形式，投與一或多個這類突變種微生物。就與本發明之無毒力微生物可相容的意義而言，載劑(們)必須是"可接受的"，且對待免疫個體而言是無害的。載劑通常是水或生理鹽水，其將是無菌和無熱原的。待免疫個體是需要保護，使其免於由敗血性巴斯德桿菌、胸膜肺炎放線桿菌、溶血性巴斯德桿菌或其他病原性微生物之毒力形式引起之疾病的個體。

應瞭解本發明之疫苗可用於人類醫學和獸醫醫學的範疇中。因此，待免疫之個體可以是人類或其他動物，例如農

五、發明說明(20)

場動物，包括牛、綿羊、豬、馬、山羊和禽類(例如雞、火雞、鴨和鵝)，同伴動物，像是狗和貓；外來及/或動物園的動物；以及實驗動物，包括老鼠、大鼠、兔子、天竺鼠和倉鼠。

本發明亦提供敗血性巴斯德桿菌、胸膜肺炎放線桿菌或溶血性巴斯德桿菌毒力所需之多肽和相對應的多核苷酸。本發明包括天然存在和非-天然存在的多核苷酸及其多肽產物兩者。天然存在的毒力產物，包括各種基因和多肽物種，以及在敗血性巴斯德桿菌、胸膜肺炎放線桿菌或溶血性巴斯德桿菌以外之生物中表現的相對應之物種同系物。非-天然存在的毒力產物，包括天然存在之產物的變體，像是類似物，以及包括共價修改的毒力產物。在較佳的具體實施例中，本發明提供包括在序列識別：1、3、7、9、11、13、15、17、19、21、23、25、29、31、33、37、39、41、51、53、55、57、58、60、68、70、72、74、76、78、80、82、84、100、102、104、106、108、110、112、114、116、118、120、122、124、126、128、130、132、134、135、136、138、140、142、144、146、148、150、152、154、156、158、160、162、163、164、166、168、170、172和174號中陳述之序列的毒力多核苷酸，及其物種同系物，以及具有由該多核苷酸編碼之胺基酸序列的多肽。

本發明提供編碼細菌毒力基因產物之新穎的經過分離和純化的敗血性巴斯德桿菌、胸膜肺炎放線桿菌和溶血性

五、發明說明 (21)

巴斯德桿菌多核苷酸(例如DNA序列和RNA轉錄本，兩者的有意義和互補反義股)。本發明之DNA序列包括基因組和cDNA序列，以及全然或部份以化學方式合成的DNA序列。本發明之基因組DNA，包括本發明之多肽的蛋白質編碼區，並包括可在相同物種之其他細菌品系中找到的變體。在本文中使用的並在此項技藝中已瞭解的"合成"，意指與酵素方法相對，純粹在化學上產製多核苷酸的方法。因此，"全然"合成的DNA序列是全部藉著化學方式產製的，而"部份"合成的DNAs則包括其中所得的DNA中只有部份是由化學方式產製的那些。編碼敗血性巴斯德桿菌毒力基因產物的較佳DNA序列，是在序列識別：1、3、7、9、11、13、15、17、19、21、23、25、29、31、33、37、39、41、51、53、55、57、58、60、68、70、72、74、76、78、80、82、84、100、102、104、106、108、110、112、114、116、118和120號中陳述的，及其物種同系物。編碼毒力基因產物之較佳的胸膜肺炎放線桿菌DNA序列，是在序列識別：122、124、126、128、130、132、134、135、136、138、140、142、144、146、148、150、152、154、156、158、160、162、163和164號中陳述的，及其物種同系物。較佳的溶血性巴斯德桿菌毒力基因產物，是在序列識別號：166、168、170、172和174號中陳述的，及其物種同系物。熟諳此藝者將迅速地瞭解本發明的較佳DNA，包括雙股的分子，例如具有在序列識別：1、3、7、9、11、13、15、17、19、21、23、25、29、31、33、37、

五、發明說明 (22)

39、41、51、53、55、57、58、60、68、70、72、74、76、78、80、82、84、100、102、104、106、108、110、112、114、116、118、120、122、124、126、128、130、132、134、135、136、138、140、142、144、146、148、150、152、154、156、158、160、162、163、164、166、168、170、172和174號中陳述之序列，及其物種同系物的分子，根據DNA的Watson-Crick鹼基配對規則，連同具有可從序列識別：1、3、7、9、11、13、15、17、19、21、23、25、29、31、33、37、39、41、51、53、55、57、58、60、68、70、72、74、76、78、80、82、84、100、102、104、106、108、110、112、114、116、118、120、122、124、126、128、130、132、134、135、136、138、140、142、144、146、148、150、152、154、156、158、160、162、163、164、166、168、170、172和174號之序列推衍之序列的互補分子("非-編碼股"或"互補物")。較佳的還有編碼由序列識別：1、3、7、9、11、13、15、17、19、21、23、25、29、31、33、37、39、41、51、53、55、57、58、60、68、70、72、74、76、78、80、82、84、100、102、104、106、108、110、112、114、116、118、120、122、124、126、128、130、132、134、135、136、138、140、142、144、146、148、150、152、154、156、158、160、162、163、164、166、168、170、172和174號中陳述之任一個多核苷酸，及其物種同系物編碼之基因產物的多核苷酸。本發明尚包括敗血性巴斯德桿菌、

五、發明說明 (23)

胸膜肺炎放線桿菌和溶血性巴斯德桿菌DNA的物種(最好是細菌)同系物。

由本發明提供之多核苷酸序列資訊，使得有可能藉著已熟知的技術，包括南方及/或北方雜交作用，和聚合酶連鎖反應(PCR)，確認和分離編碼相關細菌毒力分子的多核苷酸。相關之多核苷酸的實例，包括編碼與由序列識別：1、3、7、9、11、13、15、17、19、21、23、25、29、31、33、37、39、41、51、53、55、57、58、60、68、70、72、74、76、78、80、82、84、100、102、104、106、108、110、112、114、116、118、120、122、124、126、128、130、132、134、135、136、138、140、142、144、146、148、150、152、154、156、158、160、162、163、164、166、168、170、172和174號中陳述之任一個多核苷酸，及其物種同系物編碼之毒力基因產物同種之多肽，以及共享本發明之毒力基因產物之一或多個生物及/或物理特性，在結構上相關之多肽的多核苷酸。

本發明亦包括編碼細菌基因產物之DNA序列，其在中等或高度嚴格的條件下，與在序列識別：1、3、7、9、11、13、15、17、19、21、23、25、29、31、33、37、39、41、51、53、55、57、58、60、68、70、72、74、76、78、80、82、84、100、102、104、106、108、110、112、114、116、118、和120、122、124、126、128、130、132、134、135、136、138、140、142、144、146、148、150、152、154、156、158、160、162、163、164、166、

五、發明說明 (24)

168、170、172和174號中陳述之任一個多核苷酸，及其物種同系物的非-編碼股或互補物雜交。其將與編碼毒力多肽的DNA序列雜交，但本發明企圖包括遺傳密碼的簡併。代表性的高度嚴格條件，包括在65℃至75℃下，以包括0.2X SSC/0.1% SDS之緩衝溶液的最後沖洗，而代表性的中等嚴格條件，包括在35℃至45℃下，以包括2X SSC/0.1% SDS之緩衝溶液的最後沖洗。應瞭解在此項技藝中，可按照在Ausubel等人(編輯)，Protocols in Molecular Biology, John Wiley & Sons (1994) 第6.0.3至6.4.10頁中的描述，經由改變溫度和緩衝溶液，或鹽濃度，達到相等嚴格度的條件。可憑經驗決定，或以探針之鳥嘌呤/胞嘧啶(GC)鹼基配對的長度和百分比為基礎，精確地計算在雜交條件中的修改。可按照在Sambrook等人(編輯)，Molecular Cloning: A Laboratory Manual, Cold Spring Harbor Laboratory Press: Cold Spring Harbor, New York (1989), 第9.47至9.51頁中的描述，計算雜交條件。

亦提供併入毒力基因序列的自動複製之重組表現構築體，像是質體和病毒DNA載體。亦提供表現構築體，其中編碼毒力多肽的多核苷酸，以可操作之方式與內源或外源的表現控制DNA序列和轉錄終止序列連接。可藉著PCR選殖毒力基因，使用敗血性巴斯德桿菌基因組DNA作為模板。為了易於將基因插入表現載體內，選擇PCR引子，使得PCR-擴大之基因，在5'端在開始密碼子ATG之前，具有限制酵素位置，並在3'端在終止密碼子TAG、TGA或TAA

五、發明說明 (25)

之後，具有限制酵素位置。若需要，可根據 Grosjean 和 Fiers, Gene, 18:199-209 (1982)，以及 Konigsberg 和 Godson, Proc. Natl. Acad. Sci.(USA), 80:687-691(1983)描述的大腸桿菌密碼子優先權，改變基因中的密碼子，但不改變胺基酸。使用密碼子的最優化作用，可導致在大腸桿菌中產製時，增加基因產物的表現。如果以細胞外的方式產製基因產物，在大腸桿菌或其他細菌的細胞質中，或進入細胞培養基中，則選殖該基因，不需其開始密碼子，並放在表現載體內信號序列之後。

根據本發明的另一項觀點，提供宿主細胞，包括使用本發明之多核苷酸序列，以容許本發明之毒力多肽表現的方式，穩定或暫時地轉化、轉移感染或電穿透的原核生物和真核生物細胞。本發明之表現系統包括細菌、酵母菌、真菌、病毒、無脊椎動物和哺乳動物細胞系統。本發明之宿主細胞是用來發展專一地與毒力基因產物產生免疫反應之抗體的有價值之免疫原來源。本發明之宿主細胞顯然可用在大規模產製毒力多肽的方法中，其中使細胞生長在適當的培養基中，並從該細胞或從細胞生長於其中的培養基中，藉著例如免疫親和力純化作用，或任何此項技藝中已熟知並慣用的眾多純化技術，分離想要的多肽產物。可使用任何適當的宿主細胞，像是大腸桿菌，其他的細菌，包括敗血性巴斯德桿菌、桿菌屬(Bacillus)和金黃色葡萄球菌(S. aureus)，酵母菌，包括巴斯德畢赤酵母菌(Pichia pastoris)和酒酵母菌(Saccharomyces cerevisiae)，昆蟲細

五、發明說明 (26)

胞，或哺乳動物細胞，包括CHO細胞，利用此項技藝中已知的適當載體，來表現基因產物。可直接產製蛋白質，或與肽或多肽融合，以細胞內或細胞外之方式產製，藉著分泌至細菌細胞的近膜間隙內，或進入細胞培養基中。蛋白質的分泌需要信號肽(亦稱為前-序列)；已知許多得自原核生物和真核生物的信號序列，對於重組蛋白質之分泌是有功能的。在蛋白質分泌製程期間，藉著信號肽酶移除信號肽，產生成熟的蛋白質。

欲簡化蛋白質純化製程，可在基因密碼序列的5'或3'端附加純化標籤。常用的純化標籤包括一片6個組胺酸殘基(美國專利第5,284,933號和5,310,663號)、由Schmidt和Skerra, Protein Engineering, 6:109-122(1993)描述的鏈黴菌抗生物素蛋白-親和力標籤、FLAG肽[Hopp等人, Biotechnology, 6:1205-1210 (1988)]、穀胱甘肽S-轉移酶[Smith和Johnson, Gene, 67:31-40 (1988)]，以及硫氧化還原蛋白[LaVallie等人, Bio/Technology, 11:187-193 (1993)]。欲移除這些肽或多肽，可在融合接合處插入蛋白水解切開認知位置。常用的蛋白酶為因子Xa、凝血酶和腸激酶。

本發明亦提供由本發明之多核苷酸編碼的經過純化和分離之敗血性巴斯德桿菌、胸膜肺炎放線桿菌和溶血性巴斯德桿菌毒力多肽。目前較佳的是包括由在序列識別：1、3、7、9、11、13、15、17、19、21、23、25、29、31、33、37、39、41、51、53、55、57、58、60、68、70、

五、發明說明 (27)

72、74、76、78、80、82、84、100、102、104、106、108、110、112、114、116、118、120、122、124、126、128、130、132、134、135、136、138、140、142、144、146、148、150、152、154、156、158、160、164、166、168、170、172和174號中陳述之任一個多核苷酸，及其物種同系物編碼之胺基酸序列的多肽。本發明包括由選自包括下列之DNA編碼的毒力多肽：a)在序列識別：1、3、7、9、11、13、15、17、19、21、23、25、29、31、33、37、39、41、51、53、55、57、58、60、68、70、72、74、76、78、80、82、84、100、102、104、106、108、110、112、114、116、118、120、122、124、126、128、130、132、134、135、136、138、140、142、144、146、148、150、152、154、156、158、160、164、166、168、170、172和174號之任一個中陳述的DNA序列，及其物種同系物；b)編碼由序列識別：1、3、7、9、11、13、15、17、19、21、23、25、29、31、33、37、39、41、51、53、55、57、58、60、68、70、72、74、76、78、80、82、84、100、102、104、106、108、110、112、114、116、118、120、122、124、126、128、130、132、134、135、136、138、140、142、144、146、148、150、152、154、156、158、160、164、166、168、170、172和174號中任一個，及其物種同系物編碼之敗血性巴斯德桿菌、胸膜肺炎放線桿菌或溶血性巴斯德桿菌多肽的DNA分子；以及c)編碼毒力基因產物之DNA分子，其在中等嚴格的條件

五、發明說明 (28)

下與(a)或(b)之DNA雜交。

本發明亦包括與本發明之較佳多肽，具有至少大約99%、至少大約95、至少大約90%、至少大約85%、至少大約80%、至少大約75%、至少大約70%、至少大約65%、至少大約60%、至少大約55%和至少大約50%同一性及/或同種性的多肽。關於本發明之較佳多肽，在本文中將胺基酸序列"同一性"百分比定義為在將兩個序列排成一直線並導入間隙(若需要)，以便達到最大序列同一性百分比之後，在候選序列中，與在毒力基因產物序列中之殘基相同的胺基酸殘基的百分比，但不將任何保留性置換視為序列同一性的一部份。關於本發明之較佳多肽，在本文中將序列"同種性"百分比定義為在將序列們排成一直線並導入間隙(若需要)，以便達到最大序列同一性百分比之後，在候選序列中，與在毒力多肽序列中之殘基相同的胺基酸殘基的百分比，且亦將任何保留性置換視為序列同一性的一部份。可按照在表A和B中的陳述，定義保留性置換。

表 A

保留性置換 I

<u>側鏈特徵</u>		<u>胺基酸</u>
脂肪族	無-極性	GAP ILV
	極性-不帶電	CSTM NQ
	極性-帶電荷	DE KR

五、發明說明 (29)

芳香族
其他

HFWY
NQDE

可從天然的細菌細胞來源中分離本發明之多肽，或可以化學方式合成，但較佳的是藉著涉及本發明之宿主細胞的重組程序產製。本發明之毒力基因產物可以是全長的多肽、具有生物活性的片段，或其保留特有之生物或免疫學活性的變體。變體可包括毒力多肽類似物，其中刪除或取代一或多個指定之(也就是天然編碼的)胺基酸，或其中加入一或多個非-指定的胺基酸：(1)不喪失一或多個該毒力基因產物特有的生物活性或免疫學特徵；或(2)使該毒力基因產物特殊的生物活性失去能力。刪除變體亦企圖包括缺乏對生物活性並非必要之部份多肽的片段，而插入變體包括融合多肽，其中野外型多肽或其片段已經與其他多肽融合。

變體毒力多肽包括其中已經藉著修改編碼本發明之多肽的多核苷酸，而導入保留性置換的那些。在此項技藝中承認的保留性置換，根據其相關的物理特性將胺基酸分類，並可按照在表A(得自WO 97/09433，第10頁，1997年3月13日公告(PCT/GB96/02197，9/6/96建檔))中的陳述定義。或者，可按照在Lehninger, [Biochemistry，第2版；Worth Publishers, Inc. NY:NY (1975)，第71-77頁]中的定義將保留性胺基酸分組，如同在表B中的陳述。

五、發明說明 (30)

表 B
保留性置換 II

<u>側鏈特徵</u>	<u>胺基酸</u>
無-極性(忌水性的)	
A.脂肪族的：	ALIVP
B.芳香族的：	FW
C.含硫的：	M
D.介於兩者間難以確定的：	G
不帶電-極性的	
A.羥基：	STY
B.醯胺：	NQ
C.硫氫基：	C
D.介於兩者間難以確定的：	G
帶正電(鹼性的)：	KRH
帶負電(酸性的)：	DE

本發明之變體毒力產物包括成熟的毒力基因產物，也就是其中移除前導或信號序列，具有額外的胺基終端殘基。期待在-1位置處具有額外之甲硫胺酸殘基的毒力基因產物，還有在位置-2和-1處具有額外之甲硫胺酸和離胺酸的毒力產物。這些類型的變體，對於在細菌細胞類型中的重組蛋白質產製是特別有用的。本發明之變體亦包括其中已經導入衍生自其他蛋白質之胺基終端序列的基因產物，以及包括未曾在天然存在之蛋白質中發現的胺基終端序列的變體。

裝
訂
線

五、發明說明 (31)

本發明亦包括具有起因於使用獨特表現系統之額外胺基酸殘基的變體多肽。例如，使用市售的載體，其以帶有穀胱甘肽-S-轉移酶(GST)之融合蛋白質的形式表現想要的多肽，在從想要的多肽中切開GST組份之後，提供了在位置-1處具有額外之甘胺酸殘基的想要多肽。亦期待使用其他載體系統表現而產生的變體。

本發明亦包括抗體(例如單株和多株抗體、單鏈抗體、嵌合型抗體、人類化、人類的和CDR-移植的抗體，包括含有專一地認得本發明之多肽的CDR序列的化合物)，以及對毒力基因產物或其片段專一的其他結合蛋白質。"專一的"一詞，表示本發明之抗體的可變區獨佔地認得並與毒力多肽結合(也就是能夠區別單一毒力多肽與相關的毒力多肽，不管在多肽家族中發現的序列同一性、同種性或類似性)，但亦可經由與抗體可變區之外側序列的交互作用，特別是在該分子之恆定區中，與其他蛋白質產生交互作用(例如在ELISA技術中，金黃色葡萄球菌蛋白質A或其他抗體)。決定本發明抗體之結合專一性的篩選測定，是此項技藝中已熟知並慣用的。關於這類測定的總括性討論，參見 Harlow 等人(編輯)，Antibodies A Laboratory Manual; Cold Spring Harbor Laboratory; Cold Spring Harbor, NY (1988)，第6章。亦期待認得並與本發明之毒力多肽片段結合的抗體，其限制條件為該抗體，如同上文定義，是第一優先對從其中衍生該片段的本發明之毒力多肽專一的。

五、發明說明 (32)

由本發明提供之DNA和胺基酸序列資訊，亦使得有可能有系統地分析毒力基因及其編碼之基因產物的結構和功能。關於編碼本發明之毒力基因產物的多核苷酸之知識，亦可能獲得反-義多核苷酸，其認得並與編碼本發明之毒力多肽的多核苷酸雜交。提供全長和片段的反-義多核苷酸。熟諳此藝者將知曉本發明之片段的反-義分子包括(i)專一地認出並與特異RNA雜交的那些(藉著比較編碼本發明之毒力多肽的DNA與編碼其他已知分子之DNA的序列來決定)，以及(ii)認出並與編碼毒力蛋白質家族之變體的RNA雜交的那些。與編碼蛋白質毒力家族之其他成員的RNA雜交的反義多核苷酸，亦可經由序列比較來確認，確認分子家族序列的特徵或簽名。

本發明更期待經由核酶的使用，調節基因表現的方法。關於回顧，參見Gibson和Shillitoe, Mol. Biotech. 7: 125-137 (1997)。可使用核酶技術，以序列專一之方式，經由(i)互補RNA與標靶mRNA的雜交作用，以及(ii)經由互補股固有的核酸酶(nuclease)活性，切開已雜交的mRNA，抑制mRNA的轉譯。可藉著經驗法則確認核酶，但更佳的是以在標靶mRNA上的可進入位置為基礎而特別設計的[Bramlage等人, Trends in Biotech 16: 434-438 (1998)]。可使用此項技藝中已熟知並慣用的外源或內源之遞送技術，完成將核酶遞送至標靶細胞。外源的遞送方法可包括使用瞄準微脂粒，或直接局部注射。內源的方法包括使用病毒載體和非-病毒質體。

五、發明說明 (33)

當將核酶設計成與編碼毒力基因產物之多核苷酸的特有區域互補時，其可專一地調節毒力基因的表現。因此，"專一地調節"企圖意指本發明之核酶僅認得單一的多核苷酸。同樣地，亦可將核酶設計成調節所有或一些蛋白質家族的表現。設計該類型的核酶，使其認得在所有或一些編碼蛋白質家族的多核苷酸中，受到保護的多核苷酸序列。

本發明尚包括經由使用寡核苷酸-指揮之三股螺旋形成作用，調節本發明之毒力基因轉錄的方法。關於回顧，參見Lavrovsky等人，Biochem. Mol. Med. 62: 11-22 (1997)。使用序列專一的寡核苷酸，按照在Watson-Crick模式中的定義，其主凹溝(major groove)中與雙股DNA雜交，完成三股螺旋形成作用。序列專一之寡核苷酸的雜交作用，隨後調節DNA-結合蛋白質(包括例如轉錄因子和聚合酶)的活性。對雜交作用而言，較佳的標靶序列包括轉錄調節區，其調節毒力基因產物的表現。能夠形成三股螺旋的寡核苷酸，亦可用於標靶DNA序列的特定位置之共價修改作用。將可用於共價修改作用的寡核苷酸與各種傷害DNA之製劑偶聯，如同在Lavrovsky等人[在前]中的描述。

敗血性巴斯德桿菌、胸膜肺炎放線桿菌和溶血性巴斯德桿菌毒力基因的確認，使得該基因和基因產物可用在確認抗-細菌劑的方法中。這類方法包括測定可能之製劑，其干擾以在序列識別：1、3、7、9、11、13、15、17、19、21、23、25、29、31、33、37、39、41、51、53、55、57、58、60、68、70、72、74、76、78、80、82、84、

五、發明說明 (34)

100、102、104、106、108、110、112、114、116、118、120、122、124、126、128、130、132、134、135、136、138、140、142、144、146、148、150、152、154、156、158、160、162、163、164、166、168、170、172和174號任一個中陳述之DNA序列，及其物種同系物物(也就是以序列識別：1、3、7、9、11、13、15、17、19、21、23、25、29、31、33、37、39、41、51、53、55、57、58、60、68、70、72、74、76、78、80、82、84、100、102、104、106、108、110、112、114、116、118、120、122、124、126、128、130、132、134、135、136、138、140、142、144、146、148、150、152、154、156、158、160、162、163、164、166、168、170、172和174號之DNA序列代表的基因，其編碼毒力基因產物，或是與序列識別：1、3、7、9、11、13、15、17、19、21、23、25、29、31、33、37、39、41、51、53、55、57、58、60、68、70、72、74、76、78、80、82、84、100、102、104、106、108、110、112、114、116、118、120、122、124、126、128、130、132、134、135、136、138、140、142、144、146、148、150、152、154、156、158、160、162、163、164、166、168、170、172和174號之DNA序列相鄰，該基因編碼毒力基因產物，或涉及毒力基因產物表現的調節)代表之毒力基因產表現的能力，或測定可能之製劑，其干擾全部或部份由在序列識別：1、3、7、9、11、13、15、17、19、21、23、25、29、31、33、37、39、41、

五、發明說明 (35)

51、53、55、57、58、60、68、70、72、74、76、78、80、82、84、100、102、104、106、108、110、112、114、116、118、120、122、124、126、128、130、132、134、135、136、138、140、142、144、146、148、150、152、154、156、158、160、162、163、164、166、168、170、172和174號任一個中陳述之DNA序列，其物種同系物或其互補股編碼之細菌基因產物之功能的能力，接著確認在這類測定中肯定的製劑。在這些測定中有用的多核苷酸和多肽，不僅包括如同本文中揭示之基因和編碼的多肽，還包括其實質上具有與野外型基因和多肽相同活性的變體。

由上述方法產製的毒力基因產物，可用於高輸貫量測定中，篩選抑制劑。待篩選之可能製劑的來源為化學化合物庫、鏈黴菌、其他細菌和真菌的發酵培養基，以及植物和其他草木的細胞萃取物。至於帶有已知之酵素活性的蛋白質，以該活性為基礎建立測定，並就抑制該活性的能力來篩選大量可能的製劑。至於與其他蛋白質或核酸產生交互作用的蛋白質，建立結合測定，直接測量這類交互作用，並就抑制結合交互作用的能力，篩選可能的製劑。

企圖根據本發明的該項觀點，使用此項技藝中已知的不同測定。當已知或藉著對已知基因產物之序列類似性而預測毒力基因產物的功能時，可在關鍵為該基因產物之功能及/或特性的酵素或其他類型之生物學及/或生化測定中，篩選可能的抑制劑。當已知或藉著對已知基因產物之序列

五、發明說明 (36)

類似性而預測毒力基因產物與其他蛋白質或核酸產生交互作用時，可直接在結合測定中篩選該交互作用的抑制劑。本發明企圖倍增測定，以便篩選和確認與毒力基因產物結合的抑制劑。在一個實例中，固定毒力基因產物，並在假定之抑制劑化合物的存在和缺乏下，評估其與結合夥伴的交互作用。在另一個實例中，在假定之抑制劑化合物的存在和缺乏下，在溶液測定中評估在毒力基因產物與其結合夥伴之間的交互作用。在兩個測定中，降低在毒力基因產物與其結合夥伴之間的結合作用，便確認該化合物為抑制劑。在其中毒力基因產物結合夥伴為蛋白質的那些情況下，亦期待其他的測定。例如，期待二-離化物測定的變化，其中藉著按照在1995年8月3日公告之PCT出版物第WO 95/20652號中的描述，檢測在轉化或轉移感染之宿主細胞中的肯定信號，來確認蛋白質/蛋白質交互作用的抑制劑。

受到本發明期待的候選化合物，包括選自可能抑制劑庫的化合物。為了確認小分子抑揚調節劑，使用許多不同的庫，包括(1)化學庫、(2)天然產物庫和(3)包括隨機的肽、寡核苷酸或有機分子的綜合庫。化學庫由已知化合物的結構類似物，或經由天然產物篩選確認為"命中"或"指標"的化合物所組成。天然產物庫是微生物、動物、植物或海洋生物的集合，可用來創造混合物，以便經由：(1)得自土壤、植物或海洋微生物之肉湯的發酵和萃取作用，或(2)植物或海洋生物的萃取作用來篩選。天然產物庫包括聚乙

五、發明說明 (37)

烯及其衍生物、非-核糖體肽及其變體(非-天然存在的)。關於回顧，參見 Science 282:63-68 (1998)。綜合庫是由大量的肽、寡核苷酸或有機化合物構成的混合物。它們相對上較容易藉著傳統的自動合成方法、PCR、選殖或專利合成法來製備。特別感興趣的是肽和寡核苷酸綜合庫。其他亦感興趣的庫包括肽、蛋白質、肽模仿物、多平行合成的集合、重組和多肽庫。關於綜合化學和從其中產生之庫的回顧，參見 Myers, Curr. Opin. Biotechnol. 8:701-707 (1997)。經由使用在本文中描述的各種庫來確認抑揚調節劑，容許修改候選者"命中"(或"指標")，使對調節活性"命中"的能力發揮最大效用。

亦可設計其他受到本發明期待的候選抑制劑，並包括可溶形式的結合夥伴，以及嵌合或融合蛋白質形式的結合夥伴。在本文中使用的結合夥伴，廣泛地包括抗體、抗體片段和經過修改的化合物，其包括對已確認之毒力基因的表現產物，為免疫專一的抗體功能部位。

當毒力基因產物的結合夥伴(也就是配體)是未知的時，可使用其他測定，包括經由測量受試之結合夥伴與標靶蛋白質的直接結合，來確認標靶蛋白質之結合夥伴的測定，以及經由利用離子噴霧質譜分析/HPLC方法，或其他物理和分析方法的親和力超過濾作用，確認標靶蛋白質之結合夥伴的測定。或者，可使用在 Fields 和 Song, Nature, 340:245-246 (1989)，以及 Fields 和 Sternglanz, Trends in Genetics, 10:286-292 (1994)中描述的酵母菌兩個-雜化物系

五、發明說明 (38)

統，兩者均以引用的方式併入本文中，間接評估這類結合交互作用。兩個-雜化物系統是檢測在兩個蛋白質或多肽之間交互作用的遺傳測定。可用它來確認與已知的感興趣蛋白質結合的蛋白質，或描畫對該交互作用很重要的功能部位或殘基。已經發展出該方法學的變化，來選殖編碼DNA-結合蛋白質之基因，確認與蛋白質結合的肽，並篩選藥物。兩個-雜化物系統係利用一對交互作用蛋白質使轉錄激活功能部位與DNA-結合功能部位非常接近的能力，後者與報告者基因的上游激活序列(UAS)結合，且通常在酵母菌中進行。該測定需要建構兩個雜化物基因，其編碼(1)與第一個蛋白質融合的DNA-結合功能部位，和(2)與第二個蛋白質融合的激活功能部位。DNA-結合功能部位使第一個雜化物蛋白質瞄準報告者基因的UAS；然而，因為大多數的蛋白質缺少激活功能部位，該DNA-結合雜化物蛋白質不能激活報告者基因的轉錄。第二個雜化物蛋白質，其含有激活功能部位，自己不能激活報告者基因的表現，因為它不與UAS結合。然而，當兩個雜化物蛋白質均出現時，第一和第二個蛋白質的非共價交互作用，將激活功能部位拴在UAS上，激活了報告者基因的轉錄。當已知毒力基因產物(例如第一個蛋白質)會與其他蛋白質或核酸產生交互作用時，可使用該測定來檢測干擾該結合交互作用的製劑。將不同的受試製劑加至該系統中，監視報告者基因的表現；抑制劑的出現將導致報告者信號的缺乏。

當毒力基因產物的功能是未知的，且沒有已知與該基因

五、發明說明 (39)

產物結合的配體時，亦可使用酵母菌兩個-雜化物測定來確認與該基因產物結合的蛋白質。在確認與第一個蛋白質(標靶蛋白質)結合之蛋白質的測定中，產製大量的分別編碼不同的第二個蛋白質的雜化物基因，並在該測定中篩選。通常，由其中總cDNA或基因組DNA與激活功能部位連接的大量質體群編碼第二個蛋白質。該系統適用於各種蛋白質，且其甚至不需要知道第二個結合蛋白質的身份或功能。該系統是高度敏感的，並可檢測其他方法未透露的交互作用；即使是可誘發轉錄作用的暫時性交互作用，產生穩定的mRNA，其可重覆地轉譯，產生報告者蛋白質。

可使用其他測定，搜尋與標靶蛋白質結合的製劑。一種確認受試配體與標靶蛋白質之直接結合的這類篩選方法，描述在美國專利第5,585,277號中，以引用的方式併入本文中。該方法依賴蛋白質通常以折疊和未折疊狀態的混合物形式存在，並在兩種狀態之間不斷交替的原理。當受試配體與折疊形式的標靶蛋白質結合時(也就是當受試配體為標靶蛋白質之配體時)，與配體結合的標靶蛋白質分子維持其折疊狀態。因此，當出現與標靶蛋白質結合之受試配體時，折疊的標靶蛋白質以比在缺乏配體時更高的程度存在。可藉著任何能區別折疊和未折疊狀態之標靶蛋白質的方法，來判定配體與標靶蛋白質的結合。幾乎任何的製劑都可作為受試配體，藉著該方法來評估，包括但不限於金屬、多肽、蛋白質、脂質、多醣類、多核苷酸和小的有機分子。

五、發明說明 (40)

其他確認標靶蛋白質之配體的方法，描述在 Wieboldt 等人, Anal. Chem., 69:1683-1691 (1997) 中，以引用的方式併入本文中。該技術在溶液相中，就與標靶蛋白質的結合，一次篩選 20-30 個製劑的綜合庫。藉著離心超過濾作用，從其他的庫組份中分離出與標靶蛋白質結合的製劑。接著使保留在濾紙上的特別選出之分子，從標靶蛋白質中釋放，並藉著 HPLC 和氣動協助之電噴霧(離子噴霧)電離質譜分析分析之。該程序以對標靶蛋白質最高的親和力來選擇庫組份，並對小分子庫是特別有用的。

在敗血性巴斯德桿菌感染的活體內老鼠模式中，就其對毒力的影響，評估藉著最初篩選確認的抑制劑/結合劑。可利用菌血症、心內膜炎、敗血性關節炎、軟組織膿腫或肺炎的模式。涉及使用其他動物的模式，亦包括在本發明中。例如，可在投與各種含量的假定之抑制劑/結合劑化合物之前或之後，利用野外型敗血性巴斯德桿菌品系對兔子攻毒。對照組動物，僅投與生理鹽水代替假定之抑制劑/結合劑化合物，則提供標準，藉此可定出受試動物的惡化。其他的動物模式包括在 Animal and Plant Health Inspection Service, USDA, 1994 年 1 月 1 日編輯，§ § 113.69-113.70；Panciera 和 Corstvet, Am. J. Vet. Res. 45:2532-2537；Ames 等人, Can. J. Comp. Med. 49:395-400 (1984)；以及 Mukkur, Infection and Immunity 18:583-585 (1977) 中描述的那些。干擾細菌毒力的抑制劑/結合劑可防止感染的建立，或一旦已建立感染，可逆轉其結果。

五、發明說明 (41)

在疫苗組合物中，可使用任何此項技藝中已知的佐劑，包括以油為基礎的佐劑，像是福瑞德氏(Freund's)完全佐劑和福瑞德氏不完全佐劑，以黴菌酸鹽為基礎的佐劑(例如海藻糖二黴菌酸鹽)，細菌的脂多醣(LPS)，肽聚糖(peptidoglycans)(也就是胞壁質、黏肽或糖蛋白，像是N-歐巴卡(Opaca)、胞壁醯基二肽[MDP]或MDP類似物)，蛋白多糖(例如萃取自肺炎克雷伯氏桿菌(*Klebsiella pneumoniae*))，鏈球菌製品(例如OK432)，拜歐斯丁(Biostim)TM(例如01K2)，歐洲專利109 942號、歐洲專利180 564號和歐洲專利231 039號的"艾思康(Iscoms)"，氫氧化鋁，皂角苷，DEAE-葡聚糖，中性油(像是米格來醇(miglyol))，植物油(像是花生油)，微脂粒，普魯尼克(Pluronic)R多元醇，瑞比(Ribi)佐劑系統(參見，例如英國專利-A-2 189 141)，或介白素類，特別是刺激細胞調節之免疫的那些。另一種佐劑是由厄麥可雷塔菌(*Amycolata*) (一種放線菌目(*Actinomycetales*)中之細菌屬)的萃取物所組成，已經描述在美國專利第4,877,612號中。此外，可購買專利的佐劑混合物。所使用之佐劑，一部份將視接受者生物而定。投藥的佐劑含量，將視動物的類型和尺寸而定。可藉著例行的方法迅速地定出最適切之劑量。

疫苗組合物可視需要含有疫苗-可相容的在藥學上可接受之(也就是無菌和無-毒的)液態、半固態或固態稀釋劑，其作為藥學媒劑、賦形劑或介質。可使用此項技藝中已知的任何稀釋劑。代表性的稀釋劑，包括但不限於聚氧乙烯

五、發明說明 (42)

山梨糖醇單月桂酸酯、硬脂酸鎂、羥基苯甲酸甲酯或丙酯、滑石、藻酸鹽、澱粉、乳糖、蔗糖、右旋糖、山梨糖醇、甘露糖醇、阿拉伯樹膠、磷酸鈣、礦物油、可可脂和可可油。

亦可以便於遞送之形式包裝疫苗組合物。可將組合物封入膠囊、膠錠(caplet)、小藥囊、豆狀膠囊、明膠、紙或其他容器中。當進入接受生物內的免疫原組合物是可相容的時，這些遞送形式是較佳的，特別是在以單位劑量形式遞送該免疫原組合物時。可以例如錠劑、膠囊、栓劑或豆狀膠囊之形式包裝劑量單位。

可藉著任何傳統的方法，將疫苗組合物導入待免疫的個體內，包括例如，藉著靜脈內、皮內、肌肉內、乳房內、腹腔內或皮下注射；藉著口服、舌下、經鼻、經肛門或經陰道遞送。處理可包括單一劑量，或在一段期間內多個劑量。

本發明亦包括使用本發明之減毒細菌品系，來製造預防或減輕細菌感染及/或與其有關之症狀的疫苗醫藥。本發明亦提供使用本發明之抑制劑，來製造預防或減輕細菌感染及/或與其有關之症狀的醫藥的用途。

藉著下列的實例解釋本發明。實例1描述敗血性巴斯德桿菌突變種的建構。實例2係關於敗血性巴斯德桿菌突變種的篩選。實例3提出判定敗血性巴斯德桿菌突變種之毒力的方法。實例4描述敗血性巴斯德桿菌毒力基因的選殖。實例5提出在其他物種中，與敗血性巴斯德桿菌毒力

五、發明說明 (43)

基因有關之基因的確認。實例6描述胸膜肺炎放線桿菌突變種的建構。實例7提出減毒之胸膜肺炎放線桿菌突變種的篩選。實例8係關於胸膜肺炎放線桿菌毒力基因的確認。實例9描述胸膜肺炎放線桿菌突變種和野外型細菌的競爭性攻毒。實例10定出已確認之胸膜肺炎放線桿菌基因的特徵。實例11提出胸膜肺炎放線桿菌突變種保護對抗野外型細菌攻毒的效果。實例12描述在溶血性巴斯德桿菌中，物種同系物毒力基因的確認。

實例1

建構附加標籤-轉因子之敗血性巴斯德桿菌突變種的庫在親代載體pLOF/Km[Herrero等人, J Bacteriol. 172:6557-67 (1990)](先前已證實其在敗血性巴斯德桿菌中是有功能但無目標的[Lee等人, Vet Microbiol. 50:143-8 (1996)])中，建構附加標籤-轉因子突變種的庫。將質體pLOF/Km建構成為自殺載體pGP704的修改，並包括在Tac啟動基因的控制之下的轉因子酶基因，以及編碼康徵素抗藥性的迷你(mini)-Tn10可置換單元。按照下述，藉著修改pLOF/Km，使其接受含有半-隨機[NK]₃₅序列的序列標籤，來建構質體pTEF-1。

首先修改質體pLOF/Km，排除在多選殖區域中獨特的KpnI限制位置，然後在迷你-Tn10區導入新的KpnI位置。以KpnI消化質體，並根據製造者建議的草案，以克勒諾(Klenow)片段填滿所得的突起末端。根據製造者建議的草案(Gibco BRL, Gaithersburg, MD 和 Boehringer Mannheim,

五、發明說明 (44)

Indianapolis, IN), 進行在本文中描述的限制消化和連接作用。鈍端產物自我-連接, 產生命名為 pLOF/Km--KpnI 的質體, 為了擴大, 將其轉化至大腸桿菌 DH5 α : λ pir 內。在 37 °C 下, 在 Luria-Bertani (LB) 培養基中繁殖大腸桿菌 DH5 α : (λ pir ϕ 80dlacZ Δ M15, recA1, endA1, gyrA96, thi-1, hsdR17 (r_k^- , m_k , supE44, relA1, deoR, Δ (lacZYA-argF) U169。使用得自 QIAGEN Inc. (Santa Clarita, CA) 的 QIAGEN SpinPreps 製備質體, 並以 SfiI 消化, 其切開迷你-Tn10 可置換單元中的獨特位置。藉著黏接寡核苷酸 TEF1 (序列識別 86 號) 和 TEF3 (序列識別 87 號) 來製備 SfiI-KpnI-SfiI 接合體, 並將所得的雙股接合體連接到 SfiI 位置內, 產生質體 pTEF-1。藉著 Genosys Biotechnologies (The Woodlands, TX) 合成寡核苷酸 TEF1 和 TEF3 (以及所有在本文中描述的其他寡核苷酸)。

TEF1 5'-AGGCCGGTACCGGCCGCCT 序列識別: 86 號

TEF3 5'-CGGCCGGTACCGGCCTAGG 序列識別: 87 號

如下製備在其 KpnI 位置內插入獨特序列標籤的 pTEF-1。使用 GeneAmp XL PCR 套組 (PE Applied Biosystems, Foster City, CA), 在包括每種 dNTP 各 250 μ M, 1.5 mM Mg(OAc)₂, 引子 TEF14 (序列識別: 88 號) 和 TEF15 (序列識別: 89 號) 各 100 微微莫耳, 1 毫微克 TEF26 (序列識別: 90 號) 作為模板 DNA 和 2.5 單位重組 Tth DNA 聚合酶 XL 的條件下, 進行 PCR, 產生雙股 DNA 標籤。

TEF14 5'-CATGGTACCCATTCTAAC 序列識別: 88 號

五、發明說明 (45)

TEF15 5'-CTAGGTACCTACAACCTC 序列識別：89號

TEF26 序列識別：90號

5'-CTAGGTACCTACAACCTCAAGCTT-[NK]₃₅-

AAGCTTGGTTAGAATGGGTACCATG

反應條件包括最初在95°C下培養1分鐘，接著是在95°C下30秒，在45°C下45秒和在72°C下15秒，循環30次，接著在72°C下最後培養2分鐘。以KpnI消化PCR產物，並使用QIAGEN核苷酸移除套組(QIAGEN, Inc., Chatsworth, GA)，根據製造者建議的草案純化。將獨特的標籤序列連接到先前已使用標準程序，以KpnI消化，並以牛小腸鹼性磷酸酶(Boehringer Mannheim)脫磷酸化的直線化pTEF-1之迷你-Tn10單元內。將所得的質體庫轉化至大腸桿菌DH5α:λpir內。根據DIG使用者指引(Boehringer-Mannheim)進行菌落點分析，如下進行雜交和檢測。

基本上根據Genius非-放射性的使用者指引(Boehringer Mannheim Biochemicals)、DIG-PCR標示套組的產品傳單(Boehringer Mannheim Biochemicals)，以及CSPD的產品傳單(Boehringer Mannheim Biochemicals)，進行雜交作用。為了產製探針，建立100微升的初級PCR反應，使用Amplitaq PCR緩衝溶液(PE Applied Biosystems)、200 μM dNTPs、引子TEF5(序列識別：91號)和TEF6(序列識別：92號)各140微微莫耳、2 mM MgCl₂、2.5單位Amplitaq(PE Applied Biosystems)和1毫微克質體DNA。

TEF5 5'-TACCTACAACCTCAAGCT 序列識別：91號

五、發明說明 (46)

TEF6 5'-TACCCATTCTAACCAAGC 序列識別：92號
循環條件包括最初在95°C下培養2分鐘，接著是在95°C下30秒，在50°C下45秒和在72°C下15秒，循環35次，最後在72°C下培養3分鐘。在2%-3:1 NuSieve GTG(FMC BioProducts, Rockland, ME, USA)：瓊脂糖凝膠上，使用電泳分離擴大產物，並切開和純化109個鹼基對的產物。使用QIAGEN凝膠萃取套組(QIAGEN)進行凝膠萃取作用。在50微升PCR反應中，使用DIG PCR套組、引子TEF24和TEF25各50微微莫耳，以及帶有2 mM dNTP母液之DIG探針合成混合物的1:1混合物，標示大約15毫微克的初級產物。

TEF24 5'-TACCTACAACCTCAAGCTT 序列識別：93號
TEF25 5'-TACCCATTCTAACCAAGCTT 序列識別：94號
PCR條件包括最初在95°C下培養4分鐘，接著是在95°C下30秒，在50°C下45秒和在72°C下15秒，循環25次，最後在72°C下培養3分鐘。在90微升的總反應體積中，以HindIII消化已標示的PCR產物，並從不變的引子臂中純化，使用2%-3:1 NuSieve GTG (FMC BioProducts)：瓊脂糖凝膠。切開含有已標示之可變標籤的區域，並將整個凝膠片溶解於95°C的10毫升DIG EasyHyb中10分鐘，並使其變性。

使用Hybond®-N⁺膜(Amersham-Pharmacia Biotech)製備墨點。在96孔培養盤中，使用大約30毫微克的PCR產物，製備每個標籤的標靶DNA。加入等體積的0.1 N NaOH，使試樣變性，並使用得自Schleicher和Schuell (Keene, NH, USA)

五、發明說明 (47)

的 Minifold ITM Dot-Blot裝置，以極少的真空，將每個試樣塗在膜上。以150微升中和溶液(0.5 M Tris/3 M NaCl, pH 7.5)和150微升2X SSC沖洗各孔。在Stratalinker(Stratagene, La Jolla, CA, USA)中，以UV使膜交聯，並在42°C下，在20毫升DIG EasyHyb緩衝溶液中預先雜交(prehybridized)1小時。加入變性的探針，並在42°C下進行雜交過夜。以含有0.1% SDS的2X SSC沖洗該膜兩次，每次5分鐘。在以標準Genius檢測草案(Genius手冊)處理之前，以50毫升預先加溫15分鐘至68°C之含有0.1% SDS的0.1X SSC緩衝溶液，進行兩次高嚴格度的沖洗。

為了安全、較低之成本、容易使用和減少危險物質，想要使用非-放射性的檢測系統。在最初的實驗中，使用先前描述的類似程序[Mei等人, Mol Microbiol. 26:399-407 (1997)]，在陰性對照組中獲得無法接受的雜交背景值。為了降低背景，將標籤長度從30個鹼基對增加至總共70個，延長擴大因子使其包含所有位在可變區側面的序列，使用較低濃度的dig-dUTP，並藉著凝膠純化移除位在序列標籤區域側面的保留序列。最重要的是，在檢測得自轉因子本身的背景雜交之後，使用PCR產生[NK]₃₅序列標籤，作為墨點中的標靶DNA，而非含有附加標籤之轉因子的完整質體。使用這些修改，排除背景，使得化學發光/非-放射性篩選變得更有效。

藉著菌落墨點，篩選大約4百個不同的轉化物，其起因於pTEF-1與PCR產生之序列標籤的連接作用，並將96個最

五、發明說明 (48)

強的雜交菌落集合在微量滴定盤內，以供進一步使用。即使重複標籤的可能性極低，亦對其他標籤探測主標籤的半個培養盤，以便證實沒有標籤重複。純化含有這些標籤的質體，並轉化至大腸桿菌 S17-1: λ pir (pir, recA, thi, pro, hsd, (r-m+), RP4-2, (Tc::Mu), (Km::Tn7), [TnpR], [SmR]) 內，並在 37°C 下，在 Luria-Bertani (LB) 培養基中繁殖已經轉化的細菌。在接合交配時，使用 96 個含有附加標籤之質體 pTEF-1 的大腸桿菌 S17-1: λ pir 轉化物中的每一個，產生敗血性巴斯德桿菌的轉因子突變種。敗血性巴斯德桿菌品系 TF5 是衍生自 UC6731 (一種牛臨床分離物) 的天然茶啉酮酸抗藥性突變種。在 37°C 和 5% CO₂ 中，使敗血性巴斯德桿菌品系生長在腦心浸液 (BHI) 培養基 (Difco Laboratories, Detroit, MI, USA) 上，此時在培養盤上生長。藉著使每個大腸桿菌 S17-1: λ pir/pTEF1:[NK]₃₅ 純種系和 TF5 品系生長至後對數期，建立交配。將每種附加標籤之 pTEF-1 純種系各 50 微升培養物與 200 微升 TF5 培養物混合，並將各 50 微升的交配混合物沾染在先前已放在含有 100 mM IPTG 和 10 mM MgSO₄ 之 BHI 盤上的 0.22 TM 濾紙上。在 37°C 和 5% CO₂ 中培養過夜之後，將每個濾紙上的交配混合物洗到 3 毫升 PBS 中，並各取 25 微升放在 BHIN⁵⁰K¹⁰⁰ 盤上。在選擇性過夜生長之後，藉著牙籤移至 200 微升 BHIN⁵⁰K⁵⁰ 內，將菌落集合在微量滴定盤內，確定在微量滴定盤的每個孔中總是含有帶有相同序列標籤的轉因子突變種。在過夜生長之後，在各孔中加入 50 微升 75% 甘油，並將培養盤冷凍儲存。

五、發明說明 (49)

在 -80°C 下。

藉著將轉因子突變種移至微量滴定盤，聚集19個集合，確定每孔含有帶有適合該孔之標籤的轉因子突變種。換句話說，在每個微量滴定盤中的特定孔，總是含有帶有相同序列標籤的轉因子突變種，即使轉因子在那些突變種中的位置可能是不同的。

實例2

減毒之敗血性巴斯德桿菌突變種的老鼠篩選

使用敗血症之老鼠模式篩選19個敗血性巴斯德桿菌轉因子突變種的集合。從 -80°C 儲存中移出集合之敗血性巴斯德桿菌轉因子突變種的冷凍培養盤，並藉著從每孔中移出10微升至新的96孔圓底培養盤(Corning Costar, Cambridge, MA, USA) (含有200微升腦心浸液(DIFCO)，其帶有50微克/毫升茶啞酮酸(Sigma)和50微克/毫升康徵素(Sigma) (BHIN⁵⁰K⁵⁰))中，繼代培養。在 37°C 和 5% CO_2 中培養該盤過夜，不需振盪。藉著從各孔中移出10微升至新的平底96-孔培養盤(Corning Costar)(每孔含有100微升BHI)中，並在 37°C 下培養，以大約150 rpm振盪，繼代該過夜培養盤。使用微量滴定盤讀取器監視 OD_{540} 。在大約0.2至0.25的 OD_{540} 時，藉著混合從微量滴定盤每孔中各別取出的100微升，集合各盤形成"輸入集合"。以BHI適當地稀釋培養物至大約 10^4 、 10^5 、 10^6 CFU/毫升之劑量，並藉著腹腔內投藥，以每種稀釋度各0.2毫升感染雌性14-16克的BALB/c老鼠。在感染之後2天，將一或兩隻存活的老鼠安樂死，並

五、發明說明 (50)

收獲脾臟。在1.0毫升無菌的0.9%生理鹽水中，將整個脾臟均質化。製備從 10^{-2} 至 10^{-5} 的勻漿稀釋度，並平鋪於BHIN⁵⁰K⁵⁰培養盤上。在過夜生長之後，在10毫升BHI肉湯中集合至少20,000個菌落，形成"回收集合"，並以3,500 Xg離心0.5毫升的回收集合，然後根據先前描述的草案 [Wilson, 在 F.M. Ausubel 等人 (編輯), Current Protocols in Molecular Biology, 第1冊 John Wiley and Sons, New York, 第2.4.1-2.4.5頁(1997)中]，使用小球來製備基因組DNA。

利用有毒力之野外型敗血性巴斯德桿菌的最初實驗，指出可從脾臟、肺臟、腎臟和肝臟回收該生物，表示真的感染之敗血症模式。按照在實例1中的描述，進行"輸入"和"回收"集合兩者的墨點，並藉著目視檢查和藉著半-定量分析評估兩者。按照在實例1中的描述進行雜交作用，除了使用得自輸入和回收集合的0.5微克基因組DNA作為模板之外。半-定量分析指出在單一純種系中是否已經發生顯著的減少。如果突變種不能在宿主中存活，此時與輸入信號相比較，回收信號應該是極低的，產生高輸入/回收比例。大多數的突變種在活體內的生長像在活體外的一樣好，並因此其信號的比例應該大約等於1。選擇由定量分析選出在回收集合中降低很多的純種系，進行進一步的研究。在目視評估由墨點製成的軟片之後，亦選擇具有可疑之輸入/回收比例的額外純種系。

實例3

判定敗血性巴斯德桿菌候選突變種的毒力

五、發明說明 (51)

從原始的集合盤中分離顯示減少從脾臟回收之每個可能的突變種，並分別用在攻毒實驗中，以便證實並例行地評估由該轉因子突變引起的減毒。使得自在活體內篩選之個別候選突變種，在37°C的5% CO₂中，生長在綿羊血液瓊脂盤中過夜。將每種突變種大約6個菌落接種在BHI肉湯中，並容許生長6小時。製備稀釋物，並按照上述分別以10²、10³、10⁴、10⁵ CFU感染5隻老鼠。藉著在6天後，相對於野外型比較死亡率，來判定減毒。假設存活的老鼠是受到保護的，然後以超過野外型品系之LD₅₀大約200倍的濃度，以一個劑量的野外型敗血性巴斯德桿菌攻毒。然後對每個攻毒組老鼠定出存活率。

結果指出120個可能的轉因子突變種中有62個是減毒的，具有比野外型品系更高至少10倍的LD₅₀近似值。在表1中列舉純種系及其LD₅₀近似值。亦與每個攻毒組平行地執行利用野外型品系的對照組實驗，而在野外型-攻毒組中所有案例的死亡率為100%。

除了LD₅₀值之外，表1亦提供得自疫苗接種和攻毒實驗的數據。簡言之，以一次劑量藉著腹腔內注射，利用在表1中出示之個別敗血性巴斯德桿菌品系疫苗接種的老鼠組(n=5至10)，比具有毒力之野外型品系的LD₅₀更高大約200倍。觀察動物28天，隨後計算其死亡率數字。

五、發明說明 (52)

表 1

敗血性巴斯德桿菌毒力基因

核苷酸序列 識別編號：	代表性的 分離物	可能的 基因功能	疫苗接種的 存活/總數	攻毒的 存活/總數	LD ₅₀
-	野外型	-	0/10	-	<10
23	PM1B1	guaB	10/10, 10/10, 10/10	9/10, 9/10	4.3 x 10 ⁶
11	PM1D1	dsbB	10/10, 5/10	10/10, 5/5	8.4 x 10 ⁴
3	PM1B07	atpC	5/5, 10/10	10/10	>3 x 10 ⁵
74	PM1BE11	yhcJ (HI0145)	10/10	5/10	>2 x 10 ⁵
70	PM1BF6	yabK (HI1020)	3/5, 8/10	9/9	>2 x 10 ⁵
19	PM2G8	thaC	4/5, 9/10	9/9	>4 x 10 ⁵
76	PM3C9	yiaO (HI0146)	3/5		>6 x 10 ⁵
118	PM3G11	UnkO	4/5, 10/10	10/10	>3 x 10 ⁵
31	PM7B4	iroA (UnkB)	0/5		
17	PM4C6	thaB (thaB2)	2/5, 10/10, 9/10	10/10, 9/9	>3 x 10 ⁶
9	PM4G10-T9	dnaA	4/5		>5 x 10 ⁵
1	PM4D5-T5	atpB	5/5		>4 x 10 ⁵
53	PM4D5-T1	UnkC2	5/5		>4 x 10 ⁵
15	PM4F2	thaB (thaB1)	3/5, 6/10, 10/10	6/6, 10/10	>3 x 10 ⁵
41	PM5F7	mreB	4/5		1 x 10 ³
7	PM5E2	devB	0/5, 3/10	2/3	ND
68	PM6H5-T1	xylA	5/5		>3 x 10 ⁵
78	PM6H8	yigF (HI0719)	5/5, 9/10	9/9	>3 x 10 ⁵
108	PM7D12	pnp	5/5, 9/10	9/9	
51	PM8C1R1-T2	UnkC1	5/5		-6 x 10 ⁵
37	PM8C1-T3	mglB	5/5		-6 x 10 ⁵
58	PM8C1R1-T6	UnkD1	5/5		-6 x 10 ⁵
45	PM10H7	purF (HI1207)	3/5, 8/10, 8/10	8/8, 8/8	>3 x 10 ⁵
25	PM10H10-T2	HI1501	5/5		>1 x 10 ⁴
72	PM11G8-T2	ygiK	5/5		>2.4 x 10 ³
21	PM11G8-T4	greA	5/5		>2.4 x 10 ³
84	PM12H6	yyam (HI0687)	3/5, 0/10		-2.2 x 10 ³
33	PM15G8-T2	kdtB	5/5		>1.2 x 10 ⁵
116	PM15G8-T1	UnkK	5/5		>1.2 x 10 ⁵
104	PM16G11-T1	hmbR	3/5		>1.9 x 10 ⁵
29	PM16G11-T2	hxcC	3/5		>1.9 x 10 ⁵
35	PM16H8	lgiC	5/5, 10/10	10/10	>2.4 x 10 ⁵
80	PM16H3	yleA (HI0019)	5/5, 10/10		>2.0 x 10 ⁵
49	PM17H6-T1	sopE	4/5		-6 x 10 ⁵
120	PM17H6	UnkP	4/5		-6 x 10 ⁵
5	PM18F5-T8	cap5E	5/5		>2.4 x 10 ⁵
82	PM18F5-T10	yoyB (HI0345)	5/5		>2.4 x 10 ⁵
13	PM19A1	exbB	5/5, 10/10	10/10	>1.2 x 10 ⁵
112	PM19D4	rci	5/5, 8/10	8/8	-1.6 x 10 ⁵
39	PM20A12	mioC (HI0669)	3/5, 8/10	8/8	-2 x 10 ⁴
60	PM20C2	UnkD2	5/5, 10/10	10/10	>8.2 x 10 ⁶

五、發明說明 (53)

實例 4

選殖並確認敗血性巴斯德桿菌毒力所需之基因

進一步分析已證實其為減毒的每個轉因子突變種，以便判定被瓦解之開放編閱架構的身份。擴大、純化，並以已知不能在轉因子中切開的限制酵素，消化得自每個突變種的 DNA，通常產生與轉因子雜交的 4-8 千個鹼基之片段。使用由轉因子編碼的康黴素抗藥性來選擇，每個轉因子突變種至少選殖一個片段。

使用得自 pLOF/Km 之已標示的 18000 個鹼基之 MluI 片段作為探針，對每個減毒的突變種進行與多個限制酵素的南方雜交作用，確認可供選殖之適當尺寸的片段。將得自每個突變種的迷你-Tn10 單元和側面的 DNA 選殖到 pUC19 內，並使用內部引子 TEF32 和 TEF40，引子步行(walking)，而在一些案例中為萬能的 pUC-19 引子，定出位在側面的序列。

TEF-32 GGCAGAGCATTACGCTGAC 序列識別：95 號

TEF-40 GTACCGGCCAGGCGGCCACGCGTATTC 序列識別：96 號

使用得自 PE Applied Biosystems (Foster City, CA) 的 BigDye™ 染料中止劑化學 (Dye Terminator Chemistry) 套組進行定序反應，並在 ABI Prism 377 DNA 定序器上執行。獲得每個純種系的假定被中斷之開放編閱架構的雙股序列。使用定序者 (Sequencer) 3.0 軟體 (Genecodes, Corp., Ann Arbor, MI) 集合並分析序列數據。使用 GCG 程式 [Devereux 等人, 1997, Wisconsin 套裝版本 9.0, 9.0 版 Genetics Computer Group, Inc., Madison]，在目前可獲得的資料庫中

五、發明說明 (54)

搜尋同種的序列。

在37%確認已減毒的純種系中，在迷你-Tn10可置換單元有多個插入。分別將包括其側面序列的每個插入選殖到pGP704內，並與野外型交配，產生新的敗血性巴斯德桿菌突變種，每個僅攜帶多個原始插入中的一個。再分別測試各個突變種，來判定成為減毒表現型之原因的插入。藉著定序兩個股，定出被瓦解、預期之開放編閱架構的核苷酸序列，並使用預期的胺基酸序列，就類似序列搜尋目前可獲得的資料庫。該序列與已知的基因、未知的基因，以及先前定序之假定的開放編閱架構相配，或不與任何先前確認之序列相配。對於與先前確認之序列具有同種性的那些基因，在表1中陳述已指派之可能的功能。

實例5

在其他物種中確認相關的基因

在不同的實驗中，亦使用胸膜肺炎放線桿菌(App)進行STM。一個App品系，在基因中含有插入，定序該基因(序列識別97號)，並確認其為敗血性巴斯德桿菌atpG基因的物種同系物。該結果暗示在其他細菌物種中，存有先前未知之敗血性巴斯德桿菌基因的同系物，亦可使其突變而產生其他細菌物種的減毒品系，以供在疫苗組合物中使用。為了判定其他敗血性巴斯德桿菌基因的同系物是否存在其他的細菌物種中，對得自其他物種的基因組DNA進行南方雜交作用，使用胸膜肺炎放線桿菌atpG基因作為探針。

使用CTAB方法分離胸膜肺炎放線桿菌、溶血性巴斯德

五、發明說明 (55)

桿菌(Ph)、敗血性巴斯德桿菌和睡眠嗜血桿菌(Hs)基因組DNA，並在37°C下以EcoRI和HindIII消化2小時。在0.7%瓊脂糖凝膠上，在TEF緩衝溶液中以40伏特分離已消化的DNA過夜。接著將凝膠浸入0.1M HCl中30分鐘，浸入0.5M NaOH/1.5M NaCl中兩次，各15分鐘，浸入2.5M NaCl/1M Tris, pH 7.5中兩次。使用20X SSC緩衝溶液(3 M NaCl/0.3 M檸檬酸鈉)，將DNA移至硝基纖維素膜(Amersham Hybond N⁺)上過夜。在自動交聯裝置上，使用UV Stratalinker (120毫焦耳)，使DNA與該膜交聯。使該膜在50°C下，在5X SSC/1%封阻溶液/0.1%月桂鹽肌胺酸鈉/0.02% SDS中預先雜交大約7小時，然後在50°C下，在含有PCR產生之atgG探針的相同溶液中雜交過夜。

在GeneAmp PCR系統2400中，利用GeneAmp XL PCR套組，使用引子DEL-1389(序列識別：98號)和TEF-46(序列識別：99號)來製備探針。模板為基因組胸膜肺炎放線桿菌DNA。

DEL-1389 TCTCCATTCCCTTGCTGCGGCAGGG 序列識別：98號

TEF-46 GGAATTACAGCCGGATCCGGG 序列識別：99號

利用在94°C下5分鐘的最初加熱步驟，在94°C下變性30秒，在50°C下黏接30秒，並在72°C下延長3分鐘，循環30次，以及在72°C下5分鐘的最後延伸步驟，完成PCR。在瓊脂糖凝膠上分離擴大產物，使用QIAquick凝膠純化套組(QIAGEN)純化，並使用DIG-High引子套組(Boehringer Mannheim)標示。從雜交溶液中移出墨點，並以2X SSC漂

五、發明說明 (56)

洗，並以相同的緩衝溶液沖洗兩次，每次5分鐘。然後在60°C下以0.5X SSC沖洗墨點兩次，每次15分鐘。使用DIG核酸檢測套組(Boehringer Mannheim)使同種的譜帶顯色。

使用EcoRI消化的DNA，在溶血性巴斯德桿菌、睡眠嗜血桿菌和胸膜肺炎放線桿菌中檢測出單一的譜帶。使用EcoRI消化的DNA，從敗血性巴斯德桿菌中檢測到兩個譜帶。

實例6

建構附加標籤-轉因子之敗血性巴斯德桿菌突變種的庫
轉因子突變生成作用，使用先前已經報告，在胸膜肺炎放線桿菌中具有功能且隨機的pLOF/Km[Tascon等人，J Bacteriol. 175:5717-22 (1993)]。欲建構胸膜肺炎放線桿菌之附加標籤轉因子突變種，在接合交配時，使用96個分別含有預先選擇之附加標籤質體(pTEF-1:[NK]₃₅)的大腸桿菌S17-1:λ pir轉化物，產生胸膜肺炎放線桿菌品系AP225(衍生自在活體內繁殖之ATCC 27088品系的血清型1自發性茶啉酮酸抗藥性突變種)的轉因子突變種。在37°C和5% CO₂中，使胸膜肺炎放線桿菌品系生長在帶有10微克/毫升B-菸鹼醯胺腺嘌呤二核苷酸(V¹⁰) (Sigma, St. Louis, Missouri)的腦心浸液(BHI)(Difco Laboratories, Detroit, MI)中，此時在培養盤上生長。在37°C下，在Luria-Bertani (LB)培養基中繁殖大腸桿菌S17-1:λ pir (λ pir, recA, thi, pro, hsdR (r_k-m_k+), RP4-2, (Tc^R::Mu), (Km^R::Tn7), [Tm^R], [Sm^R])。在必需使用抗生素時，使用100微克/毫升氯苄青黴素(Sigma)、50

五、發明說明 (57)

微克/毫升菸啉酮酸(N^{50})(Sigma)和50(K^{50})或100(K^{100})微克/毫升康徽素(Sigma)。

藉著使每個大腸桿菌 S17-1: λ pir/pTEF1:[NK]₃₅ 純種系和 AP225 品系生長至後對數期，引起交配。將每種附加標籤-pTEF-1 純種系的一等份 50 微升之培養物與 150 微升的 APP225 培養物混合，然後將每種交配混合物各 50 微升點在先前放在含有 100 μ M IPTG 和 10mM $MgSO_4$ 之 BHIV¹⁰ 培養盤上的 0.22 μ M 濾紙上。在 37°C 和 5% CO_2 下培養過夜之後，從每個濾紙上將交配混合物洗到 2 毫升 PBS 中，並各取 200 微升放在 BHIV¹⁰ $N^{50}K^{100}$ 培養盤上。在選擇性過夜生長之後，藉著以牙籤移至 200 微升 BHIV¹⁰ $N^{50}K^{50}$ 中，將菌落聚集在微量滴定盤內，確定在微量滴定盤的每孔中總是含有帶有相同序列標籤的轉因子突變種。在過夜生長之後，在每孔中加入 50 微升 75% 甘油，並將培養盤冷凍儲存在 -80°C 下。

APP 似乎不像敗血性巴斯德桿菌這麼偏愛迷你-Tn10 單元的多個插入。判定僅大約 3% 的突變種含有多個插入，其與先前報告的 4% 相符 [Tascon 等人, J Bacteriol. 175: 5717-22 (1993)]。在 APP 中的問題，包括確認許多突變種 (下文討論) 含有 23S RNA 區域內的插入：總共 28 個突變種插入 13 個獨特的位置。這可能代表 23S RNA 含有優先的插入位置，且受到這些插入影響的 APP 生長，足以在宿主中導致不同的存活。使用 APP 23S RNA 探針的南方墨點分析，暗示與在流行性感冒嗜血桿菌中的 5 個 [Fleischmann 等人,

五、發明說明 (58)

Science 269:496-512 (1995)]，以及在大腸桿菌中7個完整的操縱子[Blattner等人, Science 277:1453-1474 (1997)]相比較，APP可能僅含有3個核糖體操縱子。該位置優先權及其對生長速率的影響，可能是"飽和突變生成作用"的重要障礙，因為重大數目的純種系將在這些rRNAs內含有插入，而對於獲得額外的獨特減毒突變，大量體積的篩選將是必要的。

實例7

對胸膜肺炎放線桿菌突變種進行豬的篩選

使用豬氣管內注射的模式，篩選20個胸膜肺炎放線桿菌轉因子突變種的集合，其含有總共大約800個突變種。

從-80°C的儲存中移出集合的胸膜肺炎放線桿菌轉因子突變種的冷凍培養盤，並藉著從各孔中移出20微升，至含有180微升BHIV¹⁰N⁵⁰K⁵⁰之新的96孔圓底培養盤(Corning Costar, Cambridge, MA, USA)中，繼代培養之。在37°C和5% CO₂中培養該培養盤過夜，不需振盪。然後藉著從各孔中移出10微升，至每孔含有100微升BHIV¹⁰之新的平底96孔培養盤(Corning Costar)中，並在37°C下培養，以150 rpm振盪，繼代培養該過夜培養盤。使用微量滴定盤讀取器監視OD₅₆₂。在大約0.2至0.25的OD₅₆₂時，藉著混合從微量滴定盤每孔中各別取出的100微升，集合各盤形成"輸入集合"。以BHI適當地稀釋培養物至大約2X10⁶CFU/毫升。藉著氣管內投藥，使用氣管內管，每種經過稀釋的集合各取4.0毫升來感染10-20公斤的SPF豬(Whiteshire-Hamroc,

五、發明說明 (59)

Albion, IN)。在感染後大約20小時時，將所有存活的動物安樂死，並移出肺臟。藉著將150毫升無菌的PBS注入肺中，然後揉搓使液體分散，進行灌洗以便移出存活的細菌。回收灌洗液，並重複該過程兩次。以450 x g離心灌洗液10分鐘，分離大的碎屑。然後以2,800 x g離心上清液，使細菌形成小球。以 10^{-2} 至 10^{-5} 之稀釋範圍，在BHIV¹⁰N⁵⁰K⁵⁰培養盤上，將小球再懸浮於5毫升BHI中。在過夜生長之後，在10毫升BHI肉湯中集合至少100,000個菌落，形成"回收集合"。藉著CTAB方法[Wilson, 在Ausubel等人(編輯), Current Protocols in Molecular Biology, 第1冊 John Wiley and Sons, New York, 第2.4.1-2.4.5頁(1997)中]，使用每種回收集合各0.7毫升的部份，來製備基因組DNA。

從動物中回收，從肺臟灌洗液中例行地是在 10^8 CFU的範圍內。

藉著按照先前描述的目視檢查和藉著半-定量分析，進行墨點沾染和評估兩者。所有的雜交和檢測均按照上述進行。簡言之，藉著初級PCR擴大作用製備探針，接著是想要產物的瓊脂糖凝膠純化，以及併入dig-dUTP的二級PCR擴大作用。藉著Genosys Biotechnologies(The Woodlands, TX)合成寡核苷酸，包括TEF5、TEF6、TEF24、TEF25、TEF48和TEF62。亦使用引子TEF69、TEF65和TEF66倒轉PCR反應並定序之。

TEF69 GACGTTTCCCGTTGAATATGGCTC 序列識別：166號

五、發明說明 (60)

TEF65 GCCGGATCCGGGATCATATGACAAGA 序列識別：167號

TEF66 GACAAGATGTGTATCCACCTTAAC 序列識別：168號

然後以 HindIII 消化已標示的 PCR 產物，從獨特的標籤區中分離不變的引子臂。切除含有已標示之可變標籤的區域，然後將整個凝膠片溶解於 DIG EasyHyb 中，並使其變性。製備墨點，並使用標準 CSPD 檢測草案檢測之。使軟片曝光以便進行目視評估，並對每個墨點試樣判定每秒的發光計數 (LCPS)。使用每個突變種的 $LCPS_{輸入}/LCPS_{回收}$ 比例來判定可能減毒的突變種。

選擇按照在輸入集合中出現，但在回收集合中極度降低而選出的純種系，進行進一步的研究。在目視評估由墨點製成的軟片之後，亦選擇具有可疑之輸入/回收比例的額外純種系。總共選出 110 個純種系。

實例 8

確認胸膜肺炎放線桿菌毒力基因

藉著逆 PCR 和直接的產物定序，對 110 個突變種分別定出一部份位在側面的序列。按照上述，使用逆 PCR，產生側面 DNA 產物，以便進行直接定序。使用得自 PE Applied Biosystems (Foster City, CA) 的 BigDye™ 染料中止劑化學 (Dye Terminator Chemistry) 套組進行定序反應，並在 ABI Prism 377 DNA 定序器上執行。使用定序者 (Sequencer) 3.0 軟體 (Genecodes, Corp., Ann Arbor, MI) 集合並分析序列數據。使用 GCG 程式 [Devereux 和 Haeberli, Wisconsin 套裝版本 9.0, 9.0 版 Genetics Computer Group, Inc., Madison

五、發明說明 (61)

(1997)]，在目前可獲得的資料庫中搜尋同種的序列。

表2顯示確認並延伸的胸膜肺炎放線桿菌基因，使其開放編閱架構是可判定的。提供核苷酸序列的序列識別號碼，以及所在之處推衍的胺基酸序列。

表 2

胸膜肺炎放線桿菌開放編閱架構

完整的開放編閱架構

atpH	序列識別：134號
aptG	序列識別：132號
exbB	序列識別：140號
OmpP5	序列識別：152號
OmpP5-2	序列識別：150號
tig	序列識別：160號
fkpA	序列識別：142號
hupA	序列識別：146號
rpmF	序列識別：158號

無起始密碼子-中止密碼子

dksA	序列識別：136號
dnaK	序列識別：138號
HI0379	序列識別：144號

無起始密碼子-無中止密碼子

pnp	序列識別：154號
apvA-or1	序列識別：122號
apvA-or2	序列識別：124號
apvB	序列識別：126號
apvD	序列識別：130號

起始密碼子-無中止密碼子

lpdA	序列識別：148號
potD	序列識別：156號
yaeE	序列識別：164號
apvC	序列識別：128號

RNA或非編碼序列

tRNA-leu	序列識別：162號
tRNA-glu	序列識別：163號

藉著與細菌資料庫相比較，分派在表3(下文，實例9)中列舉的假定身份。110個突變種代表35群獨特的轉因子插

五、發明說明 (62)

入。每個位點之不同突變的號碼，隨著一些總是在 ORF 中含有單一位置之插入的純種系，至在相同 ORF 之不同位置中含有插入的純種系而有所不同。篩選在 110 個突變種中檢測出的三種多個插入，藉著產生多個 PCR 譜帶，並產生多個序列電泳圖來判定。

實例 9

胸膜肺炎放線桿菌突變種與野外型 APP225 的競爭性攻毒

從原始集合盤中，從每個上文確認其在回收族群中缺乏或極度減少的獨特減毒突變種組中分離代表性的純種系，並用在與野外型品系 (AP225) 的競爭性攻毒實驗中，以便證實藉著轉因子突變作用引起的相對減毒作用。使突變種和野外型品系生長在 BHIV¹⁰ 中，至 0.6-0.9 的 OD₅₉₀。將野外型和突變種品系各大約 5.0×10^6 CFU，加至 4 毫升 BHI 中。藉著氣管內投藥，利用氣管內管，使用總共 4 毫升之劑量來感染 10-20 公斤的 SPF 豬。在感染後大約 20 小時時，安樂死所有存活的動物，並移出肺臟。按照上述進行肺臟灌洗。在 BHIV¹⁰N⁵⁰ 和 BHIV¹⁰N⁵⁰K¹⁰⁰ 上進行培養盤計數，判定在輸入培養物和肺臟灌洗試樣兩者之中，野外型對突變種的相對數目。按照 $[\text{突變種 CFU}/\text{野外型 CFU}]_{\text{輸入}}/[\text{突變種 CFU}/\text{野外型 CFU}]_{\text{回收}}$ ，計算競爭指數 (CI)。

在 35 個可能的轉因子突變種中，22 個是明顯減毒的，具有低於 0.2 的競爭指數 (CI)。從一個集合中，選出以 STM 篩選結果為基礎，似乎未被減毒的轉因子突變種作為陽性對照組。該突變種在活體內具有大約 0.6 之 CI。亦對該突變

五、發明說明 (63)

種進行在活體外的競爭作用，結果CI為0.8。接著判定突變種在2個苯丙胺酸tRNAs之間含有插入。

在表3中列舉獨特的減毒之單一-插入突變種的競爭指數。atpG、pnp和exbB App突變種的競爭指數，指出突變種不能完全有效地與野外型品系競爭，並因此是減毒的。

五、發明說明 (64)

表 3

胸膜肺炎放線桿菌突變種的毒力和建議功能

突變種	類似性	假定或已知的功能	C.I.
AP20A6	atpH	ATP合成酶	.009
AP7F10	atpG	ATP合成酶	.013
AP17C6	lpdA	二氫硫辛醯胺脫氫酶	.039
AP11E7	exbB	鐵化合物的運載	.003, .003, .006
AP3H7	potD	亞精胺/腐胺運載	.308
AP8H6	OmpP5	黏附素(adhesin)/OmpA同系物	.184
AP18H8	OmpP5-2	黏附素/OmpA同系物	.552
AP13E9	tig	肽基-丙基異構酶	.050
AP13C2	fkpA	肽基-丙基異構酶	<.001
AP15C11	pnp	多核苷酸磷酸化酶	.032
AP18F12	hupA	類組織蛋白-蛋白質	.001
AP20F8	dksA	dnaK突變作用的劑量依賴性抑制劑	.075
AP5G4	dnaK	熱休克蛋白質-分子的監護蛋白 (chaperone)	.376
AP17C9	tRNA-leu	蛋白質合成	.059
AP5D6	tRNA-glu	蛋白質合成	.055
AP18B2	rpmF	蛋白質合成	.112
AP10E7	yaeA	未知	.001
AP19A5	HI0379	未知	.061
AP10C10	apvA	未知	.157
AP18F5	apvB	未知	.103
AP2A6	apvC	未知	.091
AP2C11	apvD	未知	.014

五、發明說明 (65)

CI的精確性似乎是極佳的，像是exbB突變種在3種不同的動物中競爭，產生0.003、0.003和0.006的CI。以下文描述的實例11中，利用7個突變種對豬(n=8)之初步疫苗接種的結果為基礎，進一步證實以在大動物研究中的一次競爭為基礎，使用競爭指數的數目來分派減毒作用。

實例10

定出減毒之胸膜肺炎放線桿菌毒力基因的特徵

已確認的胸膜肺炎放線桿菌基因，代表4個廣泛功能的種類：生物合成的酵素、細胞的運載組份、細胞的調節組份和未知的。

atpG基因，編碼 $F_0F_1H^+-ATP$ 酶複合物的 $F_1-\gamma$ 亞單元，可能在ATP的產製上，或在質子運載上藉著水解ATP產生功能。亦在敗血性巴斯德桿菌中確認了相關的atpG減毒突變種。亦確認另一個atp基因，atpH，其編碼 $F_1\delta$ 亞單元。atp突變種的表現型包括不能適應的感酸性表現型[Foster, J. Bacteriol. 173:6896-6902 (1991)]，在鼠傷寒沙門氏桿菌[Garcia del Portillo 等人, Infect. Immun. 61:4489-4492 (1993)]和敗血性巴斯德桿菌(在上文)中喪失毒力，且在兩者中降低轉化頻率，並在流行性桿菌嗜血桿菌Rd中誘導能力調節基因[Gwinn等人, J Bacteriol. 179:7315-20 (1997)]。

LpdA是二氫硫辛醯胺脫氫酶，其為兩種酵素複合物的組份：丙酮酸脫氫酶和2-酮戊二酸脫氫酶。雖然與毒力的關係是未知的，但當暴露在得自人類的殺細菌蛋白質下時，在鼠傷寒沙門氏桿菌中誘導LpdA的產製，這可能暗

五、發明說明 (66)

示該誘導作用可能涉及企圖修補外膜 [Qi 等人, Mol Microbiol. 17:523-31 (1995)]。

生長和存活必要之珍貴化合物的運載，在活體內是很重要的。ExbB 是 TonB 運載複合物的一部份 [Hantke 和 Zimmerman, Microbiology Letters. 49:31-35 (1981)]，以至少兩種不同的方式與 TonB 產生交互作用 [Karlsson 等人, Mol Microbiol. 8:389-96 (1993), Karlsson 等人, Mol Microbiol. 8:379-88 (1993)]。獲得鐵對於病原而言是必要的。在該研究中，已經在 APP 和敗血性巴斯德桿菌兩者中確認減毒的 exbB 突變種。在其他細菌中，已經確認數個 TonB-依賴性鐵受體 [Biswas 等人, Mol. Microbiol. 24:169-179 (1997), Braun, FEMS Microbiol Rev. 16:295-307 (1995), Elkins 等人, Infect. Immun. 66:151-160 (1998), Occhino 等人, Mol Microbiol. 29:1493-507 (1998), Stojiljkovic 和 Srinivasan, J Bacteriol. 179:805-12 (1997)]。為了獲得鐵，胸膜肺炎放線桿菌產生 2 個鐵傳遞蛋白-結合蛋白質，其同樣地依賴 ExbB/ExbD/TonB 系統。PotD 是胞漿周圍的結合蛋白質，其為亞精胺(多胺)運載所必需的 [Kashiwagi 等人, J Biol Chem. 268:19358-63 (1993)]。巴斯德桿菌科的其他成員，溶血性巴斯德桿菌，含有 potD 的同系物 (Lpp38)，其在恢復期中為主要的免疫原，或是免疫牛的外膜蛋白質 [Pandher 和 Murphy, Vet Microbiol. 51:331-41 (1996)]。在溶血性巴斯德桿菌中，PotD 似乎與內和外膜兩者有關。PotD 在毒力上，或在與保護性抗體之交互作用上的角色是未知的，雖

五、發明說明 (67)

然先前的研究已經顯示肺炎鏈球菌 (*Streptococcus pneumoniae*) 之 potD 突變種是減毒的 [Polissi 等人, *Infect. Immun.* 66:5620-9 (1998)]。

亦確認相對上較少的"典型毒力因子"，像是黏附素或毒素，除了流行性感胃嗜血桿菌 OMP P5 的同系物之外。流行性感胃嗜血桿菌 OMP P5 是主要的外膜蛋白質，其與蛋白質之 OmpA 波林 (porin) 家族有關 [Munson 等人, *M Infect Immun.* 61:4017-20 (1993)]。已經顯示在不可作為代表之流行性感胃嗜血桿菌中的 OMP P5，編碼以絲狀結構表現之細毛 (fimbrial) 亞單元蛋白質 [Sirakova 等人, *Infect Immun.* 62:2002-20 (1994)]，其貢獻毒力，並與黏液素和表皮細胞兩者結合 [Miyamoto 和 Bakaletz, *Microb Pathog.* 21:343-56 (1996), Reddy 等人, *Infect. Immun.* 64:1477-9 (1996), Sirakova 等人, *Infect. Immun.* 62:2002-20 (1994)]。一項重大的發現是確認兩個不同的 ORF's，其似乎編碼 OMP P5 同系物。亦有具有兩個極類似蛋白質的案例，得自杜克雷氏嗜血桿菌的 MOMP 和 Omp A2。尚待決定這兩者在功能上是否涉及細毛的產製，且兩個這類 ORFs 的出現是否代表分歧的複製，具有多餘或互補的功能。有趣的是，兩個 OMP P5 突變種似乎具有不同的 CI 值，暗示在對於單一副本之必要性或功能性上的差異。已經顯示 OMP P5 在慢性感染期間，經歷分子改變 [Duim 等人, *Infect. Immun.* 65:1351-1356 (1997)]，然而，這似乎限於單一基因經歷點突變，產生胺基酸改變，而非歸因於多個基因之差示表現的"型式轉變"。

五、發明說明 (68)

蛋白質折疊酵素對於胞漿周圍和細胞外蛋白質的有效折疊而言，是很重要的輔助劑，並確認出其產物具有肽基-丙基異構酶活性的兩個基因：fkpA和tig(觸發因子)。FkpA是胞漿周圍蛋白質，其為FK506-結合蛋白質家族的成員[Horne 和 Young, Arch Microbiol. 163:357-65 (1995); Missiakas等人, Mol Microbiol. 21:871-84 (1996)]。已經顯示FkpA助成鼠傷寒沙門氏桿菌的細胞內存活[Horne等人, Infect. Immun. 65:806-10 (1997)，而嗜肺軍團桿菌(*Legionella Pneumophila*)同系物，mip [Engleberg等人, Infect. Immun. 57:1263-1270 (1989)]，則負責毒力和感染巨噬細胞[Cianciotto等人, J. Infect. Dis. 162:121-6 (1990); Cianciotto等人, Infect. Immun. 57:1255-1262 (1989)]。Tig或觸發因子[Crooke和Wickner, Proc. Natl. Acad. Sci. USA. 84:5216-20 (1987), Guthrie和Wickner, J Bacteriol. 172:5555-62 (1990)，在Hesterkamp和Bukau, FEBS Lett. 389:32-4 (1996)中回顧]，是含有代表性之FKBP區域的肽基丙基異構酶[Callebaut和Mornon, FEBS Lett. 374:211-215 (1995)]，但不受FK506影響[Stoller等人, EMBO J. 14:4939-48(1995)]。已經顯示tig與核糖體和初生多肽鏈有關[Hesterkamp等人, Proc Natl Acad Sci USA 93:4437-41 (1996), Stoller等人, EMBO J. 14:4939-48 (1995)]。可能的角色包括在大腸桿菌中，對細胞分裂有未知的影響[Guthrie和Wickner, J Bacteriol. 172:5555-62 (1990)]，在膿鏈球菌(*Streptococcus pyogenes*)半胱胺酸蛋白酶的分泌

五、發明說明 (69)

和激活作用中的角色 [Lyon 等人, EMBO J. 17:6263-75 (1998)], 以及在枯草桿菌 (*Bacillus subtilis*) 中, 在饑餓條件下存活 [Gothel 等人, Biochemistry 37:13392-9 (1998)]。

細菌病原使用許多機制, 對等地調節基因表現, 以便在宿主內各式各樣的環境中存活。在原核生物中, 在 mRNA 穩定性上的差異可調節基因表現 [Belasco 和 Higgins, Gene 72:15-23 (1988)]。例如, *rnr(vacB)* 是在副痢疾桿菌 (*Shigella flexneri*) 中, 表現質體攜帶之毒力基因所必需的 [Tobe 等人, J Bacteriol. 174:6359-67 (1992)], 並編碼 RNA 酶 R 核糖核酸酶 [Cheng 等人, J. Biol. Chem. 273:14077-14080 (1998)]。PNP 是多核苷酸磷酸化酶, 其涉及 mRNA 的降解。Null *pnp/rnr* 突變種是致命的, 暗示可能有功能的重疊。因此很可能 *rnr* 和 *pnp* 兩者均涉及毒力基因表現的調節。在老鼠敗血症模式中 (實例 2), 敗血性巴斯德桿菌的 *pnp* 突變種是無毒力的。在枯草桿菌中, 其他與 *pnp* 有關之表現型包括能力上的缺陷和感冷性 [Wang 和 Bechhofer, J Bacteriol. 178:2375-82 (1996)]。

HupA 是細菌類-組織蛋白蛋白質, 其在大腸桿菌中與 HupB 組合, 構成 HU 蛋白質。報告已暗示 *hupA* 和 *hupB* 單一的突變種, 未證明任何可觀察到的表現型 [Huisman 等人, J Bacteriol. 171:3704-12 (1989), Wada 等人, J Mol Biol. 204:581-91 (1988)], 然而, 已經顯示 *hupA-hupB* 雙重突變種是感冷性的, 感熱休克性的, 並在許多形式的指定位置之 DNA 重組作用中被阻斷 [Wada 等人, J Mol Biol. 204:581-

五、發明說明 (70)

91 (1988), Wada等人, *Gene*. 76:345-52(1989)]。先前一項受到限制的資料指出, hupA直接涉及毒力[Turner等人, *Infect. Immun.* 66:2099-106 (1998)]。hupA減毒的機制仍是未知的。

DnaK是已熟知和高度保留的熱休克蛋白質, 涉及對各種緊迫性環境改變的調節反應[在Lindquist和Craig, *Annu Rev Genet.* 22:631-77 (1988)中回顧]。DnaK在小腸結腸型耶爾森氏菌中, 在被巨噬細胞吞噬之後, 亦是最顯著誘發的緊迫蛋白質之一[Yamamoto等人, *Microbiol Immunol.* 38:295-300 (1994)], 而豬布氏桿菌(*Brucella suis*)的dnaK突變種, 無法在人類類-巨噬細胞的細胞中繁殖[Kohler等人, *Mol Microbiol.* 20:701-12 (1996)]。相反的, 其他的細胞內病原, 單核白血球增多性李士德菌(*Listeria monocytogenes*), 在吞噬作用之後未顯示dnaK的誘導[Hanawa等人, *Infect. Immun.* 63:4595-9 (1995)]。霍亂弧菌(*Vibrio cholera*)的dnaK突變種, 在活體外影響ToxR及其調節毒力因子的產製, 但並未從在活體內生長的細胞中獲得類似的結果[Chakrabati等人, *Infect. Immun.* 67:1025-1033 (1999)]。胸膜肺炎放線桿菌dnaK突變種的CI, 比大多數減毒的突變種更高, 雖然仍約為陽性對照組品系的一半。

DksA在大腸桿菌之dnaK突變種中, 是絲狀和感溫性生長的劑量依賴性抑制劑[Kang和Craig, *J Bacteriol.* 172:2055-64 (1990)]。目前還未對DksA定義分子功能, 但在雞和剛孵化的雛雞中, 已經確認該基因對於鼠傷寒沙門

五、發明說明 (71)

氏桿菌的毒力是很重要的 [Turner 等人, Infect. Immun. 66:2099-106 (1998)]。在那項工作中, 注意到 dksA 突變種不能利用葡萄糖或組胺酸良好地生長, 但可利用穀胺醯胺或穀胺酸作為唯一碳來源, 良好地生長。該觀察可能表示 dksA 突變種是在穀胺酸之生物合成中, 以某種方式受到傷害的 [Turner 等人, Infect. Immun. 66:2099-106 (1998)]。

確認三個在蛋白質合成中扮演某種角色的基因: tRNA-leu、tRNA-glu 和 rpmF。除了蛋白質合成之外, tRNA's 在肽聚糖的合成 [Stewart 等人, Nature 230:36-38 (1971)]、吡吩環合成 [Jahn 等人, Trends Biochem Sci. 17:215-8 (1992)]、為了降解而瞄準蛋白質 [Tobias 等人, Science 254:1374-7 (1991)]、轉譯後在蛋白質中添加胺基酸 [Leibowitz 和 Soffer, B.B.R.C. 36:47-53 (1969)]、以及細菌-真核生物之交互作用的調解 [Gray 等人, J Bacteriol. 174:1086-98 (1992), Hromockyj 等人, Mol Microbiol. 6:2113-24 (1992)] 中, 亦具有各式各樣功能性的角色。更特定而言, tRNA-leu 涉及轉錄減毒作用 [Carter 等人, Proc. Natl. Acad. Sci. USA 83:8127-8131 (1986)]、由山梅花假單孢菌 (*Pseudomonas syringae*) 形成的病變 [Rich 和 Willis, J Bacteriol. 179:2247-58 (1997)]、以及泌尿道病原性之大腸桿菌的毒力 [Dobrindt 等人, FEMS Microbiol Lett. 162:135-141 (1998), Ritter 等人, Mol Microbiol. 17:109-21 (1995)]。不知道我們確認的 tRNA 是否代表胸膜肺炎放線桿菌中, tRNA-leu 的次要物種。無論如何, tRNA-leu 可能具有各種功能中的任何一種。RpmF

五、發明說明 (72)

是核糖體蛋白質，在大腸桿菌中，其基因亦是含有脂肪酸生物合成酵素之操縱子的一部份。將需要進一步的研究，指出在胸膜肺炎放線桿菌中是否也是這樣，雖然在流行性感
冒嗜血桿菌中出現相同的 fab 基因和 rpmF 聚集 [Fleischmann 等人, Science 269:496-512 (1995)]。fab 基因的表現並非必要的，視起源於 rpmF 上游的轉錄本而定，因為已經在 rpmF 中確認有第二個啟動基因 [Zhang 和 Cronan, Jr., J Bacteriol. 180:3295-303 (1998)]。

最後一種減毒突變種，包括在未知功能的基因，或在先前尚未確認之基因中的突變作用。先前已經分別在大腸桿菌 [Blattner 等人, Science 277:1453-1474 (1997)] 和流行性感
冒嗜血桿菌 [Fleischmann 等人, Science 269:496-512 (1995)] 中確認了 yaeA 和 HI0379 的同系物。已經將其餘未知的命名為胸膜肺炎放線桿菌毒力基因 (apv)。apvC 基因對 HI0893 顯示出明顯的類似性，然而，所提出之 HI0893 的類似性是不確定的，就像轉錄阻遏物類似脂肪酸反應調節者 Bm3R1 一樣 [Palmer 等人, J Biol Chem. 273:18109-16 (1998)]。apvD 基因亦是最類似得自大腸桿菌的假定膜蛋白 (b0878)，其具有未知的功能 [Blattner 等人, Science 277:1453-1474 (1997)]。另外兩個未知物，apvA 和 apvB，在公告之資料庫中無顯著相配的。

實例 11

胸膜肺炎放線桿菌突變種的安全性和效力

使用 9 組 (n=8) SPF 豬 (4-5 週齡，3-10 公斤) 來判定 7 個胸膜

五、發明說明 (73)

肺炎放線桿菌突變種，作為活的減毒疫苗品系的安全性和效力。在第1天，以每種突變種各 10^{10} CFU，經鼻內感染7組。一組在第1和15天時，接種市售的疫苗Pleuromune (Bayer)，而一個無經驗組則不接種疫苗。在第29天時，以每隻豬 $1-5 \times 10^5$ CFU的野外型APP225，經鼻內攻毒所有的組別。在研究的第42天時，安樂死所有存活的動物，並進行屍體解剖。在表4中出示結果。

表 4

胸膜肺炎放線桿菌突變種的效力

在鼻內攻毒之後的死亡率%

疫苗	疫苗接種	攻毒
Pleuromune	0	37.5
exbB	0	0
tig	12.5	0
fkpA	12.5	0
HI0385	50.0	0
pnp	0	0
yaeE	0	0
atpG	0	0
無	N/A	50.0

當以鼻內 10^{10} CFU之劑量投與時，exbB、atpG、pnp和yaeA突變種並未引起死亡。fkpA和tig突變種組各有1隻死亡，而HI0379組(在實例9中顯示為受試的7個突變種中最高的CI)有4隻死亡。使用該模式時野外型LD₅₀通常是 1×10^7

五、發明說明 (74)

CFU，表示這些突變種均為至少100倍減毒的，且在CI和減毒之間有合理的關連。

實例 12

確認溶血性巴斯德桿菌之物種同系物

以在敗血性巴斯德桿菌和胸膜肺炎放線桿菌中確認的毒力基因之序列為基礎，企圖在溶血性巴斯德桿菌中進行相關基因的確認，也就是物種同系物。利用PCR，以下文出示之簡併引子，企圖按照指示擴大溶血性巴斯德桿菌基因。由Sigma-Genosys (The Woodlands, TX)合成的引子序列，包括標準單一字母名稱，其中B代表(C、G或T)，D代表(G、A或T)，H代表(A、C或T)，K代表(G或T)，M代表(A或C)，N代表(A、G、C或T)，R代表(A或G)，S代表(G或C)，V代表(G、A或C)，W代表(A或T)，且Y代表(C或T)。

atpG	TEF146 ATG GCN GGN GCN AAR GAR AT	序列識別176號
	TEF148 GCN GCY TTC ATN GCN ACC AT	序列識別177號

guaB	TEF240 GGN TTY ATY CAY AAA AAY ATG	序列識別178號
	TEF243 TCT TTN GTR ATN GTN ACA TCR TG	序列識別179號

pnp	TEF141 GCS GGY AAA CCR CGT TGG GAT TGG	序列識別180號
	TEF142 CRC CTA ARA TRT CTG AAA GCA CCA C	序列識別181號

purF	TEF244 ATG TGY GGN ATY GTN GGN AT	序列識別182號
	TEF247 CAT ATC AAT ACC ATA CAC ATT	序列識別183號

yjgF	TEF162 GGN CCN TAY GTN CAR G	序列識別184號

五、發明說明 (75)

TEF163 NGC NAC YTC NAC RCA

序列識別185號

為了擴大最初簡併的PCR產物，使用3.3X XL緩衝溶液II (PE Applied Biosystems)、200 μ M dNTPs、適當的引子各25微微莫耳、0.8mM MgCl₂、0.5單位rTth DNA聚合酶、XL (PE Applied Biosystems)和大約1微克TF1 DNA，建立50微升反應。

循環條件為94°C 1.5分鐘；接著是94°C 15秒，40-60°C 60秒，72°C 1.5分鐘的35次循環；以及最後保持在72°C下5分鐘。使用QIAGEN凝膠萃取套組(QIAGEN, Valencia CA)，從瓊脂糖凝膠中純化每個PCR產物的譜帶。

使用得自PE Applied Biosystems (Foster City, CA)的BigDye™染料中止劑化學(Dye Terminator Chemistry)套組進行定序反應，並在ABI Prism 377 DNA定序器上執行。獲得每個純種系開放編碼架構(ORF)的雙股序列。使用定序者3.0軟體(Genecodes, Corp., Ann Arbor, MI)集合並分析序列數據。使用GCG程式，藉著在目前可獲得的資料庫中搜尋同種的序列，證實ORF的身份。

使用Vectorette套組(Genosys Biotechnologies, The Woodlands, TX)，獲得每個基因額外的側面序列。根據製造者建議的草案，製備Vectorette庫。使用Perkin Elmer Applied Biosystems GeneAmp XL PCR套組組份，利用下列的反應條件，產生Vectorette PCR產物。使用3.3X XL緩衝溶液II (PE Applied Biosystems)、200 μ M dNTPs、適當的引子各25微微莫耳(下示)、0.8 mM MgCl₂、0.5單位rTth DNA

五、發明說明 (76)

聚合酶、XL(PE Applied Biosystems)和1微升適當的 vectorette庫建立50微升反應。循環條件為94°C 1.5分鐘；接著是94°C 20秒，60°C 45秒，72°C 4分鐘的35次循環；以及最後保持在72°C下7分鐘。每個庫的第二個引子為製造者的 vectorette引子。

表 5

基因	Vectorette庫	引子(們)
atpG	BglII, HindIII	TEF217 GAAGCCGCCATACGCTCTTGGG 序列識別186號
	ClaI	TEF218 GTTGCTTCCTTTGCCTGCACTGG 序列識別187號
guaB	EcoRI	TEF265 GGCTCAGAAACAATACCACTTTCA 序列識別188號
	HindIII, TaqI	TEF268 GCACCAAAGCAGAATTTGTCC 序列識別189號
pnp	ClaI, HincII	TEF219 GGTGATGATGTCGATGATAGTCCC 序列識別190號
	TaqI	TEF220 GGCGTATTAGCCGTGATGCCAACC 序列識別191號
	BamHI	TEF286 GACCACTTAGGCGATATGGACTT 序列識別192號
purF	TaqI	TEF271 ACCATCATAAATCGCCTGATTC 序列識別193號
		TEF292 ACCTGCGGCATCTTGTCTC 序列識別194號
	HincII	TEF274 ACGGGTTTATTTTGCCTCTG 序列識別195號
yjfF	ClaI	TEF221 CGCCGGTTTCAGGATTCACGGG 序列識別196號
	EcoRV	TEF281 CTGAACAACGTGAAAGCCAT 序列識別197號

五、發明說明 (77)

按照上述以譜帶純化 Vectorette PCR 產物，並定序。分別在序列識別 166、168、170、172 和 174 號中陳述 atpG、guaB、pnp、purF 和 yjgF 基因的多核苷酸序列。分別在序列識別 167、169、171、173 和 175 號中陳述由這些基因編碼的多肽。

對熟諳此藝者而言，預期在本發明中發生許多修改和變化，如同在上文解釋性之實例中陳述的。最後，應該只將在附錄之申請專利範圍中發表的這類限制，放置在本發明中。

裝

訂

線

五、發明說明 (78)

序列一覽表

<110> Lowery E., David, et al.

