



(12)发明专利

(10)授权公告号 CN 104159601 B

(45)授权公告日 2017.05.24

(21)申请号 201380012681.7

(22)申请日 2013.02.01

(65)同一申请的已公布的文献号
申请公布号 CN 104159601 A

(43)申请公布日 2014.11.19

(30)优先权数据
61/632,888 2012.02.01 US
61/689,078 2012.05.29 US

(85)PCT国际申请进入国家阶段日
2014.09.05

(86)PCT国际申请的申请数据
PCT/US2013/024332 2013.02.01

(87)PCT国际申请的公布数据
W02013/116639 EN 2013.08.08

(73)专利权人 代表亚利桑那大学的亚利桑那董
事会
地址 美国亚利桑那

(72)发明人 L·A·琼斯 B·劳
A·阿姆斯特朗

(74)专利代理机构 中国国际贸易促进委员会专
利商标事务所 11038
代理人 韩威威

(51)Int.Cl.
A61K 39/02(2006.01)
A61P 31/04(2006.01)

(56)对比文件
US 2001/038844 A1,2001.11.08,
WO 2008/008092 A2,2008.01.17,
WO 2005/049641 A2,2005.06.02,
审查员 王大鹏

权利要求书1页 说明书22页
序列表163页 附图1页

(54)发明名称

弯曲杆菌属免疫原性组合物及其用途

(57)摘要

本发明提供针对弯曲杆菌属的免疫原性组合物和使用所述免疫原性组合物产生针对弯曲杆菌属的免疫反应和/或减少弯曲杆菌属肠道定居的方法。

1. 一种免疫原性组合物,其包含一种或多种表达载体,所述表达载体包含:
 - (a) 编码两种或更多种蛋白质的一种或多种多核苷酸,所述蛋白质包括:
 - (i) 包含与SEQ ID NO:2 (Cj0998c蛋白) 至少95%相同的氨基酸序列的蛋白质,和
 - (ii) 包含与SEQ ID NO:4 (Cj0588蛋白) 至少95%相同的氨基酸序列的蛋白质;和
 - (b) 与所述一种或多种多核苷酸有效连接的启动子,其中启动子区能够指导编码的蛋白质的表达。
2. 根据权利要求1所述的免疫原性组合物,其中所述一种或多种多核苷酸编码包含SEQ ID NO:2 (Cj0998c蛋白) 的氨基酸序列的蛋白质和包含SEQ ID NO:4 (Cj0588蛋白) 的氨基酸序列的蛋白质。
3. 根据权利要求1-2中任一项所述的免疫原性组合物,其中所述免疫原性组合物存在于减毒的沙门氏菌属 (*Salmonella*) 载体细胞中。
4. 根据权利要求3所述的免疫原性组合物,其中减毒的沙门氏菌属 (*Salmonella*) 载体细胞是沙门氏菌菌株x9992。
5. 根据权利要求1-4中任一项所述的免疫原性组合物,其中将免疫原性组合物配制用于经口递送或粘膜递送。
6. 根据权利要求1-5中任一项所述的免疫原性组合物,还包含佐剂。
7. 根据权利要求1-6中任一项所述的免疫原性组合物在制备用于刺激针对弯曲杆菌属的免疫反应的方法中所用的药物中的应用,其中所述方法包括向受试者施用有效量的根据权利要求1-6中任一项所述的免疫原性组合物以产生针对弯曲杆菌属的免疫反应。
8. 根据权利要求1-6中任一项所述的免疫原性组合物在制备用于减少受试者中弯曲杆菌属肠道定居的方法中所用的药物中的应用,其中所述方法包括施用有效量的根据权利要求1-6中任一项所述的免疫原性组合物以减少受试者中的弯曲杆菌属肠道定居。
9. 根据权利要求7或8所述的应用,其中受试者选自鸡、火鸡、鸟、牛、羊、猪、犬、猫和人。
10. 根据权利要求7或8所述的应用,其中受试者选自鸡和火鸡。
11. 根据权利要求10所述的应用,其中施用最初在鸡或火鸡孵化后截至14日实施。
12. 根据权利要求7-11中任一项所述的应用,其中施用包括经口或粘膜施用。
13. 根据权利要求11或12所述的应用,其中施用包括在饮水中口服施用。
14. 根据权利要求11或12所述的应用,其中施用包括在受试者的身体上以喷雾剂施用所述免疫原性组合物。
15. 根据权利要求7-14中任一项所述的应用,其中所述方法用于诱导针对空肠弯曲杆菌 (*Campylobacter jejuni*) 的免疫反应或减少其肠道定居。