<120> 抗-細菌疫苗組合物

<130> 28341/00435

<140> 09/809,665

<141> 2001-03-15

<150> 60/153,453

<151> 1999-09-10

<150> 60/128,689

<151> 1999-04-09

<150> 09/545,199

<151> 2000-04-06

<160> 197

<170> PatentIn Ver. 2.0

<210> 1

<211> 1112

<212> DNA

<213> 敗血性巴斯德桿菌

<220>

<221> CDS

<222> (210)..(1001)

<220>

<223> atpB

<220>

<221> misc_特徵

<222> 1099

<223> n=A或T或G或C

<220>

<221> misc_特徵

<222> 1104

<223> n=A或T或G或C

<400> 1

```

gtcaacaaca ttttatggtg gagaggccgt taaatttata tccacaattt ttttgattgt 60
acttgctttt aaactgttca attcaatgca ttttattgca ttttttggtg gatattttat 120
aacaatagtt ttaaacaata ttcttccatt ttttataagt aagtacttaa atataaagca 180
ttttcataaa tatcaataaa ggattagtt atg gca gca gag ctt aca aca gcg 233
Met Ala Ala Glu Leu Thr Thr Ala
1 5
gga tat att ggg cac cat tta gca ttc ttg aaa aca ggg gat tct ttc 281
Gly Tyr Ile Gly His His Leu Ala Phe Leu Lys Thr Gly Asp Ser Phe
10 15 20

```

五、發明說明 (79)

tgg cat gtt cat tta gat acc ctt cta ttt tca att att tca ggt gca	329
Trp His Val His Leu Asp Thr Leu Leu Phe Ser Ile Ile Ser Gly Ala	
25 30 35 40	
att ttt ctt ttt gtt ttt tca aaa gtt gca aaa aaa gca acg ccg ggt	377
Ile Phe Leu Phe Val Phe Ser Lys Val Ala Lys Lys Ala Thr Pro Gly	
45 50 55	
gtg cct agc aag atg caa tgt ttt gtt gag ata atg gtt gat tgg att	425
Val Pro Ser Lys Met Gln Cys Phe Val Glu Ile Met Val Asp Trp Ile	
60 65 70	
gat ggg atc gta aaa gaa aat ttc cat ggt cct cgt cat gct gtt gga	473
Asp Gly Ile Val Lys Glu Asn Phe His Gly Pro Arg His Ala Val Gly	
75 80 85	
cca tta gca tta act att ttc tgc tgg gta ttc att atg aat gct atc	521
Pro Leu Ala Leu Thr Ile Phe Cys Trp Val Phe Ile Met Asn Ala Ile	
90 95 100	
gat ttg atc cca gta gat ttc cta cct caa tta gcc cat tta ttt ggt	569
Asp Leu Ile Pro Val Asp Phe Leu Pro Gln Leu Ala His Leu Phe Gly	
105 110 115 120	
att gaa tac tta aga gct gtt cca aca gca gat atc agt gga aca tta	617
Ile Glu Tyr Leu Arg Ala Val Pro Thr Ala Asp Ile Ser Gly Thr Leu	
125 130 135	
ggc tta tca att ggt gtc ttc ttc tta att att ttc tat aca atc aaa	665
Gly Leu Ser Ile Gly Val Phe Phe Leu Ile Ile Phe Tyr Thr Ile Lys	
140 145 150	
tca aaa ggt atg agt ggc ttt gtt aaa gaa tat acg ctt cat cct ttt	713
Ser Lys Gly Met Ser Gly Phe Val Lys Glu Tyr Thr Leu His Pro Phe	
155 160 165	
aat cat cct ttg tta att ccg gtt aac tta gcg ctt gaa tca gtc aca	761
Asn His Pro Leu Leu Ile Pro Val Asn Leu Ala Leu Glu Ser Val Thr	
170 175 180	
tta tta gca aaa cct gtt tct ttg gcg ttc cgt ctt ttc ggg aat atg	809
Leu Leu Ala Lys Pro Val Ser Leu Ala Phe Arg Leu Phe Gly Asn Met	
185 190 195 200	
tat gca ggt gaa ctt atc ttt att ctt att gca gtg atg tac atg gca	857
Tyr Ala Gly Glu Leu Ile Phe Ile Leu Ile Ala Val Met Tyr Met Ala	
205 210 215	
aat aat ttt gca ctt aat tca atg ggt att ttc atg cat ttg gct tgg	905
Asn Asn Phe Ala Leu Asn Ser Met Gly Ile Phe Met His Leu Ala Trp	
220 225 230	
gct att ttc cat att ctt gtg att acc tta caa gca ttt att ttt atg	953
Ala Ile Phe His Ile Leu Val Ile Thr Leu Gln Ala Phe Ile Phe Met	
235 240 245	
atg ctt aca gtg gtt tat ttg agt atg ggt tat aac aaa gca gaa cac	1001
Met Leu Thr Val Val Tyr Leu Ser Met Gly Tyr Asn Lys Ala Glu His	
250 255 260	
taatttttta taaacaaaac cagaccttgg gtctaaattt caatcttatg gagaacatta	1061
cggaacactg taattactac aacaatcatc gcatctgnaa tntttcttgc t	1112

五、發明說明 (80)

<210> 2
<211> 264
<212> 蛋白質
<213> 敗血性巴斯德桿菌

<400> 2

```
Met Ala Ala Glu Leu Thr Thr Ala Gly Tyr Ile Gly His His Leu Ala
  1           5           10           15

Phe Leu Lys Thr Gly Asp Ser Phe Trp His Val His Leu Asp Thr Leu
          20           25           30

Leu Phe Ser Ile Ile Ser Gly Ala Ile Phe Leu Phe Val Phe Ser Lys
          35           40           45

Val Ala Lys Lys Ala Thr Pro Gly Val Pro Ser Lys Met Gln Cys Phe
          50           55           60

Val Glu Ile Met Val Asp Trp Ile Asp Gly Ile Val Lys Glu Asn Phe
          65           70           75           80

His Gly Pro Arg His Ala Val Gly Pro Leu Ala Leu Thr Ile Phe Cys
          85           90           95

Trp Val Phe Ile Met Asn Ala Ile Asp Leu Ile Pro Val Asp Phe Leu
          100          105          110

Pro Gln Leu Ala His Leu Phe Gly Ile Glu Tyr Leu Arg Ala Val Pro
          115          120          125

Thr Ala Asp Ile Ser Gly Thr Leu Gly Leu Ser Ile Gly Val Phe Phe
          130          135          140

Leu Ile Ile Phe Tyr Thr Ile Lys Ser Lys Gly Met Ser Gly Phe Val
          145          150          155          160

Lys Glu Tyr Thr Leu His Pro Phe Asn His Pro Leu Leu Ile Pro Val
          165          170          175

Asn Leu Ala Leu Glu Ser Val Thr Leu Leu Ala Lys Pro Val Ser Leu
          180          185          190

Ala Phe Arg Leu Phe Gly Asn Met Tyr Ala Gly Glu Leu Ile Phe Ile
          195          200          205

Leu Ile Ala Val Met Tyr Met Ala Asn Asn Phe Ala Leu Asn Ser Met
          210          215          220

Gly Ile Phe Met His Leu Ala Trp Ala Ile Phe His Ile Leu Val Ile
          225          230          235          240

Thr Leu Gln Ala Phe Ile Phe Met Met Leu Thr Val Val Tyr Leu Ser
          245          250          255

Met Gly Tyr Asn Lys Ala Glu His
          260
```

<210> 3
<211> 1972
<212> DNA
<213> 敗血性巴斯德桿菌

五、發明說明 (81)

<220>
<221> CDS
<222> (364)..(1230)

<220>
<223> atpG

```

<400> 3
agcgggccat ttggctcagt tcggcttcgg attcttatga tgcacacgta agcaattatc 60
acatgggtcaa aaagtaactg aattattgaa acaaaaccaa tactctccgt tatctgtagc 120
acaacaagca ttagtggttat ttgcagtaga gtttggttac ttagaagaag tggacttaga 180
tcgtattggg tcatttgaat cagcactttt agagtatgct aaccataact atgctgattt 240
tatgcgtgag ttaacccaat ctggcaatta caatgatgaa attaaagagt cattaaaagg 300
cattttggat agcttcaaag caaacagtgc gtggtaagtt aacactttaa atggagagac 360
aaa atg gca ggt gct aaa gag ata aga acc aaa atc gcg agt gta aaa 408
Met Ala Gly Ala Lys Glu Ile Arg Thr Lys Ile Ala Ser Val Lys
1 5 10 15
agt aca caa aaa att act aaa gcg atg gaa atg gtt gct gcc tcg aaa 456
Ser Thr Gln Lys Ile Thr Lys Ala Met Glu Met Val Ala Ala Ser Lys
20 25 30
atg cgt aaa acg caa gaa cgc atg tct tct tca cgc cct tat tca gaa 504
Met Arg Lys Thr Gln Glu Arg Met Ser Ser Ser Arg Pro Tyr Ser Glu
35 40 45
aca ata cgt aac gtg att agc cac gtt tcc aaa gca acg att ggt tac 552
Thr Ile Arg Asn Val Ile Ser His Val Ser Lys Ala Thr Ile Gly Tyr
50 55 60
aag cat cca ttt tta gtg gat cgc gaa gta aaa aaa gtg ggc atg att 600
Lys His Pro Phe Leu Val Asp Arg Glu Val Lys Lys Val Gly Met Ile
65 70 75
gtt gtg tcc aca gat cgt ggt ctt tgt ggt ggc tta aac gtg aac ttg 648
Val Val Ser Thr Asp Arg Gly Leu Cys Gly Gly Leu Asn Val Asn Leu
80 85 90 95
ttt aaa act gta tta aat gaaatg aaa gaa tgg aaa gaa aaa gat gtt 696
Phe Lys Thr Val Leu Asn Glu Met Lys Glu Trp Lys Glu Lys Asp Val
100 105 110
tcc gtt caa ttg agt tta atc ggt tct aaa tct atc aac ttt ttc caa 744
Ser Val Gln Leu Ser Leu Ile Gly Ser Lys Ser Ile Asn Phe Phe Gln
115 120 125
tct ttg gga att aaa att tta acc caa gat tca ggt att ggt gat act 792
Ser Leu Gly Ile Lys Ile Leu Thr Gln Asp Ser Gly Ile Gly Asp Thr
130 135 140
ccc tct gtt gag cag tta att ggt tca gtc aat tct atg att gat gct 840
Pro Ser Val Glu Gln Leu Ile Gly Ser Val Asn Ser Met Ile Asp Ala
145 150 155
tat aaa aaa ggg gaa gta gat gtt gtg tat tta gtt tat aac aaa ttt 888
Tyr Lys Lys Gly Glu Val Asp Val Val Tyr Leu Val Tyr Asn Lys Phe
160 165 170 175

```

五、發明說明 (82)

att aac acg ~~atg~~ tcg caa aag cca gta ttg gaa aaa tta att cca tta 936
Ile Asn Thr Met Ser Gln Lys Pro Val Leu Glu Lys Leu Ile Pro Leu
180 185 190

cca gaa tta gat aat gat gaa tta ggc gaa aga aaa caa gtt tgg gat 984
Pro Glu Leu Asp Asn Asp Glu Leu Gly Glu Arg Lys Gln Val Trp Asp
195 200 205

tat att tac gaa cct gat gcg aaa gta tta tta gat aat tta ttg gtt 1032
Tyr Ile Tyr Glu Pro Asp Ala Lys Val Leu Leu Asp Asn Leu Leu Val
210 215 220

cgt tat tta gaa tct cag gtt tat caa gca gca gtt gaa aac ctt gct 1080
Arg Tyr Leu Glu Ser Gln Val Tyr Gln Ala Ala Val Glu Asn Leu Ala
225 230 235

tct gag caa gcc gct cga atg gtc gcc atg aaa gca gca aca gat aac 1128
Ser Glu Gln Ala Ala Arg Met Val Ala Met Lys Ala Ala Thr Asp Asn
240 245 250 255

gca ggt aac tta att aat gag tta cag tta gtc tat aac aaa gct cgt 1176
Ala Gly Asn Leu Ile Asn Glu Leu Gln Leu Val Tyr Asn Lys Ala Arg
260 265 270

caa gca agt att aca aat gaa tta aat gaa att gtt gcc ggt gca gca 1224
Gln Ala Ser Ile Thr Asn Glu Leu Asn Glu Ile Val Ala Gly Ala Ala
275 280 285

gca att taacaaatag aggatcggtat atggcaactg gaaaaattgt acaaatcatc 1280
Ala Ile

gggtgagggtta ttgacgttga attcccacaa gatgcagtac caaaagtata tgatgcctta 1340

aatgttgaaa cagggtttagt acttgaagtt caacaacaat taggtgggtgg tgtagttcgc 1400

tgtatcgcaa tgggatcatc tgatggatta aaacgcgggt taagcgtaac aaatacgaat 1460

aacccaatttt ctgttccagt gggaacgaaa acattgggtc gtatcatgaa cgtattgggt 1520

gaaccaatcg atgagcaagg tgaaatcggg gcagaagaga attgggtctat tcaccgtgcg 1580

ccaccaagtt atgaagaaca atctaacagt actgaacttt tagaaacggg aattaaagtt 1640

atcgacttag tttgtccgtt tgcgaaaggg ggtaaagtag gtttattcgg tgggtgcgggt 1700

gtcggtaaaa ccgtcaatat gatggaatta atccgtaaca tcgcaattga gcactcaggt 1760

tactctgtct ttgcgggggt aggtgagcgt acgcgtgaag gtaacgactt ctatcatgag 1820

atgaaagact ctaacgtatt agataaagtg tctcttgttt atgggtcaaat gaacgagcca 1880

ccaggtaacc gtttacgtgt ggcattaaca ggcttaacta tggcggaaaa attccgtgat 1940

gaaggtcgtg atgtcttatt cttcgttgat aa 1972

<210> 4
<211> 289
<212> 蛋白質
<213> 敗血性巴斯德桿菌

<400> 4
Met Ala Gly Ala Lys Glu Ile Arg Thr Lys Ile Ala Ser Val Lys Ser

五、發明說明 (83)

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

Ile

- <210> 5
- <211> 1357
- <212> DNA
- <213> 敗血性巴斯德桿菌
- <220>

五、發明說明 (84)

<221> CDS
<222> (1) .. (813)

<220>
<223> cap5E

<400> 5
gtc gac tat att tat cat gct gcc gca tta aag caa gtg cct tca tgc 48
Val Asp Tyr Ile Tyr His Ala Ala Ala Leu Lys Gln Val Pro Ser Cys
1 5 10 15
gag ttt tat ccg tta gag gca gtg aaa acc aat att tta ggt acg gca 96
Glu Phe Tyr Pro Leu Glu Ala Val Lys Thr Asn Ile Leu Gly Thr Ala
20 25 30
aat gtc tta gaa gcc gcc atc caa aac cag ata aaa cgc gtc gtc tgt 144
Asn Val Leu Glu Ala Ala Ile Gln Asn Gln Ile Lys Arg Val Val Cys
35 40 45
ctt agc aca gat aaa gcg gtg tac cca att aat gcg atg ggc att tct 192
Leu Ser Thr Asp Lys Ala Val Tyr Pro Ile Asn Ala Met Gly Ile Ser
50 55 60
aaa gca atg atg gaa aaa gtc atc atc gca aaa tcg cgt aac cta gaa 240
Lys Ala Met Met Glu Lys Val Ile Ile Ala Lys Ser Arg Asn Leu Glu
65 70 75 80
ggc aca cca acg aca atc tgt tgt act cgc tat ggc aat gtc atg gca 288
Gly Thr Pro Thr Thr Ile Cys Cys Thr Arg Tyr Gly Asn Val Met Ala
85 90 95
tcg cgt ggt tcg gtt atc cca tta ttt gtc gat caa ata cgt caa ggc 336
Ser Arg Gly Ser Val Ile Pro Leu Phe Val Asp Gln Ile Arg Gln Gly
100 105 110
aag cct ttt act att act gat cct gag atg aca cgc ttt atg atg aca 384
Lys Pro Phe Thr Ile Thr Asp Pro Glu Met Thr Arg Phe Met Met Thr
115 120 125
ttg gaa gat gct gtg gat tta gtc cta tat gca ttt aaa aat ggt caa 432
Leu Glu Asp Ala Val Asp Leu Val Leu Tyr Ala Phe Lys Asn Gly Gln
130 135 140
aat ggt gat gtt ttt gta caa aaa gcc ccc gca gca acc att ggt acc 480
Asn Gly Asp Val Phe Val Gln Lys Ala Pro Ala Ala Thr Ile Gly Thr
145 150 155 160
ctt gcc aaa gca att acc gaa tta tta tct gtc cca aat cac cct att 528
Leu Ala Lys Ala Ile Thr Glu Leu Leu Ser Val Pro Asn His Pro Ile
165 170 175
tcc att ata ggt acg cgt cat gga gag aaa gca ttc gaa gct tta tta 576
Ser Ile Ile Gly Thr Arg His Gly Glu Lys Ala Phe Glu Ala Leu Leu
180 185 190
agc cgt gaa gaa atg gtt cat gca att aat gaa ggt aat tat tat cgc 624
Ser Arg Glu Glu Met Val His Ala Ile Asn Glu Gly Asn Tyr Tyr Arg
195 200 205
atc cca gcc gat caa cgc agt tta aat tac agt aaa tat gtc gaa aaa 672
Ile Pro Ala Asp Gln Arg Ser Leu Asn Tyr Ser Lys Tyr Val Glu Lys
210 215 220

裝
訂
線

五、發明說明 (85)

ggg gaa cca aaa att acc gaa gtc acc gac tac aac tca cat aat act 720
Gly Glu Pro Lys Ile Thr Glu Val Thr Asp Tyr Asn Ser His Asn Thr
225 230 235 240

gag cgt ttg act gtc aag gaa atg aag cag tta ctg ctt aaa ctt gaa 768
Glu Arg Leu Thr Val Lys Glu Met Lys Gln Leu Leu Leu Lys Leu Glu
245 250 255

ttc ata cag aaa atg att gag ggt gaa tac atc tca ccg gag gta 813
Phe Ile Gln Lys Met Ile Glu Gly Glu Tyr Ile Ser Pro Glu Val
260 265 270

taaaaatgaa agtcttagta actggttcaa atggttttat tgcgaaaaat ctgattcagt 873

ctttatctga ggaacaagat attgagattt tatgttatca ccgtcaatcc tctgagaaaa 933

cgcttattca tcatgtattg agtgctgatt ggattattca tcttgccgggt gcgaatcgtc 993

cacctgaaga acaagaattt atgacatcaa atacacaatt gacggaaaaa atttgccgta 1053

ttttacagcg tcatcagaaa aaaacgcctt tggttatattc ctctagcatt caagtagaaa 1113

gtcccaaaat aagtacttat tcgcaaacca aattagaaag tgaatatcat gttcatcaat 1173

tacataaaga aaatggtaat ccgatttata tctgccgttt agctaattgtc tttggcaaat 1233

ggtcacgacc tactataac tcggtagtcg ccacattttg ccataactta attcatgatt 1293

taccatcga aattcatgat catactgcag aaataaggct catttatatt gatgatgtcg 1353

ttga 1357

<210> 6
<211> 271
<212> 蛋白質
<213> 敗血性巴斯德桿菌

<400> 6
Val Asp Tyr Ile Tyr His Ala Ala Ala Leu Lys Gln Val Pro Ser Cys
1 5 10 15

Glu Phe Tyr Pro Leu Glu Ala Val Lys Thr Asn Ile Leu Gly Thr Ala
20 25 30

Asn Val Leu Glu Ala Ala Ile Gln Asn Gln Ile Lys Arg Val Val Cys
35 40 45

Leu Ser Thr Asp Lys Ala Val Tyr Pro Ile Asn Ala Met Gly Ile Ser
50 55 60

Lys Ala Met Met Glu Lys Val Ile Ile Ala Lys Ser Arg Asn Leu Glu
65 70 75 80

Gly Thr Pro Thr Thr Ile Cys Cys Thr Arg Tyr Gly Asn Val Met Ala
85 90 95

Ser Arg Gly Ser Val Ile Pro Leu Phe Val Asp Gln Ile Arg Gln Gly
100 105 110

Lys Pro Phe Thr Ile Thr Asp Pro Glu Met Thr Arg Phe Met Met Thr
115 120 125

五、發明說明 (86)

Leu Glu Asp Ala Val Asp Leu Val Leu Tyr Ala Phe Lys Asn Gly Gln
130 135 140

Asn Gly Asp Val Phe Val Gln Lys Ala Pro Ala Ala Thr Ile Gly Thr
145 150 155 160

Leu Ala Lys Ala Ile Thr Glu Leu Leu Ser Val Pro Asn His Pro Ile
165 170 175

Ser Ile Ile Gly Thr Arg His Gly Glu Lys Ala Phe Glu Ala Leu Leu
180 185 190

Ser Arg Glu Glu Met Val His Ala Ile Asn Glu Gly Asn Tyr Tyr Arg
195 200 205

Ile Pro Ala Asp Gln Arg Ser Leu Asn Tyr Ser Lys Tyr Val Glu Lys
210 215 220

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

Glu Arg Leu Thr Val Lys Glu Met Lys Gln Leu Leu Leu Lys Leu Glu
245 250 255

Phe Ile Gln Lys Met Ile Glu Gly Glu Tyr Ile Ser Pro Glu Val
260 265 270

<210> 7
<211> 6132
<212> DNA
<213> 敗血性巴斯德桿菌

<220>
<221> CDS
<222> (4032) .. (4727)

<220>
<223> devB

<400> 7
gtcaacaatt accgcacttt agtggagtaa ataacaatgg cgaaaaagaa taacgggcat 60
gaaaaagagg atgatgttcg cctagataaa tggccttggg ctgcccgttt ttataaaaca 120
cgtacttttag caaaagacat gattgatggc ggtaaagtgc attataatgg gcagcgacacg 180
aaacccaata aaacggttga aattggtggt gtgatcaaac ttcgtcaagg taatgacgaa 240
aaagaagtgg aagtgccttc gctttctacg caacgtcgtg gggcgccaga agcacaattg 300
ttgtatcaag aaacagaaaa aagccttgaa caacgtgcga aaatggcgat tgcacgtaag 360
attaatgcat taacgatgcc gcatcctgat cgtcgcccga ataaaaaaga gcggcgtgat 420
ttattgaaat ttaaacatca agatagcttt tcatcttgat gatgtgatctt acctactttt 480
cttattaaag aaaggaatat ggggaagctg tgtgcttgcc cttaacctga ataaaggctt 540
tttatgacag acaacacaga caatgacaaa ctgcatcgct accttttcca agatcgcgcg 600
gtgcgcggtg aatgggtacg gttaaaccaa acgtttactg atacgttaaa tacacatcaa 660

五、發明說明 (87)

tatccgaaag tcatccaaaa cttgctcggg gaaatgatgg tggcgaccag tttattgacg 720
gcgacgttaa aatttgaagg ggatattact gttcaagtac aagggtgatgg accattaaaa 780
ttagcattag ttaatggcaa tcatcagcag caaattcgcg cattagcgcg tttacaagcg 840
gatgtcagtg atgatatgag tttggcgcaa ttagtcggga aaggggtatt agtgattacg 900
attgcaccga cagaaggcga gcgttaccaa ggcggtgattg cgttagataa gccaacatt 960
actgcctgtc ttgaagatta ttttgtgcgt tcagaacaat tgcaaacca gcttattatt 1020
cgtgctggcg aatttgaagg acaacctgtg gcagccggta tgttgttaca aattatgccg 1080
gacgggttcag gttctccaga ggattttgaa cacttagcaa cattggcagc gacggtgaaa 1140
gaggaagaac tatttggttt aacagcagaa gaattattgt accgtttata tcatgaagag 1200
cgtgttgaaa ttttcccttc acagccgatc tcatttttct gtggctgctc acaagaacgt 1260
tctggtgccg cattgttggt gatttctgat gaagaattgg atgaagtctt ggcagagcat 1320
aacggtacca ttgatatgca gtgtgaatgt tgtgggacgc attatttctt caataaagca 1380
gcgattatgc aattgaaagt agaaaaataa gtcttggtat tatggatttt gttgcaggct 1440
atcaagatat ttgatagcct gtttttctct tgcagcaaac gattttatga gaaaaacgcc 1500
gtcttctcac acagtagttt aggtattgca tagcatgaag cgggaaacta tgtttggcgc 1560
ttgtctgttt aaaaaggtta tctatgttag cactttcacc atcattactt gaaaaaacac 1620
ttgaaatcgc ggatcaagca ggagattttt taacgcgatt ttataccgac tcagggcaaa 1680
atgcgttagc aattcaaacc aaacaagata acacgccagt gactgccgtg gatttatttt 1740
tgagtcaatt ttaattgaa aaattgaccg cactgacacc tgagggtccg attctttccg 1800
aagagagttg taaaatcccc ttacaagatc gtgcacattg ggcagaatat tgggtaattg 1860
accactcga tggaacccaa caatttatta atcgacccga tcaattttcc attttgatta 1920
cacttgctca acacaatcaa cccgtcttaa gcattaccca tgcccttatt ttacaaacga 1980
cctattatgc tatgcagggc tttggtgctt acagaaggca gggcaatcaa caagaaaagc 2040
taaacaacca agcgcgacct gagcagcgaa aaatcaaaat tgctgtggga gtcgggggag 2100
ttgaacggaa aattcagccc ttgttaaatt cagcttatca atatgaattt ttgggttatg 2160
gttcaagtgg cttaaaaggc ggcttagtgg ccgatggcac ttgtgattgc tatattcgag 2220
taggaaaaac ggggtgaatg gatacggggg cggctgaaat cctcttacgt gaaatgggag 2280
gtgctgtgtt tgactttgct tttcaaccgc ttagctataa tcagagagaa agttttatta 2340
atcccaattt tgtgatggtc gcgaatacag aatttgattg gcagaaaatt tttcaatttc 2400
attcgactta ggcattattt attataagat gcgatattt atgacctta ttttaacaa 2460
acggatttca ggaaaaaat gaaaattgaa gcagacaaca attgtattgt aatttttggg 2520
gcatcagggt atttaactta tcgtaaattt attcctgcac tctataactt atataaaatc 2580

五、發明說明 (88)

ggtcgtttga ctagcattt ctccgtgtta ggtgtggcaa gaacggaatt aagtgatgag 2640
ggtttccgtg aaaaaatgcg ccaagcgttg atcaaaagtg aaaaagcgaa tggcgaaaca 2700
ctcgatcaat tttgtagcca cttttattat caggcattaa ataccgcgga tgctgccgat 2760
tatggcaagt taattcctcg tcttgatgac ttacatgata aatatcaaac ttgtggtaac 2820
acactttact atttatctac gccgccaagc ctttatggcg tgattccaga atgccttgcg 2880
gcacatgggt taaatactga agagtttggc tggaagcggg taattgtgga aaaaccgttt 2940
ggttatgata tacgcacggc aaaagaactc gatattcaaa ttcaccgttt ctttgatgaa 3000
caccaaattt atcgatttga ccaactatctt ggtaaagaaa cggttcaaaa tctgcttggtg 3060
ttgcgttttt ctaatggatg gtttgaacca ctctggaacc gtaatttcat tgattatatt 3120
gaaatcacgg gcgcagaatc tatcgggtga gaagagcgtg gtggttatta cgatgattct 3180
ggcgcaatgc gtgatatgtt ccaaaaccat ttgttgcaag tgtagccat ggttgcgatg 3240
gagccaccag caattattaa tgccgactca atgcgtgatg aagtggcaaa agtcttgat 3300
tgtttacatc cattaagtga ggatgactta gaaaatcatt tagtcttagg gcaatatacg 3360
gcaggcacag ttgaagggtga agcgggttaag ggctacttac aggaaaaagg tgtgccggca 3420
gagtctaata cggaaactta catggcatta cgttggtgaaa ttgacaactg gcgttgggcg 3480
ggtgtgccat tttatgtgcg tactgggaaa cggttaccaa gtcgagtgac cgaaattgtg 3540
attcatttca aaaccacacc acatccggta tttagccaaa aagcaccaga aaacaaatta 3600
attatccgta ttcaaccga tgaagcgatt tcgatgcgtt ttggtttgaa aaaaccggga 3660
gcagggtttg aagcaaaaga agtgtcgatg gatttccgtt atgcggatct tgcctacca 3720
agcttactga ccgcttatga gcgtttatta ttggattcta tgaaaggcga tgccactttg 3780
tttgcgcgta ctgatgcgtt acatgcctgt tggcagtttg tggagccgat ttacaatat 3840
aaagcacaaa atgggcgtgt ttatgagtat gaagccggta cttggggacc gacagaagcc 3900
gacaaactga tcgcaaaaac gggtcgtgtt tggcgtaaac caagtggatt aatgaaaaag 3960
aaagtgtaat gtccgcctct ttcgtaagaa atgcgagggg ctaatgtgag cagattgagt 4020
aaggaaagat c atg aat aca atc att ttt gac agt gca cag cat gcc gta 4070
Met Asn Thr Ile Ile Phe Asp Ser Ala Gln His Ala Val
1 5 10
gag aaa att gca caa gaa ttg tta gcg tat agc tta gaa ggt cgc cct 4118
Glu Lys Ile Ala Gln Glu Leu Leu Ala Tyr Ser Leu Glu Gly Arg Pro
15 20 25
gtg cat att tcc tta tcc gga ggc tca acg ccg aaa ttg tta ttt aaa 4166
Val His Ile Ser Leu Ser Gly Gly Ser Thr Pro Lys Leu Leu Phe Lys
30 35 40 45
act tta gct caa gca ccg tat aac acc gag att caa tgg aaa aat ttg 4214
Thr Leu Ala Gln Ala Pro Tyr Asn Thr Glu Ile Gln Trp Lys Asn Leu
50 55 60

五、發明說明 (89)

cat ttt tgg tgg ggc gat gat cgt atg gtg cca cca acc gat cca gaa	4262
His Phe Trp Trp Gly Asp Asp Arg Met Val Pro Pro Thr Asp Pro Glu	
65 70 75	
agt aat tac ggc gag gtg caa aaa ttg tta ttc gat cat att cag atc	4310
Ser Asn Tyr Gly Glu Val Gln Lys Leu Leu Phe Asp His Ile Gln Ile	
80 85 90	
cct gca gaa aat att cac cgc att cgt ggt gaa gcc ccc gtt gag agt	4358
Pro Ala Glu Asn Ile His Arg Ile Arg Gly Glu Ala Pro Val Glu Ser	
95 100 105	
gaa ctt cac cgt ttt gaa caa gcg cta agt gcg gtc att cct ggg caa	4406
Glu Leu His Arg Phe Glu Gln Ala Leu Ser Ala Val Ile Pro Gly Gln	
110 115 120 125	
gtt ttt gat tgg att att ttg ggc atg gga acg gac ggg cac acg gcc	4454
Val Phe Asp Trp Ile Ile Leu Gly Met Gly Thr Asp Gly His Thr Ala	
130 135 140	
tca tta ttc ccg cat caa acc gat ttt gac gat cct cat ttc gcc gtg	4502
Ser Leu Phe Pro His Gln Thr Asp Phe Asp Asp Pro His Phe Ala Val	
145 150 155	
atc gcg aaa cac cct gaa aca ggg caa att cgt att tca aaa aca gcg	4550
Ile Ala Lys His Pro Glu Thr Gly Gln Ile Arg Ile Ser Lys Thr Ala	
160 165 170	
aaa ttg att gaa caa gca aag cgg gtg acc tat ttg gtg aca ggt agc	4598
Lys Leu Ile Glu Gln Ala Lys Arg Val Thr Tyr Leu Val Thr Gly Ser	
175 180 185	
agt aaa gcc gag atc tta aaa gaa att caa act act ccg gca gaa caa	4646
Ser Lys Ala Glu Ile Leu Lys Glu Ile Gln Thr Thr Pro Ala Glu Gln	
190 195 200 205	
ctg cct tat cct gct gcg aaa atc aaa gcg aag cat ggg gtg acg gaa	4694
Leu Pro Tyr Pro Ala Ala Lys Ile Lys Ala Lys His Gly Val Thr Glu	
210 215 220	
tggtat ttg gat aag gat gcg gca aaa tta ctg taatgcgtcg tgagattttt	4747
Trp Tyr Leu Asp Lys Asp Ala Ala Lys Leu Leu	
225 230	
caacattttt gcaaagagac ttgaaacaaa atagaccata gcgttcgttt tcaacgagtg	4807
ctgaaaatga aggctctcgt tgaaaatggc gccatttagt gggtaagctt aaggcttcgct	4867
cagacagcgc tatcaaaagg gtaaaagaat gtatcaactc tattttaatc caccaaaatc	4927
ttcatgggtca ttacgcgttt ggggtgttatt gaaagaactg gcaattcctt ttgagcctaa	4987
aattgtacgt tatttggtatg atttaagtga acaacgccaa caatttaagg cgttttcgcc	5047
gacttcaaaa atcccagtat tgcattgctga tgggtgtgtc atttgggaca gtttagcgat	5107
tatcgagttt ttggcagaaa gttatccgca cgtgtgggag caagataagg cgacaagagc	5167
gtgggtcacgt cctgcttgtg ctgaaatgca ctctggcttt gaaaatttgc gtgaaatgtg	5227
tgatttcgcc ccttttagctc gcaaaccgtt acaagaaatg cccgctgtgt taagccaaga	5287
gctaacaagg cttaatcaat tattagaaga aggggttaaca aatcacactg ggcgatttaa	5347

五、發明說明 (90)

tgcaaacctc ~~g~~agtgtttt ggtcgagtac aatcctcggt gtcttttttc cgtaattcct 5407
atgatgactt tgccgcttat cgtgcggtgt taaatcgttt aactggcttt catagcgoga 5467
ttaaagcggc taatcgccca agcaaattag tgctcacaga aagtcgcat gatattgggt 5527
ttcatgatct caacgtagag acccgcgaag gaaaaacctt aattgacaag ctcaacctac 5587
aatttcctct cggtacatgg ttattaattc aaggacattc tgggtgtaggg aaaacaacct 5647
tgtaagaac cattgcggga ctatggcctt atgctagtgg gacaattcaa cgtccacaac 5707
aagatactct gtttctttct caaaaacctt atttgccaca aggtcgcta cttgatgccc 5767
tattttatcc tgaactggcg cctgaagacg tgaatgagca acaagttata gacatactcg 5827
cgaaagtaca actcgggcat ttaagcgata aactagaaca agaaaatgat tggacacggg 5887
tactctcttt aggtgaacaa caacgtctgt cgtttgctcg cattttattg cataaaccta 5947
ctgttggttt cttagatgaa gccactgcca gcatggatga aggactggaa gatgcatgt 6007
accgcttact gaaagatgaa ctgcctcaga ttactgtgat cagtgttgga caccgttcga 6067
cgtaattcc gcaccattca cagcaattac acattcaata acaagacagg gcgttggtga 6127
gtcga 6132

<210> 8
<211> 232
<212> 蛋白質
<213> 敗血性巴斯德桿菌

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

五、發明說明 (91)

145		150		155		160									
His	Pro	Glu	Thr	Gly	Gln	Ile	Arg	Ile	Ser	Lys	Thr	Ala	Lys	Leu	Ile
				165					170					175	
Glu	Gln	Ala	Lys	Arg	Val	Thr	Tyr	Leu	Val	Thr	Gly	Ser	Ser	Lys	Ala
			180					185					190		
Glu	Ile	Leu	Lys	Glu	Ile	Gln	Thr	Thr	Pro	Ala	Glu	Gln	Leu	Pro	Tyr
		195					200					205			
Pro	Ala	Ala	Lys	Ile	Lys	Ala	Lys	His	Gly	Val	Thr	Glu	Trp	Tyr	Leu
	210					215					220				
Asp	Lys	Asp	Ala	Ala	Lys	Leu	Leu								
225					230										

<210> 9
<211> 2438
<212> DNA
<213> 敗血性巴斯德桿菌

<220>
<221> CDS
<222> (1635) .. (2396)

<220>
<223> dnaA

<400> 9
gacccaatgc ttgccaccgg cggctctatg attgcgacaa tcgatcttct aaaagcgaaa 60
ggctgtaaac acattaaagt gctcgtgtta gtcgccgcgc ctgaaggcat taaagcatta 120
gaagctgcgc accctgatat cgaattatat accgcatcag ttgatagtca cttaaataaa 180
caaggctata ttattccagg tcttggtgat gccggtgata aaatttttgg cactaaataa 240
tcccaacaca agcggcatct tatgccgctt tttccgctt aatttatagc gcttacaatc 300
ttaacagctt gaacactata aaatgaaaag ttaattcaga cagagagttg aaacttaaca 360
tgacaaatca aaatccccct gttcttctag aacaaaatca cgcaaaacaa gccttcggtg 420
ggctacaaat gctttttgtt gccttcggtg ctttagtctt tgttccctg attacgggtt 480
taaagtccaa tactgcctta ttgaccgcag ggattgggac actcttattc caactttgta 540
ctggacgcca agtcccaatt ttcttagcct ctccctttgc ttttattgca ccaattcaat 600
atggcgtggc aacatggggc attgctacta ctatgggggg gctgggtgtt actggactgg 660
tttattttgc cctcagtacg ttagtcaaaa ttaaagggtg tgggtgctta caaaaagtct 720
ttccgccagt agttgttggc cccgttatta tcatcatcgg tatgggactt gcccttgtt 780
ccgtggacat ggcattaggt aaaaacagca cttatcaata taacgatgcc gtattcgttt 840
cgatggcaac attattgaca acgttaggtg ttgcggtgct tgctaaaggc atgatgaaat 900
taattccctat catgtttggt attgtcgtcg gctatctctt ctgcttattc ttaggcttaa 960

ttaatttcca	acgtg	catt	gatgcac	ctt	ggtttagt	ggt	gccagaa	att	actacc	ccctg	1020	
aattttaa	att	agaag	ctatt	ctttatt	tat	taccgatt	g	tatcgcccc	a	gcagttgag	1080	
atgtcgg	tgg	gatcat	ggca	atcag	ttcgg	tgacag	gggaa	agacttc	cta	caaaaacc	1140	
gattacat	c	cacttt	tatta	ggggat	ggta	ttgcaac	gag	tgccgc	ctca	ttcttagg	1200	
gaccac	cta	tacaac	ttat	gctga	agtca	ctgg	tgtgt	catg	cttac	g	cgcaact	1260
accctaaa	at	catgac	atgg	gcagcc	gttt	gggca	attgc	gatttc	cttc	tgtgg	t	1320
tccgggg	cttt	cctctc	tacc	attcca	acta	ttgtc	atggg	tggc	attatg	atgt	tagt	1380
ttgggt	ctat	cgccg	tagt	c	ggtat	gagta	cactg	atccg	tgg	t	taaagt	1440
aagcgc	gtaa	tctgt	gtatt	atttcc	gttg	tgatg	acgtt	tggc	atcg	ggt	t	1500
tgaac	tttg	agaag	tctcc	ttaaa	aggg	atag	tttatg	cgcc	gttgc	gcg	atttt	1560
tcaact	t	cttacc	caaaa	gccaaaa	aaca	cccc	a	taga	agaaa	atcga	taag	1620
ttaagg	g	tta	agtc	ttg	ctt	aac	cct	tca	ttt	ttc	g	1670
		Leu	Leu	Asn	Pro	Ser	Phe	Phe	Val	Tyr	Pro	
		1				5				10		
cct	ttt	ttc	gat	ttt	gta	gg	tgc	ttt	ttg	tta	gaa	1718
Pro	Phe	Phe	Asp	Phe	Val	Gly	Cys	Phe	Leu	Leu	Glu	
		15				20				25		
cct	ttg	cct	att	cat	caa	ctc	gat	gat	gaa	acg	ctg	1766
Pro	Leu	Pro	Ile	His	Gln	Leu	Asp	Asp	Glu	Thr	Leu	
		30				35				40		
ccc	gac	aat	aat	tta	ttg	ttg	ctc	aat	tcg	cta	cgc	1814
Pro	Asp	Asn	Asn	Leu	Leu	Leu	Leu	Asn	Ser	Leu	Arg	
		45				50				55		
tgt	cta	aca	caa	caa	ttt	ttt	tat	att	tgg	ggc	gag	1862
Cys	Leu	Thr	Gln	Gln	Phe	Phe	Tyr	Ile	Trp	Gly	Glu	
			65						70			
aaa	agt	cac	ctc	tta	aaa	ggc	att	act	cat	cat	ttt	1910
Lys	Ser	His	Leu	Leu	Lys	Gly	Ile	Thr	His	His	Phe	
			80					85			90	
cgc	ccc	gct	atc	tat	gtg	ccc	tta	gaa	aaa	tcc	caa	1958
Arg	Pro	Ala	Ile	Tyr	Val	Pro	Leu	Glu	Lys	Ser	Gln	
		95					100				105	
gcg	gta	ctc	gaa	aac	tta	gaa	caa	caa	caa	ttg	gtt	2006
Ala	Val	Leu	Glu	Asn	Leu	Glu	Gln	Gln	Gln	Leu	Val	
		110				115				120		
tta	cag	gca	att	ata	ggc	aat	act	gaa	tgg	gaa	tta	2054
Leu	Gln	Ala	Ile	Ile	Gly	Asn	Thr	Glu	Trp	Glu	Leu	
		125			130				135			
tta	ttt	aat	cgc	ata	aaa	tct	gtt	gaa	aat	aca	ctg	2102
Leu	Phe	Asn	Arg	Ile	Lys	Ser	Val	Glu	Asn	Thr	Leu	
			145						150			
gca	aat	caa	tcc	cca	act	gca	tta	cct	gta	agt	tta	2150

五、發明說明 (93)

Ala Asn Gln Ser Pro Thr Ala Leu Pro Val Ser Leu Pro Asp Leu Ala	
160 165 170	
tca cgt tta cgc tgg gga gaa agc tat caq ctg gtc ccc tta aat gat	2198
Ser Arg Leu Arg Trp Gly Glu Ser Tyr Gln Leu Val Pro Leu Asn Asp	
175 180 185	
caa caa aaa atc cat gta ttg caa aaa aat gca cat caa cgt ggt atc	2246
Gln Gln Lys Ile His Val Leu Gln Lys Asn Ala His Gln Arg Gly Ile	
190 195 200	
gaa ctc ccc gat gaa gta gct aat ttt ctt ttg aaa cgc tta gag cgc	2294
Glu Leu Pro Asp Glu Val Ala Asn Phe Leu Leu Lys Arg Leu Glu Arg	
205 210 215 220	
gat atg aaa acg tta ttt gaa gca cta agt aaa tta gat aaa gca tca	2342
Asp Met Lys Thr Leu Phe Glu Ala Leu Ser Lys Leu Asp Lys Ala Ser	
225 230 235	
tta caa gcc caa cgt aaa tta acg att ccc ttt gta aaa gaa att tta	2390
Leu Gln Ala Gln Arg Lys Leu Thr Ile Pro Phe Val Lys Glu Ile Leu	
240 245 250	
aag cta taaaaaaaga ccacctcttt atcaggtgat ctttcttgtc ga	2438
Lys Leu	

<210> 10
 <211> 254
 <212> 蛋白質
 <213> 敗血性巴斯德桿菌

<400> 10

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

裝
訂
線

五、發明說明 (94)

Pro Thr Ala Leu Pro Val Ser Leu Pro Asp Leu Ala Ser Arg Leu Arg
165 170 175

Trp Gly Glu Ser Tyr Gln Leu Val Pro Leu Asn Asp Gln Gln Lys Ile
180 185 190

His Val Leu Gln Lys Asn Ala His Gln Arg Gly Ile Glu Leu Pro Asp
195 200 205

Glu Val Ala Asn Phe Leu Leu Lys Arg Leu Glu Arg Asp Met Lys Thr
210 215 220

Leu Phe Glu Ala Leu Ser Lys Leu Asp Lys Ala Ser Leu Gln Ala Gln
225 230 235 240

Arg Lys Leu Thr Ile Pro Phe Val Lys Glu Ile Leu Lys Leu
245 250

<210> 11
<211> 2060
<212> DNA
<213> 敗血性巴斯德桿菌

<220>
<221> CDS
<222> (856)..(1389)

<220>
<223> dsbB

<400> 11
gaattcttctt tacgtatgct ccagtcacg ttgccagttc tcatttgttg tttagtgaac 60
tgcttcttag tggaaaaatt tgggtgattt ggctatggcg ccaaattgcc acgtaaagta 120
tggggcatct tggcaaagtt tgatcgcaat aatcaacaaa aaatgtcacg acaagatcgt 180
ttgaaacttt ttgtgcaagc ttaattgggt atttggttgg ttgttggaact cgcattccat 240
ctcgccgccc tgggtatcat tggtttaacg gtgattattt tggctacttc attttgtggg 300
gtcaccagcg agcatgctat tggtaaagcc ttccaggaat ccttaccctt cacagcattg 360
ttagtggtgt tcttctcggt tgttgccgtc atcattgacc aacatctgtt tgcgccaatt 420
attcagtttg tgctggctgc cagtgaacat actcagcttg ctcttttcta tatttttaac 480
ggtttgttat ccgccatttc agataatgtg ttgttggtcca cagtttatat caatgaaacc 540
aaagcggcat tagaggctgg cttaattgct caaccacaat atgaattact ggcagtagca 600
attaataccg gtaccaatct tcttctgtt gcaaccccaa atggtaagc cgcattctta 660
tttttattga cctcatcact ggcaccatta attcgtcttc cttatggtag aatggtttat 720
atggcattgc cttataccat cgtattatcc tgtattgggt tattgactgt ggaatatatt 780
ttgcctggcg caaccaatgt gctcattcaa attggtttat taaaaccaat gtaatgacaa 840
gtaaaaggag gaaac atg cta agc ttt ttt aag aca ctc tca aca aaa cga 891
Met Leu Ser Phe Phe Lys Thr Leu Ser Thr Lys Arg
1 5 10

五、發明說明 (95)

agt gca tgg ttt cta ttg ttt agc tca gct tta cta tta gag gct atc 939
Ser Ala Trp Phe Leu Leu Phe Ser Ser Ala Leu Leu Leu Glu Ala Ile
15 20 25

gct ctt tat ttt caa cat ggc atg ggg ctc gcc cct tgt gtc atg tgt 987
Ala Leu Tyr Phe Gln His Gly Met Gly Leu Ala Pro Cys Val Met Cys
30 35 40

att tac gag agg gta gct att ctt ggc att gct ttc tcc ggt tta ttg 1035
Ile Tyr Glu Arg Val Ala Ile Leu Gly Ile Ala Phe Ser Gly Leu Leu
45 50 55 60

ggg tta ctc tac ccg agt tgc atg ctt ttg cgc ctt gtg gcg tta tta 1083
Gly Leu Leu Tyr Pro Ser Ser Met Leu Leu Arg Leu Val Ala Leu Leu
65 70 75

att ggt tta agc agt gca atc aaa ggc tta atg att agc atc acc cat 1131
Ile Gly Leu Ser Ser Ala Ile Lys Gly Leu Met Ile Ser Ile Thr His
80 85 90

tta gat cta caa ctt tac cct gca cct tgg aaa caa tgt tca gcg gtg 1179
Leu Asp Leu Gln Leu Tyr Pro Ala Pro Trp Lys Gln Cys Ser Ala Val
95 100 105

gca gaa ttt ccc gag act tta ccc tta gat cag tgg ttt cct gca ctc 1227
Ala Glu Phe Pro Glu Thr Leu Pro Leu Asp Gln Trp Phe Pro Ala Leu
110 115 120

ttc ctc cct tca ggc tca tgc agt gaa gta aca tgg caa ttt ctc ggc 1275
Phe Leu Pro Ser Gly Ser Cys Ser Glu Val Thr Trp Gln Phe Leu Gly
125 130 135 140

ttt tct atg gtg caa tgg atc gtc gtc att ttt gca ctc tat acc tta 1323
Phe Ser Met Val Gln Trp Ile Val Val Ile Phe Ala Leu Tyr Thr Leu
145 150 155

tta ctt gct ctc att ttc atc agc caa gtc aaa cgt cta aaa ccc aag 1371
Leu Leu Ala Leu Ile Phe Ile Ser Gln Val Lys Arg Leu Lys Pro Lys
160 165 170

cag cgc aga ctc ttt cat taagtcataa aaaatggtgc gataaagcac 1419
Gln Arg Arg Leu Phe His
175

catttttcat ttctcgttcg gtatagatta aattttcttgc acgacaaact gcagggaatg 1479

tcttgctaata aatcttgctt tacgctgctt taagcgtttt aaacgtaatg cgcgtccctg 1539

tgataaacga tataattttt ttgtcggctt caaaaagctt ttacgtctcg ccaactctt 1599

cctcttattg tgcgttacg gttgtcgcta acgtatccgt ttctttcttg atttcgttga 1659

tgctttctat ttcggcggct tgtgtatcta atgtttcttc aatttggtgt tgcgtaccc 1719

gataataatg cacaatgctg ttcataaac gacggatatt ttccacatag tgatatgctt 1779

catagcctcg cgcatacccg tattttaacc ccgtgtaata gcgtttttct gctaatagtg 1839

gcaaattctt cttcacatct aaccaattat cgggatcacc acctaggctc ttggttaaac 1899

ggcgcgcac taacaaatgc cctaatacca tattatacgc cgctaaggca aactaaatc 1959

gctcatcttc tttaatcgta tcaggcattt gcctaataaa ccaatataaa tattctaac 2019

五、發明說明 (96)

cggttttaac actttgttcc ggatccgttc tgtcttgaat t

2060

<210> 12
<211> 178
<212> 蛋白質
<213> 敗血性巴斯德桿菌

<400> 12
Met Leu Ser Phe Phe Lys Thr Leu Ser Thr Lys Arg Ser Ala Trp Phe
1 5 10 15
Leu Leu Phe Ser Ser Ala Leu Leu Leu Glu Ala Ile Ala Leu Tyr Phe
20 25 30
Gln His Gly Met Gly Leu Ala Pro Cys Val Met Cys Ile Tyr Glu Arg
35 40 45
Val Ala Ile Leu Gly Ile Ala Phe Ser Gly Leu Leu Gly Leu Leu Tyr
50 55 60
Pro Ser Ser Met Leu Leu Arg Leu Val Ala Leu Leu Ile Gly Leu Ser
65 70 75 80
Ser Ala Ile Lys Gly Leu Met Ile Ser Ile Thr His Leu Asp Leu Gln
85 90 95
Leu Tyr Pro Ala Pro Trp Lys Gln Cys Ser Ala Val Ala Glu Phe Pro
100 105 110
Glu Thr Leu Pro Leu Asp Gln Trp Phe Pro Ala Leu Phe Leu Pro Ser
115 120 125
Gly Ser Cys Ser Glu Val Thr Trp Gln Phe Leu Gly Phe Ser Met Val
130 135 140
Gln Trp Ile Val Val Ile Phe Ala Leu Tyr Thr Leu Leu Leu Ala Leu
145 150 155 160
Ile Phe Ile Ser Gln Val Lys Arg Leu Lys Pro Lys Gln Arg Arg Leu
165 170 175
Phe His

<210> 13
<211> 4426
<212> DNA
<213> 敗血性巴斯德桿菌

<220>
<221> CDS
<222> (2756) .. (3211)

<220>
<223> exbB

<400> 13
gaattcttga cctggtgtga ggcttttatt gacttccacc ccaattgcgc gttctttcac 60
tttattaata aagtcacgta ccaactggtaa cgccacatcc gcttctaata atgccatgcg 120

裝
訂
線

五、發明說明(97)

gacttcacgt aggtttcct taatattgtc atcagttaaa cgtccacgtc cactaatgtt 180
 acgtagcgtt ttgacaagc gatccgacaa attctcaaac atgcaatctt cctatttaaat 240
 ctcgaaaaaa ttgccctaata tatactgaaa tcccatagat tttcatcctt tgtaataaat 300
 ttatagcgat ttcacagtga gaaagttaga atggacggag aacaaagggtg aggggaatttc 360
 aatgtggcctt tcaattttttt ccgtgtttttt ttatctattg agtgtcttac tcattacccc 420
 tatgttggtta aaaattcaag cgggcgaacc cgcacgggtt cccaatagga tgcctttttt 480
 aacggcagca ttactcgcca ttcttctgca ctttatcaat cttattcctc tttttaccga 540
 ttttaaccagc ggtcaaaatt tctcggttat cgaaatcagt tccttaatca gtgttatgac 600
 agcaacgac gccacattag cgtttttatt tcgcatacac actttatgggt ttttattacc 660
 gattatttat tctttcgcca tcattaatct ggtcctcagt accttaatgc cggcgcattt 720
 tttatatcat cttaatcaag atatgggctt atttattcat gtaggcttat cactgttgac 780
 ttattcgggtc tgttcgattg tcgcgttata ttccattcag ttagtttgga tcgatcgcgc 840
 cttaaaaaat aaaaaactgc ctttttcacc aatgattcca ccgttaatga ccgtagagcg 900
 ccattttttt cgtttaatgc tgatagggtga aatattactc acgattgtcc tcatttcagg 960
 gagctaccat ttatcgaaaa cttttgcccc acaagacatc cagaaagctg ttttttcttt 1020
 cttggccttg atagtctttg ggagtgcact ggttggtcat tggaagctcc attggcgtgg 1080
 aaaaaaagtg gtgtattatg cgcttttagg tatcattctc ctgactatcg cctatttttg 1140
 tagtcgtgta atgcttgaaa tataaacaag atttatttat gctacgccat agtaaaagtg 1200
 cggttcaaaa aacgaaaaaa tgaccgcact tttcgatttt tgattaaactc gcaaaaggat 1260
 gcatttttga cagtattccc cttagtaccc tctttattac actcatcatc ttattgatca 1320
 tctctgctta tttttcaggc tctgaaaccg gtttggtgtc tgccaatcgt tatcgactac 1380
 gccatttagc cgaaaaaggg catagagggtg cgaaaaagc ggaaaaatta ctgaaaaaaa 1440
 cagatgtttt gcttagcctg attttaattt gtaataactt agtcaatatt actgcttctg 1500
 ccattaccac gattatcggc atgcgcttat atggcgatgc gggagtcgcc attgcaactg 1560
 gggcattaac ctttgtgatg cttatttttg ccgaaatttt gccgaaaact atcgccgccc 1620
 gttatccaga aaaagtggca ttcacgtcca gtcatttggt gtccgttttt ctgcgacttt 1680
 ttaccccgct ggtctattta atgaatttaa ttattcaggg gattttggca ctattacgtc 1740
 taaaatcaga taataaatca acctattaa gccagagga attacgttcc atcgtaaatg 1800
 aatcaggtaa atttattcct tccgcccacc aagaaatgct gttatctatt ttggatttag 1860
 aaggggtcac cgtagatgac attatggtgc cacgtaatga cattgggggt attgatattg 1920
 acgatgattg gaaagccatt atgcgtcaac ttaaccatgc agcgcacggg cgtgttgtag 1980
 tgtataaagg aaatatggat gaaaatattt tggggatggt acgtgtacgt gaagcctatc 2040

五、發明說明 (98)

gcttaatgct cgaataaaaat gaatttaaca aagaaacttt aatccgtgcc gccgatgaag 2100
tgtatatttat tcttgaaggt acgccactga atagccaatt attaaatttc cgcaacaata 2160
aagaaaggat tggtttagtt gtagatgaat atgggtgat taaaggctta gtcaccttag 2220
aagatatctt agaagagatt gtcgggtgaat ttaccacttc aacagcccca tcaattaacg 2280
atgaagttat cccacaatca gacgggttcgc ttatcattga gggatccgcc aatttacgtg 2340
atttgaataa attatttgac tggaatctcg ataccgaaga tgcacgtacc ttcaacggct 2400
taattttaga gcatttagaa gaaattccag aagaaggaac ggtatgtgaa attaattggc 2460
tacaaatcac gattctagaa gtgaatgaca acatgattaa acaagccaaa gtcattaaac 2520
tttaattcaa catctggcta agcgatgtca tcaagacatc gcttttttat tccgtacatg 2580
aatgtttgat ccaacacaac atttattcaa cattggataa ataatcatcc taaatcgac 2640
gaattttctta ttaccctcgt ttttggtttt tgctagaatc ttgcaattga aattaattct 2700
caataccgta taatgttcaa cattattttg cgatacaaat taaaggatta ttaaa atg 2758
Met
1
cca caa tta ttc caa ttc tta caa caa tat att gat tac att att cta 2806
Pro Gln Leu Phe Gln Phe Leu Gln Gln Tyr Ile Asp Tyr Ile Ile Leu
5 10 15
ggc tta ctt gcc ttc atg agc ttt att atg gtt tgg ctt gtg att gaa 2854
Gly Leu Leu Ala Phe Met Ser Phe Ile Met Val Trp Leu Val Ile Glu
20 25 30
cgc ttt ctt ttc tta agt cgc gtc aac gtg gca tct tat gaa agc ata 2902
Arg Phe Leu Phe Leu Ser Arg Val Asn Val Ala Ser Tyr Glu Ser Ile
35 40 45
cat gaa tta gac att gac tta caa cgc cac ctc aca gct atc tct aca 2950
His Glu Leu Asp Ile Asp Leu Gln Arg His Leu Thr Ala Ile Ser Thr
50 55 60 65
atc ggt tct aat gca cct tat gta ggt ttg ctt ggt acc gtc att ggt 2998
Ile Gly Ser Asn Ala Pro Tyr Val Gly Leu Leu Gly Thr Val Ile Gly
70 75 80
att ctc tta act ttc tat gaa tta ggt cac tcc ggt ggc gat att gat 3046
Ile Leu Leu Thr Phe Tyr Glu Leu Gly His Ser Gly Gly Asp Ile Asp
85 90 95
gcg gcg gcc att atg gtg cac tta tca tta gcc tta aaa gcc aca gca 3094
Ala Ala Ala Ile Met Val His Leu Ser Leu Ala Leu Lys Ala Thr Ala
100 105 110
gta ggt att tta gtc gcc att cct gca atg gtg tgt tac aac ggt tta 3142
Val Gly Ile Leu Val Ala Ile Pro Ala Met Val Cys Tyr Asn Gly Leu
115 120 125
gga cgt aaa gtc gaa gtt aat cgt ttg aaa tgg ttt gcc tta aat gag 3190
Gly Arg Lys Val Glu Val Asn Arg Leu Lys Trp Phe Ala Leu Asn Glu
130 135 140 145
aaa aaa gcc aaa caa caa gca tagggagccg tcatgaaaaa gtttgatgaa 3241

五、發明說明 (99)

Lys Lys Ala Lys Gln Gln Ala
150

atcaacatta tcccttttat tgacatcatg ttggtactat tggctatcgt tctgattaca 3301
gcctcttttta tttcacaagg taaaatccaa gtgaatgtac caaaagcaag ttcaacagtt 3361
gcgtttcgtt cagatgattt agccaaattg ctgactatta cggaaagcgg tgaaattttt 3421
tatacagata aaccgattac gatagaggca ttggaacaag aaatcagtaa ttgggaaaaa 3481
gatcaaaaag tcaccttgaa ggtagatgca aaatccagtt tccaagattt cgtttctatc 3541
actgatatta tggctaaaaa tgaaattaaa aatgtcgcta tcgtgacggt taaagaaaag 3601
gcatctcaat gatagataaa agtcgttctt gcatcgggtt tgcaatttca ttgctttttc 3661
acgcaagttt tgtctctttc ctgtattgga ttgtacaaaa agacgatgac agcgcgaatg 3721
gatttgctgc cgatatcatc tcaactcata tttccatgga aatgctggcg gctaccgttt 3781
tagaagaacc agagccggaa ccagagccgg cgctccggt agtagaacct gaactgccaa 3841
aagaagtagt cgcagatccg acggtaaaac ctgagccacc aaaagaaccc gaaaaaccaa 3901
aagagcctga aaagccaaaa gagaaaccga aagaaaaacc aaaagaaaag ccgaaaaaac 3961
cgaagaaaga acaacgtgat ttaccaaagt cagatcgcca aattgattct aattcatcga 4021
tcaatcaaca agcgaccaca acaggcaaca tcacaaccaa taatccgaat ctggtcggta 4081
aaggtaatag cacagatgaa gtcaatgctt atcgctcggc tttacgcaga gaaattgaaa 4141
aacataaacg ctatccaaac cgtgcacgca tgatgcgcaa acaagggtgtg gtaacaatca 4201
cgttccatct taataatgcc ggcgtaatta gtaatgcgcg aatcagcaaa tcttccggct 4261
cagaagaatt agataacgct gactggtag ctgtcaataa tgcccgtcca attgggtccac 4321
tgctgttggt tatgccaaat gaagtgcgcg ttctgtcag tttcagaatc acaaattaaa 4381
aaagtgcggt aaaatttacc gcactttttt ctctctatta gaatt 4426

<210> 14
<211> 152
<212> 蛋白質
<213> 敗血性巴斯德桿菌

<400> 14
Met Pro Gln Leu Phe Gln Phe Leu Gln Gln Tyr Ile Asp Tyr Ile Ile
1 5 10 15
Leu Gly Leu Leu Ala Phe Met Ser Phe Ile Met Val Trp Leu Val Ile
20 25 30
Glu Arg Phe Leu Phe Leu Ser Arg Val Asn Val Ala Ser Tyr Glu Ser
35 40 45
Ile His Glu Leu Asp Ile Asp Leu Gln Arg His Leu Thr Ala Ile Ser
50 55 60
Thr Ile Gly Ser Asn Ala Pro Tyr Val Gly Leu Leu Gly Thr Val Ile

五、發明說明 (100)

65		70		75		80
Gly Ile Leu Leu Thr Phe Tyr Glu Leu Gly His Ser Gly Gly Asp Ile						
	85			90		95
Asp Ala Ala Ala Ile Met Val His Leu Ser Leu Ala Leu Lys Ala Thr						
	100		105		110	
Ala Val Gly Ile Leu Val Ala Ile Pro Ala Met Val Cys Tyr Asn Gly						
	115		120		125	
Leu Gly Arg Lys Val Glu Val Asn Arg Leu Lys Trp Phe Ala Leu Asn						
	130		135		140	
Glu Lys Lys Ala Lys Gln Gln Ala						
145		150				

<210> 15
<211> 6876
<212> DNA
<213> 敗血性巴斯德桿菌

<220>
<221> CDS
<222> (534) .. (6863)

<220>
<223> fhaB1

<400> 15
agatgCGTga tctgatcctt caactcagca aaagtTCgat ttattcaaca aagccgccgt 60
cccgtcaagt cagcgtaatg tctgccagtg ttacaccaat taaccaattc tgattagaaa 120
aactcatcga gcatcaaatg aaactgcaat ttattcatat caggattatc aataccatat 180
ttttgaaaaa gccgtttctg taatgaagga gaaaactcac cgaggcagtt ccataggatg 240
gcaagatcct ggtatcggtc tgcgattccg actcgtccaa catcaatata acctattaat 300
ttccccctcgt caaaaataag gttatcaagt gagaaatcac catgagtgac gactgaatcc 360
ggtgagaatg gcaaaagctt atgcatttct tccagactt gttcaacagg ccagccatta 420
cgctcgtcat caaaatcact cgcatacaacc aaaccgttat tcattcgtga ttgcgcctga 480
gcgagacgaa atacgcgatc gctgttaaaa ggacaattac aaacaggaat cga atg 536
Met
1
caa ccg gcg cag gaa cac tgc cag cgc atc aac aat att gtt aac caa 584
Gln Pro Ala Gln Glu His Cys Gln Arg Ile Asn Asn Ile Val Asn Gln
5 10 15
gaa aac ggt tta ttc cat aca ctg ggt aat atg atg tta gaa gca gag 632
Glu Asn Gly Leu Phe His Thr Leu Gly Asn Met Met Leu Glu Ala Glu
20 25 30
cgt tct gtt tat aat att ggc gat att tat gcg agt aaa aaa tta aca 680
Arg Ser Val Tyr Asn Ile Gly Asp Ile Tyr Ala Ser Lys Lys Leu Thr
35 40 45

五、發明說明 (101)

gtt cat act ~~caa~~ aat ttg att aat gat gtg cgt tta tct ggc aat gtg	728
Val His Thr His Asn Leu Ile Asn Asp Val Arg Leu Ser Gly Asn Val	
50 55 60 65	
agt tat aag cct atc ggt tca agt cgt gat tat gat atc agt cgt gtt	776
Ser Tyr Lys Pro Ile Gly Ser Ser Arg Asp Tyr Asp Ile Ser Arg Val	
70 75 80	
gcg gta cat ggt tgg cac aat aat gtt tat aag ctc aac tta aat ctg	824
Ala Val His Gly Trp His Asn Asn Val Tyr Lys Leu Asn Leu Asn Leu	
85 90 95	
caa gaa caa gat aaa acc gat att aaa gtt gtg aaa atg ggg gct atc	872
Gln Glu Gln Asp Lys Thr Asp Ile Lys Val Val Lys Met Gly Ala Ile	
100 105 110	
cgt tct gat ggt gat ttt gac ttt aag gga ata aag gcg aca tca tca	920
Arg Ser Asp Gly Asp Phe Asp Phe Lys Gly Ile Lys Ala Thr Ser Ser	
115 120 125	
gaa tca aaa ccg cag tta att aat cat gga tta att aat gtc aaa gga	968
Glu Ser Lys Pro Gln Leu Ile Asn His Gly Leu Ile Asn Val Lys Gly	
130 135 140 145	
aca ttt aat gcg gaa gct gat caa gtg gtg aac caa atg aaa gcg ttc	1016
Thr Phe Asn Ala Glu Ala Asp Gln Val Val Asn Gln Met Lys Ala Phe	
150 155 160	
aac caa aat gca tta gca agc gtg ttt aag aat cca gcg aaa atc acg	1064
Asn Gln Asn Ala Leu Ala Ser Val Phe Lys Asn Pro Ala Lys Ile Thr	
165 170 175	
atg tac tat caa cca ctt act cgt tat att tgg aca cca tta tcg ggt	1112
Met Tyr Tyr Gln Pro Leu Thr Arg Tyr Ile Trp Thr Pro Leu Ser Gly	
180 185 190	
aat gca tcg cgt gaa ttt aac aat tta gag tct ttc ctc gat gcc ttg	1160
Asn Ala Ser Arg Glu Phe Asn Asn Leu Glu Ser Phe Leu Asp Ala Leu	
195 200 205	
ttt ggc tca aca aca atc tta aaa tca agt ttc tat agt acg gaa aat	1208
Phe Gly Ser Thr Thr Ile Leu Lys Ser Ser Phe Tyr Ser Thr Glu Asn	
210 215 220 225	
ttt agt gct tat cag ctt cta tct cat att cag cat tca cca atg tac	1256
Phe Ser Ala Tyr Gln Leu Leu Ser His Ile Gln His Ser Pro Met Tyr	
230 235 240	
caa aaa gcg atg gca caa gtg ttt ggt gca gag tgg cat agt aaa tcc	1304
Gln Lys Ala Met Ala Gln Val Phe Gly Ala Glu Trp His Ser Lys Ser	
245 250 255	
tat gat gag atg cga aac aaa tgg aaa agc ttt aaa gaa aat cca aca	1352
Tyr Asp Glu Met Arg Asn Lys Trp Lys Ser Phe Lys Glu Asn Pro Thr	
260 265 270	
gat ttc att tat tac cca tca gaa aaa gca aaa atc cta gcg gga aaa	1400
Asp Phe Ile Tyr Tyr Pro Ser Glu Lys Ala Lys Ile Leu Ala Gly Lys	
275 280 285	
cta gaa ggt aag ctt aca acg cta caa aat ggt gaa tat gcc gaa cgt	1448
Leu Glu Gly Lys Leu Thr Thr Leu Gln Asn Gly Glu Tyr Ala Glu Arg	
290 295 300 305	

五、發明說明 (102)

ggt aag ttt gag gag agt atc caa att ggt aaa cac caa tta tcg cta Gly Lys Phe Asp Glu Ser Ile Gln Ile Gly Lys His Gln Leu Ser Leu 310 315 320	1496
cca tca gta gag ctt aaa gcg gag ttt agt gat aaa gaa cgt ttg gaa Pro Ser Val Glu Leu Lys Ala Glu Phe Ser Asp Lys Glu Arg Leu Glu 325 330 335	1544
gag gac ggg gta gat tta tcc tcg atc gcc gaa ctc tta gaa atg cca Glu Asp Gly Val Asp Leu Ser Ser Ile Ala Glu Leu Leu Glu Met Pro 340 345 350	1592
aac tta ttt att gat aat agt atc caa tta gaa aag aaa aag ttg tct Asn Leu Phe Ile Asp Asn Ser Ile Gln Leu Glu Lys Lys Lys Leu Ser 355 360 365	1640
cct att gag gat cta gat gaa gaa cca cgt aaa aat ctg gat ata gaa Pro Ile Glu Asp Leu Asp Glu Glu Pro Arg Lys Asn Leu Asp Ile Glu 370 375 380 385	1688
gaa agc cat tct aat tca tcg gat gac gtg ctt agc atg aat gat gat Glu Ser His Ser Asn Ser Ser Asp Asp Val Leu Ser Met Asn Asp Asp 390 395 400	1736
gag tct gat acc gac gat agc aag tgg agt atg ggc aat gat gag aaa Glu Ser Asp Thr Asp Asp Ser Lys Trp Ser Met Gly Asn Asp Glu Lys 405 410 415	1784
gag atg ccc gat gat aag ctg ggt ata agt cgt gat gat cgt gga aat Glu Met Pro Asp Asp Lys Leu Gly Ile Ser Arg Asp Asp Arg Gly Asn 420 425 430	1832
aaa cca cct cgt act gat cct acc gtt gat tat ctt aac cct gat gaa Lys Pro Pro Arg Thr Asp Pro Thr Val Asp Tyr Leu Asn Pro Asp Glu 435 440 445	1880
ttc ttt gaa aat ggt tat ctc ttg aat gag cta cta cag gag ctt gga Phe Phe Glu Asn Gly Tyr Leu Leu Asn Glu Leu Leu Gln Glu Leu Gly 450 455 460 465	1928
gaa gag ccg tta cta aaa gaa ggg gaa gat cat ttt aaa cgt tct acc Glu Glu Pro Leu Leu Lys Glu Gly Glu Asp His Phe Lys Arg Ser Thr 470 475 480	1976
aat cta gtc cgt cta ggc gag aga gat agg caa aat aga gaa aag aga Asn Leu Val Arg Leu Gly Glu Arg Asp Arg Gln Asn Arg Glu Lys Arg 485 490 495	2024
gaa aaa gag ggg tat ttt gat ctg cct ggt acc tta gat atg aaa ctg Glu Lys Glu Gly Tyr Phe Asp Leu Pro Gly Thr Leu Asp Met Lys Leu 500 505 510	2072
cag gag tta ttc gaa aaa aga aaa caa aaa cac gaa gca gaa cag aaa Gln Glu Leu Phe Glu Lys Arg Lys Gln Lys His Glu Ala Glu Gln Lys 515 520 525	2120
gca aga ata gaa aaa gca ctt cta caa aaa tca gaa caa caa gaa aaa Ala Arg Ile Glu Lys Ala Leu Leu Gln Lys Ser Glu Gln Gln Glu Lys 530 535 540 545	2168
cgt gtt gaa gaa cgt aag caa gag gaa aaa cgt caa gcg caa gat aaa Arg Val Glu Glu Arg Lys Gln Glu Glu Lys Arg Gln Ala Gln Asp Lys 550 555 560	2216

五、發明說明 (103)

att gct aag ~~aaa~~ gta gaa att gca aaa gaa atg caa cgg gta gaa gaa	2264
Ile Ala Lys Gln Val Glu Ile Ala Lys Glu Met Gln Arg Val Glu Glu	
565 570 575	
att cgc cag aga gaa aaa caa ctt gcg atc caa ctg caa gaa gaa gag	2312
Ile Arg Gln Arg Glu Lys Gln Leu Ala Ile Gln Leu Gln Glu Glu Glu	
580 585 590	
aag aaa caa caa gaa gaa aaa cat tta tcc gag gag aaa aaa caa gct	2360
Lys Lys Gln Gln Glu Glu Lys His Leu Ser Glu Glu Lys Lys Gln Ala	
595 600 605	
gaa cag aaa caa aaa gct gag gag aaa gtt gca caa gaa aga tta gac	2408
Glu Gln Lys Gln Lys Ala Glu Glu Lys Val Ala Gln Glu Arg Leu Asp	
610 615 620 625	
att gaa caa cag aaa gcg tat gaa gaa atg gcg aag cga gag gca gag	2456
Ile Glu Gln Gln Lys Ala Tyr Glu Glu Met Ala Lys Arg Glu Ala Glu	
630 635 640	
gca tca aaa aat gtt tta ttg aaa gcg att gat gaa gaa cgt cca aaa	2504
Ala Ser Lys Asn Val Leu Leu Lys Ala Ile Asp Glu Glu Arg Pro Lys	
645 650 655	
gtg gaa act gat cca ctt ttc cgt aca aaa ttg aaa tat atc aat caa	2552
Val Glu Thr Asp Pro Leu Phe Arg Thr Lys Leu Lys Tyr Ile Asn Gln	
660 665 670	
gat gac tat gct ggt gca aat tat ttc ttc aat aaa gtt ggt tta aat	2600
Asp Asp Tyr Ala Gly Ala Asn Tyr Phe Phe Asn Lys Val Gly Leu Asn	
675 680 685	
aca aaa ggt cat caa aaa gta aat gtg tta ggg gat aac tat ttt gat	2648
Thr Lys Gly His Gln Lys Val Asn Val Leu Gly Asp Asn Tyr Phe Asp	
690 695 700 705	
cat caa gtg att act cgc tcg att gag aaa aaa gta gat aac cac ctt	2696
His Gln Val Ile Thr Arg Ser Ile Glu Lys Lys Val Asp Asn His Leu	
710 715 720	
aac caa aaa tac aat ctc agc gat gtg gaa tta gtt aaa cag ctg atg	2744
Asn Gln Lys Tyr Asn Leu Ser Asp Val Glu Leu Val Lys Gln Leu Met	
725 730 735	
gac aat tcc aca aca caa gcg cag gag ttg gat ttg aaa cta ggt gcg	2792
Asp Asn Ser Thr Thr Gln Ala Gln Glu Leu Asp Leu Lys Leu Gly Ala	
740 745 750	
gca tta act aaa gaa caa caa gct aac ttg acc caa gat atc gtt tgg	2840
Ala Leu Thr Lys Glu Gln Gln Ala Asn Leu Thr Gln Asp Ile Val Trp	
755 760 765	
tat gtc aaa acg aag gta aag ggc aaa gat gtg ttt gtt cca aag gtt	2888
Tyr Val Lys Thr Lys Val Lys Gly Lys Asp Val Phe Val Pro Lys Val	
770 775 780 785	
tat ttc gct tct gaa acg ctc gta gaa gcc caa aaa tta caa ggt tta	2936
Tyr Phe Ala Ser Glu Thr Leu Val Glu Ala Gln Lys Leu Gln Gly Leu	
790 795 800	
ggc act ggg act atc aga gtt ggt gaa gct aag att aaa gcc aaa gat	2984
Gly Thr Gly Thr Ile Arg Val Gly Glu Ala Lys Ile Lys Ala Lys Asp	
805 810 815	

五、發明說明 (104)

gtg gtg aat atc ggg aca tta gct ggg aga aaa ctc aat gtt gaa gcg Val Val Asn Thr Gly Thr Leu Ala Gly Arg Lys Leu Asn Val Glu Ala 820 825 830	3032
agt aat aaa atc aaa aat caa ggg agt atc tta agt act caa gaa aca Ser Asn Lys Ile Lys Asn Gln Gly Ser Ile Leu Ser Thr Gln Glu Thr 835 840 845	3080
cgt tta gtc ggg cgt aaa ggt att gaa aac gta tct cgt tca ttt gca Arg Leu Val Gly Arg Lys Gly Ile Glu Asn Val Ser Arg Ser Phe Ala 850 855 860 865	3128
aat gat gaa tta gga gtc act gca caa cgc tca gaa atc aaa acg gaa Asn Asp Glu Leu Gly Val Thr Ala Gln Arg Ser Glu Ile Lys Thr Glu 870 875 880	3176
ggc cat tta cat ctt gaa aca gat aag gat tca act att gat gta caa Gly His Leu His Leu Glu Thr Asp Lys Asp Ser Thr Ile Asp Val Gln 885 890 895	3224
gca tcg gat att aaa gca aaa aca agc ttt gtg aag act ggt gat gtg Ala Ser Asp Ile Lys Ala Lys Thr Ser Phe Val Lys Thr Gly Asp Val 900 905 910	3272
aat ctc aaa aat aca tac aat act aaa cat gcc tac cgt gag aaa ttc Asn Leu Lys Asn Thr Tyr Asn Thr Lys His Ala Tyr Arg Glu Lys Phe 915 920 925	3320
tcg ccg agt gca cta caa gtt gca gaa ctt gat gtg gca ggg ctt aaa Ser Pro Ser Ala Leu Gln Val Ala Glu Leu Asp Val Ala Gly Leu Lys 930 935 940 945	3368
gtc cca ctt tta ggc gtg tcg tct cca tcc agt tat tca gag cat act Val Pro Leu Leu Gly Val Ser Ser Pro Ser Ser Tyr Ser Glu His Thr 950 955 960	3416
agt gag gca act tca gag gga tca atc ttc gaa gta ggg cac tta cat Ser Glu Ala Thr Ser Glu Gly Ser Ile Phe Glu Val Gly His Leu His 965 970 975	3464
ctt gcg gta gac aga gat gtg aac caa gcg ggg agt aaa att aag gct Leu Ala Val Asp Arg Asp Val Asn Gln Ala Gly Ser Lys Ile Lys Ala 980 985 990	3512
aag tat acc act ggt gtt gtg aaa ggg aac ttt aat act gaa gcg ggc Lys Tyr Thr Thr Gly Val Val Lys Gly Asn Phe Asn Thr Glu Ala Gly 995 1000 1005	3560
aag aat att aaa cat gtc gaa aaa gaa gaa tat agt tca cag cta ttt Lys Asn Ile Lys His Val Glu Lys Glu Glu Tyr Ser Ser Gln Leu Phe 1010 1015 1020 1025	3608
gct tca gca cac gcg agt ggt ggt ggc acc tca gtt cgt tat gac tat Ala Ser Ala His Ala Ser Gly Gly Gly Thr Ser Val Arg Tyr Asp Tyr 1030 1035 1040	3656
aac agc caa gat ggt ggc aat gcc tct gtt ggt gtt ccg aca aac cat Asn Ser Gln Asp Gly Gly Asn Ala Ser Val Gly Val Pro Thr Asn His 1045 1050 1055	3704
act gga gtt ggg gca gag gca gga atg tca ttc acc cat acc aaa gac Thr Gly Val Gly Ala Glu Ala Gly Met Ser Phe Thr His Thr Lys Asp 1060 1065 1070	3752

五、發明說明 (105)

aaa gaa aca ~~atg~~ ctc act cac acc aat agt gaa tta caa gtc aaa cat Lys Glu Thr Leu Leu Thr His Thr Asn Ser Glu Leu Gln Val Lys His 1075 1080 1085	3800
ggg aaa tta cat gtg ctt ggt tat gcc gat att ggt gga gta gat att Gly Lys Leu His Val Leu Gly Tyr Ala Asp Ile Gly Gly Val Asp Ile 1090 1095 1100 1105	3848
aat act aaa cta cca gaa gat gca caa agc aaa gca cag aaa gag ata Asn Thr Lys Leu Pro Glu Asp Ala Gln Ser Lys Ala Gln Lys Glu Ile 1110 1115 1120	3896
gcg gct agc aag cca gag aag acc gag caa tct gca cag gat gtg gct Ala Ala Ser Lys Pro Glu Lys Thr Glu Gln Ser Ala Gln Asp Val Ala 1125 1130 1135	3944
caa gct caa tca aat gcc aat aag gat aag gaa aat aaa gcc cca gaa Gln Ala Gln Ser Asn Ala Asn Lys Asp Lys Glu Asn Lys Ala Pro Glu 1140 1145 1150	3992
ata aaa gaa tta tca gag gct gaa atc gcg gat ctc atg tca gaa aaa Ile Lys Glu Leu Ser Glu Ala Glu Ile Ala Asp Leu Met Ser Glu Lys 1155 1160 1165	4040
tca aaa gcg tat ttt gat gat ttt gca gag caa gcg aaa aaa gca cct Ser Lys Ala Tyr Phe Asp Asp Phe Ala Glu Gln Ala Lys Lys Ala Pro 1170 1175 1180 1185	4088
gaa aac aat cga ttt gaa ttg tct gcg aaa gaa att aag tcg agc aaa Glu Asn Asn Arg Phe Glu Leu Ser Ala Lys Glu Ile Lys Ser Ser Lys 1190 1195 1200	4136
caa aaa gac caa tat gat cat gag tct gaa cgg acg act ttt aaa gtt Gln Lys Asp Gln Tyr Asp His Glu Ser Glu Arg Thr Thr Phe Lys Val 1205 1210 1215	4184
gga cct gaa gcg gag gct cat tct gcg gtt gcc gat atg gtg agc cat Gly Pro Glu Ala Glu Ala His Ser Ala Val Ala Asp Met Val Ser His 1220 1225 1230	4232
tta gtg aaa gaa tat aga gat gca caa aat ggg act aaa caa gac ggt Leu Val Lys Glu Tyr Arg Asp Ala Gln Asn Gly Thr Lys Gln Asp Gly 1235 1240 1245	4280
aca gta gca tta caa cat gct agt gat gtc tta aat att gtg acg ggg Thr Val Ala Leu Gln His Ala Ser Asp Val Leu Asn Ile Val Thr Gly 1250 1255 1260 1265	4328
gat tta gcg ggg agt tca gct aaa ttg tct gtt gaa aga aca cat gag Asp Leu Ala Gly Ser Ser Ala Lys Leu Ser Val Glu Arg Thr His Glu 1270 1275 1280	4376
aca aaa cga acg aca gaa acg ggg gat att gtt act aag att ggt ggc Thr Lys Arg Thr Thr Glu Thr Gly Asp Ile Val Thr Lys Ile Gly Gly 1285 1290 1295	4424
aat gtc aca ctg tca gca cgc agt ggt agt gtg aac ctt aaa aat gta Asn Val Thr Leu Ser Ala Arg Ser Gly Ser Val Asn Leu Lys Asn Val 1300 1305 1310	4472
caa agt gat gaa caa gct aat ttg acc tta aga gca aaa gaa gat gtg Gln Ser Asp Glu Gln Ala Asn Leu Thr Leu Arg Ala Lys Glu Asp Val 1315 1320 1325	4520

五、發明說明 (106)

aat gtg ctg tct ggt gaa aaa aca cga gaa acc aca gaa aca gta tca Asn Val Leu Ser Gly Glu Lys Thr Arg Glu Thr Thr Glu Thr Val Ser 1330 1335 1340 1345	4568
aga cag aaa ctt tct cat ggt gtg aac gca ggt tgc agt atg atg agt Arg Gln Lys Leu Ser His Gly Val Asn Ala Gly Cys Ser Met Met Ser 1350 1355 1360	4616
ggc gcc tgt act gcc ggt gtt agc aca tca ctt gaa gga aat gaa agc Gly Ala Cys Thr Ala Gly Val Ser Thr Ser Leu Glu Gly Asn Glu Ser 1365 1370 1375	4664
tat acg tca gaa cgt gaa acg gct caa aat aac agt ttc tta aaa gca Tyr Thr Ser Glu Arg Glu Thr Ala Gln Asn Asn Ser Phe Leu Lys Ala 1380 1385 1390	4712
cgc aac atg aaa gtt gaa gca ggt cgc gat ttt aat gtt gtc agt tcg Arg Asn Met Lys Val Glu Ala Gly Arg Asp Phe Asn Val Val Ser Ser 1395 1400 1405	4760
aat att gat gca gat aag ctc gat ctc cac gtt aaa gga aaa acg aat Asn Ile Asp Ala Asp Lys Leu Asp Leu His Val Lys Gly Lys Thr Asn 1410 1415 1420 1425	4808
gtg gta tcc aaa caa gat acg tta caa aaa gtg acg cat gga gtt gac Val Val Ser Lys Gln Asp Thr Leu Gln Lys Val Thr His Gly Val Asp 1430 1435 1440	4856
tat aat ctt tcc gct ggc gtt gca ctt tct agt gca aca att gct acc Tyr Asn Leu Ser Ala Gly Val Ala Leu Ser Ser Ala Thr Ile Ala Thr 1445 1450 1455	4904
cca acc ggt aat gtt ggt ttc ggt tat acc aat gag acc gaa agc aag Pro Thr Gly Asn Val Gly Phe Gly Tyr Thr Asn Glu Thr Glu Ser Lys 1460 1465 1470	4952
cgg acg gtt aat caa caa gca ggg att aaa gcg aat aaa att aca ggg Arg Thr Val Asn Gln Gln Ala Gly Ile Lys Ala Asn Lys Ile Thr Gly 1475 1480 1485	5000
caa acg cat gac tta aat ctt gag ggg gga tat ctt gtc agc aac gat Gln Thr His Asp Leu Asn Leu Glu Gly Gly Tyr Leu Val Ser Asn Asp 1490 1495 1500 1505	5048
aag gat aat cag ctg aaa gtt acc ggc gat gtc aca act aaa gcc ctt Lys Asp Asn Gln Leu Lys Val Thr Gly Asp Val Thr Thr Lys Ala Leu 1510 1515 1520	5096
cac gat caa cat gat aaa gat ggt gga aca ttt ggt tta tct gtg ggt His Asp Gln His Asp Lys Asp Gly Gly Thr Phe Gly Leu Ser Val Gly 1525 1530 1535	5144
atc agt gaa cgt ggt act acc gcc ttt aat gta cga ggt ggg cga gct Ile Ser Glu Arg Gly Thr Thr Ala Phe Asn Val Arg Gly Gly Arg Ala 1540 1545 1550	5192
gaa cag aaa cac tat aat gca acg cag aaa tcc act ctt tct ggc gtg Glu Gln Lys His Tyr Asn Ala Thr Gln Lys Ser Thr Leu Ser Gly Val 1555 1560 1565	5240
gat acc tct caa gcg aat gta tca ggt caa gtg aat aca gat tta acc Asp Thr Ser Gln Ala Asn Val Ser Gly Gln Val Asn Thr Asp Leu Thr 1570 1575 1580 1585	5288

五、發明說明 (107)

aag gca aaa gct gtc aca cgt gat gat act tac gca agt acg caa ttt	5336
Lys Ala Lys Ala Val Thr Arg Asp Asp Thr Tyr Ala Ser Thr Gln Phe	
1590 1595 1600	
agt ttt gaa gtg gca gat att gtg gaa tta gga cag aga gcg aaa aac	5384
Ser Phe Glu Val Ala Asp Ile Val Glu Leu Gly Gln Arg Ala Lys Asn	
1605 1610 1615	
aag ctg tca gca cca aac aat gac acc gat atg gcg tca ggc tcc aca	5432
Lys Leu Ser Ala Pro Asn Asn Asp Thr Asp Met Ala Ser Gly Ser Thr	
1620 1625 1630	
tta cgc tcg cgt tct act aca gaa gaa gca gat gta cca aca aca aga	5480
Leu Arg Ser Arg Ser Thr Thr Glu Glu Ala Asp Val Pro Thr Thr Arg	
1635 1640 1645	
tcg cgt gta acg gat gag gcg gat tct gta tcc gtg aaa aat ccg att	5528
Ser Arg Val Thr Asp Glu Ala Asp Ser Val Ser Val Lys Asn Pro Ile	
1650 1655 1660 1665	
tat gaa agt gca gat gct gtt gta cca aca cca cgt agt aga aat gtg	5576
Tyr Glu Ser Ala Asp Ala Val Val Pro Thr Pro Arg Ser Arg Asn Val	
1670 1675 1680	
gac agt acc gat ctt gtg gac aat cca ctg tat gct agt gcc act aca	5624
Asp Ser Thr Asp Leu Val Asp Asn Pro Leu Tyr Ala Ser Ala Thr Thr	
1685 1690 1695	
aaa gca aac atc cat gat tat gaa gaa att cca gcc gtt tat agc aaa	5672
Lys Ala Asn Ile His Asp Tyr Glu Glu Ile Pro Ala Val Tyr Ser Lys	
1700 1705 1710	
gtc ggt gat aac aat gct gat ctt gtt cgt cat aaa acg gca act agt	5720
Val Gly Asp Asn Asn Ala Asp Leu Val Arg His Lys Thr Ala Thr Ser	
1715 1720 1725	
gat gag cat ctt tat gca gag att aat gaa cca aca tat agc cgt gtt	5768
Asp Glu His Leu Tyr Ala Glu Ile Asn Glu Pro Thr Tyr Ser Arg Val	
1730 1735 1740 1745	
ggt gat aaa aat gca gat atg aga cgt cat aac gcg gca ggt aca aca	5816
Gly Asp Lys Asn Ala Asp Met Arg Arg His Asn Ala Ala Gly Thr Thr	
1750 1755 1760	
gac tat gcc gat gtc gtg caa gca cat aca aga aag gca gat gat cca	5864
Asp Tyr Ala Asp Val Val Gln Ala His Thr Arg Lys Ala Asp Asp Pro	
1765 1770 1775	
cta cca gca tta ccg aat cag ggt aaa gca aga acg gta aac gac ggt	5912
Leu Pro Ala Leu Pro Asn Gln Gly Lys Ala Arg Thr Val Asn Asp Gly	
1780 1785 1790	
tca gag cat att tat act gat att agc gac gtg ggc act caa act aaa	5960
Ser Glu His Ile Tyr Thr Asp Ile Ser Asp Val Gly Thr Gln Thr Lys	
1795 1800 1805	
gct att gat agt act tat gca aca gta ggc atg ccg aaa gcg aat gcc	6008
Ala Ile Asp Ser Thr Tyr Ala Thr Val Gly Met Pro Lys Ala Asn Ala	
1810 1815 1820 1825	
gtt aac ttg ata ggg caa aat ggc tta ggc agc att tat cac agc cca	6056
Val Asn Leu Ile Gly Gln Asn Gly Leu Gly Ser Ile Tyr His Ser Pro	
1830 1835 1840	

五、發明說明 (108)

gac agt gct ~~cat~~ aaa aca tgg caa ttg ctt gat caa ttt gcc aac aaa	6104
Asp Ser Ala Tyr Lys Thr Trp Gln Leu Leu Asp Gln Phe Ala Asn Lys	
1845 1850 1855	
ggc gga gat gcg gtc ttc tta cgc cct gca aca gaa atg aaa tgt gca	6152
Gly Gly Asp Ala Val Phe Leu Arg Pro Ala Thr Glu Met Lys Cys Ala	
1860 1865 1870	
ggc gca cct tta aaa tat acc ttt atc gtg cgt gat tat ttg ctc aga	6200
Gly Ala Pro Leu Lys Tyr Thr Phe Ile Val Arg Asp Tyr Leu Leu Arg	
1875 1880 1885	
cgc cat acc tta gat aaa tca aga tta ttt tat aac gca cat aat aaa	6248
Arg His Thr Leu Asp Lys Ser Arg Leu Phe Tyr Asn Ala His Asn Lys	
1890 1895 1900 1905	
acc tta ttt agc gtg cct atc gtt gat gca aaa gtc aaa atg ctg ttt	6296
Thr Leu Phe Ser Val Pro Ile Val Asp Ala Lys Val Lys Met Leu Phe	
1910 1915 1920	
gct gaa aaa aat atc caa gtc aat tac gat cgt agc ctt aca gcc att	6344
Ala Glu Lys Asn Ile Gln Val Asn Tyr Asp Arg Ser Leu Thr Ala Ile	
1925 1930 1935	
gat ctg agt aaa cgt att gcg acc ttt aat agc cca gaa gga gtt gta	6392
Asp Leu Ser Lys Arg Ile Ala Thr Phe Asn Ser Pro Glu Gly Val Val	
1940 1945 1950	
gaa gtc cct tat gat ttt att aat gtg gta cct cca atg cga gca cct	6440
Glu Val Pro Tyr Asp Phe Ile Asn Val Val Pro Pro Met Arg Ala Pro	
1955 1960 1965	
gat gcc gtt cgt caa tca gca ctc gcg tgg caa gaa gga aaa tgg gct	6488
Asp Ala Val Arg Gln Ser Ala Leu Ala Trp Gln Glu Gly Lys Trp Ala	
1970 1975 1980 1985	
aac gat ggt tgg gtt gaa gta gaa aaa cat acc ttg cgt cac cgt cgt	6536
Asn Asp Gly Trp Val Glu Val Glu Lys His Thr Leu Arg His Arg Arg	
1990 1995 2000	
tat gcc aat gtg ttt gct gtg ggt gat gtg gca ggg gtc cca aaa ggc	6584
Tyr Ala Asn Val Phe Ala Val Gly Asp Val Ala Gly Val Pro Lys Gly	
2005 2010 2015	
aaa acg gct gcc agt gtc aaa tgg caa gtt cct gtt gca gtg gca cat	6632
Lys Thr Ala Ala Ser Val Lys Trp Gln Val Pro Val Ala Val Ala His	
2020 2025 2030	
tta ctc gca gaa tta gag ggc aaa cct tgt gat gaa att tac aac ggt	6680
Leu Leu Ala Glu Leu Glu Gly Lys Pro Cys Asp Glu Ile Tyr Asn Gly	
2035 2040 2045	
tat aca tct tgt cca tta att act caa tta gga aag ggg atg cta gta	6728
Tyr Thr Ser Cys Pro Leu Ile Thr Gln Leu Gly Lys Gly Met Leu Val	
2050 2055 2060 2065	
gaa ttt gat tat aac aac cac tta aca cct tct ttc ccc ggt gta ata	6776
Glu Phe Asp Tyr Asn Asn His Leu Thr Pro Ser Phe Pro Gly Val Ile	
2070 2075 2080	
gcg cca tta gaa gaa ctg tgg gca aca tgg gca att aaa aca tta ggt	6824
Ala Pro Leu Glu Glu Leu Trp Ala Thr Trp Ala Ile Lys Thr Leu Gly	
2085 2090 2095	

五、發明說明 (109)

ttt aaa ccc ~~acc~~ tat tta ggt atg tta cgt gga tta gct taaggagcgt 6873
Leu Lys Pro Thr Tyr Leu Glv Met Leu Arg Gly Leu Ala
2100 2105 2110

tga 6876

<210> 15

<211> 2110

<212> 蛋白質

<213> 敗血性巴斯德桿菌

<400> 16

Met Gln Pro Ala Gln Glu His Cys Gln Arg Ile Asn Asn Ile Val Asn
1 5 10 15

Gln Glu Asn Gly Leu Phe His Thr Leu Gly Asn Met Met Leu Glu Ala
20 25 30

Glu Arg Ser Val Tyr Asn Ile Gly Asp Ile Tyr Ala Ser Lys Lys Leu
35 40 45

Thr Val His Thr His Asn Leu Ile Asn Asp Val Arg Leu Ser Gly Asn
50 55 60

Val Ser Tyr Lys Pro Ile Gly Ser Ser Arg Asp Tyr Asp Ile Ser Arg
65 70 75 80

Val Ala Val His Gly Trp His Asn Asn Val Tyr Lys Leu Asn Leu Asn
85 90 95

Leu Gln Glu Gln Asp Lys Thr Asp Ile Lys Val Val Lys Met Gly Ala
100 105 110

Ile Arg Ser Asp Gly Asp Phe Asp Phe Lys Gly Ile Lys Ala Thr Ser
115 120 125

Ser Glu Ser Lys Pro Gln Leu Ile Asn His Gly Leu Ile Asn Val Lys
130 135 140

Gly Thr Phe Asn Ala Glu Ala Asp Gln Val Val Asn Gln Met Lys Ala
145 150 155 160

Phe Asn Gln Asn Ala Leu Ala Ser Val Phe Lys Asn Pro Ala Lys Ile
165 170 175

Thr Met Tyr Tyr Gln Pro Leu Thr Arg Tyr Ile Trp Thr Pro Leu Ser
180 185 190

Gly Asn Ala Ser Arg Glu Phe Asn Asn Leu Glu Ser Phe Leu Asp Ala
195 200 205

Leu Phe Gly Ser Thr Thr Ile Leu Lys Ser Ser Phe Tyr Ser Thr Glu
210 215 220

Asn Phe Ser Ala Tyr Gln Leu Leu Ser His Ile Gln His Ser Pro Met
225 230 235 240

Tyr Gln Lys Ala Met Ala Gln Val Phe Gly Ala Glu Trp His Ser Lys
245 250 255

Ser Tyr Asp Glu Met Arg Asn Lys Trp Lys Ser Phe Lys Glu Asn Pro
260 265 270

五、發明說明 (110)

Thr Asp Phe Ile Tyr Tyr Pro Ser Glu Lys Ala Lys Ile Leu Ala Gly
275 280 285

Lys Leu Glu Gly Lys Leu Thr Thr Leu Gln Asn Gly Glu Tyr Ala Glu
290 295 300

Arg Gly Lys Phe Asp Glu Ser Ile Gln Ile Gly Lys His Gln Leu Ser
305 310 315 320

Leu Pro Ser Val Glu Leu Lys Ala Glu Phe Ser Asp Lys Glu Arg Leu
325 330 335

Glu Glu Asp Gly Val Asp Leu Ser Ser Ile Ala Glu Leu Leu Glu Met
340 345 350

Pro Asn Leu Phe Ile Asp Asn Ser Ile Gln Leu Glu Lys Lys Lys Leu
355 360 365

Ser Pro Ile Glu Asp Leu Asp Glu Glu Pro Arg Lys Asn Leu Asp Ile
370 375 380

Glu Glu Ser His Ser Asn Ser Ser Asp Asp Val Leu Ser Met Asn Asp
385 390 395 400

Asp Glu Ser Asp Thr Asp Asp Ser Lys Trp Ser Met Gly Asn Asp Glu
405 410 415

Lys Glu Met Pro Asp Asp Lys Leu Gly Ile Ser Arg Asp Asp Arg Gly
420 425 430

Asn Lys Pro Pro Arg Thr Asp Pro Thr Val Asp Tyr Leu Asn Pro Asp
435 440 445

Glu Phe Phe Glu Asn Gly Tyr Leu Leu Asn Glu Leu Leu Gln Glu Leu
450 455 460

Gly Glu Glu Pro Leu Leu Lys Glu Gly Glu Asp His Phe Lys Arg Ser
465 470 475 480

Thr Asn Leu Val Arg Leu Gly Glu Arg Asp Arg Gln Asn Arg Glu Lys
485 490 495

Arg Glu Lys Glu Gly Tyr Phe Asp Leu Pro Gly Thr Leu Asp Met Lys
500 505 510

Leu Gln Glu Leu Phe Glu Lys Arg Lys Gln Lys His Glu Ala Glu Gln
515 520 525

Lys Ala Arg Ile Glu Lys Ala Leu Leu Gln Lys Ser Glu Gln Gln Glu
530 535 540

Lys Arg Val Glu Glu Arg Lys Gln Glu Glu Lys Arg Gln Ala Gln Asp
545 550 555 560

Lys Ile Ala Lys Gln Val Glu Ile Ala Lys Glu Met Gln Arg Val Glu
565 570 575

Glu Ile Arg Gln Arg Glu Lys Gln Leu Ala Ile Gln Leu Gln Glu Glu
580 585 590

Glu Lys Lys Gln Gln Glu Glu Lys His Leu Ser Glu Glu Lys Lys Gln
595 600 605

五、發明說明 (111)

Ala Glu Gln Lys Gln Lys Ala Glu Glu Lys Val Ala Gln Glu Arg Leu
610 615 620

Asp Ile Glu Gln Gln Lys Ala Tyr Glu Glu Met Ala Lys Arg Glu Ala
625 630 635 640

Glu Ala Ser Lys Asn Val Leu Leu Lys Ala Ile Asp Glu Glu Arg Pro
645 650 655

Lys Val Glu Thr Asp Pro Leu Phe Arg Thr Lys Leu Lys Tyr Ile Asn
660 665 670

Gln Asp Asp Tyr Ala Gly Ala Asn Tyr Phe Phe Asn Lys Val Gly Leu
675 680 685

Asn Thr Lys Gly His Gln Lys Val Asn Val Leu Gly Asp Asn Tyr Phe
690 695 700

Asp His Gln Val Ile Thr Arg Ser Ile Glu Lys Lys Val Asp Asn His
705 710 715 720

Leu Asn Gln Lys Tyr Asn Leu Ser Asp Val Glu Leu Val Lys Gln Leu
725 730 735

Met Asp Asn Ser Thr Thr Gln Ala Gln Glu Leu Asp Leu Lys Leu Gly
740 745 750

Ala Ala Leu Thr Lys Glu Gln Gln Ala Asn Leu Thr Gln Asp Ile Val
755 760 765

Trp Tyr Val Lys Thr Lys Val Lys Gly Lys Asp Val Phe Val Pro Lys
770 775 780

Val Tyr Phe Ala Ser Glu Thr Leu Val Glu Ala Gln Lys Leu Gln Gly
785 790 795 800

Leu Gly Thr Gly Thr Ile Arg Val Gly Glu Ala Lys Ile Lys Ala Lys
805 810 815

Asp Val Val Asn Thr Gly Thr Leu Ala Gly Arg Lys Leu Asn Val Glu
820 825 830

Ala Ser Asn Lys Ile Lys Asn Gln Gly Ser Ile Leu Ser Thr Gln Glu
835 840 845

Thr Arg Leu Val Gly Arg Lys Gly Ile Glu Asn Val Ser Arg Ser Phe
850 855 860

Ala Asn Asp Glu Leu Gly Val Thr Ala Gln Arg Ser Glu Ile Lys Thr
865 870 875 880

Glu Gly His Leu His Leu Glu Thr Asp Lys Asp Ser Thr Ile Asp Val
885 890 895

Gln Ala Ser Asp Ile Lys Ala Lys Thr Ser Phe Val Lys Thr Gly Asp
900 905 910

Val Asn Leu Lys Asn Thr Tyr Asn Thr Lys His Ala Tyr Arg Glu Lys
915 920 925

Phe Ser Pro Ser Ala Leu Gln Val Ala Glu Leu Asp Val Ala Gly Leu
930 935 940

五、發明說明 (112)

Lys Val Pro Leu Leu Gly Val Ser Ser Pro Ser Ser Tyr Ser Glu His
945 950 955 960

Thr Ser Glu Ala Thr Ser Glu Gly Ser Ile Phe Glu Val Gly His Leu
965 970 975

His Leu Ala Val Asp Arg Asp Val Asn Gln Ala Gly Ser Lys Ile Lys
980 985 990

Ala Lys Tyr Thr Thr Gly Val Val Lys Gly Asn Phe Asn Thr Glu Ala
995 1000 1005

Gly Lys Asn Ile Lys His Val Glu Lys Glu Glu Tyr Ser Ser Gln Leu
1010 1015 1020

Phe Ala Ser Ala His Ala Ser Gly Gly Gly Thr Ser Val Arg Tyr Asp
1025 1030 1035 1040

Tyr Asn Ser Gln Asp Gly Gly Asn Ala Ser Val Gly Val Pro Thr Asn
1045 1050 1055

His Thr Gly Val Gly Ala Glu Ala Gly Met Ser Phe Thr His Thr Lys
1060 1065 1070

Asp Lys Glu Thr Leu Leu Thr His Thr Asn Ser Glu Leu Gln Val Lys
1075 1080 1085

His Gly Lys Leu His Val Leu Gly Tyr Ala Asp Ile Gly Gly Val Asp
1090 1095 1100

Ile Asn Thr Lys Leu Pro Glu Asp Ala Gln Ser Lys Ala Gln Lys Glu
1105 1110 1115 1120

Ile Ala Ala Ser Lys Pro Glu Lys Thr Glu Gln Ser Ala Gln Asp Val
1125 1130 1135

Ala Gln Ala Gln Ser Asn Ala Asn Lys Asp Lys Glu Asn Lys Ala Pro
1140 1145 1150

Glu Ile Lys Glu Leu Ser Glu Ala Glu Ile Ala Asp Leu Met Ser Glu
1155 1160 1165

Lys Ser Lys Ala Tyr Phe Asp Asp Phe Ala Glu Gln Ala Lys Lys Ala
1170 1175 1180

Pro Glu Asn Asn Arg Phe Glu Leu Ser Ala Lys Glu Ile Lys Ser Ser
1185 1190 1195 1200

Lys Gln Lys Asp Gln Tyr Asp His Glu Ser Glu Arg Thr Thr Phe Lys
1205 1210 1215

Val Gly Pro Glu Ala Glu Ala His Ser Ala Val Ala Asp Met Val Ser
1220 1225 1230

His Leu Val Lys Glu Tyr Arg Asp Ala Gln Asn Gly Thr Lys Gln Asp
1235 1240 1245

Gly Thr Val Ala Leu Gln His Ala Ser Asp Val Leu Asn Ile Val Thr
1250 1255 1260

Gly Asp Leu Ala Gly Ser Ser Ala Lys Leu Ser Val Glu Arg Thr His
1265 1270 1275 1280

五、發明說明 (113)

Glu Thr Lys Arg Thr Thr Glu Thr Gly Asp Ile Val Thr Lys Ile Gly
1285 1290 1295

Gly Asn Val Thr Leu Ser Ala Arg Ser Gly Ser Val Asn Leu Lys Asn
1300 1305 1310

Val Gln Ser Asp Glu Gln Ala Asn Leu Thr Leu Arg Ala Lys Glu Asp
1315 1320 1325

Val Asn Val Leu Ser Gly Glu Lys Thr Arg Glu Thr Thr Glu Thr Val
1330 1335 1340

Ser Arg Gln Lys Leu Ser His Gly Val Asn Ala Gly Cys Ser Met Met
1345 1350 1355 1360

Ser Gly Ala Cys Thr Ala Gly Val Ser Thr Ser Leu Glu Gly Asn Glu
1365 1370 1375

Ser Tyr Thr Ser Glu Arg Glu Thr Ala Gln Asn Asn Ser Phe Leu Lys
1380 1385 1390

Ala Arg Asn Met Lys Val Glu Ala Gly Arg Asp Phe Asn Val Val Ser
1395 1400 1405

Ser Asn Ile Asp Ala Asp Lys Leu Asp Leu His Val Lys Gly Lys Thr
1410 1415 1420

Asn Val Val Ser Lys Gln Asp Thr Leu Gln Lys Val Thr His Gly Val
1425 1430 1435 1440

Asp Tyr Asn Leu Ser Ala Gly Val Ala Leu Ser Ser Ala Thr Ile Ala
1445 1450 1455

Thr Pro Thr Gly Asn Val Gly Phe Gly Tyr Thr Asn Glu Thr Glu Ser
1460 1465 1470

Lys Arg Thr Val Asn Gln Gln Ala Gly Ile Lys Ala Asn Lys Ile Thr
1475 1480 1485

Gly Gln Thr His Asp Leu Asn Leu Glu Gly Gly Tyr Leu Val Ser Asn
1490 1495 1500

Asp Lys Asp Asn Gln Leu Lys Val Thr Gly Asp Val Thr Thr Lys Ala
1505 1510 1515 1520

Leu His Asp Gln His Asp Lys Asp Gly Gly Thr Phe Gly Leu Ser Val
1525 1530 1535

Gly Ile Ser Glu Arg Gly Thr Thr Ala Phe Asn Val Arg Gly Gly Arg
1540 1545 1550

Ala Glu Gln Lys His Tyr Asn Ala Thr Gln Lys Ser Thr Leu Ser Gly
1555 1560 1565

Val Asp Thr Ser Gln Ala Asn Val Ser Gly Gln Val Asn Thr Asp Leu
1570 1575 1580

Thr Lys Ala Lys Ala Val Thr Arg Asp Asp Thr Tyr Ala Ser Thr Gln
1585 1590 1595 1600

Phe Ser Phe Glu Val Ala Asp Ile Val Glu Leu Gly Gln Arg Ala Lys
1605 1610 1615

五、發明說明 (114)

Asn Lys Leu Ser Ala Pro Asn Asn Asp Thr Asp Met Ala Ser Gly Ser
1620 1625 1630

Thr Leu Arg Ser Arg Ser Thr Thr Glu Glu Ala Asp Val Pro Thr Thr
1635 1640 1645

Arg Ser Arg Val Thr Asp Glu Ala Asp Ser Val Ser Val Lys Asn Pro
1650 1655 1660

Ile Tyr Glu Ser Ala Asp Ala Val Val Pro Thr Pro Arg Ser Arg Asn
1665 1670 1675 1680

Val Asp Ser Thr Asp Leu Val Asp Asn Pro Leu Tyr Ala Ser Ala Thr
1685 1690 1695

Thr Lys Ala Asn Ile His Asp Tyr Glu Glu Ile Pro Ala Val Tyr Ser
1700 1705 1710

Lys Val Gly Asp Asn Asn Ala Asp Leu Val Arg His Lys Thr Ala Thr
1715 1720 1725

Ser Asp Glu His Leu Tyr Ala Glu Ile Asn Glu Pro Thr Tyr Ser Arg
1730 1735 1740

Val Gly Asp Lys Asn Ala Asp Met Arg Arg His Asn Ala Ala Gly Thr
1745 1750 1755 1760

Thr Asp Tyr Ala Asp Val Val Gln Ala His Thr Arg Lys Ala Asp Asp
1765 1770 1775

Pro Leu Pro Ala Leu Pro Asn Gln Gly Lys Ala Arg Thr Val Asn Asp
1780 1785 1790

Gly Ser Glu His Ile Tyr Thr Asp Ile Ser Asp Val Gly Thr Gln Thr
1795 1800 1805

Lys Ala Ile Asp Ser Thr Tyr Ala Thr Val Gly Met Pro Lys Ala Asn
1810 1815 1820

Ala Val Asn Leu Ile Gly Gln Asn Gly Leu Gly Ser Ile Tyr His Ser
1825 1830 1835 1840

Pro Asp Ser Ala Tyr Lys Thr Trp Gln Leu Leu Asp Gln Phe Ala Asn
1845 1850 1855

Lys Gly Gly Asp Ala Val Phe Leu Arg Pro Ala Thr Glu Met Lys Cys
1860 1865 1870

Ala Gly Ala Pro Leu Lys Tyr Thr Phe Ile Val Arg Asp Tyr Leu Leu
1875 1880 1885

Arg Arg His Thr Leu Asp Lys Ser Arg Leu Phe Tyr Asn Ala His Asn
1890 1895 1900

Lys Thr Leu Phe Ser Val Pro Ile Val Asp Ala Lys Val Lys Met Leu
1905 1910 1915 1920

Phe Ala Glu Lys Asn Ile Gln Val Asn Tyr Asp Arg Ser Leu Thr Ala
1925 1930 1935

Ile Asp Leu Ser Lys Arg Ile Ala Thr Phe Asn Ser Pro Glu Gly Val
1940 1945 1950

五、發明說明 (115)

Val Glu Val Pro Tyr Asp Phe Ile Asn Val Val Pro Pro Met Arg Ala
1955 1960 1965

Pro Asp Ala Val Arg Gln Ser Ala Leu Ala Trp Gln Glu Gly Lys Trp
1970 1975 1980

Ala Asn Asp Gly Trp Val Glu Val Glu Lys His Thr Leu Arg His Arg
1985 1990 1995 2000

Arg Tyr Ala Asn Val Phe Ala Val Gly Asp Val Ala Gly Val Pro Lys
2005 2010 2015

Gly Lys Thr Ala Ala Ser Val Lys Trp Gln Val Pro Val Ala Val Ala
2020 2025 2030

His Leu Leu Ala Glu Leu Glu Gly Lys Pro Cys Asp Glu Ile Tyr Asn
2035 2040 2045

Gly Tyr Thr Ser Cys Pro Leu Ile Thr Gln Leu Gly Lys Gly Met Leu
2050 2055 2060

Val Glu Phe Asp Tyr Asn Asn His Leu Thr Pro Ser Phe Pro Gly Val
2065 2070 2075 2080

Ile Ala Pro Leu Glu Glu Leu Trp Ala Thr Trp Ala Ile Lys Thr Leu
2085 2090 2095

Gly Leu Lys Pro Thr Tyr Leu Gly Met Leu Arg Gly Leu Ala
2100 2105 2110

<210> 17
<211> 3247
<212> DNA
<213> 敗血性巴斯德桿菌

<220>
<221> CDS
<222> (1479) .. (3245)

<220>
<223> fhaB2

<400> 17
gtcgaccttg cgggtgaaaa ggtatctcta aattttggcg atatcattca tgcttaccaa 60
aaccagcccc tatcaacaaa agttgttttt caattagtga aagatttgac ggaagtttta 120
taccgttctg gctacgtgac aagtgcattt gggttaaaaa attcaaaaat cagcaatggc 180
gatcttgaat ttattgtact gtggggaaga actcgcgac tcgtttgtgaa tggggagaaa 240
ccaaccggtt ttagagataa aacaatgtta tcagtcctac ccaatttaac cggaatcg 300
ttaagtattc acgacattga ccagttgatc gaaatcttaa atactacgaa taaaaagcc 360
acagtgaatg tgggtgcaag tgaagaaaaa ggcagctcaa atctaaatat tgaaagacaa 420
tatgatgttt tcccgcaagt gagggtcgga ttcaataatt cagggtgctg caataatgcc 480
aatgggcgta atcaagctac attgaatatt gcttggagtg atctattagg cacgaatgat 540
cgttggaatt tctcgaatga ttaccgttta tataaaaatc atcatgctaa ccaacaaacgc 600

五、發明說明 (116)

aattatactt tgccttacag tcagcctata ggcttttcta cagtagaaat taaagcatcg 660
gaatctacgt atgaaaaaga acttcgcggg ataaatactc attcttctca tgggaaaacc 720
caaagcttag ctgtcaagct gatgcatgtg ttattgcgta ataaggagag tattttatct 780
acatataccg agttcgagtt taaaaaacgg attagttatt tttctgatat tttgattggg 840
aaatatcaca ataataaagt gagcgtaggg ttatcttaca tgactaattt tgcttacggg 900
aagctttaca gcgacattgc ttacgcgaat ggggtgagat ggtttggggc gaattattca 960
gcatatgatg caaatcgtga aaaaacctta aaattattgt caggaagtat taattggcag 1020
cgtccaatat ccttgtttga acgtgcgatg aattatcaat tacgtattgg tgcccaatat 1080
ggttttgata gtttgtattc tgaaaatcaa ttttcaattg gtgatgaata tacagtaaga 1140
ggatttaaag gtgggtgcgg ttctgggtgat agtgggtgct atttatcaca aacactgacg 1200
gttccttttt atccacaaaa agcatattta tctcaggat ccccttttat tggatttgat 1260
atgggtaaag tacatattaa atcaaagcat aaaacaacca ctttagtcgg ttttgcccta 1320
ggcttgaaaa cgcaataaaa gttattttca ttatcattaa cctatgcaca accaatgaat 1380
gggtgtgagtg gtgttacgca acatcgtcaa aaaccgattt attatttctc aggatcactt 1440
tctttttaat ctcttttaag ttaaggatt aacttaat atg aac aaa aat cgt tac 1496
Met Asn Lys Asn Arg Tyr
1 5
aaa ctc att ttt agt caa gtc aaa ggt tgt ctc gtt cct gtg gca gaa 1544
Lys Leu Ile Phe Ser Gln Val Lys Gly Cys Leu Val Pro Val Ala Glu
10 15 20
tgt att aac tca gct att agc aat ggt tca tct gat tca aca tcc aca 1592
Cys Ile Asn Ser Ala Ile Ser Asn Gly Ser Ser Asp Ser Thr Ser Thr
25 30 35
tca gaa caa gtt gaa gag gaa cct ttc ctt cta gaa caa tat tca ctt 1640
Ser Glu Gln Val Glu Glu Glu Pro Phe Leu Leu Glu Gln Tyr Ser Leu
40 45 50
tcc tcc gtg tct tta tta gta aaa agc acg ttc aat cct gtt tcg tat 1688
Ser Ser Val Ser Leu Leu Val Lys Ser Thr Phe Asn Pro Val Ser Tyr
55 60 65 70
gca atg caa ttg act tgg aaa cag ctt tct att tta ttt tta act gtg 1736
Ala Met Gln Leu Thr Trp Lys Gln Leu Ser Ile Leu Phe Leu Thr Val
75 80 85
att tct gtt cct gtt ttg gct gag gga aaa ggg gat gaa aga aat caa 1784
Ile Ser Val Pro Val Leu Ala Glu Gly Lys Gly Asp Glu Arg Asn Gln
90 95 100
tta aca gtg att gat aat agc gat cat att aaa tta gat gca tct aat 1832
Leu Thr Val Ile Asp Asn Ser Asp His Ile Lys Leu Asp Ala Ser Asn
105 110 115
ctt gct ggt aat gat aaa aca aaa atc tat caa gca gaa aat aaa gtt 1880
Leu Ala Gly Asn Asp Lys Thr Lys Ile Tyr Gln Ala Glu Asn Lys Val
120 125 130

裝
訂
線

五、發明說明 (117)

ctg gtt att gat att gct aaa cca aat ggg aaa ggg att tca gat aac	1928
Leu Val Ile Asp Ile Ala Lys Pro Asn Gly Lys Gly Ile Ser Asp Asn	
135 140 145 150	
cgt ttt gaa aaa ttt aat att cca aat agc gcg gtg ttt aat aat aat	1976
Arg Phe Glu Lys Phe Asn Ile Pro Asn Ser Ala Val Phe Asn Asn Asn	
155 160 165	
ggg act gaa gcg cag gca aga tca aca tta att ggt tac att ccg caa	2024
Gly Thr Glu Ala Gln Ala Arg Ser Thr Leu Ile Gly Tyr Ile Pro Gln	
170 175 180	
aat caa aat tta agg gga ggg aaa gaa gct gat gtt ata tta aat caa	2072
Asn Gln Asn Leu Arg Gly Gly Lys Glu Ala Asp Val Ile Leu Asn Gln	
185 190 195	
gtg aca ggt cct caa gaa agt aaa att gtt ggc gcg ctt gaa gta tta	2120
Val Thr Gly Pro Gln Glu Ser Lys Ile Val Gly Ala Leu Glu Val Leu	
200 205 210	
ggg aaa aaa gct gat atc gtc att gca aac caa aat ggt att acc tta	2168
Gly Lys Lys Ala Asp Ile Val Ile Ala Asn Gln Asn Gly Ile Thr Leu	
215 220 225 230	
aat ggt gta aga aca ata aat tca gat cgt ttt gtt gcc act acg agt	2216
Asn Gly Val Arg Thr Ile Asn Ser Asp Arg Phe Val Ala Thr Thr Ser	
235 240 245	
gag ctt ata gat ccg aat cag atg atg tta aag gtt aca aaa gga aat	2264
Glu Leu Ile Asp Pro Asn Gln Met Met Leu Lys Val Thr Lys Gly Asn	
250 255 260	
gtg atc att gat att gat ggt ttt tcg aca gat gga tta aag tat tta	2312
Val Ile Ile Asp Ile Asp Gly Phe Ser Thr Asp Gly Leu Lys Tyr Leu	
265 270 275	
gat att att gct aaa aaa att gaa caa aag caa tca att aca tca ggg	2360
Asp Ile Ile Ala Lys Lys Ile Glu Gln Lys Gln Ser Ile Thr Ser Gly	
280 285 290	
gat aat tca gaa gca aaa aca gat gtc act ctt att gcg ggt tcc agt	2408
Asp Asn Ser Glu Ala Lys Thr Asp Val Thr Leu Ile Ala Gly Ser Ser	
295 300 305 310	
gaa tat gat tta agc aaa cat gag ctg aaa aaa acg agc ggt gaa aat	2456
Glu Tyr Asp Leu Ser Lys His Glu Leu Lys Lys Thr Ser Gly Glu Asn	
315 320 325	
gta tct aat gat gtt att gct atc acg gga tct agt aca ggc gca atg	2504
Val Ser Asn Asp Val Ile Ala Ile Thr Gly Ser Ser Thr Gly Ala Met	
330 335 340	
cat ggt aaa aat att aag ttg att gtg aca gat aaa ggt gca ggc gta	2552
His Gly Lys Asn Ile Lys Leu Ile Val Thr Asp Lys Gly Ala Gly Val	
345 350 355	
aaa cat gat gga att att ttg tct gaa aat gat att cag att gaa atg	2600
Lys His Asp Gly Ile Ile Leu Ser Glu Asn Asp Ile Gln Ile Glu Met	
360 365 370	
aat gaa ggt gac tta gaa ctt ggc aat acg att cag caa aca gtg gta	2648
Asn Glu Gly Asp Leu Glu Leu Gly Asn Thr Ile Gln Gln Thr Val Val	
375 380 385 390	

五、發明說明 (118)

aaa aaa gac cga aat att cga gcc aag aaa aaa att gaa gtg aaa aac Lys Lys Asp Arg Asn Ile Arg Ala Lys Lys Lys Ile Glu Val Lys Asn 395 400 405	2696
gct aat cgt gtt ttt gtt ggt agt caa acg aaa tca gat gaa att tcg Ala Asn Arg Val Phe Val Gly Ser Gln Thr Lys Ser Asp Glu Ile Ser 410 415 420	2744
tta gag gcg aaa caa gtt aaa atc aga aaa aac gca gag att agg agt Leu Glu Ala Lys Gln Val Lys Ile Arg Lys Asn Ala Glu Ile Arg Ser 425 430 435	2792
acg aca caa gcc aaa atc gta gca aag ggt gcc ctg tct att gag caa Thr Thr Gln Ala Lys Ile Val Ala Lys Gly Ala Leu Ser Ile Glu Gln 440 445 450	2840
aat gcg aag ctc gtc gct aaa aag ata gat gtg gca aca gaa act cta Asn Ala Lys Leu Val Ala Lys Lys Ile Asp Val Ala Thr Glu Thr Leu 455 460 465 470	2888
act aat gct ggg cgt att tat ggt cga gag gtt aag ctt gac act aat Thr Asn Ala Gly Arg Ile Tyr Gly Arg Glu Val Lys Leu Asp Thr Asn 475 480 485	2936
aat ttg att aat gat aaa gaa att tat gct gaa cgg aaa ttg agt att Asn Leu Ile Asn Asp Lys Glu Ile Tyr Ala Glu Arg Lys Leu Ser Ile 490 495 500	2984
ttg acg aaa gga aaa gat ctt gaa att att caa gat aga tat ttg tct Leu Thr Lys Gly Lys Asp Leu Glu Ile Ile Gln Asp Arg Tyr Leu Ser 505 510 515	3032
cca ctg atg cgc gta aaa agt agt gtc cgc ttt tta ggc tct ccg ttt Pro Leu Met Arg Val Lys Ser Ser Val Arg Phe Leu Gly Ser Pro Phe 520 525 530	3080
ttc tca ata tct ccg tcg atg ctc gca agc ctt agt gca cag ttt aag Phe Ser Ile Ser Pro Ser Met Leu Ala Ser Leu Ser Ala Gln Phe Lys 535 540 545 550	3128
cct ggt ttt gtg aat aag gga ctc att gaa agt gcg ggg agt gca gaa Pro Gly Phe Val Asn Lys Gly Leu Ile Glu Ser Ala Gly Ser Ala Glu 555 560 565	3176
tta act ttt aaa gaa aaa acc agt ttt tta aca gag ggc aat aat ttt Leu Thr Phe Lys Glu Lys Thr Ser Phe Leu Thr Glu Gly Asn Asn Phe 570 575 580	3224
att aga gct aaa gat gcg tta ac Ile Arg Ala Lys Asp Ala Leu 585	3247

<210> 18

<211> 589

<212> 蛋白質

<213> 敗血性巴斯德桿菌

<400> 18

Met Asn Lys Asn Arg Tyr Lys Leu Ile Phe Ser Gln Val Lys Gly Cys
1 5 10 15

五、發明說明 (119)

Leu Val Pro Val Ala Glu Cys Ile Asn Ser Ala Ile Ser Asn Gly Ser
20 25 30

Ser Asp Ser Thr Ser Thr Ser Glu Gln Val Glu Glu Glu Pro Phe Leu
35 40 45

Leu Glu Gln Tyr Ser Leu Ser Ser Val Ser Leu Leu Val Lys Ser Thr
50 55 60

Phe Asn Pro Val Ser Tyr Ala Met Gln Leu Thr Trp Lys Gln Leu Ser
65 70 75 80

Ile Leu Phe Leu Thr Val Ile Ser Val Pro Val Leu Ala Glu Gly Lys
85 90 95

Gly Asp Glu Arg Asn Gln Leu Thr Val Ile Asp Asn Ser Asp His Ile
100 105 110

Lys Leu Asp Ala Ser Asn Leu Ala Gly Asn Asp Lys Thr Lys Ile Tyr
115 120 125

Gln Ala Glu Asn Lys Val Leu Val Ile Asp Ile Ala Lys Pro Asn Gly
130 135 140

Lys Gly Ile Ser Asp Asn Arg Phe Glu Lys Phe Asn Ile Pro Asn Ser
145 150 155 160

Ala Val Phe Asn Asn Asn Gly Thr Glu Ala Gln Ala Arg Ser Thr Leu
165 170 175

Ile Gly Tyr Ile Pro Gln Asn Gln Asn Leu Arg Gly Gly Lys Glu Ala
180 185 190

Asp Val Ile Leu Asn Gln Val Thr Gly Pro Gln Glu Ser Lys Ile Val
195 200 205

Gly Ala Leu Glu Val Leu Gly Lys Lys Ala Asp Ile Val Ile Ala Asn
210 215 220

Gln Asn Gly Ile Thr Leu Asn Gly Val Arg Thr Ile Asn Ser Asp Arg
225 230 235 240

Phe Val Ala Thr Thr Ser Glu Leu Ile Asp Pro Asn Gln Met Met Leu
245 250 255

Lys Val Thr Lys Gly Asn Val Ile Ile Asp Ile Asp Gly Phe Ser Thr
260 265 270

Asp Gly Leu Lys Tyr Leu Asp Ile Ile Ala Lys Lys Ile Glu Gln Lys
275 280 285

Gln Ser Ile Thr Ser Gly Asp Asn Ser Glu Ala Lys Thr Asp Val Thr
290 295 300

Leu Ile Ala Gly Ser Ser Glu Tyr Asp Leu Ser Lys His Glu Leu Lys
305 310 315 320

Lys Thr Ser Gly Glu Asn Val Ser Asn Asp Val Ile Ala Ile Thr Gly
325 330 335

Ser Ser Thr Gly Ala Met His Gly Lys Asn Ile Lys Leu Ile Val Thr
340 345 350

五、發明說明 (120)

Asp Lys Gly Ala Gly Val Lys His Asp Gly Ile Ile Leu Ser Glu Asn
355 360 365

Asp Ile Gln Ile Glu Met Asn Glu Gly Asp Leu Glu Leu Gly Asn Thr
370 375 380

Ile Gln Gln Thr Val Val Lys Lys Asp Arg Asn Ile Arg Ala Lys Lys
385 390 395 400

Lys Ile Glu Val Lys Asn Ala Asn Arg Val Phe Val Gly Ser Gln Thr
405 410 415

Lys Ser Asp Glu Ile Ser Leu Glu Ala Lys Gln Val Lys Ile Arg Lys
420 425 430

Asn Ala Glu Ile Arg Ser Thr Thr Gln Ala Lys Ile Val Ala Lys Gly
435 440 445

Ala Leu Ser Ile Glu Gln Asn Ala Lys Leu Val Ala Lys Lys Ile Asp
450 455 460

Val Ala Thr Glu Thr Leu Thr Asn Ala Gly Arg Ile Tyr Gly Arg Glu
465 470 475 480

Val Lys Leu Asp Thr Asn Asn Leu Ile Asn Asp Lys Glu Ile Tyr Ala
485 490 495

Glu Arg Lys Leu Ser Ile Leu Thr Lys Gly Lys Asp Leu Glu Ile Ile
500 505 510

Gln Asp Arg Tyr Leu Ser Pro Leu Met Arg Val Lys Ser Ser Val Arg
515 520 525

Phe Leu Gly Ser Pro Phe Phe Ser Ile Ser Pro Ser Met Leu Ala Ser
530 535 540

Leu Ser Ala Gln Phe Lys Pro Gly Phe Val Asn Lys Gly Leu Ile Glu
545 550 555 560

Ser Ala Gly Ser Ala Glu Leu Thr Phe Lys Glu Lys Thr Ser Phe Leu
565 570 575

Thr Glu Gly Asn Asn Phe Ile Arg Ala Lys Asp Ala Leu
580 585

<210> 19
<211> 3247
<212> DNA
<213> 敗血性巴斯德桿菌

<220>
<221> CDS
<222> (1) .. (1446)

<220>
<223> fhaC

<400> 19
gtc gac ctt gcg ggt gaa aag gta tct cta aat ttt ggc gat atc att 48
Val Asp Leu Ala Gly Glu Lys Val Ser Leu Asn Phe Gly Asp Ile Ile
1 5 10 15