弯曲杆菌属免疫原性组合物及其用途

[0001] 交叉引用

[0002] 本申请要求2012年2月1日提交的美国临时专利申请系列号61/632,888和2012年5月29日提交的美国临时专利申请系列号61/689,078的优先权,所述文献通过引用的方式完整并入本文。

[0003] 政府资助声明

[0004] 本发明以美国农业部孵化基金在编号127032下授予的政府资助作出。美国政府在本发明中享有某些权利。

[0005] 背景

[0006] 弯曲杆菌病主要是一种伴随处置和消费家禽的食源性疾病,被视为传播中最突出的风险因子。弯曲杆菌 (*Campylobacter* spp.) 感染是细菌性胃肠炎的主导原因之一,每年在美国估计造成130万病例 (Scallan等人,2011),导致每年8-56亿美元卫生保健成本 (Buzby等人,1997)。严重并发症如关节炎出现于估计的1-5%病例中 (Pope等人,2007) 并且 Guillain-Barre综合征 (神经肌肉瘫痪的一种形式) 以每1,000位患者1.0的比率出现 (Altekruse和Tollefson,2003)。归因于出现并持续存在与日益增加的产业法规限制相关的抗生素耐药性,迫切需要控制策略如接种。迄今,不存在生产商可用于减少即将加工的家禽中弯曲杆菌数目的介入方法或疫苗。

[0007] 从2011年7月1日开始,USDA-FSIS (食品安全检验局) 已经在屠宰厂对仔鸡冷却胴体执行弯曲杆菌的新实施标准 (FSIS NOTICE,31-11,6/30/11)。这些标准将允许51份样品组中不多于8个阳性弯曲杆菌样品,计划最初警告各公司并且在2013年处以罚款。一项大型基线研究在我们的实验室中实施 (由USDA资助) 以从2007-2009年对屠宰厂中弯曲杆菌水平定量。我们的研究展示21.9% (213/972) 的冷却后胴体淋洗样品呈弯曲杆菌阳性,这等于每个51份样品集合11.17份。显然,这超过来自冷却胴体样品的可允许弯曲杆菌数并且将促进对生产商和加工厂实施罚款,除非可以实现家禽中弯曲杆菌的减少。目前,不存在生产商可获得的用来减少家禽中弯曲杆菌载量的可用介入方法或疫苗。

[0008] 发明简述

[0009] 在第一方面,本发明提供免疫原性组合物,其包含一种或多种表达载体,所述表达载体包含:

[0010] (a) 编码蛋白质或其抗原性部分的至少一种多核苷酸,所述蛋白质选自包含与SEQ ID NO:2 (Cj0998c蛋白)、SEQ ID NO:4 (Cj0588蛋白) 和SEQ ID NO:6 (Cj0248蛋白) 至少80%相同的氨基酸序列的蛋白质;和

[0011] (b) 与所述多核苷酸有效连接的启动子,其中所述启动子区能够指导编码的蛋白质的表达。

[0012] 在第二方面,本发明提供免疫原性组合物,其包含

[0013] (a) 一种或多种分离的蛋白质或其抗原性部分,所述分离的蛋白质选自包含与SEQ ID NO:2 (Cj0998c蛋白)、SEQ ID NO:4 (Cj0588蛋白) 和SEQ ID NO:6 (Cj0248蛋白) 至少80%相同的氨基酸序列的蛋白质;和

[0014] (b) 可药用载体。

[0015] 在第三方面,本发明提供用于刺激针对弯曲杆菌的免疫反应的方法,所述方法包括向受试者施用有效量的根据本发明任何实施方案的免疫原性组合物以产生针对弯曲杆菌的免疫反应。

[0016] 在第四方面,本发明提供用于减少受试者中弯曲杆菌肠道定居的方法,包括施用有效量的根据本发明任何实施方案的免疫原性组合物以减少受试者中的弯曲杆菌肠道定居。

[0017] 附图简述

[0018] 图1是pYA3493质粒的示意图。

[0019] 发明详述

[0020] 所引用的全部参考文献均通过引用的方式完整并入本文。在本申请范围内,除非另外声明,否则所用的技术可以在几种熟知参考文献的任一者中找到,如:Molecular Cloning:A Laboratory Manual (Sambrook等人,1989,Cold Spring Harbor Laboratory Press)、Gene Expression Technology (Methods in Enzymology,第185卷,D.Goeddel编著,1991.Academic Press,San Diego,CA)、“Guide to Protein Purification”引自 Methods in Enzymology (M.P.Deutschner编著,(1990) Academic Press,Inc.); PCR Protocols:A Guide to Methods and Applications (Innis等人1990.Academic Press, San Diego,CA)、Culture of Animal Cells:A Manual of Basic Technique,第2版 (R.I.Freshney.1987.Liss,Inc.New York,NY)、Gene Transfer and Expression Protocols,第109-128页,E.J.Murray编著,The Humana Press Inc.,Clifton,N.J.) 和 Ambion 1998年目录 (Ambion,Austin,TX)。

[0021] 如本文中所用,除非上下文另外清楚地说明,否则单数形式“一个”、“一种”和“该”包括复数称谓。除非另外明确地陈述,否则如本文所用的“和”可与“或”互换地使用。

[0022] 除非上下文另外清楚地说明,否则可以组合使用本发明任何方面的全部实施方案。

[0023] 在第一方面,本发明提供免疫原性组合物,其包含一种或多种表达载体,所述表达载体包含:

[0024] (i) 编码蛋白质或其抗原性部分的至少一种多核苷酸,所述蛋白质选自包含与SEQ ID NO:2 (Cj0998c蛋白)、SEQ ID NO:4 (Cj0588蛋白) 和SEQ ID NO:6 (Cj0248蛋白) 至少80% 相同的氨基酸序列的蛋白质;和

[0025] (ii) 与所述多核苷酸有效连接的启动子,其中所述启动子区能够指导编码的蛋白质的表达。

[0026] 发明人已经从空肠弯曲杆菌 (*C. jejuni*) 鉴定了三个推定性毒力基因 (Cj0248、Cj0588和Cj0998c),所述基因编码来自细菌外膜的新蛋白质。发明人已经进一步发现,Cj0998c蛋白、Cj0588蛋白和Cj0248蛋白的每一者均是刺激针对空肠弯曲杆菌 (“空肠弯曲杆菌”) 的有效免疫反应的强力免疫原。例如,如本文中详细公开,与未接种的对照禽的盲肠内容物中空肠弯曲杆菌数目相比时,采用表达Cj0988c蛋白的载体的两个独立鸡接种试验显示攻击后禽中的空肠弯曲杆菌数目降低平均2.5个对数CFU (几何平均数3个对数)。另外,接种试验显示鸡的盲肠内容物中空肠弯曲杆菌显著减少 (1-4个对数) (采用异源菌株时1个

对数并且采用同源菌株时4个对数),所述鸡用表达Cj0588蛋白的载体接种并用空肠弯曲杆菌(*Campylobacter jejuni*)攻击。每种蛋白质最初从空肠弯曲杆菌生物被膜的外膜(OMP)提取分离。

[0027] 因而,本发明的免疫原性组合物可以例如用于面临弯曲杆菌感染和/或定居风险的受试者中刺激免疫反应,所述受试者包括但不限于脊椎动物如鸡、火鸡、鸟、牛、羊、猪、犬、猫和人。

[0028] 在一个实施方案中,一种或多种表达载体编码所述的蛋白质之一或其抗原性片段。在另一个实施方案中,一种或多种表达载体编码了包含与所述的氨基酸序列(即:SEQ ID NO:2和SEQ ID NO:4;SEQ ID NO:2和SEQ ID NO:6;或SEQ ID NO:6和SEQ ID NO:8)至少80%相同的氨基酸序列的两种蛋白质或其抗原性片段。在这个实施方案中,单个表达载体可以编码两种蛋白质或其抗原性片段,或该组合物可以包含两种表达载体,其中每种表达载体编码所述的蛋白质之一或其抗原性片段。在这个实施方案中,所用的表达载体可以是相同的(除蛋白质编码序列之外)或不同的。

[0029] 在另一个实施方案中,一种或多种表达载体编码了包含与所述的氨基酸序列(即:SEQ ID NO:2、SEQ ID NO:4和SEQ ID NO:6)至少80%相同的氨基酸序列的全部三种蛋白质或其抗原性片段。在这个实施方案中,单个表达载体可以编码全部三种蛋白质或其抗原性片段。可选地,该组合物可以包含两种表达载体,一种表达载体编码所述的蛋白质之一或其抗原性片段,并且另一种表达载体编码两种所述的蛋白质或其抗原性片段。在这个实施方案的又一个备选中,组合物可以包含三种表达载体,每种表达载体编码所述的蛋白质之一或其抗原性片段。在这些备选实施方案的每一者中,使用的多种表达载体可以是相同或不同的。本文提供编码一种或多种所述蛋白质的表达载体的非限制性例子。基于本公开,根据全部本发明的实施方案制备表达载体完全处于本领域技术人员的能力范围内。