五、發明說明 (121)

cat gct tac caa aac cag ccc cta tca aca aaa gtt gtt ttt caa tta His Ala Tyr Gln Asn Gln Pro Leu Ser Thr Lys Val Val Phe Gln Leu 20 25 30	96
gtg aaa gat ttg acg gaa gtt tta tac cgt tct ggc tac gtg aca agt Val Lys Asp Leu Thr Glu Val Leu Tyr Arg Ser Gly Tyr Val Thr Ser 35 40 45	144
gca att ggt tta aaa aat tca aaa atc agc aat ggc gat ctt gaa ttt Ala Ile Gly Leu Lys Asn Ser Lys Ile Ser Asn Gly Asp Leu Glu Phe 50 55 60	192
att gta ctg tgg gga aga act cgc gat ctg ttt gtg aat ggg gag aaa Ile Val Leu Trp Gly Arg Thr Arg Asp Leu Phe Val Asn Gly Glu Lys 65 70 75 80	240
cca acc cgt ttt aga gat aaa aca atg tta tca gtc cta ccc aat tta Pro Thr Arg Phe Arg Asp Lys Thr Met Leu Ser Val Leu Pro Asn Leu 85 90 95	288
atc gga aat cgc tta agt att cac gac att gac cag ttg atc gaa atc Ile Gly Asn Arg Leu Ser Ile His Asp Ile Asp Gln Leu Ile Glu Ile 100 105 110	336
tta aat act acg aat aaa aaa gcc aca gtg aat gtg gtt gca agt gaa Leu Asn Thr Thr Asn Lys Lys Ala Thr Val Asn Val Val Ala Ser Glu 115 120 125	384
gaa aaa ggc agc tca aat cta aat att gaa aga caa tat gat gtt ttt Glu Lys Gly Ser Ser Asn Leu Asn Ile Glu Arg Gln Tyr Asp Val Phe 130 135 140	432
ccg caa gtg agt gtc gga ttc aat aat tca ggt gct ggc aat aat gcc Pro Gln Val Ser Val Gly Phe Asn Asn Ser Gly Ala Gly Asn Asn Ala 145 150 155 160	480
aat ggg cgt aat caa gct aca ttg aat att gct tgg agt gat cta tta Asn Gly Arg Asn Gln Ala Thr Leu Asn Ile Ala Trp Ser Asp Leu Leu 165 170 175	528
ggc acg aat gat cgt tgg agt ttc tgc agt agt tac cgt tta tat aaa Gly Thr Asn Asp Arg Trp Ser Phe Ser Ser Ser Tyr Arg Leu Tyr Lys 180 185 190	576
aat cat cat gct aac cag caa cgc aat tat act ttg tct tac agt cag Asn His His Ala Asn Gln Gln Arg Asn Tyr Thr Leu Ser Tyr Ser Gln 195 200 205	624
cct ata ggc ttt tct aca gta gaa att aaa gca tgc gaa tct acg tat Pro Ile Gly Phe Ser Thr Val Glu Ile Lys Ala Ser Glu Ser Thr Tyr 210 215 220	672
gaa aaa gaa ctt cgc ggt ata aat act cat tct tct cat ggg aaa acc Glu Lys Glu Leu Arg Gly Ile Asn Thr His Ser Ser His Gly Lys Thr 225 230 235 240	720
caa agc tta gct gtc aag ctg atg cat gtg tta ttg cgt aat aag gag Gln Ser Leu Ala Val Lys Leu Met His Val Leu Leu Arg Asn Lys Glu 245 250 255	768
agt att tta tct aca tat acc gag ttc gag ttt aaa aaa cgg att agt Ser Ile Leu Ser Thr Tyr Thr Glu Phe Glu Phe Lys Lys Arg Ile Ser 260 265 270	816

五、發明說明 (122)

tat ttt tct gat att ttg att ggg aaa tat cac aat aat aaa gtg agc 864
Tyr Phe Ser Asp Ile Leu Ile Gly Lys Tyr His Asn Asn Lys Val Ser
275 280 285

gta ggg tta tct tac atg act aat ttt gct tac ggg aag ctt tac agc 912
Val Gly Leu Ser Tyr Met Thr Asn Phe Ala Tyr Gly Lys Leu Tyr Ser
290 295 300

gac att gct tac gcg aat ggg ttg aga tgg ttt ggg gcg aat tat tca 960
Asp Ile Ala Tyr Ala Asn Gly Leu Arg Trp Phe Gly Ala Asn Tyr Ser
305 310 315 320

gca tat gat gca aat cgt gaa aaa acc tta aaa tta ttg tca gga agt 1008
Ala Tyr Asp Ala Asn Arg Glu Lys Thr Leu Lys Leu Leu Ser Gly Ser
325 330 335

att aat tgg cag cgt cca ata tcc ctg ttt gaa cgt gcg atg aat tat 1056
Ile Asn Trp Gln Arg Pro Ile Ser Leu Phe Glu Arg Ala Met Asn Tyr
340 345 350

caa tta cgt att ggt gcc caa tat ggt ttt gat agt ttg tat tct gaa 1104
Gln Leu Arg Ile Gly Ala Gln Tyr Gly Phe Asp Ser Leu Tyr Ser Glu
355 360 365

aat caa ttt tca att ggt gat gaa tat aca gta aga gga ttt aaa ggt 1152
Asn Gln Phe Ser Ile Gly Asp Glu Tyr Thr Val Arg Gly Phe Lys Gly
370 375 380

ggt gcg gtt tct ggt gat agt ggt gcg tat tta tca caa aca ctg acg 1200
Gly Ala Val Ser Gly Asp Ser Gly Ala Tyr Leu Ser Gln Thr Leu Thr
385 390 395 400

gtt cct ttt tat cca caa aaa gca tat tta tct cag gta tcc cct ttt 1248
Val Pro Phe Tyr Pro Gln Lys Ala Tyr Leu Ser Gln Val Ser Pro Phe
405 410 415

att gga ttt gat atg ggt aaa gta cat att aaa tca aag cat aaa aca 1296
Ile Gly Phe Asp Met Gly Lys Val His Ile Lys Ser Lys His Lys Thr
420 425 430

acc act tta gtc ggt ttt gcc cta ggc ttg aaa acg caa ata aag tta 1344
Thr Thr Leu Val Gly Phe Ala Leu Gly Leu Lys Thr Gln Ile Lys Leu
435 440 445

ttt tca tta tca tta acc tat gca caa cca atg aat ggt gtg agt ggt 1392
Phe Ser Leu Ser Leu Thr Tyr Ala Gln Pro Met Asn Gly Val Ser Gly
450 455 460

gtt acg caa cat cgt caa aaa ccg att tat tat ttc tca gga tca ctt 1440
Val Thr Gln His Arg Gln Lys Pro Ile Tyr Tyr Phe Ser Gly Ser Leu
465 470 475 480

tct ttt taatctcttt taagtttaag gattaactta atatgaacaa aaatcgttac 1495
Ser Phe

aaactcattt ttagtcaagt caaaggttgt ctgcgttctg tggcagaatg tattaactca 1556

gctattagca atgggttcac tgattcaaca tccacatcag aacaagttga agaggaacct 1616

ttccttctag aacaatatcc actttcctcc gtgtctttat tagtaaaaag cacgttcaat 1676

cctgtttcgt atgcaatgca attgacttgg aaacagcttt ctattttatt ttttaactgtg 1736

五、發明說明 (123)

atttctgttc ctgttttggc tgagggaaaa ggggatgaaa gaaatcaatt aacagtgatt 1796
gataatagcg atcatattaa attagatgca tctaattcttg ctggtaatga taaaacaaaa 1856
atctatcaag cagaaaaataa agttctgggtt attgatattg ctaaaccaaa tgggaaaggg 1916
atttcagata accgttttga aaaatttaat attccaaata gcgcggtggt taataataat 1976
gggactgaag cgcaggcaag atcaacatta attggttaca ttccgcaaaa tcaaaattta 2036
aggggagggga aagaagctga tgttatatta aatcaagtga caggctctca agaaagtaaa 2096
attggtggcg cgcttgaagt attaggtaaa aaagctgata tcgtcattgc aaacccaaat 2156
gggtattacct taaatgggtg aagaacaata aattcagatc gttttgttgc cactacgagt 2216
gagcttatag atccgaatca gatgatgta aaggttaca aaggaaatgt gatcattgat 2276
attgatgggt tttcgacaga tggattaaag tathtagata ttattgctaa aaaaattgaa 2336
caaaagcaat caattacatc aggggataat tcagaagcaa aaacagatgt cactcttatt 2396
gcgggttcca gtgaatatga ttaagcaaa catgagctga aaaaaacgag cggtgaaaaat 2456
gtatctaattg atgttattgc tatcacggga tctagtacag gcgcaatgca tggtaaaaaat 2516
attaagttga ttgtgacaga taaaggtgca ggcgtaaaac atgatggaat tattttgtct 2576
gaaaatgata ttcagattga aatgaatgaa ggtgacttag aacttggcaa tacgattcag 2636
caaacagtgg taaaaaaga ccgaaatatt cgagccaaga aaaaaattga agtgaaaaac 2696
gctaatactg tttttgttgg tagtcaaacg aaatcagatg aaatttcgtt agaggcgaaa 2756
caagttaaaa tcagaaaaaa cgcagagatt aggagtacga cacaagccaa aatcgtagca 2816
aagggtgccc tgtctattga gcaaaatgcg aagctcgtcg ctaaaaagat agatgtggca 2876
acagaaactc taactaatgc tgggcgtatt tatggtcgag aggttaagct tgacactaat 2936
aatttgatta atgataaaga aatttatgct gaacggaaat tgagtatttt gacgaaagga 2996
aaagatcttg aaattattca agatagatat ttgtctccac tgatgcgcgt aaaaagtagt 3056
gtccgctttt taggctctcc gttttttctca atatctccgt cgatgctcgc aagccttagt 3116
gcacagttta agcctgggtt tgtgaataag ggactcattg aaagtgcggg gagtgcagaa 3176
ttaactttta aagaaaaaac cagtttttta acagagggca ataattttat tagagctaaa 3236
gatgcgttaa c 3247

- <210> 20
- <211> 482
- <212> 蛋白質
- <213> 敗血性巴斯德桿菌

<400> 20
Val Asp Leu Ala Gly Glu Lys Val Ser Leu Asn Phe Gly Asp Ile Ile
1 5 10 15

裝
訂
線

五、發明說明 (124)

His Ala Tyr Gln Asn Gln Pro Leu Ser Thr Lys Val Val Phe Gln Leu
20 25 30

Val Lys Asp Leu Thr Glu Val Leu Tyr Arg Ser Gly Tyr Val Thr Ser
35 40 45

Ala Ile Gly Leu Lys Asn Ser Lys Ile Ser Asn Gly Asp Leu Glu Phe
50 55 60

Ile Val Leu Trp Gly Arg Thr Arg Asp Leu Phe Val Asn Gly Glu Lys
65 70 75 80

Pro Thr Arg Phe Arg Asp Lys Thr Met Leu Ser Val Leu Pro Asn Leu
85 90 95

Ile Gly Asn Arg Leu Ser Ile His Asp Ile Asp Gln Leu Ile Glu Ile
100 105 110

Leu Asn Thr Thr Asn Lys Lys Ala Thr Val Asn Val Val Ala Ser Glu
115 120 125

Glu Lys Gly Ser Ser Asn Leu Asn Ile Glu Arg Gln Tyr Asp Val Phe
130 135 140

Pro Gln Val Ser Val Gly Phe Asn Asn Ser Gly Ala Gly Asn Asn Ala
145 150 155 160

Asn Gly Arg Asn Gln Ala Thr Leu Asn Ile Ala Trp Ser Asp Leu Leu
165 170 175

Gly Thr Asn Asp Arg Trp Ser Phe Ser Ser Ser Tyr Arg Leu Tyr Lys
180 185 190

Asn His His Ala Asn Gln Gln Arg Asn Tyr Thr Leu Ser Tyr Ser Gln
195 200 205

Pro Ile Gly Phe Ser Thr Val Glu Ile Lys Ala Ser Glu Ser Thr Tyr
210 215 220

Glu Lys Glu Leu Arg Gly Ile Asn Thr His Ser Ser His Gly Lys Thr
225 230 235 240

Gln Ser Leu Ala Val Lys Leu Met His Val Leu Leu Arg Asn Lys Glu
245 250 255

Ser Ile Leu Ser Thr Tyr Thr Glu Phe Glu Phe Lys Lys Arg Ile Ser
260 265 270

Tyr Phe Ser Asp Ile Leu Ile Gly Lys Tyr His Asn Asn Lys Val Ser
275 280 285

Val Gly Leu Ser Tyr Met Thr Asn Phe Ala Tyr Gly Lys Leu Tyr Ser
290 295 300

Asp Ile Ala Tyr Ala Asn Gly Leu Arg Trp Phe Gly Ala Asn Tyr Ser
305 310 315 320

Ala Tyr Asp Ala Asn Arg Glu Lys Thr Leu Lys Leu Leu Ser Gly Ser
325 330 335

Ile Asn Trp Gln Arg Pro Ile Ser Leu Phe Glu Arg Ala Met Asn Tyr
340 345 350

五、發明說明 (125)

Gln Leu Arg Ile Gly Ala Gln Tyr Gly Phe Asp Ser Leu Tyr Ser Glu
355 360 365

Asn Gln Phe Ser Ile Gly Asp Glu Tyr Thr Val Arg Gly Phe Lys Gly
370 375 380

Gly Ala Val Ser Gly Asp Ser Gly Ala Tyr Leu Ser Gln Thr Leu Thr
385 390 395 400

Val Pro Phe Tyr Pro Gln Lys Ala Tyr Leu Ser Gln Val Ser Pro Phe
405 410 415

Ile Gly Phe Asp Met Gly Lys Val His Ile Lys Ser Lys His Lys Thr
420 425 430

Thr Thr Leu Val Gly Phe Ala Leu Gly Leu Lys Thr Gln Ile Lys Leu
435 440 445

Phe Ser Leu Ser Leu Thr Tyr Ala Gln Pro Met Asn Gly Val Ser Gly
450 455 460

Val Thr Gln His Arg Gln Lys Pro Ile Tyr Tyr Phe Ser Gly Ser Leu
465 470 475 480

Ser Phe

<210> 21
<211> 1170
<212> DNA
<213> 敗血性巴斯德桿菌

<220>
<221> CDS
<222> (639) .. (1022)

<220>
<223> greA

<400> 21
gtcaacaaac ggcaaccact tcggcaaaaa gcgattgcgc ttgtgttctg ctctaagctc 60
aagcggtggg atcgcgcgaa ttgcgttgac cactgggtgag atcggggtca cctgtaaaac 120
gtacgataag atcgccatgc atttcattgt tttttatttt tccattgggt aatagactgg 180
tttcaaattg aaattggtca cttagtagca gtttggcggg taaggcgggt agcacttttt 240
gtgtactggc gggtaacata aaggtagtgg cttggtgcgc tacaattttt tcattacgat 300
ttaagttttt agccacaaaa cctaggctgg tcccttcggg taaatgagcg ttgatttcag 360
caagatcaat ctcagcataa ctgaaatgac tgacgagtaa actacatata agtatcgttc 420
gtttgaaaag gcgtaaaagc gtggcagtaa aaaaagaaga tattttatac ataattggct 480
cgagcagttg ctattttttt attgtcgaac aataatagta tttgaaccct cgagagtaaa 540
tccttttttc gttaaactact tattttttta ttcaactacg gcattgtttt tacaatgttg 600

五、發明說明 (126)

tgggttttgggt tttatctaaa aaggaagaaa aaacgatt atg aaa cag att cca atg 656
 Met Lys Gln Ile Pro Met
 1 5

act ata cgt ggt gcg gaa caa tta aga caa gaa ctc gat ttt ttg aaa 704
 Thr Ile Arg Gly Ala Glu Gln Leu Arg Gln Glu Leu Asp Phe Leu Lys
 10 15 20

aac act cgt cgc cca gaa att att aat gct atc gca gaa gct cgt gaa 752
 Asn Thr Arg Arg Pro Glu Ile Ile Asn Ala Ile Ala Glu Ala Arg Glu
 25 30 35

cat ggc gat cta aaa gaa aat gca gaa tac cat gct gcg cgt gaa cag 800
 His Gly Asp Leu Lys Glu Asn Ala Glu Tyr His Ala Ala Arg Glu Gln
 40 45 50

caa gga ttt tgt gaa gga cga atc caa gaa att gaa ggg aaa tta gcg 848
 Gln Gly Phe Cys Glu Gly Arg Ile Gln Glu Ile Glu Gly Lys Leu Ala
 55 60 65 70

aat agt caa att att gat gtc aca aag atc cca aat aat ggc aaa gtg 896
 Asn Ser Gln Ile Ile Asp Val Thr Lys Ile Pro Asn Asn Gly Lys Val
 75 80 85

att ttt ggt gcc aca att ttg tta ctg aat att gac acg gaa gaa gaa 944
 Ile Phe Gly Ala Thr Ile Leu Leu Asn Ile Asp Thr Glu Glu Glu
 90 95 100

gtc tcg tac caa att gta ggc gat gat gaa gcc aat att aaa gca ggg 992
 Val Ser Tyr Gln Ile Val Gly Asp Asp Glu Ala Asn Ile Lys Ala Gly
 105 110 115

cta att tca gtt aac gcc acg cga ttg aat tagagaaagc taaatggatt 1042
 Leu Ile Ser Val Asn Ala Thr Arg Leu Asn
 120 125

gcccaagatc ttggcgtcaa acaaacgtta attgacactt ccgtcattaa agcgattacg 1102
 caaaatgcct taatggacga acaggcaaga attgagcaac atggcagtac accgaatact 1162
 ttcggttga 1170

<210> 22
 <211> 128
 <212> 蛋白質
 <213> 敗血性巴斯德桿菌

<400> 22
 Met Lys Gln Ile Pro Met Thr Ile Arg Gly Ala Glu Gln Leu Arg Gln
 1 5 10 15
 Glu Leu Asp Phe Leu Lys Asn Thr Arg Arg Pro Glu Ile Ile Asn Ala
 20 25 30
 Ile Ala Glu Ala Arg Glu His Gly Asp Leu Lys Glu Asn Ala Glu Tyr
 35 40 45
 His Ala Ala Arg Glu Gln Gln Gly Phe Cys Glu Gly Arg Ile Gln Glu
 50 55 60
 Ile Glu Gly Lys Leu Ala Asn Ser Gln Ile Ile Asp Val Thr Lys Ile
 65 70 75 80

五、發明說明 (127)

Pro Asn Asn Gly Lys Val Ile Phe Gly Ala Thr Ile Leu Leu Leu Asn
85 90 95
Ile Asp Thr Glu Glu Glu Val Ser Tyr Gln Ile Val Gly Asp Asp Glu
100 105 110
Ala Asn Ile Lys Ala Gly Leu Ile Ser Val Asn Ala Thr Arg Leu Asn
115 120 125

<210> 23
<211> 4666
<212> DNA
<213> 敗血性巴斯德桿菌

<220>
<221> CDS
<222> (980) .. (2440)

<220>
<223> .guaB

<400> 23
aacacatgaa cctcttcccc aaaatacgca tccatatctc gccaatcttg gcgaaatgct 60
tcatcaattc ctgcttggtc aaaatgttgt aaacgtgcaa tcaacttttt acctaattct 120
gcgatcaatt tattccgac aatcggttgt aatacttcaa tcagctctgc ccaagggtga 180
tcaatttgct gtgtttgttt tgggaaagac aaattaatgc caaagccaat cagcagatta 240
tggtgattat tctgacgatt ggcgatttcg accaaaatcc ctgctaattt gcgcccattg 300
aatagcacat catttggtcca ttttaatcca atgttcaaag cacctgcttg ctttagcggt 360
tctgcgattg ccataccac tactaaactc aagccttcta aattgacctt ttggtcacat 420
gcccataaca aactcataat cacttggtcca gcaaaaggag aaagccattg acgaccacgt 480
cgtccacgtc ccgcagtttg atattctgct aagcaaatac cgcctttttc caaatgtgca 540
atattgtcaa gcaagaattg attggctgag ttaataatcg gcttaatata aagtgggtga 600
gggtgctaacg cttgcgtcaa ataagattca ttttaagcga ttaattgagg tatgagacga 660
aaatgttgga cttgctgttc tatttgatc ccttggtgtt tcaatttttc gatattgtgt 720
aagatatctt gttctgaata acctaaaagt gcagtcaatt ctgctaaga aagtgttgga 780
tagctagcga gtaatgcaag tacgttttgc ataaaaatcc ttatttatat aaccaagag 840
aggcaactta ttatagacaa tgattttctc gaaaatcgat aaaaaaatcc attttcaaac 900
agcaacgaaa tctgtataat gcgaccgcaa ttttttttac ctttttatat tccatatcaa 960
cctaagagag aatattgca atg tta cga gta ata aaa gaa gca tta acc ttc 1012
Met Leu Arg Val Ile Lys Glu Ala Leu Thr Phe
1 5 10
gat gat gtt ttg ctt gtc cca gca cat tct act gtg ctg cca aat acc 1060
Asp Asp Val Leu Leu Val Pro Ala His Ser Thr Val Leu Pro Asn Thr
15 20 25

五、發明說明 (128)

gca gac ctt tcc act caa ctc acc aaa act atc cgc ctc aat atc cca Ala Asp Leu Ser Thr Gln Leu Thr Lys Thr Ile Arg Leu Asn Ile Pro 30 35 40	1108
atg tta tcc gcc gcc atg gat acc gtg aca gaa act aaa ctg gca atc Met Leu Ser Ala Ala Met Asp Thr Val Thr Glu Thr Lys Leu Ala Ile 45 50 55	1156
tct ctt gca caa gaa ggt ggc atc ggg ttt att cat aaa aat atg tct Ser Leu Ala Gln Glu Gly Gly Ile Gly Phe Ile His Lys Asn Met Ser 60 65 70 75	1204
att gag cgt caa gcg gaa cgt gtc cgc aaa gtg aaa aaa ttt gag agc Ile Glu Arg Gln Ala Glu Arg Val Arg Lys Val Lys Lys Phe Glu Ser 80 85 90	1252
ggc att gta tcc gat cct gtc acc gtt tca cca acc tta tct tta gca Gly Ile Val Ser Asp Pro Val Thr Val Ser Pro Thr Leu Ser Leu Ala 95 100 105	1300
gaa tta agt gaa tta gtg aag aaa aat ggt ttt gcg agt ttc cct gtt Glu Leu Ser Glu Leu Val Lys Lys Asn Gly Phe Ala Ser Phe Pro Val 110 115 120	1348
gtt gat gat gaa aaa aat ctt gtc ggt atc att act ggt cgt gat aca Val Asp Asp Glu Lys Asn Leu Val Gly Ile Ile Thr Gly Arg Asp Thr 125 130 135	1396
cgc ttt gtc acg gat tta aat aaa aca gtg gcg gac ttt atg acc cct Arg Phe Val Thr Asp Leu Asn Lys Thr Val Ala Asp Phe Met Thr Pro 140 145 150 155	1444
aaa gct cgt ctt gtc acg gtg aaa cgc aat gca agt cgc gat gaa att Lys Ala Arg Leu Val Thr Val Lys Arg Asn Ala Ser Arg Asp Glu Ile 160 165 170	1492
ttt ggt cta atg cat aca cac cgt gta gaa aaa gtc ctt gtt gtc agc Phe Gly Leu Met His Thr His Arg Val Glu Lys Val Leu Val Val Ser 175 180 185	1540
gac gat ttc aaa tta aaa ggc atg atc acc tta aaa gac tac caa aaa Asp Asp Phe Lys Leu Lys Gly Met Ile Thr Leu Lys Asp Tyr Gln Lys 190 195 200	1588
tcc gag caa aaa cca caa gcc tgt aaa gat gaa ttt ggt cgt tta cgt Ser Glu Gln Lys Pro Gln Ala Cys Lys Asp Glu Phe Gly Arg Leu Arg 205 210 215	1636
gtc ggt gct gca gta gga gca gga cct ggt aat gaa gaa cgt att gat Val Gly Ala Ala Val Gly Ala Gly Pro Gly Asn Glu Glu Arg Ile Asp 220 225 230 235	1684
gca tta gtg aaa gca ggg gtc gat gtg tta ttg att gac tca tca cac Ala Leu Val Lys Ala Gly Val Asp Val Leu Leu Ile Asp Ser Ser His 240 245 250	1732
ggc cat tca gaa ggt gtg tta caa cgt gtg cgt gaa act cgt gcg aaa Gly His Ser Glu Gly Val Leu Gln Arg Val Arg Glu Thr Arg Ala Lys 255 260 265	1780
tac cca gat ttg cca att gtt gca ggt aat gtg gca acc gct gaa ggc Tyr Pro Asp Leu Pro Ile Val Ala Gly Asn Val Ala Thr Ala Glu Gly 270 275 280	1828

裝
訂
線

五、發明說明 (129)

gca att gcg ttc gct gat gca ggg gca agt gca gtg aaa gtg ggg att	1876
Ala Ile Ala Leu Ala Asp Ala Gly Ala Ser Ala Val Lys Val Gly Ile	
285 290 295	
ggc cct ggt tca att tgt aca aca cgt att gtc aca ggc gtg ggc gtt	1924
Gly Pro Gly Ser Ile Cys Thr Thr Arg Ile Val Thr Gly Val Gly Val	
300 305 310 315	
cca caa att aca gcg att gcc gat gcg gca gaa gca cta aaa gat cgg	1972
Pro Gln Ile Thr Ala Ile Ala Asp Ala Ala Glu Ala Leu Lys Asp Arg	
320 325 330	
ggc att cct gtg att gca gat ggc ggt atc cgt ttc tct ggt gat att	2020
Gly Ile Pro Val Ile Ala Asp Gly Gly Ile Arg Phe Ser Gly Asp Ile	
335 340 345	
tcg aaa gcc att gcg gcg ggc gcc tct tgt gtt atg gtg ggt tcc atg	2068
Ser Lys Ala Ile Ala Ala Gly Ala Ser Cys Val Met Val Gly Ser Met	
350 355 360	
ttt gca ggt aca gaa gaa gca cca ggt gaa atc gaa ctt tat caa ggt	2116
Phe Ala Gly Thr Glu Glu Ala Pro Gly Glu Ile Glu Leu Tyr Gln Gly	
365 370 375	
cgt gcc ttt aaa tct tat cga ggt atg gga tcg tta ggt gcg atg agc	2164
Arg Ala Phe Lys Ser Tyr Arg Gly Met Gly Ser Leu Gly Ala Met Ser	
380 385 390 395	
aaa ggc tca agc gac cgc tat ttc cag tcc gat aat gca gct gac aaa	2212
Lys Gly Ser Ser Asp Arg Tyr Phe Gln Ser Asp Asn Ala Ala Asp Lys	
400 405 410	
tta gta cca gaa ggt att gaa gga cgt att cca tat aaa gga ttc tta	2260
Leu Val Pro Glu Gly Ile Glu Gly Arg Ile Pro Tyr Lys Gly Phe Leu	
415 420 425	
aaa gaa att atc cat caa caa atg ggt gga ttg cgt tct tgt atg ggc	2308
Lys Glu Ile Ile His Gln Gln Met Gly Gly Leu Arg Ser Cys Met Gly	
430 435 440	
tta acg ggt tgt gca acc att gat gaa ctc cgt acc aaa gcg cag ttt	2356
Leu Thr Gly Cys Ala Thr Ile Asp Glu Leu Arg Thr Lys Ala Gln Phe	
445 450 455	
gtg cgc att agt ggt gca ggg atc caa gaa agc cat gtg cat gat gtg	2404
Val Arg Ile Ser Gly Ala Gly Ile Gln Glu Ser His Val His Asp Val	
460 465 470 475	
act atc aca aaa gaa gcc cct aat tat cgt atg ggt taaacattgc	2450
Thr Ile Thr Lys Glu Ala Pro Asn Tyr Arg Met Gly	
480 485	
ttaggtgggg attatcccca cctaagttaa ttttaataaa caacgttaat agagaagctt	2510
atttttatgt atggcattaa aactaaaaat gttattaaac tttttctatt aaagttttta	2570
agaaataaat atcgatataa aatcaatatt caacatcatc tcattagtat tgaaggaaaa	2630
tgcggtgagt ttgatttaag ccagctaaac tatgtttatt tgggtgaaaga tcctgagata	2690
agaaataatc gactgacact gtacttgaat gattttttca aaattggggg aaattatcat	2750
ggattttactc aaatctatca gacactatca tccaagtatg gttttgatga cgcacgtttt	2810

五、發明說明 (130)

tttgaatattc tttgtaagaa agggcctttt tctattcaaa tttggcgtaa aaaacaaact 2870
 caaaattatg tgattcttga tgaagcctat actgactata cacaagggtt tgaaattcaa 2930
 tctcctgaaa aaatatttat tccttggggg actacttatg aagccttatt tcagcagaca 2990
 caattttaaag aaaaaggaat ctcttatgac tttatcttcc ctattcggat agggcgttta 3050
 ttactcaagg atgtgtggat cacaccaagt gtccgaaaag atgtaccgat tttagcgta 3110
 tacactgagt gctatcatga atccgcgaca gaaaaaagt atcaggaatt aaccgccgca 3170
 ttacgtgaga accaacagtt aatcagatca tgtgttgaag aacgagccga tccgaaatta 3230
 tataagtctg ttttacgcct taacgcgaca gaatttgaat tgcgttatta tcgacatata 3290
 cgagacgatt ttgatagggg atacactaaa ttcagcatta gagatacgac agactattta 3350
 gattatgtga tcaacgagcc ttatgaaaat caattagtga taacggatta tttagtga 3410
 gaggcgcaaa atttaataaa aatggattat accgataatt ccattattaa acgccgacca 3470
 ccaaaaataa aagaaaagt tcgtgatgca caaagcctga tttggacaga tgatctcaat 3530
 cataaaatcg gttttaccag tgatgaccgc gctatcgtct ttgataaagc ggacattgaa 3590
 tcctttactc tggcaaatat agagacaacc cgaagacata atcgcgagttc actcagcatc 3650
 tgttttgtgg ataaaaataa ggaagccatc actgtatttc tagctgaaca tcattttctg 3710
 ataccctatg tggataaaat aaaaacactg acacaaaaag aggtgttgtt tcttgaagaa 3770
 tatatagagg atgttttaaa aaccgataac atcttgatgt catcgcaa at tcaaactcct 3830
 tttacacaat atattttaaa tttaaccgga tttaatattt acgtaaaaac aactaagaga 3890
 acttaaatga acaacattca caaccataaa attttaattt tggacttcgg ttcacaatat 3950
 acccagttga ttgcccgcgg tgtacgtgaa attggcgtgt actgcgaact ttgggcatgg 4010
 gatgtatccg aagccgatat tcgtgagttt aatccaactg ggattattct ttctgggtgg 4070
 cctgaaagta ccactgaaga aaacagccca cgagctcccg aatacgtatt caacgccggg 4130
 gtaccggtat tagggatctg ttatgggtatg caaacatgg cgatgcaact aggtgggttta 4190
 actgaaactt ctactcaccg agaatttggg tatgcatcag tgaatctaaa agccgcggac 4250
 gcgttatattg ctcaattaaa tgatgatgtc gcaagttcac agcccaaatt agacgtttgg 4310
 atgagccatg gcgataaagt gacgcgtttg ccagatcatt tccaagtcac cgcaatgacc 4370
 tcaacctgtc caatcgcagc tatgtcggat gaacgtcgtc gtttttatgg tgtccaattc 4430
 caccagaag tgactcatc aaaaagcggg cttgaattat taacgaattt tgtggtgaag 4490
 atctgtgggt gtgaacgtaa ctggacacca gaaaatatca ttgaagatgc cgttgctcgt 4550
 cttaaagcac aagtgggcga tgatgaagtg attttaggct tatctgggtg cgtaactgc 4610
 cgtataggca gcttagaaaa agtgtccgcg ctcacgttaa tccccgtaag cgttga 4666

五、發明說明 (131)

<210> 24
<211> 487
<212> 蛋白質
<213> 敗血性巴斯德桿菌

<400> 24
Met Leu Arg Val Ile Lys Glu Ala Leu Thr Phe Asp Asp Val Leu Leu
1 5 10 15
Val Pro Ala His Ser Thr Val Leu Pro Asn Thr Ala Asp Leu Ser Thr
20 25 30
Gln Leu Thr Lys Thr Ile Arg Leu Asn Ile Pro Met Leu Ser Ala Ala
35 40 45
Met Asp Thr Val Thr Glu Thr Lys Leu Ala Ile Ser Leu Ala Gln Glu
50 55 60
Gly Gly Ile Gly Phe Ile His Lys Asn Met Ser Ile Glu Arg Gln Ala
65 70 75 80
Glu Arg Val Arg Lys Val Lys Lys Phe Glu Ser Gly Ile Val Ser Asp
85 90 95
Pro Val Thr Val Ser Pro Thr Leu Ser Leu Ala Glu Leu Ser Glu Leu
100 105 110
Val Lys Lys Asn Gly Phe Ala Ser Phe Pro Val Val Asp Asp Glu Lys
115 120 125
Asn Leu Val Gly Ile Ile Thr Gly Arg Asp Thr Arg Phe Val Thr Asp
130 135 140
Leu Asn Lys Thr Val Ala Asp Phe Met Thr Pro Lys Ala Arg Leu Val
145 150 155 160
Thr Val Lys Arg Asn Ala Ser Arg Asp Glu Ile Phe Gly Leu Met His
165 170 175
Thr His Arg Val Glu Lys Val Leu Val Val Ser Asp Asp Phe Lys Leu
180 185 190
Lys Gly Met Ile Thr Leu Lys Asp Tyr Gln Lys Ser Glu Gln Lys Pro
195 200 205
Gln Ala Cys Lys Asp Glu Phe Gly Arg Leu Arg Val Gly Ala Ala Val
210 215 220
Gly Ala Gly Pro Gly Asn Glu Glu Arg Ile Asp Ala Leu Val Lys Ala
225 230 235 240
Gly Val Asp Val Leu Leu Ile Asp Ser Ser His Gly His Ser Glu Gly
245 250 255
Val Leu Gln Arg Val Arg Glu Thr Arg Ala Lys Tyr Pro Asp Leu Pro
260 265 270
Ile Val Ala Gly Asn Val Ala Thr Ala Glu Gly Ala Ile Ala Leu Ala
275 280 285
Asp Ala Gly Ala Ser Ala Val Lys Val Gly Ile Gly Pro Gly Ser Ile
290 295 300

五、發明說明 (132)

Cys Thr Thr Arg Ile Val Thr Gly Val Gly Val Pro Gln Ile Thr Ala
305 310 315 320

Ile Ala Asp Ala Ala Glu Ala Leu Lys Asp Arg Gly Ile Pro Val Ile
325 330 335

Ala Asp Gly Gly Ile Arg Phe Ser Gly Asp Ile Ser Lys Ala Ile Ala
340 345 350

Ala Gly Ala Ser Cys Val Met Val Gly Ser Met Phe Ala Gly Thr Glu
355 360 365

Glu Ala Pro Gly Glu Ile Glu Leu Tyr Gln Gly Arg Ala Phe Lys Ser
370 375 380

Tyr Arg Gly Met Gly Ser Leu Gly Ala Met Ser Lys Gly Ser Ser Asp
385 390 395 400

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

Ile Glu Gly Arg Ile Pro Tyr Lys Gly Phe Leu Lys Glu Ile Ile His
420 425 430

Gln Gln Met Gly Gly Leu Arg Ser Cys Met Gly Leu Thr Gly Cys Ala
435 440 445

Thr Ile Asp Glu Leu Arg Thr Lys Ala Gln Phe Val Arg Ile Ser Gly
450 455 460

Ala Gly Ile Gln Glu Ser His Val His Asp Val Thr Ile Thr Lys Glu
465 470 475 480

Ala Pro Asn Tyr Arg Met Gly
485

<210> 25
<211> 2364
<212> DNA
<213> 敗血性巴斯德桿菌

<220>
<221> CDS
<222> (191) .. (1828)

<220>
<223> H11501

<400> 25
gtcaacactc atcgcacagc tgaggcattt cccgaaagct gatcatgatg atggacctga 60
tgcgctagag atgctgtgga aaaatgcggt aagcagctct gccccgattg agttcatgac 120
aattgacggc gatttagggc gtgatgaatt tgatgacggc gatttataca gtatttggcg 180
gagataaaaa atg gcg aag aaa aag aaa aaa tta caa caa gcg aaa aaa 229
Met Ala Lys Lys Lys Lys Lys Leu Gln Gln Ala Lys Lys
1 5 10
gta caa gtt ggc tta gat aca caa aca aat gag gcg cgt gtc acg gag 277
Val Gln Val Gly Leu Asp Thr Gln Thr Asn Glu Ala Arg Val Thr Glu
15 20 25

五、發明說明 (133)

aca gga aga att att tct gat cac cca agc aat aaa att acc ccc gca	325
Thr Gly Arg Ile Ile Ser Asp His Pro Ser Asn Lys Ile Thr Pro Ala	
30 35 40 45	
aag tta aaa ggg att tta gaa gat gct gaa ggt ggt gat att acc gcg	373
Lys Leu Lys Gly Ile Leu Glu Asp Ala Glu Gly Gly Asp Ile Thr Ala	
50 55 60	
caa cat gag ctt ttc atg gat att gaa gaa cgc gac agt tgc atc ggg	421
Gln His Glu Leu Phe Met Asp Ile Glu Glu Arg Asp Ser Cys Ile Gly	
65 70 75	
gca aat att caa acc cgt aag cgt gcg att tta acc ctt gac tgg cgc	469
Ala Asn Ile Gln Thr Arg Lys Arg Ala Ile Leu Thr Leu Asp Trp Arg	
80 85 90	
att gca gag cca cgt aat gcc aca ccg caa gaa gaa aaa ctg caa gtc	517
Ile Ala Glu Pro Arg Asn Ala Thr Pro Gln Glu Lys Leu Gln Val	
95 100 105	
gaa att gac gag ctt ttc tat caa ttc cca atg cta gaa gat tta atg	565
Glu Ile Asp Glu Leu Phe Tyr Gln Phe Pro Met Leu Glu Asp Leu Met	
110 115 120 125	
gtg gat atg atg gat gcg gta gga cat ggt ttt tcg gcg tta gaa att	613
Val Asp Met Met Asp Ala Val Gly His Gly Phe Ser Ala Leu Glu Ile	
130 135 140	
gaa tgg aag caa gct gaa agt aaa tgg att cca gtt aat ttt atc gca	661
Glu Trp Lys Gln Ala Glu Ser Lys Trp Ile Pro Val Asn Phe Ile Ala	
145 150 155	
cgt ccg cag tcg tgg ttt aaa cta gac aag gat gat aat tta ctg ctt	709
Arg Pro Gln Ser Trp Phe Lys Leu Asp Lys Asp Asp Asn Leu Leu Leu	
160 165 170	
aaa acg cca gat aat caa gac ggt gag ccg ttg aga caa tat ggc tgg	757
Lys Thr Pro Asp Asn Gln Gly Glu Pro Leu Arg Gln Tyr Gly Trp	
175 180 185	
gta gtg cat acc cac aaa tca aga aca gta cag ctt gct cgt atg ggt	805
Val Val His Thr His Lys Ser Arg Thr Val Gln Leu Ala Arg Met Gly	
190 195 200 205	
tta ttt aga acg ctc gca tgg ctt tat atg ttt aaa cac tac tcg gtg	853
Leu Phe Arg Thr Leu Ala Trp Leu Tyr Met Phe Lys His Tyr Ser Val	
210 215 220	
cat gat ttt gcc gaa ttt cta gag ctt tat ggt atg ccg att cgt att	901
His Asp Phe Ala Glu Phe Leu Glu Leu Tyr Gly Met Pro Ile Arg Ile	
225 230 235	
ggt aaa tac cca ttt ggg gca acg aat gac gaa aag cgc aca tta ttg	949
Gly Lys Tyr Pro Phe Gly Ala Thr Asn Asp Glu Lys Arg Thr Leu Leu	
240 245 250	
cgt gca ctt gct caa atc gga cat aac gca gca ggg att atg cca gaa	997
Arg Ala Leu Ala Gln Ile Gly His Asn Ala Ala Gly Ile Met Pro Glu	
255 260 265	
gga atg aat gtt gag ttg cat aat gtg aca aac act act ggc tcg gct	1045
Gly Met Asn Val Glu Leu His Asn Val Thr Asn Thr Thr Gly Ser Ala	
270 275 280 285	

五、發明說明 (134)

gga agc aac ~~ctg~~ ttt ttg caa atg gtg gac tgg tgt gaa aag tcc gcc	1093
Gly Ser Asn Pro Phe Leu Gln Met Val Asp Trp Cys Glu Lys Ser Ala	
290 295 300	
gca cgt ttg att cta ggg caa aca tta aca agc ggt gca gat ggt aaa	1141
Ala Arg Leu Ile Leu Gly Gln Thr Leu Thr Ser Gly Ala Asp Gly Lys	
305 310 315	
act tca act aat gcc ctt gga caa gtg cat aat gaa gtc aga cgt gac	1189
Thr Ser Thr Asn Ala Leu Gly Gln Val His Asn Glu Val Arg Arg Asp	
320 325 330	
ttg ctt gtg tct gat gct aaa cag att gca caa act att aca caa cag	1237
Leu Leu Val Ser Asp Ala Lys Gln Ile Ala Gln Thr Ile Thr Gln Gln	
335 340 345	
att att ctg cca tat ctt caa att aac att gat ccg aat att ttg cct	1285
Ile Ile Leu Pro Tyr Leu Gln Ile Asn Ile Asp Pro Asn Ile Leu Pro	
350 355 360 365	
tct cgt gtg ccg tat ttc gag ttt gac acg aaa gaa tat gct gat tta	1333
Ser Arg Val Pro Tyr Phe Glu Phe Asp Thr Lys Glu Tyr Ala Asp Leu	
370 375 380	
agt gtc cta gcg gat gct att cct aag ctt gtg agc gta gga gtg cgc	1381
Ser Val Leu Ala Asp Ala Ile Pro Lys Leu Val Ser Val Gly Val Arg	
385 390 395	
att cct gaa aat tgg gtg cgt gat aaa gcg ggc att cca gaa ccg cag	1429
Ile Pro Glu Asn Trp Val Arg Asp Lys Ala Gly Ile Pro Glu Pro Gln	
400 405 410	
gaa aat gaa acg att tta agt gcg gtt caa cat gat ttt aaa aca gat	1477
Glu Asn Glu Thr Ile Leu Ser Ala Val Gln His Asp Phe Lys Thr Asp	
415 420 425	
tta aac gat gtt gaa aat ccg aaa aaa cag acc gca ctt tct gta caa	1525
Leu Asn Asp Val Glu Asn Pro Lys Lys Gln Thr Ala Leu Ser Val Gln	
430 435 440 445	
aat cac gtg aca ggt tgt cag tgt gat ggc tgt cgt ggt gtt gca tta	1573
Asn His Val Thr Gly Cys Gln Cys Asp Gly Cys Arg Gly Val Ala Leu	
450 455 460	
tct gcg aat aat aac agt tct act gcg cag ggc gtg cta gat ggt gga	1621
Ser Ala Asn Asn Ser Ser Thr Ala Gln Gly Val Leu Asp Gly Gly	
465 470 475	
ctt gcg caa gca ttt aat gag cct gat ttt aat aaa caa tta aat cca	1669
Leu Ala Gln Ala Phe Asn Glu Pro Asp Phe Asn Lys Gln Leu Asn Pro	
480 485 490	
atg gta aag aaa gct gtt gcg gta ctc atg gca tgt gac tct tac gat	1717
Met Val Lys Lys Ala Val Ala Val Leu Met Ala Cys Asp Ser Tyr Asp	
495 500 505	
gag gcg gca gaa aaa ctc gct gaa gca tac cca gaa att tca agt cac	1765
Glu Ala Ala Glu Lys Leu Ala Glu Ala Tyr Pro Glu Ile Ser Ser His	
510 515 520 525	
gaa cac gaa cag tat ctc tca aat gcg ctg ttt tta gct gat tta ctt	1813
Glu His Glu Gln Tyr Leu Ser Asn Ala Leu Phe Leu Ala Asp Leu Leu	
530 535 540	

五、發明說明 (135)

gga gga act aat gtc taaaccgctt agttttctat tcggacttga accaacgcaa 1868
Gly Gly Thr Asn Val
545

gccattgagt ttttacataa taaaaaatta cttgcaacga aagtgtttta aaaatcactg 1928
catgatagtg ccacgcaag agctacaaca atcgcgagat tatctagtct tgagatgacg 1988
aatgatattt ataaatcaat ggaagttgcc aaaaaagagg gtaagagctt tacacaatgg 2048
aaaaaagact tggttaagtga gtttgagaaa aaaggctggg tattcgggca tgataaatct 2108
atcagtcgcg gtatcgacgg aaaactgttg gctgatccga aaacaggcga atattttggg 2168
acaccgcgtc ggctgaatac aatttatcgt acaaacgtgc aagccgcata ttctgctggc 2228
cgctatcagc gcatgatgga taatattgat catcgccctt attggcaata ttccgctgtc 2288
agcgatgagc gtacacgacc ctctcatctt gcactaaacg gtcgaattta tcgctatgat 2348
gaccggtttt ggtcga 2364

<210> 26
<211> 546
<212> 蛋白質
<213> 敗血性巴斯德桿菌

<400> 26
Met Ala Lys Lys Lys Lys Lys Leu Gln Gln Ala Lys Lys Val Gln Val
1 5 10 15
Gly Leu Asp Thr Gln Thr Asn Glu Ala Arg Val Thr Glu Thr Gly Arg
20 25 30
Ile Ile Ser Asp His Pro Ser Asn Lys Ile Thr Pro Ala Lys Leu Lys
35 40 45
Gly Ile Leu Glu Asp Ala Glu Gly Gly Asp Ile Thr Ala Gln His Glu
50 55 60
Leu Phe Met Asp Ile Glu Glu Arg Asp Ser Cys Ile Gly Ala Asn Ile
65 70 75 80
Gln Thr Arg Lys Arg Ala Ile Leu Thr Leu Asp Trp Arg Ile Ala Glu
85 90 95
Pro Arg Asn Ala Thr Pro Gln Glu Glu Lys Leu Gln Val Glu Ile Asp
100 105 110
Glu Leu Phe Tyr Gln Phe Pro Met Leu Glu Asp Leu Met Val Asp Met
115 120 125
Met Asp Ala Val Gly His Gly Phe Ser Ala Leu Glu Ile Glu Trp Lys
130 135 140
Gln Ala Glu Ser Lys Trp Ile Pro Val Asn Phe Ile Ala Arg Pro Gln
145 150 155 160
Ser Trp Phe Lys Leu Asp Lys Asp Asp Asn Leu Leu Leu Lys Thr Pro
165 170 175

五、發明說明 (136)

Asp Asn Gln Asp Gly Glu Pro Leu Arg Gln Tyr Gly Trp Val Val His
180 185 190

Thr His Lys Ser Arg Thr Val Gln Leu Ala Arg Met Gly Leu Phe Arg
195 200 205

Thr Leu Ala Trp Leu Tyr Met Phe Lys His Tyr Ser Val His Asp Phe
210 215 220

Ala Glu Phe Leu Glu Leu Tyr Gly Met Pro Ile Arg Ile Gly Lys Tyr
225 230 235 240

Pro Phe Gly Ala Thr Asn Asp Glu Lys Arg Thr Leu Leu Arg Ala Leu
245 250 255

Ala Gln Ile Gly His Asn Ala Ala Gly Ile Met Pro Glu Gly Met Asn
260 265 270

Val Glu Leu His Asn Val Thr Asn Thr Thr Gly Ser Ala Gly Ser Asn
275 280 285

Pro Phe Leu Gln Met Val Asp Trp Cys Glu Lys Ser Ala Ala Arg Leu
290 295 300

Ile Leu Gly Gln Thr Leu Thr Ser Gly Ala Asp Gly Lys Thr Ser Thr
305 310 315 320

Asn Ala Leu Gly Gln Val His Asn Glu Val Arg Arg Asp Leu Leu Val
325 330 335

Ser Asp Ala Lys Gln Ile Ala Gln Thr Ile Thr Gln Gln Ile Ile Leu
340 345 350

Pro Tyr Leu Gln Ile Asn Ile Asp Pro Asn Ile Leu Pro Ser Arg Val
355 360 365

Pro Tyr Phe Glu Phe Asp Thr Lys Glu Tyr Ala Asp Leu Ser Val Leu
370 375 380

Ala Asp Ala Ile Pro Lys Leu Val Ser Val Gly Val Arg Ile Pro Glu
385 390 395 400

Asn Trp Val Arg Asp Lys Ala Gly Ile Pro Glu Pro Gln Glu Asn Glu
405 410 415

Thr Ile Leu Ser Ala Val Gln His Asp Phe Lys Thr Asp Leu Asn Asp
420 425 430

Val Glu Asn Pro Lys Lys Gln Thr Ala Leu Ser Val Gln Asn His Val
435 440 445

Thr Gly Cys Gln Cys Asp Gly Cys Arg Gly Val Ala Leu Ser Ala Asn
450 455 460

Asn Asn Ser Ser Thr Ala Gln Gly Val Leu Asp Gly Gly Leu Ala Gln
465 470 475 480

Ala Phe Asn Glu Pro Asp Phe Asn Lys Gln Leu Asn Pro Met Val Lys
485 490 495

Lys Ala Val Ala Val Leu Met Ala Cys Asp Ser Tyr Asp Glu Ala Ala
500 505 510

五、發明說明 (137)

Glu Lys Leu Ala Glu Ala Tyr Pro Glu Ile Ser Ser His Glu His Glu
515 520 525

Gln Tyr Leu Ser Asn Ala Leu Phe Leu Ala Asp Leu Leu Gly Gly Thr
530 535 540

Asn Val
545

<210> 27

<211> 1353

<212> DNA

<213> 敗血性巴斯德桿菌

<220>

<223> hmbR

<220>

<221> CDS

<222> (2) .. (1351)

<220>

<221> misc_特徵

<222> 125

<223> Xaa=任何或未知的胺基酸

<220>

<221> misc_特徵

<222> 133

<223> Xaa=任何或未知的胺基酸

<220>

<221> misc_特徵

<222> 141

<223> Xaa=任何或未知的胺基酸

<220>

<221> misc_特徵

<222> 151

<223> Xaa=任何或未知的胺基酸

<400> 27

g tca acg aaa gtc ggt tac gat att aat aac act cat cgt ttt aca ctg 49
Ser Thr Lys Val Gly Tyr Asp Ile Asn Asn Thr His Arg Phe Thr Leu
1 5 10 15

ttt tta gaa gat cgc cgt gaa aag aag ctt acc gaa gaa aaa aca tta 97
Phe Leu Glu Asp Arg Arg Glu Lys Lys Leu Thr Glu Glu Lys Thr Leu
20 25 30

ggg ctt agt gat gca gtg cgt ttt gct aat gat caa acc cct tat ctc 145
Gly Leu Ser Asp Ala Val Arg Phe Ala Asn Asp Gln Thr Pro Tyr Leu
35 40 45

cgt tat ggt att gaa tat cga tat aac ggc ttg tct tgg ttg gaa acg 193
Arg Tyr Gly Ile Glu Tyr Arg Tyr Asn Gly Leu Ser Trp Leu Glu Thr
50 55 60

gta aag ctt ttt ttg gca aag cag aaa atc gaa caa cgt tct gct ctc 241
Val Lys Leu Phe Leu Ala Lys Gln Lys Ile Glu Gln Arg Ser Ala Leu
65 70 75 80

五、發明說明 (138)

caa gag ttt gat att aat aat agg aat aaa ttg gat tcg act atg tcg	289
Gln Glu Phe Asp Ile Asn Asn Arg Asn Lys Leu Asp Ser Thr Met Ser	
85 90 95	
ttt gta tat tta caa aga cag aat ata gct cgg gga gaa ttt tca acg	337
Phe Val Tyr Leu Gln Arg Gln Asn Ile Ala Arg Gly Glu Phe Ser Thr	
100 105 110	
agt cct tta tat tgg ggg ccg agt cgc cat cgt tta tnt gcg aaa ttc	385
Ser Pro Leu Tyr Trp Gly Pro Ser Arg His Arg Leu Xaa Ala Lys Phe	
115 120 125	
gaa ttt cgt gat ang ttt tta gaa aat atg aat aag cnt ttt acg ttt	433
Glu Phe Arg Asp Xaa Phe Leu Glu Asn Met Asn Lys Xaa Phe Thr Phe	
130 135 140	
cgg ccg tgg caa atc aat ana ttc aga caa caa ggt cga aat aac tat	481
Arg Pro Trp Gln Ile Asn Xaa Phe Arg Gln Gln Gly Arg Asn Asn Tyr	
145 150 155 160	
aca gaa gtg ttt ccc gtt aaa tcc cga gag ttt tct ttt tct ctt atg	529
Thr Glu Val Phe Pro Val Lys Ser Arg Glu Phe Ser Phe Ser Leu Met	
165 170 175	
gac gac att aag att ggc gaa ttg cta cat ctc gga ttg ggc ggt cgg	577
Asp Asp Ile Lys Ile Gly Glu Leu Leu His Leu Gly Leu Gly Gly Arg	
180 185 190	
tgg gat cac tat aac tat aag cca tta tta aat tct cag cat aat atc	625
Trp Asp His Tyr Asn Tyr Lys Pro Leu Leu Asn Ser Gln His Asn Ile	
195 200 205	
aac agg aca cag aga tta cct tat cca aaa aca tca tcc aaa ttt tcg	673
Asn Arg Thr Gln Arg Leu Pro Tyr Pro Lys Thr Ser Ser Lys Phe Ser	
210 215 220	
tat caa ttg agt tta gag tat caa tta cat cca tca cat caa att gca	721
Tyr Gln Leu Ser Leu Glu Tyr Gln Leu His Pro Ser His Gln Ile Ala	
225 230 235 240	
tac cgt tta agt acc ggt ttt agg gtt ccc cgt gtt gaa gat ctt tat	769
Tyr Arg Leu Ser Thr Gly Phe Arg Val Pro Arg Val Glu Asp Leu Tyr	
245 250 255	
ttt gaa gac cga gga aaa agt tct tca caa ttt ctt cct aac ccc gat	817
Phe Glu Asp Arg Gly Lys Ser Ser Ser Gln Phe Leu Pro Asn Pro Asp	
260 265 270	
cta caa ccg gaa act gca ctg aat cat gaa ata agt tac cgt ttc caa	865
Leu Gln Pro Glu Thr Ala Leu Asn His Glu Ile Ser Tyr Arg Phe Gln	
275 280 285	
aat caa tat gcc cat ttc agc gtc ggg ctt ttc cgt aca cgt tat cat	913
Asn Gln Tyr Ala His Phe Ser Val Gly Leu Phe Arg Thr Arg Tyr His	
290 295 300	
aac ttt att caa gaa cgt gag atg acc tgt gat aaa att cca tat gag	961
Asn Phe Ile Gln Glu Arg Glu Met Thr Cys Asp Lys Ile Pro Tyr Glu	
305 310 315 320	
tat aat agg act tat gga tat tgc acg cat aat act tat gta atg ttt	1009
Tyr Asn Arg Thr Tyr Gly Tyr Cys Thr His Asn Thr Tyr Val Met Phe	
325 330 335	

五、發明說明 (139)

gtt aat gaa cct gaa gcc gtg att aaa ggg gtt gaa gta agc ggt gct	1057
Val Asn Glu Pro Glu Ala Val Ile Lys Gly Val Glu Val Ser Gly Ala	
340 345 350	
tta aat ggg tcg gca ttc gga ctt tcc gac ggt tta act ttc cgt ctc	1105
Leu Asn Gly Ser Ala Phe Gly Leu Ser Asp Gly Leu Thr Phe Arg Leu	
355 360 365	
aaa ggg agc tac agc aaa ggt caa aat cat gac ggc gat ccg tta aaa	1153
Lys Gly Ser Tyr Ser Lys Gly Gln Asn His Asp Gly Asp Pro Leu Lys	
370 375 380	
tct att caa cca tgg aca gtg gta acc ggt att gat tac gaa act gaa	1201
Ser Ile Gln Pro Trp Thr Val Val Thr Gly Ile Asp Tyr Glu Thr Glu	
385 390 395 400	
ggg tgg agc gtg agt ttg agc ggg cgt tat agt gcg gct aaa aaa gcc	1249
Gly Trp Ser Val Ser Leu Ser Gly Arg Tyr Ser Ala Ala Lys Lys Ala	
405 410 415	
aaa gat gcg ata gaa acg gaa tac aca cat gat aaa aag gtt gtc aaa	1297
Lys Asp Ala Ile Glu Thr Glu Tyr Thr His Asp Lys Lys Val Val Lys	
420 425 430	
caa tgg ccg cat tta agt cca tcc tac ttt gtt gtt gat ttt acg ggg	1345
Gln Trp Pro His Leu Ser Pro Ser Tyr Phe Val Val Asp Phe Thr Gly	
435 440 445	
caa gtt ga	1353
Gln Val	
450	

<210> 28
<211> 450
<212> 蛋白質
<213> 敗血性巴斯德桿菌

<220>
<221> misc_特徵
<222> 125
<223> Xaa=任何或未知的胺基酸

<220>
<221> misc_特徵
<222> 133
<223> Xaa=任何或未知的胺基酸

<220>
<221> misc_特徵
<222> 141
<223> Xaa=任何或未知的胺基酸

<220>
<221> misc_特徵
<222> 151
<223> Xaa=任何或未知的胺基酸

<400> 28
Ser Thr Lys Val Gly Tyr Asp Ile Asn Asn Thr His Arg Phe Thr Leu
1 5 10 15

五、發明說明 (140)

Phe Leu Glu Asp Arg Arg Glu Lys Lys Leu Thr Glu Glu Lys Thr Leu
20 25 30

Gly Leu Ser Asp Ala Val Arg Phe Ala Asn Asp Gln Thr Pro Tyr Leu
35 40 45

Arg Tyr Gly Ile Glu Tyr Arg Tyr Asn Gly Leu Ser Trp Leu Glu Thr
50 55 60

Val Lys Leu Phe Leu Ala Lys Gln Lys Ile Glu Gln Arg Ser Ala Leu
65 70 75 80

Gln Glu Phe Asp Ile Asn Asn Arg Asn Lys Leu Asp Ser Thr Met Ser
85 90 95

Phe Val Tyr Leu Gln Arg Gln Asn Ile Ala Arg Gly Glu Phe Ser Thr
100 105 110

Ser Pro Leu Tyr Trp Gly Pro Ser Arg His Arg Leu Xaa Ala Lys Phe
115 120 125

Glu Phe Arg Asp Xaa Phe Leu Glu Asn Met Asn Lys Xaa Phe Thr Phe
130 135 140

Arg Pro Trp Gln Ile Asn Xaa Phe Arg Gln Gln Gly Arg Asn Asn Tyr
145 150 155 160

Thr Glu Val Phe Pro Val Lys Ser Arg Glu Phe Ser Phe Ser Leu Met
165 170 175

Asp Asp Ile Lys Ile Gly Glu Leu Leu His Leu Gly Leu Gly Gly Arg
180 185 190

Trp Asp His Tyr Asn Tyr Lys Pro Leu Leu Asn Ser Gln His Asn Ile
195 200 205

Asn Arg Thr Gln Arg Leu Pro Tyr Pro Lys Thr Ser Ser Lys Phe Ser
210 215 220

Tyr Gln Leu Ser Leu Glu Tyr Gln Leu His Pro Ser His Gln Ile Ala
225 230 235 240

Tyr Arg Leu Ser Thr Gly Phe Arg Val Pro Arg Val Glu Asp Leu Tyr
245 250 255

Phe Glu Asp Arg Gly Lys Ser Ser Ser Gln Phe Leu Pro Asn Pro Asp
260 265 270

Leu Gln Pro Glu Thr Ala Leu Asn His Glu Ile Ser Tyr Arg Phe Gln
275 280 285

Asn Gln Tyr Ala His Phe Ser Val Gly Leu Phe Arg Thr Arg Tyr His
290 295 300

Asn Phe Ile Gln Glu Arg Glu Met Thr Cys Asp Lys Ile Pro Tyr Glu
305 310 315 320

Tyr Asn Arg Thr Tyr Gly Tyr Cys Thr His Asn Thr Tyr Val Met Phe
325 330 335

Val Asn Glu Pro Glu Ala Val Ile Lys Gly Val Glu Val Ser Gly Ala
340 345 350

五、發明說明 (141)

Leu Asn Gly Ser Ala Phe Gly Leu Ser Asp Gly Leu Thr Phe Arg Leu
355 360 365

Lys Gly Ser Tyr Ser Lys Gly Gln Asn His Asp Gly Asp Pro Leu Lys
370 375 380

Ser Ile Gln Pro Trp Thr Val Val Thr Gly Ile Asp Tyr Glu Thr Glu
385 390 395 400

Gly Trp Ser Val Ser Leu Ser Gly Arg Tyr Ser Ala Ala Lys Lys Ala
405 410 415

Lys Asp Ala Ile Glu Thr Glu Tyr Thr His Asp Lys Lys Val Val Lys
420 425 430

Gln Trp Pro His Leu Ser Pro Ser Tyr Phe Val Val Asp Phe Thr Gly
435 440 445

Gln Val
450

<210> 29
<211> 4936
<212> DNA
<213> 敗血性巴斯德桿菌

<220>
<221> CDS
<222> (1078) .. (2769)

<220>
<223> hxuC

<400> 29
gtcaacaaca aagcgacag gcattacttc atgccacaca catcatcacg aaagtacgta 60
ccgatttaac gcaaattaat gccgtcaaca ttcattctttt cctatcataa agcggttcat 120
catggctagc attctagcaa aaattagttg agggaaatag cgggtcttgtt ttgcttaaaa 180
aacaacccac cccgtagggc acggctgttt ctttttgaga aattacgctt cttcatcttg 240
atcttttttc aagatctcat cttcattgag ttttaaaaga cgggcaatcg cattgcggtta 300
ggagatttca aggttttctc gactagtagc aatgacacct tgatcgatta agaaaccgtc 360
attgacatca taaaccaaac catgtaatga gagttttttc ccattttttc acgcggattt 420
aatgattgac gagcgacctt agttataaac ttgctctgag acgttaattt tcgtcagcat 480
atcagcccgt ttttcaggcg gtaaattgcc aagtaaatga ctatgcttat accaaatatc 540
gcgtaagtgg agtaaccagt tattaattaa acctaaatct tgatccgcca ttgcggtttt 600
aattccacca cagtttgtat gtccacaaat aataatgtgt tcaatattta agacctcaac 660
ggcatattgc acaacagata aacagtttaa atcgggtgtga atgacttgat ttgcaacatt 720
acgatgcaca aacagctcac ccggctcctaa atttgctaat ttttctgcag gaacacggct 780
atccgagcaa ccaatccaaa gatagctcgg ggtttgatga tcagccaatt ctttaaagta 840

五、發明說明 (142)

```

agaggagttt tctcttttca tccgtaacgc ccagctataa ttattggcaa aaagttgttc 900
aattttttttc attagagtga ttcctatacc gcaaaaataa gggggctagt atagcttaga 960
aatagacagt gggtaaagaa aggcaaaaaa ttgtatagga taacttgttt tttattgcca 1020
tttatttaga attagaatct ttaataataa aaataattat cattaagggtt aatagtt 1077
atg gat aaa aat tta atg aag gga tgt gta ttc tta tca ata gtc ggt 1125
Met Asp Lys Asn Leu Met Lys Gly Cys Val Phe Leu Ser Ile Val Gly
1 5 10 15
tgc ggt atc caa ata ggg cta gca tca aat cca aat cct cca gat gtg 1173
Cys Gly Ile Gln Ile Gly Leu Ala Ser Asn Pro Asn Pro Asp Val
20 25 30
gat gag tta tta cct att att gtg aat gct gat gaa gat aat aaa tta 1221
Asp Glu Leu Leu Pro Ile Ile Val Asn Ala Asp Glu Asp Asn Lys Leu
35 40 45
cca ggt cgt tct gta tta aaa cag aaa aat atc gat caa caa caa gca 1269
Pro Gly Arg Ser Val Leu Lys Gln Lys Asn Ile Asp Gln Gln Gln Ala
50 55 60
gat aat gcc gct gac tta ata aat att tta cct ggg gta aat atg gcg 1317
Asp Asn Ala Ala Asp Leu Ile Asn Ile Leu Pro Gly Val Asn Met Ala
65 70 75 80
gga gga ttt cgc cct ggt ggt caa aca tta aat att aat gga atg ggt 1365
Gly Gly Phe Arg Pro Gly Gly Gln Thr Leu Asn Ile Asn Gly Met Gly
85 90 95
gat gct gaa gat gtt aga gtt caa cta gac ggc gca aca aaa agt ttc 1413
Asp Ala Glu Asp Val Arg Val Gln Leu Asp Gly Ala Thr Lys Ser Phe
100 105 110
gaa aaa tat caa caa ggc tct att ttt att gaa cct gag tta tta aga 1461
Glu Lys Tyr Gln Gln Gly Ser Ile Phe Ile Glu Pro Glu Leu Leu Arg
115 120 125
aag gtg aca gta gac aaa gga aat tat tct cct caa tat ggc aat ggt 1509
Lys Val Thr Val Asp Lys Gly Asn Tyr Ser Pro Gln Tyr Gly Asn Gly
130 135 140
ggc ttt gct ggt act gta aaa ttt gaa aca aaa gat gca act gat ttt 1557
Gly Phe Ala Gly Thr Val Lys Phe Glu Thr Lys Asp Ala Thr Asp Phe
145 150 155 160
ttg aaa gaa aat cag aaa ata ggt gga tta ttt aaa tat gga aat aat 1605
Leu Lys Glu Asn Gln Lys Ile Gly Gly Leu Phe Lys Tyr Gly Asn Asn
165 170 175
agc aat aat aac caa aaa act tat agt aca gcc cta gtt tta cag aat 1653
Ser Asn Asn Asn Gln Lys Thr Tyr Ser Thr Ala Leu Val Leu Gln Asn
180 185 190
gaa caa aaa aat att gat ttg tta tta ttt ggt tct gta aga aat gca 1701
Glu Gln Lys Asn Ile Asp Leu Leu Leu Phe Gly Ser Val Arg Asn Ala
195 200 205
agc aat tat aca aga cct gat aaa agt aaa att ctt ttt tca aaa aac 1749
Ser Asn Tyr Thr Arg Pro Asp Lys Ser Lys Ile Leu Phe Ser Lys Asn
210 215 220

```

五、發明說明 (143)

aac caa aaa agt gga tta ata aaa gta aat tgg caa att act cct gaa Asn Gln Lys Ser Gly Leu Ile Lys Val Asn Trp Gln Ile Thr Pro Glu 225 230 235 240	1797
cat tta tta act tta tcc agt gtt tat ggc att cat aaa ggg tgg gaa His Leu Leu Thr Leu Ser Ser Val Tyr Gly Ile His Lys Gly Trp Glu 245 250 255	1845
cct tgg gca gca aaa aga gat gtg atg tgc aga cca aca gaa aca gaa Pro Trp Ala Ala Lys Arg Asp Val Met Ser Arg Pro Thr Glu Thr Glu 260 265 270	1893
ata aaa cac tat ggg att gat gtt gcg tgg aaa cgt aaa ctt gtt tat Ile Lys His Tyr Gly Ile Asp Val Ala Trp Lys Arg Lys Leu Val Tyr 275 280 285	1941
cga gat caa aaa gat gaa agt tat tca ttg aaa tat cgc tat tta cct Arg Asp Gln Lys Asp Glu Ser Tyr Ser Leu Lys Tyr Arg Tyr Leu Pro 290 295 300	1989
gaa aat aat aag tgg att aat ttg tct gtt cag ctg agt tat agt aaa Glu Asn Asn Lys Trp Ile Asn Leu Ser Val Gln Leu Ser Tyr Ser Lys 305 310 315 320	2037
aca gag cag aat gat act cgc cat gag aaa gtc act tct tca ttc cta Thr Glu Gln Asn Asp Thr Arg His Glu Lys Val Thr Ser Ser Phe Leu 325 330 335	2085
ggc aca tta gga aat aaa agt tgg ata act tat tca gat ctt act ttt Gly Thr Leu Gly Asn Lys Ser Trp Ile Thr Tyr Ser Asp Leu Thr Phe 340 345 350	2133
gat ata agt aac aca agt act cta aat att ggg cgt gct gag cat gaa Asp Ile Ser Asn Thr Ser Thr Leu Asn Ile Gly Arg Ala Glu His Glu 355 360 365	2181
cta cta ttt ggt tta cag tgg tta aaa aat aaa aga aat acc ctt atg Leu Leu Phe Gly Leu Gln Trp Leu Lys Asn Lys Arg Asn Thr Leu Met 370 375 380	2229
tat cat aaa ggg gga gtc aag aag gca gac tat aat tat ggc tat ttt Tyr His Lys Gly Gly Val Lys Lys Ala Asp Tyr Asn Tyr Gly Tyr Phe 385 390 395 400	2277
cag cct tat tat atg cct tct gga cgc cag tat aca caa gca ttt tat Gln Pro Tyr Tyr Met Pro Ser Gly Arg Gln Tyr Thr Gln Ala Phe Tyr 405 410 415	2325
tta caa gat caa ata aaa tgg cag aat ttc ctc ttt aca gga ggg ata Leu Gln Asp Gln Ile Lys Trp Gln Asn Phe Leu Phe Thr Gly Gly Ile 420 425 430	2373
aga tat gac cat atc aat aat ata ggg cag aaa aat tta gcg cca cga Arg Tyr Asp His Ile Asn Asn Ile Gly Gln Lys Asn Leu Ala Pro Arg 435 440 445	2421
tat aat gat atc tct gca gga cat gat tat agc cag aaa aat tat aat Tyr Asn Asp Ile Ser Ala Gly His Asp Tyr Ser Gln Lys Asn Tyr Asn 450 455 460	2469
ggc tgg tct tat tat tta ggt ctt aag tat gat gta aat cat tat tta Gly Trp Ser Tyr Tyr Leu Gly Leu Lys Tyr Asp Val Asn His Tyr Leu 465 470 475 480	2517

五、發明說明 (144)

agt tta ttt acg aat ttt agt aaa act tgg cga gcc cct gtt att gat 2565
 Ser Leu Phe Thr Asn Phe Ser Lys Thr Trp Arg Ala Pro Val Ile Asp
 485 490 495
 gaa cag tat gag aca caa tat agt caa gct tct gta tct gcg act tct 2613
 Glu Gln Tyr Glu Thr Gln Tyr Ser Gln Ala Ser Val Ser Ala Thr Ser
 500 505 510
 tta aat tta gaa aaa gaa atg att aat caa acc aga gtg ggt gga att 2661
 Leu Asn Leu Glu Lys Glu Met Ile Asn Gln Thr Arg Val Gly Gly Ile
 515 520 525
 att act ctc aat cat cta ttt cag gaa aat gat gct ttt caa ttt aga 2709
 Ile Thr Leu Asn His Leu Phe Gln Glu Asn Asp Ala Phe Gln Phe Arg
 530 535 540
 act act tat ttt tac aat cgc ggc aag aat gaa atc ttc aaa acg aga 2757
 Thr Thr Tyr Phe Tyr Asn Arg Gly Lys Asn Glu Ile Phe Lys Thr Arg
 545 550 555 560
 ggg gtt aac cgt tagagttggt tgaaatgact gaaaaattag acctatacgt 2809
 Gly Val Asn Arg
 tactgttaaa ggtggcggta tttctggtca agcgggtgca atccgtcacg gtatcactcg 2869
 tgcattaatc gaatatgatg agagtttacg ctctgtatta cgcgagctg gtttcgttac 2929
 tcgcgatgca cgtcaagttg aacgtaaaaa agtgggttta cgcaaagcgc gtcgtcgtcc 2989
 acaattctca aaacgttaat ttttctttta cgttttatat tcagattgca agcccaaaag 3049
 gcttgcaatt tttttatctc aataaaattt acgataatct ttggaaatca gtgggcgatt 3109
 tgtggtagaa taaacgcccc ttttttatat aaaatcatgc cagaatcagg caaagttaa 3169
 taaattttta ttcatttttag agctgtcgga ggaatagatg acaagcgctg caaataaacg 3229
 ttcaataatg acactttttt cagataaaaac agatatttat tgccaccaag taaggattgt 3289
 tttggctgaa aaggggtgtg cttatgaaac ggaagttgta gatcctcaag tcgtatcaga 3349
 agatttaatg gaattaaatc cgtatggcac gttgcgaca ttagttgatc gtgatttagt 3409
 gttatttaat tcacgtatta ttatggaata tcttgatgag cgtttccctc atccaccttt 3469
 gatgcctgtt tatccagtgg cacgtgggaa aagccgttta ttaatgttac gtattgagca 3529
 agattggtac ccagtattag caaaagctga aaaaggcacg gacgcagaac gtgctgtcgc 3589
 attaaaacaa ttaagagaag agatttttagc gattgcgcct attttcacgc agatgcctta 3649
 ttttatgagc gaagagttta gtttagtaga ttgttatatc gccccattat tatggcgtat 3709
 gcaagaactg ggtgtggatt tcagtggggc gggtagcaaa gcaattaaag cttacatggc 3769
 acgtgttttt gaacgcgatt catttatgca atcttttaggc gtgtcggctc cgaaaaactt 3829
 aatggatgag aaataatcag tatgctacat aaatcatcac caaagcgtcc ttacttgta 3889
 agagcgtatt atgattgggt agtggataat gatttcaccc cttatttagt ggtggacgcg 3949
 acctatgttg gtgtgaaagt cctgtggaa tatgtcaaag atgggcaaatt tgcctcaat 4009

五、發明說明 (145)

ttatctgcga atgcgacagg taatctggta ctaagcaatg aaagtattca gtttagcgcg 4069
 cgttttcgtg gtatttcaca agatatcttc attcctatgg gggctgcggt agccatttat 4129
 gctcgtgaaa atgggtgatgg tgtactgttt gaacctgaag cgatttatga tgagctcgca 4189
 acacaaaata ttggtattga gcagccactg agctttgttg aggctgtcga taaacaaaaa 4249
 accagtgaga atactcaaaa aagcacaaac aaagacaaaa cgacggaaaa aaaagcgact 4309
 tctcatttaa gaattattaa ataaaagagg ttttctttct tcataaaaaa acacgctttt 4369
 acgcgtgttt ttttgttcg gacagtttat tgtgccattt ttttgcggc ttttaagaag 4429
 ccttgcgcac tcgtgtagat gtcactttta tctgtgccc ctaaaatcat atccgacatt 4489
 tcacgaaagg ccccttgtcc acctttcagg ctttagtacgt gatcagcgtg cattttgata 4549
 taagcggcgc atcttgtact gcaaaggcaa caccacagcg gcaaaagcag gcagatcaac 4609
 gctgtcatca ccaatataag ccgtttcttg cgcacagaca ttggcttggt gtatcaattc 4669
 aagacaggcg ctttcttttt ccaatttgcc gaggaaaaag tgttggtatgc ctagatctgc 4729
 aatacgtttg cgtagaatcg gggaaatctg ccccgagagt accgcgactt gaatgccaga 4789
 ttccattaac attctgatcc ccaagccatc acgaacatga aaggttttga aagcttcacc 4849
 atgggcatcg taatgcaaag agccgtcggt cagtacaccg tcgatatctg taatcacaaa 4909
 ttttaattttt ttgagttttt ccgttga 4936

<210> 30

<211> 564

<212> 蛋白質

<213> 敗血性巴斯德桿菌

<400> 30

Met Asp Lys Asn Leu Met Lys Gly Cys Val Phe Leu Ser Ile Val Gly
 1 5 10 15

Cys Gly Ile Gln Ile Gly Leu Ala Ser Asn Pro Asn Pro Pro Asp Val
 20 25 30

Asp Glu Leu Leu Pro Ile Ile Val Asn Ala Asp Glu Asp Asn Lys Leu
 35 40 45

Pro Gly Arg Ser Val Leu Lys Gln Lys Asn Ile Asp Gln Gln Gln Ala
 50 55 60

Asp Asn Ala Ala Asp Leu Ile Asn Ile Leu Pro Gly Val Asn Met Ala
 65 70 75 80

Gly Gly Phe Arg Pro Gly Gly Gln Thr Leu Asn Ile Asn Gly Met Gly
 85 90 95

Asp Ala Glu Asp Val Arg Val Gln Leu Asp Gly Ala Thr Lys Ser Phe
 100 105 110

Glu Lys Tyr Gln Gln Gly Ser Ile Phe Ile Glu Pro Glu Leu Leu Arg
 115 120 125

五、發明說明 (146)

Lys Val Thr Val Asp Lys Gly Asn Tyr Ser Pro Gln Tyr Gly Asn Gly
130 135 140

Gly Phe Ala Gly Thr Val Lys Phe Glu Thr Lys Asp Ala Thr Asp Phe
145 150 155 160

Leu Lys Glu Asn Gln Lys Ile Gly Gly Leu Phe Lys Tyr Gly Asn Asn
165 170 175

Ser Asn Asn Asn Gln Lys Thr Tyr Ser Thr Ala Leu Val Leu Gln Asn
180 185 190

Glu Gln Lys Asn Ile Asp Leu Leu Leu Phe Gly Ser Val Arg Asn Ala
195 200 205

Ser Asn Tyr Thr Arg Pro Asp Lys Ser Lys Ile Leu Phe Ser Lys Asn
210 215 220

Asn Gln Lys Ser Gly Leu Ile Lys Val Asn Trp Gln Ile Thr Pro Glu
225 230 235 240

His Leu Leu Thr Leu Ser Ser Val Tyr Gly Ile His Lys Gly Trp Glu
245 250 255

Pro Trp Ala Ala Lys Arg Asp Val Met Ser Arg Pro Thr Glu Thr Glu
260 265 270

Ile Lys His Tyr Gly Ile Asp Val Ala Trp Lys Arg Lys Leu Val Tyr
275 280 285

Arg Asp Gln Lys Asp Glu Ser Tyr Ser Leu Lys Tyr Arg Tyr Leu Pro
290 295 300

Glu Asn Asn Lys Trp Ile Asn Leu Ser Val Gln Leu Ser Tyr Ser Lys
305 310 315 320

Thr Glu Gln Asn Asp Thr Arg His Glu Lys Val Thr Ser Ser Phe Leu
325 330 335

Gly Thr Leu Gly Asn Lys Ser Trp Ile Thr Tyr Ser Asp Leu Thr Phe
340 345 350

Asp Ile Ser Asn Thr Ser Thr Leu Asn Ile Gly Arg Ala Glu His Glu
355 360 365

Leu Leu Phe Gly Leu Gln Trp Leu Lys Asn Lys Arg Asn Thr Leu Met
370 375 380

Tyr His Lys Gly Gly Val Lys Lys Ala Asp Tyr Asn Tyr Gly Tyr Phe
385 390 395 400

Gln Pro Tyr Tyr Met Pro Ser Gly Arg Gln Tyr Thr Gln Ala Phe Tyr
405 410 415

Leu Gln Asp Gln Ile Lys Trp Gln Asn Phe Leu Phe Thr Gly Gly Ile
420 425 430

Arg Tyr Asp His Ile Asn Asn Ile Gly Gln Lys Asn Leu Ala Pro Arg
435 440 445

Tyr Asn Asp Ile Ser Ala Gly His Asp Tyr Ser Gln Lys Asn Tyr Asn
450 455 460

五、發明說明 (147)

Gly Trp Ser Tyr Tyr Leu Gly Leu Lys Tyr Asp Val Asn His Tyr Leu
465 470 475 480

Ser Leu Phe Thr Asn Phe Ser Lys Thr Trp Arg Ala Pro Val Ile Asp
485 490 495

Glu Gln Tyr Glu Thr Gln Tyr Ser Gln Ala Ser Val Ser Ala Thr Ser
500 505 510

Leu Asn Leu Glu Lys Glu Met Ile Asn Gln Thr Arg Val Gly Gly Ile
515 520 525

Ile Thr Leu Asn His Leu Phe Gln Glu Asn Asp Ala Phe Gln Phe Arg
530 535 540

Thr Thr Tyr Phe Tyr Asn Arg Gly Lys Asn Glu Ile Phe Lys Thr Arg
545 550 555 560

Gly Val Asn Arg

<210> 31
<211> 9814
<212> DNA
<213> 敗血性巴斯德桿菌

<220>
<221> CDS
<222> (4762) .. (7662)

<220>
<223> iroA

<400> 31
gtcgacctgc agcagacaat gtccactgtg taatagtcca acgactgtta taaaaatctt 60
ccgctgcttt ttctaattgt tgtacacggt gtttttcaaa ttcttccaaa ttcttggttg 120
gttggaactaa aagttgttca gccgccgctt taaaattggc gacaaaatcc gattgtttga 180
ttaaaccata ggattttgct tggatttggt cgccggctgc ttcacccaat ttatcgaaaa 240
attcaggcgt ataagtcacg tttgggatcg taggcgcgat gatctgatta acaccagcct 300
gttgtaatgc tccccattgc tgtgccatcg tttgtgccat ggttttaata ctggctaaca 360
cgtaggcttg tttctcttca ggtgttgtct tcgttactgc tgttgctaact actgtcgcca 420
aatcattacc acctgccccat agaatatgta aagcttcttt ttgactggc gcatgtaaat 480
actcgttgat ctgcttttct agtgctaaat gaggttggtc tgctgttcta gtattatgtg 540
caccaacaat caccaccacg ctgtacgcgt agttcaaacc accttggtga gaaggattta 600
atcttttccc aaatgcttga gctaaatatt catcataaag gtgatgatag tttccatcag 660
cctttaaata agaggctttc ttattccaac ctgtttgccc catatcactt aaactatcac 720
caaacacgac aacatcttgt gccagagcag ccgaacttag tgaacaaaat aatgcgaatg 780
aaagtgtatt aattttcaca ataatgtcct tcaattattc atcgtcagtc aaaaatttgc 840

五、發明說明 (148)

gtcacatcac gttgattata ggaagatacc tagccagacc actactggta tgaacagaag 900
 tcaatgttta atcacataaa aaagcctctg tgctttcaca cagaggcttt tatgtccatt 960
 cacctactca aattacatcg cttgagtaaa ggtacgcgta atcacgtctt gttgttggtc 1020
 tttggttaac gagttaaagc gtactgcata acccgaaaca cgaatgggta attgtggata 1080
 tttctccgga ttttccattg catctaaca catttcacgg ttcacgtctt tcacgtttta 1140
 gtgttggtcg ccttcaatcg ttgcttcacg gtggaagtaa ccgtccatta gacctgcaag 1200
 gttacgtttt tgtgtctcgt aatctttacc taaggcattt ggtacgattg agaagggtata 1260
 agaaatacca tctttcgcac aagcaaattg caatttcgca acagaagtta acgatgctac 1320
 tgcacctttt tggtcacgac cgtgcattgg gtccgacccc ggtccaaatg gtgcaccaga 1380
 acgacgacca tctgggggtg tacctgtttt cttaccataa accacgttag atgtaatagt 1440
 aagtacagat tgtgtcgggtg tcgcattacg ataagtaccc aatttttgga ttttcttcat 1500
 aaagcgttca actaaatcac aagcgatttc atcaacacgg ttatcgttgt taccgaattg 1560
 tggatattcg ccttcaattt caaagtcgat tgccacatct tttgcaatac caaccacttc 1620
 acccgcttta tttttgattt cgatatcacc acgaactggg ttcactttcg catatttaat 1680
 ggcagataaa gagtccgctg cgacagaaag ccctgcgata ccacaagcca tagtacggaa 1740
 tacatcacga tcatgaagtg ccattagtgc ggcttcatac gcgtatttat cgtgcataaa 1800
 gtgaatgatg ttcaatgcag taacatattg tttcgctaac caatccataa agctgtctaa 1860
 gcgcgtcatg acatcatcat aatctaagta ttcgctggta attggatcgg ttttcgggtc 1920
 tacttggtca cctgatttct catccacacc gccattgatt gcgtataaca aggttttcgc 1980
 taagttggca cgtgcaccga agaattgcat cattttaccc acgatcattg gcgatacaca 2040
 gcatgcaatc gcatagtcac cgttttgga gtcaggacgc attaatgcat cgttttcata 2100
 ctgaacagaa gacgtatcga tagacacttt tgccgcataa cgtttgaaac cttctggtaa 2160
 tttttcagac caaagaatcg ttaagtttg cttctggtag ggtcccatcg tataaagggt 2220
 gtgtaagata cgggaagctgt ttttggttac taaagtacga ccatctaagc ccataccgc 2280
 taaggtttcc gttgcccaca ttgggtcgcc cgagaataat tgatcgtact ctgggggtacg 2340
 taagaaacgc accatacgtg atttcatgac taagtgggtca attaatctt gtgcttcttg 2400
 tctgtgaatt ttgctgctt ttaaatacag ctcaatataa atatctaaga aagtcgatac 2460
 acgaccaa at gacatggcag caccgttttg tgatttcact gcagcgggtac gactttgcac 2520
 agttatcgga agataattga aatcataacc agcaacaaat gtcagccgtt ctatttcttc 2580
 tgaagaatat cggcgattgc gttctggcgg aatggctggg tttttcacat tcttgagatg 2640
 attttctttc aagtatttcc attctgtgat tgctgtcgta ataagtgcg aaagagtatt 2700
 ccattctcta agcacacttg ccgcactaac ttgtgaaagt cgttcacac gccactgcac 2760

五、發明說明 (149)

aaagtgatgt tcttgtaaatt cgattaatct cacgtagaa atcggcatac ttagcaagcg 2820
aagtaaacgc aacttttcag cacgatagcc ctttttattt atgctcactt ctttgatata 2880
tttatcgaca agttgtgcaa aagtgatgtc gggaatatca gtgaatacac cgtttatgat 2940
tttttgttct atgtctaacg cccacgcttg cgcacagct ttagtccgaa atgttgctga 3000
tttatagaca ctttttttgc gaatttgaac tcgccaacct gattttttgtt tgttaaaagt 3060
cgccacgcct aactaccatt aattttgcac aattcgttgt gcaattttgt gcaattttat 3120
ttcttaaatg atgttttagcg gatcataaat gaagaaaaaa cagaagtaaa acactatata 3180
aaaaaacagt atattttttg ttgaagtgtt taatgtagtt tgtaacttat tgatttttaa 3240
atattaaaga taaagaaaaa gccgacaaaa gtcggctttc tttttttatg ctgtttatca 3300
atggtgccta gggccggact cgaaccggca caccgaagg cggttgattt tgaatcaact 3360
gcgctacca atttcgccac ccaggctaatt attgataaag agcatcaaat taggtctgta 3420
ttataccttt tcattgatag gttacaagca aaaaatgatt ttagatattc aattgtcttt 3480
attttcatca gtgtggctgt tctctcttac tttattcagg tgcagtgaag taaccttata 3540
aaaataaagg ttttttgttt aaatttttaa taactttttt gtaaaaagat cgcagtttct 3600
tttgaaaaaa agaccgatta caaatataat taaaaactat tatcaatatt gataataatg 3660
ggattttaac catgacattt ataaggataa agtcaagatg atgctaaaag cacaaattgc 3720
agattatatt acacaaaatc cactggcaat tactttggat atggcttcgc actttggcaa 3780
acctgaagg taaattttat gtgctttacc tgatgagttt gttcgagtgt ttcttgcgga 3840
acgtgaggag gaagtgttg ctgagatcag tagttggggg attttcacga ccattattga 3900
aaaagaagga tcgatttttg aaattaaaga ccgttttccg accgggatgg ttgggcgtgg 3960
ttattataat ttgaatatga aagatgaaga aggcacgctt catggtcacc ttaaattaga 4020
taacatcagc aaaattgcct ttgtgagttt accgtttcgc ggtaaagaaa gttataacat 4080
cgcatattt gcgaataatg ggcaactat ttttaaagtt tatttggggc gcgatgctga 4140
gcgtaatta tttccagaac aagttcaaaa atttaaagca tttattttaga aggttaaaaa 4200
agtaatgaca acaaatcgtc aagaagtatt acaaaatcgt ttaggtccag aaattcaaga 4260
gttaaaggca caatgtaaaa cagtcagtgt cgctactgtc ggtgaagatg gtaatcccaa 4320
tgtgagttat gcgccatttg caattaataa tggggaatac caagtcttta tttctactat 4380
tgcacgtcat gcacgtaatc tacaagaagt accaaaagtt tctttaatgt tgatcgaaga 4440
tgaaagttaa agtcgtcaga tttttgctcg tcgtcgttta ttttttgatg cggttgcgcg 4500
tgttgctgag agagaaagtg aagaatggca ttctgggtgt gaggcactca aagcaagaca 4560
tgggtgatta atggatgaat tgtctcggat gaaagatttt catttgttta gttttaagcc 4620
ctcacaaggg ttatttgtaa aaggtttttg tcaagctttc caagtgaagta atgatgattt 4680

五、發明說明 (150)

agtgagcttt gttcacttgg ttgaaggaca ccaagaataa attttgtcaa ctttttaggg 4740

tatttacttg aggttaggaa a atg cgt aca aca aca ata aaa ttt tct gca 4791
Met Arg Thr Thr Thr Ile Lys Phe Ser Ala
1 5 10

att aca ttg gca tta ttg agt tat tgt ggg acc att ttg gcg gat agt 4839
Ile Thr Leu Ala Leu Leu Ser Tyr Cys Gly Thr Ile Leu Ala Asp Ser
15 20 25

cat caa gag gcg act gaa ctt gat acg att acc gtt tct tct caa caa 4887
His Gln Glu Ala Thr Glu Leu Asp Thr Ile Thr Val Ser Ser Gln Gln
30 35 40

gat gag atg aat att aaa gag aaa aaa atc ggt gaa act gtg aaa acg 4935
Asp Glu Met Asn Ile Lys Glu Lys Lys Ile Gly Glu Thr Val Lys Thr
45 50 55

gcg agt caa ttg aaa cgc cag caa gta cag gat agt cgt gat ctt gtg 4983
Ala Ser Gln Leu Lys Arg Gln Gln Val Gln Asp Ser Arg Asp Leu Val
60 65 70

cgc tat gaa acc ggt gtg act gtg gta gaa gct gga cgt ttt ggt tcg 5031
Arg Tyr Glu Thr Gly Val Thr Val Val Glu Ala Gly Arg Phe Gly Ser
75 80 85 90

agc ggt tat gcc att cgt ggt gtg gat gag aac cga gta gca att aca 5079
Ser Gly Tyr Ala Ile Arg Gly Val Asp Glu Asn Arg Val Ala Ile Thr
95 100 105

gta gat ggc tta cat caa gca gaa acc ctt tct tct caa ggc ttt aaa 5127
Val Asp Gly Leu His Gln Ala Glu Thr Leu Ser Ser Gln Gly Phe Lys
110 115 120

gaa tta ttc gaa ggt tac ggc aat ttt aac aat acc cga aat agt gtg 5175
Glu Leu Phe Glu Gly Tyr Gly Asn Phe Asn Asn Thr Arg Asn Ser Val
125 130 135

gaa att gag acg ttg aaa gtc gct aaa atc gcg aaa ggt gct gat tct 5223
Glu Ile Glu Thr Leu Lys Val Ala Lys Ile Ala Lys Gly Ala Asp Ser
140 145 150

gta aaa gtg ggt agt ggt tct ttg gga ggc gct gta ctt ttt gaa aca 5271
Val Lys Val Gly Ser Gly Ser Leu Gly Gly Ala Val Leu Phe Glu Thr
155 160 165 170

aaa gat gcc aga gat ttc ctg act gaa aaa gat tgg cat atc ggc tat 5319
Lys Asp Ala Arg Asp Phe Leu Thr Glu Lys Asp Trp His Ile Gly Tyr
175 180 185

aaa gcg ggc tac tca acg gca gat aat cag gga tta aat gca gtg act 5367
Lys Ala Gly Tyr Ser Thr Ala Asp Asn Gln Gly Leu Asn Ala Val Thr
190 195 200

ctt gca ggt cgc tat caa atg ttc gat gca ttg att atg cat tct aag 5415
Leu Ala Gly Arg Tyr Gln Met Phe Asp Ala Leu Ile Met His Ser Lys
205 210 215

cga cat gga cat gaa tta gaa aat tat gac tat aaa aat ggc aga gat 5463
Arg His Gly His Glu Leu Glu Asn Tyr Asp Tyr Lys Asn Gly Arg Asp
220 225 230

五、發明說明 (151)

att caa ggg aaa gaa aga gag aaa gcg gat cct tat acg att acg aaa ile Gln Gly Lys Glu Arg Glu Lys Ala Asp Pro Tyr Thr Ile Thr Lys 235 240 245 250	5511
gaa agt aca tta gtg aaa ttc tct ttt tgc cca aca gaa aat cat cgt Glu Ser Thr Leu Val Lys Phe Ser Phe Ser Pro Thr Glu Asn His Arg 255 260 265	5559
ttt aca gtc gct tct gat act tat ctt cag cat tcc cgc gga cat gat Phe Thr Val Ala Ser Asp Thr Tyr Leu Gln His Ser Arg Gly His Asp 270 275 280	5607
ctt tca tat aat ctt gtt gca aca aca cat att cag tta gat gag aaa Leu Ser Tyr Asn Leu Val Ala Thr Thr His Ile Gln Leu Asp Glu Lys 285 290 295	5655
gaa tct cgt cat gca aat gat ttg aca aaa cgt aaa aat gtt tcc ttt Glu Ser Arg His Ala Asn Asp Leu Thr Lys Arg Lys Asn Val Ser Phe 300 305 310	5703
act tat gaa aat tat act gtt acg cca ttt tgg gat acg ctc aag tta Thr Tyr Glu Asn Tyr Thr Val Thr Pro Phe Trp Asp Thr Leu Lys Leu 315 320 325 330	5751
agc tat tca caa caa aga att aca aca aga gca aga aca gaa gat tat Ser Tyr Ser Gln Gln Arg Ile Thr Thr Arg Ala Arg Thr Glu Asp Tyr 335 340 345	5799
tgt gat gga aat gag tta tgt gat tct tat aaa aat cca tta ggt ctc Cys Asp Gly Asn Glu Leu Cys Asp Ser Tyr Lys Asn Pro Leu Gly Leu 350 355 360	5847
caa ttt aaa gat ggt cag att ctt gat cct gca ggg aat aaa att aaa Gln Phe Lys Asp Gly Gln Ile Leu Asp Pro Ala Gly Asn Lys Ile Lys 365 370 375	5895
cta cag ggg tct gga ttg agc act cag att gta gat gaa aat gga aaa Leu Gln Gly Ser Gly Leu Ser Thr Gln Ile Val Asp Glu Asn Gly Lys 380 385 390	5943
cca ttt cct aca aca aca ggt act aat aat gct gct ttt agt aat aat Pro Phe Pro Thr Thr Thr Gly Thr Asn Asn Ala Ala Phe Ser Asn Asn 395 400 405 410	5991
tta cga ctc agg cct aca ggt ttt tgg tta gat tgc tgc gtt ttt gac Leu Arg Leu Arg Pro Thr Gly Phe Trp Leu Asp Cys Ser Val Phe Asp 415 420 425	6039
tgt aat aaa cca ttc act gtt tat aat att agt aat gga aca tat caa Cys Asn Lys Pro Phe Thr Val Tyr Asn Ile Ser Asn Gly Thr Tyr Gln 430 435 440	6087
gca aga gag gtt cta ctg tct gaa gag ata act gtg gat ggt aaa tta Ala Arg Glu Val Leu Leu Ser Glu Glu Ile Thr Val Asp Gly Lys Leu 445 450 455	6135
tac aaa aca gct aag gaa gaa gga ggg ctt cca aat tat ttg att tta Tyr Lys Thr Ala Lys Glu Glu Gly Gly Leu Pro Asn Tyr Leu Ile Leu 460 465 470	6183
cct aat tct aaa ggt tat ctt cct tat gat tat aaa gaa agg gat ctt Pro Asn Ser Lys Gly Tyr Leu Pro Tyr Asp Tyr Lys Glu Arg Asp Leu 475 480 485 490	6231

五、發明說明 (152)

aat acg aat <u>aca</u> aaa caa att aat tta gat tta act aaa aca ttt tta	6279
Asn Thr Asn Thr Lys Gln Ile Asn Leu Asp Leu Thr Lys Thr Phe Leu	
495 500 505	
act ttc aac atc gaa aat aat ctg tca tat ggt gga gtt tat tct cgg	6327
Thr Phe Asn Ile Glu Asn Asn Leu Ser Tyr Gly Gly Val Tyr Ser Arg	
510 515 520	
ata gag aaa gaa atg att aat aaa gct ggt tat gag ggg aga aat cct	6375
Ile Glu Lys Glu Met Ile Asn Lys Ala Gly Tyr Glu Gly Arg Asn Pro	
525 530 535	
act tgg tgg gct gat aga att tta ggg caa agt agt tac tgt ggt tat	6423
Thr Trp Trp Ala Asp Arg Ile Leu Gly Gln Ser Ser Tyr Cys Gly Tyr	
540 545 550	
aat gca ttg aag tgt ccg aaa cat gag cca tta acg tca ttt tta att	6471
Asn Ala Leu Lys Cys Pro Lys His Glu Pro Leu Thr Ser Phe Leu Ile	
555 560 565 570	
cca gtt gaa gca acg aca cag tca tta tat ttt gca aat att ctt aag	6519
Pro Val Glu Ala Thr Thr Gln Ser Leu Tyr Phe Ala Asn Ile Leu Lys	
575 580 585	
gta cat aat atg att agc ata gat tta gga tat cgt tat gat cat att	6567
Val His Asn Met Ile Ser Ile Asp Leu Gly Tyr Arg Tyr Asp His Ile	
590 595 600	
aaa tat aac cct gaa tac act cca gga gta act cca aaa att cca gat	6615
Lys Tyr Asn Pro Glu Tyr Thr Pro Gly Val Thr Pro Lys Ile Pro Asp	
605 610 615	
gat atg gta aaa ggt ttg ttt att cct atg cca aaa gag cca cag cta	6663
Asp Met Val Lys Gly Leu Phe Ile Pro Met Pro Lys Glu Pro Gln Leu	
620 625 630	
aag gat ttt gat tat aac tat gct aaa ttt ggt gag gcc tat aaa aaa	6711
Lys Asp Phe Asp Tyr Asn Tyr Ala Lys Phe Gly Glu Ala Tyr Lys Lys	
635 640 645 650	
tgg aaa gaa tat ctg cca aaa aat gcg gaa gaa aat att gct tac att	6759
Trp Lys Glu Tyr Leu Pro Lys Asn Ala Glu Glu Asn Ile Ala Tyr Ile	
655 660 665	
gct caa gat aag aca ttt aaa aaa cat tct tat tct ctt ggt gca act	6807
Ala Gln Asp Asp Thr Phe Lys Lys His Ser Tyr Ser Leu Ala Thr	
670 675 680	
ttc gat cct ctg aat ttt tta cga gta caa gta aaa tat tca aaa ggg	6855
Phe Asp Pro Leu Asn Phe Leu Arg Val Gln Val Lys Tyr Ser Lys Gly	
685 690 695	
ttt aga gcc ccg act tcg gat gaa ctt tat ttt acc ttt aag cat cca	6903
Phe Arg Ala Pro Thr Ser Asp Glu Leu Tyr Phe Thr Phe Lys His Pro	
700 705 710	
gat ttt acg att tta ccg aac ccc gtg ttg aaa cca gag gaa gca aaa	6951
Asp Phe Thr Ile Leu Pro Asn Pro Val Leu Lys Pro Glu Glu Ala Lys	
715 720 725 730	
aat caa gag att gca tta aca gtg cac gat aat tgg gga ttt gtt agc	6999
Asn Gln Glu Ile Ala Leu Thr Val His Asp Asn Trp Gly Phe Val Ser	
735 740 745	

五、發明說明 (153)

aca agt gtt ttc caa aca aag tat cgt cat ttt att gat tta gcg tat 7047
Thr Ser Val Phe Gln Thr Lys Tyr Arg His Phe Ile Asp Leu Ala Tyr
750 755 760

tta ggt tca aga aat tta tcg aat tcc gtg gga ggg cag gca caa gca 7095
Leu Gly Ser Arg Asn Leu Ser Asn Ser Val Gly Gly Gln Ala Gln Ala
765 770 775

aga gat ttc caa gtt tat caa aat gtc aat gtc gat aat gcc aaa gtt 7143
Arg Asp Phe Gln Val Tyr Gln Asn Val Asn Val Asp Asn Ala Lys Val
780 785 790

aaa gga ctt gaa att aat gca cgt ttg aat ttg gga tat ttt tgg cat 7191
Lys Gly Leu Glu Ile Asn Ala Arg Leu Asn Leu Gly Tyr Phe Trp His
795 800 805 810

gtg ttg gat gga ttt aat acg agc tat aaa ttc act tac caa cgt ggt 7239
Val Leu Asp Gly Phe Asn Thr Ser Tyr Lys Phe Thr Tyr Gln Arg Gly
815 820 825

cgt ttg gat ggc gat cgt cca atg aat gcg att cag cct aaa gct tct 7287
Arg Leu Asp Gly Asp Arg Pro Met Asn Ala Ile Gln Pro Lys Ala Ser
830 835 840

gtt ttt ggt ttg ggc tac gat cat aaa gaa aat aaa ttt ggc gct gat 7335
Val Phe Gly Leu Gly Tyr Asp His Lys Glu Asn Lys Phe Gly Ala Asp
845 850 855

tta tat att aca cgt gtg agt gag aaa aaa gcg aaa gac act tat aat 7383
Leu Tyr Ile Thr Arg Val Ser Glu Lys Lys Ala Lys Asp Thr Tyr Asn
860 865 870

atg ttc tat aaa gaa cag gga tat aaa gat agt gct gtt cgt tgg aga 7431
Met Phe Tyr Lys Glu Gln Gly Tyr Lys Asp Ser Ala Val Arg Trp Arg
875 880 885 890

agt gat gac tat acg cta gtt gat gcg gtt ggt tat att aaa ccg att 7479
Ser Asp Asp Tyr Thr Leu Val Asp Ala Val Gly Tyr Ile Lys Pro Ile
895 900 905

aag aat tta acg tta cag ttt ggc gtt tat aat ttg aca gac cgt aaa 7527
Lys Asn Leu Thr Leu Gln Phe Gly Val Tyr Asn Leu Thr Asp Arg Lys
910 915 920

tac ttg aca tgg gaa tct gct cgt tcg att aaa cca ttt ggt aca agt 7575
Tyr Leu Thr Trp Glu Ser Ala Arg Ser Ile Lys Pro Phe Gly Thr Ser
925 930 935

aat tta att aat caa aaa aca ggc gca gga att aat cgt ttt tac tca 7623
Asn Leu Ile Asn Gln Lys Thr Gly Ala Gly Ile Asn Arg Phe Tyr Ser
940 945 950

cca ggt cgt aac ttt aaa ctc agt gcc gaa atc acc ttc taatcctaag 7672
Pro Gly Arg Asn Phe Lys Leu Ser Ala Glu Ile Thr Phe
955 960 965

cctgcgtatg caggctttct ttttagggaa agtgcggtgg atttgacaaa gatttattgc 7732

ttttctgtaa atcaatgcta aaattcacac tcctttgtcg tagctggatt agagatcggc 7792

tagcgatgta tttttaactt aacttttagg agttatcaaa tgtctctaag tacagaaaaa 7852

aaagcagcaa ttgttgctga atttggtcgt gatcctaaaa ataccggttc ttcadaaactg 7912

五、發明說明 (154)

caaatcgcat taattaactgc acaaatcaac cacttacaat ctacttttgc aacgcacaaa 7972
 aaagaccacc acggctcgctg tggtttattg cgtatggttt ctcgctcgctg taaactttta 8032
 gattacttaa aacgtactaa tcttgagctt tacacttcaa ctatcgctcg tttaggttta 8092
 cgtcgctaatt ttgtattagg atttattcca aacaaaaaac ccttgataat tttatcaagg 8152
 gttttctttt ttctgcatat taggcatgtt taaattatcg caaaacacac cgcacatttc 8212
 gtggaaaagt gcggtcattt ttttaattta ttttacttct ttaaacaatga tctcacttgg 8272
 gattactgaa ccttgccagt aaagctcagt agcgactttt tcagctaatt gcataaacga 8332
 ttgggcaatg tcgctttcag gtgcggcgac aacggttggg atacctttgt ctaaactctt 8392
 acgtaagcga atatgtaatg cctgttgtcc taaaactttg acattatatt tttgtgcaat 8452
 gcgctcagca ccgcctgttc cgaaaatcgt ttcttgatga ccacaattgc tacaaatatg 8512
 catcgacata ttttcgataa tgcctaaaac gggtagacaa acacgctcaa acatcgccac 8572
 acctttaatc gcatccagta aagcaatata ttgtggtgtt gtcaccacga ccgccccgt 8632
 cactggaatt tgttgagaaa gggtcagctg gatatccct gtaccgggtg gcatatcaat 8692
 gactaaataa tctaaatcag gccataaggt ttcttgcaaa agctgactta aggcactgct 8752
 tgccattgga ccgcgcctaa tcgtagcatt gtccggttcc attaagaaac caatggaatt 8812
 ggcaaaaata tgatgtgctt gaattggggg aatgtgctgg ttatctggcg aagttgggcg 8872
 ttgatcagca acccctaaca tgtgtggaat agatggacca taaatatcgg catctaaaat 8932
 tccaacacga gcacctgtc tttgtaaggc aagagcaaga ttgacggaaa tagtagattt 8992
 tcttacacca cctttaccg atgtcacggc aataatattt tttaccctt ttacggctgg 9052
 gtggctatta gcgcgtttta atgtcgcat ttgataattt aattgccatt tgatgtctt 9112
 gcattctgct aatgtgagaa gttctgtgga gagagcgctc ttgagttgtt cgaatgcagt 9172
 attccaagca aacggcatgc tgatttcaat acgtaacgtc tcaccgcctt tttcaatttt 9232
 tttgatagca tttaggctga cgagatctt ttgtaagcta ggatgttgaa attgttgaaa 9292
 tgtgttttgg atagcttgtt ttgactgtc cgttaaactg tcagaaaata aaattcccat 9352
 tgattttatc ccgttatttt tgggtggctaa ttaaagccct agttaatcac tcaactatat 9412
 ttaaccacga agctgtagaa ctgttaagca gaaatgtgga aaagcgcggt taaagtagaa 9472
 aaaatactgc gaataaggta acataagcgc caattttttg atgaaaaata ggaatgataa 9532
 catggcaaat tcggcacgcg atattttggg cacttgcgcc ttaccttatg caaatgggtgc 9592
 aattcattta gggcatttat tagaacatat tcaagcagat atttgggtgc gttccaacgt 9652
 atgcgtgggc ataaagtgc ttttatttgt gcagatgatg cccatggcac accaatcatg 9712
 ttaaattgca taaattaggt attacaccaa agcattaatt gtcctcgaa agcagaacat 9772
 gtggcggaatt tgaaggctta atattagcta tgataatata at 9814

五、發明說明 (155)

<210> 32
<211> 967
<212> 蛋白質
<213> 敗血性巴斯德桿菌

<400> 32
Met Arg Thr Thr Thr Ile Lys Phe Ser Ala Ile Thr Leu Ala Leu Leu
1 5 10 15
Ser Tyr Cys Gly Thr Ile Leu Ala Asp Ser His Gln Glu Ala Thr Glu
20 25 30
Leu Asp Thr Ile Thr Val Ser Ser Gln Gln Asp Glu Met Asn Ile Lys
35 40 45
Glu Lys Lys Ile Gly Glu Thr Val Lys Thr Ala Ser Gln Leu Lys Arg
50 55 60
Gln Gln Val Gln Asp Ser Arg Asp Leu Val Arg Tyr Glu Thr Gly Val
65 70 75 80
Thr Val Val Glu Ala Gly Arg Phe Gly Ser Ser Gly Tyr Ala Ile Arg
85 90 95
Gly Val Asp Glu Asn Arg Val Ala Ile Thr Val Asp Gly Leu His Gln
100 105 110
Ala Glu Thr Leu Ser Ser Gln Gly Phe Lys Glu Leu Phe Glu Gly Tyr
115 120 125
Gly Asn Phe Asn Asn Thr Arg Asn Ser Val Glu Ile Glu Thr Leu Lys
130 135 140
Val Ala Lys Ile Ala Lys Gly Ala Asp Ser Val Lys Val Gly Ser Gly
145 150 155 160
Ser Leu Gly Gly Ala Val Leu Phe Glu Thr Lys Asp Ala Arg Asp Phe
165 170 175
Leu Thr Glu Lys Asp Trp His Ile Gly Tyr Lys Ala Gly Tyr Ser Thr
180 185 190
Ala Asp Asn Gln Gly Leu Asn Ala Val Thr Leu Ala Gly Arg Tyr Gln
195 200 205
Met Phe Asp Ala Leu Ile Met His Ser Lys Arg His Gly His Glu Leu
210 215 220
Glu Asn Tyr Asp Tyr Lys Asn Gly Arg Asp Ile Gln Gly Lys Glu Arg
225 230 235 240
Glu Lys Ala Asp Pro Tyr Thr Ile Thr Lys Glu Ser Thr Leu Val Lys
245 250 255
Phe Ser Phe Ser Pro Thr Glu Asn His Arg Phe Thr Val Ala Ser Asp
260 265 270
Thr Tyr Leu Gln His Ser Arg Gly His Asp Leu Ser Tyr Asn Leu Val
275 280 285
Ala Thr Thr His Ile Gln Leu Asp Glu Lys Glu Ser Arg His Ala Asn
290 295 300

五、發明說明 (156)

Asp Leu Thr Lys Arg Lys Asn Val Ser Phe Thr Tyr Glu Asn Tyr Thr
305 310 315 320

Val Thr Pro Phe Trp Asp Thr Leu Lys Leu Ser Tyr Ser Gln Gln Arg
325 330 335

Ile Thr Thr Arg Ala Arg Thr Glu Asp Tyr Cys Asp Gly Asn Glu Leu
340 345 350

Cys Asp Ser Tyr Lys Asn Pro Leu Gly Leu Gln Phe Lys Asp Gly Gln
355 360 365

Ile Leu Asp Pro Ala Gly Asn Lys Ile Lys Leu Gln Gly Ser Gly Leu
370 375 380

Ser Thr Gln Ile Val Asp Glu Asn Gly Lys Pro Phe Pro Thr Thr Thr
385 390 395 400

Gly Thr Asn Asn Ala Ala Phe Ser Asn Asn Leu Arg Leu Arg Pro Thr
405 410 415

Gly Phe Trp Leu Asp Cys Ser Val Phe Asp Cys Asn Lys Pro Phe Thr
420 425 430

Val Tyr Asn Ile Ser Asn Gly Thr Tyr Gln Ala Arg Glu Val Leu Leu
435 440 445

Ser Glu Glu Ile Thr Val Asp Gly Lys Leu Tyr Lys Thr Ala Lys Glu
450 455 460

Glu Gly Gly Leu Pro Asn Tyr Leu Ile Leu Pro Asn Ser Lys Gly Tyr
465 470 475 480

Leu Pro Tyr Asp Tyr Lys Glu Arg Asp Leu Asn Thr Asn Thr Lys Gln
485 490 495

Ile Asn Leu Asp Leu Thr Lys Thr Phe Leu Thr Phe Asn Ile Glu Asn
500 505 510

Asn Leu Ser Tyr Gly Gly Val Tyr Ser Arg Ile Glu Lys Glu Met Ile
515 520 525

Asn Lys Ala Gly Tyr Glu Gly Arg Asn Pro Thr Trp Trp Ala Asp Arg
530 535 540

Ile Leu Gly Gln Ser Ser Tyr Cys Gly Tyr Asn Ala Leu Lys Cys Pro
545 550 555 560

Lys His Glu Pro Leu Thr Ser Phe Leu Ile Pro Val Glu Ala Thr Thr
565 570 575

Gln Ser Leu Tyr Phe Ala Asn Ile Leu Lys Val His Asn Met Ile Ser
580 585 590

Ile Asp Leu Gly Tyr Arg Tyr Asp His Ile Lys Tyr Asn Pro Glu Tyr
595 600 605

Thr Pro Gly Val Thr Pro Lys Ile Pro Asp Asp Met Val Lys Gly Leu
610 615 620

Phe Ile Pro Met Pro Lys Glu Pro Gln Leu Lys Asp Phe Asp Tyr Asn
625 630 635 640

五、發明說明 (157)

Tyr Ala Lys Phe Gly Glu Ala Tyr Lys Lys Trp Lys Glu Tyr Leu Pro
645 650 655

Lys Asn Ala Glu Glu Asn Ile Ala Tyr Ile Ala Gln Asp Lys Thr Phe
660 665 670

Lys Lys His Ser Tyr Ser Leu Gly Ala Thr Phe Asp Pro Leu Asn Phe
675 680 685

Leu Arg Val Gln Val Lys Tyr Ser Lys Gly Phe Arg Ala Pro Thr Ser
690 695 700

Asp Glu Leu Tyr Phe Thr Phe Lys His Pro Asp Phe Thr Ile Leu Pro
705 710 715 720

Asn Pro Val Leu Lys Pro Glu Glu Ala Lys Asn Gln Glu Ile Ala Leu
725 730 735

Thr Val His Asp Asn Trp Gly Phe Val Ser Thr Ser Val Phe Gln Thr
740 745 750

Lys Tyr Arg His Phe Ile Asp Leu Ala Tyr Leu Gly Ser Arg Asn Leu
755 760 765

Ser Asn Ser Val Gly Gly Gln Ala Gln Ala Arg Asp Phe Gln Val Tyr
770 775 780

Gln Asn Val Asn Val Asp Asn Ala Lys Val Lys Gly Leu Glu Ile Asn
785 790 795 800

Ala Arg Leu Asn Leu Gly Tyr Phe Trp His Val Leu Asp Gly Phe Asn
805 810 815

Thr Ser Tyr Lys Phe Thr Tyr Gln Arg Gly Arg Leu Asp Gly Asp Arg
820 825 830

Pro Met Asn Ala Ile Gln Pro Lys Ala Ser Val Phe Gly Leu Gly Tyr
835 840 845

Asp His Lys Glu Asn Lys Phe Gly Ala Asp Leu Tyr Ile Thr Arg Val
850 855 860

Ser Glu Lys Lys Ala Lys Asp Thr Tyr Asn Met Phe Tyr Lys Glu Gln
865 870 875 880

Gly Tyr Lys Asp Ser Ala Val Arg Trp Arg Ser Asp Asp Tyr Thr Leu
885 890 895

Val Asp Ala Val Gly Tyr Ile Lys Pro Ile Lys Asn Leu Thr Leu Gln
900 905 910

Phe Gly Val Tyr Asn Leu Thr Asp Arg Lys Tyr Leu Thr Trp Glu Ser
915 920 925

Ala Arg Ser Ile Lys Pro Phe Gly Thr Ser Asn Leu Ile Asn Gln Lys
930 935 940

Thr Gly Ala Gly Ile Asn Arg Phe Tyr Ser Pro Gly Arg Asn Phe Lys
945 950 955 960

Leu Ser Ala Glu Ile Thr Phe
965

五、發明說明 (158)

<210> 33
<211> 2990
<212> DNA
<213> 败血性巴斯德桿菌

```
<220>  
<221> CDS  
<222> (1106) .. (1564)
```

```
<?20>
<223> kdtB
```

[illegible]

tat ttt tta tgg ttc ata ttg ttt atc ctt tca atc tat tta ttt att 1180
Tyr Phe Leu Trp Phe Ile Leu Phe Ile Leu Ser Ile Tyr Leu Phe Ile
10 15 20 25

acc ata caa gaa aga cga ggt tat tgt ttt gac aaa cgt gca tat att 1228
Thr Ile Gln Glu Arg Gly Tyr Cys Phe Asp Lys Arg Ala Tyr Ile
30 35 40

五、發明說明 (159)

cat. gag ctt tat act gag caa gag tta att gat cgg ggg att gaa tat	1276
His Glu Leu Tyr Thr Glu Gln Glu Leu Ile Asp Arg Gly Ile Glu Tyr	
45 50 55	
gtg gta tcc acc atg ccg tca ggt gtt att aaa cca gat ggc aca ata	1324
Val Val Ser Thr Met Pro Ser Gly Val Ile Lys Pro Asp Gly Thr Ile	
60 65 70	
aaa gaa gta aag cgt tac acg agt gtc gag gag ttt aaa cag atg aac	1372
Lys Glu Val Lys Arg Tyr Thr Ser Val Glu Glu Phe Lys Gln Met Asn	
75 80 85	
cca gct tgt tgt aca tta acc acc ttt att gat gaa gga ggc gat ggc	1420
Pro Ala Cys Cys Thr Leu Thr Thr Phe Ile Asp Glu Gly Gly Asp Gly	
90 95 100 105	
tat cca gat gat gat gga tat ggt tat gtc aga att gaa tat tta aga	1468
Tyr Pro Asp Asp Asp Gly Tyr Gly Tyr Val Arg Ile Glu Tyr Leu Arg	
110 115 120	
cat tat gtt gag aat cta aaa cct tat cat aga gtg att tat ctt gaa	1516
His Tyr Val Glu Asn Leu Lys Pro Tyr His Arg Val Ile Tyr Leu Glu	
125 130 135	
tat acg ccc tgt gga gag tta agg gaa gag gcg gct ttt tca aaa aat	1564
Tyr Thr Pro Cys Gly Glu Leu Arg Glu Glu Ala Ala Phe Ser Lys Asn	
140 145 150	
taagagtgag gtgaagaaat ggcattacca acagcaacaa taatgaggaa tttatcttta	1624
tctaaaaatc aattcactct gaaagggatg gaatgcgtag attccttatt tcaagcatgc	1684
agtaatatgg atcatgggta ctgaggtgga agatggcaga agaaaataaa ggaaagagat	1744
atctttttatg gttcatattg tttatccttt caatctatctt atttattacc atacaagaaa	1804
gacgagggtta ttgttttgac aaatgggaat atatccataa cctttataacc gagcaagagt	1864
tgatcgatag aggggttgaa tatgtggtat ccaccatgcc gtcagggtgtt tttgaaccag	1924
atggcacaaac aaccgaaata aaacgttatg ctagtgttga ggagttttaa cagatgaacc	1984
ctgattgttg taaattaaca agatttatta atgaaggaat agatggctat ccagatgatg	2044
atggatatgg ttatataaga attgaatatt taagacatta tggtgggaat tttaaacctg	2104
atcatagagt gctttatctc gaataacgc cttgtggaga attaaggga gaggtttctt	2164
tttaaaaaat aaataatagt gaggtgaaga aatggcatta ccaacagcaa cagaaatcac	2224
aaatgcatat ttatataaaa ataaattaac tcctaaagcg gaggaagag tagattcaat	2284
acaaattctt gaaaaaggag atgaacattt cgaagtaaatt ttttaattgat caaagtactc	2344
tattgattga aggaaaaaca gtggaattaa tggcaggtat ggcagtttct gcggaaatta	2404
aaacaggtaa acgcagtgtg ttagattact tatttagccc attaaaaacc acaaaataat	2464
attaaggaga ataatatgtc gtataataaa tatactgttg ctttgattac gttctcaaca	2524
gggatctgta ttccggcaat atgctacgct ctaaattcgc tgggatacag atcctgtttg	2584
agactatgta gaaaagacta aactttgtgt ggtaactgg gcttcggtaa aattctggaa	2644

五、發明說明 (160)

acaaatgggc ttaaccgcg tgatcttacc ccgtgagctt tcgcttgatg aaattgccga 2704
aatcgtcag caagtgccag aaatggaaat tgaagtgttc gtgcatgggg cattatgcat 2764
ggcgtattct ggacgttggt tattatcagg ctatattaat aaacgtgatc caaatcaagg 2824
cacctgtacc aatgcgtgcc gttgggaata cagtgttaacc gaagccaaag aagatgagat 2884
cggcaacatt gtgaatgtgg gtgaagaaat tccagtgaag aatgtagcac cgacacttgg 2944
cgaaggcgac accaccagta aagtattttt attagcagaa agtcga 2990

<210> 34
<211> 153
<212> 蛋白質
<213> 敗血性巴斯德桿菌

<400> 34
Met Thr Glu Glu Asn Lys Gly Lys Arg Tyr Phe Leu Trp Phe Ile Leu
1 5 10 15
Phe Ile Leu Ser Ile Tyr Leu Phe Ile Thr Ile Gln Glu Arg Arg Gly
20 25 30
Tyr Cys Phe Asp Lys Arg Ala Tyr Ile His Glu Leu Tyr Thr Glu Gln
35 40 45
Glu Leu Ile Asp Arg Gly Ile Glu Tyr Val Val Ser Thr Met Pro Ser
50 55 60
Gly Val Ile Lys Pro Asp Gly Thr Ile Lys Glu Val Lys Arg Tyr Thr
65 70 75 80
Ser Val Glu Glu Phe Lys Gln Met Asn Pro Ala Cys Cys Thr Leu Thr
85 90 95
Thr Phe Ile Asp Glu Gly Gly Asp Gly Tyr Pro Asp Asp Asp Gly Tyr
100 105 110
Gly Tyr Val Arg Ile Glu Tyr Leu Arg His Tyr Val Glu Asn Leu Lys
115 120 125
Pro Tyr His Arg Val Ile Tyr Leu Glu Tyr Thr Pro Cys Gly Glu Leu
130 135 140
Arg Glu Glu Ala Ala Phe Ser Lys Asn
145 150

<210> 35
<211> 1683
<212> DNA
<213> 敗血性巴斯德桿菌

<220>
<221> CDS
<222> (325) .. (1230)

<220>
<223> lgtC

五、發明說明 (161)

<220>
<221> misc_特徵
<222> 219
<223> Xaa=任何或未知的胺基酸

<220>
<221> misc_特徵
<222> 226
<223> Xaa=任何或未知的胺基酸

<220>
<221> misc_特徵
<222> 269
<223> Xaa=任何或未知的胺基酸

<220>
<221> misc_特徵
<222> 270
<223> Xaa=任何或未知的胺基酸

<220>
<221> misc_特徵
<222> 274
<223> Xaa=任何或未知的胺基酸

```

<400> 35
atatcaaagt ctcatggcaa gaaaattaga aaagagcgat caattattat ttgcaagatt 60
tgggtattat tcataggcta ggtgaaagat atatttttcc atgatattaa aacgattcag 120
gcagaactgg cttagcttatt acttttagat aattgtatta ttaaaagaag ctgtatgatt 180
gttattctat cattagtggg taataaatat tctttatttt ttgagagata aaaacaattc 240
atattttcaat agaaaacaga aaataaagat tatcaaaaga attatccgctc cttataaata 300
tgagtctgta ttgtgagatg atat atg aat att tta ttt gtt tct gat gat      351
                               Met Asn Ile Leu Phe Val Ser Asp Asp
                               1           5

gtt tat gct aaa cat ctg gtg gtt gcg att aaa agc att ata aat cat      399
Val Tyr Ala Lys His Leu Val Val Ala Ile Lys Ser Ile Ile Asn His
 10           15           20           25

aat gaa aaa ggt att tca ttt tat att ttt gat ttg ggt ata aag gat      447
Asn Glu Lys Gly Ile Ser Phe Tyr Ile Phe Asp Leu Gly Ile Lys Asp
          30           35           40

gaa aat aag aga aat att aat gat att gtt tct tct tat gga agt gaa      495
Glu Asn Lys Arg Asn Ile Asn Asp Ile Val Ser Ser Tyr Gly Ser Glu
          45           50           55

gtc aac ttt att gct gtg aat gag aaa gaa ttt gag agt ttt cct gtt      543
Val Asn Phe Ile Ala Val Asn Glu Lys Glu Phe Glu Ser Phe Pro Val
          60           65           70

caa att agt tat att tct tta gca aca tat gca agg cta aaa gcg gca      591
Gln Ile Ser Tyr Ile Ser Leu Ala Thr Tyr Ala Arg Leu Lys Ala Ala
          75           80           85

gag tat ttg ccg gat aat tta aat aaa att att tat tta gat gtt gat      639
Glu Tyr Leu Pro Asp Asn Leu Asn Lys Ile Ile Tyr Leu Asp Val Asp
          90           95           100           105

```

五、發明說明 (162)

gtt ttg gtt ttt aac tca tta gaa atg tta tgg aat gtt gat gtt aat	687
Val Leu Val Phe Asn Ser Leu Glu Met Leu Trp Asn Val Asp Val Asn	
110 115 120	
aat ttt ctt acc gca gcc tgt tat gat tct ttc atc gaa aat gaa aag	735
Asn Phe Leu Thr Ala Ala Cys Tyr Asp Ser Phe Ile Glu Asn Glu Lys	
125 130 135	
tct gag cat aaa aaa tcg att tca atg tca gat aag gaa tat tat ttt	783
Ser Glu His Lys Lys Ser Ile Ser Met Ser Asp Lys Glu Tyr Tyr Phe	
140 145 150	
aat gca gga gta atg cta ttt aat tta gat gaa tgg cgg aag atg gat	831
Asn Ala Gly Val Met Leu Phe Asn Leu Asp Glu Trp Arg Lys Met Asp	
155 160 165	
gta ttc tca aga gct tta gac ctg tta gct atg tat cct aat caa atg	879
Val Phe Ser Arg Ala Leu Asp Leu Leu Ala Met Tyr Pro Asn Gln Met	
170 175 180 185	
att tat cag gat caa gat ata ttg aat atc ctt ttt agg aat aaa gtc	927
Ile Tyr Gln Asp Gln Asp Ile Leu Asn Ile Leu Phe Arg Asn Lys Val	
190 195 200	
tgt tat tta gat tgc aga ttt aat ttc atg cca aat caa ctt gaa aga	975
Cys Tyr Leu Asp Cys Arg Phe Asn Phe Met Pro Asn Gln Leu Glu Arg	
205 210 215	
ata aan caa tac cat aaa gga aaa ntg agc aac tta cat tct tta gaa	1023
Ile Xaa Gln Tyr His Lys Gly Lys Xaa Ser Asn Leu His Ser Leu Glu	
220 225 230	
aaa aca acg atg cct gtc gtt att tca cat tat tgt ggt cca gaa aaa	1071
Lys Thr Thr Met Pro Val Val Ile Ser His Tyr Cys Gly Pro Glu Lys	
235 240 245	
gcg tgg cat gcg gat tgt aaa cat ttt aat gta tat ttc tat cag aaa	1119
Ala Trp His Ala Asp Cys Lys His Phe Asn Val Tyr Phe Tyr Gln Lys	
250 255 260 265	
ata tta gca naa atn tcg aga ggc ncg gat aaa gaa cgc gta tta tct	1167
Ile Leu Ala Xaa Xaa Ser Arg Gly Xaa Asp Lys Glu Arg Val Leu Ser	
270 275 280	
ata aaa act tat ctc aag gcc ttg att aga agg att aga tat aaa ttc	1215
Ile Lys Thr Tyr Leu Lys Ala Leu Ile Arg Arg Ile Arg Tyr Lys Phe	
285 290 295	
aaa tat caa gtc tat taactattga atttttgcaa atgagataag agtatagtgc	1270
Lys Tyr Gln Val Tyr	
300	
tgattttcttc aaagcgaaaa ggaggaaata gcttggttcta atttattaca ataatggttg	1330
tattcatctt gattttgaag gaaagagagt gttttttgta taaaagcatt ttcgtcacct	1390
aaatttacta atcctccaaa ttctctctct cgnagaattt ctttcggacc ggtagggcag	1450
tccatggata ttacagggtgt accgcaagcc atgcttttcta ggataactgt cggtaacccc	1510
tttttcaaag aggtgtgttaa aaatagctta gcatttttta ttaatggata cggattatct	1570
ttattttcta aaagaaaaaca atcttcttct atatttaagt attctatttg tttctcta	1630

五、發明說明 (163)

ttttctcgac actcaccatc ccaaacaata tatancnttt cttggatacc tcc 1683

- <210> 36
- <211> 302
- <212> 蛋白質
- <213> 敗血性巴斯德桿菌

- <220>
- <221> misc_特徵
- <222> 219
- <223> Xaa=任何或未知的胺基酸

- <220>
- <221> misc_特徵
- <222> 226
- <223> Xaa=任何或未知的胺基酸

- <220>
- <221> misc_特徵
- <222> 269
- <223> Xaa=任何或未知的胺基酸

- <220>
- <221> misc_特徵
- <222> 270
- <223> Xaa=任何或未知的胺基酸

- <220>
- <221> misc_特徵
- <222> 274
- <223> Xaa=任何或未知的胺基酸

<400> 36
Met Asn Ile Leu Phe Val Ser Asp Asp Val Tyr Ala Lys His Leu Val
1 5 10 15
Val Ala Ile Lys Ser Ile Ile Asn His Asn Glu Lys Gly Ile Ser Phe
20 25 30
Tyr Ile Phe Asp Leu Gly Ile Lys Asp Glu Asn Lys Arg Asn Ile Asn
35 40 45
Asp Ile Val Ser Ser Tyr Gly Ser Glu Val Asn Phe Ile Ala Val Asn
50 55 60
Glu Lys Glu Phe Glu Ser Phe Pro Val Gln Ile Ser Tyr Ile Ser Leu
65 70 75 80
Ala Thr Tyr Ala Arg Leu Lys Ala Ala Glu Tyr Leu Pro Asp Asn Leu
85 90 95
Asn Lys Ile Ile Tyr Leu Asp Val Asp Val Leu Val Phe Asn Ser Leu
100 105 110
Glu Met Leu Trp Asn Val Asp Val Asn Asn Phe Leu Thr Ala Ala Cys
115 120 125
Tyr Asp Ser Phe Ile Glu Asn Glu Lys Ser Glu His Lys Lys Ser Ile
130 135 140

裝
訂
線

五、發明說明 (164)

Ser Met Ser Asp Lys Glu Tyr Tyr Phe Asn Ala Gly Val Met Leu Phe
145 150 155 160

Asn Leu Asp Glu Trp Arg Lys Met Asp Val Phe Ser Arg Ala Leu Asp
165 170 175

Leu Leu Ala Met Tyr Pro Asn Gln Met Ile Tyr Gln Asp Gln Asp Ile
180 185 190

Leu Asn Ile Leu Phe Arg Asn Lys Val Cys Tyr Leu Asp Cys Arg Phe
195 200 205

Asn Phe Met Pro Asn Gln Leu Glu Arg Ile Xaa Gln Tyr His Lys Gly
210 215 220

Lys Xaa Ser Asn Leu His Ser Leu Glu Lys Thr Thr Met Pro Val Val
225 230 235 240

Ile Ser His Tyr Cys Gly Pro Glu Lys Ala Trp His Ala Asp Cys Lys
245 250 255

His Phe Asn Val Tyr Phe Tyr Gln Lys Ile Leu Ala Xaa Xaa Ser Arg
260 265 270

Gly Xaa Asp Lys Glu Arg Val Leu Ser Ile Lys Thr Tyr Leu Lys Ala
275 280 285

Leu Ile Arg Arg Ile Arg Tyr Lys Phe Lys Tyr Gln Val Tyr
290 295 300

<210> 37
<211> 2029
<212> DNA
<213> 敗血性巴斯德桿菌

<220>
<221> CDS
<222> (2) .. (499)

<220>
<223> mglB

<220>
<221> misc_特徵
<222> 33
<223> Xaa=任何或未知的胺基酸

<220>
<221> misc_特徵
<222> 99
<223> Xaa=任何或未知的胺基酸

<220>
<221> misc_特徵
<222> 101
<223> Xaa=任何或未知的胺基酸

<220>
<221> misc_特徵
<222> 928
<223> n=A或T或G或C

五、發明說明 (165)

<220>
<221> misc_特徵
<222> 1007
<223> n=A或T或G或C

<220>
<221> misc_特徵
<222> 1740
<223> n=A或T或G或C

<220>
<221> misc_特徵
<222> 1808
<223> n=A或T或G或C

<220>
<221> misc_特徵
<222> 1816
<223> n=A或T或G或C

<220>
<221> misc_特徵
<222> 1820
<223> n=A或T或G或C

<400> 37
c tta aat aaa gcc ggt aaa att caa tac gtt tta tta aaa ggt aac caa 49
Leu Asn Lys Ala Gly Lys Ile Gln Tyr Val Leu Leu Lys Gly Asn Gln
1 5 10 15

gga cac cca gat gca gaa gct cgt aca aaa ttc gtc att aaa gaa tta 97
Gly His Pro Asp Ala Glu Ala Arg Thr Lys Phe Val Ile Lys Glu Leu
20 25 30

nat aat aaa ggc att caa gat gag caa tta ttc atc gac acg ggg atg 145
Xaa Asn Lys Gly Ile Gln Asp Glu Gln Leu Phe Ile Asp Thr Gly Met
35 40 45

tgg gat gcc gct tta gcg aaa gat aaa atg gat gca tgg tta tct agc 193
Trp Asp Ala Ala Leu Ala Lys Asp Lys Met Asp Ala Trp Leu Ser Ser
50 55 60

tct aaa gca aat caa att gaagtgc atc atc gct aac aac gat ggt atg 241
Ser Lys Ala Asn Gln Ile Glu Val Ile Ile Ala Asn Asn Asp Gly Met
65 70 75 80

gcg atg ggg gca ttg gaa gcc acg aaa gca cat ggt aaa aaa tta cca 289
Ala Met Gly Ala Leu Glu Ala Thr Lys Ala His Gly Lys Lys Leu Pro
85 90 95

atc ttc ngc gta nat gcg tta cca gaa gtc ctc caa tta atc aaa aaa 337
Ile Phe Xaa Val Xaa Ala Leu Pro Glu Val Leu Gln Leu Ile Lys Lys
100 105 110

ggt gaa att gca ggt acg gtc tta aat gac ggt gtc aac caa ggt aaa 385
Gly Glu Ile Ala Gly Thr Val Leu Asn Asp Gly Val Asn Gln Gly Lys
115 120 125

gcc gtt gtt caa tta agt aat aat ctt gca aaa gga aaa cct gcc act 433
Ala Val Val Gln Leu Ser Asn Asn Leu Ala Lys Gly Lys Pro Ala Thr
130 135 140

五、發明說明 (166)

gaa ggc aca aaa tgg cag tta aaa cga tgg tgt cct acg tat ccc tta 481
Glu Glv Thr Lys Trp Gln Leu Lys Arg Ser Cys Pro Thr Tyr Pro Leu
145 150 155 160

tgt tgg tgt gga tgc gga taacttaaag gagttcctaa aataataaac 529
Cys Trp Cys Gly Cys Gly
165

tataacaaaa caagamgttg taattctcgg ggaggtatac cctccccctt tttatgtgag 589

gtcggatatg acaactcaaa ttccaaatca agacagtga atactgctca caatgaccaa 649

cgtctgtaaa tcctttcccg gtgttaaagc gttagacaat gcaaacctaa ctgtgcgctc 709

gcattctgtc catgccttaa tgggcgaaaa tggggcgggc aaatcgacct tattaataatg 769

cttatttggg atttacagta aagatgaagg tgacatcctt ttcttaggca agccagtcaa 829

ctttaaaccg tcgaaagaag ccttagagaa cgggattttc atggtgcacc aagaacttaa 889

cttgggttaa caatgtactg taatggataa tcctttggnt aggacgttat ccattaaaag 949

caggctttgt cgatcacggc aaaatgtatc gtgataccaa agcagatttt tgaagaanta 1009

gatatcgata tcgatccaaa agaaaaagtg gccaaattgt cagtgtcaca aatgcaaagt 1069

atcgagatcg caaaggcctt ttcatacaat gccaaaatcg taatcatgga cgaaccgact 1129

tcttcgcttt cagaaaaaga agttgaacac ctatttaaaa ttatcgcgaa gctaaaaaca 1189

cgtggctgtg gcattattta tatttcgcac aaaatggacg aaatcttcaa aatttgtgac 1249

gaaattacga ttttacgcga tggtaaattg atcaatacgg tcgctgttaa aggaccaca 1309

atggatcaga ttgtatccat gatgggtggg cgtgaactca cgcaacgttt cccacaaaa 1369

accaataccc caaaagaaac catcttaacg gtggaaaatc tgaccgcact taatcagcca 1429

tctattcaag atgttagttt tgaattacgc aaaggcgaag tgctcggcat tgcgggactg 1489

gttggggcaa aacggtaccg atattgtgga aacgatcttc ggggtgcgtg aacgtaaaac 1549

tgggtgtgatt aaactacacg ataaggaaat gaaaaaccgg aatgcgttcg aagccattaa 1609

caatggtttt gccttggtca cggaagaacg tcgctctaca gggatttatg cgaatctcag 1669

tattgagttt aactcattaa tttctaacat gaagaaatcc tatatcagca agttaggttt 1729

attgagtaac ncaaaaatga aaagcgacac gcaatggggc cattgattcc atgaatgtga 1789

aaacgccatc acaaaaccna tattggntca ntatctgggg tggtaaccaa caaaaagtgg 1849

tcattggctg ttggttatta acccaccctg aaatcttgat gttagacgaa ccaacacgtg 1909

gtatcgacat tgggtcgaaa tatgaaattt atcagctgat tatggagtta gccaaaaaag 1969

ataaagggtat catcatgatt tcatctaaag gccagagtta ttaggggtac tgaccgaatt 2029

<210> 38
<211> 166
<212> 蛋白質
<213> 敗血性巴斯德桿菌

五、發明說明 (167)

<220>
<221> misc_特徵
<222> 33
<223> Xaa=任何或未知的胺基酸

<220>
<221> misc_特徵
<222> 99
<223> Xaa=任何或未知的胺基酸

<220>
<221> misc_特徵
<222> 101
<223> Xaa=任何或未知的胺基酸

<400> 38
Leu Asn Lys Ala Gly Lys Ile Gln Tyr Val Leu Leu Lys Gly Asn Gln
1 5 10 15
Gly His Pro Asp Ala Glu Ala Arg Thr Lys Phe Val Ile Lys Glu Leu
20 25 30
Xaa Asn Lys Gly Ile Gln Asp Glu Gln Leu Phe Ile Asp Thr Gly Met
35 40 45
Trp Asp Ala Ala Leu Ala Lys Asp Lys Met Asp Ala Trp Leu Ser Ser
50 55 60
Ser Lys Ala Asn Gln Ile Glu Val Ile Ile Ala Asn Asn Asp Gly Met
65 70 75 80
Ala Met Gly Ala Leu Glu Ala Thr Lys Ala His Gly Lys Lys Leu Pro
85 90 95
Ile Phe Xaa Val Xaa Ala Leu Pro Glu Val Leu Gln Leu Ile Lys Lys
100 105 110
Gly Glu Ile Ala Gly Thr Val Leu Asn Asp Gly Val Asn Gln Gly Lys
115 120 125
Ala Val Val Gln Leu Ser Asn Asn Leu Ala Lys Gly Lys Pro Ala Thr
130 135 140
Glu Gly Thr Lys Trp Gln Leu Lys Arg Ser Cys Pro Thr Tyr Pro Leu
145 150 155 160
Cys Trp Cys Gly Cys Gly
165

<210> 39
<211> 2628
<212> DNA
<213> 敗血性巴斯德桿菌

<220>
<221> CDS
<222> (326) .. (766)

<220>
<223> mioC

<400> 39

五、發明說明 (168)

gtcaactaga gtaaaataga cacacttaat tacattgtag aggaatcctt ttatgtcttt 60
agaaatttta gatcagttag aagaaaaaat taaacaagcg gttgaaacta tccaattact 120
tcaattggaa attgatgaat taaaagaaaa aaataaccaa tctcaacaag caaatgacgc 180
attacgcagt gaaaatgaac aactaaagag tgagcaccaa aactggcaag aacgtttacg 240
ctcattatta ggcaaaattg ataacgtata attcacttct tattaaggct tagtttttct 300
aagccttatt ttttaggaga aatta atg aaa aca aaa att tgt att atc act 352
Met Lys Thr Lys Ile Cys Ile Ile Thr
1 5
ggc agt acg ctt ggt ggt gca gaa tat gtt gca gaa cat att gct gaa 400
Gly Ser Thr Leu Gly Gly Ala Glu Tyr Val Ala Glu His Ile Ala Glu
10 15 20 25
ata tta gaa caa caa gat tat cct gta cgt tta gaa cat gga cca aat 448
Ile Leu Glu Gln Gln Asp Tyr Pro Val Arg Leu Glu His Gly Pro Asn
30 35 40
ttt gaa gaa gtg atc gat gaa aaa tgt tgg ctt gtt gtc acc tct acc 496
Phe Glu Glu Val Ile Asp Glu Lys Cys Trp Leu Val Val Thr Ser Thr
45 50 55
cat ggt gca ggt gaa tta ccg gat aat att aaa cct ctg ttt gaa aaa 544
His Gly Ala Gly Glu Leu Pro Asp Asn Ile Lys Pro Leu Phe Glu Lys
60 65 70
tta gca ttt cac cca aaa cag tta gct gac tta cgc ttt gcg gtg atc 592
Leu Ala Phe His Pro Lys Gln Leu Ala Asp Leu Arg Phe Ala Val Ile
75 80 85
ggg tta ggt aat tcg gat tat gat acc ttc tgt cac gca gtg gat cat 640
Gly Leu Gly Asn Ser Asp Tyr Asp Thr Phe Cys His Ala Val Asp His
90 95 100 105
gtg gaa caa tta ctg cta agc aaa gat gct tta caa ctg tgt gaa tcg 688
Val Glu Gln Leu Leu Leu Ser Lys Asp Ala Leu Gln Leu Cys Glu Ser
110 115 120
cta aga atg gat atg cta acc att act gat cct gaa cac acg gcc gaa 736
Leu Arg Met Asp Met Leu Thr Ile Thr Asp Pro Glu His Thr Ala Glu
125 130 135
caa tgg ctc cca caa ttt ctc agt caa tta taatatttat tccctataca 786
Gln Trp Leu Pro Gln Phe Leu Ser Gln Leu
140 145
atggcatatg taaatcaa atgccatttt tcatctcgat caagcataat atttaaccaa 846
tcaaataaat attttctctg tggataacta agatcaaaac tgtataaaag ctgtttttat 906
tccctgaata agattgaatg tttttattc tgtggataac taaagaagt attcacagtt 966
ttttctggtg ccaaattgag atcttaacaa cttaaaaaat gatctaagtt attcatttaa 1026
aaaaagaaaa ggatcttaat cacagcacta taggatccta ataatacataa taataagatc 1086
tctttatata aaaagatcct atctttatta actcacgatc tttttcacga tcatcgtaca 1146
gtcttgatca aaaatgtttc tttcatggat ccataaattt cagtagaata gccaccagc 1206

五、發明說明 (169)

aaaaaggatc aaaagatcca taaaatccga gataaattaa caagggtact atgttttata 1266
 ctgaaaatta tgatgttatt gtgatcggtg gtggacacgc aggtactgaa gctgcacttg 1326
 caccggcacg catgggactc aagaccctat tattaaccca taatgttgat acactagggc 1386
 aaatgtcttg taatcctgcg attggtggga ttggtaaagg ccatttagtc cgagaaattg 1446
 atgcgatggg cggtttaatg gcaactgctg cggaccaagc aggaatccaa tttcgtacct 1506
 taaacagcag caaaggaccg gcggtacgtg ctacacgtgc gcaagctgac cgcgttttat 1566
 atcgccaagc agtacgtatt gcattagaaa atcaagaaaa tttagatatt tttcaacaag 1626
 aagtgaccga tattatttta gatcaggatc gtgtctgcgg tgttggtact aaaatgggtt 1686
 taaaatttca cgcaaaagca gtgattttaa cagccggtac tttcctttct ggtaagatcc 1746
 acattggttt agaaaattat acagggtggac gcgcgggtga tcctgcttca gtgatgttag 1806
 ccgatcgttt aagagaactg aatttacgtg tanatcgttt aaaaacgggt acaccgcccc 1866
 gtattgatgc acgtactatt gatttctcaa tactggctaa acaacatggc gatgaaaaat 1926
 tacctgtctt ttccttcacg ggatctgttg atcaacaccc acgtcaaatt ccatgtttta 1986
 ttaccatac aaatgaacaa acgcatgaag tgatccgtaa taacttacat cgcagcccaa 2046
 tgtatgctgg gatcattgaa gggatcggtc cacgttattg cccttctatt gaagataaag 2106
 taatgcgttt ttctgagcgt aattctcatc aaatctacct tgaacctgaa gggttgacaa 2166
 acaaaacaaa gaaattgctg atttacaaaa acaagtgcga gcaactgcaag cagatttaag 2226
 cgaaatggca aagaaaaacc gcaatcaagc gttgattgca ggtgggtattg gcgggtggcat 2286
 tgttgacgtc ggtattgagc tcattcgctt gcaatttggg ggctaactga tggcatttga 2346
 tgaaaaaaca cgtgcgctgg ttcgtcgcta ctatgtatct gagtttttat cgcttgagca 2406
 atcagcaagt aaagctaaag tctcatctaa caccgcgcga cgctggaaga aagaggcggc 2466
 aagcaagggc gatgactggg ataaagtgcg tgatgtacaa gtaatggcgg gcaatgagct 2526
 gactgatatc acaaaaggat tggtatcggg ctttattatt caatatcgcg caaccatgga 2586
 tgagattcaa aactcggatt taaaagcaca agataaagtc ga 2628

<210> 40
 <211> 147
 <212> 蛋白質
 <213> 敗血性巴斯德桿菌

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

五、發明說明 (170)

Lys Cys Trp Leu Val Val Thr Ser Thr His Gly Ala Gly Glu Leu Pro
50 55 60

Asp Asn Ile Lys Pro Leu Phe Glu Lys Leu Ala Phe His Pro Lys Gln
65 70 75 80

Leu Ala Asp Leu Arg Phe Ala Val Ile Gly Leu Gly Asn Ser Asp Tyr
85 90 95

Asp Thr Phe Cys His Ala Val Asp His Val Glu Gln Leu Leu Leu Ser
100 105 110

Lys Asp Ala Leu Gln Leu Cys Glu Ser Leu Arg Met Asp Met Leu Thr
115 120 125

Ile Thr Asp Pro Glu His Thr Ala Glu Gln Trp Leu Pro Gln Phe Leu
130 135 140

Ser Gln Leu
145

<210> 41
<211> 5191
<212> DNA
<213> 敗血性巴斯德桿菌

<220>
<221> CDS
<222> (3203)..(4255)

<220>
<223> mreB

<400> 41
ctgcagtagc aaccacccaa atgttggtgt tctgctgtaa ttcacgcaaa gtgcgcgcga 60
ggttgggttac acggattaat ggcacgactt cagcggcacc acaagctact ttacgtgcga 120
tagcgggttaa ttgggcagat ttatcttttg gtactatcac agcacacacg cccgctgcat 180
ccgcagtagc caaacaagca cctaagttat gtggatcagt cacaccatct aacactaata 240
gcaacggatt ggactgattt tgtaaaagcg tatctaaatc tgcttcattc aattctttcg 300
ctggctgaac acgtgccatg atgccttggt gtacttcgcc ctctgctttt ttatcaaggg 360
tttggcgatt aacaaattgg atagtaatac ccaaccgatg aagttcattg agcaaagggt 420
gtaaacgttt atcgtcgcgc cctttgagtg cataaacttc aattaaacgc tctggcgcgt 480
tgtttaaaaa ggcacttact gcatgaatgc cataaatatt ttcactcatc tactttctct 540
ttttagctga tttcttactg gcttttttcg tgggtgttga tgggttaaca acgcttggtt 600
ttcttaccgc acttttactg gtgcttggtt tacgtttatg gcgttggttt tcgagacttt 660
cagcgtagcg tgcatttttc ttgagcttgt ctttggtgtt ttgccttct cgtaatgggt 720
tacgctcact cgacactaaa gaaaaatcca cttggcggtt ttcaaggcta actgcttcca 780
cacggatttt taccttatcg ccaatgcggt agatcatacc actattttca ccgattaaac 840

五、發明說明 (171)

gttgctcgagc gagatcaaat tggtagtagt cgttatctaa ggtagaaatg tggactaagc 900
catcaataaa gaggtcatct aagcggacaa ataagccaaa acctgtcaca gatgaaatca 960
cacctgtaaa ttcttcgcct acatgatctt gcataatatt gcatttttagc cagtctgcaa 1020
catcacgagt ggcacatcg gcccgtcggt ctgtcatgga gcagtggctg cctaatacat 1080
ccatgtcatc aagtgtatag tgataccctc ccgtatcagt ggttctccgt ttcgagcctt 1140
ttagtttggc taacaagtat ttaatcccac gatgcaaagt caaatcagga taacggcgaa 1200
ttggcgaagt aaaatgcgca tattcttcga gtgcaagccc aaagtgccca atattgtcag 1260
gatgataaac ggcttgactt aacgaacgta atacatgggt tgcaataact catgatctgg 1320
acgttcgca atttgctcca ataatttagc gtagtctgcg gtacttgggt tactgccacc 1380
ttcaaggctt aaaccacatt cactgaggaa ttggcggaag cccgtcactt tttcttcgct 1440
tggaccgca tgaatacga aaagggctgg ctcttgatgt tttccataa agtttgccgc 1500
cgcaatattg gcgaggatca tacattcttc aatgatttta tgcgcatcat tacgaataac 1560
aggctcaatc cgttcgattc gccccatttc attaaacaca aacttacttt caatggtttc 1620
aaagtcaatg gcgccacgtt gatgacgggc ttccactaag gcttgggtaca ttacatggag 1680
ttctttttaa tggggaacca gtgcttgata acgagtacaa agttcttcat cgtcctctaa 1740
aatacagca accttggtat aggttaagcg agcatgagag ttcatgaccg cttcataaaa 1800
ttcatagcct gtgattttac ctttgctga aacattcagc tcacagacca tacataagcg 1860
atcgacttgt gggtttaatg aacaaagtcc attggagagg atttccggta gcataggaac 1920
aacgcgattt gggaaatata ccgagtttcc acgcgcatgt gcttcggtat caagggcagt 1980
acgtaaacga acatagtagc tgacatcggc aatggcaacc cacagtttcc aaccgcctcc 2040
acgttttttc tggcaaaaaa ccgcatcgtc aaaatcgca gcatcttcac catcaatggt 2100
gactaacgga agatggcgta aatcaatacg tcctgatttg gcttcttccg gtacttcttc 2160
actcagttta gaaacttggt tgaggaccgc gtctggaaaa acatggggaa tatcatgatt 2220
acggatagca atttccacct ccattccctt tgccatattt tcaccgagaa tttcgctaat 2280
cattccaaca ggttggttaa atgttgcggt acgtggtttt aattcaacta caaccacttg 2340
tcccatacga gcgccttggc ggtgttcatt cggaattaaa atgtcgcgat taattcgact 2400
atcgtcaggt actacataac caataccatc ttctaagaaa aaacgaccaa caatctgttt 2460
tttacgctgt tgtaagacgc ggacaatccg cacttcttgg cgaccacgac ggtcaaaacc 2520
gctaggttgg gcgaggacat agtcaccgtg cattactcgc tgcatttggc tgttgggtat 2580
aaaccaatcg ctgtctttac cttcgacttg taaaaacca taaccatcac gatgacctaa 2640
tacggctcct ttaataaat ccagtttttc cggtaaagcg tagcgtttac gtttagtgaa 2700
aaccaattgt ccgtcatttt ccacgctct taagcgacgg cgcattggctt ctcgttgctc 2760

五、發明說明 (172)

ttcattttga atagcaaagtg tggtcagtaa ttcttctttt gagatagggtg cattatgttg	2820
acgaattgta tcaagaataa attcgcgact tgggatcggg ttctcatatt ttgcgagttc	2880
ttcttgatag ttctggatctt gcaaagtgtg attgtttttg atttttgccca taatgactcc	2940
ctttgagaat ggaaatacgc attcgtttta tgacctcaag tttgacactc tgatttggtg	3000
aaagcaagta aaaaacctgt tcgtgactga aacaatctgt actcgcggga tttgtcgtgc	3060
atgaaagcgt aaagacaaag caaatttcga caatttacag aaaattctct gttataaagg	3120
tacatttttt gatacattta gcacaatttt tcaataactca aatcagagtgc tccattattt	3180
aatttagttc agcggaattc tt atg tta ttt aaa aaa att cga ggc tta ttt	3232
Met Leu Phe Lys Lys Ile Arg Gly Leu Phe	
1 5 10	
tca aat gat ctg tcc atc gat ctt ggc aca gcg aat acc tta att tat	3280
Ser Asn Asp Leu Ser Ile Asp Leu Gly Thr Ala Asn Thr Leu Ile Tyr	
15 20 25	
gtc aaa gga caa ggg att gtt tta gat gaa cct tct gtt gtg gcg att	3328
Val Lys Gly Gln Gly Ile Val Leu Asp Glu Pro Ser Val Val Ala Ile	
30 35 40	
cgc caa gaa cgt tca ggt gca tta aaa agc att gct gcg gtt ggt cgt	3376
Arg Gln Glu Arg Ser Gly Ala Leu Lys Ser Ile Ala Ala Val Gly Arg	
45 50 55	
gat gcc aaa tta atg tta ggc cgt aca ccg aaa agc att gca gcg att	3424
Asp Ala Lys Leu Met Leu Gly Arg Thr Pro Lys Ser Ile Ala Ala Ile	
60 65 70	
cgt cct atg aaa gat ggg gtg atc gca gat ttc ttt gtg aca gaa aaa	3472
Arg Pro Met Lys Asp Gly Val Ile Ala Asp Phe Phe Val Thr Glu Lys	
75 80 85 90	
atg ttg caa tat ttt att aaa caa gtg cac agc agc aat ttt atg cgt	3520
Met Leu Gln Tyr Phe Ile Lys Gln Val His Ser Ser Asn Phe Met Arg	
95 100 105	
cca agt cca cgt gtc tta gtt tgt gta cct gcg gga gct acg caa gtc	3568
Pro Ser Pro Arg Val Leu Val Cys Val Pro Ala Gly Ala Thr Gln Val	
110 115 120	
gaa cga cgt gca atc aaa gaa tct gcc att ggt gct ggg gca cgc gag	3616
Glu Arg Arg Ala Ile Lys Glu Ser Ala Ile Gly Ala Gly Ala Arg Glu	
125 130 135	
gtg tac ttg att gag gaa ccg atg gcg gca gcg att ggt gct aaa tta	3664
Val Tyr Leu Ile Glu Glu Pro Met Ala Ala Ala Ile Gly Ala Lys Leu	
140 145 150	
cct gtt tcg act gcc aca ggt tcg atg gtg atc gat atc ggt ggt ggt	3712
Pro Val Ser Thr Ala Thr Gly Ser Met Val Ile Asp Ile Gly Gly Gly	
155 160 165 170	
acg acg gaa gtt gcg gtg att tct tta aat ggc att gtg tat tcc tct	3760
Thr Thr Glu Val Ala Val Ile Ser Leu Asn Gly Ile Val Tyr Ser Ser	
175 180 185	
tca gtc cgc att ggt ggt gat cgt ttt gat gag gcg att att tct tat	3808

五、發明說明 (173)

Ser Val Arg	Ile Gly Gly Asp Arg Phe Asp Glu Ala Ile Ile Ser Tyr	
	190 200	
gta cgc aag acg ttc ggt tca att att ggg gaa ccg aca gca gag cgt	3856	
Val Arg Lys Thr Phe Gly Ser Ile Ile Gly Glu Pro Thr Ala Glu Arg		
	205 210 215	
atc aaa caa gag att ggt agt gcg ttt att caa gaa ggc gat gaa gtc	3904	
Ile Lys Gln Glu Ile Gly Ser Ala Phe Ile Gln Glu Gly Asp Glu Val		
	220 225 230	
cgt gaa att gaa gtg cat ggt cat aac tta gca gaa ggt gcg ccg cgt	3952	
Arg Glu Ile Glu Val His Gly His Asn Leu Ala Glu Gly Ala Pro Arg		
	235 240 245 250	
tct ttc aaa ctc acc tca cgt gat gtg tta gaa gct att caa gcc ccg	4000	
Ser Phe Lys Leu Thr Ser Arg Asp Val Leu Glu Ala Ile Gln Ala Pro		
	255 260 265	
tta aat ggc att gtt gcg gca gtg cgc acg gcc ttg gaa gag tgt caa	4048	
Leu Asn Gly Ile Val Ala Ala Val Arg Thr Ala Leu Glu Cys Gln		
	270 275 280	
cca gaa cat gct gcg gat att ttt gaa cgt ggc atg gtc tta act ggt	4096	
Pro Glu His Ala Ala Asp Ile Phe Glu Arg Gly Met Val Leu Thr Gly		
	285 290 295	
ggc ggt gcc ctt att cgt aat att gat gtt tta ctg tca aaa gaa acc	4144	
Gly Gly Ala Leu Ile Arg Asn Ile Asp Val Leu Leu Ser Lys Glu Thr		
	300 305 310	
ggc ggt gcc ctt att cgt aat att gat gtt tta ctg tca aaa gaa acc	4192	
Gly Val Pro Val Ile Ile Ala Asp Asp Pro Leu Thr Cys Val Ala Arg		
	315 320 325 330	
ggc ggt gcc ctt att cgt aat att gat gtt tta ctg tca aaa gaa acc	4240	
Gly Gly Gly Glu Ala Leu Glu Met Ile Asp Met His Gly Gly Asp Ile		
	335 340 345	
ttt agt gac gat atc taatatgatt taaaagtgcg gtgatattag accgcacttt	4295	
Phe Ser Asp Asp Ile		
	350	
tactttctctt ttattgctga caaggctagc ctaattcgta tatgaaacct atttttggaa	4355	
aagcacctcc tttaggtctt cgcttaattc tggcgatttt agcatccatt gcattgattg	4415	
tttcggacgg tcaatccaat gcgatgatta aagcacgcag tattatggaa accgcagtag	4475	
gcgggctgta ttatcttgcc aatacaccga gaacgggtatt ggatgggggtt tcagataatt	4535	
tggttgatac caataaattg caaattgaaa accgagtttt gcgtgatcaa ctgcgtgaaa	4595	
aaaatgcaga ttattgttg ttagatcaac tcaaagtaga aaatcaacgc ctgcgttat	4655	
tgcttaattc ccctctacgt acagatgagt ataaaaaat tgctgaagtt ttaacggcag	4715	
aaactgatgt gtatcgtaag caagtcgtga ttaaccaagg acaacgtgac ggtgcttatg	4775	
tcgggcagcc gattattgat gaaaagggtta ttgctgggca acttatctcc gttggtgaaa	4835	
atacgagtcg cgctcttcta ttgacagatg tgactcatcc tattccagta caagtactac	4895	

五、發明說明 (174)

gtaatgatgt cegtttgatt gctagtggaa caggacggaa tgatgaactg agtttagatc 4955
atgtgccgcg ttcggtcgat attgtcaaag gggatttatt agtcacttct ggattaggtg 5015
ggcgttttttt agaaggttat cctggttgcca ttgtggaatc cgtatcacgt gatgggcaaa 5075
attatttttgc tactgtaaca gcaaagccat tagcttcgat tgaacgttta cgctatgttt 5135
tgctttttatg gccgacgaat gaagagatgc gcaaagtcca gtctattttca cctgca 5191

<210> 42
<211> 351
<212> 蛋白質
<213> 敗血性巴斯德桿菌

<400> 42
Met Leu Phe Lys Lys Ile Arg Gly Leu Phe Ser Asn Asp Leu Ser Ile
1 5 10 15
Asp Leu Gly Thr Ala Asn Thr Leu Ile Tyr Val Lys Gly Gln Gly Ile
20 25 30
Val Leu Asp Glu Pro Ser Val Val Ala Ile Arg Gln Glu Arg Ser Gly
35 40 45
Ala Leu Lys Ser Ile Ala Ala Val Gly Arg Asp Ala Lys Leu Met Leu
50 55 60
Gly Arg Thr Pro Lys Ser Ile Ala Ala Ile Arg Pro Met Lys Asp Gly
65 70 75 80
Val Ile Ala Asp Phe Phe Val Thr Glu Lys Met Leu Gln Tyr Phe Ile
85 90 95
Lys Gln Val His Ser Ser Asn Phe Met Arg Pro Ser Pro Arg Val Leu
100 105 110
Val Cys Val Pro Ala Gly Ala Thr Gln Val Glu Arg Arg Ala Ile Lys
115 120 125
Glu Ser Ala Ile Gly Ala Gly Ala Arg Glu Val Tyr Leu Ile Glu Glu
130 135 140
Pro Met Ala Ala Ala Ile Gly Ala Lys Leu Pro Val Ser Thr Ala Thr
145 150 155 160
Gly Ser Met Val Ile Asp Ile Gly Gly Gly Thr Thr Glu Val Ala Val
165 170 175
Ile Ser Leu Asn Gly Ile Val Tyr Ser Ser Ser Val Arg Ile Gly Gly
180 185 190
Asp Arg Phe Asp Glu Ala Ile Ile Ser Tyr Val Arg Lys Thr Phe Gly
195 200 205
Ser Ile Ile Gly Glu Pro Thr Ala Glu Arg Ile Lys Gln Glu Ile Gly
210 215 220
Ser Ala Phe Ile Gln Glu Gly Asp Glu Val Arg Glu Ile Glu Val His
225 230 235 240
Gly His Asn Leu Ala Glu Glv Ala Pro Arg Ser Phe Lys Leu Thr Ser

五、發明說明 (175)

	245	250	255
Arg Asp Val	Leu Glu Ala Ile Gln Ala	Pro Leu Asn Gly	Ile Val Ala
	260	265	270
Ala Val Arg	Thr Ala Leu Glu Glu Cys Gln Pro	Glu His Ala Ala	Asp
	275	280	285
Ile Phe Glu	Arg Gly Met Val Leu Thr Gly Gly	Gly Ala Leu Ile	Arg
	290	295	300
Asn Ile Asp	Val Leu Leu Ser Lys Glu Thr Gly	Val Pro Val Ile	Ile
	305	310	315
Ala Asp Asp	Pro Leu Thr Cys Val Ala Arg Gly	Gly Gly Glu Ala Leu	
	325	330	335
Glu Met Ile	Asp Met His Gly Gly Asp Ile Phe Ser	Asp Asp Ile	
	340	345	350

<210> 43
 <211> 2172
 <212> DNA
 <213> 敗血性巴斯德桿菌

<220>
 <221> CDS
 <222> (1) .. (1464)

<220>
 <223> pnp

<400> 43	
acc cgc gtt ggg att ggg tgg cac ctg aac cca aat acc gcg tta att	48
Thr Arg Val Gly Ile Gly Trp His Leu Asn Pro Asn Thr Ala Leu Ile	
1 5 10 15	
gaa aaa gtg aaa gcg att gca gaa gcg cgt tta ggc gaa gca tac cgt	96
Glu Lys Val Lys Ala Ile Ala Glu Ala Arg Leu Gly Glu Ala Tyr Arg	
20 25 30	
atc act gaa aac aag cac gtt atg aac aaa att gat gcg att aaa gct	144
Ile Thr Glu Asn Lys His Val Met Asn Lys Ile Asp Ala Ile Lys Ala	
35 40 45	
gat gtg att gca caa atc aca gct gaa gta gca gaa ggc gaa gac atc	192
Asp Val Ile Ala Gln Ile Thr Ala Glu Val Ala Glu Gly Glu Asp Ile	
50 55 60	
agt gaa ggg aaa att gtc gat att ttc acc gca ctt gaa agc caa atc	240
Ser Glu Gly Lys Ile Val Asp Ile Phe Thr Ala Leu Glu Ser Gln Ile	
65 70 75 80	
gta cgt agc cgt atc att gct ggt gaa cca cgt att gat ggt cgt aca	288
Val Arg Ser Arg Ile Ile Ala Gly Glu Pro Arg Ile Asp Gly Arg Thr	
85 90 95	
gtg gat act gtt cgt gca tta gat att tgt act ggt gtt tta cca cgt	336
Val Asp Thr Val Arg Ala Leu Asp Ile Cys Thr Gly Val Leu Pro Arg	
100 105 110	
aca cac ggt tct gcg att ttc acc cgt ggt gaa aca cag gcc tta act	384

裝
訂
線

五、發明說明 (176)

Thr	His	Gly	Ser	Ala	Ile	Phe	Thr	Arg	Gly	Glu	Thr	Gln	Ala	Leu	Ala	
		115					120					125				
gtc	gcg	aca	tta	ggg	aca	gaa	cgt	qat	gca	caa	att	att	gat	gaa	tta	432
Val	Ala	Thr	Leu	Gly	Thr	Glu	Arg	Asp	Ala	Gln	Ile	Ile	Asp	Glu	Leu	
		130					135				140					
aca	ggg	gag	cgt	tca	gat	cac	ttc	tta	ttc	cac	tac	aac	ttc	ccg	gca	480
Thr	Gly	Glu	Arg	Ser	Asp	His	Phe	Leu	Phe	His	Tyr	Asn	Phe	Pro	Pro	
		145				150				155					160	
tat	tct	gtg	ggg	gaa	acc	ggg	atg	att	ggg	tca	cca	aaa	cgt	cgt	gaa	528
Tyr	Ser	Val	Gly	Glu	Thr	Gly	Met	Ile	Gly	Ser	Pro	Lys	Arg	Arg	Glu	
				165					170					175		
att	ggg	cat	ggg	cgt	tta	gcg	aaa	cgc	ggg	gta	gct	gca	gtg	atg	cca	576
Ile	Gly	His	Gly	Arg	Leu	Ala	Lys	Arg	Gly	Val	Ala	Ala	Val	Met	Pro	
			180					185					190			
aca	ctt	gcc	gag	ttc	ccg	tat	gtg	gta	cgt	gtt	gtc	tct	gaa	atc	aca	624
Thr	Leu	Ala	Glu	Phe	Pro	Tyr	Val	Val	Arg	Val	Val	Ser	Glu	Ile	Thr	
		195					200					205				
gaa	tca	aat	ggg	tct	tct	tct	atg	gca	tcg	gtt	tgt	ggg	gcg	tct	tta	672
Glu	Ser	Asn	Gly	Ser	Ser	Ser	Met	Ala	Ser	Val	Cys	Gly	Ala	Ser	Leu	
		210					215				220					
gca	tta	atg	gat	gcg	ggg	gta	cca	att	aaa	gcg	gcg	gtt	gca	ggg	att	720
Ala	Leu	Met	Asp	Ala	Gly	Val	Pro	Ile	Lys	Ala	Ala	Val	Ala	Gly	Ile	
		225			230				235					240		
gca	atg	ggc	tta	gtc	aaa	gaa	gac	gaa	aaa	ttt	gtg	gtg	ctt	tca	gac	768
Ala	Met	Gly	Leu	Val	Lys	Glu	Asp	Glu	Lys	Phe	Val	Val	Leu	Ser	Asp	
				245					250					255		
atc	tta	ggg	gat	gaa	gat	cac	tta	ggg	gac	atg	gac	ttc	aaa	gtc	gcg	816
Ile	Leu	Gly	Asp	Glu	Asp	His	Leu	Gly	Asp	Met	Asp	Phe	Lys	Val	Ala	
			260					265					270			
ggg	aca	cgt	acg	ggg	gtg	acg	gca	tta	caa	atg	gat	atc	aaa	atc	gaa	864
Gly	Thr	Arg	Thr	Gly	Val	Thr	Ala	Leu	Gln	Met	Asp	Ile	Lys	Ile	Glu	
		275					280					285				
ggg	atc	aca	gca	gaa	atc	atg	caa	att	gcg	tta	aac	caa	gcg	aaa	agc	912
Gly	Ile	Thr	Ala	Glu	Ile	Met	Gln	Ile	Ala	Leu	Asn	Gln	Ala	Lys	Ser	
		290				295					300					
gca	cgt	tta	cac	att	tta	ggg	gtg	atg	gag	caa	gcg	atc	cca	gcg	cca	960
Ala	Arg	Leu	His	Ile	Leu	Gly	Val	Met	Glu	Gln	Ala	Ile	Pro	Ala	Pro	
		305			310				315					320		
cgt	gcg	gat	att	tct	gat	ttt	gca	ccg	cgt	att	tac	act	atg	aaa	att	1008
Arg	Ala	Asp	Ile	Ser	Asp	Phe	Ala	Pro	Arg	Ile	Tyr	Thr	Met	Lys	Ile	
				325					330					335		
gat	ccg	aag	aaa	atc	aaa	gat	gtg	atc	ggg	aaa	ggg	ggg	gca	acc	att	1056
Asp	Pro	Lys	Lys	Ile	Lys	Asp	Val	Ile	Gly	Lys	Gly	Gly	Ala	Thr	Ile	
			340				345						350			
cgt	gcc	tta	aca	gaa	gaa	aca	ggg	acc	tca	att	gat	atc	gat	gat	gat	1104
Arg	Ala	Leu	Thr	Glu	Glu	Thr	Gly	Thr	Ser	Ile	Asp	Ile	Asp	Asp	Asp	
		355					360					365				

五、發明說明 (177)

ggt acg gtg aag att gct gcg gtt gat ggc aat tca gca aaa gag gtg 1152
Gly Thr Val Lys Ile Ala Ala Val Asp Gly Asn Ser Ala Lys Glu Val
370 375 380

atg gcg cgt att gaa gat att act gca gaa gtt gaa gcg ggt gca gtg 1200
Met Ala Arg Ile Glu Asp Ile Thr Ala Glu Val Glu Ala Gly Ala Val
385 390 395 400

tat aaa ggt aaa gtt act cgt tta gct gat ttt ggt gcc ttc gtt tct 1248
Tyr Lys Gly Lys Val Thr Arg Leu Ala Asp Phe Gly Ala Phe Val Ser
405 410 415

atc gta ggt aac aaa gaa ggc tta gtg cat att tct caa atc gcg gaa 1296
Ile Val Gly Asn Lys Glu Gly Leu Val His Ile Ser Gln Ile Ala Glu
420 425 430

gag cgt gtt gag aaa gtg agt gat tat ctt gca gtg ggg caa gaa gtg 1344
Glu Arg Val Glu Lys Val Ser Asp Tyr Leu Ala Val Gly Gln Glu Val
435 440 445

act gtt aaa gtg gtt gag att gat cgt caa ggt cgt att cgt tta acc 1392
Thr Val Lys Val Val Glu Ile Asp Arg Gln Gly Arg Ile Arg Leu Thr
450 455 460

atg aaa gaa gtt gca cca aag caa gaa cac gtt gat tct gtt gtc gca 1440
Met Lys Glu Val Ala Pro Lys Gln Glu His Val Asp Ser Val Val Ala
465 470 475 480

gac gtt gcc gca gaa gaa aac gca taagcaataa acaccaacgc ccttcgtgat 1494
Asp Val Ala Ala Glu Asn Ala
485

aaagggcggtt ggtgtgcatg ttgataagta caatttgtgc ttttaaggcga agcgaaatga 1554

agcaatttca tccgtgggta aagtgcctgc taattttccc attttgggta tgttgtttta 1614

cagcttgtgt taatcatgaa caagttttcc tttcaaaaga gaaattaatg ttagcagagc 1674

aacatccgaa tgatcatctt gagcatgagg tgatgggtgc gcaaattagc gaattgttac 1734

ttgttaaagg gttaaaaaaa gaagaacgtg cgattttaca ttttgagcga ggcgtgctgt 1794

acgatagctt aggattgtgg gcattggcgc gttatgattt tgaccaaaca ttagcgttgt 1854

atccaaagtt ggcagcagcg ttttaattatt taggtttata tttattgtta gaggaagatt 1914

acagcgcatt tctagatatc tttaatgtgt tgcttgaact tgatcctcaa tatgagtatg 1974

cattcctaaa tagagggcta aatttttatt acgtcggacg ttatgaatta gctcagcggg 2034

attttcttca attttatcaa gccgataaat cagatccata ccgcacttta tggctttatt 2094

taaatgaatt aaagcataat cctcaggatg cttctaaaaa tcttgctcaa cgagcaatgg 2154

ggctttctga tgaatatt 2172

<210> 44
<211> 488
<212> 蛋白質
<213> 敗血性巴斯德桿菌

<400> 44

五、發明說明 (178)

Thr Arg Val Gly Ile Gly Trp His Leu Asn Pro Asn Thr Ala Leu Ile
1 5 10 15

Glu Lys Val Lys Ala Ile Ala Glu Ala Arg Leu Gly Glu Ala Tyr Arg
20 25 30

Ile Thr Glu Asn Lys His Val Met Asn Lys Ile Asp Ala Ile Lys Ala
35 40 45

Asp Val Ile Ala Gln Ile Thr Ala Glu Val Ala Glu Gly Glu Asp Ile
50 55 60

Ser Glu Gly Lys Ile Val Asp Ile Phe Thr Ala Leu Glu Ser Gln Ile
65 70 75 80

Val Arg Ser Arg Ile Ile Ala Gly Glu Pro Arg Ile Asp Gly Arg Thr
85 90 95

Val Asp Thr Val Arg Ala Leu Asp Ile Cys Thr Gly Val Leu Pro Arg
100 105 110

Thr His Gly Ser Ala Ile Phe Thr Arg Gly Glu Thr Gln Ala Leu Ala
115 120 125

Val Ala Thr Leu Gly Thr Glu Arg Asp Ala Gln Ile Ile Asp Glu Leu
130 135 140

Thr Gly Glu Arg Ser Asp His Phe Leu Phe His Tyr Asn Phe Pro Pro
145 150 155 160

Tyr Ser Val Gly Glu Thr Gly Met Ile Gly Ser Pro Lys Arg Arg Glu
165 170 175

Ile Gly His Gly Arg Leu Ala Lys Arg Gly Val Ala Ala Val Met Pro
180 185 190

Thr Leu Ala Glu Phe Pro Tyr Val Val Arg Val Val Ser Glu Ile Thr
195 200 205

Glu Ser Asn Gly Ser Ser Ser Met Ala Ser Val Cys Gly Ala Ser Leu
210 215 220

Ala Leu Met Asp Ala Gly Val Pro Ile Lys Ala Ala Val Ala Gly Ile
225 230 235 240

Ala Met Gly Leu Val Lys Glu Asp Glu Lys Phe Val Val Leu Ser Asp
245 250 255

Ile Leu Gly Asp Glu Asp His Leu Gly Asp Met Asp Phe Lys Val Ala
260 265 270

Gly Thr Arg Thr Gly Val Thr Ala Leu Gln Met Asp Ile Lys Ile Glu
275 280 285

Gly Ile Thr Ala Glu Ile Met Gln Ile Ala Leu Asn Gln Ala Lys Ser
290 295 300

Ala Arg Leu His Ile Leu Gly Val Met Glu Gln Ala Ile Pro Ala Pro
305 310 315 320

Arg Ala Asp Ile Ser Asp Phe Ala Pro Arg Ile Tyr Thr Met Lys Ile
325 330 335

五、發明說明 (179)

Asp Pro Lys Lys Ile Lys Asp Val Ile Gly Lys Gly Gly Ala Thr Ile
340 345 350

Arg Ala Leu Thr Glu Glu Thr Gly Thr Ser Ile Asp Ile Asp Asp Asp
355 360 365

Gly Thr Val Lys Ile Ala Ala Val Asp Gly Asn Ser Ala Lys Glu Val
370 375 380

Met Ala Arg Ile Glu Asp Ile Thr Ala Glu Val Glu Ala Gly Ala Val
385 390 395 400

Tyr Lys Gly Lys Val Thr Arg Leu Ala Asp Phe Gly Ala Phe Val Ser
405 410 415

Ile Val Gly Asn Lys Glu Gly Leu Val His Ile Ser Gln Ile Ala Glu
420 425 430

Glu Arg Val Glu Lys Val Ser Asp Tyr Leu Ala Val Gly Gln Glu Val
435 440 445

Thr Val Lys Val Val Glu Ile Asp Arg Gln Gly Arg Ile Arg Leu Thr
450 455 460

Met Lys Glu Val Ala Pro Lys Gln Glu His Val Asp Ser Val Val Ala
465 470 475 480

Asp Val Ala Ala Glu Glu Asn Ala
485

<210> 45

<211> 633

<212> DNA

<213> 敗血性巴斯德桿菌

<220>

<221> CDS

<222> (2) .. (631)

<220>

<223> purF

<400> 45

c gat ggg gtt tct gtt tat gct gcc cgt gtt cat atg gga caa cgt tta 49
Asp Gly Val Ser Val Tyr Ala Ala Arg Val His Met Gly Gln Arg Leu
1 5 10 15

ggt gaa aaa att gca cgg gaa tgg gcg gat gtg gat gat att gat gtg 97
Gly Glu Lys Ile Ala Arg Glu Trp Ala Asp Val Asp Asp Ile Asp Val
20 25 30

gtc att cct gtg cct gaa acc tct aac gat att gct tta cgt att gcg 145
Val Ile Pro Val Pro Glu Thr Ser Asn Asp Ile Ala Leu Arg Ile Ala
35 40 45

cgc gtg tta aat aaa ccg tat cgt caa ggt ttt gtg aaa aat cgc tat 193
Arg Val Leu Asn Lys Pro Tyr Arg Gln Gly Phe Val Lys Asn Arg Tyr
50 55 60

gta gga cgt acg ttt att atg ccg ggg cag gca ttg cga gtc agt tct 241
Val Gly Arg Thr Phe Ile Met Pro Gly Gln Ala Leu Arg Val Ser Ser
65 70 75 80

五、發明說明 (180)

gtt aga cgt aaa ctc aat acc att gct tca gaa ttt aaa gat aag aat	289
Val Arg Arg Lys Leu Asn Thr Ile Ala Ser Glu Phe Lys Asp Lys Asn	
85 90 95	
gtg tta tta gtt gac gac tcg att gta cgt ggt acc acg tct gaa caa	337
Val Leu Leu Val Asp Asp Ser Ile Val Arg Gly Thr Thr Ser Glu Gln	
100 105 110	
att gtc gaa atg gcg aga gcg gca ggt gcg aag aaa att tat ttt gcc	385
Ile Val Glu Met Ala Arg Ala Ala Gly Ala Lys Lys Ile Tyr Phe Ala	
115 120 125	
tct gct gca cca gaa att cgt tat cca aat gtg tat ggt att gat atg	433
Ser Ala Ala Pro Glu Ile Arg Tyr Pro Asn Val Tyr Gly Ile Asp Met	
130 135 140	
cca acc aaa aat gaa ttg atc gct tat ggt cgt gat gta gat gaa att	481
Pro Thr Lys Asn Glu Leu Ile Ala Tyr Gly Arg Asp Val Asp Glu Ile	
145 150 155 160	
gct aac tta att ggt gtg gat aaa ttg att ttc caa gat ttg gat gcg	529
Ala Asn Leu Ile Gly Val Asp Lys Leu Ile Phe Gln Asp Leu Asp Ala	
165 170 175	
tta act ggt tct gtg caa caa gaa aat cca agt att caa gac ttt gat	577
Leu Thr Gly Ser Val Gln Gln Glu Asn Pro Ser Ile Gln Asp Phe Asp	
180 185 190	
tgt tcg gtg ttt aca ggg gtt tat gtg acg ggc gat att aca cct gaa	625
Cys Ser Val Phe Thr Gly Val Tyr Val Thr Gly Asp Ile Thr Pro Glu	
195 200 205	
tat ctg ga	633
Tyr Leu	
210	

<210> 46

<211> 210

<212> 蛋白質

<213> 敗血性巴斯德桿菌

<400> 46

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

五、發明說明 (181)

Ile Val Glu Met Ala Arg Ala Ala Gly Ala Lys Lys Ile Tyr Phe Ala
115 120 125

Ser Ala Ala Pro Glu Ile Arg Tyr Pro Asn Val Tyr Gly Ile Asp Met
130 135 140

Pro Thr Lys Asn Glu Leu Ile Ala Tyr Gly Arg Asp Val Asp Glu Ile
145 150 155 160

Ala Asn Leu Ile Gly Val Asp Lys Leu Ile Phe Gln Asp Leu Asp Ala
165 170 175

Leu Thr Gly Ser Val Gln Gln Glu Asn Pro Ser Ile Gln Asp Phe Asp
180 185 190

Cys Ser Val Phe Thr Gly Val Tyr Val Thr Gly Asp Ile Thr Pro Glu
195 200 205

Tyr Leu
210

<210> 47
<211> 4788
<212> DNA
<213> 敗血性巴斯德桿菌

<220>
<221> CDS
<222> (1) .. (876)

<220>
<223> rci

<220>
<223> 在位置3084處的核苷酸是A、T、G或C

<400> 47
gac gag gag aga aaa tta gct gat ttg gca aaa ggt atc gct cca gat 48
Asp Glu Glu Arg Lys Leu Ala Asp Leu Ala Lys Gly Ile Ala Pro Asp
1 5 10 15

att att ttt aga gat gta ata gaa cgc tat caa aat gaa gtg tct ata 96
Ile Ile Phe Arg Asp Val Ile Glu Arg Tyr Gln Asn Glu Val Ser Ile
20 25 30

act aaa aaa ggc gcg cga aat gaa att ata aga tta aac cgc ttt tta 144
Thr Lys Lys Gly Ala Arg Asn Glu Ile Ile Arg Leu Asn Arg Phe Leu
35 40 45

aga tat gat att tct aat ctg tat att cgt gat tta aga aaa gaa gat 192
Arg Tyr Asp Ile Ser Asn Leu Tyr Ile Arg Asp Leu Arg Lys Glu Asp
50 55 60

ttt gag gag tgg atc aga att cgc cta acc gaa gta tcg gat gct agc 240
Phe Glu Glu Trp Ile Arg Ile Arg Leu Thr Glu Val Ser Asp Ala Ser
65 70 75 80

gtt aga cgt gag ctt gtt act ata tcg tca gtg ctg aca aca gca ata 288
Val Arg Arg Glu Leu Val Thr Ile Ser Ser Val Leu Thr Thr Ala Ile
85 90 95

aat aag tgg gga tat att tca agg cat cca atg act ggt att gaa aaa 336

五、發明說明 (182)

Asn Lys Trp Gly Tyr Ile Ser Arg His Pro Met Thr Gly Ile Glu Lys	
100 105 110	
cca aaa aac tcg gca gaa aga aaa gaa cga tat tca gaa cag gac att	384
Pro Lys Asn Ser Ala Glu Arg Lys Glu Arg Tyr Ser Glu Gln Asp Ile	
115 120 125	
aaa aca ata tta gaa aca gct aga tat tgt gaa gat aaa cta ccc ata	432
Lys Thr Ile Leu Glu Thr Ala Arg Tyr Cys Glu Asp Lys Leu Pro Ile	
130 135 140	
aca ctc aaa caa aga gta gca att gca atg tta ttt gct att gaa acc	480
Thr Leu Lys Gln Arg Val Ala Ile Ala Met Leu Phe Ala Ile Glu Thr	
145 150 155 160	
gct atg cgt gct ggt gag att gct agt ata aaa tgg gat aat gtt ttt	528
Ala Met Arg Ala Gly Glu Ile Ala Ser Ile Lys Trp Asp Asn Val Phe	
165 170 175	
ctt gaa aag aga ata gta cat tta ccg aca act aaa aac ggg cac tct	576
Leu Glu Lys Arg Ile Val His Leu Pro Thr Thr Lys Asn Gly His Ser	
180 185 190	
aga gat gtg ccg ctt tcg caa aga gct gtt gcg cta att tta aaa atg	624
Arg Asp Val Pro Leu Ser Gln Arg Ala Val Ala Leu Ile Leu Lys Met	
195 200 205	
aaa gag gta gaa aat gga gat ctt gtg ttt cag acc acg cct gaa tca	672
Lys Glu Val Glu Asn Gly Asp Leu Val Phe Gln Thr Pro Glu Ser	
210 215 220	
tta agc acc acg ttt aga gtg tta aag aaa gag tgt gga ctt gaa cat	720
Leu Ser Thr Thr Phe Arg Val Leu Lys Lys Glu Cys Gly Leu Glu His	
225 230 235 240	
ctc cat ttt cat gat acg aga agg gaa gcg ttg acg aga tta tct aag	768
Leu His Phe His Asp Thr Arg Arg Glu Ala Leu Thr Arg Leu Ser Lys	
245 250 255	
aaa gta gat gta atg act cta gcc aaa att agc gga cat aga gat tta	816
Lys Val Asp Val Met Thr Leu Ala Lys Ile Ser Gly His Arg Asp Leu	
260 265 270	
aga att tta caa aac aca tat tac gca ccg aat atg agt gaa gtg gca	864
Arg Ile Leu Gln Asn Thr Tyr Tyr Ala Pro Asn Met Ser Glu Val Ala	
275 280 285	
aac ttg ttg gat taattcactc ttcttaaata cgccttttgc cacttgatta	916
Asn Leu Leu Asp	
290	
catcgccagc cttatatctt ttactttcat tacttccctt ttctaatagaa actggggatg	976
gaaagtcttg gcgggtaata atatgacgag atgtgtaatt gtaagaacga ttaatcatga	1036
tagaaatgtc ttcaatacta agaagaactg gactatcttc ttttaagttga gctaaggctc	1096
caaacctcac agagcgtagc acttcatctt gttgtttctt tgtagagaaa atattttcca	1156
tttttacctc acttaataaa aaaagccgtc atggacggct taataaagca tttcgctata	1216
cagttctttt gaggtgtacc caatatcgaa cttgatttga ttgttttgtt ttgcgatttc	1276

五、發明說明 (183)

cagtgttctt tttcgatcaa caaatcttcc gaagttggta ataacaccct gtttcttacc 1336
aattagcgga tattgtgtac cgttctcaat agatttaatt tgtttacgca taaacatgtc 1396
atagtgtctc gcgccagtca ctaaatgaag ttcttttgtt gtgtaatctt caagctcgca 1456
cgcagcgcag acgattaatt ctggacgatc tccattttc ctatctccga gcatttttca 1516
tagcctcaaa ccaagcttgt gcgtctcctt cactgtaaaa taatgaaccg ctttctagca 1576
tttttctgtg cttatctcta ttagcatcaa aatagaatct cataattgtt gagttaccic 1636
ttttaaagac ctcttgattg tgggtgtgtg ttttgattgg agcgggcaaa gtaagcggtta 1696
ctgttgggag tggttcttcc cacattccga ctatatcaaa tggattttct aaatgcggat 1756
atttgttatg ttcaaaaaa gaagatccat caatcgtcca agaatttctc tcaaattgtg 1816
tcttgctctt gccaatgtga aatacacctt gatataagaa agtgttgaac ggaaagaact 1876
ttgaataatc agcagttaca tatcctttac ttccatttct aagcacaact ggctcaccgg 1936
ttaatgcttt ttctaagtca aatgctttca ttttttactc tccagcttgc tcatcaataa 1996
gctcatcaat ccattctcga atttcagatt ggaaattttc taacgaatta ttttcattaa 2056
aataatctgc ttcttttaac ttactcaccg ctgttttact aaagcattta taaaaagac 2116
gcttttcttc aaacaaatca tcttttgaga ttgcgcatac ttttctacg ccctctatac 2176
ttttgtcttg aataaaacta ttaaaaagaa cctcttcttg ctgcttggtt tctactaaaa 2236
tagaaatcgt atattttttt ggatattcca tttttaatcc tttcttttag ataacaaaaa 2296
accgcatttc tgcggttatt ctgtgtatct atttaaaata ttacttatag tttcagcatc 2356
ttctaagtgt aatttagaat agcttgaggt catttttctt ttaacggcaa tctcaattc 2416
ttccagcttt aagctataca agtagtcttt tttatcttta taaatacgac cgtacaccat 2476
tccggataat ttaccttctt cataccatt agataaattg atctttctat ctgcaccgag 2536
cactctaatt gttaaatatt ttcttccaat ttttaagact tcagcctcat gttcaatgtt 2596
tgagcgcag agtgtttcta aaaaatatac ggtatcgcca actttaagat ttttaatcca 2656
atctttattc ataaatacc ttatactttc ggtggcagtg gaagtgggtt ccaatgagtt 2716
actgaagata gatggtaagt acgaagagac ataaagaaaa catcatctcg ccacgcgatt 2776
tttatttccc ctctatctgt ataaatcaga atatcctctc tctcactggg caatctatct 2836
tttactactaa tccagccatc atcttgcgaa aattccacaa tttctggctt ttcaagcacc 2896
aaatcagagc cgtaatcttc ttttctctc tcgctcaact gcttttctt gcagtcagcc 2956
ttgccaaagga cgacaccgta cacggcataa ggtaaatcat tcaacgcaaa atcctcatga 3016
tcacacatat catctgcgaa ctcatgagct tctactgcac catctaaaca actttgctta 3076
gcttgatnta atgttctgtg taagttaacg atatgtatgt cattagatac atctactgag 3136
aaaaattttt tttctgttcc tatcatagtt aaattcctta tttttttatt aatgggagag 3196

五、發明說明 (184)

gaatcgggttg ccagtgtgta acgttaatag ctagatcata aattggacca ttctgattta 3256
tagctaccca aaaatattca ccacacgcaa tttctcttga tgcaattgcy taatgctcgc 3316
catattcacc ttcacaaaaa gcaatgactg gtgtttcaac ttctggtaac ttgtcatcaa 3376
cactaatcca gttgctatat tcccaatgaa aattaagctt ctcatagcca ttgatgactt 3436
gatctaacgc aggtcttaat tgggtttctc caacaataat atgtgttgtt atcttaatct 3496
ctgggattcc atctattact tcacaccagt ttttttcaat aaagtccaat ctttttttat 3556
ctgctaaaag actttcatat tctgcttttg tgattgttac tgtttctgtc atagttaaatt 3616
tcctcatgat aaattccatg tttatttacc tttttctgg cacaaaaaaa cagctattg 3676
cgtgctgtct tgattgatat aatcaattaa tctaagccca atccatttca taactggaac 3736
agccatactg tttccaattg ctttgtatcg tggagaatca gggcattcat ctattgattt 3796
gttgcgatat gggatttttag tgtaatcgtc tggaaatccc tgtaatcttt cacactcacg 3856
cggcgtagt tttctaacia ctgattctac tgataaagca acgcaaggaa cattattacc 3916
accagttccc attcttgctt ttaagggttg tgaaatatca tegtgaatac gacaagcttc 3976
ttcaccctta acctcaaata gaatattttc caatcctcca tttcttccaa tgcaatgcgc 4036
tgtattttta gaaatgattg gatcttgtga accgtgaaca acaaaagttt cactaccgcc 4096
agcaagaact ccaccgcttg ctcttaattg tcccgcaaca tccgatttgc gatattgagc 4156
aaagcttgct tcaataaagg cggcaatatc ttttgctgc gttccgctct gttcaatatt 4216
ccctcgcacg cttttggact caatgagtat ttgtgcaaca cttcgttttc tagcatttgc 4276
cacaagaaac actcttttac gacgttgggc aactccgaag tattgagcat cgagaactcg 4336
ccagcagatt gttcggattg aatgcacata accagcgttc gtccatcttc tccctgtgtg 4396
ctgcaatggc tcacactctt gaaccagtcc agccagaagg tgtccgaatg cgttgtccga 4456
ggtggatagc acaccggaa cgttttccca cagcagaatg cacgggtggtt tgttgtcatt 4516
gaatctaaca tagtcgatcg cttctaaaat ttttaattaaa actaacgtga gatttcctcg 4576
ctcatcgtct aaactttgac gattgccagc aactgaaaaa gattgacaag gaggaccacc 4636
aactaaaacg tctgggtgcc gaatttcacg atctaattatt ttctgttgca attcagtcatt 4696
atcaccaaga ttgggaacgt tagggtaatg gtaagctaatt actgcgcttg ggaattgctc 4756
aatttcagaa aaccagagtg gctctgcgaa tt 4788

<210> 48
<211> 292
<212> 蛋白質
<213> 敗血性巴斯德桿菌

<400> 48
Asp Glu Glu Arg Lys Leu Ala Asp Leu Ala Lys Gly Ile Ala Pro Asp
1 5 10 15

五、發明說明 (185)

Ile Ile Phe Arg Asp Val Ile Glu Arg Tyr Gln Asn Glu Val Ser Ile
20 25 30

Thr Lys Lys Gly Ala Arg Asn Glu Ile Ile Arg Leu Asn Arg Phe Leu
35 40 45

Arg Tyr Asp Ile Ser Asn Leu Tyr Ile Arg Asp Leu Arg Lys Glu Asp
50 55 60

Phe Glu Glu Trp Ile Arg Ile Arg Leu Thr Glu Val Ser Asp Ala Ser
65 70 75 80

Val Arg Arg Glu Leu Val Thr Ile Ser Ser Val Leu Thr Thr Ala Ile
85 90 95

Asn Lys Trp Gly Tyr Ile Ser Arg His Pro Met Thr Gly Ile Glu Lys
100 105 110

Pro Lys Asn Ser Ala Glu Arg Lys Glu Arg Tyr Ser Glu Gln Asp Ile
115 120 125

Lys Thr Ile Leu Glu Thr Ala Arg Tyr Cys Glu Asp Lys Leu Pro Ile
130 135 140

Thr Leu Lys Gln Arg Val Ala Ile Ala Met Leu Phe Ala Ile Glu Thr
145 150 155 160

Ala Met Arg Ala Gly Glu Ile Ala Ser Ile Lys Trp Asp Asn Val Phe
165 170 175

Leu Glu Lys Arg Ile Val His Leu Pro Thr Thr Lys Asn Gly His Ser
180 185 190

Arg Asp Val Pro Leu Ser Gln Arg Ala Val Ala Leu Ile Leu Lys Met
195 200 205

Lys Glu Val Glu Asn Gly Asp Leu Val Phe Gln Thr Thr Pro Glu Ser
210 215 220

Leu Ser Thr Thr Phe Arg Val Leu Lys Lys Glu Cys Gly Leu Glu His
225 230 235 240

Leu His Phe His Asp Thr Arg Arg Glu Ala Leu Thr Arg Leu Ser Lys
245 250 255

Lys Val Asp Val Met Thr Leu Ala Lys Ile Ser Gly His Arg Asp Leu
260 265 270

Arg Ile Leu Gln Asn Thr Tyr Tyr Ala Pro Asn Met Ser Glu Val Ala
275 280 285

Asn Leu Leu Asp
290

<210> 49
<211> 1618
<212> DNA
<213> 敗血性巴斯德桿菌

<220>
<221> CDS
<222> (2) .. (1195)

五、發明說明 (186)

<220>

<223> sopE

<400> 49

```

g ggc gat cta tgt ctg aaa ata tct aca tgg tgt caa agt cac aga atc 49
  Gly Asp Leu Cys Leu Lys Ile Ser Thr Trp Cys Gln Ser His Arg Ile
    1           5           10           15

aat caa gca att cgc aca att caa agt cta tca acc gca gtc atc ggt 97
Asn Gln Ala Ile Arg Thr Ile Gln Ser Leu Ser Thr Ala Val Ile Gly
      20           25           30

att gtc tgt act gca aat gac gca gac aat gaa aca ttc cca ctc aat 145
Ile Val Cys Thr Ala Asn Asp Ala Asp Asn Glu Thr Phe Pro Leu Asn
      35           40           45

gaa ccc gtt ctc atc aca aac gtg gca gcg gca att ggc aag gct gga 193
Glu Pro Val Leu Ile Thr Asn Val Ala Ala Ile Gly Lys Ala Gly
      50           55           60

aaa caa ggc acg ctt tca cgt gcg ctt gac ggg att tct gat gta gtc 241
Lys Gln Gly Thr Leu Ser Arg Ala Leu Asp Gly Ile Ser Asp Val Val
      65           70           75           80

aat tgc aaa gtg att gtt gtg cga gtg caa gaa agt gcg caa gaa gac 289
Asn Cys Lys Val Ile Val Val Arg Val Gln Glu Ser Ala Gln Glu Asp
      85           90           95

gaa gaa aca aaa gca agt gaa atg aac acg gca att att ggc aca atc 337
Glu Glu Thr Lys Ala Ser Glu Met Asn Thr Ala Ile Ile Gly Thr Ile
      100          105          110

aca gaa gaa ggg cag tac aca ggc ttg aag gcg tta ttg att gcg aaa 385
Thr Glu Glu Gly Gln Tyr Thr Gly Leu Lys Ala Leu Leu Ile Ala Lys
      115          120          125

aac aaa ttc ggt atc aaa cca cgt att tta tgt gtg cca aaa ttc gac 433
Asn Lys Phe Gly Ile Lys Pro Arg Ile Leu Cys Val Pro Lys Phe Asp
      130          135          140

aca aaa gaa gtc gcc aca gag ctt gca agt atc gcc gcc aaa ctc aac 481
Thr Lys Glu Val Ala Thr Glu Leu Ala Ser Ile Ala Ala Lys Leu Asn
      145          150          155          160

gca ttt gct tac att tca tgt caa ggg tgt aaa acg aaa gaa caa gcg 529
Ala Phe Ala Tyr Ile Ser Cys Gln Gly Cys Lys Thr Lys Glu Gln Ala
      165          170          175

gtg caa tat aaa cgc aac ttc tca caa cgt gaa gtc atg ctg atc atg 577
Val Gln Tyr Lys Arg Asn Phe Ser Gln Arg Glu Val Met Leu Ile Met
      180          185          190

ggc gat ttt ctg tca ttt aat gtc aac aca tca aaa gtt gag att gac 625
Gly Asp Phe Leu Ser Phe Asn Val Asn Thr Ser Lys Val Glu Ile Asp
      195          200          205

tat gcc gtc act cgt gcg gcg gca atg cgt gca tat ctt gat aaa gaa 673
Tyr Ala Val Thr Arg Ala Ala Met Arg Ala Tyr Leu Asp Lys Glu
      210          215          220

cag ggc tgg cat acg tct att tca aat aaa ggc att aat ggc gtg agc 721
Gln Gly Trp His Thr Ser Ile Ser Asn Lys Gly Ile Asn Gly Val Ser
      225          230          235          240

```


五、發明說明 (187)

ggt gtc aca caa cca ctc tat ttt gac att aac gac agc tcg act gat 769
Gly Val Thr Gln Pro Leu Tyr Phe Asp Ile Asn Asp Ser Ser Thr Asp
245 250 255

gtg aac tat ctc aat gaa caa ggc atc acg tgt tgc gtg aat cat aat 817
Val Asn Tyr Leu Asn Glu Gln Gly Ile Thr Cys Cys Val Asn His Asn
260 265 270

ggc ttt cgt ttt tgg ggc tta cgc acg act gca gaa gat cca tta ttc 865
Gly Phe Arg Phe Trp Gly Leu Arg Thr Thr Ala Glu Asp Pro Leu Phe
275 280 285

aag ttt gaa gtg tac acc cgc act gca caa atc tta aaa gat acg att 913
Lys Phe Glu Val Tyr Thr Arg Thr Ala Gln Ile Leu Lys Asp Thr Ile
290 295 300

gca ggg gcg ttt gat tgg gca gtg gat aaa gat att tct gtc acg cta 961
Ala Gly Ala Phe Asp Trp Ala Val Asp Lys Asp Ile Ser Val Thr Leu
305 310 315 320

gtg aaa gat att att gaa gca atc aat gcg aag tgg cgt gat tac acc 1009
Val Lys Asp Ile Ile Glu Ala Ile Asn Ala Lys Trp Arg Asp Tyr Thr
325 330 335

aca aaa ggc tac tta att ggc ggt aaa gcg tgg ctt aat aaa gag ctt 1057
Thr Lys Gly Tyr Leu Ile Gly Gly Lys Ala Trp Leu Asn Lys Glu Leu
340 345 350

aac agt gca acg aat tta aaa gat gcg aag ttg ttg atc tct tat gat 1105
Asn Ser Ala Thr Asn Leu Lys Asp Ala Lys Leu Leu Ile Ser Tyr Asp
355 360 365

tat cac cca gta cca ccg ctc gaa cag cta ggc ttt aat cag tac att 1153
Tyr His Pro Val Pro Pro Leu Glu Gln Leu Gly Phe Asn Gln Tyr Ile
370 375 380

tct gat gaa tac ctt gtt gat ttt tca aat cgt tta gca tcg 1195
Ser Asp Glu Tyr Leu Val Asp Phe Ser Asn Arg Leu Ala Ser
385 390 395

taaggggtag aaaatggctt taccacgcaa acttaaattg atgaatttaa tcacgacgg 1255

taacaaatat ctggcggaag tcacggaagt gactcaacca aaattagcaa tgaaaatcga 1315

agaatttcgc gcggcggtta tgattggttc ggtggatgtc aatctcgggc ttgaaaagct 1375

cgaagcggaa tttaaagccg gtggctacat ggtcgaatta attaaaaaat tcggcggggtc 1435

aatcaacggc attccattgc gttttcttggt ctcatatcag cgtgatgaca cagaagaagt 1495

cacatctggt gagcttgtga tgcaaggctc atttactgaa attgacagcg gaaacagcaa 1555

agtgggcgat gacactgaac aaacattcaa agtgccctta acgtattaca aaatcattgt 1615

tga 1613

<210> 50
<211> 398
<212> 蛋白質
<213> 敗血性巴斯德桿菌

<400> 50

五、發明說明 (188)

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

五、發明說明 (189)

Thr Lys Gly Tyr Leu Ile Gly Gly Lys Ala Trp Leu Asn Lys Glu Leu
340 345 350

Asn Ser Ala Thr Asn Leu Lys Asp Ala Lys Leu Leu Ile Ser Tyr Asp
355 360 365

Tyr His Pro Val Pro Pro Leu Glu Gln Leu Gly Phe Asn Gln Tyr Ile
370 375 380

Ser Asp Glu Tyr Leu Val Asp Phe Ser Asn Arg Leu Ala Ser
385 390 395

<210> 51
<211> 353
<212> DNA
<213> 敗血性巴斯德桿菌

<220>
<221> CDS
<222> (1) .. (351)

<220>
<223> 未知的Cl

<400> 51
atg aca tta ttt gat gaa tgt aaa tta gct ctt aga gac gat ttt aat 48
Met Thr Leu Phe Asp Glu Cys Lys Leu Ala Leu Arg Asp Asp Phe Asn
1 5 10 15

cta att tgt gat gaa gag aag gat tgt gta atg gat aag ttt tat ttc 96
Leu Ile Cys Asp Glu Glu Lys Asp Cys Val Met Asp Lys Phe Tyr Phe
20 25 30

tat ttc ttg gaa aag aaa gag gaa ttt aat ttt caa gat tat tca ttt 144
Tyr Phe Leu Glu Lys Lys Glu Glu Phe Asn Phe Gln Asp Tyr Ser Phe
35 40 45

gaa gaa atg tat ata ttt tca aaa atg gaa cct gtg tat gtt tta tgt 192
Glu Glu Met Tyr Ile Phe Ser Lys Met Glu Pro Val Tyr Val Leu Cys
50 55 60

gat agc tct aat ata cct ttg ttt agg agt aat tgg gaa ttg att atc 240
Asp Ser Ser Asn Ile Pro Leu Phe Arg Ser Asn Trp Glu Leu Ile Ile
65 70 75 80

aat aat ata tat gat gtt gtc tgt tta tct aca aaa gta ttt ttt cta 288
Asn Asn Ile Tyr Asp Val Val Cys Leu Ser Thr Lys Val Phe Phe Leu
85 90 95

gat gat gaa aag tta atg atg gaa tta ttt cct gaa gat aaa gta aga 336
Asp Asp Glu Lys Leu Met Met Glu Leu Phe Pro Glu Asp Lys Val Arg
100 105 110

gtc atc tat aaa aga ta 353
Val Ile Tyr Lys Arg
115

<210> 52
<211> 117
<212> 蛋白質
<213> 敗血性巴斯德桿菌

五、發明說明 (190)

<400> 52

```
Met Thr Leu Phe Asp Glu Cys Lys Leu Ala Leu Arg Asp Asp Phe Asn
 1           5           10           15
Leu Ile Cys Asp Glu Glu Lys Asp Cys Val Met Asp Lys Phe Tyr Phe
          20           25           30
Tyr Phe Leu Glu Lys Lys Glu Glu Phe Asn Phe Gln Asp Tyr Ser Phe
          35           40           45
Glu Glu Met Tyr Ile Phe Ser Lys Met Glu Pro Val Tyr Val Leu Cys
          50           55           60
Asp Ser Ser Asn Ile Pro Leu Phe Arg Ser Asn Trp Glu Leu Ile Ile
          65           70           75           80
Asn Asn Ile Tyr Asp Val Val Cys Leu Ser Thr Lys Val Phe Phe Leu
          85           90           95
Asp Asp Glu Lys Leu Met Met Glu Leu Phe Pro Glu Asp Lys Val Arg
          100           105           110
Val Ile Tyr Lys Arg
          115
```

<210> 53

<211> 509

<212> DNA

<213> 敗血性巴斯德桿菌

<220>

<221> CDS

<222> (1) .. (507)

<220>

<223> 未知的C2

<400> 53

```
atg aaa aat ttt agg aat ata aat att tat agt gat tat gga aag gtt 48
Met Lys Asn Phe Arg Asn Ile Asn Ile Tyr Ser Asp Tyr Gly Lys Val
 1           5           10           15
gat aag gaa att ata tta gaa ttc gaa aat gaa ttt aat ata aag ctt 96
Asp Lys Glu Ile Ile Leu Glu Phe Glu Asn Glu Phe Asn Ile Lys Leu
          20           25           30
cct tct tta tac ata gat tta att acg gcg cat aat gct ccg aag agt 144
Pro Ser Leu Tyr Ile Asp Leu Ile Thr Ala His Asn Ala Pro Lys Ser
          35           40           45
gaa gag aat tgc ttt gaa tat tac aat gag cgt aat gag ccc acg ttt 192
Glu Glu Asn Cys Phe Glu Tyr Tyr Asn Glu Arg Asn Glu Pro Thr Phe
          50           55           60
tct tcc ttt gga ttt gaa ggg ttt gag aca gag cgg tct agc gcc tct 240
Ser Ser Phe Gly Phe Glu Gly Phe Glu Thr Glu Arg Ser Ser Ala Ser
          65           70           75           80
ctt gaa aat ata tat gct cag tat att tat gat gat cca atc tat ggt 288
Leu Glu Asn Ile Tyr Ala Gln Tyr Ile Tyr Asp Asp Pro Ile Tyr Gly
          85           90           95
```

五、發明說明 (191)

tat gaa cat gtg tat tct ttt ggt agt act ggc gag gga cat ttt atc 336
Tyr Glu His Val Tyr Ser Phe Gly Ser Thr Gly Glu Gly His Phe Ile
100 105 110

tgt ttt gat tat cgt gat gat cca aaa ggt gat gaa ccc aaa atc tgt 384
Cys Phe Asp Tyr Arg Asp Asp Pro Lys Gly Asp Glu Pro Lys Ile Cys
115 120 125

atc gtg att cac gat gaa tat gat gaa aaa aca ggg aaa atg cga ctg 432
Ile Val Ile His Asp Glu Tyr Asp Glu Lys Thr Gly Lys Met Arg Leu
130 135 140

ttt cct ata gca gag aat ttt gaa gcg ttt tta gat agt ttg aaa tca 480
Phe Pro Ile Ala Glu Asn Phe Glu Ala Phe Leu Asp Ser Leu Lys Ser
145 150 155 160

ttt gat gaa atg ata gag aag tat tcg ta 509
Phe Asp Glu Met Ile Glu Lys Tyr Ser
165

<210> 54
<211> 169
<212> 蛋白質
<213> 敗血性巴斯德桿菌

<400> 54
Met Lys Asn Phe Arg Asn Ile Asn Ile Tyr Ser Asp Tyr Gly Lys Val
1 5 10 15

Asp Lys Glu Ile Ile Leu Glu Phe Glu Asn Glu Phe Asn Ile Lys Leu
20 25 30

Pro Ser Leu Tyr Ile Asp Leu Ile Thr Ala His Asn Ala Pro Lys Ser
35 40 45

Glu Glu Asn Cys Phe Glu Tyr Tyr Asn Glu Arg Asn Glu Pro Thr Phe
50 55 60

Ser Ser Phe Gly Phe Glu Gly Phe Glu Thr Glu Arg Ser Ser Ala Ser
65 70 75 80

Leu Glu Asn Ile Tyr Ala Gln Tyr Ile Tyr Asp Asp Pro Ile Tyr Gly
85 90 95

Tyr Glu His Val Tyr Ser Phe Gly Ser Thr Gly Glu Gly His Phe Ile
100 105 110

Cys Phe Asp Tyr Arg Asp Asp Pro Lys Gly Asp Glu Pro Lys Ile Cys
115 120 125

Ile Val Ile His Asp Glu Tyr Asp Glu Lys Thr Gly Lys Met Arg Leu
130 135 140

Phe Pro Ile Ala Glu Asn Phe Glu Ala Phe Leu Asp Ser Leu Lys Ser
145 150 155 160

Phe Asp Glu Met Ile Glu Lys Tyr Ser
165

<210> 55
<211> 443

五、發明說明 (192)

<212> DNA

<213> 敗血性巴斯德桿菌

<220>

<221> CDS

<222> (1) .. (441)

<220>

<223> 未知的C3

<400> 55

atg	ata	aaa	tat	tta	gag	gga	aat	att	aac	tcg	ttt	ata	tcg	gca	tta	48
Met	Ile	Lys	Tyr	Leu	Glu	Gly	Asn	Ile	Asn	Ser	Phe	Ile	Ser	Ala	Leu	
1				5					10					15		

ggt	aaa	aac	gaa	agt	aat	aaa	gat	att	tta	aaa	tta	gta	gaa	ata	gtt	96
Gly	Lys	Asn	Glu	Ser	Asn	Lys	Asp	Ile	Leu	Lys	Leu	Val	Glu	Ile	Val	
		20						25					30			

tct	tca	gat	ttt	gaa	gtg	gat	gaa	cta	agt	cat	aaa	gat	gaa	cac	gag	144
Ser	Ser	Asp	Phe	Glu	Val	Asp	Glu	Leu	Ser	His	Lys	Asp	Glu	His	Glu	
		35					40					45				

ata	tat	tat	ttg	ttt	tat	aag	agg	ggt	ggt	gaa	ttt	tgt	ttt	aaa	aga	192
Ile	Tyr	Tyr	Leu	Phe	Tyr	Lys	Arg	Gly	Val	Glu	Phe	Cys	Phe	Lys	Arg	
	50					55					60					

ata	gat	gaa	gag	tat	gtc	tta	tat	tcg	ggt	ttc	ttt	ttc	ttg	gta	gag	240
Ile	Asp	Glu	Glu	Tyr	Val	Leu	Tyr	Ser	Val	Phe	Phe	Phe	Leu	Val	Glu	
65					70				75					80		

ggt	gat	aat	tat	ttt	tca	tgc	cca	ttt	att	cat	gaa	tta	ata	tgt	gat	288
Val	Asp	Asn	Tyr	Phe	Ser	Cys	Pro	Phe	Ile	His	Glu	Leu	Ile	Cys	Asp	
			85					90						95		

ctt	aaa	cac	gga	ttc	tca	ata	gag	gat	att	ata	agg	ttt	tta	ggg	gag	336
Leu	Lys	His	Gly	Phe	Ser	Ile	Glu	Asp	Ile	Ile	Arg	Phe	Leu	Gly	Glu	
			100					105					110			

cca	aat	ttt	aaa	ggt	agt	ggc	tgg	gta	aga	tat	tct	tat	aat	gga	aga	384
Pro	Asn	Phe	Lys	Gly	Ser	Gly	Trp	Val	Arg	Tyr	Ser	Tyr	Asn	Gly	Arg	
		115					120					125				

aat	att	cat	ttc	gaa	ttt	aat	gaa	tct	aat	gaa	tta	tcc	cag	att	agc	432
Asn	Ile	His	Phe	Glu	Phe	Asn	Glu	Ser	Asn	Glu	Leu	Ser	Gln	Ile	Ser	
	130					135					140					

att	ttt	att	ta													443
Ile	Phe	Ile														
145																

<210> 56

<211> 147

<212> 蛋白質

<213> 敗血性巴斯德桿菌

<400> 56

Met	Ile	Lys	Tyr	Leu	Glu	Gly	Asn	Ile	Asn	Ser	Phe	Ile	Ser	Ala	Leu
1				5					10					15	

Gly	Lys	Asn	Glu	Ser	Asn	Lys	Asp	Ile	Leu	Lys	Leu	Val	Glu	Ile	Val
		20					25					30			

五、發明說明 (193)

Ser Ser Asp Phe Glu Val Asp Glu Leu Ser His Lys Asp Glu His Glu
35 40 45

Ile Tyr Tyr Leu Phe Tyr Lys Arg Gly Val Glu Phe Cys Phe Lys Arg
50 55 60

Ile Asp Glu Glu Tyr Val Leu Tyr Ser Val Phe Phe Phe Leu Val Glu
65 70 75 80

Val Asp Asn Tyr Phe Ser Cys Pro Phe Ile His Glu Leu Ile Cys Asp
85 90 95

Leu Lys His Gly Phe Ser Ile Glu Asp Ile Ile Arg Phe Leu Gly Glu
100 105 110

Pro Asn Phe Lys Gly Ser Gly Trp Val Arg Tyr Ser Tyr Asn Gly Arg
115 120 125

Asn Ile His Phe Glu Phe Asn Glu Ser Asn Glu Leu Ser Gln Ile Ser
130 135 140

Ile Phe Ile
145

<210> 57
<211> 8498
<212> DNA
<213> 敗血性巴斯德桿菌

<220>
<223> 未知的C

<400> 57
gaattcgaat taagcgagaa aattgctgaa acactagaac aaagtcaatt aaatattagt 60
caattatcaa ttgttgaaat ttatcctttc aatgaagaac aagggatagc ttttcataat 120
aaaagtgtgg tacaacttaa accagaagag gtggaatggc catcaatcca ttatcttttc 180
tttgctggcg atattcagca agtcgctcat ctgcgaaaag ccgcagaaat ggggtgctg 240
gtgattgata tgaaagggat ttgtgccagc ttgcaagacg tccctgtggg gataccggga 300
gtaaatcagg aaaaattggg agatttacgt cagcgtaata ttgtgtcctt agccgatcca 360
caagtgcac aacttgcat agtcacgccc tcgttgatgt caaatcacga aatcaaagac 420
attgccgtaa cctcgttatt acctgcatct tatactaacg gagaaacggg aggtaaatta 480
gcgggacaaa cagcgcgatt gttaaattggc attccacttg atgaaggcga acaacgttta 540
gcttttgatg ttttccttac gctgcatcg catttaaata tgcaaattca caagatcttt 600
ccacaattag ataatgtcgt atttcattct atccaagtgc ctgttttcta cgggatgggg 660
caaagtgtga gcgtattatc ggattatgca ttagatcctc aatcttgctt agcgagctgg 720
actgacaatc cgttgatgac ttatcatgca gaaaaatatt gcacccagc gacgaatggc 780
gaacaggaaa tggcagaaga gcaagcagca aaattacata taagtgggtt aagtgcgggtg 840
gaaaatggtc tacaattttg gtcgggtgca gatgaacagc gctttaatct tgctttattg 900

五、發明說明 (194)

agtggttacgc ttgcagagtt aatttactcg caagggtatt aattttaaagtg tgtttttgca 960
 cgatattttt atcttgaact ttgagagcgc actcgttttt gacgagtgcg tttttgttaa 1020
 aacattcggt tgaaagacag tgaatgaata gcggagttat tgataagaat caatttatac 1080
 aaaagcaact gaatgttatt aatcgaggca ataaacctat tgatagtttt agttggcgcc 1140
 ataatacata aactgtactt aataatatgc aatcaatacc tagaaatatt catgacgtaa 1200
 tccaacatat cggggagggg attttaagtg atggtagaaa aaacatttag aaatctaaaa 1260
 atatatgatg attatgggtc tgtctctcag gaaattattt ttaattttga aaaagagttt 1320
 gatataaaac tccctttatc ctatatctca cttgtgaaaa agtataatgg cgtttggttt 1380
 aaggaaagtg attttgaata tttatctcaa aatgggaaaa gaataataag ctcatgtagt 1440
 tttgatagtt ttgagacaaa agataatatc gaaccaatga ataatatatt aagacaatat 1500
 atttatgatg atgaaattta tggatataag aatgtttatt cctttgggtta cactggaaat 1560
 ggtgactttg tctgttttga ttatcgtgat gacccaaaag gtgatgagcc caaaatctgt 1620
 atcgtgatcc atgatgaata tgatgaaaaa acaggcaagc gtttgttatt gcctgtggca 1680
 gaaaattttg aggcattttt agatatgctt tacgattttg atgaacgcta tccgaatggt 1740
 tatgaatagg tatttggtta aataatgtgt tgtatttttt aagcattatt tacaactaac 1800
 attttaagtg cgggtcaattt tgaaaaagtt ttgggctttg agaattgggc gcattttttt 1860
 tgaaatatcc ttcaatgatg agcactaatt atggattaga taatgggaat tatcgagata 1920
 tggatggtaa taaaggatgg aggctagatt ttgatcctga gaaagtgtt catgtaaaata 1980
 tttttgactt tactaaaggt aaaggactag gtaaacgagt taaaaagtca ttctttttga 2040
 tagtactgaa caagagtttg aaaaatttta aagcaattaa ataaggaaga taaaatgaca 2100
 ttatttgatg aatgtaaatt agctcttaga gacgatttta atctaatttg tgatgaagag 2160
 aaggattgtg taatggataa gttttatttc tatttcttgg aaaagaaaga ggaatttaaat 2220
 tttcaagatt attcatttga agaaatgtat atattttcaa aaatggaacc tgtgtatgtt 2280
 ttatgtgata gctctaatat acctttgttt aggagtaatt ggggaattgat tatcaataat 2340
 atatatgatg ttgtctgttt atctacaaaa gtattttttc tagatgatga aaagttaatg 2400
 atggaattat ttcttgaaga taaagtaaga gtcatttata aaagataatt accccttgat 2460
 cgcgctcgtg tcagcacgag ttcgctttca ttaaagctct cgttaaagac tagcactagc 2520
 agtgagggtg atcgtaatca atttactgaa gaacagttaa ttaaaattaa taagaggctt 2580
 gataaaatag agggatttac atggcatcat aactcacaaa gtagtcccca aaatatgtag 2640
 ttaataccta caccaattca taaggctgtt cagcatatag gtgaaggcgc ttttaagtga 2700
 ggaaagtgat aaaatgaaaa attttaggaa tataaatatt tatagtgatt atggaaaggt 2760
 tgataaggaa attatattac aattcaaaaa tgaatttaat ataaagcttc cttctttata 2820

五、發明說明 (195)

catagatttta attacggcgc ataatgctcc gaagagtga gagaattgct ttgaatatta 2880
caatgagcgt aatgagccca cgttttcttc ctttggattt gaagggtttg agacagagcg 2940
gtctagcgcc tctcttgaaa atatatatgc tcagtataatt tatgatgatc caatctatgg 3000
ttatgaacat gtgtattctt ttggtagtac tggcgaggga cattttatct gttttgatta 3060
tcgtgatgat ccaaaagggtg atgaacccaa aatctgtatc gtgattcacg atgaatatga 3120
tgaaaaaaca gggaaaatgc gactgtttcc tatagcagag aattttgaag cgtttttaga 3180
tagtttgaaa tcatttgatg aaatgataga gaagtattcg taatgtctcc gttcatatct 3240
catagcgatg ctctctcccc tgattttatg gaaattttgt tttaaattagg agggcactaa 3300
aatgaaaaaa ttttatttta tttttttatt attcctaagt ggatgttttt atcatgatgg 3360
atgtatctat actcctcaga tggtaaattg ttttgttgat aaaggagata tatttccatc 3420
aatatctcgg tatcaaaagc cttatagtct agggaaaaacc aattcagaac agcgttgga 3480
ggatgttatg ttttgtggag gtaaatatgg tgattataaa ttagagaata taaaaacagt 3540
ggaacaatcg gataaattac atcattgtat gacccaaaaa gggatatatcc atttaactcc 3600
cgcagaatgt ggataccaaa atcctaattg ggataaaggc gtttgaatt tataagtgtt 3660
ttggatttta ctttacgaat ttttttgaa aaaagttacc gcaggatgtt ttttaatcaa 3720
agcccagggtg gcgcttggtg gatgtgttat tcgcatagta gttattatgc ggaagtgcta 3780
aatgaattca ttattaaaaa tggaattaaa gagcgtaatt agcaccgttt gcggtgagt 3840
atttaatttc tcctgatgtt atggaaatat tatttaagt agggagtgat taggatgaaa 3900
aagttgttat tgttcagttt attattactt ttaaattggat gcctatatatc ttttgaagag 3960
gagtgtttta gaccgttaat tcagggtggg tcacttgctt gtcataagaa taaaggagat 4020
atatttccat caatagcacg tttccaaaaa gttagagaaca tcggaaaaac tgatgccaa 4080
caacgttgga aagatgcggt tgattgtgga agtaagtatg gcgatgaaga tttaatatat 4140
ataaatgata ataatttata tagcattttt cactcctgta tggttaaaaa aggatataaa 4200
aagtttcatc ccgcagaatg tgataccaa aatcctaatt gggataaggg tatttgaatt 4260
ttataagtgt tttgaatttt actttacaaa cttttttga aaaatgttac cgctggatg 4320
tctgttttta gggataaaga ttcgttcatt ttttttaaat ttaggcacgg tataaaagag 4380
cttgattatc aaataataat atcgtgttcg tgtccacacg agtagggttt gattaaagta 4440
ctcctcaaaa gcgagtgtta gctgtgggtt aaacgggtgg aaagaaagta aagagtatat 4500
aaaccaattg accgcataac gtgcgggtcaa tttctaagat ttatgagttc cagaaaaata 4560
gaccgaaaag tgcggtaaag gggtaacgaa acacaaaaaa taaaaatatg acagcaagct 4620
gtgtcattaa accccagaaa aaaacttgac cgattgttcg actgctgaaa atggcaaaaa 4680
gtaagccgat ttcatagggt agcattqcaa taaaccaat taatccactt ggtatcatc 4740

五、發明說明 (196)

ttttcattac ggactcctta tttatggctg ataacttaac acttgtattg aaaattaaag 4800
cagatttaaa caatgcgttg agcgatttta aagcgcttaa aacggaattg caacgcgcag 4860
gcgtggagtc tatcagtaag taactcgcca gtttttgcaa tcatttatca tattcacaaa 4920
gccgtaatgc atattggaga aggttaagt taagtgaagg aagataaaat gaaatttaga 4980
cattttggca tttattatga ttatggcgta gtttcccaag agattatatt agattttgag 5040
gaaacgtttg gtattaaatt accaactatt tatattgagt tgatcacaaa acataattcc 5100
ccaagattga atagagatca tttcaattat tatgatttct ctacgagtga ggaagaagga 5160
acggaattta tattcaaagg atttgaaaca gaaagtaata ggcatgcgcc gccagaaaat 5220
atttatgcac aatatcttta tgatgatgaa atatatggtt atgaacatgt gtattctttt 5280
ggcagtaccg ctagtgggtga ctttgtctgt tttgattacc gagataatcc gaaaggcagt 5340
gaacctaaaa tttgtcttgt gattcatgat gaatatgatg aagaaacagg caagcattta 5400
ttgtttcttg tggcagaaaa ttttgaggta tttttagata tgctttacga ttttgatgaa 5460
cgctatccga atggttatga ataggatttt aaataatgta ttgtattttt taagcgttat 5520
ttaataacgt ttaagtgcg gtcaatttca aaaaagtttt gctttgagga attgaccgtt 5580
tttgtatcat ggatatgatg tgagcaattg atatcctgtt tgtgttaact ggcatgtggt 5640
aaagcattcg tcaaagacga gctctagtgg tgagggacta atcatgaatg aactattgga 5700
cttttataga aatataactt tttttgaaga atatgatgaa aactcattca taggaagatg 5760
gcttgattac tcggaatgga atgataaaga atattggaaa ttagagaaaag atttactgaa 5820
aattgctcaa atgtatagaa ctactaatga agtttttcca gatattttta taggggttat 5880
gcgtatcatt gaattattaa tgatacctaa ctggaatagt tttataatat ctaattcaga 5940
aagtgttgat atttatgata gatatgaacg atttaaatat ataatttcaa tacttttcaa 6000
taataaagat gttagactag atggcttttc atatacagaa aagaatgatg atgtatttta 6060
taatgaatag aaaaattaaa agtaagctaa tttgtagaaa taataaaagt ctgcgttgta 6120
ttttttcttt gagatcgtgc ttgagtcac acgagtgcga gctgtaggca gagtgccttg 6180
gtgattataa aaagttaagg atagtattgt tgatatgaaa gaaaagacta aatattcaat 6240
ggggaatcaa agtgataaaa aataaatttt atatttcttg gttaggattt tcaatatcat 6300
tatatgtttt gcttttatgt agagatttgt tttattctct ttatatgttt tttattatga 6360
tgtatttgct ttaaaatttt cttttaagga ggcgtttttt actatcttta tttttattgt 6420
gctatgtttc attattcatt attcattatt cattattcat tattcattat tcattatttt 6480
atatataaat atggtaaaaag gtctgaatgc caaaaaaga aaccattaag tgaaaaatgta 6540
acatacaata aaaggtagta ggaataaata aaatattagg aataacagaa tgataaaata 6600
tttagaggga aatattaact cgttttatatc ggcatttaqct aaaaacqaaa ataataaata 6660

裝
訂
線

五、發明說明 (197)

tatttttaaaa ttagtagaaa tagtttcttc agattttgaa gtggatgaac taagtcataa 6720
agatgaacac gagatatatt atttgtttta taagaggggt gttgaatttt gttttaaaag 6780
aatagatgaa gagtatgtct tatattcggg tttctttttc ttggtagagg ttgataatta 6840
tttttcatgc ccatttattc atgaattaat atgtgatctt aaacacggat tctcaataga 6900
ggatattata aggttttttag gggagccaaa ttttaaagggt agtggctggg taagatatct 6960
ttataatgga agaaatattc atttcgaatt laatgaatct aatgaattat cccagattag 7020
cattttttatt taataattta ggattgggaa cgctctcgtg ttcacacaag tgcggtttga 7080
ttaaagcact tgtcaaaggc gagatccagc tgtgggagat ttgatagaga aatggctctc 7140
aggattgacg ttagtagagg gagcataaat caagaaaaaa catttaaaat aggaacatta 7200
gggtggtgagt aatggaaatc actcgtttta aaatcctact tattgccttg attatattag 7260
gtaatgggta tgtgtttctt ggtggaccag ctaaaaaaca attcgtata gaagcagaaa 7320
caaggcggat ttatcgtact ttaacgaaag aaattatttt tatgaatgga gaatataaac 7380
aatttgagg gcgagttatt caaggattta ctttagtcat ttctttttct cattcaagta 7440
cagaaaaccg cattaaagatt ttagaaaaaa ttaaagagat gggattttgat tcaaaaaata 7500
aaacatcaaa accgagtctt catctttttt gtcaaggaga aagtggtttt ttgatcgcag 7560
aaaaacctga atttagaata gattatgaga aaaagatgac ttattgtttg gagtagcaaa 7620
ggaaggcaat gataagtgtg ttttctaact agatttaatt taagtattaa agtgcggtca 7680
attttgaaaa cgtttttact tgaaaaattg accgtttttt tacatgagag agtgaaagta 7740
caccacctta ggcaatgtgg ttgtggataa ggtgattaag gaatacccaa atgggggtta 7800
tgaagcgagg gtgctgatcc ctaaccgaa agcgaacc gatcctgatg cgccgaaatt 7860
tttgagaaaa aggggaaatg aagggtgtat cacaatgtt ccaagaacat ggacagagga 7920
taggttgaat gtggagttag agcatgcgt taataataga gtaccaatgg aaaagtttga 7980
aaataaatgg gaaggataaa caaaatcagg cgtgaaagta gaatgggttc tggatagaaa 8040
tggtaaagtg ttgactctat tttgttaatt ttctgtgtct ttttgtaaaa aataagttgt 8100
tgaaataaca tttttctcta taatcaaact ttaatgataa ttaatcat taaataagaa 8160
tggatactta gatgaggatt atatgaaaga tttatcaaaa atgacctgcc ttgaagactt 8220
acgccgtgtt gcgcaacgta aagtgcctaaa aatgttttat gactatgtag ttccaggatc 8280
ttggagcgaa agcacattgc atgccaaacc taatgatttt caagcaatta agctacgtcg 8340
acctgtggcg attttgcca tttctgcatt cagctctgca attcgtcgtc tgtgctgttc 8400
tgttgcgcgc gcaagctctc ttgtcgactt gccttttcta attgggcttg ttgctcccaa 8460
taacgtgagg tcgccacatc cactttacgt agtgttga 8498

五、發明說明 (198)

<210> 58
 <211> 5798
 <212> DNA
 <213> 敗血性巴斯德桿菌

<220>
 <221> CDS
 <222> (2686) .. (4446)

<220>
 <221> 未知的D1

<400> 58
 gtcgacaaga ataaaaacgaa acagcaaata gaattagaat tactacttat taacaataat 60
 ccttttttaa agattctagc tgttttagat aaaaatatac gtgtgaagct tttggtcaca 120
 ttattattat caggcctata ttatttatat gcagtaaaaa acgattcaaa ttttgtcata 180
 ggtttatcta ttattttagt ttttattatt gtcattccag ggattttgac aaatgctatt 240
 ttgaaagcta aggtgaaaaa aatcatggta gattttaccag gttttattga cttagttgca 300
 gtaaatgttc aaacagggat tagtattgat gcggctttaa aacaagtggc aatcgatttt 360
 aagaaactta atccagatct tacttatgtg atgttaagga ttattagaaa atctgaactt 420
 acgggattat cacaagcgtt acaggatctt tcgatctcat tgccaacaac agaaataaga 480
 atgttttgta ctgttttaca acagagttaa aattttgggt cttcaattta ttctcactta 540
 attcagttgt ctgcagatat caggagata caattattaa tcattgagga aaagttaggt 600
 acattatcag ctaaaatgag tatcccattg attttggtta ttatgttccc aataatcatt 660
 ttaattctag caccaggtat aatgagggtta tttccaaatg ttttttaaatt ttaccaagaa 720
 aatcgttttt gttagtttag ctttatctgt cgttggttgt tctaccatt ctcagcaagg 780
 catgacacag aaaagtatgt catctgaaac aataacggca aaagagactt tatatgaaag 840
 tacgcaaaat tattcggcac tcatttcact gtatcgcat gtgttgaaag ccaaagaaga 900
 tccttcaata cgctataaat tagcgaagac atactatcag cgagggtgaca gcaaatcttc 960
 tttactttat ttaacgccat tactgaatga taatacgaag cttgctacac aagcgaaaat 1020
 attacagata aaaaatctaa ttcaattaaa taatttccaa gaagcaattt ctgtcgcaaa 1080
 tgaactctta ttaaaatcac ctaatgaagg agaagtatat aatttaagag gtatcgctta 1140
 tgcgcaaaat gggaatttggt tgaatgcccg aaatgatatc aataaagcaa gagagttctt 1200
 tattaatgat aatgttgcta ttaataattt agccatgcta aatattatta atggcgattt 1260
 taataatgct gtttctttac tgttgccaca atatttaaatt ggcgttaaga attctcgatt 1320
 gattcataat cttgtttttg ctttagttaa aaatgggtgat cttgattatg caaaagatat 1380
 cattgttaaa gagcgtttta atacttcacc agatgattta attaatgcat tgaaaaaac 1440
 tacacatgta tcaaaagggt taactcggta acactaagga tttgatatga aaaagtttct 1500

五、發明說明 (199)

atcaaataaa aaaggaacct cgtcaattga atttgctttg acgatagcgt tctattttatt 1560
tggttgatg tttatttttg aattttgtcg attagcgggt gcgacagctt attgggattt 1620
agctataacg gaaagtgtca gaattgcaa gaatgaacaa gcaattttctg gaaattatga 1680
agaagcattt aggaagctc ttacaaagca aaaaaattc catgatgaat cgacaattgg 1740
atatttggtg ttgttagaag ataataaatt tgatgtaaaa gtccaatatg tggattgtga 1800
taaagaaacg gaattgtatta aaaatcttct gcttaataaa tttcgccaac cacaaaaaaa 1860
tcataaagga gagttaatct ctctacggg gagtcgctg acttttagcac aatattcttt 1920
aacttataaa tataagttaa tgggtgccgt agtattttatt cctgagctt ggtctcaagt 1980
agtgtgaac cgtgaatttg ttgtgtaca ggaatttgag cgttctcaat ttatgttagg 2040
agcaaaacca agttctcttg ggacgaatcc atagaaaatt tactcattat ttcgagctat 2100
atatgaaaga gtcaggttta gttaaattca agcatttttg gaaaaataaa aagggcgag 2160
tgacgataga gttctttttt atgtcaatgt ttctgattgt gctatttgca tttctcttcg 2220
atthagtaat gttacgttct acattaggca agttagataa tgcctcatat acattagtta 2280
gtattctccg tgaacgtaca cagttgtacg atagagttgc acaaattaat attgatgatc 2340
ataagcaatt tgaaaagctt gctaagaaac tgattttatgg tgatcagaat agtaataaaa 2400
ggatcgatgt tgttttagaa tattgggcac aagacgggtc tggacggagg attccaaata 2460
tcattggcga ttgtacgctt tacaaaaaac tttctgattt atcctattta tctctctgct 2520
cagaactcaa taatgaaaga aaaataccgc tttatcaaat tactctttgt gttgaaactc 2580
agggcttggt tgaaacaata ttactggata agtctgagcg ttcaacgggg ctgattagat 2640
catcgtcaat gtcagtatca cgataaatta tcgttaggga acttt atg aaa aaa ctt 2697
Met Lys Lys Leu
1
tat tta att cgt tct tgc tat gat tca gtc aga aaa ttt tat gag aat 2745
Tyr Leu Ile Arg Ser Cys Tyr Asp Ser Val Arg Lys Phe Tyr Glu Asn
5 10 15 20
gag cta ggt gtt tat aca gta atg act gca tta cta gca ttt cca tta 2793
Glu Leu Gly Val Tyr Thr Val Met Thr Ala Leu Leu Ala Phe Pro Leu
25 30 35
tta gtt ttg att gga ttt acg gtt gat gga act ggg gtt gtg ctt gat 2841
Leu Val Leu Ile Gly Phe Thr Val Asp Gly Thr Gly Val Val Leu Asp
40 45 50
aaa gca cgt tta gct caa gga atg gat caa gct gct tta gct ttg gtt 2889
Lys Ala Arg Leu Ala Gln Gly Met Asp Gln Ala Ala Leu Ala Leu Val
55 60 65
gct gaa aac aat gac tac cga gaa aat aaa aaa cat ggt gat gtt aat 2937
Ala Glu Asn Asn Asp Tyr Arg Glu Asn Lys Lys His Gly Asp Val Asn
70 75 80
cgg caa cta cta tca cct caa qac aaa gca aaa ttt oct ggt aat gaa 2985

五、發明說明 (200)

Arg	Gln	Val	Val	Ser	Pro	Gln	Asp	Lys	Ala	Lys	Phe	Gly	Gly	Asn	Glu	
85					90					95					100	
ttt	atg	gcg	aaa	caa	gaa	aag	cgt	aat	caa	gag	ctt	atc	cag	ggg	att	3033
Phe	Met	Ala	Lys	Gln	Glu	Lys	Arg	Asn	Gln	Glu	Leu	Ile	Gln	Gly	Ile	
				105					110					115		
gcc	aaa	ctt	tat	tta	cgt	tca	gaa	aat	gcg	aat	gct	tca	tct	gat	gca	3081
Ala	Lys	Leu	Tyr	Leu	Arg	Ser	Glu	Asn	Ala	Asn	Ala	Ser	Ser	Asp	Ala	
			120					125					130			
cca	atc	act	att	gat	aaa	cct	ttt	cat	tat	tca	tgt	gag	gag	tta	gat	3129
Pro	Ile	Thr	Ile	Asp	Lys	Pro	Phe	His	Tyr	Ser	Cys	Glu	Glu	Leu	Asp	
			135				140					145				
tta	cct	aca	gct	aat	gag	tat	gca	cgt	cgt	aaa	cct	att	gtt	tgt	gaa	3177
Leu	Pro	Thr	Ala	Asn	Glu	Tyr	Ala	Arg	Arg	Lys	Pro	Ile	Val	Cys	Glu	
	150					155					160					
gtg	caa	ggg	ggc	gtc	aat	cgt	aaa	ttt	tgg	ctt	cct	gtc	agt	gaa	tcg	3225
Val	Gln	Gly	Gly	Val	Asn	Arg	Lys	Phe	Trp	Leu	Pro	Val	Ser	Glu	Ser	
165					170					175					180	
tta	gtt	agt	gaa	gat	aaa	ctg	aaa	aaa	gat	cga	gtt	aga	ctg	gaa	tcc	3273
Leu	Val	Ser	Glu	Asp	Lys	Leu	Lys	Lys	Asp	Arg	Val	Arg	Leu	Glu	Ser	
				185					190					195		
gat	acc	agt	tat	gcg	att	aaa	gaa	aaa	ggc	atc	gtg	att	cct	gtg	gag	3321
Asp	Thr	Ser	Tyr	Ala	Ile	Lys	Glu	Lys	Gly	Ile	Val	Ile	Pro	Val	Glu	
			200					205					210			
cta	atg	ctt	gtt	tcg	gat	tat	tct	ggg	tcg	atg	aat	agt	cat	tta	cag	3369
Leu	Met	Leu	Val	Ser	Asp	Tyr	Ser	Gly	Ser	Met	Asn	Ser	His	Leu	Gln	
		215					220					225				
gat	aaa	aac	ggg	aga	tct	cta	gga	aaa	gct	aaa	att	act	att	tta	aga	3417
Asp	Lys	Asn	Gly	Arg	Ser	Leu	Gly	Lys	Ala	Lys	Ile	Thr	Ile	Leu	Arg	
	230					235					240					
gaa	gtg	gtt	agt	gaa	att	tcg	aaa	att	tta	ttg	cca	gaa	gat	gtt	agc	3465
Glu	Val	Val	Ser	Glu	Ile	Ser	Lys	Ile	Leu	Leu	Pro	Glu	Asp	Val	Ser	
245					250					255					260	
gaa	ggg	gtg	agc	cct	ttc	aac	cgt	att	ggc	ttt	acg	act	ttt	tct	ggc	3513
Glu	Gly	Val	Ser	Pro	Phe	Asn	Arg	Ile	Gly	Phe	Thr	Thr	Phe	Ser	Gly	
				265					270					275		
ggg	gtt	aga	caa	cgg	gat	gtc	act	gaa	ggc	tgt	gtg	ctt	cca	tat	gaa	3561
Gly	Val	Arg	Gln	Arg	Asp	Val	Thr	Glu	Gly	Cys	Val	Leu	Pro	Tyr	Glu	
			280					285					290			
gga	aaa	ata	tca	caa	act	tct	cga	aaa	tta	act	att	cgt	tat	tgg	att	3609
Gly	Lys	Ile	Ser	Gln	Thr	Ser	Arg	Lys	Leu	Thr	Ile	Arg	Tyr	Trp	Ile	
		295					300					305				
acg	ggg	aat	aat	aca	cct	tgg	aaa	ttt	aat	gct	ggg	aga	tgg	gag	aga	3657
Thr	Gly	Asn	Asn	Thr	Pro	Trp	Lys	Phe	Asn	Ala	Gly	Arg	Trp	Glu	Arg	
	310					315					320					
agt	aca	gtg	tct	ttc	cag	gag	cat	tat	aaa	ggc	tat	tat	gac	aaa	ttc	3705
Ser	Thr	Val	Ser	Phe	Gln	Glu	His	Tyr	Lys	Gly	Tyr	Tyr	Asp	Lys	Phe	
	325				330					335					340	

五、發明說明 (201)

cat tct tca act tgt aga ggc tca ggg agc tct aga act tgt caa att	3753
His Ser Ser Thr Cys Arg Gly Ser Gly Ser Ser Arg Thr Cys Gln Ile	
345 350 355	
gat gca aat cct aag aaa att atg gat tat gca cta aaa att aat gac	3801
Asp Ala Asn Pro Lys Lys Ile Met Asp Tyr Ala Leu Lys Ile Asn Asp	
360 365 370	
tgg acg aca att aga gaa tta ttt aat act tat ata gat gta agt ggg	3849
Trp Thr Thr Ile Arg Glu Leu Phe Asn Thr Tyr Ile Asp Val Ser Gly	
375 380 385	
acg att gac caa att tcc cag ttt gat ggt tca aac aga cgt tat gat	3897
Thr Ile Asp Gln Ile Ser Gln Phe Asp Gly Ser Asn Arg Arg Tyr Asp	
390 395 400	
atg gtg ttt act gat gaa gaa cgg tgt ctt ggc gga aat att ggt aga	3945
Met Val Phe Thr Asp Glu Glu Arg Cys Leu Gly Gly Asn Ile Gly Arg	
405 410 415 420	
aga aca act cga gct tgg ttt gat caa aaa aat aaa gat att aca aga	3993
Arg Thr Thr Arg Ala Trp Phe Asp Gln Lys Asn Lys Asp Ile Thr Arg	
425 430 435	
gag ttg aat att gtt cgt cct tct ggt tgg act tct gca tct tcg ggg	4041
Glu Leu Asn Ile Val Arg Pro Ser Gly Trp Thr Ser Ala Ser Ser Gly	
440 445 450	
ctt ctt gtt gga gct aat atc atg atg gac gag aat aag aat cct gat	4089
Leu Leu Val Gly Ala Asn Ile Met Met Asp Glu Asn Lys Asn Pro Asp	
455 460 465	
gcg caa cct tcg aaa ctc ggg aca aat att caa cgt gtt atc tta gta	4137
Ala Gln Pro Ser Lys Leu Gly Thr Asn Ile Gln Arg Val Ile Leu Val	
470 475 480	
tta tct gat ggt gaa gat aac tgg cca act tat agt aca tta acg act	4185
Leu Ser Asp Gly Glu Asp Asn Trp Pro Thr Tyr Ser Thr Leu Thr Thr	
485 490 495 500	
ctt tta aac aat ggt atg tgt gac aaa att cga gaa caa ttg ggc aag	4233
Leu Leu Asn Asn Gly Met Cys Asp Lys Ile Arg Glu Gln Leu Gly Lys	
505 510 515	
tta caa gat cca aat tta cga gag tta cca gga aga att gcg ttt gtt	4281
Leu Gln Asp Pro Asn Leu Arg Glu Leu Pro Gly Arg Ile Ala Phe Val	
520 525 530	
gcg ttt ggc tat agt cca cca gca aac caa gtt gcc gct tgg aaa aaa	4329
Ala Phe Gly Tyr Ser Pro Pro Ala Asn Gln Val Ala Ala Trp Lys Lys	
535 540 545	
tgt gta ggt gat caa tat tat acg gct tat tcg aaa gaa gag ttg tta	4377
Cys Val Gly Asp Gln Tyr Tyr Thr Ala Tyr Ser Lys Glu Glu Leu Leu	
550 555 560	
gat agt ttc aaa caa att att gga ttt gaa gaa gag gtg ggg cgt tct	4425
Asp Ser Phe Lys Gln Ile Ile Gly Phe Glu Glu Glu Val Gly Arg Ser	
565 570 575 580	
tca tct cat aaa ccg aaa ttt taagattgtc caaggataac gctaaaaaat	4476
Ser Ser His Lys Pro Lys Phe	
585	

五、發明說明 (202)

ctcttagcac aggctaagag atttttttat gtgtttttca aattttatct actggtgatt 4536
ttaattcatt acataacata acttttttct gaataatata gaatagacaa caataagaat 4596
taaaacgctc aaggcataga ggcttagtcg aacaaactaa gctattttgc gcgattgatt 4656
gggatataga tggtattttca aataagcaat aaccatggta ctgagaaaga agatgagtgc 4716
cgtaataaag tagaagcgat ttttcttttg gctgaaagggt ggtgtagcc ttttctggct 4776
aaagaaaata gtagcaacgg caatataaag ggcgataaag agcattttgt aaatgaacca 4836
tggtgttaca ttttgctgaa aaagaagaaa tagcccaatt cccgaacaga acaacagcgt 4896
atcacttaag tgcggtaaga tttttaatac ttttctgtct cgccaatttt tgctgttaa 4956
ttgcatcatg ccacggataa taaatagact gaggtgaga aaggcacagg caatgtgtag 5016
ataaataaga taatatgcca tcgatttttt tcctaagata aagaagcag tagcgaggct 5076
actgctttta aataatatcg tatttagtga atgaatttaa ctttctgcgc tttcgaccgc 5136
actttctgctc gcatcactct caatgtcttc ttcacgaca tcacaaacga gttgtaatcc 5196
aaccagtgtt tcactttcac ttgttcggat gagacgtact ccttgtgtat ttcgaccgat 5256
aatattgatt tcgtttacgc gagtacgtac tagcgtaccg gcatcagtaa tgagcataat 5316
ttgatcgctt tcttcaactt gtgttgctgc aacgacttta ccgttacgct cactcacttt 5376
aatcgagatc acgccttttg tggtacgtga ttttagttggg tattccgcta attcagtacg 5436
tttaccataa ccgttttgtg tggcggttaa aatggcgctt tcattttttg gaataacaag 5496
tgacacgact ttatcaatat tgagatccaa ggcacatta gtattctcat cagagatctc 5556
ttccatatcg accgcacttt catcatccga caaatcattc gttaacgcca gtttaataacc 5616
gcgtacacct gttgctgcac gccccatggc acgcacagca ttttactaa agcgaactac 5676
acgtccttgt gcggagaaga gcatgatttc attttgacca tcggtgatat ccacaccgat 5736
aagttcgtct tcatcacgca agttgagtgc aataatgctt gttgaacgag gacgactgaa 5796
tt 5798

<210> 59
<211> 587
<212> 蛋白質
<213> 敗血性巴斯德桿菌

<400> 59
Met Lys Lys Leu Tyr Leu Ile Arg Ser Cys Tyr Asp Ser Val Arg Lys
1 5 10 15
Phe Tyr Glu Asn Glu Leu Gly Val Tyr Thr Val Met Thr Ala Leu Leu
20 25 30
Ala Phe Pro Leu Leu Val Leu Ile Gly Phe Thr Val Asp Gly Thr Gly
35 40 45
Val Val Leu Asp Lys Ala Arg Leu Ala Gln Gly Met Asp Gln Ala Ala

五、發明說明 (203)

50	55	60
Leu Ala Leu Val Ala Glu Asn Asn Asp Tyr Arg Glu Asn Lys Lys His		
65	70	75
Gly Asp Val Asn Arg Gln Val Val Ser Pro Gln Asp Lys Ala Lys Phe		
	85	90
Gly Gly Asn Glu Phe Met Ala Lys Gln Glu Lys Arg Asn Gln Glu Leu		
	100	105
Ile Gln Gly Ile Ala Lys Leu Tyr Leu Arg Ser Glu Asn Ala Asn Ala		
	115	120
Ser Ser Asp Ala Pro Ile Thr Ile Asp Lys Pro Phe His Tyr Ser Cys		
	130	135
Glu Glu Leu Asp Leu Pro Thr Ala Asn Glu Tyr Ala Arg Arg Lys Pro		
	145	150
Ile Val Cys Glu Val Gln Gly Gly Val Asn Arg Lys Phe Trp Leu Pro		
	165	170
Val Ser Glu Ser Leu Val Ser Glu Asp Lys Leu Lys Lys Asp Arg Val		
	180	185
Arg Leu Glu Ser Asp Thr Ser Tyr Ala Ile Lys Glu Lys Gly Ile Val		
	195	200
Ile Pro Val Glu Leu Met Leu Val Ser Asp Tyr Ser Gly Ser Met Asn		
	210	215
Ser His Leu Gln Asp Lys Asn Gly Arg Ser Leu Gly Lys Ala Lys Ile		
	225	230
Thr Ile Leu Arg Glu Val Val Ser Glu Ile Ser Lys Ile Leu Leu Pro		
	245	250
Glu Asp Val Ser Glu Gly Val Ser Pro Phe Asn Arg Ile Gly Phe Thr		
	260	265
Thr Phe Ser Gly Gly Val Arg Gln Arg Asp Val Thr Glu Gly Cys Val		
	275	280
Leu Pro Tyr Glu Gly Lys Ile Ser Gln Thr Ser Arg Lys Leu Thr Ile		
	290	295
Arg Tyr Trp Ile Thr Gly Asn Asn Thr Pro Trp Lys Phe Asn Ala Gly		
	305	310
Arg Trp Glu Arg Ser Thr Val Ser Phe Gln Glu His Tyr Lys Gly Tyr		
	325	330
Tyr Asp Lys Phe His Ser Ser Thr Cys Arg Gly Ser Gly Ser Ser Arg		
	340	345
Thr Cys Gln Ile Asp Ala Asn Pro Lys Lys Ile Met Asp Tyr Ala Leu		
	355	360
Lys Ile Asn Asp Trp Thr Thr Ile Arg Glu Leu Phe Asn Thr Tyr Ile		
	370	375
Asp Val Ser Gly Thr Ile Asp Gln Ile Ser Gln Phe Asp Gly Ser Asn		

五、發明說明 (204)

385		390		395		400
Arg Arg Tyr Asp Met Val Phe Thr Asp Glu Glu Arg Cys Leu Gly Gly						
	405			410		415
Asn Ile Gly Arg Arg Thr Thr Arg Ala Trp Phe Asp Gln Lys Asn Lys						
	420		425			430
Asp Ile Thr Arg Glu Leu Asn Ile Val Arg Pro Ser Gly Trp Thr Ser						
	435		440			445
Ala Ser Ser Gly Leu Leu Val Gly Ala Asn Ile Met Met Asp Glu Asn						
	450		455			460
Lys Asn Pro Asp Ala Gln Pro Ser Lys Leu Gly Thr Asn Ile Gln Arg						
	465		470		475	480
Val Ile Leu Val Leu Ser Asp Gly Glu Asp Asn Trp Pro Thr Tyr Ser						
	485		490			495
Thr Leu Thr Thr Leu Leu Asn Asn Gly Met Cys Asp Lys Ile Arg Glu						
	500		505			510
Gln Leu Gly Lys Leu Gln Asp Pro Asn Leu Arg Glu Leu Pro Gly Arg						
	515		520			525
Ile Ala Phe Val Ala Phe Gly Tyr Ser Pro Pro Ala Asn Gln Val Ala						
	530		535			540
Ala Trp Lys Lys Cys Val Gly Asp Gln Tyr Tyr Thr Ala Tyr Ser Lys						
	545		550		555	560
Glu Glu Leu Leu Asp Ser Phe Lys Gln Ile Ile Gly Phe Glu Glu Glu						
	565		570			575
Val Gly Arg Ser Ser Ser His Lys Pro Lys Phe						
	580		585			

<210> 60
<211> 5798
<212> DNA
<213> 敗血性巴斯德桿菌

<220>
<221> CDS
<222> (698) .. (1468)

<220>
<223> 未知的D2

<400> 60
gtcgcacaaga ataaaacgaa acagcaaata gaattagaat tactacttat taacaataat 60
ccttttttaa agattctagc tgttttagat aaaaatatac gtgtgaagct tttggtcaca 120
ttattattat caggcctata ttatttatat gcagtaaaaa acgattcaaa ttttgtcata 180
ggtttatcta ttattttagt ttttattatt gtcattccag ggattttgac aaatgctatt 240
ttgaaagcta aggtgaaaaa aatcatggta gatttaccag gttttattga cttagttgca 300
gtaaatgttc aaacagggat taqtattgat gcggccttaa aacaactcc aatccatttt 360

五、發明說明 (205)

aagaaactta atccagatct tacttatgtg atgttaagga ttattagaaa atctgaactt 420
acgggattat cacaagcggt acaggatctt tcgatctcat tgccaacaac agaaataaga 480
atgcttttgta ctgcttttaca acagagttaa aatttttggtt cttcaattta ttctcactta 540
attcagttgt ctgcagatat cagggagata caattattaa tcattgagga aaagttaggt 600
acattatcag ctaaaatgag tatcccatgt attttgttta ttatgttccc aataatcatt 660
ttaattctag caccaggtat aatgagggtta ttcccaa atg ttt ttt aaa ttt acc 715
Met Phe Phe Lys Phe Thr
1 5
aag aaa atc gtt ttt gtt agt tta gct tta tct gtc gtt ggt tgt tct 763
Lys Lys Ile Val Phe Val Ser Leu Ala Leu Ser Val Val Gly Cys Ser
10 15 20
acc cat tct cag caa ggc atg aca cag aaa agt atg tca tct gaa aca 811
Thr His Ser Gln Gln Gly Met Thr Gln Lys Ser Met Ser Ser Glu Thr
25 30 35
ata acg gca aaa gag act tta tat gaa agt acg caa aat tat tcg gca 859
Ile Thr Ala Lys Glu Thr Leu Tyr Glu Ser Thr Gln Asn Tyr Ser Ala
40 45 50
ctc att tca ctg tat cgc gat gtg ttg aaa gcc aaa gaa gat cct tca 907
Leu Ile Ser Leu Tyr Arg Asp Val Leu Lys Ala Lys Glu Asp Pro Ser
55 60 65 70
ata cgc tat aaa tta gcg aag aca tac tat cag cga ggt gac agc aaa 955
Ile Arg Tyr Lys Leu Ala Lys Thr Tyr Tyr Gln Arg Gly Asp Ser Lys
75 80 85
tct tct tta ctt tat tta acg cca tta ctg aat gat aat acg aag ctt 1003
Ser Ser Leu Leu Tyr Leu Thr Pro Leu Leu Asn Asp Asn Thr Lys Leu
90 95 100
gct aca caa gcg aaa ata tta cag ata aaa aat cta att caa tta aat 1051
Ala Thr Gln Ala Lys Ile Leu Gln Ile Lys Asn Leu Ile Gln Leu Asn
105 110 115
aat ttc caa gaa gca att tct gtc gca aat gaa ctc tta tta aaa tca 1099
Asn Phe Gln Glu Ala Ile Ser Val Ala Asn Glu Leu Leu Leu Lys Ser
120 125 130
cct aat gaa gga gaa gta tat aat tta aga ggt atc gct tat gcg caa 1147
Pro Asn Glu Gly Glu Val Tyr Asn Leu Arg Gly Ile Ala Tyr Ala Gln
135 140 145 150
aat ggg aat ttg gtg aat gcc cga aat gat atc aat aaa gca aga gag 1195
Asn Gly Asn Leu Val Asn Ala Arg Asn Asp Ile Asn Lys Ala Arg Glu
155 160 165
ttc ttt att aat gat aat gtt gct att aat aat tta gcc atg cta aat 1243
Phe Phe Ile Asn Asp Asn Val Ala Ile Asn Asn Leu Ala Met Leu Asn
170 175 180
att att aat ggc gat ttt aat aat gct gtt tct tta ctg ttg cca caa 1291
Ile Ile Asn Gly Asp Phe Asn Asn Ala Val Ser Leu Leu Pro Gln
185 190 195
tat tta aat ggc gtt aag aat tct cga ttg att cat aat ctt gtt ttt 1339

五、發明說明 (206)

Tyr Leu Asn Gly Val Lys Asn Ser Arg Leu Ile His Asn Leu Val Phe
200 205 210

gct tta gtt aaa aat ggt gat ctt gat tat gca aaa gat atc att gtt 1387
Ala Leu Val Lys Asn Gly Asp Leu Asp Tyr Ala Lys Asp Ile Ile Val
215 220 225 230

aaa gag cgt tta aat act tca cca gat gat tta att aat gca ttg aaa 1435
Lys Glu Arg Leu Asn Thr Ser Pro Asp Asp Leu Ile Asn Ala Leu Lys
235 240 245

aaa act aca cat gta tca aaa ggt gta act cgg taacactaag gatttgatat 1488
Lys Thr Thr His Val Ser Lys Gly Val Thr Arg
250 255

gaaaaagtgt ctatcaaata taaaaggaac ctcgtaatt gaatttgctt tgacgatagc 1548
gttctattta tttgtgtga tgtttatttt tgaattttgt cgatttagcgg ttgcgacagc 1608
ttattgggat tttagctataa cggaaagtgt cagaattgag aagaatgaac aagcaatttc 1668
tggaatttat gaagaagcat ttaggaaagc tcttacaag caaaaaaat tccatgatga 1728
atcgacaatt ggatatttgg cgttggttaga agataataaa tttgatgtaa aagtccaata 1788
tgtggattgt gataaagaaa cggaaatgtat taaaaatctt ctgcttaata aatttcgcca 1848
accacaaaaa aatcataaag gagagttaat ctctcctacg gggagtcgag cgacttttagc 1908
acaatattct ttaacttata aatataagtt tatggtgccc ttagtattta ttcttgagtc 1968
ttggtctcaa gtagtgctga accgtgaatt tgtgtgtga caggaaattg agcgttctca 2028
atztatgtta ggagcaaaac caagttctct tgggacgaat ccatagaaaa ttactcatt 2088
atctcgagct atatatgaaa gagtcagggt tagttaaatt caagcatttt tggaaaaata 2148
aaaagggcgc agtgacgata gagttccttt ttatgtcaat gtttctgatt gtgctatttg 2208
catttctctt cgatttagta atgttacgtt ctacattagg caagtttagat aatgcctcat 2268
atacattagt tagtattctc cgtgaacgta cacagttgta cgatagagtt gcacaaatta 2328
atattgatga tcataagcaa tttgaaaagc ttgctaagaa actgatttat ggtgatcaga 2388
atagtaataa aaggatcgat gttgttttag aatattgggc acaagacggt tctggacgga 2448
ggattccaaa tatcattggc gattgtacgc cttacaaaaa actttctgat ttatcctatt 2508
tatctcctcg ctgagaactc aataatgaaa gaaaaatacc gctttatcaa attactcttt 2568
gtgttgaaac tcagggttg tttgaaacaa tattactgga taagtctgag cgttcaacgg 2628
ggctgattag atcatcgtca atgtcagtat cacgataaat tatcgttagg gaactttatg 2688
aaaaaacttt atttaattcg ttcttgctat gattcagtc gaaaatttta tgagaatgag 2748
ctaggtgttt atacagtaat gactgcatta cttagctttc cattattagt tttgattgga 2808
tttacgggtg atggaactgg ggttggtgctt gataaagcac gtttagctca aggaatggat 2868
caagctgctt tagctttggt tgctgaaaac aatgactacc gagaaaataa aaaacatggg 2928

五、發明說明 (207)

gatgttaatc ggcaagtagt atcgccctcaa gacaaagcaa aatttggtgg taatgaattt 2988
atggcgaaac aagaaaagcg taatcaagag cttatccagg gtattgcca actttattta 3048
cgttcagaaa atgcgaatgc ttcacctgat gcaccaatca ctattgataa accttttcat 3108
tattcatgtg aggagttaga ttacctaca gctaagtatg atgcacgtcg taaacctatt 3168
gtttgtgaag tgcaagggtgg cgtcaatcgt aaattttggc ttctgtcag tgaatcgta 3228
gttagtgaag ataaactgaa aaaagatcga gttagactgg aaaccgatac cagttatgcg 3288
attaaagaaa aaggcatcgt gattcctgtg gagctaagc ttgtttcgga ttattctggt 3348
tcgatgaata gtcatttaca ggataaaaac ggtagatctc taggaaaagc taaaattact 3408
attttaagag aagtggttag tgaaatttcg aaaattttat tgccagaaga tgtagcgaa 3468
gggtgtgagcc ctttcaaccg tattggcttt acgacttttt ctggcggtgt tagacaacgg 3528
gatgtcactg aaggctgtgt gcttccatat gaaggaaaaa taccacaaac ttctcgaaaa 3588
ttaactattc gttattggat tacgggtaat aatacacctt ggaaatttaa tgctgggaga 3648
tgaggagaaa gtacagtgtc ttccaggag cattataaag gctattatga caaattccat 3708
ttttcaactt gtagaggctc agggagctct agaacttgct aaattgatgc aaatcctaag 3768
aaaattatgg attatgcact aaaaattaat gactggacga caattagaga attatttaat 3828
acttatatag atgtaagtgg gacgattgac caaatttccc agtttgatgg ttcaaacaga 3888
cgttatgata tgggtgtttac tgatgaagaa cgggtgtctg gcggaaatat tggtagaaga 3948
acaactcgag cttggtttga tcaaaaaaat aaagatatta caagagagtt gaatattgtt 4008
cgtccttctg gttggacttc tgcattctcg gggcttctg ttggagctaa tatcatgatg 4068
gacgagaata agaactctga tgcgcaacct tcgaaactcg ggacaaatat tcaacgtgtt 4128
atcttagtat tatctgatgg tgaagataac tggccaactt atagtacatt aacgactctt 4188
ttaaacaatg gtatgtgtga caaaattcga gaacaattgg gcaagttaca agatccaaat 4248
ttacgagagt taccaggaag aattgcgttt gttgcgtttg gctatagtcc accagcaaac 4308
caagttgccg cttggaaaaa atgtgtaggt gatcaatatt atacggctta ttcgaaagaa 4368
gagttgttag atagtttcaa acaaattatt ggatttgaag aagaggtggg gcgttcttca 4428
tttcataaac cgaaatttta agattgtcca aggataacgc taaaaaatct cttagcacag 4488
gctaagagat ttttttatgt gtttttcaaa ttttatctac tgggtgatttt aattcattac 4548
ataacataac tttttcgtga ataatacaga atagacaaca ataagaatta aaacgctcaa 4608
ggcatagagg cttagtcgaa caaactaagc tattttgcgc gattgattgg gatatagatg 4668
ttatttcaaa taagcaataa ccatgggtact gagaaagaag atgagtgccg taataaagta 4728
gaagcgattt ttcttttggc tgaaagggtg tgtagcctt ttctggctaa agaaaatagt 4788
agcaacqgca atataaaagg cqataaaag catcttctaa atgaaccatg ttgttacatt 4848

五、發明說明 (208)

ttgctgaaaa agaagaaata gcccaattcc cgaacagaac aacagcgtat cacttaagtg 4908
cggtaagatt ttttaatactt ttctgtctcg ccaatttttg cctgttaatt gcatcatgcc 4968
acggataata aatagactga ggctgagaaa ggcacaggca atgtgtagat aaataagata 5028
atatgccatc gatttttttc ctaagataaa gaaagcagta gcgaggctac tgctttaaaa 5088
taatatcgta tttagtgaat gaatttaact ttctgcgctt tcgaccgcac tttcgctcgc 5148
atcactctca atgtctcctt catcgacatc acaaacgagt tgtaatccaa ccagtgtttc 5208
actttcactt gttcggatga gacgtactcc ttgtgtattt cgaccgataa tattgatttc 5268
gtttacgcga gtacgtacta gcgtaccggc atcagtaatg agcataatth gatcgctttc 5328
ctcaacttgt gttgctgcaa cgactttacc gttacgctca ctactttta tcgagatcac 5388
gcctttgggtg ttacgtgatt tagttgggta ttccgctaatt tcagtacgtt taccataacc 5448
gttttgtgtg gcggttaaaa tggcgcttcc attttttggga ataacaagtg acacgacttt 5508
atcaatattg agatccaagg catcattagt attctcatca gagatctctt ccatatcgac 5568
cgacttttca tcatccgaca aatcattcgt taacgccagt ttaataaccgc gtacacctgt 5628
tgctgcacgc cccatggcac gcacagcatt ttcactaaag cgaactacac gtccttgtgc 5688
ggagaagagc atgatttcat tttgaccatc ggtgatatcc acaccgataa gttcgtcttc 5748
atcacgcaag ttgagtgcaa taatgcctgt tgaacgagga cgactgaatt 5798

<210> 61
<211> 257
<212> 蛋白質
<213> 敗血性巴斯德桿菌

<400> 61
Met Phe Phe Lys Phe Thr Lys Lys Ile Val Phe Val Ser Leu Ala Leu
1 5 10 15
Ser Val Val Gly Cys Ser Thr His Ser Gln Gln Gly Met Thr Gln Lys
20 25 30
Ser Met Ser Ser Glu Thr Ile Thr Ala Lys Glu Thr Leu Tyr Glu Ser
35 40 45
Thr Gln Asn Tyr Ser Ala Leu Ile Ser Leu Tyr Arg Asp Val Leu Lys
50 55 60
Ala Lys Glu Asp Pro Ser Ile Arg Tyr Lys Leu Ala Lys Thr Tyr Tyr
65 70 75 80
Gln Arg Gly Asp Ser Lys Ser Ser Leu Leu Tyr Leu Thr Pro Leu Leu
85 90 95
Asn Asp Asn Thr Lys Leu Ala Thr Gln Ala Lys Ile Leu Gln Ile Lys
100 105 110
Asn Leu Ile Gln Leu Asn Asn Phe Gln Glu Ala Ile Ser Val Ala Asn
115 120 125

五、發明說明 (209)

Glu Leu Leu Leu Lys Ser Pro Asn Glu Gly Glu Val Tyr Asn Leu Arg
130 135 140

Gly Ile Ala Tyr Ala Gln Asn Gly Asn Leu Val Asn Ala Arg Asn Asp
145 150 155 160

Ile Asn Lys Ala Arg Glu Phe Phe Ile Asn Asp Asn Val Ala Ile Asn
165 170 175

Asn Leu Ala Met Leu Asn Ile Ile Asn Gly Asp Phe Asn Asn Ala Val
180 185 190

Ser Leu Leu Leu Pro Gln Tyr Leu Asn Gly Val Lys Asn Ser Arg Leu
195 200 205

Ile His Asn Leu Val Phe Ala Leu Val Lys Asn Gly Asp Leu Asp Tyr
210 215 220

Ala Lys Asp Ile Ile Val Lys Glu Arg Leu Asn Thr Ser Pro Asp Asp
225 230 235 240

Leu Ile Asn Ala Leu Lys Lys Thr Thr His Val Ser Lys Gly Val Thr
245 250 255

Arg

<210> 62
<211> 1788
<212> DNA
<213> 敗血性巴斯德桿菌

<220>
<221> CDS
<222> (1) .. (600)

<220>
<223> 未知的K

<400> 62
gtc aac act ggg cta att cac agt aac ggt aat gcc aag ctc act ttt 48
Val Asn Thr Gly Leu Ile His Ser Asn Gly Asn Ala Lys Leu Thr Phe
1 5 10 15

aaa gat gac acc agt ttt gtg act gaa gga aat aac ttt atc aca gca 96
Lys Asp Asp Thr Ser Phe Val Thr Glu Gly Asn Asn Phe Ile Thr Ala
20 25 30

aaa gac aac tta gaa atc acg gca aaa aat gtt caa att gat caa gcg 144
Lys Asp Asn Leu Glu Ile Thr Ala Lys Asn Val Gln Ile Asp Gln Ala
35 40 45

aaa aat att caa tta aac gcg aat atc acg atc aat acc aag tct ggt 192
Lys Asn Ile Gln Leu Asn Ala Asn Ile Thr Ile Asn Thr Lys Ser Gly
50 55 60

ttt gtg aat tac ggt acc tta gca agt gct caa aat tta acg att aat 240
Phe Val Asn Tyr Gly Thr Leu Ala Ser Ala Gln Asn Leu Thr Ile Asn
65 70 75 80

acc gaa caa ggc agc att tat aac ata ggc ggt atc ttg ggg gcg ggt 288
Thr Glu Gln Gly Ser Ile Tyr Asn Ile Gly Gly Ile Leu Gly Ala Gly

五、發明說明 (210)

	85	90	95	
aaa agt ttg aat ctg agc gcg aaa aga gga gaa aac caa gga gga tat				336
Lys Ser Leu Asn Leu Ser Ala Lys Arg Gly Glu Asn Gln Gly Gly Tyr				
	100	105	110	
ctt att aat caa ggt aag agt cta ctc cat tct gaa ggc gcc atg aac				384
Leu Ile Asn Gln Gly Lys Ser Leu Leu His Ser Glu Gly Ala Met Asn				
	115	120	125	
ctc aca gcg gat cgc acg gtg tac aat tta ggg aat att ttt gct aaa				432
Leu Thr Ala Asp Arg Thr Val Tyr Asn Leu Gly Asn Ile Phe Ala Lys				
	130	135	140	
ggg gac gcg acg atc aat gca aac gcg tta att aat gat gtt act ctc				480
Gly Asp Ala Thr Ile Asn Ala Asn Ala Leu Ile Asn Asp Val Thr Leu				
	145	150	155	160
aca ggt cgt ctt gag tat caa gat ctg aaa aaa gat tat acg cgt tat				528
Thr Gly Arg Leu Glu Tyr Gln Asp Leu Lys Lys Asp Tyr Thr Arg Tyr				
	165	170	175	
tat cgt atc aat gaa acg gca aaa cat ggt tgg cat aat aac ttc tat				576
Tyr Arg Ile Asn Glu Thr Ala Lys His Gly Trp His Asn Asn Phe Tyr				
	180	185	190	
gaa tta aac gtc gac aga gtt tct tgatttgtgc atcaattttg taaccaccgg				630
Glu Leu Asn Val Asp Arg Val Ser				
	195	200		
ttaataaaac accagcaatt tcaacgccat tcatggcaga taatgccgct gcgacgatca				690
catcaggacg atccgcggaa gtgacaagta aacttccaac gcggaaatgt tccaccatat				750
tggtcaaatt acgtgcacag aaagtgatgc cacgaatgcg acgttcattg atcgcgcctt				810
catgaataat ggcagcacct aaatgttttg ctaaataaat ggcacgagtc gcaattaatt				870
ctgcgctcca aggaatacat gccaaagattt taattgggct tttctcaaat aaatgataaa				930
tctcagatac ttgattttgt gtgtgttgga aagaatcaaa aatttctgcc aagtcagggc				990
gagtacgacc agattcatca atcggcgcgcat taaatttatt gatcacaaca ccaagtaaat				1050
tagggttatt tttgctgcca aataatgagg ctgcggcttt gatgcgttct ttgagttctg				1110
ccggtgtttc cgtcgccggt gctgcaacaa gaatgatttc cgcatacaagt gcttgagcaa				1170
tttcatagtt aatgctattg gcataagaat gcttacgcgt agggattaaa cttccacca				1230
cgacaatttc attgtttttg gcgagttgtt gatgattttc aacaattttt tctagtagca				1290
catcagattg attttgaccg atgagtgatt cagctacact taacataaat ggttcactgg				1350
tttcaatggg ggtactgggt cgaataattg atgttgtgcg atcaatcata ttttcacctg				1410
agttcggctg agaaattggg ttcataaagc cgactttcgc ccttttttgc tccagtgcac				1470
gtgttaaacc taagctgaca ctggttaagc ctacaccagc actaatcggg ataaggataa				1530
ttgtacgtga cataataaac cctaatttgt tgataattta taaaaaaga aactgccgat				1590
gaatcggcag ttaattaatc tttaacgcgat gcaaaacgcg gcggatattt atcaataaac				1650

五、發明說明 (211)

aagttcttca ttcgttgga tcaccatggc aacaggcgta ttgtctgctg taatcacccc 1710
ttcatgacca aagcgagccg ctttgttttt atctgaatcc acttgataac cgaacagttt 1770
taaagtgttt aaggttga 1788

<210> 63
<211> 200
<212> 蛋白質
<213> 敗血性巴斯德桿菌

<400> 63
Val Asn Thr Gly Leu Ile His Ser Asn Gly Asn Ala Lys Leu Thr Phe
1 5 10 15
Lys Asp Asp Thr Ser Phe Val Thr Glu Gly Asn Asn Phe Ile Thr Ala
20 25 30
Lys Asp Asn Leu Glu Ile Thr Ala Lys Asn Val Gln Ile Asp Gln Ala
35 40 45
Lys Asn Ile Gln Leu Asn Ala Asn Ile Thr Ile Asn Thr Lys Ser Gly
50 55 60
Phe Val Asn Tyr Gly Thr Leu Ala Ser Ala Gln Asn Leu Thr Ile Asn
65 70 75 80
Thr Glu Gln Gly Ser Ile Tyr Asn Ile Gly Gly Ile Leu Gly Ala Gly
85 90 95
Lys Ser Leu Asn Leu Ser Ala Lys Arg Gly Glu Asn Gln Gly Gly Tyr
100 105 110
Leu Ile Asn Gln Gly Lys Ser Leu Leu His Ser Glu Gly Ala Met Asn
115 120 125
Leu Thr Ala Asp Arg Thr Val Tyr Asn Leu Gly Asn Ile Phe Ala Lys
130 135 140
Gly Asp Ala Thr Ile Asn Ala Asn Ala Leu Ile Asn Asp Val Thr Leu
145 150 155 160
Thr Gly Arg Leu Glu Tyr Gln Asp Leu Lys Lys Asp Tyr Thr Arg Tyr
165 170 175
Tyr Arg Ile Asn Glu Thr Ala Lys His Gly Trp His Asn Asn Phe Tyr
180 185 190
Glu Leu Asn Val Asp Arg Val Ser
195 200

<210> 64
<211> 278
<212> DNA
<213> 敗血性巴斯德桿菌

<220>
<221> CDS
<222> (108) .. (278)
<220>

五、發明說明 (212)

<223> 未知的O

<400> 64

```
gaattccaac caaatctcac accagagcaa gaacgctaca tagtggaatg gttggcagaa 60
cattacccaa atggaaataa accttaacca tagcaagaga gaagaaa atg aaa att 116
                                     Met Lys Ile
                                     1
act att aca cga aat cat cca gaa gta ttt caa gaa tcc gct cgt tta 164
Thr Ile Thr Arg Asn His Pro Glu Val Phe Gln Glu Ser Ala Arg Leu
      5                                10                                15
gta gcc gaa aag ttc att aaa gcc caa tgt gta gaa gca tta aca ttg 212
Val Ala Glu Lys Phe Ile Lys Ala Gln Cys Val Glu Ala Leu Thr Leu
      20                                25                                30                                35
gct ttg att gag ggt gtc gag cac ttt gtg ctg gaa ggt gag gag gaa 260
Ala Leu Ile Glu Gly Val Glu His Phe Val Leu Glu Gly Glu Glu Glu
      40                                45                                50
agc aaa agg gga cat agt 278
Ser Lys Arg Gly His Ser
      55
```

<210> 65

<211> 57

<212> 蛋白質

<213> 敗血性巴斯德桿菌

<400> 65

```
Met Lys Ile Thr Ile Thr Arg Asn His Pro Glu Val Phe Gln Glu Ser
      1                                5                                10                                15
Ala Arg Leu Val Ala Glu Lys Phe Ile Lys Ala Gln Cys Val Glu Ala
      20                                25                                30
Leu Thr Leu Ala Leu Ile Glu Gly Val Glu His Phe Val Leu Glu Gly
      35                                40                                45
Glu Glu Glu Ser Lys Arg Gly His Ser
      50                                55
```

<210> 66

<211> 1020

<212> DNA

<213> 敗血性巴斯德桿菌

<220>

<221> CDS

<222> (1) .. (597)

<220>

<223> 未知的P

<400> 66

```
gtc aac aca tca aaa gtt gag att gac tat gcc gtc act cgt gcg gcg 48
Val Asn Thr Ser Lys Val Glu Ile Asp Tyr Ala Val Thr Arg Ala Ala
      1                                5                                10                                15
gca atg cgt gca tat ctt gat aaa gaa cag ggc tgg cat acg tct att 96
```

五、發明說明 (213)

Ala Met Arg Ala Tyr Leu Asp Lys Glu Gln Gly Trp His Thr Ser Ile	
20 25 30	
tca aat aaa ggc att aat ggc gtg agc ggt gtc aca caa cca ctc tat	144
Ser Asn Lys Gly Ile Asn Gly Val Ser Gly Val Thr Gln Pro Leu Tyr	
35 40 45	
ttt gac att aac gac agc tcg act gat gtg aac tat ctc aat gaa caa	192
Phe Asp Ile Asn Asp Ser Ser Thr Asp Val Asn Tyr Leu Asn Glu Gln	
50 55 60	
ggc atc acg tgt tgc gtg aat cat aat ggc ttt cgt ttt tgg ggc tta	240
Gly Ile Thr Cys Cys Val Asn His Asn Gly Phe Arg Phe Trp Gly Leu	
65 70 75 80	
cgc acg act gca gaa gat cca tta ttc aag ttt gaa gtg tac acc cgc	288
Arg Thr Thr Ala Glu Asp Pro Leu Phe Lys Phe Glu Val Tyr Thr Arg	
85 90 95	
act gca caa atc tta aaa gat acg att gca ggg gcg ttt gat tgg gca	336
Thr Ala Gln Ile Leu Lys Asp Thr Ile Ala Gly Ala Phe Asp Trp Ala	
100 105 110	
gtg gat aaa gat att tct gtc acg cta gtg aaa gat att att gaa gca	384
Val Asp Lys Asp Ile Ser Val Thr Leu Val Lys Asp Ile Ile Glu Ala	
115 120 125	
atc aat gcg aag tgg cgt gat tac acc aca aaa ggc tac tta att ggc	432
Ile Asn Ala Lys Trp Arg Asp Tyr Thr Thr Lys Gly Tyr Leu Ile Gly	
130 135 140	
ggc aaa gcg tgg ctt aat aaa gag ctt aac agt gca acg aat tta aaa	480
Gly Lys Ala Trp Leu Asn Lys Glu Leu Asn Ser Ala Thr Asn Leu Lys	
145 150 155 160	
gat gcg aag ttg ttg atc tct tat gat tat cac cca gta cca ccg ctc	528
Asp Ala Lys Leu Leu Ile Ser Tyr Asp Tyr His Pro Val Pro Pro Leu	
165 170 175	
gaa cag cta ggc ttt aat cag tac att tct gat gaa tac ctt gtt gat	576
Glu Gln Leu Gly Phe Asn Gln Tyr Ile Ser Asp Glu Tyr Leu Val Asp	
180 185 190	
ttt tca aat cgt tta gca tcg taaggggtag aaaatggctt taccacgcaa	627
Phe Ser Asn Arg Leu Ala Ser	
195	
acttaaattg atgaatttaa tcatcgacgg taacaaatat ctggcggaag tcacggaagt	687
gactcaacca aaattagcaa tgaaaatcga agaatttcgc gcgggcggtg tgattgggtc	747
ggcggatgtc aatctcgggc ttgaaaagct cgaagcgga tttaaagccg gtggctacat	807
ggcgaatta attaaaaat tcggcggggc aatcaacggc attccattgc gttttcttgg	867
ctcatatcag cgtgatgaca cagaagaagt cacatctgtt gagcttgtga tgcaaggctg	927
atttactgaa attgacagcg gaaacagcaa agtgggcgat gacactgaac aaacattcaa	987
agtgccttta acgtattaca aaatcattgt tga	1020

<210> 67

五、發明說明 (214)

<211> 199

<212> 蛋白質

<213> 敗血性巴斯德桿菌

<400> 67

Val Asn Thr Ser Lys Val Glu Ile Asp Tyr Ala Val Thr Arg Ala Ala
1 5 10 15

Ala Met Arg Ala Tyr Leu Asp Lys Glu Gln Gly Trp His Thr Ser Ile
20 25 30

Ser Asn Lys Gly Ile Asn Gly Val Ser Gly Val Thr Gln Pro Leu Tyr
35 40 45

Phe Asp Ile Asn Asp Ser Ser Thr Asp Val Asn Tyr Leu Asn Glu Gln
50 55 60

Gly Ile Thr Cys Cys Val Asn His Asn Gly Phe Arg Phe Trp Gly Leu
65 70 75 80

Arg Thr Thr Ala Glu Asp Pro Leu Phe Lys Phe Glu Val Tyr Thr Arg
85 90 95

Thr Ala Gln Ile Leu Lys Asp Thr Ile Ala Gly Ala Phe Asp Trp Ala
100 105 110

Val Asp Lys Asp Ile Ser Val Thr Leu Val Lys Asp Ile Ile Glu Ala
115 120 125

Ile Asn Ala Lys Trp Arg Asp Tyr Thr Thr Lys Gly Tyr Leu Ile Gly
130 135 140

Gly Lys Ala Trp Leu Asn Lys Glu Leu Asn Ser Ala Thr Asn Leu Lys
145 150 155 160

Asp Ala Lys Leu Leu Ile Ser Tyr Asp Tyr His Pro Val Pro Pro Leu
165 170 175

Glu Gln Leu Gly Phe Asn Gln Tyr Ile Ser Asp Glu Tyr Leu Val Asp
180 185 190

Phe Ser Asn Arg Leu Ala Ser
195

<210> 68

<211> 2584

<212> DNA

<213> 敗血性巴斯德桿菌

<220>

<221> CDS

<222> (1042) .. (2286)

<220>

<223> xylA

<400> 68

gtcgcaccagc ttagatcttg cgacgggggtt aattctctct atcgtttcaa tcattgcgtt 60

taccattatt ttatggaatc tctctggacc gatgaccatt gccaatattg aaattcctca 120

cgcaatgacg tttctgctc ttatttacct accttttacc agtattctgg catttaaaat 180

五、發明說明 (215)

cggtcgcccg	ttaattcagc	tcaattttgc	caatgaacgc	ttaaaccgcca	actaccgtta	240										
ttcacttatc	cgtctgaaag	aatatgctga	aagcattgct	ttttatcgtg	gtgaaaaaat	300										
ggaaaaacgt	ctattgacca	cacaatttaa	tcagggtgatt	gataacgttt	ggcaagtaat	360										
ctaccgcacc	ttgaaattat	ccggttttta	cttaatcatt	acgcagattt	cgggtggtttt	420										
cccgtgggtg	attcaagtga	cacgtrattt	tcgtcgacaa	taggtgcata	tgaggggtgt	480										
agaatagcga	tactttctgt	tggaaaagta	aactctttta	tataaataga	aatcgcttga	540										
atgattctcg	ggcaaaaaat	aatgtactca	tttgcgatct	catactgata	atggcggaagt	600										
aaatatcttc	ttacaatatt	atggtaatta	tcaggtaata	ccgtatagcc	atagattcca	660										
gttctatttt	gttttgctaa	ataattgatg	agcatttgag	gcgcgagtaa	atccatatct	720										
gcaacagaca	ttgaaatcat	atccttgccg	tattttacgag	taattgccca	tttagcacta	780										
tgacaatctg	atctatcagt	aaaaacatca	aacaaattat	ccgtcataca	tgttctccaa	840										
tattggattt	atataaactt	tagaacttga	ggtagattgt	tgggaattgt	aaatctggta	900										
tttctattac	gttttttctt	ttttgtgata	taagccacaa	taaccaataa	tcttaattgt	960										
taagtgaaat	aacgtaattg	atcctcccat	tgttttacta	aattatgtct	ctgaaactta	1020										
tttgttcagg	agaaatcatt	t	atg	tcc	act	tac	ttc	gac	aaa	att	gaa	aaa	1071			
			Met	Ser	Thr	Tyr	Phe	Asp	Lys	Ile	Glu	Lys				
			1					5				10				
gta	aat	tat	gaa	ggg	gta	act	tca	tct	aat	ccg	ttt	gca	tat	aag	cat	1119
Val	Asn	Tyr	Glu	Gly	Val	Thr	Ser	Ser	Asn	Pro	Phe	Ala	Tyr	Lys	His	
				15					20					25		
tat	gat	gct	aat	caa	gtt	att	tta	ggg	aag	acg	atg	gct	gaa	cac	tta	1167
Tyr	Asp	Ala	Asn	Gln	Val	Ile	Leu	Gly	Lys	Thr	Met	Ala	Glu	His	Leu	
				30				35					40			
cgt	tta	gcc	gtc	tgt	tat	tgg	cac	act	ttc	tgt	tgg	aca	ggg	aat	gat	1215
Arg	Leu	Ala	Val	Cys	Tyr	Trp	His	Thr	Phe	Cys	Trp	Thr	Gly	Asn	Asp	
				45			50					55				
atg	ttc	ggg	gtc	ggg	tct	ttc	gat	cgt	tgt	tgg	cag	aag	gcg	agt	gat	1263
Met	Phe	Gly	Val	Gly	Ser	Phe	Asp	Arg	Cys	Trp	Gln	Lys	Ala	Ser	Asp	
				60			65				70					
tca	tta	gca	ggg	gca	aaa	caa	aaa	gca	gat	atc	gct	ttt	gaa	ttt	ttc	1311
Ser	Leu	Ala	Gly	Ala	Lys	Gln	Lys	Ala	Asp	Ile	Ala	Phe	Glu	Phe	Phe	
					80					85					90	
agt	aaa	tta	ggc	ata	cct	tat	tat	tgt	ttc	cat	gat	gtt	gat	gtt	gcg	1359
Ser	Lys	Leu	Gly	Ile	Pro	Tyr	Tyr	Cys	Phe	His	Asp	Val	Asp	Val	Ala	
				95					100					105		
cca	gaa	ggg	cat	tca	ttt	aaa	gaa	tat	ttg	tcg	aac	ttt	aat	aca	atg	1407
Pro	Glu	Gly	His	Ser	Phe	Lys	Glu	Tyr	Leu	Ser	Asn	Phe	Asn	Thr	Met	
				110				115					120			
atc	gat	gtt	tta	gcg	cag	aaa	caa	gaa	gaa	aca	ggc	gtc	aaa	ttg	ttg	1455
Ile	Asp	Val	Leu	Ala	Gln	Lys	Gln	Glu	Glu	Thr	Gly	Val	Lys	Leu	Leu	
				125			130					135				

五、發明說明 (216)

tgg ggg act gca aat tgt ttt aca cac cct cgt tat atg tct ggt gct	1503
Trp Gly Thr Ala Asn Cys Phe Thr His Pro Arg Tyr Met Ser Gly Ala	
140 145 150	
gca aca aat ccg aat cca gaa att ttt gct tgg gct gct gca caa gta	1551
Ala Thr Asn Pro Asn Pro Glu Ile Phe Ala Trp Ala Ala Ala Gln Val	
155 160 165 170	
ttt act gcc atg ggg gca act cag cgt tta ggt ggt gaa aat tat gtt	1599
Phe Thr Ala Met Gly Ala Thr Gln Arg Leu Gly Gly Glu Asn Tyr Val	
175 180 185	
ttg tgg gga gga cgt gaa gga tat gaa acg tta tta aat acc aat tta	1647
Leu Trp Gly Gly Arg Glu Gly Tyr Glu Thr Leu Leu Asn Thr Asn Leu	
190 195 200	
aaa cag gag cga gag caa att gga cgt ttc atg caa atg gtg gtt gag	1695
Lys Gln Glu Arg Glu Gln Ile Gly Arg Phe Met Gln Met Val Val Glu	
205 210 215	
cat aaa tat aaa atc ggt ttt aac ggg act ttg ctg att gaa cca aag	1743
His Lys Tyr Lys Ile Gly Phe Asn Gly Thr Leu Leu Ile Glu Pro Lys	
220 225 230	
cca caa gag cca acg aaa cat caa tat gac tat gat gtg gcg acc gtt	1791
Pro Gln Glu Pro Thr Lys His Gln Tyr Asp Tyr Asp Val Ala Thr Val	
235 240 245 250	
tat ggc ttt tta aag cag ttt ggt tta gaa aaa gaa att aaa gtg aat	1839
Tyr Gly Phe Leu Lys Gln Phe Gly Leu Glu Lys Glu Ile Lys Val Asn	
255 260 265	
att gaa gct aat cac gca aca tta gct gga cac act ttc cag cat gaa	1887
Ile Glu Ala Asn His Ala Thr Leu Ala Gly His Thr Phe Gln His Glu	
270 275 280	
gtc gcc atg gct aca gcg tta gat att ttt ggt tct att gat gca aat	1935
Val Ala Met Ala Thr Ala Leu Asp Ile Phe Gly Ser Ile Asp Ala Asn	
285 290 295	
cgt ggt gat cca caa tta ggt tgg gat acc gat caa ttc cct aat agc	1983
Arg Gly Asp Pro Gln Leu Gly Trp Asp Thr Asp Gln Phe Pro Asn Ser	
300 305 310	
gta gaa gaa aat act ttg gtc ata tat gaa att ctc aaa gca ggg ggc	2031
Val Glu Glu Asn Thr Leu Val Ile Tyr Glu Ile Leu Lys Ala Gly Gly	
315 320 325 330	
ttt aca acc ggt ggt ttt aat ttt gat gct aaa atc cgt cgg cag agt	2079
Phe Thr Thr Gly Gly Phe Asn Phe Asp Ala Lys Ile Arg Arg Gln Ser	
335 340 345	
acg gat cct tac gat tta ttt cat gga cat att ggc gcg att gat gta	2127
Thr Asp Pro Tyr Asp Leu Phe His Gly His Ile Gly Ala Ile Asp Val	
350 355 360	
ctt gcc tta tca cta aaa tgt gcg gcg aaa atg ctc gaa gag caa gct	2175
Leu Ala Leu Ser Leu Lys Cys Ala Ala Lys Met Leu Glu Glu Gln Ala	
365 370 375	
tta caa aaa gtc gtc aat caa cgt tat gct ggt tgg aca tca tca ctt	2223
Leu Gln Lys Val Val Asn Gln Arg Tyr Ala Gly Trp Thr Ser Ser Leu	
380 385 390	

五、發明說明 (217)

ggc caa ctt gtt caa atc cgg tcc tac cac gcg tgt ctg caa tac aga 2271
Gly Gln Leu Val Gln Ile Arg Ser Tyr His Ala Cys Leu Gln Tyr Arg
335 400 405 410

cta aca aaa gtg ctt taaaacgttc cggcttacgc cagacatcta gacgattgaa 2326
Leu Thr Lys Val Leu
415

taatttcaat attgtctccg cacgtaattc aaaggctttg tgtatgtgcg aatgatattc 2386

acaacaaagt tctgcaaaat cttgaattgc gtgaggtaat ttaaagcgt gacataagcg 2446

tcttgcggc atgacaccag ctttttcatg tccataatga tgtggcaata tttcttttgg 2506

tgtaaggct tttcctaaat catgacaaat tgcagcaaaa cgtaccgcac ttttgtcact 2566

gtccgtgttt tctgtcga 2584

<210> 69

<211> 415

<212> 蛋白質

<213> 敗血性巴斯德桿菌

<400> 69

Met Ser Thr Tyr Phe Asp Lys Ile Glu Lys Val Asn Tyr Glu Gly Val
1 5 10 15

Thr Ser Ser Asn Pro Phe Ala Tyr Lys His Tyr Asp Ala Asn Gln Val
20 25 30

Ile Leu Gly Lys Thr Met Ala Glu His Leu Arg Leu Ala Val Cys Tyr
35 40 45

Trp His Thr Phe Cys Trp Thr Gly Asn Asp Met Phe Gly Val Gly Ser
50 55 60

Phe Asp Arg Cys Trp Gln Lys Ala Ser Asp Ser Leu Ala Gly Ala Lys
65 70 75 80

Gln Lys Ala Asp Ile Ala Phe Glu Phe Phe Ser Lys Leu Gly Ile Pro
85 90 95

Tyr Tyr Cys Phe His Asp Val Asp Val Ala Pro Glu Gly His Ser Phe
100 105 110

Lys Glu Tyr Leu Ser Asn Phe Asn Thr Met Ile Asp Val Leu Ala Gln
115 120 125

Lys Gln Glu Glu Thr Gly Val Lys Leu Leu Trp Gly Thr Ala Asn Cys
130 135 140

Phe Thr His Pro Arg Tyr Met Ser Gly Ala Ala Thr Asn Pro Asn Pro
145 150 155 160

Glu Ile Phe Ala Trp Ala Ala Ala Gln Val Phe Thr Ala Met Gly Ala
165 170 175

Thr Gln Arg Leu Gly Gly Glu Asn Tyr Val Leu Trp Gly Gly Arg Glu
180 185 190

Gly Tyr Glu Thr Leu Leu Asn Thr Asn Leu Lys Gln Glu Arg Glu Gln
195 200 205

五、發明說明 (218)

Ile Gly Arg Phe Met Gln Met Val Val Glu His Lys Tyr Lys Ile Gly
210 215 220

Phe Asn Gly Thr Leu Leu Ile Glu Pro Lys Pro Gln Glu Pro Thr Lys
225 230 235 240

His Gln Tyr Asp Tyr Asp Val Ala Thr Val Tyr Gly Phe Leu Lys Gln
245 250 255

Phe Gly Leu Glu Lys Glu Ile Lys Val Asn Ile Glu Ala Asn His Ala
260 265 270

Thr Leu Ala Gly His Thr Phe Gln His Glu Val Ala Met Ala Thr Ala
275 280 285

Leu Asp Ile Phe Gly Ser Ile Asp Ala Asn Arg Gly Asp Pro Gln Leu
290 295 300

Gly Trp Asp Thr Asp Gln Phe Pro Asn Ser Val Glu Glu Asn Thr Leu
305 310 315 320

Val Ile Tyr Glu Ile Leu Lys Ala Gly Gly Phe Thr Thr Gly Gly Phe
325 330 335

Asn Phe Asp Ala Lys Ile Arg Arg Gln Ser Thr Asp Pro Tyr Asp Leu
340 345 350

Phe His Gly His Ile Gly Ala Ile Asp Val Leu Ala Leu Ser Leu Lys
355 360 365

Cys Ala Ala Lys Met Leu Glu Glu Gln Ala Leu Gln Lys Val Val Asn
370 375 380

Gln Arg Tyr Ala Gly Trp Thr Ser Ser Leu Gly Gln Leu Val Gln Ile
385 390 395 400

Arg Ser Tyr His Ala Cys Leu Gln Tyr Arg Leu Thr Lys Val Leu
405 410 415

<210> 70
<211> 3501
<212> DNA
<213> 敗血性巴斯德桿菌

<220>
<221> CDS
<222> (298) .. (1905)

<220>
<223> yabk

<400> 70
gaattcagagg aagggggcgt attacaaatt gaaacggctg cacgtgtagc acaacatgat 60
aatgcctgtg cggatcattt ccttgccctt ttacttcac cagaagcaca agggcattta 120
gtcaagaata atgtgatgtt accggtgatt aataccaata ttgaaccgca ctttgatgcc 180
cttagagcca cccaaatgaa caccgaaagt ctcgatacct caaaagtgaa tgccgaacaa 240
gtcaaaaaat ggattgctgt ttggcaaacg accctaacc aataattgtt tgccttg 297

五、發明說明 (219)

atg ttt aag cga ttt cgt gca ttc aca tac cgt ccc gcc agt tat ctt	345
Met Phe Lys Arg Phe Arg Ala Phe Thr Tyr Arg Pro Ala Ser Tyr Leu	
1 5 10 15	
ggc ggg atg ttg gtg att gtc ttt ctg agc gct ttt tat gcg ttc gcc	393
Gly Gly Met Leu Val Ile Val Phe Leu Ser Ala Phe Tyr Ala Phe Ala	
20 25 30	
tta ggg gcg gtt ttt tcg ctc cct ttt gcg cgc agt tgg aca gcg ttg	441
Leu Gly Ala Val Phe Ser Leu Pro Phe Ala Arg Ser Trp Thr Ala Leu	
35 40 45	
ttg agt gat cag tat tta caa cac gtg atc atc ttt agc ttt tgg caa	489
Leu Ser Asp Gln Tyr Leu Gln His Val Ile Ile Phe Ser Phe Trp Gln	
50 55 60	
gcc ttt ctg tcg gcg gta ctt gcg gtc ctc ttt ggt ggc att gta gca	537
Ala Phe Leu Ser Ala Val Leu Ala Val Leu Phe Gly Gly Ile Val Ala	
65 70 75 80	
cga gcc ttt ttt tat caa ccg ttt gtg ggc aag aaa ctg atc ctc aaa	585
Arg Ala Phe Phe Tyr Gln Pro Phe Val Gly Lys Lys Leu Ile Leu Lys	
85 90 95	
tta ttt tca ctg act ttt gtg tta cct gcc tta gtg gcg att ttt ggt	633
Leu Phe Ser Leu Thr Phe Val Leu Pro Ala Leu Val Ala Ile Phe Gly	
100 105 110	
tta tta ggc gtg tat ggc gct tct ggc tgg tta gcg atg tta agc cag	681
Leu Leu Gly Val Tyr Gly Ala Ser Gly Trp Leu Ala Met Leu Ser Gln	
115 120 125	
ttt ttc gct tgg gat tgg act cct aat att tac ggc tta aca ggt att	729
Phe Phe Ala Trp Asp Trp Thr Pro Asn Ile Tyr Gly Leu Thr Gly Ile	
130 135 140	
tta ctg gcg cat ctt ttt ttt aat gtc cca tta gct tgt cgc ctg ttt	777
Leu Leu Ala His Leu Phe Phe Asn Val Pro Leu Ala Cys Arg Leu Phe	
145 150 155 160	
tta caa ggt ttg caa gca att ccg gtg caa caa cgt cag ctc gcg gca	825
Leu Gln Gly Leu Gln Ala Ile Pro Val Gln Gln Arg Gln Leu Ala Ala	
165 170 175	
caa ctc aat tta cgt ggt tgg cat ttt ata cgt ctg att gag tgg ccc	873
Gln Leu Asn Leu Arg Gly Trp His Phe Ile Arg Leu Ile Glu Trp Pro	
180 185 190	
tat tta cgc cag caa ttg tta cct gca ttt act ttg att ttc atg ctg	921
Tyr Leu Arg Gln Gln Leu Leu Pro Ala Phe Thr Leu Ile Phe Met Leu	
195 200 205	
tgt ttt acc agt ttt gcg att gtg ctc act tta ggt ggc gga ccg aaa	969
Cys Phe Thr Ser Phe Ala Ile Val Leu Thr Leu Gly Gly Gly Pro Lys	
210 215 220	
tat acc acg ttg gaa gtg gct atc tat caa gcg att tta ttt gag ttt	1017
Tyr Thr Thr Leu Glu Val Ala Ile Tyr Gln Ala Ile Leu Phe Glu Phe	
225 230 235 240	
gat gta ccg aaa gcc ggc tta ttt gcg tta tta caa ttt gtt ttt tgt	1065
Asp Val Pro Lys Ala Gly Leu Phe Ala Leu Leu Gln Phe Val Phe Cys	
245 250 255	

五、發明說明 (220)

ttt ctg tta ttc acg ctg agt agc ttt ttt tct cca gcc ccc gcc acg	1113
Phe Leu Leu Phe Thr Leu Ser Ser Phe Phe Ser Pro Ala Pro Ala Thr	
260 265 270	
aca tta cac agt caa cct act tgg ttt gcg ccc caa tcg tat tgg gtt	1161
Thr Leu His Ser Gln Pro Thr Trp Phe Ala Pro Gln Ser Tyr Trp Val	
275 280 285	
aaa tta tgg caa cgt atg atc att gtg tgt gcg aca gta ttt atc tta	1209
Lys Leu Trp Gln Arg Met Ile Ile Val Cys Ala Thr Val Phe Ile Leu	
290 295 300	
tta ccg cta ctc aat acg cta gtt tct gct ttg ctt tcg tct cag ttt	1257
Leu Pro Leu Leu Asn Thr Leu Val Ser Ala Leu Leu Ser Ser Gln Phe	
305 310 315 320	
ttt acc ttg tgg tta caa cct caa tta tgg aaa gca tta ggt tac tcg	1305
Phe Thr Leu Trp Leu Gln Pro Gln Leu Trp Lys Ala Leu Gly Tyr Ser	
325 330 335	
ctc acc atc gcc ccc act tct gca ttg ctc gct tta gta ctg tct ttt	1353
Leu Thr Ile Ala Pro Thr Ser Ala Leu Leu Ala Leu Val Leu Ser Phe	
340 345 350	
gcc tta tta ttg ctt gcc aga gaa tta cat tgg cga cat tat cgc agc	1401
Ala Leu Leu Leu Leu Ala Arg Glu Leu His Trp Arg His Tyr Arg Ser	
355 360 365	
tta tcc cat gtg att tta aat atc ggt gcg acc att tta gcc att cca	1449
Leu Ser His Val Ile Leu Asn Ile Gly Ala Thr Ile Leu Ala Ile Pro	
370 375 380	
acg tta gtg tta gct att ggt tta ttc att tta tta cgt gag atc gat	1497
Thr Leu Val Leu Ala Ile Gly Leu Phe Ile Leu Leu Arg Glu Ile Asp	
385 390 395 400	
ttt tct cca tac cat ctt ttt ggg gtt gtg gta tgc tgt aac gcg tta	1545
Phe Ser Pro Tyr His Leu Phe Gly Val Val Val Cys Cys Asn Ala Leu	
405 410 415	
gct gct atg cct ttt gtg ttg cgt att ttg gct tta ccg atg cat aac	1593
Ala Ala Met Pro Phe Val Leu Arg Ile Leu Ala Leu Pro Met His Asn	
420 425 430	
aat atg att tat tat gaa aaa tta tgc caa tca ctt aac ctg cgt ggt	1641
Asn Met Ile Tyr Tyr Glu Lys Leu Cys Gln Ser Leu Asn Leu Arg Gly	
435 440 445	
tgg caa cgt ttt cga ttg att gaa tgg cac aag ctt cgt gcg cca atg	1689
Trp Gln Arg Phe Arg Leu Ile Glu Trp His Lys Leu Arg Ala Pro Met	
450 455 460	
aaa tac gcc ttt gca ctg gct tgt gcg tta tca tta ggc gat ttc acc	1737
Lys Tyr Ala Phe Ala Leu Ala Cys Ala Leu Ser Leu Gly Asp Phe Thr	
465 470 475 480	
gca atc gcg tta ttt ggt cag gct gac ttc aca tcg tta ccg cat ttg	1785
Ala Ile Ala Leu Phe Gly Gln Ala Asp Phe Thr Ser Leu Pro His Leu	
485 490 495	
ttg tat caa caa ttg ggg cat tat cgt agt cag gaa gcg gca gta aca	1833
Leu Tyr Gln Gln Leu Gly His Tyr Arg Ser Gln Glu Ala Ala Val Thr	
500 505 510	

[illegible]

五、發明說明 (222)

<210> 71
<211> 536
<212> 蛋白質
<213> 敗血性巴斯德桿菌

<400> 71
Met Phe Lys Arg Phe Arg Ala Phe Thr Tyr Arg Pro Ala Ser Tyr Leu
1 5 10 15
Gly Gly Met Leu Val Ile Val Phe Leu Ser Ala Phe Tyr Ala Phe Ala
20 25 30
Leu Gly Ala Val Phe Ser Leu Pro Phe Ala Arg Ser Trp Thr Ala Leu
35 40 45
Leu Ser Asp Gln Tyr Leu Gln His Val Ile Ile Phe Ser Phe Trp Gln
50 55 60
Ala Phe Leu Ser Ala Val Leu Ala Val Leu Phe Gly Gly Ile Val Ala
65 70 75 80
Arg Ala Phe Phe Tyr Gln Pro Phe Val Gly Lys Lys Leu Ile Leu Lys
85 90 95
Leu Phe Ser Leu Thr Phe Val Leu Pro Ala Leu Val Ala Ile Phe Gly
100 105 110
Leu Leu Gly Val Tyr Gly Ala Ser Gly Trp Leu Ala Met Leu Ser Gln
115 120 125
Phe Phe Ala Trp Asp Trp Thr Pro Asn Ile Tyr Gly Leu Thr Gly Ile
130 135 140
Leu Leu Ala His Leu Phe Phe Asn Val Pro Leu Ala Cys Arg Leu Phe
145 150 155 160
Leu Gln Gly Leu Gln Ala Ile Pro Val Gln Gln Arg Gln Leu Ala Ala
165 170 175
Gln Leu Asn Leu Arg Gly Trp His Phe Ile Arg Leu Ile Glu Trp Pro
180 185 190
Tyr Leu Arg Gln Gln Leu Leu Pro Ala Phe Thr Leu Ile Phe Met Leu
195 200 205
Cys Phe Thr Ser Phe Ala Ile Val Leu Thr Leu Gly Gly Gly Pro Lys
210 215 220
Tyr Thr Thr Leu Glu Val Ala Ile Tyr Gln Ala Ile Leu Phe Glu Phe
225 230 235 240
Asp Val Pro Lys Ala Gly Leu Phe Ala Leu Leu Gln Phe Val Phe Cys
245 250 255
Phe Leu Leu Phe Thr Leu Ser Ser Phe Phe Ser Pro Ala Pro Ala Thr
260 265 270
Thr Leu His Ser Gln Pro Thr Trp Phe Ala Pro Gln Ser Tyr Trp Val
275 280 285
Lys Leu Trp Gln Arg Met Ile Ile Val Cys Ala Thr Val Phe Ile Leu
290 295 300

五、發明說明 (223)

Leu Pro Leu Leu Asn Thr Leu Val Ser Ala Leu Leu Ser Ser Gln Phe
305 310 315 320

Phe Thr Leu Trp Leu Gln Pro Gln Leu Trp Lys Ala Leu Gly Tyr Ser
325 330 335

Leu Thr Ile Ala Pro Thr Ser Ala Leu Leu Ala Leu Val Leu Ser Phe
340 345 350

Ala Leu Leu Leu Leu Ala Arg Glu Leu His Trp Arg His Tyr Arg Ser
355 360 365

Leu Ser His Val Ile Leu Asn Ile Gly Ala Thr Ile Leu Ala Ile Pro
370 375 380

Thr Leu Val Leu Ala Ile Gly Leu Phe Ile Leu Leu Arg Glu Ile Asp
385 390 395 400

Phe Ser Pro Tyr His Leu Phe Gly Val Val Val Cys Cys Asn Ala Leu
405 410 415

Ala Ala Met Pro Phe Val Leu Arg Ile Leu Ala Leu Pro Met His Asn
420 425 430

Asn Met Ile Tyr Tyr Glu Lys Leu Cys Gln Ser Leu Asn Leu Arg Gly
435 440 445

Trp Gln Arg Phe Arg Leu Ile Glu Trp His Lys Leu Arg Ala Pro Met
450 455 460

Lys Tyr Ala Phe Ala Leu Ala Cys Ala Leu Ser Leu Gly Asp Phe Thr
465 470 475 480

Ala Ile Ala Leu Phe Gly Gln Ala Asp Phe Thr Ser Leu Pro His Leu
485 490 495

Leu Tyr Gln Gln Leu Gly His Tyr Arg Ser Gln Glu Ala Ala Val Thr
500 505 510

Ala Phe Ile Leu Leu Val Phe Cys Leu Ser Val Phe Met Ile Ile Glu
515 520 525

Arg His Gln Glu Pro Arg Asp Asp
530 535

<210> 72
<211> 3182
<212> DNA
<213> 敗血性巴斯德桿菌

<220>
<221> CDS
<222> (1544)..(2809)

<220>
<223> ygiK

<220>
<221> misc_特徵
<222> 452
<223> N=A或T或G或C

五、發明說明 (224)

<400> 72

```

aactactaag gagttatgta tgaatattag aaaatcatta ctattaatat ccctagcaag 60
cttcatgtca ctttcagttt cagctgcaga aatcaatttg aaatttgaaa gttcgaattt 120
tgcaggagaa aaagtttatg aaatccaaaa agaatggact gacaatattg aaaaagcttc 180
caatgggaga ataagtatag agttattacc tctcgactca gtcttaaaat ctagtgacat 240
gctttctggg gttcgaaata aaattattga tggagcgggt gcaacagcgg caatgtatgc 300
aggcactgac cctggattcg gattaattgg tgatactatt tctgcttga accatgacga 360
agatatttta aatttttact ataatggagg tggttttgaa gttgttgata atattttcca 420
acaatatggg gccaaactca ttgggtgtatc anttacggga gcagaatcat taccatcgaa 480
agtaaaaata gctaatactg aagattttta aggtataaaa attcgggctc cctctgggtcc 540
tatccaaaaa ttgtttgcaa gattaggagc cgctcctgtt ggtcttcctg gttcagaaat 600
ctatactagt ttagaaaaag gtattattga tgctgccgat ttctcaacgt ttgcaaataa 660
tcaagcacia ggagtccatg atattgcaa atatccaatc tatccgggaa ttcattcttc 720
accagccgtt catatgatta tgaatcataa aacttggagt agcttaactc catcggatca 780
agcattctta attgcttact ttaaagggat ggctctcgat actctgactc gtgctcatta 840
tgaagataaa ctagcatata aagaagcact tgagaaagga gtacaaccag tttcttgga 900
tcaacaagaa attacaaaag ttcgttctat cgctaaagaa atttggcaag agatagctca 960
acaatctgaa ataggtaatc aagtattatc aagtattaat gaaattccta gaatctcaag 1020
gaatgctgca ataatcgta agatggataa gacgatatcg tcttatccat taaggagtaa 1080
aacatgctta tttctaaata tttattatgg ctctgtaata agctagatca aatattcatt 1140
aaagtagggt attacgtttc ttatattttt ctattagttg ttatcattgg ttttacgagg 1200
ttgttgctcg gtatttatcc tctagcccaa cactttgggt tcatgaagta acaacatttt 1260
taataagtct atcattactt tatgggtggag tagcttgta cgccagtaat aaacatattg 1320
ccatgacatt tattagacia aaattaccta ataagatcaa atgggtacta gaactcttag 1380
ttgaaatact tatttttatc ttctttatct tgcttagtta cggagcatac ttatcagcta 1440
gagaagcatt atttactcca tcaggaaaat tcaaaatgca aacttctgga agtgtattag 1500
acatgccatt tccagcaatt gaaaaaagtt tcttctttat ttc atg cct cat cat 1555
                                Met Pro His His
                                1

tgt tgt tct ttc agt act aca tat att ccg tca cat cta tac aaa ata 1503
Cys Cys Ser Phe Ser Thr Tyr Ile Pro Ser His Leu Tyr Lys Ile
  5              10              15              20

tca gga gga att atc atg ata agt gca ttt ggg ata ggt att gga act 1651
Ser Gly Gly Ile Ile Met Ile Ser Ala Phe Gly Ile Gly Ile Gly Thr
              25              30              35

```

五、發明說明 (225)

ctt att atc ttt tta atg atg att tcc ctt tta ttt att gga atg cca	1699
Leu Ile Ile Phe Leu Met Met Ile Ser Leu Leu Phe Ile Gly Met Pro	
40 45 50	
tta ggt ttt ctc act ggg tta atc gct tta gtt att tca tat ctt tgg	1747
Leu Gly Phe Leu Thr Gly Leu Ile Ala Leu Val Ile Ser Tyr Leu Trp	
55 60 65	
ttt gat act acc gca ata atg caa atg ata gct tca cgt gtc act gat	1795
Phe Asp Thr Thr Ala Ile Met Gln Met Ile Ala Ser Arg Val Thr Asp	
70 75 80	
ttc aca tca tct tac act ttt gta gct gtg cct atg ttt gtt ctt atg	1843
Phe Thr Ser Ser Tyr Thr Phe Val Ala Val Pro Met Phe Val Leu Met	
85 90 95 100	
gca aca tta ctt gat aag act gga att gct aga gat ctc tac aac gca	1891
Ala Thr Leu Leu Asp Lys Thr Gly Ile Ala Arg Asp Leu Tyr Asn Ala	
105 110 115	
atg cga gtc att ggc ggt cga tta cga ggt gga att gca att caa tcg	1939
Met Arg Val Ile Gly Gly Arg Leu Arg Gly Gly Ile Ala Ile Gln Ser	
120 125 130	
atg ttt gtt gca gtt cta ctt gct acg atg tca ggt att atc ggt gga	1987
Met Phe Val Ala Val Leu Leu Ala Thr Met Ser Gly Ile Ile Gly Gly	
135 140 145	
gaa act gtt tta tta ggc atg ttg gca tta cca caa atg tta cgc tta	2035
Glu Thr Val Leu Leu Gly Met Leu Ala Leu Pro Gln Met Leu Arg Leu	
150 155 160	
ggc tat aat aaa aac tta gct ata gga act gtt gta gca gga gga gca	2083
Gly Tyr Asn Lys Asn Leu Ala Ile Gly Thr Val Val Ala Gly Gly Ala	
165 170 175 180	
ttg ggt aca atg gtt cct cca agt atc gtg ttg att att tac gga atg	2131
Leu Gly Thr Met Val Pro Pro Ser Ile Val Leu Ile Ile Tyr Gly Met	
185 190 195	
acc gca aat gtt tct att gga gaa cta ttt ctt gca gca att cca gcc	2179
Thr Ala Asn Val Ser Ile Gly Glu Leu Phe Leu Ala Ala Ile Pro Ala	
200 205 210	
tcc tta cta ctt tct aca ttc tat att tta tat att cta gta ctt tgc	2227
Ser Leu Leu Leu Ser Thr Phe Tyr Ile Leu Tyr Ile Leu Val Leu Cys	
215 220 225	
tac ttc aaa cct agc tat ggc cct gca atg cct agc tca gaa aat cat	2275
Tyr Phe Lys Pro Ser Tyr Gly Pro Ala Met Pro Ser Ser Glu Asn His	
230 235 240	
aca tta acg aaa gaa gat att aaa aaa att att cat gat att gca att	2323
Thr Leu Thr Lys Glu Asp Ile Lys Lys Ile Ile His Asp Ile Ala Ile	
245 250 255 260	
cca gta gct atc gcc aca tgg att tta gga agt att tat ggc ggg ata	2371
Pro Val Ala Ile Ala Thr Trp Ile Leu Gly Ser Ile Tyr Gly Gly Ile	
265 270 275	
gca tca atc act gaa tct gcc tgt gtt ggt gta gtt ggg gta ata tta	2419
Ala Ser Ile Thr Glu Ser Ala Cys Val Gly Val Val Gly Val Ile Leu	
280 285 290	

五、發明說明 (226)

gca gca ttc tat cga aaa gaa tta aat ttc aaa ata gta caa gaa tca 2467
Ala Ala Phe Tyr Arg Lys Glu Leu Asn Phe Lys Ile Val Gln Glu Ser
295 300 305

cta aaa cat aca atc aat act gtt ggt atg ata atc tgg gtc ggc att 2515
Leu Lys His Thr Ile Asn Thr Val Gly Met Ile Ile Trp Val Gly Ile
310 315 320

ggc gca aca atg att ata ggt att tat aat cta atg ggt ggg gac cga 2563
Gly Ala Thr Met Ile Ile Gly Ile Tyr Asn Leu Met Gly Gly Asp Arg
325 330 335 340

ttt ata gct aac tta ttc gct agc tta gat gcc tct cca att tat act 2611
Phe Ile Ala Asn Leu Phe Ala Ser Leu Asp Ala Ser Pro Ile Tyr Thr
345 350 355

atc att att atg atg gtt att tta tta ata ctt ggt atg ttc tta gat 2659
Ile Ile Ile Met Met Val Ile Leu Leu Ile Leu Gly Met Phe Leu Asp
360 365 370

tgg att ggt gtt gcc atg ttg act ttc ctc aag aca agt aaa gcg aca 2707
Trp Ile Gly Val Ala Met Leu Thr Phe Leu Lys Thr Ser Lys Ala Thr
375 380 385

atc aat ttg tgt ttt gac ata gtc agg tac agt att tgg cgt ggt ccc 2755
Ile Asn Leu Cys Phe Asp Ile Val Arg Tyr Ser Ile Trp Arg Gly Pro
390 395 400

tcc ttc cac agt acc aat gtt cat cgt ggt acc ttt gtc ggg cgc ggt 2803
Ser Phe His Ser Thr Asn Val His Arg Gly Thr Phe Val Gly Arg Gly
405 410 415 420

act ttt tagtaaactc tgccgcatc gaataaacgc attgatggca tttgctccgt 2859
Thr Phe

tttgtggatc gactgccgca tgagcagatt tgccaaaaaa ttcaattaca tacttcccaa 2919

tccctttttct ttcgttaacg tttccactta gattgcccgag aagccgatct gtctgaatgg 2979

gaacaagtgt tataccaaga agcgaatcca acaggtgaag tggatgatcgg tatgggtgggt 3039

aaatacactg aattaccgga tgcctacaaa tcggttaatg aagccttgaa acacgcaggc 3099

ttaaaaaacc gtcttagcgt gcaaatcaaa tatattgatt cacaagatgt ggaaacccaa 3159

ggcacagaag tgtagaagg cgt 3182

<210> 73
<211> 422
<212> 蛋白質
<213> 敗血性巴斯德桿菌

<400> 73
Met Pro His His Cys Cys Ser Phe Ser Thr Thr Tyr Ile Pro Ser His
1 5 10 15
Leu Tyr Lys Ile Ser Gly Gly Ile Ile Met Ile Ser Ala Phe Gly Ile
20 25 30
Gly Ile Gly Thr Leu Ile Ile Phe Leu Met Met Ile Ser Leu Leu Phe
35 40 45

五、發明說明 (227)

Ile Gly Met Pro Leu Gly Phe Leu Thr Gly Leu Ile Ala Leu Val Ile
50 55 60

Ser Tyr Leu Trp Phe Asp Thr Thr Ala Ile Met Gln Met Ile Ala Ser
65 70 75 80

Arg Val Thr Asp Phe Thr Ser Ser Tyr Thr Phe Val Ala Val Pro Met
85 90 95

Phe Val Leu Met Ala Thr Leu Leu Asp Lys Thr Gly Ile Ala Arg Asp
100 105 110

Leu Tyr Asn Ala Met Arg Val Ile Gly Gly Arg Leu Arg Gly Gly Ile
115 120 125

Ala Ile Gln Ser Met Phe Val Ala Val Leu Leu Ala Thr Met Ser Gly
130 135 140

Ile Ile Gly Gly Glu Thr Val Leu Leu Gly Met Leu Ala Leu Pro Gln
145 150 155 160

Met Leu Arg Leu Gly Tyr Asn Lys Asn Leu Ala Ile Gly Thr Val Val
165 170 175

Ala Gly Gly Ala Leu Gly Thr Met Val Pro Pro Ser Ile Val Leu Ile
180 185 190

Ile Tyr Gly Met Thr Ala Asn Val Ser Ile Gly Glu Leu Phe Leu Ala
195 200 205

Ala Ile Pro Ala Ser Leu Leu Leu Ser Thr Phe Tyr Ile Leu Tyr Ile
210 215 220

Leu Val Leu Cys Tyr Phe Lys Pro Ser Tyr Gly Pro Ala Met Pro Ser
225 230 235 240

Ser Glu Asn His Thr Leu Thr Lys Glu Asp Ile Lys Lys Ile Ile His
245 250 255

Asp Ile Ala Ile Pro Val Ala Ile Ala Thr Trp Ile Leu Gly Ser Ile
260 265 270

Tyr Gly Gly Ile Ala Ser Ile Thr Glu Ser Ala Cys Val Gly Val Val
275 280 285

Gly Val Ile Leu Ala Ala Phe Tyr Arg Lys Glu Leu Asn Phe Lys Ile
290 295 300

Val Gln Glu Ser Leu Lys His Thr Ile Asn Thr Val Gly Met Ile Ile
305 310 315 320

Trp Val Gly Ile Gly Ala Thr Met Ile Ile Gly Ile Tyr Asn Leu Met
325 330 335

Gly Gly Asp Arg Phe Ile Ala Asn Leu Phe Ala Ser Leu Asp Ala Ser
340 345 350

Pro Ile Tyr Thr Ile Ile Ile Met Met Val Ile Leu Leu Ile Leu Gly
355 360 365

Met Phe Leu Asp Trp Ile Gly Val Ala Met Leu Thr Phe Leu Lys Thr
370 375 380

五、發明說明 (228)

Ser Lys Ala Thr Ile Asn Leu Cys Phe Asp Ile Val Arg Tyr Ser Ile
385 390 395 400

Trp Arg Gly Pro Ser Phe His Ser Thr Asn Val His Arg Gly Thr Phe
405 410 415

Val Gly Arg Gly Thr Phe
420

<210> 74

<211> 2787

<212> DNA

<213> 敗血性巴斯德桿菌

<220>

<221> CDS

<222> (463) .. (936)

<220>

<223> yhcJ

<400> 74

gttaacacac catgattaat gatgccggtt gaagccactg caacgtaatc gaattgtccg 60
gcatacaaag caagaatggt ggccagtgtg tcatgcatcg cattggcagc atcagcttgt 120
ggcgttgcaa tctgttggcg ttgttctatt ttgccgtctg ttacaatagc cgaggcaatt 180
tttgttccac caatatctaa tgctaaacag cgcataggct ctccttctgt gatgacttat 240
tttgccgatt tgacggcatc ggcaaaccag cttacgatat gttcgaggcg agtcagcgca 300
gatcctacgg tgacagagta agcaccaatc tcaattgcgg ttttcgccaa ttctgggggtg 360
ttatagcgcc cttctgccat cactcggcag ccagcagcat tcaaattcttt gactaactga 420
taatccggtt cagctggaat ttcaccgcca gtataaccag ac atg gtg cta cca 474
Met Val Leu Pro
1

ata att tct acc cct aag ttg tgg caa tac atc cct tct tca aaa tta 522
Ile Ile Ser Thr Pro Lys Leu Trp Gln Tyr Ile Pro Ser Ser Lys Leu
5 10 15 20

gaa caa tcc gcc atg gct aaa caa cct aat tct ttg att cgt tta ata 570
Glu Gln Ser Ala Met Ala Lys Gln Pro Asn Ser Leu Ile Arg Leu Ile
25 30 35

atg gct tca cgt gta gtt gga cgg acg cga tcg gta cca tca aaa gca 618
Met Ala Ser Arg Val Val Gly Arg Thr Arg Ser Val Pro Ser Lys Ala
40 45 50

ata ata tcg gcg cct gct gcg gct aac tct tca atg tct tgt aaa aat 666
Ile Ile Ser Ala Pro Ala Ala Ala Asn Ser Ser Met Ser Cys Lys Asn
55 60 65

ggg cta ata cga acg gga ctg tca ggt aaa tcg cgt tta acg ata cca 714
Gly Leu Ile Arg Thr Gly Leu Ser Gly Lys Ser Arg Leu Thr Ile Pro
70 75 80

ata atc ggt aca ttg acg acg tta cgc gtg gct ttt aaa ttt tcg atc 762
Ile Ile Gly Thr Leu Thr Thr Leu Arg Val Ala Phe Lys Phe Ser Ile

五、發明說明 (229)

85	90	95	100	
ccg tca ata cgt aac ccg gca gca cca ccg ata acg gat gct tgc gcc				810
Pro Ser Ile Arg Asn Pro Ala Ala Pro Pro Ile Thr Asp Ala Cys Ala				
	105	110	115	
atg gcg gca aca att tct ggc gag tcc att ggc cca tta tct acg ggc				858
Met Ala Ala Thr Ile Ser Gly Glu Ser Ile Gly Pro Leu Ser Thr Gly				
	120	125	130	
tgg caa gat gcg att aag cca tat tt att tgt tct aaa act tgc gga				906
Trp Gln Asp Ala Ile Lys Pro Tyr Leu Ile Cys Ser Lys Thr Cys Gly				
	135	140	145	
tgt gat agt ttt gac ata tta act cca gtc taaatttatc aaaagaagat				956
Cys Asp Ser Phe Asp Ile Leu Thr Pro Val				
	150	155		
tgactccaat ttgcataggt taatcttaga attaaaaaat aacaacccaaa ataataaaaa				1016
tttgagatct ttgtcgcata tttattcata gggaatagac agcttaattt tagttatgat				1076
ttgtcaatcc ttgctatttc ttgtgtttgc tggtttgca tacactgttc taatattgct				1136
ttgagcactt gataaccttg ctcatataaa tgtaatccgt cggtacaaag gcgtaaatcc				1196
agttcaccgt tagaatcaca aaagtatttt tgtgtttcaa cgtaagtcac gtctgacgga				1256
caatgttggt ttaaataggt attgagcctg tgaatttggt cgtagtgac cgtattaatc				1316
tgattgaccg gtgtggcttc taataaaaaag tagtgggacg taggagaaat ggtgtgtagg				1376
tgagtcagaa tgctatttaa ctatcgcatg acttgcgccg gtgaatacgt ttcttcctta				1436
caaatatcat tgacgcctaa aaaaagaaaa acagattgtc caagtgttg aatccgttta				1496
ggtttaacga taacatccaa atattgtcgc gtactgacgc cagaaagtcc taaattggcg				1556
acggtttgct ccgctaattg aggtgtgcct gctacctgtt cgtcccatat gtcaaaaagt				1616
gaatgaccaa ttaagctgat attggcaggt ttggaaaatt ccgccatttt gctctgatag				1676
cgttgataaa taccctgatc acttagcatg tgtggacctc tattttgaaa taaaacgcta				1736
agtattatat aaaacctgat atgccggtaa acagtaaact tatcttccgt aggggtaaat				1796
attcaatttt gtgacgaacc tatcatttat gaaataaaac ttcattttct atataaaaaa				1856
tagttttttc actttagaat gccaaacgtg tgaaatttat ttcatcatca ttttaacgta				1916
atcccaacgt aaccaataga ggagaactca taatgaaatt taaaaaacta ctacttgcat				1976
ctttatgttt aggtgtttca gcttctgtat ttgcagcaga ttacgatctt aaattcggt				2036
tgggtgcggg tccaagctca aacgaatata aagcagtaga attctttgcg aaagaagtga				2096
aagaaaaatc caatggcaaa attgatgtgg ctattttccc tagctcacag ttaggtgatg				2156
accgtgtgat gattaaacaa ttaaaagacg gtgcattaga ctttacgtta ggtgaatcag				2216
cacgtttcca aatttacttc ccagaagcag aagtatttgc gttgccttat atgattccta				2276
atcttgaaac ctctaaaaaa gcgttgctcg acacaaaatt tgggtcaagggt ttattgaaaa				2336

五、發明說明 (230)

aaattgataa agagttaaac gtacaagtgt tatctgtggc gtataacggc acacgtcaaa 2396
caacttcctaa ccgtgcaatc aacagcattg aagacatgaa agggctaaaa ttacgtgtac 2456
ctaacgcggc aaccaacctt gcttatgcaa aatacgtggg tgcagcgcca acaccaatgg 2516
cattctctga agtttacctt gcgcttcaaa caaactctgt ggatgggtcaa gaaaacccat 2576
taccgacaat ccaagcacia aaattctatg aagtacaaaa atacttagcg ttaactaacc 2636
acatc'taaa tgaccaactt tacttaatca gtaacgatac gttggcagat ttaccagaag 2696
atttacaaaa agtgggtaaa gatgcagcag cgaaagccgc tgaatatcac actaaactct 2756
tcggtgacgg tgagaacagc ttagttgaat t 2787

<210> 75

<211> 158

<212> 蛋白質

<213> 敗血性巴斯德桿菌

<400> 75

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

<210> 76

<211> 2787

<212> DNA

<213> 敗血性巴斯德桿菌

<220>

<221> CDS

<222> (1949) .. (2785)

五、發明說明 (231)

<220>

<223> via0

<400> 76

gttaacacac catgattaat gatgccggtt gaagccactg caacgtaatc gaattgtccg 60
gcatacaaag caagaatggt ggccagtgtg tcatgcatcg cattggcagc atcagcttgt 120
ggcgttgcaa tctgttggcg ttgttctatt ttgccgtctg ttacaatagc cgaggcaatt 180
tttgttccac caatatctaa tgctaaacag cgcataggct ctccttctgt gatgacttat 240
tttgccgatt tgacggcatc ggcaaaccag cttacgatat gttcgaggcg agtcagcgca 300
gatcctacgg tgacagagta agcaccaatc tcaattgcgg ttttcgcaa ttctggggtg 360
ttatagcgcc cttctgccat cactcggcag ccagcagcat tcaaactctt gactaactga 420
taatccggtt cagctggaat ttcaccgcca gtataaccag acatggtgct accaataatt 480
tctaccctta agttgtggca atacatccct tcttcaaaat tagaacaatc cgccatggct 540
aaacaaccta attctttgat tcgtttaata atggcttcac gtgtagttgg acggacgcga 600
tcggtaccat caaaagcaat aatatcgcg cctgctgcgg ctaactctt aatgtcttgt 660
aaaaatgggc taatacgaac gggactgtca ggtaaactgc gtttaacgat accaataatc 720
ggtacattga cgacgttacg cgtggctttt aaattttcga tcccttcaat acgtaaccgc 780
gcagcaccac cgataacgga tgcttgccg atggcggcaa caatttctgg cgagtcatt 840
ggcccattat ctacgggctg gcaagatgcg attaagccat atttaatttg ttctaaaact 900
tgcggtatgtg atagttttga catattaact ccagtctaaa tttatcaaaa gaagattgac 960
tccaatttgc ataggttaat cttagaatta aaaaataaca accaaaataa taaaaatttg 1020
agatctttgt cgcataattt ttcataggga atagacagct taattttagt tatgatttgt 1080
caatccttgc tattttttgt gtttgctggt ttgcgataca ctgttctaatt attgctttga 1140
gcacttgata accttgctca ttaaaatgta atccgtcggc acaaaggcgt aaatccagtt 1200
cacggttaga atcacaaaag tattttttgt tttcaacgta agtcacgtct gacggacaat 1260
gttgttttaa ataggtattg agcctgtgaa tttgtgcgtt agtgaccgta ttaatctgat 1320
tgaccggtgt ggcttctaatt aaaaagtagt gggacgtagg agaaatgggtg tgtaggtgag 1380
tcagaatgtc atttaactat cgcatagact gcgccggtga atacgtttct tcttataaaa 1440
tatcattgac gcctaaaaaa agaaaaacag attgtccaag ttgttgaatc cgtttaggtt 1500
taacgataac atccaaatat tgctcgctac tgacgccaga agtcctaaa ttggcgacgg 1560
tttgtccgc taattgaggt gtgcctgcta cctgttcgtc ccacatgtca aaaagtgaat 1620
gaccaattaa gctgatattg gcaggtttg aaaattccgc catittgctc tgatagcggt 1680
gataaatatc ctgatcactt agcatgtgtg gacctctatt ttgaaataaa acgctaagta 1740
ttatataaaa cctgatattc cgttaaacag taaacttatt tccgtaggg gtaaatattc 1800

五、發明說明 (232)

aattttgtga	cgaacctatc	atttatgaaa	taaaacttca	ttttctatat	aaaaaatagt	1860										
tttttcactt	tagaatgcc	aacgtgtgaa	atttatttca	tcatcatttt	aacgtaatcc	1920										
caacgtaacc	aatagaggag	aactcata	atg	aaa	ttt	aaa	aaa	cta	cta	ctt	1972					
			Met	Lys	Phe	Lys	Lys	Leu	Leu	Leu						
			1				5									
gca	tct	tta	tgt	tta	ggt	ggt	tca	gct	tct	gta	ttt	gca	gca	gat	tac	2020
Ala	Ser	Leu	Cys	Leu	Gly	Val	Ser	Ala	Ser	Val	Phe	Ala	Ala	Asp	Tyr	
	10					15					20					
gat	ctt	aaa	ttc	ggt	atg	ggt	gcg	ggg	cca	agc	tca	aac	gaa	tat	aaa	2068
Asp	Leu	Lys	Phe	Gly	Met	Val	Ala	Gly	Pro	Ser	Ser	Asn	Glu	Tyr	Lys	
	25				30					35					40	
gca	gta	gaa	ttc	ttt	gcg	aaa	gaa	gtg	aaa	gaa	aaa	tcc	aat	ggc	aaa	2116
Ala	Val	Glu	Phe	Phe	Ala	Lys	Glu	Val	Lys	Glu	Lys	Ser	Asn	Gly	Lys	
				45					50					55		
att	gat	gtg	gct	att	ttc	cct	agc	tca	cag	tta	ggg	gat	gac	cgt	gtg	2164
Ile	Asp	Val	Ala	Ile	Phe	Pro	Ser	Ser	Gln	Leu	Gly	Asp	Asp	Arg	Val	
			60					65					70			
atg	att	aaa	caa	tta	aaa	gac	ggg	gca	tta	gac	ttt	acg	tta	ggg	gaa	2212
Met	Ile	Lys	Gln	Leu	Lys	Asp	Gly	Ala	Leu	Asp	Phe	Thr	Leu	Gly	Glu	
		75					80					85				
tca	gca	cgt	ttc	caa	att	tac	ttc	cca	gaa	gca	gaa	gta	ttt	gcg	ttg	2260
Ser	Ala	Arg	Phe	Gln	Ile	Tyr	Phe	Pro	Glu	Ala	Glu	Val	Phe	Ala	Leu	
	90					95					100					
cct	tat	atg	att	cct	aat	ttt	gaa	acc	tct	aaa	aaa	gcg	ttg	ctc	gac	2308
Pro	Tyr	Met	Ile	Pro	Asn	Phe	Glu	Thr	Ser	Lys	Lys	Ala	Leu	Leu	Asp	
	105				110					115					120	
aca	aaa	ttt	ggg	caa	ggg	tta	ttg	aaa	aaa	att	gat	aaa	gag	tta	aac	2356
Thr	Lys	Phe	Gly	Gln	Gly	Leu	Leu	Lys	Lys	Ile	Asp	Lys	Glu	Leu	Asn	
				125				130						135		
gta	caa	gtg	tta	tct	gtg	gcg	tat	aac	ggg	aca	cgt	caa	aca	act	tct	2404
Val	Gln	Val	Leu	Ser	Val	Ala	Tyr	Asn	Gly	Thr	Arg	Gln	Thr	Thr	Ser	
			140					145					150			
aac	cgt	gca	atc	aac	agc	att	gaa	gac	atg	aaa	ggg	tta	aaa	tta	cgt	2452
Asn	Arg	Ala	Ile	Asn	Ser	Ile	Glu	Asp	Met	Lys	Gly	Leu	Lys	Leu	Arg	
		155					160					165				
gta	cct	aac	gcg	gca	acc	aac	cct	gct	tat	gca	aaa	tac	gtg	ggg	gca	2500
Val	Pro	Asn	Ala	Ala	Thr	Asn	Leu	Ala	Tyr	Ala	Lys	Tyr	Val	Gly	Ala	
	170					175					180					
gcg	cca	aca	cca	atg	gca	ttc	tct	gaa	gtt	tac	ctt	gcg	ctt	caa	aca	2548
Ala	Pro	Thr	Pro	Met	Ala	Phe	Ser	Glu	Val	Tyr	Leu	Ala	Leu	Gln	Thr	
	185				190					195					200	
aac	tct	gtg	gat													

五、發明說明 (233)

aat gac caa ctt tac tta atc agt aac gat acg ttg gca gat tta cca 2692
Asn Asp Gln Leu Tyr Leu Ile Ser Asn Asp Thr Leu Ala Asp Leu Pro 245

gaa gat tta caa aaa gtg gtt aaa gat gca gca gcg aaa gcc gct gaa 2740
Glu Asp Leu Gln Lys Val Val Lys Asp Ala Ala Ala Lys Ala Ala Glu 260

tat cac act aaa ctc ttc gtt gac ggt gag aac agc tta gtt gaa tt 2787
Tyr His Thr Lys Leu Phe Val Asp Gly Glu Asn Ser Leu Val Glu 275

<210> 77
<211> 279
<212> 蛋白質
<213> 敗血性巴斯德桿菌

<400> 77
Met Lys Phe Lys Lys Leu Leu Leu Ala Ser Leu Cys Leu Gly Val Ser 15
1 5 10

Ala Ser Val Phe Ala Ala Asp Tyr Asp Leu Lys Phe Gly Met Val Ala 30
20 25

Gly Pro Ser Ser Asn Glu Tyr Lys Ala Val Glu Phe Phe Ala Lys Glu 45
35 40

Val Lys Glu Lys Ser Asn Gly Lys Ile Asp Val Ala Ile Phe Pro Ser 60
50 55

Ser Gln Leu Gly Asp Asp Arg Val Met Ile Lys Gln Leu Lys Asp Gly 80
65 70 75

Ala Leu Asp Phe Thr Leu Gly Glu Ser Ala Arg Phe Gln Ile Tyr Phe 95
85 90

Pro Glu Ala Glu Val Phe Ala Leu Pro Tyr Met Ile Pro Asn Phe Glu 110
100 105

Thr Ser Lys Lys Ala Leu Leu Asp Thr Lys Phe Gly Gln Gly Leu Leu 125
115 120

Lys Lys Ile Asp Lys Glu Leu Asn Val Gln Val Leu Ser Val Ala Tyr 140
130 135

Asn Gly Thr Arg Gln Thr Thr Ser Asn Arg Ala Ile Asn Ser Ile Glu 160
145 150 155

Asp Met Lys Gly Leu Lys Leu Arg Val Pro Asn Ala Ala Thr Asn Leu 175
165 170

Ala Tyr Ala Lys Tyr Val Gly Ala Ala Pro Thr Pro Met Ala Phe Ser 190
180 185

Glu Val Tyr Leu Ala Leu Gln Thr Asn Ser Val Asp Gly Gln Glu Asn 205
195 200

Pro Leu Pro Thr Ile Gln Ala Gln Lys Phe Tyr Glu Val Gln Lys Tyr 220
210 215

Leu Ala Leu Thr Asn His Ile Leu Asn Asp Gln Leu Tyr Leu Ile Ser 240
225 230 235

裝
訂
線

五、發明說明 (234)

Asn Asp Thr Leu Ala Asp Leu Pro Glu Asp Leu Gln Lys Val Val Lys
245 250 255
Asp Ala Ala Ala Lys Ala Ala Glu Tyr His Thr Lys Leu Phe Val Asp
260 265 270
Gly Glu Asn Ser Leu Val Glu
275

<210> 78
<211> 2590
<212> DNA
<213> 敗血性巴斯德桿菌

<220>
<221> CDS
<222> (908) .. (1294)

<220>
<223> yjgF

<400> 78
ctgcaggctc gattagtggg gcaccgaaag aaaaaaccgt gcaaattatt cacgccgcag 60
aacagcagcc acgcggttat tacacgggga tttttggtct gttcgatggt gagtcgttac 120
aaagtgcggt ggcaattcgt tttattgagc aagtggacga gaaattgatt ttccgcagcg 180
gtggcgggat tacgatctta agcgagctag aagacgagta ccaagaattg atccaaaaag 240
tgtatgtacc agtaggataa gcgatgacat ttcctttatt tgagacgac gctattgtga 300
acggtgaaat tcagcacctt gccctgcac aacaacgtta tgcggcaagt ttggcgacct 360
tttacggcga gaaaggagcg aaagtacagg atcttgcgaa aattattcag attccgaccg 420
cacttgaaca cactcaacat gcgccgataa tccgttgctg gattgattac aatcagcaag 480
actgtgacgt gcattatctt ccctatcaac gcaaaattta ccgcactttt cagcctgtca 540
tttgcatga aattaactat gatctgaaat atgctgatcg ggcattatta aatcagttat 600
ttgctcagcg tagggattgt gatgagatta tgattatcaa acacggcaag gtgacggatt 660
gcagtattgg taatctggtg tttcgccaag gtgagcaatg gttcacgcca gatagcccgt 720
tattttacgg cacacaacga gcctggttat tacaacaagg caaaattcaa gcccgttcca 780
tcttattgca agagatcgca caatttgaag aaattcggtt aattaatgca ctaaattccgc 840
tgtaaatttt ccttgaacag cgtaaaataa aacaactttt tcagtcagat aaaaggagat 900
aaacgac atg acg aaa gta att cat act gac aat gca cca gcc gcc att 949
Met Thr Lys Val Ile His Thr Asp Asn Ala Pro Ala Ala Ile
1 5 10
ggg cct tat gta caa gcg gta gat tta ggt aat atg ctg tta acc tct 997
Gly Pro Tyr Val Gln Ala Val Asp Leu Gly Asn Met Leu Leu Thr Ser
15 20 25 30
ggg caa att cca gtg aat cca aaa acc ggt gaa gtg cca gcg gat atc 1045
Gly Gln Ile Pro Val Asn Pro Lys Thr Gly Glu Val Pro Ala Asp Ile

五、發明說明 (235)

35	40	45	
gta gca caa gca cgt caa tcg tta gaa aac gtg aaa gcg att gtg gaa			1093
Val Ala Gln Ala Arg Gln Ser Leu Glu Asn Val Lys Ala Ile Val Glu			
50	55	60	
caa gcg gga tta caa gtc gca aat atc gtg aaa acc acg gtg ttt gtg			1141
Gln Ala Gly Leu Gln Val Ala Asn Ile Val Lys Thr Thr Val Phe Val			
65	70	75	
aaa gat tta aat gac ttt gca gcg gtc aat gcg gag tac gaa cgt ttc			1189
Lys Asp Leu Asn Asp Phe Ala Ala Val Asn Ala Glu Tyr Glu Arg Phe			
80	85	90	
ttt aaa gag aac aat cac cct agc ttc cct gct cgt tca tgt gtg gaa			1237
Phe Lys Glu Asn Asn His Pro Ser Phe Pro Ala Arg Ser Cys Val Glu			
95	100	105	110
gtg gca cgt ttg ccg aaa gat gtg ggg att gaa atc gag gca atc gct			1285
Val Ala Arg Leu Pro Lys Asp Val Gly Ile Glu Ile Glu Ala Ile Ala			
115	120	125	
gta aaa gcc taatgaatag cttgcattta tcttagtcgt agcaaaacaa			1334
Val Lys Ala			
tctctttttca cttgctctct tcaaagcaag ttgataagtg attttttattg ggcgtttttc			1394
tattgatagc caaaaacgcc ctttactgat agagaataaa ctatgcaaaa tcaagtcattc			1454
gagattctac aataccgttt aaaaccacaa tcaggacaaa cgtttcacca aattatgcgt			1514
gagatcagtg ttccactcca taaacaacat gggattgatg tcattgcgta tggaaattca			1574
ttacatgata ttgacagcta ttatttaatc cgtgcatttg agacagaaac caaattgcaa			1634
cagcagctcg atgcttttta tgccagtgat gattggcgtg atggaccaag agaaagtatc			1594
attcgccctga ttgaaagcag tttaaaatcg gtgatcatgc tcccagacaca ggcaatccat			1754
gcactacgca accattatcc tcaataaaat caacaaccgc acccaatcag tgcggtcatt			1814
ttttcttact ttttcagtgc taagggaataa acaacgatag tggacgttgt ttaatcaatt			1874
tccaaacaca ttgcgcgata tcacaccaac tctcaatttc tgtttctaaa gaacgcagcg			1934
caaccataa cgcgataaag aaactgacaa tcaaatccac cataccaatc aataacacga			1994
acactaaacc ttgtaagaac atctgccaaag taaacgcgcc actgatcgcc atatagccca			2054
aattcgcaga agaaaacgcc acatggcgaa tatctaacgg taaattaagc aaatacccgga			2114
ctaaccctgt taaaccaagc aataaaccaa aacacagatt tcccataatc gaaccgtaat			2174
tatcatgcca gtattctgca aatttgtagc gcatattacg ggtcaacaga cggcgtaaaa			2234
tagggtgatt tcttagtcgc atttttaagt tcaataaatt actacgatta tcaaaataac			2294
cagaaataat ccagaaaaag aataaccaga aaccgcgaat ggcggcaaac cataaggacc			2354
ctttcatcgg atcaagggat ttttggtggg aggcaatctc cgcgtcactc aataaagggtg			2414
taccaacata atggtgatag cctagcgcaa gcaaacaagc cacagaaatc gctaaagtga			2474

五、發明說明 (236)

cattacccaa gactgccact gtttgcgagc gaaacacatc gatcagcagt tgagctaatt 2534
gcagattaac ggatttgcct tgtccattat ccaccgtttc tgcaaaacgt gctgca 2590

<210> 79
<211> 129
<212> 蛋白質
<213> 敗血性巴斯德桿菌

<400> 79
Met Thr Lys Val Ile His Thr Asp Asn Ala Pro Ala Ala Ile Gly Pro
1 5 10 15
Tyr Val Gln Ala Val Asp Leu Gly Asn Met Leu Leu Thr Ser Gly Gln
20 25 30
Ile Pro Val Asn Pro Lys Thr Gly Glu Val Pro Ala Asp Ile Val Ala
35 40 45
Gln Ala Arg Gln Ser Leu Glu Asn Val Lys Ala Ile Val Glu Gln Ala
50 55 60
Gly Leu Gln Val Ala Asn Ile Val Lys Thr Thr Val Phe Val Lys Asp
65 70 75 80
Leu Asn Asp Phe Ala Ala Val Asn Ala Glu Tyr Glu Arg Phe Phe Lys
85 90 95
Glu Asn Asn His Pro Ser Phe Pro Ala Arg Ser Cys Val Glu Val Ala
100 105 110
Arg Leu Pro Lys Asp Val Gly Ile Glu Ile Glu Ala Ile Ala Val Lys
115 120 125
Ala

<210> 80
<211> 6642
<212> DNA
<213> 敗血性巴斯德桿菌

<220>
<221> CDS
<222> (463)..(1884)

<220>
<223> yleA

<400> 80
aaccagctc agataagttt aattctggct atggaaagtg gaccaaattc ttcgatctcc 60
caggtttcta aggcgcgata cgggcaaata cgagtatttt cgatatatctg ccaagcacct 120
agttgtttta agagattaac ggaagcaaca ctgatcgag aaatgcgaag atcgtaaggc 180
gaattagggtt gaaactgtgg gagtggggcg tgttcgataa gctggacttg atgtccttgt 240
ttacgtaagc caagcgcaca ggctgcacca accatgccac cgccaaccac gatcatgtct 300
ttttgtatga cgtccatagg attttccttt tctttttgtt acgtattcta ccgtcaatga 360

五、發明說明 (237)

```

gggaatttca aaagaaatct ctttttttagc tagccagcat aggttcaaga ctgtaaaata 420
gtcagtcaca ttttttatagg ttaactgaat ttttttaaacy at atg acg caa aaa 474
                                     Met Thr Gln Lys
                                     1

tta cat att aaa acg tgg ggt tgt cag atg aat gaa tat gat tca tct 522
Leu His Ile Lys Thr Tro Gly Cys Gln Met Asn Glu Tyr Asp Ser Ser
5 10 15 20

aaa atg gca gat ctc tta aac agt act cac ggc tta gag tta aca gaa 570
Lys Met Ala Asp Leu Leu Asn Ser Thr His Gly Leu Glu Leu Thr Glu
25 30 35

att ccg gaa gaa gcg gat gtg tta ttg tta aac act tgc tca att cgt 618
Ile Pro Glu Glu Ala Asp Val Leu Leu Leu Asn Thr Cys Ser Ile Arg
40 45 50

gaa aaa gca caa gaa aaa gtt ttc cat caa tta gga cgt tgg aaa gaa 666
Glu Lys Ala Gln Glu Lys Val Phe His Gln Leu Gly Arg Trp Lys Glu
55 60 65

tta aag aaa cat aag ccg gga ctc gtt atc ggt gtt ggg ggc tgt gtt 714
Leu Lys Lys His Lys Pro Gly Leu Val Ile Gly Val Gly Gly Cys Val
70 75 80

gcc tca caa gaa gga gaa cac att cgt act cgt gct cct tat gtc gat 762
Ala Ser Gln Glu Gly Glu His Ile Arg Thr Arg Ala Pro Tyr Val Asp
85 90 95 100

att att ttt gga cca caa acc tta cat cgt tta cct gaa atg atc aat 810
Ile Ile Phe Gly Pro Gln Thr Leu His Arg Leu Pro Glu Met Ile Asn
105 110 115

cag atc aga ggt ggt aaa agc tca gta gtc gat gtc agt ttt cca gaa 858
Gln Ile Arg Gly Gly Lys Ser Ser Val Val Asp Val Ser Phe Pro Glu
120 125 130

att gaa aaa ttc gac cgt tta cca gaa ccg cgt gca gaa ggt cca act 906
Ile Glu Lys Phe Asp Arg Leu Pro Glu Pro Arg Ala Glu Gly Pro Thr
135 140 145

gct ttc gta tcc att atg gaa ggc tgt aat aaa tat tgc tca ttc tgt 954
Ala Phe Val Ser Ile Met Glu Gly Cys Asn Lys Tyr Cys Ser Phe Cys
150 155 160

gtc gtg cct tat acg cgt ggt gaa gaa gtc agt cgt cca gtg gat gat 1002
Val Val Pro Tyr Thr Arg Gly Glu Glu Val Ser Arg Pro Val Asp Asp
165 170 175 180

gta tta ttt gaa att gca cag ttg gca gag caa ggc gtg cgt gaa gtg 1050
Val Leu Phe Glu Ile Ala Gln Leu Ala Glu Gln Gly Val Arg Glu Val
185 190 195

aat tta tta gga caa aac gtg aac gct tat cgt ggt gca act cat gat 1098
Asn Leu Leu Gly Gln Asn Val Asn Ala Tyr Arg Gly Ala Thr His Asp
200 205 210

gac ggt att tgt act ttt gcg gaa ttg tta cgt tta gta gcc gct att 1146
Asp Gly Ile Cys Thr Phe Ala Glu Leu Leu Arg Leu Val Ala Ala Ile
215 220 225

gat ggt att gac cgt tta cgt ttt acc acc agt cac cca att gag ttc 1194

```

五、發明說明 (238)

Asp Gly Ile Asp Arg Leu Arg Phe Thr Thr Ser His Pro Ile Glu Phe	
230 235 240	
act gat gac att att gat gtg tac cgt gat acg cca gag ttg gtg agt	1242
Thr Asp Asp Ile Ile Asp Val Tyr Arg Asp Thr Pro Glu Leu Val Ser	
245 250 255 260	
ttc tta cac tta cct gta caa agt ggt tct gat cgt gtg tta tct atg	1290
Phe Leu His Leu Pro Val Gln Ser Gly Ser Asp Arg Val Leu Ser Met	
265 270 275	
atg aaa cgc aat cat acg gca tta gaa tat aaa tcg att att cgg aag	1338
Met Lys Arg Asn His Thr Ala Leu Glu Tyr Lys Ser Ile Ile Arg Lys	
280 285 290	
tta aga gcg gtg cgt cca gag att caa att agc tca gat ttt att gtc	1386
Leu Arg Ala Val Arg Pro Glu Ile Gln Ile Ser Ser Asp Phe Ile Val	
295 300 305	
ggt ttc ccg ggc gaa aca gca gaa gat ttc gag caa acc atg aat tta	1434
Gly Phe Pro Gly Glu Thr Ala Glu Asp Phe Glu Gln Thr Met Asn Leu	
310 315 320	
att gca caa gta aat ttt gat atg agt ttc agc ttc att tat tca gca	1482
Ile Ala Gln Val Asn Phe Asp Met Ser Phe Ser Phe Ile Tyr Ser Ala	
325 330 335 340	
cgt cca ggc acg cca gca gca gat atg cct gat gat gtg aca gaa gaa	1530
Arg Pro Gly Thr Pro Ala Ala Asp Met Pro Asp Asp Val Thr Glu Glu	
345 350 355	
gag aag aaa caa cgt tta tat gtg ttg caa caa cgc att aac aat caa	1578
Glu Lys Lys Gln Arg Leu Tyr Val Leu Gln Gln Arg Ile Asn Asn Gln	
360 365 370	
gcc gcg caa ttt agt cga gca atg tta ggc aca gaa cag cgc gtg tta	1626
Ala Ala Gln Phe Ser Arg Ala Met Leu Gly Thr Glu Gln Arg Val Leu	
375 380 385	
gtg gaa gga ccc tcg aaa aaa gat tta atg gaa ctc aca ggg cgt aca	1674
Val Glu Gly Pro Ser Lys Lys Asp Leu Met Glu Leu Thr Gly Arg Thr	
390 395 400	
gaa act aat cgt atc gtc aat ttt gtg ggc acg cct gat atg att ggg	1722
Glu Thr Asn Arg Ile Val Asn Phe Val Gly Thr Pro Asp Met Ile Gly	
405 410 415 420	
aag ttt gtt gat atc aag atc acg gat gtg ttt act aac tca ctg cgt	1770
Lys Phe Val Asp Ile Lys Ile Thr Asp Val Phe Thr Asn Ser Leu Arg	
425 430 435	
ggt gaa gtc gtt aga act gaa gaa caa atg gga ctt cgc gtt gtt caa	1818
Gly Glu Val Val Arg Thr Glu Glu Gln Met Gly Leu Arg Val Val Gln	
440 445 450	
tcg cca caa atg gtg att aat cgt act cgt aaa gaa gat gaa ctc ggc	1866
Ser Pro Gln Met Val Ile Asn Arg Thr Arg Lys Glu Asp Glu Leu Gly	
455 460 465	
gtg gga cgt tat cac gcg tagtcgtgct atcccttcaa atatttaacc	1914
Val Gly Arg Tyr His Ala	
470	

五、發明說明 (239)

gctctcgagt ttctcaagag cggttatctt ttatgaaaaa tttttgataa attgaccgct 1974
 ctttttattg cttcatttta tgatagacag cgtgttttct gttattcacc gtatttcctt 2034
 ttatttcact tcattaataa attattaaat ttcaattgct tatcaaaatt gttgtttttt 2094
 gctttttttc tatttatagc atggttatct ttatatacaca catggcggtat ttctccatat 2154
 ttttacaaaa aactgtgact tcactctaac tattgttctc tcgtgcttta ctccatttta 2214
 taaggcggtt agtttagatc atgttgcttt tacaacatat tttgaggttg tttgaagggt 2274
 gagcttatct tatagttgag gtgatgatga aaaaatttaa tcctagtata ttggcggttg 2334
 ccatatcaag tctgtactc acatccacat tgacctttgg tcaaatccag caacaagata 2394
 aagcactctt tgggtgtgaa gaacatcaag aaagcctact ctttcatcag agcttagtag 2454
 aacaaggtag tgataatgtg ccaatttggc gcattccgtc tttattaaga acaaaagacg 2514
 gtgtattaat tgccgcgcga gataagcgtt ggcaacaccg tggtgactgg ggcgatattg 2574
 ataccgcaat ccgaattagt catgatgatg ggaaaacatg gggaaatatt acaacgattt 2634
 tggatttgcc atcaaagaat ggggaaaaat ccccatcagc accagatcct gtaacattca 2694
 acgcgtgggg agatagacaa aattgtacaa cttactgtaa ttctgctttt ttgatcgatg 2754
 ctcatggtt acaagataaa cgtaattgga gaattttttt agcagttgat atgtttgccc 2814
 atggagcagg ttttttttgt gtaaaagaca gtggtaattg gcgcattaat attgatggta 2874
 aacagtatcc tatttttaaa gaaaagcaat cgggtcgaca ttgaaccctg tgttcttaac 2934
 tctttcactt gctcaacgtt caccggaatc acgcggtcaa taaaagtcgg tttccagttt 2994
 aaaccggtt gaacaatagc gtgtaattca ccaaacgca tcaccacgcc acgttctgct 3054
 tctttgacag tataaaaacc gctaacgccc cagacaattg caccaatcac cgctgcaatt 3114
 ggcaataatt taccaagatt taacgatcca ccagaatgcg agttattgcg tttaccgcca 3174
 ttccctgaac cgctaattt tttcagcaga ttattaaaaa tctcttcaat atcaggtggt 3234
 gattgctctt gattgttttg cttacgacct gactgggtat cattccaatt cggctgaccg 3294
 ccttcattat caggacgctg actctcaggt tttttctgtc cgggtttgcc ccaaggatct 3354
 tgatctgaac cgttcaatga cattacgttc tccatttgtc aaaaaattgt tacttgctta 3414
 aacaaattcc cacagtctaa acaaaatgtt ggattaagtc taacgaaact cgttactaaa 3474
 tggggatatt ttttatgatt taaagtgcg ccaataaaaa cgcacaatgg tctcattttt 3534
 acggcttact acctgacttt tgtcctatcg ctctgtcggc catgtttttt cattcacctt 3594
 ataataaatg gcgtcgtgta aggtgggttc cgctaataat cccctctgcc aagtaaaata 3654
 gtgcacatct aagcactgtg tttgggtaat aaaaaagcc aagtaaaacg gcaagcgggtg 3714
 actaaagagg agttaactaa gtttctgtat gctagcgtac tattgactct tcttgactg 3774
 cgtttgggtt ttattgcggt gaatgaaacc ctagcgtgta tttctttgtt attggtgggt 3834

五、發明說明 (240)

tatttaagcg ttagccgagt attatattgcg ctcgcgttgt tgggcgtgat catgaatttg 3894
 agctattact attatctctt gagtatccct ttattacata aatctttctt actcatggga 3954
 gtaggcacg ttctggcact agttacgttt gttttatcac gttataacaa ggcaccgcag 4014
 gcaacattac aagctgaatc gcacaatacg tttcaaccac aaacaatgtt acgtaaaaaa 4074
 ctaggattca ctttggtggc gacatgtttg attgcctttg ccacgaatta tactattcat 4134
 aaatatgaag atattttaac gaatggtgag tcaattattt taaaaacggc acccgttgat 4194
 ccgcgttcct tgatgcaagg ggattatatg acgttgaact atgaaatctt ggcagacatt 4254
 agtgaggaat ggggaaaaaa tttagaagag gaaaaaacac agtattttgt ttatgcgttg 4314
 ttaaaacgag acagcctagg gattgctacc ttgtgtcgtc ttgaaaccaa agcacctaca 4374
 acatttgacg ggtgtacacc aaatatattac ttaccggtga atgtcgcgat gtggtggccg 4434
 cgttttaccaa gtcaagacta cttttttgcc gagggaaaag gtgaatatta tgcacaagct 4494
 gaatatgccg aatatcgctt taaaggggga aaagcgttgt tgttcgctt actagataaa 4554
 aattttaaag cattataaaa caaaaggcgg tagtgaaccg cttttatgtt gtatgccact 4614
 tacttcaccg caatcattga gccaaaatta aagcattgaa accataattc cacttgttga 4674
 aaaccgactt cagctaaacg cattttatgg gcttgaatgc tgtctgtacg catcacattt 4734
 tcaagtgcgg tgcgtttttg gctgacttca agttcactgt atccattcgc gcgtttaaat 4794
 tgatgatgta aatcaatcaa caaggcattc atgttttgat cttcaaaatg aaattttctg 4854
 gatagtacca agatcccatt cggttgtaag ccttggtaaa tcttacttaa taaggctcga 4914
 cgatcttcag gtggcagaaa ttgcaaagtg aaatttaaaa ttaccatgaa ggcattttctg 4974
 atttcgatat ggcgtatatt atcacaaata atgtccacag gtattgtact ttgataggca 5034
 ctaacatgct ggcgacaacg atcgaccatg gggtgtgagt tatcaacacc aatgatcttg 5094
 acgccgggtt gattaatatg acgacgtgca gataatgttg ccgcaccgcg cgagcacccc 5154
 agatcataga cgttgctatt cgcgtaaca aagcgtgatg ccaacatccc aatagcggta 5214
 atgatgttg catagccggg aatagagcgt tggatcatgt cgggaaagac ttcagctacg 5274
 ctttcacaa aagtaaaatc ccccaattta gcaatgggga gtcgaaaata gagtatcttt 5334
 tgtcataatg tattaaagac cgagaaaaag tgcggtcatt ttagaagaag tttcgacctt 5394
 tcacaaataa attatgattt cggaataaaa tgcgccatgg cactttcttc ttgtttaata 5454
 cgcacgccta ggataagcaa ataaatgggt aatccaatca atgcggtata ttttgcttg 5514
 cagaaaagcg ataaaccaat taactcggga ataatgttta agaaataatt cgggtgacgt 5574
 acgtatttaa acaagaaaga cgggttaatg tgatgttccg gtaaaatgta aagttttact 5634
 gtccaaatct ctttcagtcc ataaatcacg taaaatagca tggcgatcgc aaagactaaa 5694
 atcqcacccc ctatttctga cctactatta aatcctctct ttttaattatt aacttcata 5754

五、發明說明 (241)

atcgcggcga gataaaatac aacatgggca atggataaca gcgtagaatt gcgtttacca 5814
tattgtattg caccttttgc aatcaatgct ttttcatggc ggattgaaat agacagacta 5874
taaaaacgga tcgctaaaat acaggcaaaa gtgatattga taaataacat gtggttatcc 5934
ttaacataat tttattccaa taaagtggcg taatataaca aaaaatccga tgatatggca 5994
tggaataacg cctttatttt gaacgttcat cgcttttctt tttctttatt ggttgatttg 6054
taagcataaa taaccttttt atctctcttg gttttccgct ataattgagt gaatttttga 6114
gcataattaa gagtacaaag gattttgaaa tgatgcgtac acattattgc ggtgcattaa 6174
accgtgacaa tatcgacaa gaagtaacat tgagtgggtg ggtgcacgt cgccgtgatt 6234
taggtgggtt aatttttatt gatatgcgtg atcgtgaagg gattgtacaa gtgtgtttcg 6294
atccaatata tcaagaagca ctccaccag cagcaagttt acgtaatgag ttttgtattc 6354
aaattaaagg cgaagtgatt gcccgcggcag ataatcaaat caacaaaaat atggcaacag 6414
gcgaagtgga agtgtagca aaatccctgt ctatttataa cagcgcagag ccattacctc 6474
tcgactttta ccaaaataat acggaagaac agcgttttaa ataccgttat ttagacttac 6534
gtcgcggcaga aatggcgcaa cgtttaaaaa cagcagccaa aattaccagc tttgtgcgtc 6594
gctttatgga cgaacatggt ttcttagata ttgaaacacc gatgttga 6642

<210> 81
<211> 474
<212> 蛋白質
<213> 敗血性巴斯德桿菌

<400> 81
Met Thr Gln Lys Leu His Ile Lys Thr Trp Gly Cys Gln Met Asn Glu
1 5 10 15
Tyr Asp Ser Ser Lys Met Ala Asp Leu Leu Asn Ser Thr His Gly Leu
20 25 30
Glu Leu Thr Glu Ile Pro Glu Glu Ala Asp Val Leu Leu Leu Asn Thr
35 40 45
Cys Ser Ile Arg Glu Lys Ala Gln Glu Lys Val Phe His Gln Leu Gly
50 55 60
Arg Trp Lys Glu Leu Lys Lys His Lys Pro Gly Leu Val Ile Gly Val
65 70 75 80
Gly Gly Cys Val Ala Ser Gln Glu Gly Glu His Ile Arg Thr Arg Ala
85 90 95
Pro Tyr Val Asp Ile Ile Phe Gly Pro Gln Thr Leu His Arg Leu Pro
100 105 110
Glu Met Ile Asn Gln Ile Arg Gly Gly Lys Ser Ser Val Val Asp Val
115 120 125
Ser Phe Pro Glu Ile Glu Lys Phe Asp Arg Leu Pro Glu Pro Arg Ala
130 135 140

五、發明說明 (242)

Glu	Gly	Pro	Thr	Ala	Phe	Val	Ser	Ile	Met	Glu	Gly	Cys	Asn	Lys	Tyr	145	150	155	160
Cys	Ser	Phe	Cys	Val	Val	Pro	Tyr	Thr	Arg	Gly	Glu	Glu	Val	Ser	Arg	165	170	175	
Pro	Val	Asp	Asp	Val	Leu	Phe	Glu	Ile	Ala	Gln	Leu	Ala	Glu	Gln	Gly	180	185	190	
Val	Arg	Glu	Val	Asn	Leu	Leu	Gly	Gln	Asn	Val	Asn	Ala	Tyr	Arg	Gly	195	200	205	
Ala	Thr	His	Asp	Asp	Gly	Ile	Cys	Thr	Phe	Ala	Glu	Leu	Leu	Arg	Leu	210	215	220	
Val	Ala	Ala	Ile	Asp	Gly	Ile	Asp	Arg	Leu	Arg	Phe	Thr	Thr	Ser	His	225	230	235	240
Pro	Ile	Glu	Phe	Thr	Asp	Asp	Ile	Ile	Asp	Val	Tyr	Arg	Asp	Thr	Pro	245	250	255	
Glu	Leu	Val	Ser	Phe	Leu	His	Leu	Pro	Val	Gln	Ser	Gly	Ser	Asp	Arg	260	265	270	
Val	Leu	Ser	Met	Met	Lys	Arg	Asn	His	Thr	Ala	Leu	Glu	Tyr	Lys	Ser	275	280	285	
Ile	Ile	Arg	Lys	Leu	Arg	Ala	Val	Arg	Pro	Glu	Ile	Gln	Ile	Ser	Ser	290	295	300	
Asp	Phe	Ile	Val	Gly	Phe	Pro	Gly	Glu	Thr	Ala	Glu	Asp	Phe	Glu	Gln	305	310	315	320
Thr	Met	Asn	Leu	Ile	Ala	Gln	Val	Asn	Phe	Asp	Met	Ser	Phe	Ser	Phe	325	330	335	
Ile	Tyr	Ser	Ala	Arg	Pro	Gly	Thr	Pro	Ala	Ala	Asp	Met	Pro	Asp	Asp	340	345	350	
Val	Thr	Glu	Glu	Glu	Lys	Lys	Gln	Arg	Leu	Tyr	Val	Leu	Gln	Gln	Arg	355	360	365	
Ile	Asn	Asn	Gln	Ala	Ala	Gln	Phe	Ser	Arg	Ala	Met	Leu	Gly	Thr	Glu	370	375	380	
Gln	Arg	Val	Leu	Val	Glu	Gly	Pro	Ser	Lys	Lys	Asp	Leu	Met	Glu	Leu	385	390	395	400
Thr	Gly	Arg	Thr	Glu	Thr	Asn	Arg	Ile	Val	Asn	Phe	Val	Gly	Thr	Pro	405	410	415	
Asp	Met	Ile	Gly	Lys	Phe	Val	Asp	Ile	Lys	Ile	Thr	Asp	Val	Phe	Thr	420	425	430	
Asn	Ser	Leu	Arg	Gly	Glu	Val	Val	Arg	Thr	Glu	Glu	Gln	Met	Gly	Leu	435	440	445	
Arg	Val	Val	Gln	Ser	Pro	Gln	Met	Val	Ile	Asn	Arg	Thr	Arg	Lys	Glu	450	455	460	
Asp	Glu	Leu	Gly	Val	Gly	Arg	Tyr	His	Ala							465	470		

五、發明說明 (243)

<210> 82
<211> 4835
<212> DNA
<213> 敗血性巴斯德桿菌

<220>
<221> CDS
<222> (407)..(1156)

<220>
<223> yojB

```

<400> 82
gtcaacgacg gggcggtct tagaacattg gcatacgggt acgatgacac gccgtgtccc 60
agagctccat cgctccttcc caaataactt ggtttggatg caccattag atgcgaaaaa 120
acgtggttta cgatcatggcg ataaagtga gatcagctca cgctgtggcg aaatgatttc 180
tcacttagat acccggtggac gtaataaagt cccacaaggc ttagttttaca ccactttctt 240
tgatgcaggt cagtttagcaa actatctcac tttagatgcg acagacccaa tttcaaaaga 300
aacggacttc aaaaaatgtg cgggtcaaagt ggaaaaagcg taacacgtta aatttaatga 360
ggaacgaccg cactttgctt tcagtaaagt gcggttggaa agtcga atg aaa aaa 415
                               Met Lys Lys
                               1

aca gtt gtg aat cct gaa cgt cgt cga ttt ttt aaa gag gct acg cgc 463
Thr Val Val Asn Pro Glu Arg Arg Arg Phe Phe Lys Glu Ala Thr Arg
      5                10                15

act gca ggc ggg ttg gca ggg gtg act ttg ctc ctt ggt ttg caa caa 511
Thr Ala Gly Gly Leu Ala Gly Val Thr Leu Leu Leu Gly Leu Gln Gln
      20                25                30                35

aag cag agt ctt gcg cgc gaa ggc gtg gcg tta cgc cca cct ttt gcc 559
Lys Gln Ser Leu Ala Arg Glu Gly Val Ala Leu Arg Pro Pro Phe Ala
                40                45                50

ctt gag aat gag aaa gcg ttt tct gct gcg tgc att cgt tgt ggt cag 607
Leu Glu Asn Glu Lys Ala Phe Ser Ala Ala Cys Ile Arg Cys Gly Gln
                55                60                65

tgt gta caa gcc tgt cca cat gag atg ttg cat ctt gcc tca ctg att 655
Cys Val Gln Ala Cys Pro His Glu Met Leu His Leu Ala Ser Leu Ile
                70                75                80

tca ccg atg gaa gca ggt aca ccg tat ttc att gcg cgc gat aag ccc 703
Ser Pro Met Glu Ala Gly Thr Pro Tyr Phe Ile Ala Arg Asp Lys Pro
      85                90                95

tgt gaa atg tgt gtg gat att cct tgt gca aaa gcc tgc cca acc ggt 751
Cys Glu Met Cys Val Asp Ile Pro Cys Ala Lys Ala Cys Pro Thr Gly
      100                105                110                115

gca ttg gat aat caa gca aca gaa atc gat gat gcg cgt atg ggg tta 799
Ala Leu Asp Asn Gln Ala Thr Glu Ile Asp Asp Ala Arg Met Gly Leu
                120                125                130

gct gtc ctg cta gat cat gaa act tgt ctg aac tgg caa ggt tta cgc 847
Ala Val Leu Leu Asp His Glu Thr Cys Leu Asn Trp Gln Gly Leu Arg

```

五、發明說明 (244)

135	140	145	
tgt gat gtg tgt tat cgc gtc tgt ccg ctg att aat aaa gcg att acg			895
Cys Asp Val Cys Tyr Arg Val Cys Pro Leu Ile Asn Lys Ala Ile Thr			
150	155	160	
tta gtg atg cat cgt aat gag cgt acg ggt aag cac gcc gtc ttt atc			943
Leu Val Met His Arg Asn Glu Arg Thr Gly Lys His Ala Val Phe Ile			
165	170	175	
cca aca gtg cat tcc gaa gcc tgt aca gga tgt ggc aaa tgt gaa gaa			991
Pro Thr Val His Ser Glu Ala Cys Thr Gly Cys Gly Lys Cys Glu Glu			
180	185	190	195
gct tgc gtt cta gaa gaa gcg gca atc aaa gtg tta ccg atg gca tta			1039
Ala Cys Val Leu Glu Glu Ala Ala Ile Lys Val Leu Pro Met Ala Leu			
200	205	210	
gcg aaa ggc atg tta ggt aaa cat tac cgt tta ggt tgg gaa gag aaa			1087
Ala Lys Gly Met Leu Gly Lys His Tyr Arg Leu Gly Trp Glu Glu Lys			
215	220	225	
gaa aaa gcc ggg cat tcc ctt gcg cca gaa ggc att att tct ctc ccg			1135
Glu Lys Ala Gly His Ser Leu Ala Pro Glu Gly Ile Ile Ser Leu Pro			
230	235	240	
act cgg tta ccg gag agc ttg taatggcaaa ttcaccaaaa tatgcgggta			1186
Thr Arg Leu Pro Glu Ser Leu			
245	250		
aagaagcacg agaaaagtta ggctgggtggc acgccaatcg ctttttggtc tggcgacggt			1246
taaccagct gagtattcct gccatgtttt taagcggacc ttattttggg gtgtggatct			1306
tgaaggcaa ttacagtagt agtcttttgc ttgatttgat cccgatgact gatcctttga			1366
ttatggcaga aagtctcgcg accggtttta tgcttaccat gaccgcgttg ttgggtgccc			1426
tgattgtggt ggtgctttat gccattttag ggagtcgcgt tttctgtgct tgggtttgtc			1486
cgtaaacaat cgtgacagat gcgtccgctt ggctcagacg taaattagaa attcgtcaat			1546
cggcaaaact cccacgaagt ttacgctatg cgatcttagt gatgattttg ttaggcagtg			1606
cgctaagcgg gttattactt tgggaatggc tcaatccggg tgcagcacta ggtcgtgcgt			1666
taattttacgg tttcgggtgcg acagtttggc ttgttcttgc ggtgttttta tttgatttat			1726
ttattgtcga gcatgggttg tgtgggcatt tatgcccatt aggtgcagcc tatgggtgtga			1786
ttgggtgcgaa aggacttttt cgtatcaaag ttgagcatcg ccaacaatgt gataattgca			1846
tggattgcta taacgtctgt ccagaaccac aagtgttacg cgatccatta catgcaaaaa			1906
agagtgaag cccacttgtg ctttcaaaag attgtatcag ctgtggacgt tgtatcgacg			1966
tttgccctga aaaagtattt atttttacaa cacgatttaa tcattcagtt aatcattcgg			2026
gggagtgatc aaaatgaaaa aaacaatgct aattttgacc gcactttttg ctttcacggg			2086
caatgccaat gaagtcaaag tgggcaaaag ttacaagat tcacctgaaa atatcgcgcc			2146
agccttccac aatacaccaa aagaaagtgg cttggcgccg ttaaacnaro taaaccaacc			2206

五、發明說明 (245)

accgatggtg ccacacgcga cgaaaaacta tcaggtgacg aaaaatatca accaatgttt 2266
aacttgcat agcccagaag cctcacgtgt tactggtgca acacgcacatca gtccaacca 2326
ctttatggat cgtgatggta acattgtcgg aggcacctca cctcgccgtt acttctgttt 2386
acaatgccat gtctctcaat ctgatgttga gccgattatt caaaatgaat ttaaaccgat 2446
ggctgggttt ggtaaataag ttaaggacgg aactatgttg aacttaatta aacgcttttg 2506
gaaatgggtt cgctcgccca gtcgtattgc cgttgggtacc ttgattaccc ttgcttttat 2566
tgcagggtatt gtctcttggg ttgggtttaa ttatggctta gagcaaacca atacagagga 2626
attctgtgtt agttgtcaca gtaatgatgt gtatccagaa tatttacata cggcgcatta 2686
tttaaactgc agtggagtaa aagccacttg tcttgattgc catgtaccgc acgaatttat 2746
tccaaaaatg atccgtaaag tccaagccag tcgagaagtg tatgcgcac tttatgggtta 2806
tacggatacc attgataaat ttaactcccg tcgtttgcat atggcagaac gtgaatgggc 2866
acgattaaaa gccataaact cgcaggaatg ccgtaactgc cataactttg agaatatgga 2926
tttttagtcag caaaaaacgg tggcggaaaa aatgcatgca cttgctataa aagaagaaaa 2986
aacctgtatt gactgtcaca aagggattgc gcaccaatta ccggatatga gcggtgttga 3046
gtcgggtttt agtacggaac aaaaataaca cttttcttgt tctccacag gaaatctgca 3106
tcgtattcag gtgcagattt ttttattttt acgatcatcc tcacaacctt ttcgctgata 3166
aataggatac aacgctagct acacgctatc ttgctgcttt ttgtgttgtt gtgagggtt 3226
atgtcatctt atctgcctct tttattacgt ttgttataaa ttccgctgtt gggttcgtg 3286
gcgatccagc gtttattgga gcacatcagt ccagcggaaat taatggaata tgatacaaaa 3346
gcctttcaac agataggctg gacggcacag cagattcagc gttgggtttac gcctgagaac 3406
cgttatattg atcccgctt agcctgggta aacgaacaac aacatattgt ggattggttt 3466
gatcctcatt atcctccctt gttaaagcaa acagaagagg caccacttgt cttgtttgtg 3526
aaaggggaag tggctacgct atctgcacag caagtggcga tcgtgggcag tcgtcattgt 3586
tcacgttatg gggaaactg ggcaaattat ttccgcaactc aactggctta tgccgatatt 3646
gtggtgacca gtgggttagc gttaggtatt gatgggtttt cacatcaagc ggtagtggat 3706
atccacggga agacgattgc agtattaggc agtgggttag aggtcattta tccgaaaaaa 3766
caccgaggtt tagccgaaaa aattattgaa catcaagggtg cgttagtgtc tgaattttta 3826
cctttccaac cccctgtggc agaaaatttt ccacgtcgta atcgcatat tagtgggtta 3886
tctttgggga cattagtcat tgaagcctca gaaaacagtg gttctttaat tactgcccgc 3946
tatgctttag agcaaaatcg agatgttttt gcgttaccgg ggcagattca gcatggattt 4006
agccaagggt gtcataaact gattaaacag ggggcaatat tagtcgaaaag tattcaggat 4066
attttagaac atctctcgcc ttattcgcac tctgccatgc cagcgttgc tcgtacccag 4126

五、發明說明 (246)

aacgcctttt ctcaacaagt aacagacaca tcaaccatca atactgcgcg gataacgcc 4186
gaacatccgg aattatatgc caaaattggc tatatgcccg tcagtattga tgtattagcc 4246
caacaagtca atctacctat tgatacctta ttagtacagc ttttaacctt ggaattgcaa 4306
gacttgattg ttgctgaaaa tggattatat cagcgcaa at aacggaaaga gtaaccacaa 4366
atgagaaaagg actgtgttga aacggctatc aacatcagtc cttgcagtat attatctcat 4426
atgacacgag acggcagttt catgagatta atagagacta aacgcttgta aatacggtag 4486
tttgccctcgt tgtagcattt tctcaatatt gcctttgtga tcatcacgac ctaagcctcg 4546
tagctcaata ttgataccaa tacttttgtc ataaaaaatt tgattcgccg tttgggttttc 4606
tttgctggtc aactacgtc gggcaccaac attaatcgcc caacagcaag tgctgtattc 4666
tagtcccaaa tattgctcaa caggctttct caacgcaaga tcttgataat gacgtgctac 4726
caccgccc at tgatccgtga gtgccc atgc cacagttaga ccaagctgtt ttatgtcttg 4786
tccgtagcgg ttcgccgctg aggtgaggtt ttggtcaata tattgttga 4835

<210> 83
<211> 250
<212> 蛋白質
<213> 敗血性巴斯德桿菌

<400> 83
Met Lys Lys Thr Val Val Asn Pro Glu Arg Arg Phe Phe Lys Glu
1 5 10 15
Ala Thr Arg Thr Ala Gly Gly Leu Ala Gly Val Thr Leu Leu Leu Gly
20 25 30
Leu Gln Gln Lys Lys Ser Leu Ala Arg Glu Gly Val Ala Leu Arg Pro
35 40 45
Pro Phe Ala Leu Glu Asn Glu Lys Ala Phe Ser Ala Ala Cys Ile Arg
50 55 60
Cys Gly Gln Cys Val Gln Ala Cys Pro His Glu Met Leu His Leu Ala
65 70 75 80
Ser Leu Ile Ser Pro Met Glu Ala Gly Thr Pro Tyr Phe Ile Ala Arg
85 90 95
Asp Lys Pro Cys Glu Met Cys Val Asp Ile Pro Cys Ala Lys Ala Cys
100 105 110
Pro Thr Gly Ala Leu Asp Asn Gln Ala Thr Glu Ile Asp Asp Ala Arg
115 120 125
Met Gly Leu Ala Val Leu Leu Asp His Glu Thr Cys Leu Asn Trp Gln
130 135 140
Gly Leu Arg Cys Asp Val Cys Tyr Arg Val Cys Pro Leu Ile Asn Lys
145 150 155 160
Ala Ile Thr Leu Val Met His Arg Asn Glu Arg Thr Gly Lys His Ala
165 170 175

五、發明說明 (247)

Val Phe Ile Pro Thr Val His Ser Glu Ala Cys Thr Gly Cys Gly Lys
180 185 190

Cys Glu Glu Ala Cys Val Leu Glu Glu Ala Ala Ile Lys Val Leu Pro
195 200 205

Met Ala Leu Ala Lys Gly Met Leu Gly Lys His Tyr Arg Leu Gly Trp
210 215 220

Glu Glu Lys Glu Lys Ala Gly His Ser Leu Ala Pro Glu Gly Ile Ile
225 230 235 240

Ser Leu Pro Thr Arg Leu Pro Glu Ser Leu
245 250

<210> 84
<211> 3494
<212> DNA
<213> 敗血性巴斯德桿菌

<220>
<221> CDS
<222> (2411) .. (2719)

<220>
<223> yyaM

<400> 84
gtcaacgata cgaatacgac ggaagaaaac tatatgcaag tcatttatgg caagactgcg 60
cgtctatttcg aagctgcgac gcattgccc gcgatacttg ctcatgcgac ggaagcccaa 120
gaaaatgctt tacgcgaata tggttgttat ctaggcacag cttttcaatt agtcgatgat 180
attttagatt atagtgcaga tgcaaaagca ctccggcaaaa atattggtga tgatttagcg 240
gaaggtaaac caacattacc gttattacac gccatgcac acggcaatcc agcacaagca 300
aaattgattc gcgaagcgat tgagcaaggg ggtaagcgtg atattttaga ggatgtactg 360
acaattatga cagaacataa atccctcgac tatgcgatga tgcgcgctaa acaagaagca 420
caaaaagccg ttgatgcgat tgcattattg cctgaaaatg aatataaaca agcgttaatt 480
tcattagctt acttatccgt cgatcgcgct tattaaccac ttaataaggc gagacatgtt 540
agcgtaacga ccgcctaaag tgcgggtcatt tatttagtaa ttttaaacac gacaatgaca 600
gaacaaaaca tccctacgaa aaaaacacgc aaaggcaaag atcctcacgc gccttttgta 660
cgcgaaaaat tatccctacc aaatgggcat aacaaattgt tattgcattc ttgttggtcg 720
ccttgctcgg gagaagtaat ggaggcaatt catgcttcag gtattgaatt tactatttac 780
ttctacaacc caaacattca ccattataaa gaatatctca ttcgtaaaga agaaaatatt 840
cgttttgctg aaaaatgggg cattccgttt attgatgccg attatgatcg tcaagaatgg 900
tttgaccgtg ccaaaggcat ggaagatgag ccagagcgtg gtattcggtg cactatgtgc 960
tttgatatgc gttttgaaaa agccgcagaa tatgcacaca acaatgggtt ccccgatatt 1020

五、發明說明 (248)

actagctgct taggtatttc acgttggaaa gacatgaacc aaatcaacgg ttgtggacac 1080
cgtgccgccc aaaaatatga tgatgtagtg tattgggatt ataactggcg taaaggtggg 1140
ggctcacaac gtagtattga aatcagtaag cgtgaacggt tttaccagca agaattattgc 1200
ggttgtgtgt attcttttgc tgacacgaat aaatggcggt aagcaaacgg acgcaaaaaa 1260
attgaaattg gcaaattgta ttattccgcc gattaaaaca accaagtaaa ccatcggtgcc 1320
gtcatataac atggcggcac ttttttaggc tttatatatg caacgttttc gccaatcttt 1380
cgaaacctaa tgctaacgcc tcttactaa tatttaatgc tggggcaaaa cgcaatacat 1440
taggaccgcg cactaaaatc attagccat tatctgctgc ttttttgaca aattcgctcg 1500
ctcttccgtg atattgctcg ataagttctg caccaattaa caaaccttcg ccacggattt 1560
ctttaataaa gccacattgc tgattaattt ctgcagctt tgcataaat tttcagaag 1620
tgcgctgaat tttttgcaag aatgggtggg ctgaaatgat atcaatcact tttctgcca 1680
cggcacaagc gagaggattg ccaccaaagg tggtgccatg caccgaggt gcaaaaactt 1740
tggcgatctc atgcgttgc aacgaatgag aaaattgtga cagattgggc tccaacggga 1800
cgtgcggatg agattgggga tacgcaagta cgttatgaaa ttgagcaggt gagttctagc 1860
aattatagtg cactgtttgt ctccatttta cagatgaaac gtaatgaggt ggtatttagt 1920
ccacatttag cggataaaca acgttatagt tctgatcgct tgaaccaact tgttggtgaa 1980
ttagatgcgt cttatcgtaa acaagtcgt gatttgaata acagcggatt gatgccaatt 2040
cagtctgtat tcggtacgga cagtaatggg cgtactgctc tcgtgttagg cgcacccttt 2100
aatcatgcgt ggacaaaact aggacaagtt ttaccgcagc ttgaatttga tattaagat 2160
gaaattattg gtcgtggggg aagggagtta aaataccgtc cagctggagc aaaaagttgg 2220
tgggtggccat ttggtcgtgc tgaaggcagt agcggactga aaacaggtac ctattttatg 2280
cagttaagcg ccttagggaa gcaaagtgcg gtggtgatga ccgatgatga tggcaatgcg 2340
ttatctgggg agcaagctca ggcgctttat caagcattac aaaatctctt agcgaataaa 2400
tacagtcaag atg act aaa ctc agt atc cag cga gat aac ttg att tgt 2449
Met Thr Lys Leu Ser Ile Gln Arg Asp Asn Leu Ile Cys
1 5 10
ttg agt tat gtc gca tta atg gga ttc ggc ttt ccc att atg cgt tat 2497
Leu Ser Tyr Val Ala Leu Met Gly Phe Gly Phe Pro Ile Met Arg Tyr
15 20 25
atg agt att cat ttt gat aca tta aat aat aac gct gtt cgc ttt ctc 2545
Met Ser Ile His Phe Asp Thr Leu Asn Asn Asn Ala Val Arg Phe Leu
30 35 40 45
tca ggg ggc agc gtt ttt att tta gcc tgt ttt ttt tat tat cgc gct 2593
Ser Gly Gly Ser Val Phe Ile Leu Ala Cys Phe Phe Tyr Tyr Arg Ala
50 55 60
gag tta aca tct tcg ggg gct ggc gtc cag tcc gtt gcg atg ttg ccg 2641

五、發明說明 (249)

Glu Leu Thr Ser Ser Gly Ala Gly Val Gln Ser Val Ala Met Leu Pro
65 70 75
agt tca agt tta ggt ttc tta ata ttg aaa act gta cca tct ttt tca 2689
Ser Ser Ser Leu Gly Phe Leu Ile Leu Lys Thr Val Pro Ser Phe Ser
80 85 90
tac gtt aca atc tca aca ctt aat cgc gtt tgaccttccg atttttgata 2739
Tyr Val Thr Ile Ser Thr Leu Asn Arg Val
95 100
gtcaaagact actgagtaac gcttgtagtc gcgtgaatcg actgttacat aagccgatat 2799
gtcagaataa gtactgccg tatatcgtct taatctaaga ttaagcttgc cacttttggt 2859
cgataaagcg tcaaacgaaa gcacgacttt accgtccttg acttccacct gatcttcaat 2919
gagcacttga cttagtgcga ccaatcgacc gttggcagtc agtgctgcaa tgccgtgac 2979
cgtatcaagc gttacaccgc tattttttcc ccagttttta ttgagctttt cactatgttt 3039
cagtaagttt ctgccaccaa tctgcaactg attaaactta gcttcaagcg tttcactctt 3099
gactgcaagc gacttgtttt cattgctaac cgtctgctca agtgctgtga ttttggatgt 3159
taaatactaac ttagttgcat tgacttcac agtcattct gactttaact cttttctcgc 3219
aagtgcgcc acttcatctt tgctagcttt cgtttctttt aagtcagaaa tgccactagt 3279
attttgcgcc actttagaat cgagcgtttc tagttttgta gagaaagatt tgtctttttc 3339
gctagccgtt ttttgaatta gctgtatttc actttcgtc aatccaactc tagcagttag 3399
actgtctagc ttgtcagcag tagatttatt cacagtcgct tgtgattgct tgtgttgaat 3459
aatatccgcg cttacttccg agatagccac gtcga 3494

<210> 85
<211> 103
<212> 蛋白質
<213> 敗血性巴斯德桿菌

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

五、發明說明 (250)

<210> 86
<211> 19
<212> DNA
<213> 人造的序列

<220>
<223> 人造序列的說明：引子

<400> 86
aggccggtac cggccgcct

19

<210> 87
<211> 19
<212> DNA
<213> 人造的序列

<220>
<223> 人造序列的說明：引子

<400> 87
cggccggtac cggcctagg

19

<210> 88
<211> 18
<212> DNA
<213> 人造的序列

<220>
<223> 人造序列的說明：引子

<400> 88
catggtaccc attctaac

18

<210> 89
<211> 18
<212> DNA
<213> 人造的序列

<220>
<223> 人造序列的說明：引子

<400> 89
ctaggtacct acaacctc

18

<210> 90
<211> 119
<212> DNA
<213> 人造的序列

<220>
<221>
<222>
<223> 人造序列的說明：轉因子插入

<220>

五、發明說明 (251)

<221> misc_特徵
<222> 25
<223> N=A或T或G或C

<220>
<221> misc_特徵
<222> 27
<223> N=A或T或G或C

<220>
<221> misc_特徵
<222> 29
<223> N=A或T或G或C

<220>
<221> misc_特徵
<222> 31
<223> N=A或T或G或C

<220>
<221> misc_特徵
<222> 33
<223> N=A或T或G或C

<220>
<221> misc_特徵
<222> 35
<223> N=A或T或G或C

<220>
<221> misc_特徵
<222> 37
<223> N=A或T或G或C

<220>
<221> misc_特徵
<222> 39
<223> N=A或T或G或C

<220>
<221> misc_特徵
<222> 41
<223> N=A或T或G或C

<220>
<221> misc_特徵
<222> 43
<223> N=A或T或G或C

<220>
<221> misc_特徵
<222> 45
<223> N=A或T或G或C

<220>
<221> misc_特徵
<222> 47
<223> N=A或T或G或C

<220>
<221> misc_特徵
<222> 49
<223> N=A或T或G或C

五、發明說明 (252)

<220>
<221> misc_特徵
<222> 51
<223> N=A或T或G或C

<220>
<221> misc_特徵
<222> 53
<223> N=A或T或G或C

<220>
<221> misc_特徵
<222> 55
<223> N=A或T或G或C

<220>
<221> misc_特徵
<222> 57
<223> N=A或T或G或C

<220>
<221> misc_特徵
<222> 59
<223> N=A或T或G或C

<220>
<221> misc_特徵
<222> 61
<223> N=A或T或G或C

<220>
<221> misc_特徵
<222> 63
<223> N=A或T或G或C

<220>
<221> misc_特徵
<222> 65
<223> N=A或T或G或C

<220>
<221> misc_特徵
<222> 67
<223> N=A或T或G或C

<220>
<221> misc_特徵
<222> 69
<223> N=A或T或G或C

<220>
<221> misc_特徵
<222> 71
<223> N=A或T或G或C

<220>
<221> misc_特徵
<222> 73
<223> N=A或T或G或C

五、發明說明 (253)

<220>

<221> misc_特徵

<222> 75

<223> N=A或T或G或C

<220>

<221> misc_特徵

<222> 77

<223> N=A或T或G或C

<220>

<221> misc_特徵

<222> 79

<223> N=A或T或G或C

<220>

<221> misc_特徵

<222> 81

<223> N=A或T或G或C

<220>

<221> misc_特徵

<222> 83

<223> N=A或T或G或C

<220>

<221> misc_特徵

<222> 85

<223> N=A或T或G或C

<220>

<221> misc_特徵

<222> 87

<223> N=A或T或G或C

<220>

<221> misc_特徵

<222> 89

<223> N=A或T或G或C

<220>

<221> misc_特徵

<222> 91

<223> N=A或T或G或C

<220>

<221> misc_特徵

<222> 93

<223> N=A或T或G或C

<400> 90

ctaggtagcct acaacctcaa gcttnknknk nknknknknk nknknknknk nknknknknk 60

nknknknknk nknknknknk nknknknknk nknkaagctt ggtagaatg ggtaccatg 119

<210> 91

<211> 18

<212> DNA

<213> 人造的序列

<220>

<223> 人造序列的說明：引子

五、發明說明 (254)

<400> 91 tacctacaac ctcaagct	18
<210> 92 <211> 18 <212> DNA <213> 人造的序列	
<220> <223> 人造序列的說明：引子 <400> 92 taccattct aaccaagc	18
<210> 93 <211> 19 <212> DNA <213> 人造的序列	
<220> <223> 人造序列的說明：引子 <400> 93 tacctacaac ctcaagctt	19
<210> 94 <211> 20 <212> DNA <213> 人造的序列	
<220> <223> 人造序列的說明：引子 <400> 94 taccattct aaccaagctt	20
<210> 95 <211> 19 <212> DNA <213> 人造的序列	
<220> <223> 人造序列的說明：引子 <400> 95 ggcagagcat tacgctgac	19
<210> 96 <211> 27 <212> DNA <213> 人造的序列	
<220> <223> 人造序列的說明：引子 <400> 96 gtaccggcca ggccggccacg cgtattc	27

裝
訂
線

五、發明說明 (255)

<210> 97
<211> 531
<212> DNA
<213> 胸膜肺炎放線桿菌

<220>
<223> atpG

<400> 97
tggtgagctt ggttttagtag ggtcgaaagg cgtaagcttt taccaaaatc taggcttaaa 60
cgtgagatct caagtaacgg gattaggcga taatccggaa atggaacgta tcgtgggcgc 120
agttaatgaa atgattaatg cgttccgaaa cggagaagtg gatgcggttt acgtcgctta 180
caaccgtttt gaaaatacga tgtcacaaaa acctgttatc gcacagttac ttccgttacc 240
taaactagat gacgatgaat tagatacgaa aggttcattg gattatattt atgaaccgaa 300
tccacaagtt ttattggata gtttacttgt tcgttattta gaaactcagg tataccaagc 360
agttgtagat aacctagctt ctgaacaagc cgctcgaatg gtagcgatga aagccgcaac 420
agataatgcg ggtacattaa tcgatgaatt acaattagtg tataacaaag ctgcgcaagc 480
aagcattaca aatgaattaa acgaaattgt tgcgggtgcc gcagcaattt a 531

<210> 98
<211> 25
<212> DNA
<213> 人造的序列

<220>
<223>人造序列的說明：引子

<400> 98
tctccattcc cttgctcgg cacc 25

<210> 99
<211> 20
<212> DNA
<213> 人造的序列

<220>
<223>人造序列的說明：引子

<400> 99
ggattacagc cggatccgg 20

<210> 100
<211> 1034
<212> DNA
<213> 敗血性巴斯德桿菌

<220>
<223> cap5E

<220>
<221> CDS
<222> (1)..(1032)

五、發明說明 (256)

<400> 100
atg ttt aaa aat aaa aca ctt tta att aca ggt gga acg ggt tct ttt 48
Met Phe Lys Asn Lys Thr Leu Leu Ile Thr Gly Gly Thr Gly Ser Phe
1 5 10 15

ggt aat gct gta ctc aaa cgt ttc tta gaa aca gat att cga gaa att 96
Gly Asn Ala Val Leu Lys Arg Phe Leu Glu Thr Asp Ile Arg Glu Ile
20 25 30

cgt gtt ttt tcg cgt gat gag aag aaa caa gat gac atg cgg aaa aaa 144
Arg Val Phe Ser Arg Asp Glu Lys Lys Gln Asp Asp Met Arg Lys Lys
35 40 45

tat aat gat gca aaa tta aaa ttt tat att ggc gat gtt cgt gac tac 192
Tyr Asn Asp Ala Lys Leu Lys Phe Tyr Ile Gly Asp Val Arg Asp Tyr
50 55 60

gat agt att tta aat gcc tcg cga ggt gtt gac tat att tat cat gct 240
Asp Ser Ile Leu Asn Ala Ser Arg Gly Val Asp Tyr Ile Tyr His Ala
65 70 75 80

gcc gca tta aag caa gtg cct tca tgc gag ttt tat ccg tta gag gca 288
Ala Ala Leu Lys Gln Val Pro Ser Cys Glu Phe Tyr Pro Leu Glu Ala
85 90 95

gtg aaa acc aat att tta ggt acg gca aat gtc tta gaa gcc gcc atc 336
Val Lys Thr Asn Ile Leu Gly Thr Ala Asn Val Leu Glu Ala Ala Ile
100 105 110

caa aac cag ata aaa cgc gtc gtc tgt ctt agc aca gat aaa gcg gtg 384
Gln Asn Gln Ile Lys Arg Val Val Cys Leu Ser Thr Asp Lys Ala Val
115 120 125

tac cca att aat gcg atg ggc att tct aaa gca atg atg gaa aaa gtc 432
Tyr Pro Ile Asn Ala Met Gly Ile Ser Lys Ala Met Met Glu Lys Val
130 135 140

atc atc gca aaa tcg cgt aac cta gaa ggc aca cca acg aca atc tgt 480
Ile Ile Ala Lys Ser Arg Asn Leu Glu Gly Thr Pro Thr Thr Ile Cys
145 150 155 160

tgt act cgc tat ggc aat gtc atg gca tcg cgt ggt tcg gtt atc cca 528
Cys Thr Arg Tyr Gly Asn Val Met Ala Ser Arg Gly Ser Val Ile Pro
165 170 175

tta ttt gtc gat caa ata cgt caa ggc aag cct ttt act att act gat 576
Leu Phe Val Asp Gln Ile Arg Gln Gly Lys Pro Phe Thr Ile Thr Asp
180 185 190

cct gag atg aca cgc ttt atg atg aca ttg gaa gat gct gtg gat tta 624
Pro Glu Met Thr Arg Phe Met Met Thr Leu Glu Asp Ala Val Asp Leu
195 200 205

gtc cta tat gca ttt aaa aat ggt caa aat ggt gat gtt ttt gta caa 672
Val Leu Tyr Ala Phe Lys Asn Gly Gln Asn Gly Asp Val Phe Val Gln
210 215 220

aaa gcc ccc gca gca acc att ggt acc ctt gcc aaa gca att acc gaa 720
Lys Ala Pro Ala Ala Thr Ile Gly Thr Leu Ala Lys Ala Ile Thr Glu
225 230 235 240

tta tta tct gtc cca aat cac cct att tcc att ata ggt acg cgt cat 768
Leu Leu Ser Val Pro Asn His Pro Ile Ser Ile Ile Gly Thr Arg His

五、發明說明 (257)

245	250	255	
gga gag aaa gca ttc gaa gct tta tta agc cgt gaa gaa atg gtt cat			816
Gly Glu Lys Ala Phe Glu Ala Leu Leu Ser Arg Glu Glu Met Val His			
260	265	270	
gca att aat gaa ggt aat tat tat cgc atc cca gcc gat caa cgc agt			864
Ala Ile Asn Glu Gly Asn Tyr Tyr Arg Ile Pro Ala Asp Gln Arg Ser			
275	280	285	
cta aat tac agt aaa tat gtc gaa aaa ggg gaa cca aaa att acc gaa			912
Leu Asn Tyr Ser Lys Tyr Val Glu Lys Gly Glu Pro Lys Ile Thr Glu			
290	295	300	
gtc acc gac tac aac tca cat aat act gag cgt ttg act gtc aag gaa			960
Val Thr Asp Tyr Asn Ser His Asn Thr Glu Arg Leu Thr Val Lys Glu			
305	310	315	320
atg aag cag tta ctg ctt aaa ctt gaa ttc ata cag aaa atg att gag			1008
Met Lys Gln Leu Leu Leu Lys Leu Glu Phe Ile Gln Lys Met Ile Glu			
325	330	335	
ggg gaa tac atc tca ccg gag gta ta			1034
Gly Glu Tyr Ile Ser Pro Glu Val			
340			

<210> 101

<211> 344

<212> 蛋白質

<213> 敗血性巴斯德桿菌

<400> 101

Met Phe Lys Asn Lys Thr Leu Leu Ile Thr Gly Gly Thr Gly Ser Phe
1 5 10 15

Gly Asn Ala Val Leu Lys Arg Phe Leu Glu Thr Asp Ile Arg Glu Ile
20 25 30

Arg Val Phe Ser Arg Asp Glu Lys Lys Gln Asp Asp Met Arg Lys Lys
35 40 45

Tyr Asn Asp Ala Lys Leu Lys Phe Tyr Ile Gly Asp Val Arg Asp Tyr
50 55 60

Asp Ser Ile Leu Asn Ala Ser Arg Gly Val Asp Tyr Ile Tyr His Ala
65 70 75 80

Ala Ala Leu Lys Gln Val Pro Ser Cys Glu Phe Tyr Pro Leu Glu Ala
85 90 95

Val Lys Thr Asn Ile Leu Gly Thr Ala Asn Val Leu Glu Ala Ala Ile
100 105 110

Gln Asn Gln Ile Lys Arg Val Val Cys Leu Ser Thr Asp Lys Ala Val
115 120 125

Tyr Pro Ile Asn Ala Met Gly Ile Ser Lys Ala Met Met Glu Lys Val
130 135 140

Ile Ile Ala Lys Ser Arg Asn Leu Glu Gly Thr Pro Thr Thr Ile Cys
145 150 155 160

五、發明說明 (258)

Cys Thr Arg Tyr Gly Asn Val Met Ala Ser Arg Gly Ser Val Ile Pro
165 170 175
Leu Phe Val Asp Gln Ile Arg Gln Gly Lys Pro Phe Thr Ile Thr Asp
180 185 190
Pro Glu Met Thr Arg Phe Met Met Thr Leu Glu Asp Ala Val Asp Leu
195 200 205
Val Leu Tyr Ala Phe Lys Asn Gly Gln Asn Gly Asp Val Phe Val Gln
210 215 220
Lys Ala Pro Ala Ala Thr Ile Gly Thr Leu Ala Lys Ala Ile Thr Glu
225 230 235 240
Leu Leu Ser Val Pro Asn His Pro Ile Ser Ile Ile Gly Thr Arg His
245 250 255
Gly Glu Lys Ala Phe Glu Ala Leu Leu Ser Arg Glu Glu Met Val His
260 265 270
Ala Ile Asn Glu Gly Asn Tyr Tyr Arg Ile Pro Ala Asp Gln Arg Ser
275 280 285
Leu Asn Tyr Ser Lys Tyr Val Glu Lys Gly Glu Pro Lys Ile Thr Glu
290 295 300
Val Thr Asp Tyr Asn Ser His Asn Thr Glu Arg Leu Thr Val Lys Glu
305 310 315 320
Met Lys Gln Leu Leu Leu Lys Leu Glu Phe Ile Gln Lys Met Ile Glu
325 330 335
Gly Glu Tyr Ile Ser Pro Glu Val
340

<210> 102
<211> 4931
<212> DNA
<213> 敗血性巴斯德桿菌

<220>
<223> fhaB2

<220>
<221> CDS
<222> (1) .. (4929)

<220>
<221> misc_特徵
<222> 1632
<223> Xaa=任何或未知的胺基酸

<400> 102
atg aac aaa aat cgt tac aaa ctc att ttt agt caa gtc aaa ggt tgt 48
Met Asn Lys Asn Arg Tyr Lys Leu Ile Phe Ser Gln Val Lys Gly Cys
1 5 10 15
ctc gtt cct gtg gca gaa tgt att aac tca gct att agc aat ggt tca 96
Leu Val Pro Val Ala Glu Cys Ile Asn Ser Ala Ile Ser Asn Gly Ser

裝
打
線

五、發明說明 (259)

20	25	30	
tct gat tca aca tcc aca tca gaa caa gtt gaa gag gaa cct ttc ctt			144
Ser Asp Ser Thr Ser Thr Ser Glu Gln Val Glu Glu Glu Pro Phe Leu			
35	40	45	
cta gaa caa tat tca ctt tcc tcc gtg tct tta tta gta aaa agc acg			192
Leu Glu Gln Tyr Ser Leu Ser Ser Val Ser Leu Leu Val Lys Ser Thr			
50	55	60	
ttc aat cct gtt cgc tat gca atg caa ttg act tgg aaa cag ctt tct			240
Phe Asn Pro Val Ser Tyr Ala Met Gln Leu Thr Trp Lys Gln Leu Ser			
65	70	75	80
att tta ttt tta act gtg att tct gtt cct gtt ttg gct gag gga aaa			288
Ile Leu Phe Leu Thr Val Ile Ser Val Pro Val Leu Ala Glu Gly Lys			
85	90		95
ggg gat gaa aga aat caa tta aca gtg att gat aat agc gat cat att			336
Gly Asp Glu Arg Asn Gln Leu Thr Val Ile Asp Asn Ser Asp His Ile			
100	105		110
aaa tta gat gca tct aat ctt gct ggt aat gat aaa aca aaa atc tat			384
Lys Leu Asp Ala Ser Asn Leu Ala Gly Asn Asp Lys Thr Lys Ile Tyr			
115	120		125
caa gca gaa aat aaa gtt ctg gtt att gat att gct aaa cca aat ggg			432
Gln Ala Glu Asn Lys Val Leu Val Ile Asp Ile Ala Lys Pro Asn Gly			
130	135		140
aaa ggg att tca gat aac cgt ttt gaa aaa ttt aat att cca aat agc			480
Lys Gly Ile Ser Asp Asn Arg Phe Glu Lys Phe Asn Ile Pro Asn Ser			
145	150		155
gcg gtg ttt aat aat aat ggg act gaa gcg cag gca aga tca aca tta			528
Ala Val Phe Asn Asn Asn Gly Thr Glu Ala Gln Ala Arg Ser Thr Leu			
165	170		175
att ggt tac att ccg caa aat caa aat tta agg gga ggg aaa gaa gct			576
Ile Gly Tyr Ile Pro Gln Asn Gln Asn Leu Arg Gly Gly Lys Glu Ala			
180	185		190
gat gtt ata tta aat caa gtg aca ggt cct caa gaa agt aaa att gtt			624
Asp Val Ile Leu Asn Gln Val Thr Gly Pro Gln Glu Ser Lys Ile Val			
195	200		205
ggc gcg ctt gaa gta tta ggt aaa aaa gct gat atc gtc att gca aac			672
Gly Ala Leu Glu Val Leu Gly Lys Lys Ala Asp Ile Val Ile Ala Asn			
210	215		220
caa aat ggt att acc tta aat ggt gta aga aca ata aat tca gat cgt			720
Gln Asn Gly Ile Thr Leu Asn Gly Val Arg Thr Ile Asn Ser Asp Arg			
225	230		235
ttt gtt gcc act acg agt gag ctt ata gat ccg aat cag atg atg tta			768
Phe Val Ala Thr Thr Ser Glu Leu Ile Asp Pro Asn Gln Met Met Leu			
245	250		255
aag gtt aca aaa gga aat gtg atc att gat att gat ggt ttt tcg aca			816
Lys Val Thr Lys Gly Asn Val Ile Ile Asp Ile Asp Gly Phe Ser Thr			
260	265		270
gat gga tta aag tat tta gat att att gct aaa aaa att gaa caa aag			864

五、發明說明 (260)

Asp Gly Leu Lys Tyr Leu Asp Ile Ile Ala Lys Lys Ile Glu Gln Lys	
275 280 285	
caa tca att aca tca ggg gat aat tca gaa gca aaa aca gat gtc act	912
Gln Ser Ile Thr Ser Gly Asp Asn Ser Glu Ala Lys Thr Asp Val Thr	
290 295 300	
ctt att gcg ggt tcc agt gaa tat gat tta agc aaa cat gag ctg aaa	960
Leu Ile Ala Gly Ser Ser Glu Tyr Asp Leu Ser Lys His Glu Leu Lys	
305 310 315 320	
aaa acg agc ggt gaa aat gta tct aat gat gtt att gct atc acg gga	1008
Lys Thr Ser Gly Glu Asn Val Ser Asn Asp Val Ile Ala Ile Thr Gly	
325 330 335	
tct agt aca ggc gca atg cat ggt aaa aat att aag ttg att gtg aca	1056
Ser Ser Thr Gly Ala Met His Gly Lys Asn Ile Lys Leu Ile Val Thr	
340 345 350	
gat aaa ggt gca ggc gta aaa cat gat gga att att ttg tct gaa aat	1104
Asp Lys Gly Ala Gly Val Lys His Asp Gly Ile Ile Leu Ser Glu Asn	
355 360 365	
gat att cag att gaa atg aat gaa ggt gac tta gaa ctt ggc aat acg	1152
Asp Ile Gln Ile Glu Met Asn Glu Gly Asp Leu Glu Leu Gly Asn Thr	
370 375 380	
att cag caa aca gtg gta aaa aaa gac cga aat att cga gcc aag aaa	1200
Ile Gln Gln Thr Val Val Lys Lys Asp Arg Asn Ile Arg Ala Lys Lys	
385 390 395 400	
aaa att gaa gtg aaa aac gct aat cgt gtt ttt gtt ggt agt caa acg	1248
Lys Ile Glu Val Lys Asn Ala Asn Arg Val Phe Val Gly Ser Gln Thr	
405 410 415	
aaa tca gat gaa att tcg tta gag gcg aaa caa gtt aaa atc aga aaa	1296
Lys Ser Asp Glu Ile Ser Leu Glu Ala Lys Gln Val Lys Ile Arg Lys	
420 425 430	
aac gca gag att agg agt acg aca caa gcc aaa atc gta gca aag ggt	1344
Asn Ala Glu Ile Arg Ser Thr Thr Gln Ala Lys Ile Val Ala Lys Gly	
435 440 445	
gcc ctg tct att gag caa aat gcg aag ctc gtc gct aaa aag ata gat	1392
Ala Leu Ser Ile Glu Gln Asn Ala Lys Leu Val Ala Lys Lys Ile Asp	
450 455 460	
gtg gca aca gaa act cta act aat gct ggg cgt att tat ggt cga gag	1440
Val Ala Thr Glu Thr Leu Thr Asn Ala Gly Arg Ile Tyr Gly Arg Glu	
465 470 475 480	
gtt aag ctt gac act aat aat ttg att aat gat aaa gaa att tat gct	1488
Val Lys Leu Asp Thr Asn Asn Leu Ile Asn Asp Lys Glu Ile Tyr Ala	
485 490 495	
gaa cgg aaa ttg agt att ttg acg aaa gga aaa gat ctt gaa att att	1536
Glu Arg Lys Leu Ser Ile Leu Thr Lys Gly Lys Asp Leu Glu Ile Ile	
500 505 510	
caa gat aga tat ttg tct cca ctg atg cgc gta aaa agt agt gtc cgc	1584
Gln Asp Arg Tyr Leu Ser Pro Leu Met Arg Val Lys Ser Ser Val Arg	
515 520 525	

五、發明說明 (261)

ttt tta ggc tct ccg ttt ttc tca ata tct ccg tcg atg ctc gca agc Phe Leu Gly Ser Pro Phe Phe Ser Ile Ser Pro Ser Met Leu Ala Ser 530 535 540	1632
ctt agt gca cag ttt aag cct ggt ttt gtg aat aag gga ctc att gaa Leu Ser Ala Gln Phe Lys Pro Gly Phe Val Asn Lys Gly Leu Ile Glu 545 550 555 560	1680
agt gcg ggg agt gca gaa tta act ttt aaa gaa aaa acc agt ttt tta Ser Ala Gly Ser Ala Glu Leu Thr Phe Lys Glu Lys Thr Ser Phe Leu 565 570 575	1728
aca gag ggc aat aat ttt att aga gct aaa gat gcg tta act att aac Thr Glu Gly Asn Asn Phe Ile Arg Ala Lys Asp Ala Leu Thr Ile Asn 580 585 590	1776
gcc caa aat att gaa att gat aaa aat caa gat att caa ttg ggt gct Ala Gln Asn Ile Glu Ile Asp Lys Asn Gln Asp Ile Gln Leu Gly Ala 595 600 605	1824
aat ata acg ttg aat gtg gaa gaa aac ttt gtt aat cgt gca gga aca Asn Ile Thr Leu Asn Val Glu Glu Asn Phe Val Asn Arg Ala Gly Thr 610 615 620	1872
ctg gca act ggt aaa aca ctg aca att aat acc gaa agt ggc agt att Leu Ala Thr Gly Lys Thr Leu Thr Ile Asn Thr Glu Ser Gly Ser Ile 625 630 635 640	1920
tac aat ctt ggt ggg aca tta ggt gct gga aaa tca tta aaa ctg act Tyr Asn Leu Gly Gly Thr Leu Gly Ala Gly Lys Ser Leu Lys Leu Thr 645 650 655	1968
gct aaa tca acg gaa gaa ggt atg gga aat att gtt aac caa gaa aac Ala Lys Ser Thr Glu Glu Gly Met Gly Asn Ile Val Asn Gln Glu Asn 660 665 670	2016
ggt tta ttc cat aca ctc ggt aat atg atg tta gaa gca gag cgt tct Gly Leu Phe His Thr Leu Gly Asn Met Met Leu Glu Ala Glu Arg Ser 675 680 685	2064
gtt tat aat att ggc gat att tat gcg agt aaa aaa tta aca gtt cat Val Tyr Asn Ile Gly Asp Ile Tyr Ala Ser Lys Lys Leu Thr Val His 690 695 700	2112
act cat aat ttg att aat gat gtg cgt tta tct ggc aat gtg agt tat Thr His Asn Leu Ile Asn Asp Val Arg Leu Ser Gly Asn Val Ser Tyr 705 710 715 720	2160
aag cct atc ggt tca agt cgt gat tat gat atc agt cgt gtt gcg gta Lys Pro Ile Gly Ser Ser Arg Asp Tyr Asp Ile Ser Arg Val Ala Val 725 730 735	2208
cat ggt tgg cac aat aat gtt tat aag ctc aac tta aat ctg caa gaa His Gly Trp His Asn Asn Val Tyr Lys Leu Asn Leu Asn Leu Gln Glu 740 745 750	2256
caa gat aaa acc gat att aaa gtt gtg aaa atg ggg gct atc cgt tct Gln Asp Lys Thr Asp Ile Lys Val Val Lys Met Gly Ala Ile Arg Ser 755 760 765	2304
gat ggt gat ttt gac ttt aag gga ata aag gcg aca tca tca gaa tca Asp Gly Asp Phe Asp Phe Lys Gly Ile Lys Ala Thr Ser Ser Glu Ser 770 775 780	2352

五、發明說明 (262)

aaa ccg cag tta att aat cat gga tta att aat gtc aaa gga aca ttt	2400
Lys Pro Gln Leu Ile Asn His Gly Leu Ile Asn Val Lys Gly Thr Phe	
785 790 795 800	
aat gcg gaa gct gat caa gtg gtg aac caa atg aaa gcg ttt aac caa	2448
Asn Ala Glu Ala Asp Gln Val Val Asn Gln Met Lys Ala Phe Asn Gln	
805 810 815	
aat gca tta gca agc gtg ttt aag aat cca gcg aaa atc acg atg tac	2496
Asn Ala Leu Ala Ser Val Phe Lys Asn Pro Ala Lys Ile Thr Met Tyr	
820 825 830	
tat caa cca ctt act cgt tat att tgg aca cca tta tcg ggt aat gca	2544
Tyr Gln Pro Leu Thr Arg Tyr Ile Trp Thr Pro Leu Ser Gly Asn Ala	
835 840 845	
tcg cgt gaa ttt aac aat tta gag tct ttc ctc gat gcc ttg ttt ggc	2592
Ser Arg Glu Phe Asn Asn Leu Glu Ser Phe Leu Asp Ala Leu Phe Gly	
850 855 860	
tca aca aca atc tta aaa tca agt ttc tat agt acg gaa aat ttt agt	2640
Ser Thr Thr Ile Leu Lys Ser Ser Phe Tyr Ser Thr Glu Asn Phe Ser	
865 870 875 880	
gct tat cag ctt cta tct cat att cag cat tca cca atg tac caa aaa	2688
Ala Tyr Gln Leu Leu Ser His Ile Gln His Ser Pro Met Tyr Gln Lys	
885 890 895	
gcg atg gca caa gtg ttt ggt gca gag tgg cat agt aaa tcc tat gat	2736
Ala Met Ala Gln Val Phe Gly Ala Glu Trp His Ser Lys Ser Tyr Asp	
900 905 910	
gag atg cga aac aaa tgg aaa agc ttt aaa gaa aat cca aca gat ttc	2784
Glu Met Arg Asn Lys Trp Lys Ser Phe Lys Glu Asn Pro Thr Asp Phe	
915 920 925	
att tat tac cca tca gaa aaa gca aaa atc cta gcg gga aaa cta gaa	2832
Ile Tyr Tyr Pro Ser Glu Lys Ala Lys Ile Leu Ala Gly Lys Leu Glu	
930 935 940	
ggg aag ctt aca acg cta caa aat ggt gaa tat gcc gaa cgt ggt aag	2880
Gly Lys Leu Thr Thr Leu Gln Asn Gly Glu Tyr Ala Glu Arg Gly Lys	
945 950 955 960	
ttt gat gag agt atc caa att ggt aaa cac caa tta tcg cta cca tca	2928
Phe Asp Glu Ser Ile Gln Ile Gly Lys His Gln Leu Ser Leu Pro Ser	
965 970 975	
gta gag ctt aaa gcg gag ttt agt gat aaa gaa cgt ttg gaa gag gac	2976
Val Glu Leu Lys Ala Glu Phe Ser Asp Lys Glu Arg Leu Glu Glu Asp	
980 985 990	
ggg gta gat tta tcc tcg atc gcc gaa ctc tta gaa atg cca aac tta	3024
Gly Val Asp Leu Ser Ser Ile Ala Glu Leu Leu Glu Met Pro Asn Leu	
995 1000 1005	
ttt att gat aat agt atc caa tta gaa aag aaa aag ttg tct cct att	3072
Phe Ile Asp Asn Ser Ile Gln Leu Glu Lys Lys Lys Leu Ser Pro Ile	
1010 1015 1020	
gag gat cta gat gaa gaa cca cgt aaa aat ctg gat ata gaa gaa agc	3120
Glu Asp Leu Asp Glu Glu Pro Arg Lys Asn Leu Asp Ile Glu Glu Ser	
1025 1030 1035 1040	

五、發明說明 (263)

cat tct aat tca tgc gat gac gtg ctt agc atg aat gat gat gag tct	3168
His Ser Asn Ser Ser Asp Asp Val Leu Ser Met Asn Asp Asp Glu Ser	
1045 1050 1055	
gat aca gac gat agc aag tgg agt atg ggc aat gat gag aaa gag atg	3216
Asp Thr Asp Asp Ser Lys Trp Ser Met Gly Asn Asp Glu Lys Glu Met	
1060 1065 1070	
ccc gat gat aag ctg ggt ata agt cgt gat gat cgt gga aat aaa cca	3264
Pro Asp Asp Lys Leu Gly Ile Ser Arg Asp Asp Arg Gly Asn Lys Pro	
1075 1080 1085	
cct cgt act gat cct aca gtt gat tat ctt aac cct gat gaa ttc ttt	3312
Pro Arg Thr Asp Pro Thr Val Asp Tyr Leu Asn Pro Asp Glu Phe Phe	
1090 1095 1100	
gaa aat ggt tat ctc ttg aat gag cta cta cag gag ctt gga gaa gag	3360
Glu Asn Gly Tyr Leu Leu Asn Glu Leu Leu Gln Glu Leu Gly Glu Glu	
1105 1110 1115 1120	
ccg tta cta aaa gaa ggg gaa gat cat ttt aaa cgt tct acc aat cta	3408
Pro Leu Leu Lys Glu Gly Glu Asp His Phe Lys Arg Ser Thr Asn Leu	
1125 1130 1135	
gtc cgt cta ggc gag aga gat agg caa aat aga gaa aag aga gaa aaa	3456
Val Arg Leu Gly Glu Arg Asp Arg Gln Asn Arg Glu Lys Arg Glu Lys	
1140 1145 1150	
gag ggg tat ttt gat ctg cct ggt aca tta gat atg aaa ctg cag gag	3504
Glu Gly Tyr Phe Asp Leu Pro Gly Thr Leu Asp Met Lys Leu Gln Glu	
1155 1160 1165	
tta ttc gaa aaa aga aaa caa aaa cac gaa gca gaa cag aaa gca aga	3552
Leu Phe Glu Lys Arg Lys Gln Lys His Glu Ala Glu Gln Lys Ala Arg	
1170 1175 1180	
ata gaa aaa gca ctt cta caa aaa tca gaa caa caa gaa aaa cgt gtt	3600
Ile Glu Lys Ala Leu Leu Gln Lys Ser Glu Gln Gln Glu Lys Arg Val	
1185 1190 1195 1200	
gaa gaa cgt aag caa gag gaa aaa cgt caa gcg caa gat aaa att gct	3648
Glu Glu Arg Lys Gln Glu Glu Lys Arg Gln Ala Gln Asp Lys Ile Ala	
1205 1210 1215	
aag caa gta gaa att gca aaa gaa atg caa cgg gta gaa gaa att cgc	3696
Lys Gln Val Glu Ile Ala Lys Glu Met Gln Arg Val Glu Glu Ile Arg	
1220 1225 1230	
cag aga gaa aaa caa ctt gcg atc caa ctg caa gaa gaa gag aag aaa	3744
Gln Arg Glu Lys Gln Leu Ala Ile Gln Leu Gln Glu Glu Glu Lys Lys	
1235 1240 1245	
caa caa gaa gaa aaa cat tta tcc gag gag aaa aaa caa gct gaa cag	3792
Gln Gln Glu Glu Lys His Leu Ser Glu Glu Lys Lys Gln Ala Glu Gln	
1250 1255 1260	
aaa caa aaa gct gag gag aaa gtt gca caa gaa aga tta gac att gaa	3840
Lys Gln Lys Ala Glu Glu Lys Val Ala Gln Glu Arg Leu Asp Ile Glu	
1265 1270 1275 1280	
caa cag aaa gcg tat gaa gaa atg gcg aag cga gag gca gag gca tca	3888
Gln Gln Lys Ala Tyr Glu Glu Met Ala Lys Arg Glu Ala Glu Ala Ser	
1285 1290 1295	

五、發明說明 (264)

aaa aat gtt tta ttg aaa gcg att gat gaa gaa cgt cca aaa gtg gaa	3936
Lys Asn Val Leu Leu Lys Ala Ile Asp Glu Glu Arg Pro Lys Val Glu	
1300 1305 1310	
act gat cca ctt ttc cgt aca aaa ttg aaa tat atc aat caa gat gac	3984
Thr Asp Pro Leu Phe Arg Thr Lys Leu Lys Tyr Ile Asn Gln Asp Asp	
1315 1320 1325	
tat gct ggt gca aat tat ttc ttc aat aaa gtt ggt tta aat aca aaa	4032
Tyr Ala Gly Ala Asn Tyr Phe Phe Asn Lys Val Gly Leu Asn Thr Lys	
1330 1335 1340	
ggt cat caa aaa gta aat gtg tta ggg gat aac tat ttt gat cat caa	4080
Gly His Gln Lys Val Asn Val Leu Gly Asp Asn Tyr Phe Asp His Gln	
1345 1350 1355 1360	
gtg att act cgc tcg att gag aaa aaa gta gat aac cac ctt aac caa	4128
Val Ile Thr Arg Ser Ile Glu Lys Lys Val Asp Asn His Leu Asn Gln	
1365 1370 1375	
aaa tac aat ctc agc gat gtg gaa tta gtt aaa cag ctg atg gac aat	4176
Lys Tyr Asn Leu Ser Asp Val Glu Leu Val Lys Gln Leu Met Asp Asn	
1380 1385 1390	
tcc aca aca caa gcg cag gag ttg gat ttg aaa cta ggt gcg gca tta	4224
Ser Thr Thr Gln Ala Gln Glu Leu Asp Leu Lys Leu Gly Ala Ala Leu	
1395 1400 1405	
act aaa gaa caa caa gct aac ttg acc caa gat atc gtt tgg tat gtc	4272
Thr Lys Glu Gln Gln Ala Asn Leu Thr Gln Asp Ile Val Trp Tyr Val	
1410 1415 1420	
aaa acg aag gta aag ggc aaa gat gtg ttt gtt cca aag gtt tat ttc	4320
Lys Thr Lys Val Lys Gly Lys Asp Val Phe Val Pro Lys Val Tyr Phe	
1425 1430 1435 1440	
gct tct gaa acg ctc gta gaa gcc caa aaa tta caa ggt tta ggc act	4368
Ala Ser Glu Thr Leu Val Glu Ala Gln Lys Leu Gln Gly Leu Gly Thr	
1445 1450 1455	
ggg act atc aga gtt ggt gaa gct aag att aaa gcc aaa gat gtg gtg	4416
Gly Thr Ile Arg Val Gly Glu Ala Lys Ile Lys Ala Lys Asp Val Val	
1460 1465 1470	
aat acc ggg aca tta gct ggg aga aaa ctc aat gtt gaa gcg agt aat	4464
Asn Thr Gly Thr Leu Ala Gly Arg Lys Leu Asn Val Glu Ala Ser Asn	
1475 1480 1485	
aaa atc aaa aat caa ggg agt atc tta agt act caa gaa aca cgt tta	4512
Lys Ile Lys Asn Gln Gly Ser Ile Leu Ser Thr Gln Glu Thr Arg Leu	
1490 1495 1500	
gtc ggg cgt aaa ggt att gaa aac gta tct cgt tca ttt gca aat gat	4560
Val Gly Arg Lys Gly Ile Glu Asn Val Ser Arg Ser Phe Ala Asn Asp	
1505 1510 1515 1520	
gaa tta gga gtc act gca caa cgc tca gaa atc aaa acg gaa ggt cat	4608
Glu Leu Gly Val Thr Ala Gln Arg Ser Glu Ile Lys Thr Glu Gly His	
1525 1530 1535	
tta cat ctt gaa aca gat aag gat tca act att gat gta caa gca tcg	4656
Leu His Leu Glu Thr Asp Lys Asp Ser Thr Ile Asp Val Gln Ala Ser	
1540 1545 1550	

五、發明說明 (265)

gat att aaa gca aaa aca agc ttt gtg aag act ggt gat gtg aat ctc 4704
Asp Ile Lys Ala Lys Thr Ser Phe Val Lys Thr Gly Asp Val Asn Leu
1555 1560 1565

aaa aat aca tac aat act aaa cat gcc tac cgt gag aaa ttc tcg ccg 4752
Lys Asn Thr Tyr Asn Thr Lys His Ala Tyr Arg Glu Lys Phe Ser Pro
1570 1575 1580

agt gca cta caa gtt gca gaa ctt gat gtg gca ggg ctt aaa gtc cca 4800
Ser Ala Leu Gln Val Ala Glu Leu Asp Val Ala Gly Leu Lys Val Pro
1585 1590 1595 1600

ctt tta ggc gtg tcc gtc tcc atc cag ttt att cag agc ata cta gtg 4848
Leu Leu Gly Val Ser Val Ser Ile Gln Phe Ile Gln Ser Ile Leu Val
1605 1610 1615

agg caa ctt caa gag gga tca atc ttc gaa gta ggg cac tta cat ntt 4896
Arg Gln Leu Gln Glu Gly Ser Ile Phe Glu Val Gly His Leu His Xaa
1620 1625 1630

gcg gta gac aga aga tgt gaa cca agc ggg gag ta 4931
Ala Val Asp Arg Arg Cys Glu Pro Ser Gly Glu
1635 1640

<210> 103
<211> 1643
<212> 蛋白質
<213> 敗血性巴斯德桿菌

<220>
<221> misc_特徵
<222> 1632
<223> Xaa=任何或未知的胺基酸

<400> 103
Met Asn Lys Asn Arg Tyr Lys Leu Ile Phe Ser Gln Val Lys Gly Cys
1 5 10 15

Leu Val Pro Val Ala Glu Cys Ile Asn Ser Ala Ile Ser Asn Gly Ser
20 25 30

Ser Asp Ser Thr Ser Thr Ser Glu Gln Val Glu Glu Glu Pro Phe Leu
35 40 45

Leu Glu Gln Tyr Ser Leu Ser Ser Val Ser Leu Leu Val Lys Ser Thr
50 55 60

Phe Asn Pro Val Ser Tyr Ala Met Gln Leu Thr Trp Lys Gln Leu Ser
65 70 75 80

Ile Leu Phe Leu Thr Val Ile Ser Val Pro Val Leu Ala Glu Gly Lys
85 90 95

Gly Asp Glu Arg Asn Gln Leu Thr Val Ile Asp Asn Ser Asp His Ile
100 105 110

Lys Leu Asp Ala Ser Asn Leu Ala Gly Asn Asp Lys Thr Lys Ile Tyr
115 120 125

Gln Ala Glu Asn Lys Val Leu Val Ile Asp Ile Ala Lys Pro Asn Gly
130 135 140

五、發明說明 (266)

Lys Gly Ile Ser Asp Asn Arg Phe Glu Lys Phe Asn Ile Pro Asn Ser
145 150 155 160

Ala Val Phe Asn Asn Asn Gly Thr Glu Ala Gln Ala Arg Ser Thr Leu
165 170 175

Ile Gly Tyr Ile Pro Gln Asn Gln Asn Leu Arg Gly Gly Lys Glu Ala
180 185 190

Asp Val Ile Leu Asn Gln Val Thr Gly Pro Gln Glu Ser Lys Ile Val
195 200 205

Gly Ala Leu Glu Val Leu Gly Lys Lys Ala Asp Ile Val Ile Ala Asn
210 215 220

Gln Asn Gly Ile Thr Leu Asn Gly Val Arg Thr Ile Asn Ser Asp Arg
225 230 235 240

Phe Val Ala Thr Thr Ser Glu Leu Ile Asp Pro Asn Gln Met Met Leu
245 250 255

Lys Val Thr Lys Gly Asn Val Ile Ile Asp Ile Asp Gly Phe Ser Thr
260 265 270

Asp Gly Leu Lys Tyr Leu Asp Ile Ile Ala Lys Lys Ile Glu Gln Lys
275 280 285

Gln Ser Ile Thr Ser Gly Asp Asn Ser Glu Ala Lys Thr Asp Val Thr
290 295 300

Leu Ile Ala Gly Ser Ser Glu Tyr Asp Leu Ser Lys His Glu Leu Lys
305 310 315 320

Lys Thr Ser Gly Glu Asn Val Ser Asn Asp Val Ile Ala Ile Thr Gly
325 330 335

Ser Ser Thr Gly Ala Met His Gly Lys Asn Ile Lys Leu Ile Val Thr
340 345 350

Asp Lys Gly Ala Gly Val Lys His Asp Gly Ile Ile Leu Ser Glu Asn
355 360 365

Asp Ile Gln Ile Glu Met Asn Glu Gly Asp Leu Glu Leu Gly Asn Thr
370 375 380

Ile Gln Gln Thr Val Val Lys Lys Asp Arg Asn Ile Arg Ala Lys Lys
385 390 395 400

Lys Ile Glu Val Lys Asn Ala Asn Arg Val Phe Val Gly Ser Gln Thr
405 410 415

Lys Ser Asp Glu Ile Ser Leu Glu Ala Lys Gln Val Lys Ile Arg Lys
420 425 430

Asn Ala Glu Ile Arg Ser Thr Thr Gln Ala Lys Ile Val Ala Lys Gly
435 440 445

Ala Leu Ser Ile Glu Gln Asn Ala Lys Leu Val Ala Lys Lys Ile Asp
450 455 460

Val Ala Thr Glu Thr Leu Thr Asn Ala Gly Arg Ile Tyr Gly Arg Glu
465 470 475 480

五、發明說明 (267)

Val Lys Leu Asp Thr Asn Asn Leu Ile Asn Asp Lys Glu Ile Tyr Ala
485 490 495

Glu Arg Lys Leu Ser Ile Leu Thr Lys Gly Lys Asp Leu Glu Ile Ile
500 505 510

Gln Asp Arg Tyr Leu Ser Pro Leu Met Arg Val Lys Ser Ser Val Arg
515 520 525

Phe Leu Gly Ser Pro Phe Phe Ser Ile Ser Pro Ser Met Leu Ala Ser
530 535 540

Leu Ser Ala Gln Phe Lys Pro Gly Phe Val Asn Lys Gly Leu Ile Glu
545 550 555 560

Ser Ala Gly Ser Ala Glu Leu Thr Phe Lys Glu Lys Thr Ser Phe Leu
565 570 575

Thr Glu Gly Asn Asn Phe Ile Arg Ala Lys Asp Ala Leu Thr Ile Asn
580 585 590

Ala Gln Asn Ile Glu Ile Asp Lys Asn Gln Asp Ile Gln Leu Gly Ala
595 600 605

Asn Ile Thr Leu Asn Val Glu Glu Asn Phe Val Asn Arg Ala Gly Thr
610 615 620

Leu Ala Thr Gly Lys Thr Leu Thr Ile Asn Thr Glu Ser Gly Ser Ile
625 630 635 640

Tyr Asn Leu Gly Gly Thr Leu Gly Ala Gly Lys Ser Leu Lys Leu Thr
645 650 655

Ala Lys Ser Thr Glu Glu Gly Met Gly Asn Ile Val Asn Gln Glu Asn
660 665 670

Gly Leu Phe His Thr Leu Gly Asn Met Met Leu Glu Ala Glu Arg Ser
675 680 685

Val Tyr Asn Ile Gly Asp Ile Tyr Ala Ser Lys Lys Leu Thr Val His
690 695 700

Thr His Asn Leu Ile Asn Asp Val Arg Leu Ser Gly Asn Val Ser Tyr
705 710 715 720

Lys Pro Ile Gly Ser Ser Arg Asp Tyr Asp Ile Ser Arg Val Ala Val
725 730 735

His Gly Trp His Asn Asn Val Tyr Lys Leu Asn Leu Asn Leu Gln Glu
740 745 750

Gln Asp Lys Thr Asp Ile Lys Val Val Lys Met Gly Ala Ile Arg Ser
755 760 765

Asp Gly Asp Phe Asp Phe Lys Gly Ile Lys Ala Thr Ser Ser Glu Ser
770 775 780

Lys Pro Gln Leu Ile Asn His Gly Leu Ile Asn Val Lys Gly Thr Phe
785 790 795 800

Asn Ala Glu Ala Asp Gln Val Val Asn Gln Met Lys Ala Phe Asn Gln
805 810 815

五、發明說明 (268)

Asn	Ala	Leu	Ala	Ser	Val	Phe	Lys	Asn	Pro	Ala	Lys	Ile	Thr	Met	Tyr	820	825	830
Tyr	Gln	Pro	Leu	Thr	Arg	Tyr	Ile	Trp	Thr	Pro	Leu	Ser	Gly	Asn	Ala	835	840	845
Ser	Arg	Glu	Phe	Asn	Asn	Leu	Glu	Ser	Phe	Leu	Asp	Ala	Leu	Phe	Gly	850	855	860
Ser	Thr	Thr	Ile	Leu	Lys	Ser	Ser	Phe	Tyr	Ser	Thr	Glu	Asn	Phe	Ser	865	870	875
Ala	Tyr	Gln	Leu	Leu	Ser	His	Ile	Gln	His	Ser	Pro	Met	Tyr	Gln	Lys	885	890	895
Ala	Met	Ala	Gln	Val	Phe	Gly	Ala	Glu	Trp	His	Ser	Lys	Ser	Tyr	Asp	900	905	910
Glu	Met	Arg	Asn	Lys	Trp	Lys	Ser	Phe	Lys	Glu	Asn	Pro	Thr	Asp	Phe	915	920	925
Ile	Tyr	Tyr	Pro	Ser	Glu	Lys	Ala	Lys	Ile	Leu	Ala	Gly	Lys	Leu	Glu	930	935	940
Gly	Lys	Leu	Thr	Thr	Leu	Gln	Asn	Gly	Glu	Tyr	Ala	Glu	Arg	Gly	Lys	945	950	955
Phe	Asp	Glu	Ser	Ile	Gln	Ile	Gly	Lys	His	Gln	Leu	Ser	Leu	Pro	Ser	965	970	975
Val	Glu	Leu	Lys	Ala	Glu	Phe	Ser	Asp	Lys	Glu	Arg	Leu	Glu	Glu	Asp	980	985	990
Gly	Val	Asp	Leu	Ser	Ser	Ile	Ala	Glu	Leu	Leu	Glu	Met	Pro	Asn	Leu	995	1000	1005
Phe	Ile	Asp	Asn	Ser	Ile	Gln	Leu	Glu	Lys	Lys	Lys	Leu	Ser	Pro	Ile	1010	1015	1020
Glu	Asp	Leu	Asp	Glu	Glu	Pro	Arg	Lys	Asn	Leu	Asp	Ile	Glu	Glu	Ser	1025	1030	1035
His	Ser	Asn	Ser	Ser	Asp	Asp	Val	Leu	Ser	Met	Asn	Asp	Asp	Glu	Ser	1045	1050	1055
Asp	Thr	Asp	Asp	Ser	Lys	Trp	Ser	Met	Gly	Asn	Asp	Glu	Lys	Glu	Met	1060	1065	1070
Pro	Asp	Asp	Lys	Leu	Gly	Ile	Ser	Arg	Asp	Asp	Arg	Gly	Asn	Lys	Pro	1075	1080	1085
Pro	Arg	Thr	Asp	Pro	Thr	Val	Asp	Tyr	Leu	Asn	Pro	Asp	Glu	Phe	Phe	1090	1095	1100
Glu	Asn	Gly	Tyr	Leu	Leu	Asn	Glu	Leu	Leu	Gln	Glu	Leu	Gly	Glu	Glu	1105	1110	1115
Pro	Leu	Leu	Lys	Glu	Gly	Glu	Asp	His	Phe	Lys	Arg	Ser	Thr	Asn	Leu	1125	1130	1135
Val	Arg	Leu	Gly	Glu	Arg	Asp	Arg	Gln	Asn	Arg	Glu	Lys	Arg	Glu	Lys	1140	1145	1150

五、發明說明 (269)

Glu Gly Tyr Phe Asp Leu Pro Gly Thr Leu Asp Met Lys Leu Gln Glu
1155 1160 1165

Leu Phe Glu Lys Arg Lys Gln Lys His Glu Ala Glu Gln Lys Ala Arg
1170 1175 1180

Ile Glu Lys Ala Leu Leu Gln Lys Ser Glu Gln Gln Glu Lys Arg Val
1185 1190 1195 1200

Glu Glu Arg Lys Gln Glu Glu Lys Arg Gln Ala Gln Asp Lys Ile Ala
1205 1210 1215

Lys Gln Val Glu Ile Ala Lys Glu Met Gln Arg Val Glu Glu Ile Arg
1220 1225 1230

Gln Arg Glu Lys Gln Leu Ala Ile Gln Leu Gln Glu Glu Glu Lys Lys
1235 1240 1245

Gln Gln Glu Glu Lys His Leu Ser Glu Glu Lys Lys Gln Ala Glu Gln
1250 1255 1260

Lys Gln Lys Ala Glu Glu Lys Val Ala Gln Glu Arg Leu Asp Ile Glu
1265 1270 1275 1280

Gln Gln Lys Ala Tyr Glu Glu Met Ala Lys Arg Glu Ala Glu Ala Ser
1285 1290 1295

Lys Asn Val Leu Leu Lys Ala Ile Asp Glu Glu Arg Pro Lys Val Glu
1300 1305 1310

Thr Asp Pro Leu Phe Arg Thr Lys Leu Lys Tyr Ile Asn Gln Asp Asp
1315 1320 1325

Tyr Ala Gly Ala Asn Tyr Phe Phe Asn Lys Val Gly Leu Asn Thr Lys
1330 1335 1340

Gly His Gln Lys Val Asn Val Leu Gly Asp Asn Tyr Phe Asp His Gln
1345 1350 1355 1360

Val Ile Thr Arg Ser Ile Glu Lys Lys Val Asp Asn His Leu Asn Gln
1365 1370 1375

Lys Tyr Asn Leu Ser Asp Val Glu Leu Val Lys Gln Leu Met Asp Asn
1380 1385 1390

Ser Thr Thr Gln Ala Gln Glu Leu Asp Leu Lys Leu Gly Ala Ala Leu
1395 1400 1405

Thr Lys Glu Gln Gln Ala Asn Leu Thr Gln Asp Ile Val Trp Tyr Val
1410 1415 1420

Lys Thr Lys Val Lys Gly Lys Asp Val Phe Val Pro Lys Val Tyr Phe
1425 1430 1435 1440

Ala Ser Glu Thr Leu Val Glu Ala Gln Lys Leu Gln Gly Leu Gly Thr
1445 1450 1455

Gly Thr Ile Arg Val Gly Glu Ala Lys Ile Lys Ala Lys Asp Val Val
1460 1465 1470

Asn Thr Gly Thr Leu Ala Gly Arg Lys Leu Asn Val Glu Ala Ser Asn
1475 1480 1485

五、發明說明 (270)

Lys Ile Lys Asn Gln Gly Ser Ile Leu Ser Thr Gln Glu Thr Arg Leu
1490 1495 1500

Val Gly Arg Lys Gly Ile Glu Asn Val Ser Arg Ser Phe Ala Asn Asp
1505 1510 1515 1520

Glu Leu Gly Val Thr Ala Gln Arg Ser Glu Ile Lys Thr Glu Gly His
1525 1530 1535

Leu His Leu Glu Thr Asp Lys Asp Ser Thr Ile Asp Val Gln Ala Ser
1540 1545 1550

Asp Ile Lys Ala Lys Thr Ser Phe Val Lys Thr Gly Asp Val Asn Leu
1555 1560 1565

Lys Asn Thr Tyr Asn Thr Lys His Ala Tyr Arg Glu Lys Phe Ser Pro
1570 1575 1580

Ser Ala Leu Gln Val Ala Glu Leu Asp Val Ala Gly Leu Lys Val Pro
1585 1590 1595 1600

Leu Leu Gly Val Ser Val Ser Ile Gln Phe Ile Gln Ser Ile Leu Val
1605 1610 1615

Arg Gln Leu Gln Glu Gly Ser Ile Phe Glu Val Gly His Leu His Xaa
1620 1625 1630

Ala Val Asp Arg Arg Cys Glu Pro Ser Gly Glu
1635 1640

<210> 104
<211> 2009
<212> DNA
<213> 敗血性巴斯德桿菌

<220>
<223> hmbR

<220>
<221> CDS
<222> (1) .. (2007)

<400> 104
atc cgt ggc gtt gat aaa gat cgt gtc gct gtt att gtt gat gga ata 48
Ile Arg Gly Val Asp Lys Asp Arg Val Ala Val Ile Val Asp Gly Ile
1 5 10 15

ccg cag gct gaa tcg act ata tct act tcc gca cgt tat tcg act gaa 96
Pro Gln Ala Glu Ser Thr Ile Ser Thr Ser Ala Arg Tyr Ser Thr Glu
20 25 30

cgt cat aat ggt aat att aat aat att gaa tac gaa aat gtt agt tcg 144
Arg His Asn Gly Asn Ile Asn Asn Ile Glu Tyr Glu Asn Val Ser Ser
35 40 45

ttg aaa gtt caa aaa ggg gca gct tct gta atg tat ggt agc ggt gcg 192
Leu Lys Val Gln Lys Gly Ala Ala Ser Val Met Tyr Gly Ser Gly Ala
50 55 60

tta ggt gga acc gtg gag ttt acc aca aaa gat att gag gac ttt gtc 240
Leu Gly Gly Thr Val Glu Phe Thr Thr Lys Asp Ile Glu Asp Phe Val
65 70 75 80

五、發明說明 (271)

gaa cct ggt cgc cat ttg ggc ttt ttg tct aaa acc ggc tat act tca	288
Glu Pro Gly Arg His Leu Gly Phe Leu Ser Lys Thr Gly Tyr Thr Ser	
85 90 95	
aaa aac aga gaa tat cgt caa gtc atc gga gct gga ggg aaa ggg gaa	336
Lys Asn Arg Glu Tyr Arg Gln Val Ile Gly Val Gly Gly Lys Gly Glu	
100 105 110	
cac ttt ttt ggt ttt gta caa tta acc aaa cgt tgg ggg cat gaa aca	384
His Phe Phe Gly Phe Val Gln Leu Thr Lys Arg Trp Gly His Glu Thr	
115 120 125	
atc aac aac ggc aaa ggt aca gac att ctc ggc gaa cat cga ggt aaa	432
Ile Asn Asn Gly Lys Gly Thr Asp Ile Leu Gly Glu His Arg Gly Lys	
130 135 140	
ccc aat ccg ctc aac tac tat act aca tca tgg tta acg aaa gtc ggt	480
Pro Asn Pro Leu Asn Tyr Tyr Thr Thr Ser Trp Leu Thr Lys Val Gly	
145 150 155 160	
tac gat att aat aac act cat cgt ttt aca ctg ttt tta gaa gat cgc	528
Tyr Asp Ile Asn Asn Thr His Arg Phe Thr Leu Phe Leu Glu Asp Arg	
165 170 175	
cgt gaa aag aag ctt acc gaa gaa aaa aca tta ggg ctt agt gat gca	576
Arg Glu Lys Lys Leu Thr Glu Glu Lys Thr Leu Gly Leu Ser Asp Ala	
180 185 190	
gtg cgt ttt gct aat gat caa acc cct tat ctc cgt tat ggt att gaa	624
Val Arg Phe Ala Asn Asp Gln Thr Pro Tyr Leu Arg Tyr Gly Ile Glu	
195 200 205	
tat cga tat aac ggc ttg tct tgg ttg gaa acg gta aag ctt ttt ttg	672
Tyr Arg Tyr Asn Gly Leu Ser Trp Leu Glu Thr Val Lys Leu Phe Leu	
210 215 220	
gca aag cag aaa atc gaa caa cgt tct gct ctc caa gag ttt gat att	720
Ala Lys Gln Lys Ile Glu Gln Arg Ser Ala Leu Gln Glu Phe Asp Ile	
225 230 235 240	
aat aat agg aat aaa ttg gat tcg act atg tcg ttt gta tat tta caa	768
Asn Asn Arg Asn Lys Leu Asp Ser Thr Met Ser Phe Val Tyr Leu Gln	
245 250 255	
aga cag aat ata gct cgg gga gaa ttt tca acg agt cct tta tat tgg	816
Arg Gln Asn Ile Ala Arg Gly Glu Phe Ser Thr Ser Pro Leu Tyr Trp	
260 265 270	
ggg ccg agt cgc cat cgt tta tct gcg aaa ttc gaa ttt cgt gat aag	864
Gly Pro Ser Arg His Arg Leu Ser Ala Lys Phe Glu Phe Arg Asp Lys	
275 280 285	
ttt tta gaa aat atg aat aag cat ttt acg ttt cgg ccg tgg caa atc	912
Phe Leu Glu Asn Met Asn Lys His Phe Thr Phe Arg Pro Trp Gln Ile	
290 295 300	
aat aga ttc aga caa caa ggt cga aat aac tat aca gaa gtg ttt ccc	960
Asn Arg Phe Arg Gln Gln Gly Arg Asn Asn Tyr Thr Glu Val Phe Pro	
305 310 315 320	
gtt aaa tcc cga gag ttt tct ttt tct ctt atg gac gac att aag att	1008
Val Lys Ser Arg Glu Phe Ser Phe Ser Leu Met Asp Asp Ile Lys Ile	
325 330 335	

五、發明說明 (272)

ggc gaa ttg cta cat ctc gga ttg ggc ggt cgg tgg gat cac tat aac Gly Glu Leu Leu His Leu Gly Leu Gly Gly Arg Trp Asp His Tyr Asn 340 345 350	1056
tat aag cca tta tta aat tct cag cat aat atc aac agg aca cag aga Tyr Lys Pro Leu Leu Asn Ser Gln His Asn Ile Asn Arg Thr Gln Arg 355 360 365	1104
tta cct tat cca aaa aca tca tcc aaa ttt tct tat caa ttg agt tta Leu Pro Tyr Pro Lys Thr Ser Ser Lys Phe Ser Tyr Gln Leu Ser Leu 370 375 380	1152
gag tat caa tta cat cca tca cat caa att gca tac cgt tta agt acc Glu Tyr Gln Leu His Pro Ser His Gln Ile Ala Tyr Arg Leu Ser Thr 385 390 395 400	1200
ggg ttt agg gtt ccc cgt gtt gaa gat ctt tat ttt gaa gac cga gga Gly Phe Arg Val Pro Arg Val Glu Asp Leu Tyr Phe Glu Asp Arg Gly 405 410 415	1248
aaa agt tct tca caa ttt ctt cct aac ccc gat cta caa ccg gaa act Lys Ser Ser Ser Gln Phe Leu Pro Asn Pro Asp Leu Gln Pro Glu Thr 420 425 430	1296
gca ctg aat cat gaa ata agt tac cgt ttc caa aat caa tat gcc cat Ala Leu Asn His Glu Ile Ser Tyr Arg Phe Gln Asn Gln Tyr Ala His 435 440 445	1344
ttc agc gtc ggg ctt ttc cgt aca cgt tat cat aac ttt att caa gaa Phe Ser Val Gly Leu Phe Arg Thr Arg Tyr His Asn Phe Ile Gln Glu 450 455 460	1392
cgt gag atg acc tgt gat aaa att cca tat gag tat aat agg act tat Arg Glu Met Thr Cys Asp Lys Ile Pro Tyr Glu Tyr Asn Arg Thr Tyr 465 470 475 480	1440
gga tat tgc acg cat aat act tat gta atg ttt gtt aat gaa cct gaa Gly Tyr Cys Thr His Asn Thr Tyr Val Met Phe Val Asn Glu Pro Glu 485 490 495	1488
gcc gtg att aaa ggg gtt gaa gta agc ggt gct tta aat ggg tct gca Ala Val Ile Lys Gly Val Glu Val Ser Gly Ala Leu Asn Gly Ser Ala 500 505 510	1536
ttc gga ctt tcc gac ggt tta act ttc cgt ctc aaa ggg agc tac agc Phe Gly Leu Ser Asp Gly Leu Thr Phe Arg Leu Lys Gly Ser Tyr Ser 515 520 525	1584
aaa ggt caa aat cat gac ggc gat ccg tta aaa tct att caa cca tgg Lys Gly Gln Asn His Asp Gly Asp Pro Leu Lys Ser Ile Gln Pro Trp 530 535 540	1632
aca gtg gta acc ggt att gat tac gaa act gaa ggg tgg agc gtg agt Thr Val Val Thr Gly Ile Asp Tyr Glu Thr Glu Gly Trp Ser Val Ser 545 550 555 560	1680
ttg agc ggg cgt tat agt gcg gct aaa aaa gcc aaa gat gcg ata gaa Leu Ser Gly Arg Tyr Ser Ala Ala Lys Lys Ala Lys Asp Ala Ile Glu 565 570 575	1728
acg gaa tac aca cat gat aaa aag gtt gtc aaa caa tgg ccg cat tta Thr Glu Tyr Thr His Asp Lys Lys Val Val Lys Gln Trp Pro His Leu 580 585 590	1776

五、發明說明 (273)

agt cca tcc tac ttt gtt gtt gat ttt acg ggg caa gtt aac ctc agt	1824
Ser Pro Ser Tyr Phe Val Val Asp Phe Thr Gly Gln Val Asn Leu Ser	
595 600 605	
aaa aat gtc att ttg aat atg ggg gta ttt aac ttg ttc aat cgt gat	1872
Lys Asn Val Ile Leu Asn Met Gly Val Phe Asn Leu Phe Asn Arg Asp	
610 615 620	
tat atg acg tgg gac agt gca tat aac ttg ttt act agg ggg tat act	1920
Tyr Met Thr Trp Asp Ser Ala Tyr Asn Leu Phe Thr Arg Gly Tyr Thr	
625 630 635 640	
tcc cgt tct gtc cgt gct aac agc cca ggc att aat cgg ttt acc gca	1968
Ser Arg Ser Val Arg Ala Asn Ser Pro Gly Ile Asn Arg Phe Thr Ala	
645 650 655	
cca aaa cgt aat ttt gct gcc tcg gtg gaa att cgt ttt ta	2009
Pro Lys Arg Asn Phe Ala Ala Ser Val Glu Ile Arg Phe	
660 665	

<210> 105
 <211> 669
 <212> 蛋白質
 <213> 敗血性巴斯德桿菌

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

裝
訂
線

五、發明說明 (274)

Val Arg Phe Ala Asn Asp Gln Thr Pro Tyr Leu Arg Tyr Gly Ile Glu
195 200 205

Tyr Arg Tyr Asn Gly Leu Ser Trp Leu Glu Thr Val Lys Leu Phe Leu
210 215 220

Ala Lys Gln Lys Ile Glu Gln Arg Ser Ala Leu Gln Glu Phe Asp Ile
225 230 235 240

Asn Asn Arg Asn Lys Leu Asp Ser Thr Met Ser Phe Val Tyr Leu Gln
245 250 255

Arg Gln Asn Ile Ala Arg Gly Glu Phe Ser Thr Ser Pro Leu Tyr Trp
260 265 270

Gly Pro Ser Arg His Arg Leu Ser Ala Lys Phe Glu Phe Arg Asp Lys
275 280 285

Phe Leu Glu Asn Met Asn Lys His Phe Thr Phe Arg Pro Trp Gln Ile
290 295 300

Asn Arg Phe Arg Gln Gln Gly Arg Asn Asn Tyr Thr Glu Val Phe Pro
305 310 315 320

Val Lys Ser Arg Glu Phe Ser Phe Ser Leu Met Asp Asp Ile Lys Ile
325 330 335

Gly Glu Leu Leu His Leu Gly Leu Gly Gly Arg Trp Asp His Tyr Asn
340 345 350

Tyr Lys Pro Leu Leu Asn Ser Gln His Asn Ile Asn Arg Thr Gln Arg
355 360 365

Leu Pro Tyr Pro Lys Thr Ser Ser Lys Phe Ser Tyr Gln Leu Ser Leu
370 375 380

Glu Tyr Gln Leu His Pro Ser His Gln Ile Ala Tyr Arg Leu Ser Thr
385 390 395 400

Gly Phe Arg Val Pro Arg Val Glu Asp Leu Tyr Phe Glu Asp Arg Gly
405 410 415

Lys Ser Ser Ser Gln Phe Leu Pro Asn Pro Asp Leu Gln Pro Glu Thr
420 425 430

Ala Leu Asn His Glu Ile Ser Tyr Arg Phe Gln Asn Gln Tyr Ala His
435 440 445

Phe Ser Val Gly Leu Phe Arg Thr Arg Tyr His Asn Phe Ile Gln Glu
450 455 460

Arg Glu Met Thr Cys Asp Lys Ile Pro Tyr Glu Tyr Asn Arg Thr Tyr
465 470 475 480

Gly Tyr Cys Thr His Asn Thr Tyr Val Met Phe Val Asn Glu Pro Glu
485 490 495

Ala Val Ile Lys Gly Val Glu Val Ser Gly Ala Leu Asn Gly Ser Ala
500 505 510

Phe Gly Leu Ser Asp Gly Leu Thr Phe Arg Leu Lys Gly Ser Tyr Ser
515 520 525

五、發明說明 (275)

Lys Gly Gln Asn His Asp Gly Asp Pro Leu Lys Ser Ile Gln Pro Trp
530 535 540

Thr Val Val Thr Gly Ile Asp Tyr Glu Thr Glu Gly Trp Ser Val Ser
545 550 555 560

Leu Ser Gly Arg Tyr Ser Ala Ala Lys Lys Ala Lys Asp Ala Ile Glu
565 570 575

Thr Glu Tyr Thr His Asp Lys Lys Val Val Lys Gln Trp Pro His Leu
580 585 590

Ser Pro Ser Tyr Phe Val Val Asp Phe Thr Gly Gln Val Asn Leu Ser
595 600 605

Lys Asn Val Ile Leu Asn Met Gly Val Phe Asn Leu Phe Asn Arg Asp
610 615 620

Tyr Met Thr Trp Asp Ser Ala Tyr Asn Leu Phe Thr Arg Gly Tyr Thr
625 630 635 640

Ser Arg Ser Val Arg Ala Asn Ser Pro Gly Ile Asn Arg Phe Thr Ala
645 650 655

Pro Lys Arg Asn Phe Ala Ala Ser Val Glu Ile Arg Phe
660 665

<210> 106

<211> 908

<212> DNA

<213> 敗血性巴斯德桿菌

<220>

<223> lgtC

<220>

<221> CDS

<222> (1) .. (906)

<400> 106

atg aat att tta ttt gtt tct gat gat gtt tat gct aaa cat ctg gtg 48
Met Asn Ile Leu Phe Val Ser Asp Asp Val Tyr Ala Lys His Leu Val
1 5 10 15

gtt gcg att aaa agc att ata aat cat aat gaa aaa ggt att tca ttt 96
Val Ala Ile Lys Ser Ile Ile Asn His Asn Glu Lys Gly Ile Ser Phe
20 25 30

tat att ttt gat ttg ggt ata aag gat gaa aat aag aga aat att aat 144
Tyr Ile Phe Asp Leu Gly Ile Lys Asp Glu Asn Lys Arg Asn Ile Asn
35 40 45

gat att gtt tct tct tat gga agt gaa gtc aac ttt att gct gtg aat 192
Asp Ile Val Ser Ser Tyr Gly Ser Glu Val Asn Phe Ile Ala Val Asn
50 55 60

gag aaa gaa ttt gag agt ttt cct gtt caa att agt tat att tct tta 240
Glu Lys Glu Phe Glu Ser Phe Pro Val Gln Ile Ser Tyr Ile Ser Leu
65 70 75 80

五、發明說明 (276)

gca aca tat gca agg cta aaa gcg gca gag tat ttg ccg gat aat tta	288
Ala Thr Tyr Ala Arg Leu Lys Ala Ala Glu Tyr Leu Pro Asp Asn Leu	
85 90 95	
aat aaa att att tat tta gat gtt gat gtt ttg gtt ttt aac tca tta	336
Asn Lys Ile Ile Tyr Leu Asp Val Asp Val Leu Val Phe Asn Ser Leu	
100 105 110	
gaa atg tta tgg aat gtt gat gtt aat aat ttt ctt acc gca gcc tgt	384
Glu Met Leu Trp Asn Val Asp Val Asn Asn Phe Leu Thr Ala Ala Cys	
115 120 125	
tat gat tct ttc atc gaa aat gaa aag tct gag cat aaa aaa tcg att	432
Tyr Asp Ser Phe Ile Glu Asn Glu Lys Ser Glu His Lys Lys Ser Ile	
130 135 140	
tca atg tca gat aag gaa tat tat ttt aat gca gga gta atg cta ttt	480
Ser Met Ser Asp Lys Glu Tyr Tyr Phe Asn Ala Gly Val Met Leu Phe	
145 150 155 160	
aat tta gat gaa tgg cgg aag atg gat gta ttc tca aga gct tta gac	528
Asn Leu Asp Glu Trp Arg Lys Met Asp Val Phe Ser Arg Ala Leu Asp	
165 170 175	
ctg tta gct atg tat cct aat caa atg att tat cag gat caa gat ata	576
Leu Leu Ala Met Tyr Pro Asn Gln Met Ile Tyr Gln Asp Gln Asp Ile	
180 185 190	
ttg aat atc ctt ttt agg aat aaa gtc tgt tat tta gat tgc aga ttt	624
Leu Asn Ile Leu Phe Arg Asn Lys Val Cys Tyr Leu Asp Cys Arg Phe	
195 200 205	
aat ttc atg cca aat caa ctt gaa aga ata aaa caa tac cat aaa gga	672
Asn Phe Met Pro Asn Gln Leu Glu Arg Ile Lys Gln Tyr His Lys Gly	
210 215 220	
aaa ttg agc aac tta cat tct tta gaa aaa aca acg atg cct gtc gtt	720
Lys Leu Ser Asn Leu His Ser Leu Glu Lys Thr Thr Met Pro Val Val	
225 230 235 240	
att tca cat tat tgt ggt cca gaa aaa gcg tgg cat gcg gat tgt aaa	768
Ile Ser His Tyr Cys Gly Pro Glu Lys Ala Trp His Ala Asp Cys Lys	
245 250 255	
cat ttt aat gta tat ttc tat cag aaa ata tta gca gaa ata acg aga	816
His Phe Asn Val Tyr Phe Tyr Gln Lys Ile Leu Ala Glu Ile Thr Arg	
260 265 270	
ggc acg gat aaa gaa cgc gta tta tct ata aaa act tat ctc aag gcc	864
Gly Thr Asp Lys Glu Arg Val Leu Ser Ile Lys Thr Tyr Leu Lys Ala	
275 280 285	
ttg att aga agg att aga tat aaa ttc aaa tat caa gtc tat ta	908
Leu Ile Arg Arg Ile Arg Tyr Lys Phe Lys Tyr Gln Val Tyr	
290 295 300	

<210> 107

<211> 302

<212> 蛋白質

<213> 敗血性巴斯德桿菌

<400> 107

五、發明說明 (277)

Met Asn Ile Leu Phe Val Ser Asp Asp Val Tyr Ala Lys His Leu Val
1 5 10 15

Val Ala Ile Lys Ser Ile Ile Asn His Asn Glu Lys Gly Ile Ser Phe
20 25 30

Tyr Ile Phe Asp Leu Gly Ile Lys Asp Glu Asn Lys Arg Asn Ile Asn
35 40 45

Asp Ile Val Ser Ser Tyr Gly Ser Glu Val Asn Phe Ile Ala Val Asn
50 55 60

Glu Lys Glu Phe Glu Ser Phe Pro Val Gln Ile Ser Tyr Ile Ser Leu
65 70 75 80

Ala Thr Tyr Ala Arg Leu Lys Ala Ala Glu Tyr Leu Pro Asp Asn Leu
85 90 95

Asn Lys Ile Ile Tyr Leu Asp Val Asp Val Leu Val Phe Asn Ser Leu
100 105 110

Glu Met Leu Trp Asn Val Asp Val Asn Asn Phe Leu Thr Ala Ala Cys
115 120 125

Tyr Asp Ser Phe Ile Glu Asn Glu Lys Ser Glu His Lys Lys Ser Ile
130 135 140

Ser Met Ser Asp Lys Glu Tyr Tyr Phe Asn Ala Gly Val Met Leu Phe
145 150 155 160

Asn Leu Asp Glu Trp Arg Lys Met Asp Val Phe Ser Arg Ala Leu Asp
165 170 175

Leu Leu Ala Met Tyr Pro Asn Gln Met Ile Tyr Gln Asp Gln Asp Ile
180 185 190

Leu Asn Ile Leu Phe Arg Asn Lys Val Cys Tyr Leu Asp Cys Arg Phe
195 200 205

Asn Phe Met Pro Asn Gln Leu Glu Arg Ile Lys Gln Tyr His Lys Gly
210 215 220

Lys Leu Ser Asn Leu His Ser Leu Glu Lys Thr Thr Met Pro Val Val
225 230 235 240

Ile Ser His Tyr Cys Gly Pro Glu Lys Ala Trp His Ala Asp Cys Lys
245 250 255

His Phe Asn Val Tyr Phe Tyr Gln Lys Ile Leu Ala Glu Ile Thr Arg
260 265 270

Gly Thr Asp Lys Glu Arg Val Leu Ser Ile Lys Thr Tyr Leu Lys Ala
275 280 285

Leu Ile Arg Arg Ile Arg Tyr Lys Phe Lys Tyr Gln Val Tyr
290 295 300

<210> 108
<211> 2054
<212> DNA
<213> 敗血性巴斯德桿菌

五、發明說明 (278)

<220>

<223> pnp

<220>

<221> CDS

<222> (1) .. (2052)

<400> 108

atg	gca	agt	atg	gat	gat	act	act	gtg	ttt	gtc	aca	gtg	ggt	gcc	aaa	48
Met	Ala	Ser	Met	Asp	Asp	Thr	Thr	Val	Phe	Val	Thr	Val	Val	Ala	Lys	
1				5					10					15		

aaa	gat	gtg	aaa	gaa	ggg	caa	gac	ttc	ttc	cca	tta	act	ggt	aac	tat	96
Lys	Asp	Val	Lys	Glu	Gly	Gln	Asp	Phe	Phe	Pro	Leu	Thr	Val	Asn	Tyr	
		20					25						30			

caa	gag	cgt	act	tat	gct	gca	ggc	cgt	att	cct	ggg	ggc	ttt	ttc	aaa	144
Gln	Glu	Arg	Thr	Tyr	Ala	Ala	Gly	Arg	Ile	Pro	Gly	Gly	Phe	Phe	Lys	
		35					40					45				

cgt	gaa	ggg	cgt	cct	tct	gaa	ggc	gaa	act	tta	att	gct	cgt	tta	att	192
Arg	Glu	Gly	Arg	Pro	Ser		Gly	Glu	Thr	Leu	Ile	Ala	Arg	Leu	Ile	
	50					55					60					

gac	cgt	cca	att	cgt	cct	ctt	ttc	cca	gaa	ggg	ttt	tat	aac	gaa	atc	240
Asp	Arg	Pro	Ile	Arg	Pro	Leu	Phe	Pro	Glu	Gly	Phe	Tyr	Asn	Glu	Ile	
	65				70				75					80		

caa	atc	gtg	gag	aca	gtg	gtg	tct	gtt	aat	ccg	caa	att	tgt	cca	gat	288
Gln	Ile	Val	Ala	Thr	Val	Val	Ser	Val	Asn	Pro	Gln	Ile	Cys	Pro	Asp	
			85					90						95		

tta	gtg	gca	atg	atc	ggg	gca	tct	gag	gca	ctt	tct	tta	tca	ggg	gtg	336
Leu	Val	Ala	Met	Ile	Gly	Ala	Ser	Ala	Ala	Leu	Ser	Leu	Ser	Gly	Val	
		100					105						110			

cca	ttt	aat	ggc	cct	atc	ggg	gag	gca	cgt	gtt	ggg	ttt	att	gat	gat	384
Pro	Phe	Asn	Gly	Pro	Ile	Gly	Ala	Ala	Arg	Val	Gly	Phe	Ile	Asp	Asp	
		115				120						125				

caa	ttt	gtg	tta	aac	cca	acc	atg	aac	gag	caa	aaa	caa	agc	cgt	tta	432
Gln	Phe	Val	Leu	Asn	Pro	Thr	Met	Asn	Glu	Gln	Lys	Gln	Ser	Arg	Leu	
		130				135					140					

gac	ttg	gtt	gtc	gag	gga	aca	gat	aaa	gag	gtg	tta	atg	gtg	gaa	tct	480
Asp	Leu	Val	Val	Ala	Gly	Thr	Asp	Lys	Ala	Val	Leu	Met	Val	Glu	Ser	
	145				150				155					160		

gaa	gcc	gat	gta	tta	acc	gaa	gaa	caa	atg	tta	gct	gag	gtg	gtg	ttt	528
Glu	Ala	Asp	Val	Leu	Thr	Glu	Glu	Gln	Met	Leu	Ala	Ala	Val	Val	Phe	
			165						170					175		

ggg	cat	cag	caa	caa	caa	gtg	gtg	att	gac	gag	atc	aaa	gaa	ttt	acc	576
Gly	His	Gln	Gln	Gln	Gln	Val	Val	Ile	Asp	Ala	Ile	Lys	Glu	Phe	Thr	
			180					185					190			

gca	gaa	gcc	ggg	aaa	ccg	cgt	tgg	gat	tgg	gtg	gca	cct	gaa	cca	aat	624
Ala	Glu	Ala	Gly	Lys	Pro	Arg	Trp	Asp	Trp	Val	Ala	Pro	Glu	Pro	Asn	
		195					200					205				

acc	gag	tta	att	gaa	aaa	gtg	aaa	gag	att	gca	gaa	gag	cgt	tta	ggc	672
Thr	Ala	Leu	Ile	Glu	Lys	Val	Lys	Ala	Ile	Ala	Glu	Ala	Arg	Leu	Gly	
		210				215					220					

五、發明說明 (279)

gaa gca tac cgt atc act gaa aaa caa gca cgt tat gaa caa att gat Glu Ala Tyr Arg Ile Thr Glu Lys Gln Ala Arg Tyr Glu Gln Ile Asp 225 230 235 240	720
gcg att aaa gct gat gtg att gca caa atc aca gct gaa gta gca gaa Ala Ile Lys Ala Asp Val Ile Ala Gln Ile Thr Ala Glu Val Ala Glu 245 250 255	768
ggc gaa gac atc agt gaa ggg aaa att gtc gat att ttc acc gca ctt Gly Glu Asp Ile Ser Glu Glv Lys Ile Val Asp Ile Phe Thr Ala Leu 260 265 270	816
gaa agc caa atc gta cgt agc cgt atc att gct ggt gaa cca cgt att Glu Ser Gln Ile Val Arg Ser Arg Ile Ile Ala Gly Glu Pro Arg Ile 275 280 285	864
gat ggt cgt aca gtg gat act gtt cgt gca tta gat att tgt act ggt Asp Gly Arg Thr Val Asp Thr Val Arg Ala Leu Asp Ile Cys Thr Gly 290 295 300	912
gtt tta cca cgt aca cac ggt tct gcg att ttc acc cgt ggt gaa aca Val Leu Pro Arg Thr His Gly Ser Ala Ile Phe Thr Arg Gly Glu Thr 305 310 315 320	960
cag gcg tta gct gtc gcg aca tta ggt aca gaa cgt gat gca caa att Gln Ala Leu Ala Val Ala Thr Leu Gly Thr Glu Arg Asp Ala Gln Ile 325 330 335	1008
att gat gaa tta aca ggt gag cgt tca gat cac ttc tta ttc cac tac Ile Asp Glu Leu Thr Gly Glu Arg Ser Asp His Phe Leu Phe His Tyr 340 345 350	1056
aac ttc ccg cca tat tct gtg ggt gaa acc ggt atg att ggt tca cca Asn Phe Pro Pro Tyr Ser Val Gly Glu Thr Gly Met Ile Gly Ser Pro 355 360 365	1104
aaa cgt cgt gaa att ggt cat ggt cgt tta gcg aaa cgc ggt gta gct Lys Arg Arg Glu Ile Gly His Gly Arg Leu Ala Lys Arg Gly Val Ala 370 375 380	1152
gca gtg atg cca aca ctt gcc gag ttc ccg tat gtg gta cgt gtt gtc Ala Val Met Pro Thr Leu Ala Glu Phe Pro Tyr Val Val Arg Val Val 385 390 395 400	1200
tct gaa atc aca gaa tca aat ggt tct tct tct atg gca tcg gtt tgt Ser Glu Ile Thr Glu Ser Asn Gly Ser Ser Ser Met Ala Ser Val Cys 405 410 415	1248
ggc gcg tct tta gca tta atg gat gcg ggt gta cca att aaa gcg gcg Gly Ala Ser Leu Ala Leu Met Asp Ala Gly Val Pro Ile Lys Ala Ala 420 425 430	1296
gtt gca ggt att gca atg ggc tta gtc aaa gaa gac gaa aaa ttt gtg Val Ala Gly Ile Ala Met Gly Leu Val Lys Glu Asp Glu Lys Phe Val 435 440 445	1344
gtg ctt tca gac atc tta ggt gat gaa gat cac tta ggt gac atg gac Val Leu Ser Asp Ile Leu Gly Asp Glu Asp His Leu Gly Asp Met Asp 450 455 460	1392
ttc aaa gtc gcg ggt aca cgt acg ggt gtg acg gca tta caa atg gat Phe Lys Val Ala Gly Thr Arg Thr Gly Val Thr Ala Leu Gln Met Asp 465 470 475 480	1440

五、發明說明 (280)

atc aaa atc gaa ggt atc aca gca gaa atc atg caa att gcg tta aac 1488
Ile Lys Ile Glu Gly Ile Thr Ala Glu Ile Met Gln Ile Ala Leu Asn
485 490 495

caa gcg aaa agc gca cgt tta cac att tta ggt gtg atg gag caa gcg 1536
Gln Ala Lys Ser Ala Arg Leu His Ile Leu Gly Val Met Glu Gln Ala
500 505 510

atc cca gcg cca cgt gcg gat att tct gat ttt gca ccg cgt att tac 1584
Ile Pro Ala Pro Arg Ala Asp Ile Ser Asp Phe Ala Pro Arg Ile Tyr
515 520 525

act atg aaa att gat ccg aag aaa atc aaa gat gtg atc ggt aaa ggt 1632
Thr Met Lys Ile Asp Pro Lys Lys Ile Lys Asp Val Ile Gly Lys Gly
530 535 540

ggc gca acc att cgt gcc tta aca gaa gaa aca ggt acc tca att gat 1680
Gly Ala Thr Ile Arg Ala Leu Thr Glu Glu Thr Gly Thr Ser Ile Asp
545 550 555 560

atc gat gat gat ggt acg gtg aag att gct gcg gtt gat ggc aat tca 1728
Ile Asp Asp Asp Gly Thr Val Lys Ile Ala Ala Val Asp Gly Asn Ser
565 570 575

gca aaa gag gtg atg gcg cgt att gaa gat att act gca gaa gtt gaa 1776
Ala Lys Glu Val Met Ala Arg Ile Glu Asp Ile Thr Ala Glu Val Glu
580 585 590

gcg ggt gca gtg tat aaa ggt aaa gtt act cgt tta gct gat ttt ggt 1824
Ala Gly Ala Val Tyr Lys Gly Lys Val Thr Arg Leu Ala Asp Phe Gly
595 600 605

gcc ttc gtt tct atc gta ggt aac aaa gaa ggc tta gtg cat att tct 1872
Ala Phe Val Ser Ile Val Gly Asn Lys Glu Gly Leu Val His Ile Ser
610 615 620

caa atc gcg gaa gag cgt gtt gag aaa gtg agt gat tat ctt gca gtg 1920
Gln Ile Ala Glu Glu Arg Val Glu Lys Val Ser Asp Tyr Leu Ala Val
625 630 635 640

ggg caa gaa gtg act gtt aaa gtg gtt gag att gat cgt caa ggt cgt 1968
Gly Gln Glu Val Thr Val Lys Val Val Glu Ile Asp Arg Gln Gly Arg
645 650 655

att cgt tta acc atg aaa gaa gtt gca cca aag caa gaa cac gtt gat 2016
Ile Arg Leu Thr Met Lys Glu Val Ala Pro Lys Gln Glu His Val Asp
660 665 670

tct gtt gtc gca gac gtt gcc gca gaa gaa aac gca ta 2054
Ser Val Val Ala Asp Val Ala Glu Glu Asn Ala
675 680

<210> 109
<211> 684
<212> 蛋白質
<213> 敗血性巴斯德桿菌

<400> 109
Met Ala Ser Met Asp Asp Thr Thr Val Phe Val Thr Val Val Ala Lys
1 5 10 15
Lys Asp Val Lys Glu Gly Gln Asp Phe Phe Pro Leu Thr Val Asn Tyr

五、發明說明 (281)

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

五、發明說明 (282)

355	360	365
Lys Arg Arg Glu Ile Gly His Gly Arg Leu Ala Lys Arg Gly Val Ala		
370	375	380
Ala Val Met Pro Thr Leu Ala Glu Phe Pro Tyr Val Val Arg Val Val		
385	390	395 400
Ser Glu Ile Thr Glu Ser Asn Gly Ser Ser Ser Met Ala Ser Val Cys		
	405	410 415
Gly Ala Ser Leu Ala Leu Met Asp Ala Gly Val Pro Ile Lys Ala Ala		
	420	425 430
Val Ala Gly Ile Ala Met Gly Leu Val Lys Glu Asp Glu Lys Phe Val		
	435	440 445
Val Leu Ser Asp Ile Leu Gly Asp Glu Asp His Leu Gly Asp Met Asp		
	450	455 460
Phe Lys Val Ala Gly Thr Arg Thr Gly Val Thr Ala Leu Gln Met Asp		
	465	470 475 480
Ile Lys Ile Glu Gly Ile Thr Ala Glu Ile Met Gln Ile Ala Leu Asn		
	485	490 495
Gln Ala Lys Ser Ala Arg Leu His Ile Leu Gly Val Met Glu Gln Ala		
	500	505 510
Ile Pro Ala Pro Arg Ala Asp Ile Ser Asp Phe Ala Pro Arg Ile Tyr		
	515	520 525
Thr Met Lys Ile Asp Pro Lys Lys Ile Lys Asp Val Ile Gly Lys Gly		
	530	535 540
Gly Ala Thr Ile Arg Ala Leu Thr Glu Glu Thr Gly Thr Ser Ile Asp		
	545	550 555 560
Ile Asp Asp Asp Gly Thr Val Lys Ile Ala Ala Val Asp Gly Asn Ser		
	565	570 575
Ala Lys Glu Val Met Ala Arg Ile Glu Asp Ile Thr Ala Glu Val Glu		
	580	585 590
Ala Gly Ala Val Tyr Lys Gly Lys Val Thr Arg Leu Ala Asp Phe Gly		
	595	600 605
Ala Phe Val Ser Ile Val Gly Asn Lys Glu Gly Leu Val His Ile Ser		
	610	615 620
Gln Ile Ala Glu Glu Arg Val Glu Lys Val Ser Asp Tyr Leu Ala Val		
	625	630 635 640
Gly Gln Glu Val Thr Val Lys Val Val Glu Ile Asp Arg Gln Gly Arg		
	645	650 655
Ile Arg Leu Thr Met Lys Glu Val Ala Pro Lys Gln Glu His Val Asp		
	660	665 670
Ser Val Val Ala Asp Val Ala Ala Glu Glu Asn Ala		
	675	680

五、發明說明 (283)

<210> 110
<211> 1514
<212> DNA
<213> 敗血性巴斯德桿菌

<220>
<223> purF

<220>
<221> CDS
<222> (1)..(1512)

```

<400> 110
atg tgt ggt att gtt ggt att gtt agc caa agc ccc gtt aac caa tca 48
Met Cys Gly Ile Val Gly Ile Val Ser Gln Ser Pro Val Asn Gln Ser
  1           5           10           15

att tat gat gcg tta acc tta ttg caa cac cgc ggg caa gac gcc gcc 96
Ile Tyr Asp Ala Leu Thr Leu Leu Gln His Arg Gly Gln Asp Ala Ala
          20           25           30

ggg att gta acc gta gat gat gaa aac cga ttc cgc ttg cgt aaa gcg 144
Gly Ile Val Thr Val Asp Asp Glu Asn Arg Phe Arg Leu Arg Lys Ala
          35           40           45

aac ggg tta gtc agc gat gta ttt gaa caa gtt cat atg tta cgt tta 192
Asn Gly Leu Val Ser Asp Val Phe Glu Gln Val His Met Leu Arg Leu
          50           55           60

caa ggc aat gct ggc att gga cat gtt cgt tat cct acg gct ggg agc 240
Gln Gly Asn Ala Gly Ile Gly His Val Arg Tyr Pro Thr Ala Gly Ser
          65           70           75           80

tca agt gtc tct gaa gcg caa cct ttt tat gta aat tcg cct tat ggc 288
Ser Ser Val Ser Glu Ala Gln Pro Phe Tyr Val Asn Ser Pro Tyr Gly
          85           90           95

tta acc tta gtg cat aat ggt aac ttg acc aat tca agt gaa tta aaa 336
Leu Thr Leu Val His Asn Gly Asn Leu Thr Asn Ser Ser Glu Leu Lys
          100          105          110

gaa aag tta ttt cgt ctc gca cgt cgc cat gta aat acc aat tca gat 384
Glu Lys Leu Phe Arg Leu Ala Arg Arg His Val Asn Thr Asn Ser Asp
          115          120          125

tct gaa tta tta ctc aat atc tta gcc aat cac ctt gat cac ttc gaa 432
Ser Glu Leu Leu Leu Asn Ile Leu Ala Asn His Leu Asp His Phe Glu
          130          135          140

aaa tac caa tta gat ccg caa gat gta ttc agt gct gtc aaa caa acg 480
Lys Tyr Gln Leu Asp Pro Gln Asp Val Phe Ser Ala Val Lys Gln Thr
          145          150          155          160

cat cag gat att cgt ggt gct tat gct tgt atc gcc atg att att ggt 528
His Gln Asp Ile Arg Gly Ala Tyr Ala Cys Ile Ala Met Ile Ile Gly
          165          170          175

cat ggt atg gtc gcg ttt cgt gat ccg aac ggt atc cgt ccg tta gtg 576
His Gly Met Val Ala Phe Arg Asp Pro Asn Gly Ile Arg Pro Leu Val
          180          185          190

tta ggg aaa cgc gag gaa aat ggc aaa aca gag tat atg ttt gcc tcc 624
Leu Gly Lys Arg Glu Glu Asn Gly Lys Thr Glu Tyr Met Phe Ala Ser

```

五、發明說明 (284)

195	200	205	
gaa agt atc gca tta gat Glu Ser Ile Ala Leu Asp 210	aca gtg ggt ttt gag Thr Val Gly Phe Glu 215	ttt gta cga gat gta Phe Val Arg Asp Val 220	672
caa ccc ggc gaa gcg att Gln Pro Gly Glu Ala Ile 225	tat gtc acg ttt gaa ggg Tyr Val Thr Phe Glu Gly 230	gaa atg tat gct Glu Met Tyr Ala 240	720
cag caa tgc gca gac aaa Gln Gln Cys Ala Asp Lys 245	cca aca tta aca cct Pro Thr Leu Thr Pro 250	tgt att ttt gaa tac Cys Ile Phe Glu Tyr 255	768
gtc tat ttt gca cgt cca Val Tyr Phe Ala Arg Pro 260	gac tct tgc atc gat Asp Ser Cys Ile Asp 265	ggg gtt tct gtt tat Gly Val Ser Val Tyr 270	816
gct gcc cgt gtt cat atg Ala Ala Arg Val His Met 275	gga caa cgt tta ggt Gln Arg Leu Gly Glu 280	gaa aaa att gca cgg Lys Ile Ala Arg 285	864
gaa tgg gcg gat gtg gat Glu Trp Ala Asp Val Asp 290	gat att gat gtg gtc Asp Ile Asp Val Val 295	att cct gtg cct gaa Ile Pro Val Pro Glu 300	912
acc tct aac gat att gct Thr Ser Asn Asp Ile Ala 305	tta cgt att gcg cgc Leu Arg Ile Ala Arg 310	gtg tta aat aaa ccg Val Leu Asn Lys Pro 315	960
tat cgt caa ggt ttt gtg Tyr Arg Gln Gly Phe Val 325	aaa aat cgc tat gta Lys Asn Arg Tyr Val 330	gga cgt acg ttt att Gly Arg Thr Phe Ile 335	1008
atg ccg ggg cag gca ttg Met Pro Gly Gln Ala Leu 340	cga gtc agt tct gtt Arg Val Ser Ser Val 345	aga cgt aaa ctc aat Arg Arg Lys Leu Asn 350	1056
acc att gct tca gaa ttt Thr Ile Ala Ser Glu Phe 355	aaa gat aag aat gtg Lys Asp Lys Asn Val 360	tta tta gtt gac gac Leu Leu Val Asp Asp 365	1104
tcg att gta cgt ggt acc Ser Ile Val Arg Gly Thr 370	acg tct gaa caa att Thr Ser Glu Gln Ile 375	gtc gaa atg gcg aga Val Glu Met Ala Arg 380	1152
gcg gca ggt gcg aag aaa Ala Ala Gly Ala Lys Lys 385	att tat ttt gcc tct Ile Tyr Phe Ala Ser 390	gct gca cca gaa att Ala Ala Pro Glu Ile 395	1200
cgt tat cca aat gtg tat Arg Tyr Pro Asn Val Tyr 405	ggt att gat atg cca Gly Ile Asp Met Pro 410	acc aaa aat gaa ttg Thr Lys Asn Glu Leu 415	1248
atc gct tat ggt cgt gat Ile Ala Tyr Gly Arg Asp 420	gta gat gaa att gct Val Asp Glu Ile Ala 425	aac tta att ggt gtg Asn Leu Ile Gly Val 430	1296
gat aaa ttg att ttc caa Asp Lys Leu Ile Phe Gln 435	gat ttg gat gcg tta Leu Asp Ala Leu Thr 440	act ggt tct gtg caa Gly Ser Val Gln 445	1344
caa gaa aat cca agt att caa gac ttt gat tgt 450	tcg gtc ttt aca ggg 455		1392

五、發明說明 (285)

Gln Glu Asn Pro Ser Ile Gln Asp Phe Asp Cys Ser Val Phe Thr Gly
450 455 460
gtt tat gtg acg ggc gat att aca cct gaa tat ctg gat aat att gca 1440
Val Tyr Val Thr Gly Asp Ile Thr Pro Glu Tyr Leu Asp Asn Ile Ala
465 470 475 480
gaa cag cgt aat gat atc gcc aag aaa aag cgt gaa aaa gat gct acc 1488
Glu Gln Arg Asn Asp Ile Ala Lys Lys Lys Arg Glu Lys Asp Ala Thr
485 490 495
aat ctt gaa atg cac aat gaa aaa ta 1514
Asn Leu Glu Met His Asn Glu Lys
500

<210> 111
<211> 504
<212> 蛋白質
<213> 敗血性巴斯德桿菌

<400> 111
Met Cys Gly Ile Val Gly Ile Val Ser Gln Ser Pro Val Asn Gln Ser
1 5 10 15
Ile Tyr Asp Ala Leu Thr Leu Leu Gln His Arg Gly Gln Asp Ala Ala
20 25 30
Gly Ile Val Thr Val Asp Asp Glu Asn Arg Phe Arg Leu Arg Lys Ala
35 40 45
Asn Gly Leu Val Ser Asp Val Phe Glu Gln Val His Met Leu Arg Leu
50 55 60
Gln Gly Asn Ala Gly Ile Gly His Val Arg Tyr Pro Thr Ala Gly Ser
65 70 75 80
Ser Ser Val Ser Glu Ala Gln Pro Phe Tyr Val Asn Ser Pro Tyr Gly
85 90 95
Leu Thr Leu Val His Asn Gly Asn Leu Thr Asn Ser Ser Glu Leu Lys
100 105 110
Glu Lys Leu Phe Arg Leu Ala Arg Arg His Val Asn Thr Asn Ser Asp
115 120 125
Ser Glu Leu Leu Leu Asn Ile Leu Ala Asn His Leu Asp His Phe Glu
130 135 140
Lys Tyr Gln Leu Asp Pro Gln Asp Val Phe Ser Ala Val Lys Gln Thr
145 150 155 160
His Gln Asp Ile Arg Gly Ala Tyr Ala Cys Ile Ala Met Ile Ile Gly
165 170 175
His Gly Met Val Ala Phe Arg Asp Pro Asn Gly Ile Arg Pro Leu Val
180 185 190
Leu Gly Lys Arg Glu Glu Asn Gly Lys Thr Glu Tyr Met Phe Ala Ser
195 200 205
Glu Ser Ile Ala Leu Asp Thr Val Gly Phe Glu Phe Val Arg Asp Val
210 215 220

裝
訂
線

五、發明說明 (286)

Gln Pro Gly Glu Ala Ile Tyr Val Thr Phe Glu Gly Glu Met Tyr Ala
225 230 235 240

Gln Gln Cys Ala Asp Lys Pro Thr Leu Thr Pro Cys Ile Phe Glu Tyr
245 250 255

Val Tyr Phe Ala Arg Pro Asp Ser Cys Ile Asp Gly Val Ser Val Tyr
260 265 270

Ala Ala Arg Val His Met Gly Gln Arg Leu Gly Glu Lys Ile Ala Arg
275 280 285

Glu Trp Ala Asp Val Asp Asp Ile Asp Val Val Ile Pro Val Pro Glu
290 295 300

Thr Ser Asn Asp Ile Ala Leu Arg Ile Ala Arg Val Leu Asn Lys Pro
305 310 315 320

Tyr Arg Gln Gly Phe Val Lys Asn Arg Tyr Val Gly Arg Thr Phe Ile
325 330 335

Met Pro Gly Gln Ala Leu Arg Val Ser Ser Val Arg Arg Lys Leu Asn
340 345 350

Thr Ile Ala Ser Glu Phe Lys Asp Lys Asn Val Leu Leu Val Asp Asp
355 360 365

Ser Ile Val Arg Gly Thr Thr Ser Glu Gln Ile Val Glu Met Ala Arg
370 375 380

Ala Ala Gly Ala Lys Lys Ile Tyr Phe Ala Ser Ala Ala Pro Glu Ile
385 390 395 400

Arg Tyr Pro Asn Val Tyr Gly Ile Asp Met Pro Thr Lys Asn Glu Leu
405 410 415

Ile Ala Tyr Gly Arg Asp Val Asp Glu Ile Ala Asn Leu Ile Gly Val
420 425 430

Asp Lys Leu Ile Phe Gln Asp Leu Asp Ala Leu Thr Gly Ser Val Gln
435 440 445

Gln Glu Asn Pro Ser Ile Gln Asp Phe Asp Cys Ser Val Phe Thr Gly
450 455 460

Val Tyr Val Thr Gly Asp Ile Thr Pro Glu Tyr Leu Asp Asn Ile Ala
465 470 475 480

Glu Gln Arg Asn Asp Ile Ala Lys Lys Lys Arg Glu Lys Asp Ala Thr
485 490 495

Asn Leu Glu Met His Asn Glu Lys
500

<210> 112

<211> 989

<212> DNA

<213> 敗血性巴斯德桿菌

<220>

<223> rci

五、發明說明 (287)

<220>

<221> CDS

<222> (1) .. (987)

<400> 112

atg gca aca ata aga aaa cgt ggt aac tca tat cgt gct gag ata agc	48
Met Ala Thr Ile Arg Lys Arg Gly Asn Ser Tyr Arg Ala Glu Ile Ser	
1 5 10 15	

aaa aac gga gta agg aaa tca gca aca ttt aag act aaa tca gaa gct	96
Lys Asn Gly Val Arg Lys Ser Ala Thr Phe Lys Thr Lys Ser Glu Ala	
20 25 30	

aat gcg tgg gct gtt gac gag gag aga aaa tta gct gat ttg gca aaa	144
Asn Ala Trp Ala Val Asp Glu Glu Arg Lys Leu Ala Asp Leu Ala Lys	
35 40 45	

ggt atc gct cca gat att att ttt aga gat gta ata gaa cgc tat caa	192
Gly Ile Ala Pro Asp Ile Ile Phe Arg Asp Val Ile Glu Arg Tyr Gln	
50 55 60	

aat gaa gtg tct ata act aaa aaa ggc gcg cga aat gaa att ata aga	240
Asn Glu Val Ser Ile Thr Lys Lys Gly Ala Arg Asn Glu Ile Ile Arg	
65 70 75 80	

tta aac cgc ttt tta aga tat gat att tct aat ctg tat att cgt gat	288
Leu Asn Arg Phe Leu Arg Tyr Asp Ile Ser Asn Leu Tyr Ile Arg Asp	
85 90 95	

tta aga aaa gaa gat ttt gag gag tgg atc aga att cgc cta acc gaa	336
Leu Arg Lys Glu Asp Phe Glu Glu Trp Ile Arg Ile Arg Leu Thr Glu	
100 105 110	

gta tcg gat gct agc gtt aga cgt gag ctt gtt act ata tcg tca gtg	384
Val Ser Asp Ala Ser Val Arg Arg Glu Leu Val Thr Ile Ser Ser Val	
115 120 125	

ctg aca aca gca ata aat aag tgg gga tat att tca agg cat cca atg	432
Leu Thr Thr Ala Ile Asn Lys Trp Gly Tyr Ile Ser Arg His Pro Met	
130 135 140	

act ggt att gaa aaa cca aaa aac tcg gca gaa aga aaa gaa cga tat	480
Thr Gly Ile Glu Lys Pro Lys Asn Ser Ala Glu Arg Lys Glu Arg Tyr	
145 150 155 160	

tca gaa cag gac att aaa aca ata tta gaa aca gct aga tat tgt gaa	528
Ser Glu Gln Asp Ile Lys Thr Ile Leu Glu Thr Ala Arg Tyr Cys Glu	
165 170 175	

gat aaa cta ccc ata aca ctc aaa caa aga gta gca att gca atg tta	576
Asp Lys Leu Pro Ile Thr Leu Lys Gln Arg Val Ala Ile Ala Met Leu	
180 185 190	

ttt gct att gaa acc gct atg cgt gct ggt gag att gct agt ata aaa	624
Phe Ala Ile Glu Thr Ala Met Arg Ala Gly Glu Ile Ala Ser Ile Lys	
195 200 205	

tgg gat aat gtt ttt ctt gaa aag aga ata gta cat tta ccg aca act	672
Trp Asp Asn Val Phe Leu Glu Lys Arg Ile Val His Leu Pro Thr Thr	
210 215 220	

五、發明說明 (288)

aaa aac ggg cac tct aga gat gtg ccg ctt tcg caa aga gct gtt gcg	720
Lys Asn Gly His Ser Arg Asp Val Pro Leu Ser Gln Arg Ala Val Ala	
225 230 235 240	
cta att tta aaa atg aaa gag gta gaa aat gga gat ctt gtg ttt cag	768
Leu Ile Leu Lys Met Lys Glu Val Glu Asn Gly Asp Leu Val, Phe Gln	
245 250 255	
acc acg cct gaa tca tta agc acc acg ttt aga gtg tta aag aaa gag	816
Thr Thr Pro Glu Ser Leu Ser Thr Thr Phe Arg Val Leu Lys Lys Glu	
260 265 270	
tgt gga ctt gaa cat ctc cat ttt cat gat acg aga agg gaa gcg ttg	864
Cys Gly Leu Glu His Leu His Phe His Asp Thr Arg Arg Glu Ala Leu	
275 280 285	
acg aga tta tct aag aaa gta gat gta atg act cta gcc aaa att agc	912
Thr Arg Leu Ser Lys Lys Val Asp Val Met Thr Leu Ala Lys Ile Ser	
290 295 300	
gga cat aga gat tta aga att tta caa aac aca tat tac gca ccg aat	960
Gly His Arg Asp Leu Arg Ile Leu Gln Asn Thr Tyr Tyr Ala Pro Asn	
305 310 315 320	
atg agt gaa gtg gca aac ttg ttg gat tao	989
Met Ser Glu Val Ala Asn Leu Leu Asp	
325	

<210> 113

<211> 329

<212> 蛋白質

<213> 敗血性巴斯德桿菌

<400> 113

Met Ala Thr Ile Arg Lys Arg Gly Asn Ser Tyr Arg Ala Glu Ile Ser
1 5 10 15

Lys Asn Gly Val Arg Lys Ser Ala Thr Phe Lys Thr Lys Ser Glu Ala
20 25 30

Asn Ala Trp Ala Val Asp Glu Glu Arg Lys Leu Ala Asp Leu Ala Lys
35 40 45

Gly Ile Ala Pro Asp Ile Ile Phe Arg Asp Val Ile Glu Arg Tyr Gln
50 55 60

Asn Glu Val Ser Ile Thr Lys Lys Gly Ala Arg Asn Glu Ile Ile Arg
65 70 75 80

Leu Asn Arg Phe Leu Arg Tyr Asp Ile Ser Asn Leu Tyr Ile Arg Asp
85 90 95

Leu Arg Lys Glu Asp Phe Glu Glu Trp Ile Arg Ile Arg Leu Thr Glu
100 105 110

Val Ser Asp Ala Ser Val Arg Arg Glu Leu Val Thr Ile Ser Ser Val
115 120 125

Leu Thr Thr Ala Ile Asn Lys Trp Gly Tyr Ile Ser Arg His Pro Met
130 135 140

Thr Gly Ile Glu Lys Pro Lys Asn Ser Ala Glu Arg Lys Glu Arg Tyr

145					150					155					160
Ser	Glu	Gln	Asp	Ile 165	Lys	Thr	Ile	Leu	Glu 170	Thr	Ala	Arg	Tyr	Cys 175	Glu
Asp	Lys	Leu	Pro 180	Ile	Thr	Leu	Lys	Gln 185	Arg	Val	Ala	Ile	Ala 190	Met	Leu
Phe	Ala	Ile 195	Glu	Thr	Ala	Met	Arg 200	Ala	Gly	Glu	Ile	Ala 205	Ser	Ile	Lys
Trp	Asp 210	Asn	Val	Phe	Leu	Glu 215	Lys	Arg	Ile	Val	His 220	Leu	Pro	Thr	Thr
Lys 225	Asn	Gly	His	Ser	Arg 230	Asp	Val	Pro	Leu	Ser 235	Gln	Arg	Ala	Val	Ala 240
Leu	Ile	Leu	Lys	Met 245	Lys	Glu	Val	Glu	Asn 250	Gly	Asp	Leu	Val	Phe 255	Gln
Thr	Thr	Pro	Glu 260	Ser	Leu	Ser	Thr	Thr 265	Phe	Arg	Val	Leu	Lys 270	Lys	Glu
Cys	Gly	Leu	Glu	His	Leu	His	Phe 280	His	Asp	Thr	Arg	Arg 285	Glu	Ala	Leu
Thr	Arg 290	Leu	Ser	Lys	Lys	Val 295	Asp	Val	Met	Thr	Leu 300	Ala	Lys	Ile	Ser
Gly 305	His	Arg	Asp	Leu	Arg 310	Ile	Leu	Gln	Asn	Thr 315	Tyr	Tyr	Ala	Pro	Asn 320
Met	Ser	Glu	Val	Ala	Asn 325	Leu	Leu	Asp							

<210> 114
<211> 1190
<212> DNA
<213> 败血性巴斯德桿菌

<220>
<223> sopE

```
<220>
<221> CDS
<222> (1)..(1188)
```

<400> 114																	
atg	tct	gaa	gaa	tat	cta	cat	ggg	gtc	aaa	gtc	aca	gaa	atc	aat	caa	48	
Met	Ser	Glu	Glu	Tyr	Leu	His	Gly	Val	Lys	Val	Thr	Glu	Ile	Asn	Gln		
1				5					10					15			
gca	att	cgc	aca	att	caa	agt	cta	tca	acc	gca	gtc	atc	ggg	att	gtc	96	
Ala	Ile	Arg	Thr	Ile	Gln	Ser	Leu	Ser	Thr	Ala	Val	Ile	Gly	Ile	Val		
			20					25					30				
tgt	act	gca	aat	gac	gca	gac	aat	gaa	aca	ttc	cca	ctc	aat	gaa	ccc	144	
Cys	Thr	Ala	Asn	Asp	Ala	Asp	Asn	Glu	Thr	Phe	Pro	Leu	Asn	Glu	Pro		
		35					40					45					
gct	ctc	atc	aca	aac	gtg	gca	gcg	gca	att	ggc	aag	gct	gga	aaa	caa	192	
Val	Leu	Ile	Thr	Asn	Val	Ala	Ala	Ala	Ile	Gly	Lys	Ala	Gly	Lys	Gln		

五、發明說明 (290)

50	55	60	
ggc acg ctt tca cgt gcg ctt gac ggg att tct gat gta gtc aat tgc			240
Gly Thr Leu Ser Arg Ala Leu Asp Gly Ile Ser Asp Val Val Asn Cys			
65	70	75	80
aaa gtg att gtt gtg cga gtg caa gaa agt gcg caa gaa gac gaa gaa			288
Lys Val Ile Val Val Arg Val Gln Glu Ser Ala Gln Glu Asp Glu Glu			
	85	90	95
aca aaa gca agt gaa atg aac acg gca att att ggc aca atc aca gaa			336
Thr Lys Ala Ser Glu Met Asn Thr Ala Ile Ile Gly Thr Ile Thr Glu			
	100	105	110
gaa ggg cag tac aca ggc ttg aag gcg tta ttg att gcg aaa aac aaa			384
Glu Gly Gln Tyr Thr Gly Leu Lys Ala Leu Leu Ile Ala Lys Asn Lys			
	115	120	125
ttc ggt atc aaa cca cgt att tta tgt gtg cca aaa ttc gac aca aaa			432
Phe Gly Ile Lys Pro Arg Ile Leu Cys Val Pro Lys Phe Asp Thr Lys			
	130	135	140
gaa gtc gcc aca gag ctt gca agt atc gcc gcc aaa ctc aac gca ttt			480
Glu Val Ala Thr Glu Leu Ala Ser Ile Ala Ala Lys Leu Asn Ala Phe			
	145	150	155
gct tac att tca tgt caa ggg tgt aaa acg aaa gaa caa gcg gtg caa			528
Ala Tyr Ile Ser Cys Gln Gly Cys Lys Thr Lys Glu Gln Ala Val Gln			
	165	170	175
tat aaa cgc aac ttc tca caa cgt gaa gtc atg ctg atc atg ggc gat			576
Tyr Lys Arg Asn Phe Ser Gln Arg Glu Val Met Leu Ile Met Gly Asp			
	180	185	190
ttt ctg tca ttt aat gtc aac aca tca aaa gtt gag att gac tat gcc			624
Phe Leu Ser Phe Asn Val Asn Thr Ser Lys Val Glu Ile Asp Tyr Ala			
	195	200	205
gtc act cgt gcg gcg gca atg cgt gca tat ctt gat aaa gaa cag ggc			672
Val Thr Arg Ala Ala Ala Met Arg Ala Tyr Leu Asp Lys Glu Gln Gly			
	210	215	220
tgg cat acg tct att tca aat aaa ggc att aat ggc gtg agc ggt gtc			720
Trp His Thr Ser Ile Ser Asn Lys Gly Ile Asn Gly Val Ser Gly Val			
	225	230	235
aca caa cca ctc tat ttt gac att aac gac agc tcg act gat gtg aac			768
Thr Gln Pro Leu Tyr Phe Asp Ile Asn Asp Ser Ser Thr Asp Val Asn			
	245	250	255
tat ctc aat gaa caa ggc atc acg tgt tgc gtg aat cat aat ggc ttt			816
Tyr Leu Asn Glu Gln Gly Ile Thr Cys Cys Val Asn His Asn Gly Phe			
	260	265	270
cgt ttt tgg ggc tta cgc acg act gca gaa gat cca tta ttc aag ttt			864
Arg Phe Trp Gly Leu Arg Thr Thr Ala Glu Asp Pro Leu Phe Lys Phe			
	275	280	285
gaa gtg tac acc cgc act gca caa atc tta aaa gat acg att gca ggg			912
Glu Val Tyr Thr Arg Thr Ala Gln Ile Leu Lys Asp Thr Ile Ala Gly			
	290	295	300
gcg ttt gat tgg gca gtg gat aaa gat att tct gtc acg cta gtg aaa			960

五、發明說明 (291)

Ala Phe Asp Trp Ala Val Asp Lys Asp Ile Ser Val Thr Leu Val Lys
305 310 315 320

gat att att gaa gca atc aat gcg aag tgg cgt gat tac acc aca aaa 1008
Asp Ile Ile Glu Ala Ile Asn Ala Lys Trp Arg Asp Tyr Thr Thr Lys
325 330 335

ggc tac tta att ggc ggt aaa gcg tgg ctt aat aaa gag ctt aac agt 1056
Gly Tyr Leu Ile Gly Gly Lys Ala Trp Leu Asn Lys Glu Leu Asn Ser
340 345 350

gca acg aat tta aaa gat gcg aag ttg ttg atc tct tat gat tat cac 1104
Ala Thr Asn Leu Lys Asp Ala Lys Leu Leu Ile Ser Tyr Asp Tyr His
355 360 365

cca gta cca ccg ctc gaa cag cta ggc ttt aat cag tac att tct gat 1152
Pro Val Pro Pro Leu Glu Gln Leu Gly Phe Asn Gln Tyr Ile Ser Asp
370 375 380

gaa tac ctt gtt gat ttt tca aat cgt tta gca tcg ta 1190
Glu Tyr Leu Val Asp Phe Ser Asn Arg Leu Ala Ser
385 390 395

<210> 115
<211> 396
<212> 蛋白質
<213> 敗血性巴斯德桿菌

<400> 115
Met Ser Glu Glu Tyr Leu His Gly Val Lys Val Thr Glu Ile Asn Gln
1 5 10 15

Ala Ile Arg Thr Ile Gln Ser Leu Ser Thr Ala Val Ile Gly Ile Val
20 25 30

Cys Thr Ala Asn Asp Ala Asp Asn Glu Thr Phe Pro Leu Asn Glu Pro
35 40 45

Val Leu Ile Thr Asn Val Ala Ala Ala Ile Gly Lys Ala Gly Lys Gln
50 55 60

Gly Thr Leu Ser Arg Ala Leu Asp Gly Ile Ser Asp Val Val Asn Cys
65 70 75 80

Lys Val Ile Val Val Arg Val Gln Glu Ser Ala Gln Glu Asp Glu Glu
85 90 95

Thr Lys Ala Ser Glu Met Asn Thr Ala Ile Ile Gly Thr Ile Thr Glu
100 105 110

Glu Gly Gln Tyr Thr Gly Leu Lys Ala Leu Leu Ile Ala Lys Asn Lys
115 120 125

Phe Gly Ile Lys Pro Arg Ile Leu Cys Val Pro Lys Phe Asp Thr Lys
130 135 140

Glu Val Ala Thr Glu Leu Ala Ser Ile Ala Ala Lys Leu Asn Ala Phe
145 150 155 160

Ala Tyr Ile Ser Cys Gln Gly Cys Lys Thr Lys Glu Gln Ala Val Gln
165 170 175

五、發明說明 (292)

Tyr Lys Arg Asn Phe Ser Gln Arg Glu Val Met Leu Ile Met Gly Asp
180 185 190

Phe Leu Ser Phe Asn Val Asn Thr Ser Lys Val Glu Ile Asp Tyr Ala
195 200 205

Val Thr Arg Ala Ala Ala Met Arg Ala Tyr Leu Asp Lys Glu Gln Gly
210 215 220

Trp His Thr Ser Ile Ser Asn Lys Gly Ile Asn Gly Val Ser Gly Val
225 230 235 240

Thr Gln Pro Leu Tyr Phe Asp Ile Asn Asp Ser Ser Thr Asp Val Asn
245 250 255

Tyr Leu Asn Glu Gln Gly Ile Thr Cys Cys Val Asn His Asn Gly Phe
260 265 270

Arg Phe Trp Gly Leu Arg Thr Thr Ala Glu Asp Pro Leu Phe Lys Phe
275 280 285

Glu Val Tyr Thr Arg Thr Ala Gln Ile Leu Lys Asp Thr Ile Ala Gly
290 295 300

Ala Phe Asp Trp Ala Val Asp Lys Asp Ile Ser Val Thr Leu Val Lys
305 310 315 320

Asp Ile Ile Glu Ala Ile Asn Ala Lys Trp Arg Asp Tyr Thr Thr Lys
325 330 335

Gly Tyr Leu Ile Gly Gly Lys Ala Trp Leu Asn Lys Glu Leu Asn Ser
340 345 350

Ala Thr Asn Leu Lys Asp Ala Lys Leu Leu Ile Ser Tyr Asp Tyr His
355 360 365

Pro Val Pro Pro Leu Glu Gln Leu Gly Phe Asn Gln Tyr Ile Ser Asp
370 375 380

Glu Tyr Leu Val Asp Phe Ser Asn Arg Leu Ala Ser
385 390 395

<210> 116
<211> 2204
<212> DNA
<213> 敗血性巴斯德桿菌

<220>
<223> unkK

<220>
<221> CDS
<222> (1) .. (2202)

<400> 116
atg aat aaa aat cgc tat aaa ctc att ttt agt aaa act aaa ggc tgt 48
Met Asn Lys Asn Arg Tyr Lys Leu Ile Phe Ser Lys Thr Lys Gly Cys
1 5 10 15
ctt gta cct gtt gct gaa acg att aat tct gca gta gga aat gcc tca 96
Leu Val Pro Val Ala Glu Thr Ile Asn Ser Ala Val Gly Asn Ala Ser
20 25 30

裝
訂
線

五、發明說明 (293)

tca aaa gac gtt tct gac acc gag ata agt gct tct caa cca gcg ctc	144
Ser Lys Asp Val Ser Asp Thr Glu Ile Ser Ala Ser Gln Pro Ala Leu	
35 40 45	
aac tcg ccg ctt tcg acc ctt tct gta tta gtc aaa acc gca ttt aat	192
Asn Ser Pro Leu Ser Thr Leu Ser Val Leu Val Lys Thr Ala Phe Asn	
50 55 60	
ccg gtt tca aca ttg atg tcg ttg act tgg aaa gaa tac gcc gtt tta	240
Pro Val Ser Thr Leu Met Ser Leu Thr Trp Lys Glu Tyr Ala Val Leu	
65 70 75 80	
tta tta agt gtg gtg tct ttt cct ctt atg gca caa gcc tct gat aca	288
Leu Leu Ser Val Val Ser Phe Pro Leu Met Ala Gln Ala Ser Asp Thr	
85 90 95	
gat tca gtg gta caa aga aaa cct gaa tta act gat gtg acg aat agc	336
Asp Ser Val Val Gln Arg Lys Pro Glu Leu Thr Asp Val Thr Asn Ser	
100 105 110	
aac agc tat cat gtg gaa tta gat aga gag cat cat aaa ggg gag cat	384
Asn Ser Tyr His Val Glu Leu Asp Arg Glu His His Lys Gly Glu His	
115 120 125	
caa aca aaa atc aaa cat act gag aat aat gtc atc att gtt gat att	432
Gln Thr Lys Ile Lys His Thr Glu Asn Asn Val Ile Ile Val Asp Ile	
130 135 140	
gca aaa cca aac caa aag ggc att tca gat aac cgt ttt aaa cac ttc	480
Ala Lys Pro Asn Gln Lys Gly Ile Ser Asp Asn Arg Phe Lys His Phe	
145 150 155 160	
aac atc cca aat ggg gcg gta ttt aac aat agc gcc aag gaa aaa cgc	528
Asn Ile Pro Asn Gly Ala Val Phe Asn Asn Ser Ala Lys Glu Lys Arg	
165 170 175	
tca cag tta gtg ggg tat ttg cca ggt aac cag aat tta acg gaa ggt	576
Ser Gln Leu Val Gly Tyr Leu Pro Gly Asn Gln Asn Leu Thr Glu Gly	
180 185 190	
agt gaa gca aaa gcg atc tta aat cag gtg act gga ccg gat gcc agt	624
Ser Glu Ala Lys Ala Ile Leu Asn Gln Val Thr Gly Pro Asp Ala Ser	
195 200 205	
aaa att gaa ggc gcc ctt gaa att tta ggg caa aaa gcc gat ttg gtg	672
Lys Ile Glu Gly Ala Leu Glu Ile Leu Gly Gln Lys Ala Asp Leu Val	
210 215 220	
att gcg aac caa aat ggc att gtg ctt aat ggg gta aaa acc att aat	720
Ile Ala Asn Gln Asn Gly Ile Val Leu Asn Gly Val Lys Thr Ile Asn	
225 230 235 240	
gcc aat cgt ttt gtg gca aca acc agt agt acc att gat cct gag caa	768
Ala Asn Arg Phe Val Ala Thr Thr Ser Ser Thr Ile Asp Pro Glu Gln	
245 250 255	
atg cag tta aat gtc acg caa ggt aca gtg aca att ggg gtg gat gga	816
Met Gln Leu Asn Val Thr Gln Gly Thr Val Thr Ile Gly Val Asp Gly	
260 265 270	
ttt gcc aca gat ggc tta cct tat ttg gat atc att gcc aaa aag att	864
Phe Ala Thr Asp Gly Leu Pro Tyr Leu Asp Ile Ile Ala Lys Lys Ile	
275 280 285	

五、發明說明 (294)

gaa caa aaa caa gcg att aca aaa gaa aga aca gga aat tcc gaa acc	912
Glu Gln Lys Gln Ala Ile Thr Lys Glu Arg Thr Gly Asn Ser Glu Thr	
290 295 300	
gat atc act ttt gtc gca ggt aac agt aaa tat gat tta aag aca cat	960
Asp Ile Thr Phe Val Ala Gly Asn Ser Lys Tyr Asp Leu Lys Thr His	
305 310 315 320	
caa gtg aca gaa aag cat acc gct gag gca caa ggt gaa att gcg att	1008
Gln Val Thr Glu Lys His Thr Ala Glu Ala Gln Gly Glu Ile Ala Ile	
325 330 335	
agc ggt gcg agt acc ggt gca atg tac ggt aaa aat atc aaa tta atc	1056
Ser Gly Ala Ser Thr Gly Ala Met Tyr Gly Lys Asn Ile Lys Leu Ile	
340 345 350	
gta acg gat aaa ggc gct ggg gta aaa cat gat ggc att att tta tct	1104
Val Thr Asp Lys Gly Ala Gly Val Lys His Asp Gly Ile Ile Leu Ser	
355 360 365	
gag gcg gat att caa att gaa acc cat gag ggc gat gtt gaa tta ggc	1152
Glu Ala Asp Ile Gln Ile Glu Thr His Glu Gly Asp Val Glu Leu Gly	
370 375 380	
aat aca aaa aat aat cag aat gag aat tat gcc aaa gct cat gcg gaa	1200
Asn Thr Lys Asn Asn Gln Asn Glu Asn Tyr Ala Lys Ala His Ala Glu	
385 390 395 400	
ggg aat ttt acg gtt aaa ggc ggt aag cac gtt att att ggt aag gaa	1248
Gly Asn Phe Thr Val Lys Gly Gly Lys His Val Ile Ile Gly Lys Glu	
405 410 415	
gtt aaa gcc aac aaa gcg gtc gat att caa gca caa gaa aca aca gta	1296
Val Lys Ala Asn Lys Ala Val Asp Ile Gln Ala Gln Glu Thr Thr Val	
420 425 430	
aga caa aat gcg aaa tta act gcc aaa acg agt gcc aaa att aca gca	1344
Arg Gln Asn Ala Lys Leu Thr Ala Lys Thr Ser Ala Lys Ile Thr Ala	
435 440 445	
agt aag agt gtg aat ctt gaa gat aac gcg aaa ctt att gct aat gag	1392
Ser Lys Ser Val Asn Leu Glu Asp Asn Ala Lys Leu Ile Ala Asn Glu	
450 455 460	
ctg agc aca aca acc aat aaa tta acc aat aaa ggt agc att tac ggc	1440
Leu Ser Thr Thr Thr Asn Lys Leu Thr Asn Lys Gly Ser Ile Tyr Gly	
465 470 475 480	
aag aaa gtg acg cta gat gct gat aat tta gtc aat agt aaa gaa atc	1488
Lys Lys Val Thr Leu Asp Ala Asp Asn Leu Val Asn Ser Lys Glu Ile	
485 490 495	
tat gcg tct agc gaa ctt gat att caa acc aaa ggt cgt gat ctt tta	1536
Tyr Ala Ser Ser Glu Leu Asp Ile Gln Thr Lys Gly Arg Asp Leu Leu	
500 505 510	
ctt gag gat ggg gtt aat caa cca ctg agt ttc tta aaa ggc gct tca	1584
Leu Glu Asp Gly Val Asn Gln Pro Leu Ser Phe Leu Lys Gly Ala Ser	
515 520 525	
ttg tta gcg ccg ggg ttt gtc aac act ggg cta att cac agt aac ggt	1632
Leu Leu Ala Pro Gly Phe Val Asn Thr Gly Leu Ile His Ser Asn Gly	
530 535 540	

五、發明說明 (295)

aat gcc aag ctc act ttt aaa gat gac acc agt ttt gtg act gaa gga	1680
Asn Ala Lys Leu Thr Phe Lys Asp Asp Thr Ser Phe Val Thr Glu Gly	
545 550 555 560	
aat aac ttt atc aca gca aaa gac aac tta gaa atc acg gca aaa aat	1728
Asn Asn Phe Ile Thr Ala Lys Asp Asn Leu Glu Ile Thr Ala Lys Asn	
565 570 575	
gtt caa att gat caa gcg aaa aat att caa tta aac gcg aat atc acg	1776
Val Gln Ile Asp Gln Ala Lys Asn Ile Gln Leu Asn Ala Asn Ile Thr	
580 585 590	
atc aat acc aag tct ggt ttt gtg aat tac ggt acc tta gca agt gct	1824
Ile Asn Thr Lys Ser Gly Phe Val Asn Tyr Gly Thr Leu Ala Ser Ala	
595 600 605	
caa aat tta acg att aat acc gaa caa ggc agc att tat aac ata ggc	1872
Gln Asn Leu Thr Ile Asn Thr Glu Gln Gly Ser Ile Tyr Asn Ile Gly	
610 615 620	
ggt atc ttg ggg gcg ggt aaa agt ttg aat ctg agc gcg aaa aga gga	1920
Gly Ile Leu Gly Ala Gly Lys Ser Leu Asn Leu Ser Ala Lys Arg Gly	
625 630 635 640	
gaa aac caa gga gga tat ctt att aat caa ggt aag agt cta ctc cat	1968
Glu Asn Gln Gly Tyr Leu Ile Asn Gln Gly Lys Ser Leu Leu His	
645 650 655	
tct gaa ggc gcc atg aac ctc aca gcg gat cgc acg gtg tac aat tta	2016
Ser Glu Gly Ala Met Asn Leu Thr Ala Asp Arg Thr Val Tyr Asn Leu	
660 665 670	
ggg aat att ttt gct aaa ggt gac gcg acg atc aat gca aac gcg tta	2064
Gly Asn Ile Phe Ala Lys Gly Asp Ala Thr Ile Asn Ala Asn Ala Leu	
675 680 685	
att aat gat gtt act ctc aca ggt cgt ctt gag tat caa gat ctg aaa	2112
Ile Asn Asp Val Thr Leu Thr Gly Arg Leu Glu Tyr Gln Asp Leu Lys	
690 695 700	
aaa gat tat acg cgt tat tat cgt atc aat gaa acg gca aaa cat ggt	2160
Lys Asp Tyr Thr Arg Tyr Tyr Arg Ile Asn Glu Thr Ala Lys His Gly	
705 710 715 720	
tgg cat aat aac ttc tat gaa tta aac gtc gac aga gtt tct tg	2204
Trp His Asn Asn Phe Tyr Glu Leu Asn Val Asp Arg Val Ser	
725 730	

<210> 117

<211> 734

<212> 蛋白質

<213> 敗血性巴斯德桿菌

<400> 117

Met Asn Lys Asn Arg Tyr Lys Leu Ile Phe Ser Lys Thr Lys Gly Cys
1 5 10 15

Leu Val Pro Val Ala Glu Thr Ile Asn Ser Ala Val Gly Asn Ala Ser
20 25 30

Ser Lys Asp Val Ser Asp Thr Glu Ile Ser Ala Ser Gln Pro Ala Leu
35 40 45

五、發明說明 (296)

Asn Ser Pro Leu Ser Thr Leu Ser Val Leu Val Lys Thr Ala Phe Asn
50 55 60

Pro Val Ser Thr Leu Met Ser Leu Thr Trp Lys Glu Tyr Ala Val Leu
65 70 75 80

Leu Leu Ser Val Val Ser Phe Pro Leu Met Ala Gln Ala Ser Asp Thr
85 90 95

Asp Ser Val Val Gln Arg Lys Pro Glu Leu Thr Asp Val Thr Asn Ser
100 105 110

Asn Ser Tyr His Val Glu Leu Asp Arg Glu His His Lys Gly Glu His
115 120 125

Gln Thr Lys Ile Lys His Thr Glu Asn Asn Val Ile Ile Val Asp Ile
130 135 140

Ala Lys Pro Asn Gln Lys Gly Ile Ser Asp Asn Arg Phe Lys His Phe
145 150 155 160

Asn Ile Pro Asn Gly Ala Val Phe Asn Asn Ser Ala Lys Glu Lys Arg
165 170 175

Ser Gln Leu Val Gly Tyr Leu Pro Gly Asn Gln Asn Leu Thr Glu Gly
180 185 190

Ser Glu Ala Lys Ala Ile Leu Asn Gln Val Thr Gly Pro Asp Ala Ser
195 200 205

Lys Ile Glu Gly Ala Leu Glu Ile Leu Gly Gln Lys Ala Asp Leu Val
210 215 220

Ile Ala Asn Gln Asn Gly Ile Val Leu Asn Gly Val Lys Thr Ile Asn
225 230 235 240

Ala Asn Arg Phe Val Ala Thr Thr Ser Ser Thr Ile Asp Pro Glu Gln
245 250 255

Met Gln Leu Asn Val Thr Gln Gly Thr Val Thr Ile Gly Val Asp Gly
260 265 270

Phe Ala Thr Asp Gly Leu Pro Tyr Leu Asp Ile Ile Ala Lys Lys Ile
275 280 285

Glu Gln Lys Gln Ala Ile Thr Lys Glu Arg Thr Gly Asn Ser Glu Thr
290 295 300

Asp Ile Thr Phe Val Ala Gly Asn Ser Lys Tyr Asp Leu Lys Thr His
305 310 315 320

Gln Val Thr Glu Lys His Thr Ala Glu Ala Gln Gly Glu Ile Ala Ile
325 330 335

Ser Gly Ala Ser Thr Gly Ala Met Tyr Gly Lys Asn Ile Lys Leu Ile
340 345 350

Val Thr Asp Lys Gly Ala Gly Val Lys His Asp Gly Ile Ile Leu Ser
355 360 365

Glu Ala Asp Ile Gln Ile Glu Thr His Glu Gly Asp Val Glu Leu Gly
370 375 380

五、發明說明 (297)

Asn Thr Lys Asn Asn Gln Asn Glu Asn Tyr Ala Lys Ala His Ala Glu
385 390 395 400

Gly Asn Phe Thr Val Lys Gly Gly Lys His Val Ile Ile Gly Lys Glu
405 410 415

Val Lys Ala Asn Lys Ala Val Asp Ile Gln Ala Gln Glu Thr Thr Val
420 425 430

Arg Gln Asn Ala Lys Leu Thr Ala Lys Thr Ser Ala Lys Ile Thr Ala
435 440 445

Ser Lys Ser Val Asn Leu Glu Asp Asn Ala Lys Leu Ile Ala Asn Glu
450 455 460

Leu Ser Thr Thr Thr Asn Lys Leu Thr Asn Lys Gly Ser Ile Tyr Gly
465 470 475 480

Lys Lys Val Thr Leu Asp Ala Asp Asn Leu Val Asn Ser Lys Glu Ile
485 490 495

Tyr Ala Ser Ser Glu Leu Asp Ile Gln Thr Lys Gly Arg Asp Leu Leu
500 505 510

Leu Glu Asp Gly Val Asn Gln Pro Leu Ser Phe Leu Lys Gly Ala Ser
515 520 525

Leu Leu Ala Pro Gly Phe Val Asn Thr Gly Leu Ile His Ser Asn Gly
530 535 540

Asn Ala Lys Leu Thr Phe Lys Asp Asp Thr Ser Phe Val Thr Glu Gly
545 550 555 560

Asn Asn Phe Ile Thr Ala Lys Asp Asn Leu Glu Ile Thr Ala Lys Asn
565 570 575

Val Gln Ile Asp Gln Ala Lys Asn Ile Gln Leu Asn Ala Asn Ile Thr
580 585 590

Ile Asn Thr Lys Ser Gly Phe Val Asn Tyr Gly Thr Leu Ala Ser Ala
595 600 605

Gln Asn Leu Thr Ile Asn Thr Glu Gln Gly Ser Ile Tyr Asn Ile Gly
610 615 620

Gly Ile Leu Gly Ala Gly Lys Ser Leu Asn Leu Ser Ala Lys Arg Gly
625 630 635 640

Glu Asn Gln Gly Gly Tyr Leu Ile Asn Gln Gly Lys Ser Leu Leu His
645 650 655

Ser Glu Gly Ala Met Asn Leu Thr Ala Asp Arg Thr Val Tyr Asn Leu
660 665 670

Gly Asn Ile Phe Ala Lys Gly Asp Ala Thr Ile Asn Ala Asn Ala Leu
675 680 685

Ile Asn Asp Val Thr Leu Thr Gly Arg Leu Glu Tyr Gln Asp Leu Lys
690 695 700

Lys Asp Tyr Thr Arg Tyr Tyr Arg Ile Asn Glu Thr Ala Lys His Gly
705 710 715 720

五、發明說明 (298)

Trp His Asn Asn Phe Tyr Glu Leu Asn Val Asp Arg Val Ser
725 730

<210> 118
<211> 251
<212> DNA
<213> 敗血性巴斯德桿菌

<220>
<223> unkO

<220>
<221> CDS
<222> (1) .. (249)

<400> 118
atg aaa att act att aca cga aat cat cca gaa gta ttt caa gaa tcc 48
Met Lys Ile Thr Ile Thr Arg Asn His Pro Glu Val Phe Gln Glu Ser
1 5 10 15
gct cgt tta gta gcc gaa aag ttc att aaa gcc caa tgt gta gaa gca 96
Ala Arg Leu Val Ala Glu Lys Phe Ile Lys Ala Gln Cys Val Glu Ala
20 25 30
tta aca ttg gct ttg att gag ggt gtc gag cac ttt gtg ctg gaa ggt 144
Leu Thr Leu Ala Leu Ile Glu Gly Val Glu His Phe Val Leu Glu Gly
35 40 45
gag gag gaa agc aaa agg gga cat agt att aag gtt gta tta aaa gga 192
Glu Glu Glu Ser Lys Arg Gly His Ser Ile Lys Val Val Leu Lys Gly
50 55 60
agt cac gaa gtt att aag tca gag gtg aat aca aat gaa aaa aat cat 240
Ser His Glu Val Ile Lys Ser Glu Val Asn Thr Asn Glu Lys Asn His
65 70 75 80
tgt aat cat ta 251
Cys Asn His

<210> 119
<211> 83
<212> 蛋白質
<213> 敗血性巴斯德桿菌

<400> 119
Met Lys Ile Thr Ile Thr Arg Asn His Pro Glu Val Phe Gln Glu Ser
1 5 10 15
Ala Arg Leu Val Ala Glu Lys Phe Ile Lys Ala Gln Cys Val Glu Ala
20 25 30
Leu Thr Leu Ala Leu Ile Glu Gly Val Glu His Phe Val Leu Glu Gly
35 40 45
Glu Glu Glu Ser Lys Arg Gly His Ser Ile Lys Val Val Leu Lys Gly
50 55 60
Ser His Glu Val Ile Lys Ser Glu Val Asn Thr Asn Glu Lys Asn His
65 70 75 80

五、發明說明 (299)

Cys Asn His

<210> 120
<211> 548
<212> DNA
<213> 敗血性巴斯德桿菌

<220>
<223> unkP

<220>
<221> CDS
<222> (1) .. (546)

```

<400> 120
atg cgt gca tat ctt gat aaa gaa cag ggc tgg cat acg tct att tca 48
Met Arg Ala Tyr Leu Asp Lys Glu Gln Gly Trp His Thr Ser Ile Ser
  1          5          10          15

aat aaa ggc att aat ggc gtg agc ggt gtc aca caa cca ctc tat ttt 96
Asn Lys Gly Ile Asn Gly Val Ser Gly Val Thr Gln Pro Leu Tyr Phe
          20          25          30

gac att aac gac agc tcg act gat gtg aac tat ctc aat gaa caa ggc 144
Asp Ile Asn Asp Ser Ser Thr Asp Val Asn Tyr Leu Asn Glu Gln Gly
          35          40          45

atc acg tgt tgc gtg aat cat aat ggc ttt cgt ttt tgg ggc tta cgc 192
Ile Thr Cys Cys Val Asn His Asn Gly Phe Arg Phe Trp Gly Leu Arg
          50          55          60

acg act gca gaa gat cca tta ttc aag ttt gaa gtg tac acc cgc act 240
Thr Thr Ala Glu Asp Pro Leu Phe Lys Phe Glu Val Tyr Thr Arg Thr
          65          70          75          80

gca caa atc tta aaa gat acg att gca ggg gcg ttt gat tgg gca gtg 288
Ala Gln Ile Leu Lys Asp Thr Ile Ala Gly Ala Phe Asp Trp Ala Val
          85          90          95

gat aaa gat att tct gtc acg cta gtg aaa gat att att gaa gca atc 336
Asp Lys Asp Ile Ser Val Thr Leu Val Lys Asp Ile Ile Glu Ala Ile
          100          105          110

aat gcg aag tgg cgt gat tac acc aca aaa ggc tac tta att ggc ggt 384
Asn Ala Lys Trp Arg Asp Tyr Thr Thr Lys Gly Tyr Leu Ile Gly Gly
          115          120          125

aaa gcg tgg ctt aat aaa gag ctt aac agt gca acg aat tta aaa gat 432
Lys Ala Trp Leu Asn Lys Glu Leu Asn Ser Ala Thr Asn Leu Lys Asp
          130          135          140

gcg aag ttg ttg atc tct tat gat tat cac cca gta cca ccg ctc gaa 480
Ala Lys Leu Leu Ile Ser Tyr Asp Tyr His Pro Val Pro Pro Leu Glu
          145          150          155          160

cag cta ggc ttt aat cag tac att tct gat gaa tac ctt gtt gat ttt 528
Gln Leu Gly Phe Asn Gln Tyr Ile Ser Asp Glu Tyr Leu Val Asp Phe
          165          170          175

tca aat cgt tta gca tcg ta 548

```

五、發明說明 (300)

Ser Asn Arg Leu Ala Ser
180

<210> 121

<211> 182

<212> 蛋白質

<213> 敗血性巴斯德桿菌

<400> 121

Met Arg Ala Tyr Leu Asp Lys Glu Gln Gly Trp His Thr Ser Ile Ser
1 5 10 15

Asn Lys Gly Ile Asn Gly Val Ser Gly Val Thr Gln Pro Leu Tyr Phe
20 25 30

Asp Ile Asn Asp Ser Ser Thr Asp Val Asn Tyr Leu Asn Glu Gln Gly
35 40 45

Ile Thr Cys Cys Val Asn His Asn Gly Phe Arg Phe Trp Gly Leu Arg
50 55 60

Thr Thr Ala Glu Asp Pro Leu Phe Lys Phe Glu Val Tyr Thr Arg Thr
65 70 75 80

Ala Gln Ile Leu Lys Asp Thr Ile Ala Gly Ala Phe Asp Trp Ala Val
85 90 95

Asp Lys Asp Ile Ser Val Thr Leu Val Lys Asp Ile Ile Glu Ala Ile
100 105 110

Asn Ala Lys Trp Arg Asp Tyr Thr Thr Lys Gly Tyr Leu Ile Gly Gly
115 120 125

Lys Ala Trp Leu Asn Lys Glu Leu Asn Ser Ala Thr Asn Leu Lys Asp
130 135 140

Ala Lys Leu Leu Ile Ser Tyr Asp Tyr His Pro Val Pro Pro Leu Glu
145 150 155 160

Gln Leu Gly Phe Asn Gln Tyr Ile Ser Asp Glu Tyr Leu Val Asp Phe
165 170 175

Ser Asn Arg Leu Ala Ser
180

<210> 122

<211> 69

<212> DNA

<213> 胸膜肺炎放線桿菌

<220>

<223> apvA-or1

<220>

<221> CDS

<222> (1) .. (69)

<400> 122

atg ttt tat gtc atg ctt gcc aat agg acg tct ata att tca tca atc 48
Met Phe Tyr Val Met Leu Ala Asn Arg Thr Ser Ile Ile Ser Ser Ile
1 5 10 15

五、發明說明 (301)

gat aag ttt aag ata ctt agc
Asp Lys Phe Lys Ile Leu Ser
20

69

<210> 123
<211> 23
<212> 蛋白質
<213> 胸膜肺炎放線桿菌

<400> 123
Met Phe Tyr Val Met Leu Ala Asn Arg Thr Ser Ile Ile Ser Ser Ile
1 5 10 15
Asp Lys Phe Lys Ile Leu Ser
20

<210> 124
<211> 64
<212> DNA
<213> 胸膜肺炎放線桿菌

<220>
<223> apvA-or2

<220>
<221> CDS
<222> (3)..(62)

<400> 124
ag cta agt atc tta aac tta tcg att gat gaa att ata gac gtc cta
Leu Ser Ile Leu Asn Leu Ser Ile Asp Glu Ile Ile Asp Val Leu
1 5 10 15 47

ttg gca agc atg aca ta
Leu Ala Ser Met Thr
20 64

<210> 125
<211> 20
<212> 蛋白質
<213> 胸膜肺炎放線桿菌

<400> 125
Leu Ser Ile Leu Asn Leu Ser Ile Asp Glu Ile Ile Asp Val Leu Leu
1 5 10 15

Ala Ser Met Thr
20

<210> 126
<211> 653
<212> DNA
<213> 胸膜肺炎放線桿菌

<220>
<223> apvB

<220>
<221> CDS

五、發明說明 (302)

<222> (1) .. (651)

<400> 126

tta att agc ttt cct ttt att act ttt gca agt aat gtt aat gga gcc	48
Leu Ile Ser Phe Pro Phe Ile Thr Phe Ala Ser Asn Val Asn Gly Ala	
1 5 10 15	
gaa att gga ttg gga gga gcc cgt gag agt agt att tac tat tct aaa	96
Glu Ile Gly Leu Gly Gly Ala Arg Glu Ser Ser Ile Tyr Tyr Ser Lys	
20 25 30	
cat aaa gta gca aca aat ccc ttt tta gca ctt gat ctt tct tta ggt	144
His Lys Val Ala Thr Asn Pro Phe Leu Ala Leu Asp Leu Ser Leu Gly	
35 40 45	
aat ttt tat atg aga ggg act gca gga att agc gaa ata gga tat gaa	192
Asn Phe Tyr Met Arg Gly Thr Ala Gly Ile Ser Glu Ile Gly Tyr Glu	
50 55 60	
caa tct ttc act gac aat ttc agc gta tca ctg ttt gtt aac cca ttt	240
Gln Ser Phe Thr Asp Asn Phe Ser Val Ser Leu Phe Val Asn Pro Phe	
65 70 75 80	
gat ggt ttt tca att aaa gga aaa gac ttg tta cct gga tat caa agt	288
Asp Gly Phe Ser Ile Lys Gly Lys Asp Leu Leu Pro Gly Tyr Gln Ser	
85 90 95	
att caa act cgc aaa act caa ttt gcc ttt ggt tgg gga tta aat tat	336
Ile Gln Thr Arg Lys Thr Gln Phe Ala Phe Gly Trp Gly Leu Asn Tyr	
100 105 110	
aat ttg gga ggt tta ttc ggc tta aat gat act ttt ata tcc ttg gaa	384
Asn Leu Gly Gly Leu Phe Gly Leu Asn Asp Thr Phe Ile Ser Leu Glu	
115 120 125	
gga aaa agc gga aaa cgt ggt gcg agt agt aat gtc agc tta ctt aaa	432
Gly Lys Ser Gly Lys Arg Gly Ala Ser Ser Asn Val Ser Leu Leu Lys	
130 135 140	
tcg ttt aat atg acg aaa aat tgg aaa gtt tca cca tat att ggc tca	480
Ser Phe Asn Met Thr Lys Asn Trp Lys Val Ser Pro Tyr Ile Gly Ser	
145 150 155 160	
agt tat tat tca tct aaa tat aca gat tat tac ttt ggt att aaa caa	528
Ser Tyr Tyr Ser Ser Lys Tyr Thr Asp Tyr Tyr Phe Gly Ile Lys Gln	
165 170 175	
tcc gaa tta ggt aat aaa att aca tcc gta tat aaa cct aaa gca gct	576
Ser Glu Leu Gly Asn Lys Ile Thr Ser Val Tyr Lys Pro Lys Ala Ala	
180 185 190	
tat gca aca cac ata ggt att aat act gat tat gct ttc acg aac aat	624
Tyr Ala Thr His Ile Gly Ile Asn Thr Asp Tyr Ala Phe Thr Asn Asn	
195 200 205	
ctt ggc atg ggt tta tct gtc ggt tgg at	653
Leu Gly Met Gly Leu Ser Val Gly Trp	
210 215	

<210> 127

<211> 217

<212> 蛋白質

五、發明說明 (303)

<213> 胸膜肺炎放線桿菌

<400> 127

```

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

```

<210> 128

<211> 242

<212> DNA

<213> 胸膜肺炎放線桿菌

<220>

<223> apvC

<220>

<221> CDS

<222> (1) .. (240)

<400> 128

```

atg tgg cgg atg gga gat ttt atg tct aaa aaa gag agg ctg aat gat    48
Met Trp Arg Met Gly Asp Phe Met Ser Lys Lys Glu Arg Leu Asn Asp
 1           5           10           15

```

裝
訂
線

五、發明說明 (304)

atg gct cgc cag att tta tca gcg gcg gag ttg ctc att gca aag gaa	96
Met Ala Arg Gln Ile Leu Ser Ala Ala Glu Leu Leu Ile Ala Lys Glu	
20 25 30	
ggc ttg caa aat tta tcg atg agg aaa atc gca agt gaa gcc ggt atc	144
Gly Leu Gln Asn Leu Ser Met Arg Lys Ile Ala Ser Glu Ala Gly Ile	
35 40 45	
gca aca ggc acg ctt tat ctc tat ttc aaa acg aaa gac gag tta ctg	192
Ala Thr Gly Thr Leu Tyr Leu Tyr Phe Lys Thr Lys Asp Glu Leu Leu	
50 55 60	
gat tgt ttg gcg gaa caa tta cat gaa cga tat tat cgt tat ctg aat	240
Asp Cys Leu Ala Glu Gln Leu His Glu Arg Tyr Tyr Arg Tyr Leu Asn	
65 70 75 80	
at	242

<210> 129
<211> 80
<212> 蛋白質
<213> 胸膜肺炎放線桿菌

<400> 129	
Met Trp Arg Met Gly Asp Phe Met Ser Lys Lys Glu Arg Leu Asn Asp	
1 5 10 15	
Met Ala Arg Gln Ile Leu Ser Ala Ala Glu Leu Leu Ile Ala Lys Glu	
20 25 30	
Gly Leu Gln Asn Leu Ser Met Arg Lys Ile Ala Ser Glu Ala Gly Ile	
35 40 45	
Ala Thr Gly Thr Leu Tyr Leu Tyr Phe Lys Thr Lys Asp Glu Leu Leu	
50 55 60	
Asp Cys Leu Ala Glu Gln Leu His Glu Arg Tyr Tyr Arg Tyr Leu Asn	
65 70 75 80	

<210> 130
<211> 527
<212> DNA
<213> 胸膜肺炎放線桿菌

<220>
<223> apvD

<220>
<221> CDS
<222> (1) .. (525)

<400> 130	
aat att caa aaa aca gtt att gct agc ggc aca ttg caa gcg act gaa	48
Asn Ile Gln Lys Thr Val Ile Ala Ser Gly Thr Leu Gln Ala Thr Glu	
1 5 10 15	
caa gta gat att ggt gca caa gta tct ggg cag att aag cat att tta	96
Gln Val Asp Ile Gly Ala Gln Val Ser Gly Gln Ile Lys His Ile Leu	
20 25 30	
gta caa gaa gga cag aag gtt aaa aaa ggt gag cta tta gct gta att	144

五、發明說明 (305)

Val	Gln	Glu	Gly	Gln	Lys	Val	Lys	Lys	Gly	Glu	Leu	Leu	Ala	Val	Ile		
	35						40				45						
gat	cca	cgt	ctg	gct	gaa	acg	gaa	tta	aaa	cta	gca	aaa	gct	gag	cta	192	
Asp	Pro	Arg	Leu	Ala	Glu	Thr	Glu	Leu	Lys	Leu	Ala	Lys	Ala	Glu	Leu		
	50					55				60							
gca	aat	gct	tct	gct	aat	ttg	gat	aca	aaa	aaa	att	aat	ctt	aag	caa	240	
Ala	Asn	Ala	Ser	Ala	Asn	Leu	Asp	Thr	Lys	Lys	Ile	Asn	Leu	Lys	Gln		
	65				70				75					80			
ctg	caa	tca	gat	tgg	gaa	cgt	cat	caa	cgt	ttg	ata	cga	acc	aat	gcg	288	
Leu	Gln	Ser	Asp	Trp	Glu	Arg	His	Gln	Arg	Leu	Ile	Arg	Thr	Asn	Ala		
			85					90					95				
aca	agc	caa	aag	gaa	aca	gaa	gaa	gca	aaa	agt	aga	tta	aat	acg	gcc	336	
Thr	Ser	Gln	Lys	Glu	Thr	Glu	Glu	Ala	Lys	Ser	Arg	Leu	Asn	Thr	Ala		
		100						105					110				
aaa	gca	gaa	ctt	caa	att	gcg	caa	aat	aat	cta	gat	atc	gct	aaa	atc	384	
Lys	Ala	Glu	Leu	Gln	Ile	Ala	Gln	Asn	Asn	Leu	Asp	Ile	Ala	Lys	Ile		
	115					120				125							
aga	gtg	gaa	aaa	gct	gaa	acc	gaa	cta	gga	tat	aca	gaa	att	cgt	tct	432	
Arg	Val	Glu	Lys	Ala	Glu	Thr	Glu	Leu	Gly	Tyr	Thr	Glu	Ile	Arg	Ser		
	130					135				140							
cca	ctt	gat	gca	aca	gta	att	tca	gta	ttt	gcg	caa	aat	ggt	caa	act	480	
Pro	Leu	Asp	Ala	Thr	Val	Ile	Ser	Val	Phe	Gln	Ala	Gln	Asn	Gly	Gln	Thr	
	145				150				155						160		
tta	gtc	acc	acc	caa	caa	gta	cca	gtg	ctg	atg	aaa	tta	gct	aat	at	527	
Leu	Val	Thr	Thr	Gln	Gln	Val	Pro	Val	Leu	Met	Lys	Leu	Ala	Asn			
				165				170						175			
<210>	131																
<211>	175																
<212>	蛋白質																
<213>	胸腺肺炎放線桿菌																
<400>	131																
Asn	Ile	Gln	Lys	Thr	Val	Ile	Ala	Ser	Gly	Thr	Leu	Gln	Ala	Thr	Glu		
	1			5					10					15			
Gln	Val	Asp	Ile	Gly	Ala	Gln	Val	Ser	Gly	Gln	Ile	Lys	His	Ile	Leu		
		20						25					30				
Val	Gln	Glu	Gly	Gln	Lys	Val	Lys	Lys	Gly	Glu	Leu	Leu	Ala	Val	Ile		
	35						40					45					
Asp	Pro	Arg	Leu	Ala	Glu	Thr	Glu	Leu	Lys	Leu	Ala	Lys	Ala	Glu	Leu		
	50					55				60							
Ala	Asn	Ala	Ser	Ala	Asn	Leu	Asp	Thr	Lys	Lys	Ile	Asn	Leu	Lys	Gln		
	65				70				75					80			
Leu	Gln	Ser	Asp	Trp	Glu	Arg	His	Gln	Arg	Leu	Ile	Arg	Thr	Asn	Ala		
			85					90					95				
Thr	Ser	Gln	Lys	Glu	Thr	Glu	Glu	Ala	Lys	Ser	Arg	Leu	Asn	Thr	Ala		
		100						105					110				

五、發明說明 (306)

Lys Ala Glu Leu Gln Ile Ala Gln Asn Asn Leu Asp Ile Ala Lys Ile
115 120 125
Arg Val Glu Lys Ala Glu Thr Glu Leu Gly Tyr Thr Glu Ile Arg Ser
130 135 140
Pro Leu Asp Ala Thr Val Ile Ser Val Phe Ala Gln Asn Gly Gln Thr
145 150 155 160
Leu Val Thr Thr Gln Gln Val Pro Val Leu Met Lys Leu Ala Asn
165 170 175

<210> 132
<211> 867
<212> DNA
<213> 胸膜肺炎放線桿菌

<220>
<223> atpG

<220>
<221> CDS
<222> (1) .. (864)

<400> 132
atg gca ggt gcg aaa gag ata aga acc aaa att gca agt gtg aaa (aat 48
Met Ala Gly Ala Lys Glu Ile Arg Thr Lys Ile Ala Ser Val Lys Asn
1 5 10 15
act caa aaa atc acc aaa gca atg gaa atg gtt gct acc tct aaa atg 96
Thr Gln Lys Ile Thr Lys Ala Met Glu Met Val Ala Thr Ser Lys Met
20 25 30
cgt aaa acg caa gag cgt atg gct gcc agt cgt cct tat tcg gaa aca 144
Arg Lys Thr Gln Glu Arg Met Ala Ala Ser Arg Pro Tyr Ser Glu Thr
35 40 45
atc cgt aag gtg att agc cat att gcg aaa gga agc att ggt tat aag 192
Ile Arg Lys Val Ile Ser His Ile Ala Lys Gly Ser Ile Gly Tyr Lys
50 55 60
cac ccg ttt tta act gaa cgt gat att aaa aaa gta ggc tat ctt gtc 240
His Pro Phe Leu Thr Glu Arg Asp Ile Lys Lys Val Gly Tyr Leu Val
65 70 75 80
gtt tcg acc gat cgc ggt tta tgc ggt ggc ctt aat atc aat tta ttc 288
Val Ser Thr Asp Arg Gly Leu Cys Gly Gly Leu Asn Ile Asn Leu Phe
85 90 95
aaa gcg act ttg aat gaa ttt aaa acg tgg aaa gat aaa gac gtt agt 336
Lys Ala Thr Leu Asn Glu Phe Lys Thr Trp Lys Asp Lys Asp Val Ser
100 105 110
gtt gag ctt ggt tta gta ggg tcg aaa ggc gta agc ttt tac caa aat 384
Val Glu Leu Gly Leu Val Gly Ser Lys Gly Val Ser Phe Tyr Gln Asn
115 120 125
cta ggc tta aac gtg aga tct caa gta acg gga tta ggc gat aat ccg 432
Leu Gly Leu Asn Val Arg Ser Gln Val Thr Gly Leu Gly Asp Asn Pro
130 135 140
gaa atg gaa cgt atc gtg ggc gca gtt aat gaa atg att aat gcg ttc 480

五、發明說明 (307)

Glu Met Glu Arg Ile Val Gly Ala Val Asn Glu Met Ile Asn Ala Phe	145	150	155	160	
cga aac gga gaa gtg gat gcg gtt tac gtc gct tac aac cgt ttt gaa					528
Arg Asn Gly Glu Val Asp Ala Val Tyr Val Ala Tyr Asn Arg Phe Glu		165	170	175	
aat acg atg tca caa aaa cct gtt atc gca cag tta ctt ccg tta cct					576
Asn Thr Met Ser Gln Lys Pro Val Ile Ala Gln Leu Leu Pro Leu Pro		180	185	190	
aaa cta gat gac gat gaa tta gat acg aaa ggt tca tgg gat tat att					624
Lys Leu Asp Asp Asp Glu Leu Asp Thr Lys Gly Ser Trp Asp Tyr Ile		195	200	205	
tat gaa ccg aat cca caa gtt tta ttg gat agt tta ctt gtt cgt tat					672
Tyr Glu Pro Asn Pro Gln Val Leu Leu Asp Ser Leu Leu Val Arg Tyr	210		215	220	
tta gaa act cag gta tac caa gca gtt gta gat aac cta gct tct gaa					720
Leu Glu Thr Gln Val Tyr Gln Ala Val Val Asp Asn Leu Ala Ser Glu	225		230	235	240
caa gcc gct cga atg gta gcg atg aaa gcc gca aca gat aat gcg ggt					768
Gln Ala Ala Arg Met Val Ala Met Lys Ala Ala Thr Asp Asn Ala Gly		245	250	255	
aca tta atc gat gaa tta caa tta gtg tat aac aaa gct cgc caa gca					816
Thr Leu Ile Asp Glu Leu Gln Leu Val Tyr Asn Lys Ala Arg Gln Ala		260	265	270	
agc att aca aat gaa tta aac gaa att gtt gcg ggt gcc gca gca att					864
Ser Ile Thr Asn Glu Leu Asn Glu Ile Val Ala Gly Ala Ala Ile		275	280	285	
taa					867

<210> 133
<211> 288
<212> 蛋白質
<213> 胸膜肺炎放線桿菌

```
<400> 133  
Met Ala Gly Ala Lys Glu Ile Arg Thr Lys Ile Ala Ser Val Lys Asn  
      1              5              10             15
```

Thr Gln Lys Ile Thr Lys Ala Met Glu Met Val Ala Thr Ser Lys Met
20 25 30

Arg Lys Thr Gln Glu Arg Met Ala Ala Ser Arg Pro Tyr Ser Glu Thr
35 40 45

Ile Arg Lys Val Ile Ser His Ile Ala Lys Gly Ser Ile Gly Tyr Lys
50 55 60

His Pro Phe Leu Thr Glu Arg Asp Ile Lys Lys Val Gly Tyr Leu Val
65 70 75 80

Val Ser Thr Asp Arg Gly Leu Cys Gly Gly Leu Asn Ile Asn Leu Phe
85 90 95

五、發明說明 (308)

Lys Ala Thr Leu Asn Glu Phe Lys Thr Trp Lys Asp Lys Asp Val Ser
100 105 110

Val Glu Leu Gly Leu Val Gly Ser Lys Gly Val Ser Phe Tyr Gln Asn
115 120 125

Leu Gly Leu Asn Val Arg Ser Gln Val Thr Gly Leu Gly Asp Asn Pro
130 135 140

Glu Met Glu Arg Ile Val Gly Ala Val Asn Glu Met Ile Asn Ala Phe
145 150 155 160

Arg Asn Gly Glu Val Asp Ala Val Tyr Val Ala Tyr Asn Arg Phe Glu
165 170 175

Asn Thr Met Ser Gln Lys Pro Val Ile Ala Gln Leu Leu Pro Leu Pro
180 185 190

Lys Leu Asp Asp Asp Glu Leu Asp Thr Lys Gly Ser Trp Asp Tyr Ile
195 200 205

Tyr Glu Pro Asn Pro Gln Val Leu Leu Asp Ser Leu Leu Val Arg Tyr
210 215 220

Leu Glu Thr Gln Val Tyr Gln Ala Val Val Asp Asn Leu Ala Ser Glu
225 230 235 240

Gln Ala Ala Arg Met Val Ala Met Lys Ala Ala Thr Asp Asn Ala Gly
245 250 255

Thr Leu Ile Asp Glu Leu Gln Leu Val Tyr Asn Lys Ala Arg Gln Ala
260 265 270

Ser Ile Thr Asn Glu Leu Asn Glu Ile Val Ala Gly Ala Ala Ala Ile
275 280 285

<210> 134
<211> 534
<212> DNA
<213> 胸膜肺炎放線桿菌

<220>
<223> atpH

<220>
<221> CDS
<222> (1) .. (531)

<400> 134
atg tca gaa tta agt aca gta gct cgc ccc tac gct aaa gca gct ttt 48
Met Ser Glu Leu Ser Thr Val Ala Arg Pro Tyr Ala Lys Ala Ala Phe
1 5 10 15

gat ttt gct tta gaa caa ggt cag ttg gac aaa tgg caa gaa atg tta 96
Asp Phe Ala Leu Glu Gln Gly Gln Leu Asp Lys Trp Gln Glu Met Leu
20 25 30

cag ttt tcg gca ttc gtt gct gaa aac gaa caa gtg gcg gaa tat att 144
Gln Phe Ser Ala Phe Val Ala Glu Asn Glu Gln Val Ala Glu Tyr Ile
35 40 45

aat tct tcc ctt gca agc ggt cag att tct gaa act ttt atc aaa atc 192

裝
訂
線

五、發明說明 (309)

Asn	Ser	Ser	Leu	Ala	Ser	Gly	Gln	Ile	Ser	Glu	Thr	Phe	Ile	Lys	Ile	
50						55					60					
tgc	ggc	gac	caa	ctt	gat	caa	tat	ggg	caa	aat	ttt	att	cgt	gta	atg	240
Cys	Gly	Asp	Gln	Leu	Asp	Gln	Tyr	Gly	Gln	Asn	Phe	Ile	Arg	Val	Met	
65					70					75					80	
gct	gaa	aat	aaa	cgt	ctg	gct	gtg	ttg	cct	atg	gtt	ttt	gat	act	ttc	288
Ala	Glu	Asn	Lys	Arg	Leu	Ala	Val	Leu	Pro	Met	Val	Phe	Asp	Thr	Phe	
				85					90					95		
gta	tca	tta	cga	gcg	gaa	cat	gaa	gcg	gta	aaa	gat	gta	aca	att	gtt	336
Val	Ser	Leu	Arg	Ala	Glu	His	Glu	Ala	Val	Lys	Asp	Val	Thr	Ile	Val	
			100					105					110			
tcg	gca	aac	gaa	tta	agt	caa	gca	caa	gaa	gat	aaa	atc	gca	aaa	gcg	384
Ser	Ala	Asn	Glu	Leu	Ser	Gln	Ala	Gln	Glu	Asp	Lys	Ile	Ala	Lys	Ala	
		115					120					125				
atg	gaa	aaa	cgc	tta	ggt	caa	aaa	gtt	cgt	tta	acc	aac	caa	atc	gat	432
Met	Glu	Lys	Arg	Leu	Gly	Gln	Lys	Val	Arg	Leu	Thr	Asn	Gln	Ile	Asp	
	130					135					140					
aac	agc	ctg	att	gca	ggc	gta	att	att	aaa	tac	gat	gat	gtt	gtt	att	480
Asn	Ser	Leu	Ile	Ala	Gly	Val	Ile	Ile	Lys	Tyr	Asp	Asp	Val	Val	Ile	
	145				150					155					160	
gat	ggt	agt	agc	cgc	ggt	cag	tta	aat	cgc	tta	gcg	tca	gcg	ttg	agc	528
Asp	Gly	Ser	Ser	Arg	Gly	Gln	Leu	Asn	Arg	Leu	Ala	Ser	Ala	Leu	Ser	
				165					170					175		
ttg	taa															534
Leu																

<210> 135
 <211> 177
 <212> 蛋白質
 <213> 胸膜肺炎放線桿菌

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

五、發明說明 (310)

Ser Ala Asn Glu Leu Ser Gln Ala Gln Glu Asp Lys Ile Ala Lys Ala
115 120 125

Met Glu Lys Arg Leu Gly Gln Lys Val Arg Leu Thr Asn Gln Ile Asp
130 135 140

Asn Ser Leu Ile Ala Gly Val Ile Ile Lys Tyr Asp Asp Val Val Ile
145 150 155 160

Asp Gly Ser Ser Arg Gly Gln Leu Asn Arg Leu Ala Ser Ala Leu Ser
165 170 175

Leu

<210> 136
<211> 321
<212> DNA
<213> 胸膜肺炎放線桿菌

<220>
<223> dksA

<220>
<221> CDS
<222> (1)..(318)

<400> 136
gca tgg cat gtg caa att atg gac gaa gct gag cgt aca aaa aac caa 48
Ala Trp His Val Gln Ile Met Asp Glu Ala Glu Arg Thr Lys Asn Gln
1 5 10 15

atg cag gaa gaa gtc gct aat ttc gcc gat cct gcg gac cgc gcc act 96
Met Gln Glu Glu Val Ala Asn Phe Ala Asp Pro Ala Asp Arg Ala Thr
20 25 30

cag gaa gaa gaa ttc agt ctt gaa tta aga aac cgt gac cgt gag cgt 144
Gln Glu Glu Glu Phe Ser Leu Glu Leu Arg Asn Arg Asp Arg Glu Arg
35 40 45

aaa ttg ctt aag aag att gag caa acg tta aat agc att gcc gaa gac 192
Lys Leu Leu Lys Lys Ile Glu Gln Thr Leu Asn Ser Ile Ala Glu Asp
50 55 60

gaa tac ggc tat tgc gaa act tgc ggt gtt gaa atc ggt tta cgt cgt 240
Glu Tyr Gly Tyr Cys Glu Thr Cys Gly Val Glu Ile Gly Leu Arg Arg
65 70 75 80

tta gaa gcg cgc ccg acc gcg gat atg tgt atc gat tgc aaa aca ctt 288
Leu Glu Ala Arg Pro Thr Ala Asp Met Cys Ile Asp Cys Lys Thr Leu
85 90 95

gcg gaa atc cgt gaa aag caa atg ggc tta taa 321
Ala Glu Ile Arg Glu Lys Gln Met Gly Leu
100 105

<210> 137
<211> 106
<212> 蛋白質
<213> 胸膜肺炎放線桿菌

五、發明說明 (311)

<400> 137
Ala Trp His Val Gln Ile Met Asp Glu Ala Glu Arg Thr Lys Asn Gln
1 5 10 15
Met Gln Glu Glu Val Ala Asn Phe Ala Asp Pro Ala Asp Arg Ala Thr
20 25 30
Gln Glu Glu Glu Phe Ser Leu Glu Leu Arg Asn Arg Asp Arg Glu Arg
35 40 45
Lys Leu Leu Lys Lys Ile Glu Gln Thr Leu Asn Ser Ile Ala Glu Asp
50 55 60
Glu Tyr Gly Tyr Cys Glu Thr Cys Gly Val Glu Ile Gly Leu Arg Arg
65 70 75 80
Leu Glu Ala Arg Pro Thr Ala Asp Met Cys Ile Asp Cys Lys Thr Leu
85 90 95
Ala Glu Ile Arg Glu Lys Gln Met Gly Leu
100 105

<210> 138
<211> 33
<212> DNA
<213> 胸膜肺炎放線桿菌

<220>
<223> dnaK

<220>
<221> CDS
<222> (1) .. (30)

<400> 138
gct gag ttt gaa gaa gtg aaa gat aat aaa taa
Ala Glu Phe Glu Glu Val Lys Asp Asn Lys
1 5 10

33

<210> 139
<211> 10
<212> 蛋白質
<213> 胸膜肺炎放線桿菌

<400> 139
Ala Glu Phe Glu Glu Val Lys Asp Asn Lys
1 5 10

<210> 140
<211> 453
<212> DNA
<213> 胸膜肺炎放線桿菌

<220>
<223> exbB

<220>
<221> CDS
<222> (1) .. (450)

五、發明說明 (312)

<400> 140
atg gaa caa atg ctt gaa ctt tta caa ggt cat gtt gat tat att att 48
Met Glu Gln Met Leu Glu Leu Leu Gln Gly His Val Asp Tyr Ile Ile
1 5 10 15

tta ggc tta tta cta tta atg agt gtt gtg ttg gta tgg aaa att att 96
Leu Gly Leu Leu Leu Leu Met Ser Val Val Leu Val Trp Lys Ile Ile
20 25 30

gaa cgc gta ctt ttc tac aaa cta ttg gat gtg acc aaa tat gac acg 144
Glu Arg Val Leu Phe Tyr Lys Gln Leu Asp Val Thr Lys Tyr Asp Thr
35 40 45

cta caa gat ttg gaa att gat acc act cgc aat tta acc acc att tcc 192
Leu Gln Asp Leu Glu Ile Asp Thr Thr Arg Asn Leu Thr Thr Ile Ser
50 55 60

act atc ggt gcc aac gcc cct tat atc ggt tta tta gga acc gta tta 240
Thr Ile Gly Ala Asn Ala Pro Tyr Ile Gly Leu Leu Gly Thr Val Leu
65 70 75 80

ggg atc tta ctt acc ttc tat cat tta ggg cat tcc ggc ggt gat att 288
Gly Ile Leu Leu Thr Phe Tyr His Leu Gly His Ser Gly Gly Asp Ile
85 90 95

gac gcc gca tcc att atg gtt cac ctt tgc ctt gca tta aaa gca acc 336
Asp Ala Ala Ser Ile Met Val His Leu Ser Leu Ala Leu Lys Ala Thr
100 105 110

gca gcc ggt atc tta gtc gct att ccg gca atg atg ttc tac agc ggt 384
Ala Ala Gly Ile Leu Val Ala Ile Pro Ala Met Met Phe Tyr Ser Gly
115 120 125

ttt aac cgt aaa gtg gat gaa agc aaa ctt aaa tgg caa gcg att caa 432
Phe Asn Arg Lys Val Asp Glu Ser Lys Leu Lys Trp Gln Ala Ile Gln
130 135 140

gct cgt aaa gcc aat caa taa 453
Ala Arg Lys Ala Asn Gln
145 150

<210> 141

<211> 150

<212> 蛋白質

<213> 胸膜肺炎放線桿菌

<400> 141

Met Glu Gln Met Leu Glu Leu Leu Gln Gly His Val Asp Tyr Ile Ile
1 5 10 15

Leu Gly Leu Leu Leu Leu Met Ser Val Val Leu Val Trp Lys Ile Ile
20 25 30

Glu Arg Val Leu Phe Tyr Lys Gln Leu Asp Val Thr Lys Tyr Asp Thr
35 40 45

Leu Gln Asp Leu Glu Ile Asp Thr Thr Arg Asn Leu Thr Thr Ile Ser
50 55 60

Thr Ile Gly Ala Asn Ala Pro Tyr Ile Gly Leu Leu Gly Thr Val Leu
65 70 75 80

五、發明說明 (313)

Gly Ile Leu Leu Thr Phe Tyr His Leu Gly His Ser Gly Gly Asp Ile
85 90 95
Asp Ala Ala Ser Ile Met Val His Leu Ser Leu Ala Leu Lys Ala Thr
100 105 110
Ala Ala Gly Ile Leu Val Ala Ile Pro Ala Met Met Phe Tyr Ser Gly
115 120 125
The Asn Arg Lys Val Asp Glu Ser Lys Leu Lys Trp Gln Ala Ile Gln
130 135 140
Ala Arg Lys Ala Asn Gln
145 150

<210> 142
<211> 720
<212> DNA
<213> 胸膜肺炎放線桿菌

<220>
<223> fkpA

<220>
<221> CDS
<222> (1) .. (717)

<400> 142
atg tta aaa aat aaa ctt tct gtt ctt gca atc gta gcc ggt acg ttc 48
Met Leu Lys Asn Lys Leu Ser Val Leu Ala Ile Val Ala Gly Thr Phe
1 5 10 15
ggt tca gct caa act gca ttt gca gcg gat caa aaa ttc att gac gat 96
Val Ser Ala Gln Thr Ala Phe Ala Ala Asp Gln Lys Phe Ile Asp Asp
20 25 30
tca tca tat gca gtc ggc gta ttg atg ggt aaa aat atc gaa ggc gtc 144
Ser Ser Tyr Ala Val Gly Val Leu Met Gly Lys Asn Ile Glu Gly Val
35 40 45
ggt gaa tca caa aaa gaa att ttt tct tat aac caa gat aaa atc ttg 192
Val Glu Ser Gln Lys Glu Ile Phe Ser Tyr Asn Gln Asp Lys Ile Leu
50 55 60
gcg ggt gtc caa gat acc atc aaa aaa acc ggt aaa tta acc gat gaa 240
Ala Gly Val Gln Asp Thr Ile Lys Lys Thr Gly Lys Leu Thr Asp Glu
65 70 75 80
gat cta caa aaa caa tta aaa tcg ctt gat act tat ctt gca agt caa 288
Asp Leu Gln Lys Gln Leu Lys Ser Leu Asp Thr Tyr Leu Ala Ser Gln
85 90 95
gaa agc aaa att gcg gcg gag aaa agc aaa gca acc gta gaa gcc ggt 336
Glu Ser Lys Ile Ala Ala Glu Lys Ser Lys Ala Thr Val Glu Ala Gly
100 105 110
aat aaa ttt cgt acc gac tac gaa aaa caa agc ggc gtg aaa aaa acc 384
Asn Lys Phe Arg Thr Asp Tyr Glu Lys Gln Ser Gly Val Lys Lys Thr
115 120 125
gct tcc ggt tta ctt tat aaa att gaa aaa gcc ggc acc ggc gaa tcg 432

五、發明說明 (314)

Ala	Ser	Gly	Leu	Leu	Tyr	Lys	Ile	Glu	Lys	Ala	Gly	Thr	Gly	Glu	Ser	
130						135					140					
cct	aaa	gcg	gaa	gat	acc	gtt	aaa	gtt	cac	tat	aaa	ggg	aca	tta	acc	480
Pro	Lys	Ala	Glu	Asp	Thr	Val	Lys	Val	His	Tyr	Lys	Gly	Thr	Leu	Thr	
145					150				155					160		
gat	ggt	acg	gta	ttc	gat	agc	tca	tac	gat	cgc	ggt	gag	ccg	att	gaa	528
Asp	Gly	Thr	Val	Phe	Asp	Ser	Ser	Tyr	Asp	Arg	Gly	Glu	Pro	Ile	Glu	
			165					170						175		
ttc	caa	tta	aac	caa	tta	att	ccg	ggt	tgg	att	gaa	gcg	att	cca	atg	576
Phe	Gln	Leu	Asn	Gln	Leu	Ile	Pro	Gly	Trp	Ile	Glu	Ala	Ile	Pro	Met	
			180					185					190			
ttg	aaa	aaa	ggc	gga	aaa	atg	gaa	atc	gtc	gtt	ccg	cct	gaa	ctt	ggt	624
Leu	Lys	Lys	Gly	Gly	Lys	Met	Glu	Ile	Val	Val	Pro	Pro	Glu	Leu	Gly	
		195					200					205				
tac	ggc	gaa	cgc	caa	gca	ggt	aag	att	ccg	gca	agt	tca	acc	tta	aaa	672
Tyr	Gly	Glu	Arg	Gln	Ala	Gly	Lys	Ile	Pro	Ala	Ser	Ser	Thr	Leu	Lys	
	210					215					220					
ttc	gag	att	gaa	ttg	tta	gat	ttc	aaa	gcg	gcc	gaa	gcg	aaa	aaa	taa	720
Phe	Glu	Ile	Glu	Leu	Leu	Asp	Phe	Lys	Ala	Ala	Glu	Ala	Lys	Lys		
225					230				235							

<210> 143

<211> 239

<212> 蛋白質

<213> 胸膜肺炎放線桿菌

<400> 143

Met	Leu	Lys	Asn	Lys	Leu	Ser	Val	Leu	Ala	Ile	Val	Ala	Gly	Thr	Phe	
1				5					10					15		

Val	Ser	Ala	Gln	Thr	Ala	Phe	Ala	Ala	Asp	Gln	Lys	Phe	Ile	Asp	Asp	
		20					25						30			

Ser	Ser	Tyr	Ala	Val	Gly	Val	Leu	Met	Gly	Lys	Asn	Ile	Glu	Gly	Val	
		35					40					45				

Val	Glu	Ser	Gln	Lys	Glu	Ile	Phe	Ser	Tyr	Asn	Gln	Asp	Lys	Ile	Leu	
	50					55					60					

Ala	Gly	Val	Gln	Asp	Thr	Ile	Lys	Lys	Thr	Gly	Lys	Leu	Thr	Asp	Glu	
	65				70					75					80	

Asp	Leu	Gln	Lys	Gln	Leu	Lys	Ser	Leu	Asp	Thr	Tyr	Leu	Ala	Ser	Gln	
			85					90						95		

Glu	Ser	Lys	Ile	Ala	Ala	Glu	Lys	Ser	Lys	Ala	Thr	Val	Glu	Ala	Gly	
		100					105						110			

Asn	Lys	Phe	Arg	Thr	Asp	Tyr	Glu	Lys	Gln	Ser	Gly	Val	Lys	Lys	Thr	
		115					120					125				

Ala	Ser	Gly	Leu	Leu	Tyr	Lys	Ile	Glu	Lys	Ala	Gly	Thr	Gly	Glu	Ser	
		130				135					140					

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

五、發明說明 (315)

Asp Gly Thr Val Phe Asp Ser Ser Tyr Asp Arg Gly Glu Pro Ile Glu
165 170 175
Phe Gln Leu Asn Gln Leu Ile Pro Gly Trp Ile Glu Ala Ile Pro Met
180 185 190
Leu Lys Lys Gly Gly Lys Met Glu Ile Val Val Pro Pro Glu Leu Gly
195 200 205
Tyr Gly Glu Arg Gln Ala Gly Lys Ile Pro Ala Ser Ser Thr Leu Lys
210 215 220
Phe Glu Ile Glu Leu Leu Asp Phe Lys Ala Ala Glu Ala Lys Lys
225 230 235

<210> 144
<211> 290
<212> DNA
<213> 胸膜肺炎放線桿菌

<220>
<223> HI0379

<220>
<221> CDS
<222> (3) .. (287)

<400> 144
tg cat agc gtg aga ggt ccg ggc ggc ggt tat caa ctc ggt aag caa 47
His Ser Val Arg Gly Pro Gly Gly Gly Tyr Gln Leu Gly Lys Gln 15
1 5 10
cct gaa gag att agt gtg ggg atg att att gcg gcg gtg aat gaa aat 95
Pro Glu Glu Ile Ser Val Gly Met Ile Ile Ala Ala Val Asn Glu Asn 30
20 25 30
ctc gac gta acc aaa tgt aaa ggt agc ggc aac tgt agc aaa aac tct 143
Leu Asp Val Thr Lys Cys Lys Gly Ser Gly Asn Cys Ser Lys Asn Ser 45
35 40 45
cag tgc tta acc cat cat tta tgg gaa cgt tta gaa gaa caa atc ggt 191
Gln Cys Leu Thr His His Leu Trp Glu Arg Leu Glu Glu Gln Ile Gly 60
50 55 60
gtg ttt tta aat acg att act tta gcg gaa ctt gtt gaa gaa cat tcg 239
Val Phe Leu Asn Thr Ile Thr Leu Ala Glu Leu Val Glu Glu His Ser 75
65 70 75
gat cac gat tgt gaa aaa gaa cat tgc cac gat cat tca cac aaa cat 287
Asp His Asp Cys Glu Lys Glu His Cys His Asp His Ser His Lys His 95
80 85 90 95
taa 290

<210> 145
<211> 95
<212> 蛋白質
<213> 胸膜肺炎放線桿菌

<400> 145
His Ser Val Arg Gly Pro Gly Gly Gly Tyr Gln Leu Gly Lys Gln Pro

五、發明說明 (316)

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

<210> 146

<211> 273

<212> DNA

<213> 胸膜肺炎放線桿菌

<220>

<223> hupA

<220>

<221> CDS

<222> (1) .. (270)

<400> 146

atg aac aaa act gag tta atc gat gca atc gca gct ggt gca gag tta	48
Met Asn Lys Thr Glu Leu Ile Asp Ala Ile Ala Ala Gly Ala Glu Leu	
1 5 10 15	
agc aag aaa gac gcg aaa gcg gca tta gaa gcg act tta aat gcg atc	96
Ser Lys Lys Asp Ala Lys Ala Ala Leu Glu Ala Thr Leu Asn Ala Ile	
20 25 30	
tct gaa agc cta aaa aat ggc gac acc gtt cag tta atc ggc ttc ggt	144
Ser Glu Ser Leu Lys Asn Gly Asp Thr Val Gln Leu Ile Gly Phe Gly	
35 40 45	
act ttt aaa gta aac gag cgt aat gca cgt acg ggt cgt aac ccg cgt	192
Thr Phe Lys Val Asn Glu Arg Asn Ala Arg Thr Gly Arg Asn Pro Arg	
50 55 60	
acc ggc gaa gaa atc aaa atc gca gca tct aaa gtg ccg gcg ttt gtt	240
Thr Gly Glu Glu Ile Lys Ile Ala Ala Ser Lys Val Pro Ala Phe Val	
65 70 75 80	
gca ggt aaa gca tta aaa gat tta gta aaa taa	273
Ala Gly Lys Ala Leu Lys Asp Leu Val Lys	
85 90	

<210> 147

<211> 90

<212> 蛋白質

<213> 胸膜肺炎放線桿菌

<400> 147

Met Asn Lys Thr Glu Leu Ile Asp Ala Ile Ala Ala Gly Ala Glu Leu

五、發明說明 (317)

1	5	10	15
Ser Lys Lys Asp Ala Lys Ala Ala Leu Glu Ala Thr Leu Asn Ala Ile	20	25	30
Ser Glu Ser Leu Lys Asn Gly Asp Thr Val Gln Leu Ile Gly Phe Gly	35	40	45
Thr Phe Lys Val Asn Glu Arg Asn Ala Arg Thr Gly Arg Asn Pro Arg	50	55	60
Thr Gly Glu Glu Ile Lys Ile Ala Ala Ser Lys Val Pro Ala Phe Val	65	70	75
Ala Gly Lys Ala Leu Lys Asp Leu Val Lys	85	90	

<210> 148
<211> 551
<212> DNA
<213> 胸腺肺炎放線桿菌

<220>
<223> lpdA

<220>
<221> CDS
<222> (1) .. (549)

<400> 148	
atg agc aaa gaa atc aaa acg caa gtc gtg gta ctt ggt gcg ggt cct	48
Met Ser Lys Glu Ile Lys Thr Gln Val Val Leu Gly Ala Gly Pro	15
1 5 10	
gcc ggt tat tca gcg gca ttc cgt tgt gcc gac tta ggc tta gaa aca	96
Ala Gly Tyr Ser Ala Ala Phe Arg Cys Ala Asp Leu Gly Leu Glu Thr	30
20 25	
gta att gtc gaa cgt tat tca act ttg ggc ggt gta tgc tta aac gta	144
Val Ile Val Glu Arg Tyr Ser Thr Leu Gly Gly Val Cys Leu Asn Val	45
35 40	
ggt tgt att ccg tct aaa gca tta tta cac gtt gca aaa gtt atc gaa	192
Gly Cys Ile Pro Ser Lys Ala Leu Leu His Val Ala Lys Val Ile Glu	60
50 55	
gaa gca aaa cac gca gag aaa aac ggt att act ttc ggt gag ccc aac	240
Glu Ala Lys His Ala Glu Lys Asn Gly Ile Thr Phe Gly Glu Pro Asn	80
65 70 75	
att gat tta gat aaa gtg cgt gcg ggt aaa gaa gcg gtt gtt tct aaa	288
Ile Asp Leu Asp Lys Val Arg Ala Gly Lys Glu Ala Val Val Ser Lys	95
85 90	
tta acc ggc ggt tta gcg ggt atg gct aaa gca cgt aaa gta aca gta	336
Leu Thr Gly Gly Leu Ala Gly Met Ala Lys Ala Arg Lys Val Thr Val	110
100 105	
gtg gaa ggt tta gcg gcg ttt acc gat ccg aat act tta gta gct cgt	384
Val Glu Gly Leu Ala Ala Phe Thr Asp Pro Asn Thr Leu Val Ala Arg	125
115 120	

五、發明說明 (318)

gac cgt gac ggt aat ccg aca acg att aaa ttt gat tat gca att att 432
Asp Arg Asp Gly Asn Pro Thr Thr Ile Lys Phe Asp Tyr Ala Ile Ile
130 135 140

gca gcc ggt tct cgt ccg att cag ctt ccg ttc att cca cac gaa gat 480
Ala Ala Gly Ser Arg Pro Ile Gln Leu Pro Phe Ile Pro His Glu Asp
145 150 155 160

ccg cgt gtg tgg gat tct acg gat gca ctt aaa tta aaa gaa gta ccc 528
Pro Arg Val Trp Asp Ser Thr Asp Ala Leu Lys Leu Lys Glu Val Pro
165 170 175

gaa aaa att act cat tat ggg cc 551
Glu Lys Ile Thr His Tyr Gly
180

<210> 149

<211> 183

<212> 蛋白質

<213> 胸膜肺炎放線桿菌

<400> 149

Met Ser Lys Glu Ile Lys Thr Gln Val Val Val Leu Gly Ala Gly Pro
1 5 10 15

Ala Gly Tyr Ser Ala Ala Phe Arg Cys Ala Asp Leu Gly Leu Glu Thr
20 25 30

Val Ile Val Glu Arg Tyr Ser Thr Leu Gly Gly Val Cys Leu Asn Val
35 40 45

Gly Cys Ile Pro Ser Lys Ala Leu Leu His Val Ala Lys Val Ile Glu
50 55 60

Glu Ala Lys His Ala Glu Lys Asn Gly Ile Thr Phe Gly Glu Pro Asn
65 70 75 80

Ile Asp Leu Asp Lys Val Arg Ala Gly Lys Glu Ala Val Val Ser Lys
85 90 95

Leu Thr Gly Gly Leu Ala Gly Met Ala Lys Ala Arg Lys Val Thr Val
100 105 110

Val Glu Gly Leu Ala Ala Phe Thr Asp Pro Asn Thr Leu Val Ala Arg
115 120 125

Asp Arg Asp Gly Asn Pro Thr Thr Ile Lys Phe Asp Tyr Ala Ile Ile
130 135 140

Ala Ala Gly Ser Arg Pro Ile Gln Leu Pro Phe Ile Pro His Glu Asp
145 150 155 160

Pro Arg Val Trp Asp Ser Thr Asp Ala Leu Lys Leu Lys Glu Val Pro
165 170 175

Glu Lys Ile Thr His Tyr Gly
180

<210> 150

<211> 1095

<212> DNA

五、發明說明 (319)

<213> 胸膜肺炎放線桿菌

<220>

<223> Omp5-2

<220>

<221> CDS

<222> (1) .. (1092)

<400> 150

atg	aaa	aaa	tca	tta	ggt	gct	tta	aca	gta	tta	tcg	gct	gca	gcg	gta	48
Met	Lys	Lys	Ser	Leu	Val	Ala	Leu	Thr	Val	Leu	Ser	Ala	Ala	Ala	Val	
1				5					10					15		

gct	caa	gca	gcg	cca	caa	caa	aat	act	ttc	tac	gca	ggt	gcg	aaa	gca	96
Ala	Gln	Ala	Ala	Pro	Gln	Gln	Asn	Thr	Phe	Tyr	Ala	Gly	Ala	Lys	Ala	
			20					25					30			

ggt	tgg	gcg	tca	ttc	cat	gat	ggt	atc	gaa	caa	tta	gat	tca	gct	aaa	144
Gly	Trp	Ala	Ser	Phe	His	Asp	Gly	Ile	Glu	Gln	Leu	Asp	Ser	Ala	Lys	
		35					40					45				

aac	aca	gat	cgc	ggt	aca	aaa	tac	ggt	atc	aac	cgt	aat	tca	gta	act	192
Asn	Thr	Asp	Arg	Gly	Thr	Lys	Tyr	Gly	Ile	Asn	Arg	Asn	Ser	Val	Thr	
		50				55					60					

tac	ggc	gta	ttc	ggc	ggt	tac	caa	att	tta	aac	caa	gac	aaa	tta	ggt	240
Tyr	Gly	Val	Phe	Gly	Gly	Tyr	Gln	Ile	Leu	Asn	Gln	Asp	Lys	Leu	Gly	
		65			70					75					80	

tta	gcg	gct	gaa	tta	ggt	tat	gac	tat	ttc	ggt	cgt	gtg	cgc	ggt	tct	288
Leu	Ala	Ala	Glu	Leu	Gly	Tyr	Asp	Tyr	Phe	Gly	Arg	Val	Arg	Gly	Ser	
			85						90					95		

gaa	aaa	cca	aac	ggt	aaa	gcg	gac	aag	aaa	act	ttc	cgt	cac	gct	gca	336
Glu	Lys	Pro	Asn	Gly	Lys	Ala	Asp	Lys	Lys	Thr	Phe	Arg	His	Ala	Ala	
			100					105					110			

cac	ggt	gcg	aca	atc	gca	tta	aaa	cct	agc	tac	gaa	gta	tta	cct	gac	384
His	Gly	Ala	Thr	Ile	Ala	Leu	Lys	Pro	Ser	Tyr	Glu	Val	Leu	Pro	Asp	
		115					120					125				

tta	gac	ggt	tac	ggt	aaa	gta	ggt	atc	gca	tta	gta	aac	aat	aca	tat	432
Leu	Asp	Val	Tyr	Gly	Lys	Val	Gly	Ile	Ala	Leu	Val	Asn	Asn	Thr	Tyr	
		130				135					140					

aaa	aca	ttc	aat	gca	gca	caa	gag	aaa	gtg	aaa	act	cgt	cgt	ttc	caa	480
Lys	Thr	Phe	Asn	Ala	Ala	Gln	Glu	Lys	Val	Lys	Thr	Arg	Arg	Phe	Gln	
		145			150					155					160	

agt	tct	tta	att	tta	ggt	gcg	ggt	gtt	gag	tac	gca	att	ctt	ccg	gaa	528
Ser	Ser	Leu	Ile	Leu	Gly	Ala	Gly	Val	Glu	Tyr	Ala	Ile	Leu	Pro	Glu	
				165					170					175		

tta	gcg	gca	cgt	gtt	gaa	tac	caa	tgg	tta	aac	aac	gca	ggt	aaa	gca	576
Leu	Ala	Ala	Arg	Val	Glu	Tyr	Gln	Trp	Leu	Asn	Asn	Ala	Gly	Lys	Ala	
			180					185					190			

agc	tac	tct	act	tta	aat	cgt	atg	ggt	gca	act	gac	tac	cgt	tcg	gat	624
Ser	Tyr	Ser	Thr	Leu	Asn	Arg	Met	Gly	Ala	Thr	Asp	Tyr	Arg	Ser	Asp	
			195				200					205				

五、發明說明 (320)

atc agt tcc gta tct gca ggt tta agc tac cgt ttc ggt caa ggt gcg 672
Ile Ser Ser Val Ser Ala Gly Leu Ser Tyr Arg Phe Gly Gln Gly Ala
210 215 220

gca ccg gtt gca gct ccg gca gtt gaa act aaa aac ttc gca ttc agc 720
Ala Pro Val Ala Ala Pro Ala Val Glu Thr Lys Asn Phe Ala Phe Ser
225 230 235 240

tct gac gta tta ttc gca ttc ggt aaa tca aac tta aaa ccg gct gcg 768
Ser Asp Val Leu Phe Ala Phe Gly Lys Ser Asn Leu Lys Pro Ala Ala
245 250 255

gca aca gca tta gat gca atg caa acc gaa atc aat aac gca ggt tta 816
Ala Thr Ala Leu Asp Ala Met Gln Thr Glu Ile Asn Asn Ala Gly Leu
260 265 270

tca aat gct gcg atc caa gta aac ggt tac acg gac cgt atc ggt aaa 864
Ser Asn Ala Ala Ile Gln Val Asn Gly Tyr Thr Asp Arg Ile Gly Lys
275 280 285

gaa gct tca aac tta aaa ctt tca caa cgt cgt gcg gaa aca gta gct 912
Glu Ala Ser Asn Leu Lys Leu Ser Gln Arg Arg Ala Glu Thr Val Ala
290 295 300

aac tac atc gtt tct aaa ggt gct ccg gca gct aac gta act gca gta 960
Asn Tyr Ile Val Ser Lys Gly Ala Pro Ala Ala Asn Val Thr Ala Val
305 310 315 320

ggg tac ggt gaa gca aac cct gta acc ggc gca aca tgt gac aaa gtt 1008
Gly Tyr Gly Glu Ala Asn Pro Val Thr Gly Ala Thr Cys Asp Lys Val
325 330 335

aaa ggt cgt aaa gca tta atc gct tgc tta gca ccg gat cgt cgt gtt 1056
Lys Gly Arg Lys Ala Leu Ile Ala Cys Leu Ala Pro Asp Arg Arg Val
340 345 350

gaa gtt caa gtt caa ggt act aaa gaa gta act atg taa 1095
Glu Val Gln Val Gln Gly Thr Lys Glu Val Thr Met
355 360

<210> 151
<211> 364
<212> 蛋白質
<213> 胸膜肺炎放線桿菌

<400> 151
Met Lys Lys Ser Leu Val Ala Leu Thr Val Leu Ser Ala Ala Val
1 5 10 15

Ala Gln Ala Ala Pro Gln Gln Asn Thr Phe Tyr Ala Gly Ala Lys Ala
20 25 30

Gly Trp Ala Ser Phe His Asp Gly Ile Glu Gln Leu Asp Ser Ala Lys
35 40 45

Asn Thr Asp Arg Gly Thr Lys Tyr Gly Ile Asn Arg Asn Ser Val Thr
50 55 60

Tyr Gly Val Phe Gly Gly Tyr Gln Ile Leu Asn Gln Asp Lys Leu Gly
65 70 75 80

Leu Ala Ala Glu Leu Gly Tyr Asp Tyr Phe Gly Arg Val Arg Gly Ser

五、發明說明 (321)

	85		90		95
Glu Lys Pro	Asn Gly Lys Ala Asp	Lys Lys Thr Phe Arg	His Ala Ala		
	100	105	110		
His Gly Ala Thr	Ile Ala Leu Lys Pro	Ser Tyr Glu Val	Leu Pro Asp		
	115	120	125		
Leu Asp Val Tyr	Gly Lys Val Gly Ile Ala	Leu Val Asn Asn Thr Tyr			
	130	135	140		
Lys Thr Phe Asn	Ala Ala Gln Glu Lys Val	Lys Thr Arg Arg Phe Gln			
	145	150	155		160
Ser Ser Leu Ile	Leu Gly Ala Gly Val	Glu Tyr Ala Ile Leu Pro Glu			
	165	170	175		
Leu Ala Ala Arg	Val Glu Tyr Gln Trp	Leu Asn Asn Ala Gly Lys Ala			
	180	185	190		
Ser Tyr Ser Thr	Leu Asn Arg Met Gly Ala Thr	Asp Tyr Arg Ser Asp			
	195	200	205		
Ile Ser Ser Val	Ser Ala Gly Leu Ser Tyr Arg	Phe Gly Gln Gly Ala			
	210	215	220		
Ala Pro Val Ala	Ala Pro Ala Val Glu Thr	Lys Asn Phe Ala Phe Ser			
	225	230	235		240
Ser Asp Val Leu	Phe Ala Phe Gly Lys Ser	Asn Leu Lys Pro Ala Ala			
	245	250	255		
Ala Thr Ala Leu	Asp Ala Met Gln Thr Glu Ile	Asn Asn Ala Gly Leu			
	260	265	270		
Ser Asn Ala Ala	Ile Gln Val Asn Gly Tyr Thr	Asp Arg Ile Gly Lys			
	275	280	285		
Glu Ala Ser Asn	Leu Lys Leu Ser Gln Arg Arg	Ala Glu Thr Val Ala			
	290	295	300		
Asn Tyr Ile Val	Ser Lys Gly Ala Pro Ala	Ala Asn Val Thr Ala Val			
	305	310	315		320
Gly Tyr Gly Glu	Ala Asn Pro Val Thr Gly Ala Thr	Cys Asp Lys Val			
	325	330	335		
Lys Gly Arg Lys	Ala Leu Ile Ala Cys Leu Ala	Pro Asp Arg Arg Val			
	340	345	350		
Glu Val Gln Val	Gln Gly Thr Lys Glu Val Thr Met				
	355	360			

<210> 152
<211> 1110
<212> DNA
<213> 胸膜肺炎放線桿菌

<220>
<223> Omp5

<220>

裝

訂

線

五、發明說明 (322)

<221> CDS

<222> (1)..(1107)

<400> 152

atg aaa aaa tca tta gtt gct tta gca gta tta tcg gct gca gca gta	48
Met Lys Lys Ser Leu Val Ala Leu Ala Val Leu Ser Ala Ala Val	
1 5 10 15	
gct caa gca gct cca caa caa aat act ttc tac gca ggt gcg aaa gtt	96
Ala Gln Ala Ala Pro Gln Gln Asn Thr Phe Tyr Ala Gly Ala Lys Val	
20 25 30	
ggt caa tca tca ttt cac cac ggt gtt aac caa tta aaa tct ggt cac	144
Gly Gln Ser Ser Phe His His Gly Val Asn Gln Leu Lys Ser Gly His	
35 40 45	
gat gat cgt tat aat gat aaa aca cgt aag tat ggt atc aac cgt aac	192
Asp Asp Arg Tyr Asn Asp Lys Thr Arg Lys Tyr Gly Ile Asn Arg Asn	
50 55 60	
tct gta act tac ggt gta ttc ggc ggt tac caa atc tta aac caa aat	240
Ser Val Thr Tyr Gly Val Phe Gly Gly Tyr Gln Ile Leu Asn Gln Asn	
65 70 75 80	
aac ttc ggt tta gca gct gaa tta ggc tat gac tac tac ggt cgc gta	288
Asn Phe Gly Leu Ala Ala Glu Leu Gly Tyr Asp Tyr Tyr Gly Arg Val	
85 90 95	
cgt ggt aac gta gat gaa ttc cgt aca gtt aaa cac tct gct cac ggt	336
Arg Gly Asn Val Asp Glu Phe Arg Thr Val Lys His Ser Ala His Gly	
100 105 110	
tta aac tta gcg tta aaa cca agc tac gaa gta tta cct gac tta gac	384
Leu Asn Leu Ala Leu Lys Pro Ser Tyr Glu Val Leu Pro Asp Leu Asp	
115 120 125	
ggt tac ggt aaa gta ggt att gcg gtt gtt cgt aat gac tat aaa aaa	432
Val Tyr Gly Lys Val Gly Ile Ala Val Val Arg Asn Asp Tyr Lys Lys	
130 135 140	
tat ggt gcg gaa aac act aac gaa tca aca aca aaa ttc cac aaa tta	480
Tyr Gly Ala Glu Asn Thr Asn Glu Ser Thr Thr Lys Phe His Lys Leu	
145 150 155 160	
aaa gca tca act att tta ggt gca ggt gtt gag tac gca att ctt cct	528
Lys Ala Ser Thr Ile Leu Gly Ala Gly Val Glu Tyr Ala Ile Leu Pro	
165 170 175	
gaa tta gcg gca cgt gtt gaa tac caa tac tta aac aaa gcg ggt aac	576
Glu Leu Ala Ala Arg Val Glu Tyr Gln Tyr Leu Asn Lys Ala Gly Asn	
180 185 190	
tta aat aaa gca tta gtt cgt tca ggc aca caa gat gtg gac ttc caa	624
Leu Asn Lys Ala Leu Val Arg Ser Gly Thr Gln Asp Val Asp Phe Gln	
195 200 205	
tat gct cct gat atc cac tct gta aca gca ggt tta tca tac cgt ttc	672
Tyr Ala Pro Asp Ile His Ser Val Thr Ala Gly Leu Ser Tyr Arg Phe	
210 215 220	
ggt caa ggc gct gta gca cca gtt gtt gag cca gaa gtt gta act aaa	720
Gly Gln Gly Ala Val Ala Pro Val Val Glu Pro Glu Val Val Thr Lys	
225 230 235 240	

五、發明說明 (323)

aac ttc gca ttc agc tca gac gtt tta ttt gat ttc ggt aaa tca agc	768
Asn Phe Ala Phe Ser Ser Asp Val Leu Phe Asp Phe Gly Lys Ser Ser	
245 250 255	
tta aaa cca gca gca gca aca gct tta gac gca gct aac act gaa atc	816
Leu Lys Pro Ala Ala Ala Thr Ala Leu Asp Ala Ala Asn Thr Glu Ile	
260 265 270	
gct aac tta ggt tta gca act cca gct atc caa gtt aac ggt tat aca	864
Ala Asn Leu Gly Leu Ala Thr Pro Ala Ile Gln Val Asn Gly Tyr Thr	
275 280 285	
gac cgt atc ggt aaa gaa gct tca aac tta aaa ctt tca caa cgc cgt	912
Asp Arg Ile Gly Lys Glu Ala Ser Asn Leu Lys Leu Ser Gln Arg Arg	
290 295 300	
gca gaa act gta gct aac tac tta gtt tct aaa ggt caa aac cct gca	960
Ala Glu Thr Val Ala Asn Tyr Leu Val Ser Lys Gly Gln Asn Pro Ala	
305 310 315 320	
aac gta act gca gta ggt tac ggt gaa gca aac cca gta acc ggc gca	1008
Asn Val Thr Ala Val Gly Tyr Gly Glu Ala Asn Pro Val Thr Gly Ala	
325 330 335	
aca tgt gat gca gtt aaa ggt cgt aaa gca tta atc gct tgc tta gca	1056
Thr Cys Asp Ala Val Lys Gly Arg Lys Ala Leu Ile Ala Cys Leu Ala	
340 345 350	
ccg gat cgt cgt gtt gaa gtt caa gta caa ggt gct aaa aac gta gct	1104
Pro Asp Arg Arg Val Glu Val Gln Val Gln Gly Ala Lys Asn Val Ala	
355 360 365	
atg taa	1110
Met	

<210> 153

<211> 369

<212> 蛋白質

<213> 胸膜肺炎放線桿菌

<400> 153

Met Lys Lys Ser Leu Val Ala Leu Ala Val Leu Ser Ala Ala Ala Val
1 5 10 15

Ala Gln Ala Ala Pro Gln Gln Asn Thr Phe Tyr Ala Gly Ala Lys Val
20 25 30

Gly Gln Ser Ser Phe His His Gly Val Asn Gln Leu Lys Ser Gly His
35 40 45

Asp Asp Arg Tyr Asn Asp Lys Thr Arg Lys Tyr Gly Ile Asn Arg Asn
50 55 60

Ser Val Thr Tyr Gly Val Phe Gly Gly Tyr Gln Ile Leu Asn Gln Asn
65 70 75 80

Asn Phe Gly Leu Ala Ala Glu Leu Gly Tyr Asp Tyr Tyr Gly Arg Val
85 90 95

Arg Gly Asn Val Asp Glu Phe Arg Thr Val Lys His Ser Ala His Gly
100 105 110

五、發明說明 (324)

Leu Asn Leu Ala Leu Lys Pro Ser Tyr Glu Val Leu Pro Asp Leu Asp
115 120 125

Val Tyr Gly Lys Val Gly Ile Ala Val Val Arg Asn Asp Tyr Lys Lys
130 135 140

Tyr Gly Ala Glu Asn Thr Asn Glu Ser Thr Thr Lys Phe His Lys Leu
145 150 155 160

Lys Ala Ser Thr Ile Leu Gly Ala Gly Val Glu Tyr Ala Ile Leu Pro
165 170 175

Glu Leu Ala Ala Arg Val Glu Tyr Gln Tyr Leu Asn Lys Ala Gly Asn
180 185 190

Leu Asn Lys Ala Leu Val Arg Ser Gly Thr Gln Asp Val Asp Phe Gln
195 200 205

Tyr Ala Pro Asp Ile His Ser Val Thr Ala Gly Leu Ser Tyr Arg Phe
210 215 220

Gly Gln Gly Ala Val Ala Pro Val Val Glu Pro Glu Val Val Thr Lys
225 230 235 240

Asn Phe Ala Phe Ser Ser Asp Val Leu Phe Asp Phe Gly Lys Ser Ser
245 250 255

Leu Lys Pro Ala Ala Ala Thr Ala Leu Asp Ala Ala Asn Thr Glu Ile
260 265 270

Ala Asn Leu Gly Leu Ala Thr Pro Ala Ile Gln Val Asn Gly Tyr Thr
275 280 285

Asp Arg Ile Gly Lys Glu Ala Ser Asn Leu Lys Leu Ser Gln Arg Arg
290 295 300

Ala Glu Thr Val Ala Asn Tyr Leu Val Ser Lys Gly Gln Asn Pro Ala
305 310 315 320

Asn Val Thr Ala Val Gly Tyr Gly Glu Ala Asn Pro Val Thr Gly Ala
325 330 335

Thr Cys Asp Ala Val Lys Gly Arg Lys Ala Leu Ile Ala Cys Leu Ala
340 345 350

Pro Asp Arg Arg Val Glu Val Gln Val Gln Gly Ala Lys Asn Val Ala
355 360 365

Met

<210> 154
<211> 1076
<212> DNA
<213> 胸膜肺炎放線桿菌

<220>
<223> pnp new

<220>
<221> CDS
<222> (1) .. (1074)

五、發明說明 (325)

<400> 154
aat att aaa gaa ttc gta aaa gaa gcg ggt aaa ccg cgt tgg gat tgg 48
Asn Ile Lys Glu Phe Val Lys Glu Ala Gly Lys Pro Arg Trp Asp Trp
1 5 10 15
gtt gcg ccg gaa ccg aat acc gca tta atc aac caa gtt aaa gcg tta 96
Val Ala Pro Glu Pro Asn Thr Ala Leu Ile Asn Gln Val Lys Ala Leu
20 25 30
gcg gaa gcg cgt atc ggc gat gcg tat cgt att aca gaa aaa caa gcg 144
Ala Glu Ala Arg Ile Gly Asp Ala Tyr Arg Ile Thr Glu Lys Gln Ala
35 40 45
cgt tac gaa caa atc gat gca att aaa gcg gat gtt atc gca caa tta 192
Arg Tyr Glu Gln Ile Asp Ala Ile Lys Ala Asp Val Ile Ala Gln Leu
50 55 60
acc gca caa gac gaa acc gtt tct gaa ggt gcg att att gat att att 240
Thr Ala Gln Asp Glu Thr Val Ser Glu Gly Ala Ile Ile Asp Ile Ile
65 70 75 80
acc gca tta gaa agt tct att gtt cgc ggt cgt att att gcc ggc gaa 288
Thr Ala Leu Glu Ser Ser Ile Val Arg Gly Arg Ile Ile Ala Gly Glu
85 90 95
ccg cgt att gac ggt cgt acg gta gat acg gtt cgt gca tta gac att 336
Pro Arg Ile Asp Gly Arg Thr Val Asp Thr Val Arg Ala Leu Asp Ile
100 105 110
tgc acc ggc gta tta cct cgt acg cac ggt tct gca atc ttt act cgc 384
Cys Thr Gly Val Leu Pro Arg Thr His Gly Ser Ala Ile Phe Thr Arg
115 120 125
ggg gaa aca caa gca tta gcg gtt gca acc tta ggt act gag cgc gat 432
Gly Glu Thr Gln Ala Leu Ala Val Ala Thr Leu Gly Thr Glu Arg Asp
130 135 140
gca caa att gtt gac gaa tta acc ggc gag aaa tca gac cgt ttc tta 480
Ala Gln Ile Val Asp Glu Leu Thr Gly Glu Lys Ser Asp Arg Phe Leu
145 150 155 160
ttc cac tat aac ttc cct ccg tac tct gtc ggt gaa acc ggt cgt atc 528
Phe His Tyr Asn Phe Pro Pro Tyr Ser Val Gly Glu Thr Gly Arg Ile
165 170 175
ggg tgc ccg aaa cgt cgt gaa atc ggc cac ggt cgt tta gcg aaa cgc 576
Gly Ser Pro Lys Arg Arg Glu Ile Gly His Gly Arg Leu Ala Lys Arg
180 185 190
ggg gta tta gcg gta atg ccg act gct gaa gaa ttc ccg tat gta gtg 624
Gly Val Leu Ala Val Met Pro Thr Ala Glu Glu Phe Pro Tyr Val Val
195 200 205
cgc gta gta tct gaa att acc gaa tca aac ggt tct tct tca atg gct 672
Arg Val Val Ser Glu Ile Thr Glu Ser Asn Gly Ser Ser Ser Met Ala
210 215 220
tcc gta tgc ggc gca tct tta gcg tta atg gac gca ggc gta ccg att 720
Ser Val Cys Gly Ala Ser Leu Ala Leu Met Asp Ala Gly Val Pro Ile
225 230 235 240
aaa gcg gcg gtt gcg ggt atc gca atg ggc tta gtg aaa gaa gaa gaa 768
Lys Ala Ala Val Ala Gly Ile Ala Met Gly Leu Val Lys Glu Glu Glu

五、發明說明 (326)

245	250	255	
aaa ttt gtg gtg ctt tca gac atc tta ggt gac gaa gac cat tta ggc			816
Lys Phe Val Val Leu Ser Asp Ile Leu Gly Asp Glu Asp His Leu Gly			
260	265	270	
gat atg gac ttc aaa gta gcc ggt acg cgt gaa ggt gta acc gca ctt			864
Asp Met Asp Phe Lys Val Ala Gly Thr Arg Glu Gly Val Thr Ala Leu			
275	280	285	
caa atg gat att aaa atc gaa ggt atc acg cct gaa att atg caa atc			912
Gln Met Asp Ile Lys Ile Glu Gly Ile Thr Pro Glu Ile Met Gln Ile			
290	295	300	
gca tta aat caa gcg aaa ggt gcg cgt atg cac atc tta agc gtg atg			960
Ala Leu Asn Gln Ala Lys Gly Ala Arg Met His Ile Leu Ser Val Met			
305	310	315	320
gaa caa gcg att cct gca cct cgt gcc gat att tcc gat ttt gcg cct			1008
Glu Gln Ala Ile Pro Ala Pro Arg Ala Asp Ile Ser Asp Phe Ala Pro			
325	330	335	
cgt att cat acg atg aag atc gat ccg aag aaa atc aaa gac gtg atc			1056
Arg Ile His Thr Met Lys Ile Asp Pro Lys Lys Ile Lys Asp Val Ile			
340	345	350	
ggg aaa ggc ggt gcg gtt at			1076
Gly Lys Gly Gly Ala Val			
355			

<210> 155

<211> 358

<212> 蛋白質

<213> 胸腺肺炎放線桿菌

<400> 155

Asn Ile Lys Glu Phe Val Lys Glu Ala Gly Lys Pro Arg Trp Asp Trp
1 5 10 15

Val Ala Pro Glu Pro Asn Thr Ala Leu Ile Asn Gln Val Lys Ala Leu
20 25 30

Ala Glu Ala Arg Ile Gly Asp Ala Tyr Arg Ile Thr Glu Lys Gln Ala
35 40 45

Arg Tyr Glu Gln Ile Asp Ala Ile Lys Ala Asp Val Ile Ala Gln Leu
50 55 60

Thr Ala Gln Asp Glu Thr Val Ser Glu Gly Ala Ile Ile Asp Ile Ile
65 70 75 80

Thr Ala Leu Glu Ser Ser Ile Val Arg Gly Arg Ile Ile Ala Gly Glu
85 90 95

Pro Arg Ile Asp Gly Arg Thr Val Asp Thr Val Arg Ala Leu Asp Ile
100 105 110

Cys Thr Gly Val Leu Pro Arg Thr His Gly Ser Ala Ile Phe Thr Arg
115 120 125

Gly Glu Thr Gln Ala Leu Ala Val Ala Thr Leu Gly Thr Glu Arg Asp

五、發明說明 (327)

130

135

140

Ala Gln Ile Val Asp Glu Leu Thr Gly Glu Lys Ser Asp Arg Phe Leu
145 150 155 160

Phe His Tyr Asn Phe Pro Pro Tyr Ser Val Gly Glu Thr Gly Arg Ile
165 170 175

Gly Ser Pro Lys Arg Arg Glu Ile Gly His Gly Arg Leu Ala Lys Arg
180 185 190

Gly Val Leu Ala Val Met Pro Thr Ala Glu Glu Phe Pro Tyr Val Val
195 200 205

Arg Val Val Ser Glu Ile Thr Glu Ser Asn Gly Ser Ser Ser Met Ala
210 215 220

Ser Val Cys Gly Ala Ser Leu Ala Leu Met Asp Ala Gly Val Pro Ile
225 230 235 240

Lys Ala Ala Val Ala Gly Ile Ala Met Gly Leu Val Lys Glu Glu Glu
245 250 255

Lys Phe Val Val Leu Ser Asp Ile Leu Gly Asp Glu Asp His Leu Gly
260 265 270

Asp Met Asp Phe Lys Val Ala Gly Thr Arg Glu Gly Val Thr Ala Leu
275 280 285

Gln Met Asp Ile Lys Ile Glu Gly Ile Thr Pro Glu Ile Met Gln Ile
290 295 300

Ala Leu Asn Gln Ala Lys Gly Ala Arg Met His Ile Leu Ser Val Met
305 310 315 320

Glu Gln Ala Ile Pro Ala Pro Arg Ala Asp Ile Ser Asp Phe Ala Pro
325 330 335

Arg Ile His Thr Met Lys Ile Asp Pro Lys Lys Ile Lys Asp Val Ile
340 345 350

Gly Lys Gly Gly Ala Val
355

<210> 156
<211> 1055
<212> DNA
<213> 胸膜肺炎放線桿菌

<220>
<223> potD

<220>
<221> CDS
<222> (1) .. (1053)

<400> 156
atg aaa aaa tta gcg ggt tta ttt gca gca ggt tta gcg aca gtt gca 48
Met Lys Lys Leu Ala Gly Leu Phe Ala Ala Gly Leu Ala Thr Val Ala
1 5 10 15
tta aca gcg tgt aat gaa gaa aag cca aaa gcg gct gaa gca gcg gct 96

裝
訂
線

五、發明說明 (328)

Leu Thr Ala Cys Asn Glu Glu Lys Pro Lys Ala Ala Glu Ala Ala Ala	20	25	30	
caa ccg gca gca gcg gga aca gtt cac ctt tat act tgg act gaa tat				144
Gln Pro Ala Ala Ala Gly Thr Val His Leu Tyr Thr Trp Thr Glu Tyr	35	40	45	
gtg cct gaa ggc ttg tta gat gaa ttt aca aag caa acc ggt atc aaa				192
Val Pro Glu Gly Leu Leu Asp Glu Phe Thr Lys Gln Thr Gly Ile Lys	50	55	60	
gta gag gtt tca agc ctt gaa tct aac gaa acc atg tat gcg aaa tta				240
Val Glu Val Ser Ser Leu Glu Ser Asn Glu Thr Met Tyr Ala Lys Leu	65	70	75	80
aaa tta caa ggt aaa gac ggc ggt tac gat gtt atc gca cct tct aac				288
Lys Leu Gln Gly Lys Asp Gly Gly Tyr Asp Val Ile Ala Pro Ser Asn	85	90	95	
tac ttc gtt tca aaa atg gcg aaa gaa ggt atg tta gcg gaa tta gat				336
Tyr Phe Val Ser Lys Met Ala Lys Glu Gly Met Leu Ala Glu Leu Asp	100	105	110	
cac gca aaa ctt cct gta atc aaa gag tta aac caa gat tgg tta aac				384
His Ala Lys Leu Pro Val Ile Lys Glu Leu Asn Gln Asp Trp Leu Asn	115	120	125	
aaa cct tat gac caa ggt aac aaa tac tct tta ccg caa tta tta ggt				432
Lys Pro Tyr Asp Gln Gly Asn Lys Tyr Ser Leu Pro Gln Leu Leu Gly	130	135	140	
gca ccg ggt atc gca ttt aac tca aat gac tat aag ggc gat gcg ttc				480
Ala Pro Gly Ile Ala Phe Asn Ser Asn Asp Tyr Lys Gly Asp Ala Phe	145	150	155	160
act tct tgg ggt gat tta tgg aaa cct gag ttt gcg aat aaa gta caa				528
Thr Ser Trp Gly Asp Leu Trp Lys Pro Glu Phe Ala Asn Lys Val Gln	165	170	175	
tta tta gat gac gca cgt gaa gta ttt aac att gcg tta tta aaa tta				576
Leu Leu Asp Asp Ala Arg Glu Val Phe Asn Ile Ala Leu Leu Lys Leu	180	185	190	
ggt aaa aac cct aat aca acc aat ccg gaa gag att aaa gcg gct tac				624
Gly Lys Asn Pro Asn Thr Thr Asn Pro Glu Glu Ile Lys Ala Ala Tyr	195	200	205	
gaa gag tta aga aaa tta cgt cca aac gta ctt tct ttc act tca gac				672
Glu Glu Leu Arg Lys Leu Arg Pro Asn Val Leu Ser Phe Thr Ser Asp	210	215	220	
aac cca gcg aac tca ttt atc gca ggt gaa gta tct gta ggt caa tta				720
Asn Pro Ala Asn Ser Phe Ile Ala Gly Glu Val Ser Val Gly Gln Leu	225	230	235	240
tgg aac ggt tct gta cgt att gcg aaa aaa gaa caa gcg ccg gta aac				768
Trp Asn Gly Ser Val Arg Ile Ala Lys Lys Glu Gln Ala Pro Val Asn	245	250	255	
atg gtg ttc cca aaa gaa ggt cct gta ctt tgg gtt gat acg tta gcc				816
Met Val Phe Pro Lys Glu Gly Pro Val Leu Trp Val Asp Thr Leu Ala				

五、發明說明 (329)

260	265	270	
att ccg gcg aat gcg aaa aac aaa gaa aat gcg cat aag tta atc aac			864
Ile Pro Ala Asn Ala Lys Asn Lys Glu Asn Ala His Lys Leu Ile Asn			
275	280	285	
tac tta tta agc gca ccg gtt gcg gaa aaa tta acg tta gaa atc ggt			912
Tyr Leu Leu Ser Ala Pro Val Ala Glu Lys Leu Thr Leu Glu Ile Gly			
290	295	300	
tat ccg act tca aac gta gaa gcg tta aaa aca tta cca aaa gag att			960
Tyr Pro Thr Ser Asn Val Glu Ala Leu Lys Thr Leu Pro Lys Glu Ile			
305	310	315	320
acc gaa gat ccg gca atc tat ccg aca gct gat gtg tta aaa gcg gca			1008
Thr Glu Asp Pro Ala Ile Tyr Pro Thr Ala Asp Val Leu Lys Ala Ala			
325	330	335	
caa tgg caa gac gat gta ggt aat gca atc gaa ctt tac gaa aaa ta			1055
Gln Trp Gln Asp Asp Val Gly Asn Ala Ile Glu Leu Tyr Glu Lys			
340	345	350	
<210> 157			
<211> 351			
<212> 蛋白質			
<213> 胸膜肺炎放線桿菌			
<400> 157			
Met Lys Lys Leu Ala Gly Leu Phe Ala Ala Gly Leu Ala Thr Val Ala			
1	5	10	15
Leu Thr Ala Cys Asn Glu Glu Lys Pro Lys Ala Ala Glu Ala Ala Ala			
20	25	30	
Gln Pro Ala Ala Ala Gly Thr Val His Leu Tyr Thr Trp Thr Glu Tyr			
35	40	45	
Val Pro Glu Gly Leu Leu Asp Glu Phe Thr Lys Gln Thr Gly Ile Lys			
50	55	60	
Val Glu Val Ser Ser Leu Glu Ser Asn Glu Thr Met Tyr Ala Lys Leu			
65	70	75	80
Lys Leu Gln Gly Lys Asp Gly Gly Tyr Asp Val Ile Ala Pro Ser Asn			
85	90	95	
Tyr Phe Val Ser Lys Met Ala Lys Glu Gly Met Leu Ala Glu Leu Asp			
100	105	110	
His Ala Lys Leu Pro Val Ile Lys Glu Leu Asn Gln Asp Trp Leu Asn			
115	120	125	
Lys Pro Tyr Asp Gln Gly Asn Lys Tyr Ser Leu Pro Gln Leu Leu Gly			
130	135	140	
Ala Pro Gly Ile Ala Phe Asn Ser Asn Asp Tyr Lys Gly Asp Ala Phe			
145	150	155	160
Thr Ser Trp Gly Asp Leu Trp Lys Pro Glu Phe Ala Asn Lys Val Gln			
165	170	175	
Leu Leu Asp Asp Ala Arg Glu Val Phe Asn Ile Ala Leu Leu Lys Leu			

五、發明說明 (330)

180	185	190
Gly Lys Asn Pro Asn Thr Thr	Asn Pro Glu Glu Ile	Lys Ala Ala Tyr
195	200	205
Glu Glu Leu Arg Lys Leu Arg	Pro Asn Val Leu Ser Phe Thr Ser Asp	
210	215	220
Asn Pro Ala Asn Ser Phe Ile Ala Gly Glu Val Ser Val Gly Gln Leu		
225	230	235
Trp Asn Gly Ser Val Arg Ile Ala Lys Lys Glu Gln Ala Pro Val Asn		
245	250	255
Met Val Phe Pro Lys Glu Gly Pro Val Leu Trp Val Asp Thr Leu Ala		
260	265	270
Ile Pro Ala Asn Ala Lys Asn Lys Glu Asn Ala His Lys Leu Ile Asn		
275	280	285
Tyr Leu Leu Ser Ala Pro Val Ala Glu Lys Leu Thr Leu Glu Ile Gly		
290	295	300
Tyr Pro Thr Ser Asn Val Glu Ala Leu Lys Thr Leu Pro Lys Glu Ile		
305	310	315
Thr Glu Asp Pro Ala Ile Tyr Pro Thr Ala Asp Val Leu Lys Ala Ala		
325	330	335
Gln Trp Gln Asp Asp Val Gly Asn Ala Ile Glu Leu Tyr Glu Lys		
340	345	350

<210> 158

<211> 525

<212> DNA

<213> 胸膜肺炎放線桿菌

<220>

<223> rpmF

<220>

<221> CDS

<222> (1) .. (522)

<400> 158

atg	caa	aag	gta	aaa	cta	ccc	ctc	acc	att	gac	cca	tat	aaa	gac	gct	48
Met	Gln	Lys	Val	Lys	Leu	Pro	Leu	Thr	Ile	Asp	Pro	Tyr	Lys	Asp	Ala	
1				5					10					15		

cag	cgt	cga	atg	gat	tac	gaa	ggc	tac	atc	tca	cgt	agt	ctg	ctt	aat	96
Gln	Arg	Arg	Met	Asp	Tyr	Glu	Gly	Tyr	Ile	Ser	Arg	Ser	Leu	Leu	Asn	
			20					25					30			

cgt	ttg	ggt	gaa	tct	gtg	agc	aat	gtg	cta	agc	gat	gca	caa	gtt	act	144
Arg	Leu	Gly	Glu	Ser	Val	Ser	Asn	Val	Leu	Ser	Asp	Ala	Gln	Val	Thr	
		35					40					45				

ctc	tcg	tta	tat	atc	gat	ccg	caa	cgc	tta	acc	gtt	att	aaa	ggc	acg	192
Leu	Ser	Leu	Tyr	Ile	Asp	Pro	Gln	Arg	Leu	Thr	Val	Ile	Lys	Gly	Thr	
	50					55					60					

gcg	aca	gtg	gaa	gtg	gaa	ttc	gat	tgc	caa	cga	tgc	ggc	aac	ccg	ttt	240

五、發明說明 (331)

Ala	Thr	Val	Glu	Val	Glu	Phe	Asp	Cys	Gln	Arg	Cys	Gly	Asn	Pro	Phe	
65					70					75					80	
aca	caa	acg	ctt	gac	tgt	tcg	ttt	tgt	ttc	agt	ccg	gtg	tcc	aat	atg	288
Thr	Gln	Thr	Leu	Asp	Cys	Ser	Phe	Cys	Phe	Ser	Pro	Val	Ser	Asn	Met	
			85						90					95		
gat	cag	gcg	gac	aat	ttg	ccc	gaa	att	tat	gaa	cca	atc	gaa	gta	aac	336
Asp	Gln	Ala	Asp	Asn	Leu	Pro	Glu	Ile	Tyr	Glu	Pro	Ile	Glu	Val	Asn	
			100					105					110			
gag	ttc	ggt	gaa	gta	aat	tta	cta	gat	atg	atc	gaa	gat	gga	ttt	atc	384
Glu	Phe	Gly	Glu	Val	Asn	Leu	Leu	Asp	Met	Ile	Glu	Asp	Gly	Phe	Ile	
		115					120					125				
atc	gaa	ttg	cct	cta	gtc	ccg	atg	cat	agt	gaa	gaa	cac	tgt	gaa	gtg	432
Ile	Glu	Leu	Pro	Leu	Val	Pro	Met	His	Ser	Glu	Glu	His	Cys	Glu	Val	
		130				135					140					
tcc	gtg	agt	gaa	cag	gtg	ttt	ggc	gaa	ttg	cct	gaa	gaa	ttg	gcg	aaa	480
Ser	Val	Ser	Glu	Gln	Val	Phe	Gly	Glu	Leu	Pro	Glu	Glu	Leu	Ala	Lys	
145					150					155					160	
aaa	cct	aac	ccg	ttc	gct	gta	tta	gct	aat	tta	aag	aaa	aac	tag		525
Lys	Pro	Asn	Pro	Phe	Ala	Val	Leu	Ala	Asn	Leu	Lys	Lys	Asn			
				165					170							

<210> 159

<211> 174

<212> 蛋白質

<213> 胸腺肺炎放線桿菌

<400> 159

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

五、發明說明 (332)

Lys Pro Asn Pro Phe Ala Val Leu Ala Asn Leu Lys Lys Asn
165 170

<210> 160

<211> 1302

<212> DNA

<213> 胸膜肺炎放線桿菌

<220>

<223> tig

<220>

<221> CDS

<222> (1) .. (1299)

<400> 160

atg	tca	att	tct	att	gaa	act	tta	gaa	ggc	tta	caa	cgc	cgc	gta	act	48
Met	Ser	Ile	Ser	Ile	Glu	Thr	Leu	Glu	Gly	Leu	Gln	Arg	Arg	Val	Thr	
1				5					10					15		

att	acc	gta	gct	gct	gat	aaa	atc	gaa	gcg	gct	tac	aaa	gag	caa	tta	96
Ile	Thr	Val	Ala	Ala	Asp	Lys	Ile	Glu	Ala	Ala	Tyr	Lys	Glu	Gln	Leu	
		20						25					30			

aaa	ggc	tat	gcg	aaa	aac	gct	cgt	gta	gac	ggc	ttc	cgt	aaa	ggc	aaa	144
Lys	Gly	Tyr	Ala	Lys	Asn	Ala	Arg	Val	Asp	Gly	Phe	Arg	Lys	Gly	Lys	
	35					40						45				

gta	ccg	cac	gca	att	atc	gaa	caa	cgt	ttc	ggc	tta	gcg	gct	cgc	caa	192
Val	Pro	His	Ala	Ile	Ile	Glu	Gln	Arg	Phe	Gly	Leu	Ala	Ala	Arg	Gln	
	50				55						60					

gac	gta	tta	tcc	gat	gaa	atg	caa	cgt	gcg	ttc	ttt	gat	gcg	gta	atc	240
Asp	Val	Leu	Ser	Asp	Glu	Met	Gln	Arg	Ala	Phe	Phe	Asp	Ala	Val	Ile	
65				70					75					80		

gct	gag	aaa	att	aac	ctt	gcc	ggc	cgt	cct	acc	ttc	aca	ccg	aac	aac	288
Ala	Glu	Lys	Ile	Asn	Leu	Ala	Gly	Arg	Pro	Thr	Phe	Thr	Pro	Asn	Asn	
			85					90						95		

tac	caa	ccg	agt	caa	gaa	ttc	agc	ttc	act	gca	act	ttt	gaa	gta	ttc	336
Tyr	Gln	Pro	Ser	Gln	Glu	Phe	Ser	Phe	Thr	Ala	Thr	Phe	Glu	Val	Phe	
		100					105						110			

ccg	gaa	gtt	gaa	tta	aaa	ggc	tta	gaa	aat	atc	gaa	gtt	gaa	aaa	ccg	384
Pro	Glu	Val	Glu	Leu	Lys	Gly	Leu	Glu	Asn	Ile	Glu	Val	Glu	Lys	Pro	
	115					120					125					

gtt	gta	gaa	atc	aca	gaa	gct	gat	tta	gac	aaa	atg	atc	gat	gtg	tta	432
Val	Val	Glu	Ile	Thr	Glu	Ala	Asp	Leu	Asp	Lys	Met	Ile	Asp	Val	Leu	
	130				135					140						

cgt	aaa	caa	caa	gcg	act	tgg	gct	gaa	tct	caa	gca	gcg	gca	caa	gcg	480
Arg	Lys	Gln	Gln	Ala	Thr	Trp	Ala	Glu	Ser	Gln	Ala	Ala	Ala	Gln	Ala	
145				150					155					160		

gaa	gac	cgt	gtt	gta	atc	gac	ttc	gta	ggc	tct	gta	gac	ggc	gaa	gag	528
Glu	Asp	Arg	Val	Val	Ile	Asp	Phe	Val	Gly	Ser	Val	Asp	Gly	Glu	Glu	
			165					170					175			

ttt	gaa	ggc	ggc	aaa	gcg	aca	gac	ttc	act	cta	gca	atg	ggc	caa	agt	576
Phe	Glu	Gly	Gly	Lys	Ala	Thr	Asp	Phe	Thr	Leu	Ala	Met	Gly	Gln	Ser	

五、發明說明 (333)

180															185															190														
cgt	atg	atc	cct	ggt	ttt	gaa	gaa	ggt	atc	ggt	ggt	cac	aaa	gcc	ggc															624														
Arg	Met	Ile	Pro	Gly	Phe	Glu	Glu	Gly	Ile	Val	Gly	His	Lys	Ala	Gly																													
		195						200				205																																
gaa	caa	ttc	gat	atc	gat	ggt	act	ttc	cct	gaa	gaa	tac	cac	gct	gaa															672														
Glu	Gln	Phe	Asp	Ile	Asp	Val	Thr	Phe	Pro	Glu	Glu	Tyr	His	Ala	Glu																													
		210					215					220																																
aac	tta	aaa	ggt	aaa	gcg	gcg	aaa	ttc	gca	att	aca	ctt	aag	aaa	gta															720														
Asn	Leu	Lys	Gly	Lys	Ala	Ala	Lys	Phe	Ala	Ile	Thr	Leu	Lys	Lys	Val																													
		225				230				235					240																													
gaa	aat	atc	gta	tta	cct	gaa	tta	acc	gaa	gaa	ttc	gtg	aaa	aaa	ttc															768														
Glu	Asn	Ile	Val	Leu	Pro	Glu	Leu	Thr	Glu	Glu	Phe	Val	Lys	Lys	Phe																													
				245					250						255																													
ggt	tca	gca	aaa	act	gta	gaa	gat	tta	cgt	gcg	gaa	att	aag	aaa	aat															816														
Gly	Ser	Ala	Lys	Thr	Val	Glu	Asp	Leu	Arg	Ala	Glu	Ile	Lys	Lys	Asn																													
			260					265					270																															
atg	caa	cgt	gaa	ctt	aaa	aac	gca	gta	acc	gca	cgc	ggt	aaa	aac	caa															864														
Met	Gln	Arg	Glu	Leu	Lys	Asn	Ala	Val	Thr	Ala	Arg	Val	Lys	Asn	Gln																													
		275					280					285																																
gta	atc	aac	ggt	tta	atc	gca	caa	aat	gaa	att	gaa	gtg	ccg	gct	gca															912														
Val	Ile	Asn	Gly	Leu	Ile	Ala	Gln	Asn	Glu	Ile	Glu	Val	Pro	Ala	Ala																													
		290				295					300																																	
gcg	gta	gcg	gaa	gaa	gtg	gac	gta	tta	cgt	cgt	caa	gcg	ggt	caa	cgt															960														
Ala	Val	Ala	Glu	Glu	Val	Asp	Val	Leu	Arg	Arg	Gln	Ala	Val	Gln	Arg																													
		305				310				315					320																													
ttc	ggt	ggt	aaa	ccg	gaa	atg	gct	gca	caa	tta	ccg	gcg	gaa	tta	ttc															1008														
Phe	Gly	Gly	Lys	Pro	Glu	Met	Ala	Ala	Gln	Leu	Pro	Ala	Glu	Leu	Phe																													
			325						330					335																														
gaa	gcg	gat	gca	aaa	cgt	cgt	ggt	caa	gta	ggt	tta	tta	ctt	tca	acc															1056														
Glu	Ala	Asp	Ala	Lys	Arg	Arg	Val	Gln	Val	Gly	Leu	Leu	Leu	Ser	Thr																													
			340				345						350																															
gta	atc	ggt	act	aac	gaa	tta	aaa	ggt	gat	gaa	aaa	cgt	ggt	gaa	gaa															1104														
Val	Ile	Gly	Thr	Asn	Glu	Leu	Lys	Val	Asp	Glu	Lys	Arg	Val	Glu	Glu																													
		355					360					365																																
acg	att	gca	gaa	atc	gct	tca	gct	tac	gaa	caa	ccg	gcg	gaa	ggt	ggt															1152														
Thr	Ile	Ala	Glu	Ile	Ala	Ser	Ala	Tyr	Glu	Gln	Pro	Ala	Glu	Val	Val																													
		370				375					380																																	
gct	cat	tat	gcg	aaa	aac	cgt	caa	tta	acc	gaa	aat	atc	cgt	aac	gta															1200														
Ala	His	Tyr	Ala	Lys	Asn	Arg	Gln	Leu	Thr	Glu	Asn	Ile	Arg	Asn	Val																													
		385			390					395					400																													
gtg	tta	gaa	gag	caa	gcg	ggt	gaa	ggt	gta	ctt	gcg	aaa	gca	aaa	gta															1248														
Val	Leu	Glu	Glu	Gln	Ala	Val	Glu	Val	Val	Leu	Ala	Lys	Ala	Lys	Val																													
				405					410					415																														
act	gaa	aaa	gcg	act	tct	ttt	gat	gaa	gta	atg	gct	caa	caa	gct	caa															1296														
Thr	Glu	Lys	Ala	Thr	Ser	Phe	Asp	Glu	Val	Met	Ala	Gln	Gln	Ala	Gln																													
			420					425					430																															
ggc	taa																													1302														

五、發明說明 (334)

Gly

<210> 161

<211> 433

<212> 蛋白質

<213> 胸膜肺炎放線桿菌

<400> 161

```

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

```

五、發明說明 (335)

Val Ile Asn Gly Leu Ile Ala Gln Asn Glu Ile Glu Val Pro Ala Ala
290 295 300

Ala Val Ala Glu Glu Val Asp Val Leu Arg Arg Gln Ala Val Gln Arg
305 310 315 320

Phe Gly Gly Lys Pro Glu Met Ala Ala Gln Leu Pro Ala Glu Leu Phe
325 330 335

Glu Ala Asp Ala Lys Arg Arg Val Gln Val Gly Leu Leu Leu Ser Thr
340 345 350

Val Ile Gly Thr Asn Glu Leu Lys Val Asp Glu Lys Arg Val Glu Glu
355 360 365

Thr Ile Ala Glu Ile Ala Ser Ala Tyr Glu Gln Pro Ala Glu Val Val
370 375 380

Ala His Tyr Ala Lys Asn Arg Gln Leu Thr Glu Asn Ile Arg Asn Val
385 390 395 400

Val Leu Glu Glu Gln Ala Val Glu Val Val Leu Ala Lys Ala Lys Val
405 410 415

Thr Glu Lys Ala Thr Ser Phe Asp Glu Val Met Ala Gln Gln Ala Gln
420 425 430

Gly

<210> 162

<211> 316

<212> DNA

<213> 胸膜肺炎放線桿菌

<220>

<223> tRNA-glu

<400> 162

aatattgctgc tcaaattggca aagcggagag catcttttaa tggtgtcccc atcgtctaga 60

ggcctaggac atcgcccttt cacggcggta accgggggttc gaatccccgt ggggacgccca 120

tttaaagatg acttttggtg tctgaattgt tctttaaaaa attggaaaca agctgaaaac 180

tgagagatct tcgaaagaaa gtctgagtag taaaagataa gtaattatct tgaaaatctt 240

agctgaacaa aagcagctaa gtgttttagt gaataaagta tcgcgttgaa tgcgttcaaa 300

taaaatttga aaatat 316

<210> 163

<211> 85

<212> DNA

<213> 胸膜肺炎放線桿菌

<220>

<223> tRNA-leu

<400> 163

gctctggtgg tggaattggc agacacgcta tcttgagggg gtagtgccca taggatgtgc 60

五、發明說明 (336)

gagttcgagt ctcgcccaga gcacc

85

<210> 164

<211> 623

<212> DNA

<213> 胸膜肺炎放線桿菌

<220>

<223> yaeE

<220>

<221> CDS

<222> (1)..(621)

<400> 164

atg	caa	gaa	ctc	aca	cct	caa	atg	tgg	ggc	tta	gtc	ggc	act	tca	acg	48
Met	Gln	Glu	Leu	Thr	Pro	Gln	Met	Trp	Gly	Leu	Val	Gly	Thr	Ser	Thr	
1				5					10				15			

ctt	gaa	acg	ctc	tat	atg	ggc	ttt	gcg	gcg	act	tta	ctt	gct	gtg	gta	96
Leu	Glu	Thr	Leu	Tyr	Met	Gly	Phe	Ala	Ala	Thr	Leu	Leu	Ala	Val	Val	
			20				25						30			

gtc	ggc	ttg	ccg	atc	ggc	ttt	ctg	gca	ttt	tta	acc	ggc	aaa	gga	gag	144
Val	Gly	Leu	Pro	Ile	Gly	Phe	Leu	Ala	Phe	Leu	Thr	Gly	Lys	Gly	Glu	
		35				40						45				

att	tta	gag	aat	ccg	cgt	tta	cat	caa	gta	tta	gat	gtg	att	att	aat	192
Ile	Leu	Glu	Asn	Pro	Arg	Leu	His	Gln	Val	Leu	Asp	Val	Ile	Ile	Asn	
	50					55					60					

atc	ggc	cgt	tcc	gta	ccg	ttt	att	att	ttg	tta	gtc	gtg	ttg	tta	cct	240
Ile	Gly	Arg	Ser	Val	Pro	Phe	Ile	Ile	Leu	Leu	Val	Val	Leu	Leu	Pro	
	65				70					75					80	

ttt	acg	cgt	tta	ttg	gtc	ggg	aca	acg	ctc	ggc	act	acg	gcg	gcg	att	288
Phe	Thr	Arg	Leu	Leu	Val	Gly	Thr	Thr	Leu	Gly	Thr	Thr	Ala	Ala	Ile	
			85						90					95		

gtg	ccg	tta	agc	gtt	tcg	gca	att	ccg	ttt	ttt	gcg	cgt	tta	act	tca	336
Val	Pro	Leu	Ser	Val	Ser	Ala	Ile	Pro	Phe	Phe	Ala	Arg	Leu	Thr	Ser	
			100					105					110			

aat	gcg	tta	tta	gaa	atc	cca	gca	ggc	tta	acc	gaa	gcg	gcg	aaa	tcg	384
Asn	Ala	Leu	Leu	Glu	Ile	Pro	Ala	Gly	Leu	Thr	Glu	Ala	Ala	Lys	Ser	
		115					120					125				

atg	ggc	gca	acg	aat	tgg	caa	gtg	gtc	agt	aaa	ttt	tat	tta	ccg	gaa	432
Met	Gly	Ala	Thr	Asn	Trp	Gln	Val	Val	Ser	Lys	Phe	Tyr	Leu	Pro	Glu	
	130					135					140					

tca	ctg	ccg	att	tta	atc	aat	ggc	atc	aca	tta	act	tta	gtc	gct	tta	480
Ser	Leu	Pro	Ile	Leu	Ile	Asn	Gly	Ile	Thr	Leu	Thr	Leu	Val	Ala	Leu	
	145				150					155					160	

atc	ggc	tat	tcg	gca	atg	gcg	ggc	gcg	gtc	ggc	ggc	ggc	ggc	ttg	ggc	528
Ile	Gly	Tyr	Ser	Ala	Met	Ala	Gly	Ala	Val	Gly	Gly	Gly	Gly	Gly	Gly	
				165					170					175		

aac	ctt	gcc	atc	agt	tac	ggc	gaa	cac	cga	aat	atg	gtc	tat	gta	aaa	576
Asn	Leu	Ala	Ile	Ser	Tyr	Gly	Glu	His	Arg	Asn	Met	Val	Tyr	Val	Lys	
			180					185					190			

五、發明說明 (337)

tgg atc tca aca att att atc gta gcg att gtg atg atc agt caa aa 623
Trp Ile Ser Thr Ile Ile Ile Val Ala Ile Val Met Ile Ser Gln
195 200 205

<210> 165
<211> 207
<212> 蛋白質
<213> 胸腺肺炎放線桿菌

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

<210> 166
<211> 866
<212> DNA
<213> 溶血性巴斯德桿菌

<220>
<221> CDS
<222> (1) .. (864)

<220>
<223> atpG

裝
訂
線

五、發明說明 (338)

<400> 166																	
atg	gca	ggt	gct	aaa	gag	ata	aga	acc	aaa	att	gca	agt	gtt	cgt	aat		48
Met	Ala	Gly	Ala	Lys	Glu	Ile	Arg	Thr	Lys	Ile	Ala	Ser	Val	Arg	Asn		
1				5					10					15			
aca	caa	aaa	att	acc	aaa	gag	atg	gaa	atg	gtt	gcc	gca	tca	aaa	atg		96
Thr	Gln	Lys	Ile	Thr	Lys	Ala	Met	Glu	Met	Val	Ala	Ala	Ser	Lys	Met		
			20					25					30				
cgt	aaa	acc	caa	gag	cgt	atg	gag	gct	tct	cgc	cct	tat	gct	gaa	agt		144
Arg	Lys	Thr	Gln	Glu	Arg	Met	Ala	Ala	Ser	Arg	Pro	Tyr	Ala	Glu	Ser		
		35				40					45						
att	cgc	aag	gca	att	agc	cat	att	gcc	aaa	ggg	aac	att	gag	tat	aaa		192
Ile	Arg	Lys	Ala	Ile	Ser	His	Ile	Ala	Lys	Gly	Asn	Ile	Glu	Tyr	Lys		
	50					55					60						
cac	cca	ttt	ttg	acc	cca	cgt	ccg	gta	aaa	aaa	gtt	ggc	tat	tta	gta		240
His	Pro	Phe	Leu	Thr	Pro	Arg	Pro	Val	Lys	Lys	Val	Gly	Tyr	Leu	Val		
65					70					75					80		
gtt	tca	acc	gat	cgc	ggg	tta	tgt	ggg	ggc	tta	aat	atc	aat	tta	ttt		288
Val	Ser	Thr	Asp	Arg	Gly	Leu	Cys	Gly	Gly	Leu	Asn	Ile	Asn	Leu	Phe		
				85				90						95			
aaa	acc	gtt	tta	cat	gaa	ttg	aaa	gaa	aaa	gat	gac	caa	ggg	gtt	aag		336
Lys	Thr	Val	Leu	His	Glu	Leu	Lys	Glu	Lys	Asp	Asp	Gln	Gly	Val	Lys		
			100					105					110				
tct	cga	ctt	gct	gtg	gtg	gga	aat	aaa	ggg	atc	tcc	ttt	ttt	aac	cca		384
Ser	Arg	Leu	Ala	Val	Val	Gly	Asn	Lys	Gly	Ile	Ser	Phe	Phe	Asn	Pro		
		115					120					125					
atg	ggg	cta	gag	att	aaa	ggg	cat	atc	aat	gga	ttg	ggg	gat	aca	ccg		432
Met	Gly	Leu	Glu	Ile	Lys	Gly	His	Ile	Asn	Gly	Leu	Gly	Asp	Thr	Pro		
	130					135					140						
gca	atg	gaa	gat	tta	gtc	ggg	att	gtt	aat	ggg	atg	gta	aat	gcc	tac		480
Ala	Met	Glu	Asp	Leu	Val	Gly	Ile	Val	Asn	Gly	Met	Val	Asn	Ala	Tyr		
145					150					155					160		
cgt	gaa	ggc	gaa	att	gat	gaa	gtg	tat	gtg	gta	tat	aac	cgt	ttt	ata		528
Arg	Glu	Gly	Glu	Ile	Asp	Glu	Val	Tyr	Val	Val	Tyr	Asn	Arg	Phe	Ile		
				165				170						175			
aac	acg	atg	tca	caa	aaa	ccg	aca	gta	caa	cag	ttg	ctt	cct	ttg	cct		576
Asn	Thr	Met	Ser	Gln	Lys	Pro	Thr	Val	Gln	Gln	Leu	Leu	Pro	Leu	Pro		
			180					185					190				
gca	ctg	gaa	aat	gac	tca	tta	gag	caa	act	ggg	tct	tgg	gat	tat	ctc		624
Ala	Leu	Glu	Asn	Asp	Ser	Leu	Glu	Gln	Thr	Gly	Ser	Trp	Asp	Tyr	Leu		
		195					200					205					
tat	gaa	cca	aat	cca	caa	gag	tta	tta	gac	agc	tta	ctg	gtt	cgt	tat		672
Tyr	Glu	Pro	Asn	Pro	Gln	Ala	Leu	Leu	Asp	Ser	Leu	Leu	Val	Arg	Tyr		
	210					215					220						
tta	gaa	tct	caa	gtt	tat	cag	gca	gtg	gta	gat	aat	ctt	gag	tct	gaa		720
Leu	Glu	Ser	Gln	Val	Tyr	Gln	Ala	Val	Val	Asp	Asn	Leu	Ala	Ser	Glu		
225					230					235					240		
cag	gct	gct	cga	atg	gtg	gca	atg	aaa	gca	gca	acc	gat	aac	gca	ggg		768
Gln	Ala	Ala	Arg	Met	Val	Ala	Met	Lys	Ala	Ala	Thr	Asp	Asn	Ala	Gly		

五、發明說明 (339)

	245	250	255	
aat ctg att aat gag tta cag tta gtg tat aac aaa gct cgt caa gca				816
Asn Leu Ile Asn Glu Leu Gln Leu Val Tyr Asn Lys Ala Arg Gln Ala				
	260	265	270	
agt att acg aat gaa tta aat gaa att gtc gcg ggt gcc gca gca att				864
Ser Ile Thr Asn Glu Leu Asn Glu Ile Val Ala Gly Ala Ala Ala Ile				
	275	280	285	
ta				866
 <210> 167 <211> 288 <212> 蛋白質 <213> 溶血性巴斯德桿菌				
 <400> 167				
Met Ala Gly Ala Lys Glu Ile Arg Thr Lys Ile Ala Ser Val Arg Asn				
1 5 10 15				
Thr Gln Lys Ile Thr Lys Ala Met Glu Met Val Ala Ala Ser Lys Met				
20 25 30				
Arg Lys Thr Gln Glu Arg Met Ala Ala Ser Arg Pro Tyr Ala Glu Ser				
35 40 45				
Ile Arg Lys Ala Ile Ser His Ile Ala Lys Gly Asn Ile Glu Tyr Lys				
50 55 60				
His Pro Phe Leu Thr Pro Arg Pro Val Lys Lys Val Gly Tyr Leu Val				
65 70 75 80				
Val Ser Thr Asp Arg Gly Leu Cys Gly Gly Leu Asn Ile Asn Leu Phe				
85 90 95				
Lys Thr Val Leu His Glu Leu Lys Glu Lys Asp Asp Gln Gly Val Lys				
100 105 110				
Ser Arg Leu Ala Val Val Gly Asn Lys Gly Ile Ser Phe Phe Asn Pro				
115 120 125				
Met Gly Leu Glu Ile Lys Gly His Ile Asn Gly Leu Gly Asp Thr Pro				
130 135 140				
Ala Met Glu Asp Leu Val Gly Ile Val Asn Gly Met Val Asn Ala Tyr				
145 150 155 160				
Arg Glu Gly Glu Ile Asp Glu Val Tyr Val Val Tyr Asn Arg Phe Ile				
165 170 175				
Asn Thr Met Ser Gln Lys Pro Thr Val Gln Gln Leu Leu Pro Leu Pro				
180 185 190				
Ala Leu Glu Asn Asp Ser Leu Glu Gln Thr Gly Ser Trp Asp Tyr Leu				
195 200 205				
Tyr Glu Pro Asn Pro Gln Ala Leu Leu Asp Ser Leu Leu Val Arg Tyr				
210 215 220				
Leu Glu Ser Gln Val Tyr Gln Ala Val Val Asp Asn Leu Ala Ser Glu				
225 230 235 240				

五、發明說明 (340)

Gln Ala Ala Arg Met Val Ala Met Lys Ala Ala Thr Asp Asn Ala Gly
245 250 255
Asn Leu Ile Asn Glu Leu Gln Leu Val Tyr Asn Lys Ala Arg Gln Ala
260 265 270
Ser Ile Thr Asn Glu Leu Asn Glu Ile Val Ala Gly Ala Ala Ala Ile
275 280 285

<210> 168
<211> 1463
<212> DNA
<213> 溶血性巴斯德桿菌

<220>
<221> CDS
<222> (1) .. (1461)

<220>
<223> guaB

<400> 168
atg cta cga att aaa caa gaa gcc ctc act ttt gat gat gtt ctt ctc 48
Met Leu Arg Ile Lys Gln Glu Ala Leu Thr Phe Asp Asp Val Leu Leu
1 5 10 15
gtc ccg gca cat tct act gtg ctt cct aat act gct gat ctt tct act 96
Val Pro Ala His Ser Thr Val Leu Pro Asn Thr Ala Asp Leu Ser Thr
20 25 30
caa tta act aaa acc att cgt tta aac att ccg atg ctt tct gct gca 144
Gln Leu Thr Lys Thr Ile Arg Leu Asn Ile Pro Met Leu Ser Ala Ala
35 40 45
atg gat acc gtt aca gaa act aag ctt gcg atc tcc ctt gct caa gaa 192
Met Asp Thr Val Thr Glu Thr Lys Leu Ala Ile Ser Leu Ala Gln Glu
50 55 60
ggc ggc att ggt ttt atc cat aaa aat atg tcg att gaa cgc cag gca 240
Gly Gly Ile Gly Phe Ile His Lys Asn Met Ser Ile Glu Arg Gln Ala
65 70 75 80
gac cgt gtg cgt aaa gtg aaa aaa ttt gaa agt ggt att gtt tct gag 288
Asp Arg Val Arg Lys Val Lys Lys Phe Glu Ser Gly Ile Val Ser Glu
85 90 95
cca gtg acg att tct cct gat atg aca tta gcg gaa ttg gct gaa ttg 336
Pro Val Thr Ile Ser Pro Asp Met Thr Leu Ala Glu Leu Ala Glu Leu
100 105 110
gtg aaa aag aac ggt ttt gca ggc tat ccg gtg att gat gaa aac caa 384
Val Lys Lys Asn Gly Phe Ala Gly Tyr Pro Val Ile Asp Glu Asn Gln
115 120 125
aat tta gtg gga att att acc gga cgt gat acc cga ttt gtc acg gat 432
Asn Leu Val Gly Ile Ile Thr Gly Arg Asp Thr Arg Phe Val Thr Asp
130 135 140
tta agc aaa aca gtg cgt gaa ttt atg aca cca aaa gac cgt tta gtg 480
Leu Ser Lys Thr Val Arg Glu Phe Met Thr Pro Lys Asp Arg Leu Val
145 150 155 160

五、發明說明 (341)

acg gta aaa gaa aac gca agc cgt gaa gaa att ttc cac tta atg cac	528
Thr Val Lys Glu Asn Ala Ser Arg Glu Glu Ile Phe His Leu Met His	
165 170 175	
gaa cac cga gtg gag aaa gtg ctg gta gtg aat aat gaa ttt cag tta	576
Glu His Arg Val Glu Lys Val Leu Val Val Asn Asn Glu Phe Gln Leu	
180 185 190	
aaa gga atg att acc cta aaa gac tac caa aaa gcg gaa agc aaa ccg	624
Lys Gly Met Ile Thr Leu Lys Asp Tyr Gln Lys Ala Glu Ser Lys Pro	
195 200 205	
aat gcc tgt aaa gat gag ttt ggg cgt ttg cgt gtg ggg gcg gca gtg	672
Asn Ala Cys Lys Asp Glu Phe Gly Arg Leu Arg Val Gly Ala Ala Val	
210 215 220	
gga gcc ggt ccg ggc aat gaa gaa cga att gat gct tta gta aaa gcg	720
Gly Ala Gly Pro Gly Asn Glu Glu Arg Ile Asp Ala Leu Val Lys Ala	
225 230 235 240	
ggg gtc gat gtg cta tta atc gac tct tcg cac ggg cat tct gaa ggt	768
Gly Val Asp Val Leu Leu Ile Asp Ser Ser His Gly His Ser Glu Gly	
245 250 255	
gta tta caa cgt gtg cgt gaa acc cgt gca aaa tac cct gat tta ccg	816
Val Leu Gln Arg Val Arg Glu Thr Arg Ala Lys Tyr Pro Asp Leu Pro	
260 265 270	
att gtt gcc ggt aat att gcc act gca gaa gga gcg att gcg tta gct	864
Ile Val Ala Gly Asn Ile Ala Thr Ala Glu Gly Ala Ile Ala Leu Ala	
275 280 285	
gat gca gga gcc agt gct gtg aaa gta gga atc ggc ccg ggt tca att	912
Asp Ala Gly Ala Ser Ala Val Lys Val Gly Ile Gly Pro Gly Ser Ile	
290 295 300	
tgt acc acc aga att gta aca ggc gtt ggc gtg cca caa atc acg gca	960
Cys Thr Thr Arg Ile Val Thr Gly Val Gly Val Pro Gln Ile Thr Ala	
305 310 315 320	
atc gca gaa gcg gca gct gcg ctt aaa gaa cga ggc att cct gtg att	1008
Ile Ala Glu Ala Ala Ala Ala Leu Lys Glu Arg Gly Ile Pro Val Ile	
325 330 335	
gct gat ggt gga att cgt tat tca ggc gat att tca aaa gct att gcc	1056
Ala Asp Gly Gly Ile Arg Tyr Ser Gly Asp Ile Ser Lys Ala Ile Ala	
340 345 350	
gcc ggt gca agt tgc gta atg gtc ggt tcg atg ttt gcc ggc aca gaa	1104
Ala Gly Ala Ser Cys Val Met Val Gly Ser Met Phe Ala Gly Thr Glu	
355 360 365	
gaa gcc ccg ggt gaa att gag ctt tat caa ggc aga gca ttc aaa tcc	1152
Glu Ala Pro Gly Glu Ile Glu Leu Tyr Gln Gly Arg Ala Phe Lys Ser	
370 375 380	
tac cgt gga atg gga tca tta ggt gca atg agt aaa ggc tcg tca gat	1200
Tyr Arg Gly Met Gly Ser Leu Gly Ala Met Ser Lys Gly Ser Ser Asp	
385 390 395 400	
cgc tat ttc caa tct gat aat gcc gcc gac aag ctc gta ccg gaa ggg	1248
Arg Tyr Phe Gln Ser Asp Asn Ala Ala Asp Lys Leu Val Pro Glu Gly	
405 410 415	

五、發明說明 (342)

att gaa ggg cgt atc gct tac aaa ggc tac ttg aaa gaa att atc cac 1296
Ile Glu Gly Arg Ile Ala Tyr Lys Gly Tyr Leu Lys Glu Ile Ile His
420 425 430

caa caa atg ggc ggc tta cgc tcc tgt atg gga tta acc ggc tgt gcc 1344
Gln Gln Met Gly Gly Leu Arg Ser Cys Met Gly Leu Thr Gly Cys Ala
435 440 445

act att gaa gaa ctc cgc acc aaa gca gaa ttt gtc cgc att agt ggt 1392
Thr Ile Glu Glu Leu Arg Thr Lys Ala Glu Phe Val Arg Ile Ser Gly
450 455 460

gct ggt att aaa gaa agc cac gtc cac gat gtg aca att acc aaa gaa 1440
Ala Gly Ile Lys Glu Ser His Val His Asp Val Thr Ile Thr Lys Glu
465 470 475 480

gca ccg aac tac cga atg ggt ta 1463
Ala Pro Asn Tyr Arg Met Gly
485

<210> 169
<211> 487
<212> 蛋白質
<213> 溶血性巴斯德桿菌

<400> 169
Met Leu Arg Ile Lys Gln Glu Ala Leu Thr Phe Asp Asp Val Leu Leu
1 5 10 15

Val Pro Ala His Ser Thr Val Leu Pro Asn Thr Ala Asp Leu Ser Thr
20 25 30

Gln Leu Thr Lys Thr Ile Arg Leu Asn Ile Pro Met Leu Ser Ala Ala
35 40 45

Met Asp Thr Val Thr Glu Thr Lys Leu Ala Ile Ser Leu Ala Gln Glu
50 55 60

Gly Gly Ile Gly Phe Ile His Lys Asn Met Ser Ile Glu Arg Gln Ala
65 70 75 80

Asp Arg Val Arg Lys Val Lys Lys Phe Glu Ser Gly Ile Val Ser Glu
85 90 95

Pro Val Thr Ile Ser Pro Asp Met Thr Leu Ala Glu Leu Ala Glu Leu
100 105 110

Val Lys Lys Asn Gly Phe Ala Gly Tyr Pro Val Ile Asp Glu Asn Gln
115 120 125

Asn Leu Val Gly Ile Ile Thr Gly Arg Asp Thr Arg Phe Val Thr Asp
130 135 140

Leu Ser Lys Thr Val Arg Glu Phe Met Thr Pro Lys Asp Arg Leu Val
145 150 155 160

Thr Val Lys Glu Asn Ala Ser Arg Glu Glu Ile Phe His Leu Met His
165 170 175

Glu His Arg Val Glu Lys Val Leu Val Val Asn Asn Glu Phe Gln Leu
180 185 190

五、發明說明 (343)

Lys Gly Met Ile Thr Leu Lys Asp Tyr Gln Lys Ala Glu Ser Lys Pro
195 200 205

Asn Ala Cys Lys Asp Glu Phe Gly Arg Leu Arg Val Gly Ala Ala Val
210 215 220

Gly Ala Gly Pro Gly Asn Glu Glu Arg Ile Asp Ala Leu Val Lys Ala
225 230 235 240

Gly Val Asp Val Leu Leu Ile Asp Ser Ser His Gly His Ser Glu Gly
245 250 255

Val Leu Gln Arg Val Arg Glu Thr Arg Ala Lys Tyr Pro Asp Leu Pro
260 265 270

Ile Val Ala Gly Asn Ile Ala Thr Ala Glu Gly Ala Ile Ala Leu Ala
275 280 285

Asp Ala Gly Ala Ser Ala Val Lys Val Gly Ile Gly Pro Gly Ser Ile
290 295 300

Cys Thr Thr Arg Ile Val Thr Gly Val Gly Val Pro Gln Ile Thr Ala
305 310 315 320

Ile Ala Glu Ala Ala Ala Ala Leu Lys Glu Arg Gly Ile Pro Val Ile
325 330 335

Ala Asp Gly Gly Ile Arg Tyr Ser Gly Asp Ile Ser Lys Ala Ile Ala
340 345 350

Ala Gly Ala Ser Cys Val Met Val Gly Ser Met Phe Ala Gly Thr Glu
355 360 365

Glu Ala Pro Gly Glu Ile Glu Leu Tyr Gln Gly Arg Ala Phe Lys Ser
370 375 380

Tyr Arg Gly Met Gly Ser Leu Gly Ala Met Ser Lys Gly Ser Ser Asp
385 390 395 400

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

Ile Glu Gly Arg Ile Ala Tyr Lys Gly Tyr Leu Lys Glu Ile Ile His
420 425 430

Gln Gln Met Gly Gly Leu Arg Ser Cys Met Gly Leu Thr Gly Cys Ala
435 440 445

Thr Ile Glu Glu Leu Arg Thr Lys Ala Glu Phe Val Arg Ile Ser Gly
450 455 460

Ala Gly Ile Lys Glu Ser His Val His Asp Val Thr Ile Thr Lys Glu
465 470 475 480

Ala Pro Asn Tyr Arg Met Gly
485

<210> 170
<211> 2150
<212> DNA
<213> 溶血性巴斯德桿菌

五、發明說明 (344)

<220>

<221> CDS

<222> (1) .. (2148)

<220>

<223> pnp

<400> 170

atg act cca att gta aaa cag ttt aaa tac ggt cag cac acc gtg acc	48
Met Thr Pro Ile Val Lys Gln Phe Lys Tyr Gly Gln His Thr Val Thr	
1 5 10 15	
tta gaa acc ggt gct atc gca cgc caa gca acg gca gca gta atg gca	96
Leu Glu Thr Gly Ala Ile Ala Arg Gln Ala Thr Ala Ala Val Met Ala	
20 25 30	
agt atg gac gac aca acc gta ttt gtt acc gta gta gcg aaa aaa gac	144
Ser Met Asp Asp Thr Thr Val Phe Val Thr Val Val Ala Lys Lys Asp	
35 40 45	
gta aaa gaa ggg caa gat ttc ttc cca tta acc gta gat tat caa gag	192
Val Lys Glu Gly Gln Asp Phe Phe Pro Leu Thr Val Asp Tyr Gln Glu	
50 55 60	
cgt act tac gca gcc ggt cgt att ccg ggc ggt ttc ttc aaa cgt gaa	240
Arg Thr Tyr Ala Ala Gly Arg Ile Pro Gly Gly Phe Phe Lys Arg Glu	
65 70 75 80	
gga cgt cct agc gaa ggt gaa acc tta atc gct cgc ttg atc gac cgt	288
Gly Arg Pro Ser Glu Gly Glu Thr Leu Ile Ala Arg Leu Ile Asp Arg	
85 90 95	
cct gtg cgt cca ctt ttc cca gaa ggt ttc ttt aac gaa att caa gtg	336
Pro Val Arg Pro Leu Phe Pro Glu Gly Phe Phe Asn Glu Ile Gln Val	
100 105 110	
att gcg acc gta gta tcg gta aac cca caa atc agt cct gat ctg gtt	384
Ile Ala Thr Val Val Ser Val Asn Pro Gln Ile Ser Pro Asp Leu Val	
115 120 125	
gcg atg atc ggt gca tcg gct gcc ctt tca tta tcc ggc gtg ccg ttt	432
Ala Met Ile Gly Ala Ser Ala Ala Leu Ser Leu Ser Gly Val Pro Phe	
130 135 140	
aac ggt cca atc ggt gcg gct cgt gtc ggt ttt atc aac gat caa ttc	480
Asn Gly Pro Ile Gly Ala Ala Arg Val Gly Phe Ile Asn Asp Gln Phe	
145 150 155 160	
gta tta aac cca acc acc agc gag caa aaa atc agc cgc tta gat tta	528
Val Leu Asn Pro Thr Thr Ser Glu Gln Lys Ile Ser Arg Leu Asp Leu	
165 170 175	
gtg gtt tca ggt aca gac aaa gcc gtg ttg atg gtg gaa tct gaa gcg	576
Val Val Ser Gly Thr Asp Lys Ala Val Leu Met Val Glu Ser Glu Ala	
180 185 190	
gat atc tta acc gaa gag caa atg tta gcg gcg gtg gtg ttc ggc cac	624
Asp Ile Leu Thr Glu Glu Gln Met Leu Ala Ala Val Val Phe Gly His	
195 200 205	
gag caa caa cag gtt gta atc gaa aac atc aaa gaa ttt gtt aaa gaa	672
Glu Gln Gln Gln Val Val Ile Glu Asn Ile Lys Glu Phe Val Lys Glu	
210 215 220	

五、發明說明 (345)

gcg ggc aaa cca cgt tgg gat tgg gtt gca cca gag cca aat aca gat Ala Gly Lys Pro Arg Trp Asp Trp Val Ala Pro Glu Pro Asn Thr Asp 225 230 235 240	720
tta atc aac aaa gta aaa gca tta gca gaa aca cgc ctt ggc gat gct Leu Ile Asn Lys Val Lys Ala Leu Ala Glu Thr Arg Leu Gly Asp Ala 245 250 255	768
tat cgt atc gta gaa aaa caa gtt cgt tac gag caa atc gat gcg att Tyr Arg Ile Val Glu Lys Gln Val Arg Tyr Glu Gln Ile Asp Ala Ile 260 265 270	816
aaa gca gag gtg att gca caa ctt acc gca gaa gat gaa act gtt tct Lys Ala Glu Val Ile Ala Gln Leu Thr Ala Glu Asp Glu Thr Val Ser 275 280 285	864
gaa ggg act atc atc gac atc atc acc gca tta gag agc caa atc gtg Glu Gly Thr Ile Ile Asp Ile Ile Thr Ala Leu Glu Ser Gln Ile Val 290 295 300	912
cgt agc cgt att att gca ggc gaa cca cgc att gac ggc cgt acg gtg Arg Ser Arg Ile Ile Ala Gly Glu Pro Arg Ile Asp Gly Arg Thr Val 305 310 315 320	960
gat acc gtg cgt gca ttg gat att tgc acc agt gtg tta cca cgc acc Asp Thr Val Arg Ala Leu Asp Ile Cys Thr Ser Val Leu Pro Arg Thr 325 330 335	1008
cac ggt tct gct ctt ttc acc cgt ggc gaa acc caa gca tta gca gta His Gly Ser Ala Leu Phe Thr Arg Gly Glu Thr Gln Ala Leu Ala Val 340 345 350	1056
gca aca ttg ggc aca gag cgt gat gcc caa atc att gac gaa ttg acc Ala Thr Leu Gly Thr Glu Arg Asp Ala Gln Ile Ile Asp Glu Leu Thr 355 360 365	1104
ggc gaa aaa tct gac cgt ttc tta ttc cac tac aat ttc cct cca tac Gly Glu Lys Ser Asp Arg Phe Leu Phe His Tyr Asn Phe Pro Pro Tyr 370 375 380	1152
tct gtg ggc gaa acc ggt cgt atc ggc tcg cca aaa cgc cgt gaa atc Ser Val Gly Glu Thr Gly Arg Ile Gly Ser Pro Lys Arg Arg Glu Ile 385 390 395 400	1200
ggt cac ggt cgt tta gca aaa cgt ggc gta tta gcc gtg atg cca acc Gly His Gly Arg Leu Ala Lys Arg Gly Val Leu Ala Val Met Pro Thr 405 410 415	1248
gct gaa gag ttc ccg tat gta gtg cgt gtg gtg tct gaa atc act gaa Ala Glu Glu Phe Pro Tyr Val Val Arg Val Val Ser Glu Ile Thr Glu 420 425 430	1296
tct aac ggt tct tct tca atg gca tct gtg tgt ggt gcg tct ctt gcg Ser Asn Gly Ser Ser Ser Met Ala Ser Val Cys Gly Ala Ser Leu Ala 435 440 445	1344
ttg atg gac gca ggt gtg cca atc aaa gca gcg gtt gcc ggt atc gca Leu Met Asp Ala Gly Val Pro Ile Lys Ala Ala Val Ala Gly Ile Ala 450 455 460	1392
atg ggg ctc gtg aaa gaa gac gag aaa ttc gtg gta ctt tct gac atc Met Gly Leu Val Lys Glu Asp Glu Lys Phe Val Val Leu Ser Asp Ile 465 470 475 480	1440

五、發明說明 (346)

tta ggt gat gaa gac cac tta ggc gat atg gac ttt aaa gta gcg gga	1488
Leu Gly Asp Glu Asp His Leu Gly Asp Met Asp Phe Lys Val Ala Gly	
485 490 495	
acc cgt acc ggt gtg act gcg ctg caa atg gac atc aaa atc gaa ggg	1536
Thr Arg Thr Gly Val Thr Ala Leu Gln Met Asp Ile Lys Ile Glu Gly	
500 505 510	
atc acc cct gaa att atg cgt att gcc tta aac caa gct aaa ggt gca	1584
Ile Thr Pro Glu Ile Met Arg Ile Ala Leu Asn Gln Ala Lys Gly Ala	
515 520 525	
aga atg cac att tta ggt gta atg gaa caa gcc att ccg gca cct cgt	1632
Arg Met His Ile Leu Gly Val Met Glu Gln Ala Ile Pro Ala Pro Arg	
530 535 540	
gca gat att tct gac tat gcc cca cgc att cac aca atg aag atc gat	1680
Ala Asp Ile Ser Asp Tyr Ala Pro Arg Ile His Thr Met Lys Ile Asp	
545 550 555 560	
ccg aag aaa atc aaa gat gtg att ggt aaa ggc ggt gca aca att cgt	1728
Pro Lys Lys Ile Lys Asp Val Ile Gly Lys Gly Gly Ala Thr Ile Arg	
565 570 575	
gct tta acc gaa gag acc aat act tct atc gac att gat gat gac ggt	1776
Ala Leu Thr Glu Glu Thr Asn Thr Ser Ile Asp Ile Asp Asp Asp Gly	
580 585 590	
acg gtg aaa att gcg gca act gac ggc aat gca gcg aaa gca gta atg	1824
Thr Val Lys Ile Ala Ala Thr Asp Gly Asn Ala Ala Lys Ala Val Met	
595 600 605	
gct cgt att gaa gag atc gtt gcc gaa gtg gaa gta aac caa atc tac	1872
Ala Arg Ile Glu Glu Ile Val Ala Glu Val Glu Val Asn Gln Ile Tyr	
610 615 620	
aac ggt aaa gta acc cgt gtg gtg gac ttc ggt gca ttc gtt tcc atc	1920
Asn Gly Lys Val Thr Arg Val Val Asp Phe Gly Ala Phe Val Ser Ile	
625 630 635 640	
tta ggt ggc aaa gaa ggt tta gtc cac att tca caa atc acc aac gaa	1968
Leu Gly Gly Lys Glu Gly Leu Val His Ile Ser Gln Ile Thr Asn Glu	
645 650 655	
cgt gtt gag cgt gta gcg gac tac tta acc gtt ggt caa gaa gta caa	2016
Arg Val Glu Arg Val Ala Asp Tyr Leu Thr Val Gly Gln Glu Val Gln	
660 665 670	
gtg aaa gtg gta gaa att gac cgt caa gga cgc att cgt ctg acg atg	2064
Val Lys Val Val Glu Ile Asp Arg Gln Gly Arg Ile Arg Leu Thr Met	
675 680 685	
aaa gac atc aat aat acc aac gag gca aat gca gaa gaa act gta gct	2112
Lys Asp Ile Asn Asn Thr Asn Glu Ala Asn Ala Glu Glu Thr Val Ala	
690 695 700	
gaa aat gtg gta gaa aca gaa caa gaa aat aat ttc ta	2150
Glu Asn Val Val Glu Thr Glu Gln Glu Asn Asn Phe	
705 710 715	

<210> 171
<211> 716

五、發明說明 (347)

<212> 蛋白質

<213> 溶血性巴斯德桿菌

<400> 171

```

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

```

五、發明說明 (348)

Asp	Thr	Val	Arg	Ala	Leu	Asp	Ile	Cys	Thr	Ser	Val	Leu	Pro	Arg	Thr	325	330	335	
His	Gly	Ser	Ala	Leu	Phe	Thr	Arg	Gly	Glu	Thr	Gln	Ala	Leu	Ala	Val	340	345	350	
Ala	Thr	Leu	Gly	Thr	Glu	Arg	Asp	Ala	Gln	Ile	Ile	Asp	Glu	Leu	Thr	355	360	365	
Gly	Glu	Lys	Ser	Asp	Arg	Phe	Leu	Phe	His	Tyr	Asn	Phe	Pro	Pro	Tyr	370	375	380	
Ser	Val	Gly	Glu	Thr	Gly	Arg	Ile	Gly	Ser	Pro	Lys	Arg	Arg	Glu	Ile	385	390	395	400
Gly	His	Gly	Arg	Leu	Ala	Lys	Arg	Gly	Val	Leu	Ala	Val	Met	Pro	Thr	405	410	415	
Ala	Glu	Glu	Phe	Pro	Tyr	Val	Val	Arg	Val	Val	Ser	Glu	Ile	Thr	Glu	420	425	430	
Ser	Asn	Gly	Ser	Ser	Ser	Met	Ala	Ser	Val	Cys	Gly	Ala	Ser	Leu	Ala	435	440	445	
Leu	Met	Asp	Ala	Gly	Val	Pro	Ile	Lys	Ala	Ala	Val	Ala	Gly	Ile	Ala	450	455	460	
Met	Gly	Leu	Val	Lys	Glu	Asp	Glu	Lys	Phe	Val	Val	Leu	Ser	Asp	Ile	465	470	475	480
Leu	Gly	Asp	Glu	Asp	His	Leu	Gly	Asp	Met	Asp	Phe	Lys	Val	Ala	Gly	485	490	495	
Thr	Arg	Thr	Gly	Val	Thr	Ala	Leu	Gln	Met	Asp	Ile	Lys	Ile	Glu	Gly	500	505	510	
Ile	Thr	Pro	Glu	Ile	Met	Arg	Ile	Ala	Leu	Asn	Gln	Ala	Lys	Gly	Ala	515	520	525	
Arg	Met	His	Ile	Leu	Gly	Val	Met	Glu	Gln	Ala	Ile	Pro	Ala	Pro	Arg	530	535	540	
Ala	Asp	Ile	Ser	Asp	Tyr	Ala	Pro	Arg	Ile	His	Thr	Met	Lys	Ile	Asp	545	550	555	560
Pro	Lys	Lys	Ile	Lys	Asp	Val	Ile	Gly	Lys	Gly	Gly	Ala	Thr	Ile	Arg	565	570	575	
Ala	Leu	Thr	Glu	Glu	Thr	Asn	Thr	Ser	Ile	Asp	Ile	Asp	Asp	Asp	Gly	580	585	590	
Thr	Val	Lys	Ile	Ala	Ala	Thr	Asp	Gly	Asn	Ala	Ala	Lys	Ala	Val	Met	595	600	605	
Ala	Arg	Ile	Glu	Glu	Ile	Val	Ala	Glu	Val	Glu	Val	Asn	Gln	Ile	Tyr	610	615	620	
Asn	Gly	Lys	Val	Thr	Arg	Val	Val	Asp	Phe	Gly	Ala	Phe	Val	Ser	Ile	625	630	635	640
Leu	Gly	Gly	Lys	Glu	Gly	Leu	Val	His	Ile	Ser	Gln	Ile	Thr	Asn	Glu	645	650	655	

五、發明說明 (349)

Arg Val Glu Arg Val Ala Asp Tyr Leu Thr Val Gly Gln Glu Val Gln
660 665 670

Val Lys Val Val Glu Ile Asp Arg Gln Gly Arg Ile Arg Leu Thr Met
675 680 685

Lys Asp Ile Asn Asn Thr Asn Glu Ala Asn Ala Glu Glu Thr Val Ala
690 695 700

Glu Asn Val Val Glu Thr Glu Gln Glu Asn Asn Phe
705 710 715

<210> 172
<211> 1517
<212> DNA
<213> 溶血性巴斯德桿菌

<220>
<221> CDS
<222> (1)..(1515)

<220>
<223> purF

<400> 172	
atg tgc ggc att gtc ggt att att ggg aat tcg ccg gtg aat cag gcg	48
Met Cys Gly Ile Val Gly Ile Ile Gly Asn Ser Pro Val Asn Gln Ala	
1 5 10 15	
att tat gat ggt tta aca tta ctt caa cac cga gga caa gat gcc gca	96
Ile Tyr Asp Gly Leu Thr Leu Leu Gln His Arg Gly Gln Asp Ala Ala	
20 25 30	
ggg atc gtc acc ata gac gat gaa aat cgt ttc cgc tta cgc aaa gct	144
Gly Ile Val Thr Ile Asp Asp Glu Asn Arg Phe Arg Leu Arg Lys Ala	
35 40 45	
aac ggc tta gtc agc gat gtt ttc cag caa gag cat atg gtg aga tta	192
Asn Gly Leu Val Ser Asp Val Phe Gln Gln Glu His Met Val Arg Leu	
50 55 60	
caa ggc aat gtt gga att ggt cac gtt cgc tac cca aca gca ggt agc	240
Gln Gly Asn Val Gly Ile Gly His Val Arg Tyr Pro Thr Ala Gly Ser	
65 70 75 80	
tca agt gtg tct gaa gcc cag cca ttt tat gtc aat tca cct ttc ggt	288
Ser Ser Val Ser Glu Ala Gln Pro Phe Tyr Val Asn Ser Pro Phe Gly	
85 90 95	
att acc tta gtt cac aac ggt aat tta act aat aat gcg gaa ctt aaa	336
Ile Thr Leu Val His Asn Gly Asn Leu Thr Asn Asn Ala Glu Leu Lys	
100 105 110	
gct cgc tta tac aac gaa gcc cgc cgc cat gtg aac act aat tct gat	384
Ala Arg Leu Tyr Asn Glu Ala Arg Arg His Val Asn Thr Asn Ser Asp	
115 120 125	
tct gaa tcc ctt ctt aat att ttt gct tac ttt tta gat ctc tat tcc	432
Ser Glu Ser Leu Leu Asn Ile Phe Ala Tyr Phe Leu Asp Leu Tyr Ser	
130 135 140	
act cag cat tta agc cca gac aat atc ttt gaa acg gtt cgt aaa acc	480

五、發明說明 (350)

Thr Gln His Leu Ser Pro Asp Asn Ile Phe Glu Thr Val Arg Lys Thr	
145 150 155 160	
aat gat agc att cgt ggt gct tat gct tgc att gcg atg att atc gga	528
Asn Asp Ser Ile Arg Gly Ala Tyr Ala Cys Ile Ala Met Ile Ile Gly	
165 170 175	
cac ggt atg gtt gct ttc cgt gac cca ttc ggt att cgc ccg tta gtg	576
His Gly Met Val Ala Phe Arg Asp Pro Phe Gly Ile Arg Pro Leu Val	
180 185 190	
ctg ggt aaa cgt gaa atc gag ggt aaa acc gaa tat atg ttt gct tcg	624
Leu Gly Lys Arg Glu Ile Glu Gly Lys Thr Glu Tyr Met Phe Ala Ser	
195 200 205	
gaa agt gtg gct ctt gat gta gtg ggg ttt gaa ttt gtg cga gat gtg	672
Glu Ser Val Ala Leu Asp Val Val Gly Phe Glu Phe Val Arg Asp Val	
210 215 220	
ctg ccg ggt gaa gcg att tat gtt acc ttt gat ggg caa tta cat tcg	720
Leu Pro Gly Glu Ala Ile Tyr Val Thr Phe Asp Gly Gln Leu His Ser	
225 230 235 240	
caa att tgt gcc gat aat cca aaa ctg aat cct tgt att ttt gaa tat	768
Gln Ile Cys Ala Asp Asn Pro Lys Leu Asn Pro Cys Ile Phe Glu Tyr	
245 250 255	
gtt tat ttt gcc cgt cct gat tcc gtc att gat ggc gtt tct gta tat	816
Val Tyr Phe Ala Arg Pro Asp Ser Val Ile Asp Gly Val Ser Val Tyr	
260 265 270	
tct gca cga gtg cat atg ggc gaa tta tta ggt gag aaa att aaa cgt	864
Ser Ala Arg Val His Met Gly Glu Leu Leu Gly Glu Lys Ile Lys Arg	
275 280 285	
gaa tgg gga cga att atc gat gat att gat gtg gtg atc ccg att cct	912
Glu Trp Gly Arg Ile Ile Asp Asp Ile Asp Val Val Ile Pro Ile Pro	
290 295 300	
gaa acc tca aat gat att gcg gta cgt att gct aat atg ttg tat aaa	960
Glu Thr Ser Asn Asp Ile Ala Val Arg Ile Ala Asn Met Leu Tyr Lys	
305 310 315 320	
ccc tat cgt caa ggg ttt gtt aaa aac cgc tat gta gct cga act ttt	1008
Pro Tyr Arg Gln Gly Phe Val Lys Asn Arg Tyr Val Ala Arg Thr Phe	
325 330 335	
att atg ccg ggg caa gca cag cgt aaa agc tcg gtt cgc cgt aaa tta	1056
Ile Met Pro Gly Gln Ala Gln Arg Lys Ser Ser Val Arg Arg Lys Leu	
340 345 350	
aat gcg att gcc tct gaa ttt aaa ggc aaa agc gtg tta ctg gtt gat	1104
Asn Ala Ile Ala Ser Glu Phe Lys Gly Lys Ser Val Leu Leu Val Asp	
355 360 365	
gat tct att gta cga ggt aca acg tct gaa caa atc gtg gaa atg gca	1152
Asp Ser Ile Val Arg Gly Thr Thr Ser Glu Gln Ile Val Glu Met Ala	
370 375 380	
cga gca gct ggt gca aaa cgg gtt tat ttt gcc tct gcc gca ccg gaa	1200
Arg Ala Ala Gly Ala Lys Arg Val Tyr Phe Ala Ser Ala Ala Pro Glu	
385 390 395 400	

五、發明說明 (351)

att cgc tac ccg aat gtg tat ggc att gat atg ccg act tgt gaa gaa 1248
Ile Arg Tyr Pro Asn Val Tyr Gly Ile Asp Met Pro Thr Cys Glu Glu
405 410 415

tta gtg gct tat gat cgc tca gtg gaa gag gtt gca cag atg ata ggg 1296
Leu Val Ala Tyr Asp Arg Ser Val Glu Glu Val Ala Gln Met Ile Gly
420 425 430

gtg gat aaa ttg att ttc caa gac ctt gaa gca ctt tat aag tct att 1344
Val Asp Lys Leu Ile Phe Jln Asp Leu Glu Ala Leu Tyr Lys Ser Ile
435 440 445

caa ctg gaa aat ccg act att cat cgc ttt gat gac tct gta ttt aca 1392
Gln Leu Glu Asn Pro Thr Ile His Arg Phe Asp Asp Ser Val Phe Thr
450 455 460

gga gaa tat att aca ggt gat gta gat aaa tgc tat tta gac agt ata 1440
Gly Glu Tyr Ile Thr Gly Asp Val Asp Lys Cys Tyr Leu Asp Ser Ile
465 470 475 480

gca aga tct cga aac gat aaa gca aaa gca gag gcg gca aaa caa gcc 1488
Ala Arg Ser Arg Asn Asp Lys Ala Lys Ala Glu Ala Ala Lys Gln Ala
485 490 495

acc aat tta gaa att cat aac gaa aga ta 1517
Thr Asn Leu Glu Ile His Asn Glu Arg
500 505

<210> 173
<211> 505
<212> 蛋白質
<213> 溶血性巴斯德桿菌

<400> 173
Met Cys Gly Ile Val Gly Ile Ile Gly Asn Ser Pro Val Asn Gln Ala
1 5 10 15

Ile Tyr Asp Gly Leu Thr Leu Leu Gln His Arg Gly Gln Asp Ala Ala
20 25 30

Gly Ile Val Thr Ile Asp Asp Glu Asn Arg Phe Arg Leu Arg Lys Ala
35 40 45

Asn Gly Leu Val Ser Asp Val Phe Gln Gln Glu His Met Val Arg Leu
50 55 60

Gln Gly Asn Val Gly Ile Gly His Val Arg Tyr Pro Thr Ala Gly Ser
65 70 75 80

Ser Ser Val Ser Glu Ala Gln Pro Phe Tyr Val Asn Ser Pro Phe Gly
85 90 95

Ile Thr Leu Val His Asn Gly Asn Leu Thr Asn Asn Ala Glu Leu Lys
100 105 110

Ala Arg Leu Tyr Asn Glu Ala Arg Arg His Val Asn Thr Asn Ser Asp
115 120 125

Ser Glu Ser Leu Leu Asn Ile Phe Ala Tyr Phe Leu Asp Leu Tyr Ser
130 135 140

裝
訂
線

五、發明說明 (352)

Thr Gln His Leu Ser Pro Asp Asn Ile Phe Glu Thr Val Arg Lys Thr
145 150 155 160

Asn Asp Ser Ile Arg Gly Ala Tyr Ala Cys Ile Ala Met Ile Ile Gly
165 170 175

His Gly Met Val Ala Phe Arg Asp Pro Phe Gly Ile Arg Pro Leu Val
180 185 190

Leu Gly Lys Arg Glu Ile Glu Gly Lys Thr Glu Tyr Met Phe Ala Ser
195 200 205

Glu Ser Val Ala Leu Asp Val Val Gly Phe Glu Phe Val Arg Asp Val
210 215 220

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

Gln Ile Cys Ala Asp Asn Pro Lys Leu Asn Pro Cys Ile Phe Glu Tyr
245 250 255

Val Tyr Phe Ala Arg Pro Asp Ser Val Ile Asp Gly Val Ser Val Tyr
260 265 270

Ser Ala Arg Val His Met Gly Glu Leu Leu Gly Glu Lys Ile Lys Arg
275 280 285

Glu Trp Gly Arg Ile Ile Asp Asp Ile Asp Val Val Ile Pro Ile Pro
290 295 300

Glu Thr Ser Asn Asp Ile Ala Val Arg Ile Ala Asn Met Leu Tyr Lys
305 310 315 320

Pro Tyr Arg Gln Gly Phe Val Lys Asn Arg Tyr Val Ala Arg Thr Phe
325 330 335

Ile Met Pro Gly Gln Ala Gln Arg Lys Ser Ser Val Arg Arg Lys Leu
340 345 350

Asn Ala Ile Ala Ser Glu Phe Lys Gly Lys Ser Val Leu Leu Val Asp
355 360 365

Asp Ser Ile Val Arg Gly Thr Thr Ser Glu Gln Ile Val Glu Met Ala
370 375 380

Arg Ala Ala Gly Ala Lys Arg Val Tyr Phe Ala Ser Ala Ala Pro Glu
385 390 395 400

Ile Arg Tyr Pro Asn Val Tyr Gly Ile Asp Met Pro Thr Cys Glu Glu
405 410 415

Leu Val Ala Tyr Asp Arg Ser Val Glu Glu Val Ala Gln Met Ile Gly
420 425 430

Val Asp Lys Leu Ile Phe Gln Asp Leu Glu Ala Leu Tyr Lys Ser Ile
435 440 445

Gln Leu Glu Asn Pro Thr Ile His Arg Phe Asp Asp Ser Val Phe Thr
450 455 460

Gly Glu Tyr Ile Thr Gly Asp Val Asp Lys Cys Tyr Leu Asp Ser Ile
465 470 475 480

五、發明說明 (353)

Ala Arg Ser Arg Asn Asp Lys Ala Lys Ala Glu Ala Ala Lys Gln Ala
485 490 495

Thr Asn Leu Glu Ile His Asn Glu Arg
500 505

- <210> 174
- <211> 386
- <212> DNA
- <213> 溶血性巴斯德桿菌

- <220>
- <221> CDS
- <222> (1) .. (384)

- <220>
- <223> yjgF

<400> 174	
atg aca gtt atc cac aca gaa aat gca ccg gca gcg att ggg cct tat	48
Met Thr Val Ile His Thr Glu Asn Ala Pro Ala Ala Ile Gly Pro Tyr	
1 5 10 15	
gtg caa gca gtt gat tta ggc aat atg gtt tta act tct ggg caa att	96
Val Gln Ala Val Asp Leu Gly Asn Met Val Leu Thr Ser Gly Gln Ile	
20 25 30	
ccc gtg aat cct gaa acc ggc gaa atc ccg agt gat att gtg caa caa	144
Pro Val Asn Pro Glu Thr Gly Glu Ile Pro Ser Asp Ile Val Gln Gln	
35 40 45	
acc cgc caa tct ctg aac aac gtg aaa gcc att atc gaa caa gcc ggc	192
Thr Arg Gln Ser Leu Asn Asn Val Lys Ala Ile Ile Glu Gln Ala Gly	
50 55 60	
tta acc gtt gcc gat att gta aag acc acc gta ttt gtc aaa gat ctt	240
Leu Thr Val Ala Asp Ile Val Lys Thr Thr Val Phe Val Lys Asp Leu	
65 70 75 80	
aac gac ttc gca aag gta aat gcg gaa tac caa gcc ttc ttc caa gaa	288
Asn Asp Phe Ala Lys Val Asn Ala Glu Tyr Gln Ala Phe Phe Gln Glu	
85 90 95	
aac gaa cac cct aat ttt ccg gct cgt tct tgc gta gaa gtg gct cgt	336
Asn Glu His Pro Asn Phe Pro Ala Arg Ser Cys Val Glu Val Ala Arg	
100 105 110	
tta cca aaa gat gtt ggc att gag atc gaa gcg att gca gta cgc cga	384
Leu Pro Lys Asp Val Gly Ile Glu Ile Glu Ala Ile Ala Val Arg Arg	
115 120 125	
ta	386

- <210> 175
- <211> 128
- <212> 蛋白質
- <213> 溶血性巴斯德桿菌

<400> 175
Met Thr Val Ile His Thr Glu Asn Ala Pro Ala Ala Ile Gly Pro Tyr
1 5 10 15

五、發明說明 (354)

Val Gln Ala Val Asp Leu Gly Asn Met Val Leu Thr Ser Gly Gln Ile
20 25 30
Pro Val Asn Pro Glu Thr Gly Glu Ile Pro Ser Asp Ile Val Gln Gln
35 40 45
Thr Arg Gln Ser Leu Asn Asn Val Lys Ala Ile Ile Glu Gln Ala Gly
50 55 60
Leu Thr Val Ala Asp Ile Val Lys Thr Thr Val Phe Val Lys Asp Leu
65 70 75 80
Asn Asp Phe Ala Lys Val Asn Ala Glu Tyr Gln Ala Phe Phe Gln Glu
85 90 95
Asn Glu His Pro Asn Phe Pro Ala Arg Ser Cys Val Glu Val Ala Arg
100 105 110
Leu Pro Lys Asp Val Gly Ile Glu Ile Glu Ala Ile Ala Val Arg Arg
115 120 125

<210> 176
<211> 20
<212> DNA
<213> 人造的序列

<220>
<221>
<222>
<223> 人造序列的說明：引子

<400> 176
atggcnggng cnaargarat 20

<210> 177
<211> 20
<212> DNA
<213> 人造的序列

<220>
<221>
<222>
<223> 人造序列的說明：引子

<220>
<221> misc_特徵
<222> 3
<223> n=A或T或G或C

<220>
<221> misc_特徵
<222> 12
<223> n=A或T或G或C

<220>
<221> misc_特徵
<222> 15
<223> n=A或T或G或C

<400> 177
gcngcyttca tngcnaccat 20

<210> 178

裝
訂
線

五、發明說明 (355)

<211> 21
 <212> DNA
 <213> 人造的序列

<220>
 <223> 人造序列的說明：引子

<220>
 <221> misc_特徵
 <222> 3
 <223> N=A或T或G或C

<400> 178
 ggnttyatyc ayaaaaayat g

21

<210> 179
 <211> 23
 <212> DNA
 <213> 人造的序列

<220>
 <223> 人造序列的說明：引子

<220>
 <221> misc_特徵
 <222> 6
 <223> N=A或T或G或C

<220>
 <221> misc_特徵
 <222> 12
 <223> N=A或T或G或C

<220>
 <221> misc_特徵
 <222> 15
 <223> N=A或T或G或C

<400> 179
 tcttngtra tngtnacatc rtg

23

<210> 180
 <211> 24
 <212> DNA
 <213> 人造的序列

<220>
 <223> 人造序列的說明：引子

<400> 180
 gcsggyaac ctcgttagga ttgg

24

<210> 181
 <211> 25
 <212> DNA
 <213> 人造的序列

<220>
 <223> 人造序列的說明：引子

<400> 181
 ctcctaarat tctgaaagc accac

25

五、發明說明 (356)

<210> 182
<211> 20
<212> DNA
<213> 人造的序列

<220>
<223> 人造序列的說明：引子

<220>
<221> misc_特徵
<222> 9
<223> N=A或T或G或C

<220>
<221> misc_特徵
<222> 15
<223> N=A或T或G或C

<220>
<221> misc_特徵
<222> 18
<223> N=A或T或G或C

<400> 182
atgtgygggha tygtnggnat 20

<210> 183
<211> 21
<212> DNA
<213> 人造的序列

<220>
<223> 人造序列的說明：引子

<400> 183
catatcaata ccatacacat t 21

<210> 184
<211> 16
<212> DNA
<213> 人造的序列

<220>
<223> 人造序列的說明：引子

<220>
<221> misc_特徵
<222> 3
<223> N=A或T或G或C

<220>
<221> misc_特徵
<222> 6
<223> N=A或T或G或C

<220>
<221> misc_特徵
<222> 12
<223> N=A或T或G或C

<400> 184
ggncntayg tncarg 16

五、發明說明 (357)

<210> 185
<211> 13
<212> DNA
<213> 人造的序列

<220>
<223> 人造序列的說明：引子

<220>
<221> misc_特徵
<222> 1
<223> N=A或T或G或C

<220>
<221> misc_特徵
<222> 4
<223> N=A或T或G或C

<220>
<221> misc_特徵
<222> 10
<223> N=A或T或G或C

<400> 185
ngcnacyten acrc 15

<210> 186
<211> 22
<212> DNA
<213> 人造的序列

<220>
<223> 人造序列的說明：引子

<400> 186
gaagccgcca tacgtcttg gg 22

<210> 187
<211> 23
<212> DNA
<213> 人造的序列

<220>
<223> 人造序列的說明：引子

<400> 187
gttgcctcct ttgcctgcac tgg 23

<210> 188
<211> 24
<212> DNA
<213> 人造的序列

<220>
<223> 人造序列的說明：引子

<400> 188
ggctcagaaa caataccact ttca 24

<210> 189
<211> 21
<212> DNA
<213> 人造的序列

五、發明說明 (358)

<220> <223>人造序列的說明：引子	
<400> 189 gcaccaaagc agaattgtc c	21
<210> 190 <211> 24 <212> DNA <213>人造的序列	
<220> <223>人造序列的說明：引子	
<400> 190 ggtgatgatg tcgatgatag tccc	24
<210> 191 <211> 24 <212> DNA <213>人造的序列	
<220> <223>人造序列的說明：引子	
<400> 191 ggcgtattag ccgtgatgcc aacc	24
<210> 192 <211> 23 <212> DNA <213>人造的序列	
<220> <223>人造序列的說明：引子	
<400> 192 gaccacttag gcgatatgga ctt	23
<210> 193 <211> 22 <212> DNA <213>人造的序列	
<220> <223>人造序列的說明：引子	
<400> 193 accatcataa atgcctgat tc	22
<210> 194 <211> 20 <212> DNA <213>人造的序列	
<220> <223>人造序列的說明：引子	
<400> 194 acctgcggca tcttgcctc	20
<210> 195 <211> 20	

裝
訂
線

五、發明說明 (359)

<212> DNA
<213>人造的序列

<220>
<223>人造序列的說明：引子

<400> 195
acgggtttat ttgcctctg 20

<210> 196
<211> 22
<212> DNA
<213>人造的序列

<220>
<223>人造序列的說明：引子

<400> 196
cgccgggttc aggattcacg gg 22

<210> 197
<211> 20
<212> DNA
<213>人造的序列

<220>
<223>人造序列的說明：引子

<400> 197
ctgaacaacg tgaagccat 20

裝
訂
線

四、中文發明摘要 (發明之名稱： 抗細菌疫苗組合物)

本發明係關於確認出革蘭氏陰性細菌毒力基因，藉此容許確認瞄準這些毒力基因及其產物的新穎抗-細菌劑，並提供可用於疫苗之新穎的革蘭氏陰性細菌突變種。

英文發明摘要 (發明之名稱： "ANTI-BACTERIAL VACCINE COMPOSITIONS")

Gram negative bacterial virulence genes are identified, thereby allowing the identification of novel anti-bacterial agents that target these virulence genes and their products, and the provision of novel gram negative bacterial mutants useful in vaccines.

六、申請專利範圍

1. 一種減毒巴斯德桿菌科 (*Pasteurellaceae* (*Mannheimia*)) 細菌，其係選自下列群組：溶血性巴斯德桿菌 (*Pasteurella* (*Mannheimia*) *haemolytica*)、敗血性巴斯德桿菌 (*Pasteurella multocida*) 及胸膜肺炎放線桿菌 (*Actinobacillus pleuropneumoniae*)，其包括編碼 *atpG* 多肽之多核苷酸中之一突變，該 *atpG* 多肽包含與 *atpG* 胺基酸序列 SEQ ID NO: 167 至少 70% 相同之胺基酸序列，其中該突變導致降低該細菌之致病力及毒力。
2. 根據申請專利範圍第1項之巴斯德桿菌科細菌，其中該突變導致編碼該 *atpG* 多肽之多核苷酸序列的全部或一部份被刪除。
3. 根據申請專利範圍第1項之巴斯德桿菌科細菌，其中該突變導致編碼該 *atpG* 多肽之多核苷酸序列的插入。
4. 根據申請專利範圍第1項之巴斯德桿菌科細菌，其為 *Pasteurella* (*Mannheimia*) *haemolytica* 細菌。
5. 一種免疫原組合物，其包括根據申請專利範圍第1、2、3及4項中任一項的細菌。
6. 一種疫苗組合物，包括根據申請專利範圍第5項之免疫原組合物和藥學上可接受的載劑。
7. 根據申請專利範圍第6項之疫苗組合物，尚包括佐劑。
8. 一種減毒巴斯德桿菌科 (*Pasteurellaceae*) 細菌，其係選自下列群組：溶血性巴斯德桿菌 (*Pasteurella*

六、申請專利範圍

(*Mannheimia*) *haemolytica*)、敗血性巴斯德桿菌 (*Pasteurella multocida*) 及胸膜肺炎放線桿菌 (*Actinobacillus pleuropneumoniae*)，其包括編碼 *atpG* 多肽之多核苷酸中之一突變，其中該多核苷酸序列在嚴格條件下與 SEQ ID NO: 166 之多核苷酸序列的互補物雜交，該嚴格條件包含在 35°C 至 45°C 下，於包含 2×SSC/0.1 % SDS 之緩衝液之最終清洗。

9. 根據申請專利範圍第 8 項中之巴斯德桿菌科細菌，其中該突變是在 SEQ ID NO: 166 之多核苷酸序列。
10. 一種免疫原組合物，其包含如根據申請專利範圍第 8 或 9 項之細菌。
11. 一種疫苗組合物，其包含根據申請專利範圍第 10 項之免疫原組合物及藥學上可接受的載劑。
12. 根據申請專利範圍第 11 項之疫苗組合物，尚包括佐劑。
13. 一種經過純化和分離之多核苷酸，其包括 SEQ ID NOS: 166 之核苷酸序列。
14. 一種經過純化和分離之多核苷酸，其包括編碼具有 SEQ ID NOS: 167 之胺基酸序列的多肽之核苷酸序列。
15. 根據申請專利範圍第 14 項之多核苷酸，其為 DNA。
16. 一種載體，其包括申請專利範圍第 15 項之 DNA。
17. 根據申請專利範圍第 16 項之載體，其為表現載體，其中該 DNA 以可操作之方式與表現控制 DNA 序列連接。
18. 一種以申請專利範圍第 15 項之 DNA 穩定地轉化或轉移感

六、申請專利範圍

染的宿主細胞，其係容許該編碼多肽在該宿主細胞中表現。

裝
訂