[0030] Cj0998c、Cj0588和Cj0248蛋白存在于不同空肠弯曲杆菌菌株之间高度保守的变体中,并且因此由一种或多种表达载体编码的蛋白质可以在所述氨基酸序列或其抗原性片段的全长范围内是至少80%相同或相似的(具有相似特性即疏水性、亲水性等的残基)。在多种其他实施方案中,由一种或多种表达载体编码的蛋白质在所述氨基酸序列或其抗原性片段的全长范围内至少81%、82%、83%、84%、85%、86%、87%、88%、89%、90%、91%、92%、93%、94%、95%、96%、97%、98%、99%或100%相同。

[0031] 在一个实施方案中,至少一种多核苷酸编码选自以下的蛋白质或其抗原性片段:

[0032] (a) SEQ ID NO:7 (Cj0998c类属)

[0033] MKK (I/V/F) (L/V) (V/A/L) S (V/I) (L/F) S (S/F) CLLASALSAVSFKEDSLK (I/V) SFEGYKTKDM (I/V) G (T/V/I/A) (K/R) GEFKNVEY (K/N) FSK (N/S) (I/T) KD (L/F) ASYLKGAKATI (K/E) PS (N/D) AFM (G/S) EG (N/L) D (I/V) ITNNITKVFFPALLG (D/N) (T/A) DIKVVFDQ (V/A/M) I (A/V) GE-X1ITMDKKSTI (V/I) PLTYTIKD (N/D) KFEAKGQ (L/F) DLH (T/A) FKN (G/A) SKALKALSD (V/A) A (A/T/P) GHGGISWPLVDISFNADL (A/T/V) E

[0034] 其中X1不存在或是

[0035] NKGVISAK (SEQ ID NO:135);

[0036] (b) SEQ ID NO:8: (Cj0588类属)

[0037] X1- (L/M) (D/N/E) LL (S/R) EIY (V/I) SRAALKLK (K/N) FLEEN (D/G/N) IE (I/V) (K/N)

(H/Q/N) KNCLDIGSSTGGFVQILLEN (Q/K) ALKIT (A/T) LDVG (S/N) NQLH (P/S/L) (S/N) LR (V/A/T) NE (K/I) (I/V) IL (H/Y) EN (T/I) DLR (A/T/V) FKSEKFE (L/F) (V/I) TCDVSFISL (I/V) NLLYY (I/V) (D/N) NLAL (K/R) EIILLFKPQFEVGKN (I/V) KRDKKGVLKD (D/G) (K/R) (A/V) ILKA (R/K) MDFEK (A/E) CAKL (G/S) W (L/F/I) LKNTQKS (S/C) IKGKEGNVEYFYIYIKN

[0038] 其中X1不存在或是

[0039] M (R/I) (F/-) (D/-) FF (V/I) SKRL (N/D) ISRNKALELIE (N/S) EE (I/V) LLNGK (S/N) FKAS (F/C) DVKN (F/L) LENLKK (T/A/K) QDLN (P/L/S) E (D/E) (I/V) (L/Y) L (A/T/S) (N/D/K) (E/G) L (K/N) (SEQ ID NO:136); 以及

[0040] (c) SEQ ID NO:9 (Cj0248类属)

[0041] (M/-) I (G/-) DMNELLLKSVEVLPPLPDTVSKLRKYVSEANSNIETMKV (A/V) EIISSDPLMTAKLLQLANSPYYGFTREITTI (N/S) QVITLLG (V/I) GNIINIV (M/T) ADSI (R/K) D (N/S) FKIDVSPYGL (N/D) T (Q/K) (N/V) FL (K/R) (T/N) CN (E/D) EATFI (A/V/T) NWLNDEDKKLSHLLVPCAMLLRLGIVIFSNFLIQN (H/Y/F) (K/R) -X1

[0042] 其中X1不存在或是

[0043] (D/E) K (D/E) FL (A/T) FLN (-/E/K) (-/T) K (N/S/I) EN (L/I) ALAENEFLGVDHISFLGFL (H/Y) RWNFD (V/I) LIESICFV (R/H) TPHAARE (K/E) VKKSAYALAITDHLF (A/T) PHDGSSPFN (A/V/T) KAAVALL (K/E) EAK-X2 (SEQ ID NO:137或138); 和

[0044] 其中X2不存在或选自

[0045] TQGINFDL (N/D) NLLSKLP (N/S) KAKENL (N/D) (K/E) ED (SEQ ID NO:139) 和

[0046] NSRN (SEQ ID NO:140)。

[0047] 在多种其他实施方案中,至少一种多核苷酸编码选自SEQ ID NOS:10-106的蛋白质或其抗原性片段。SEQ ID NOS:44-82分别是来自其他空肠弯曲杆菌菌株的Cj0998c蛋白同源物;SEQ ID NOS:83至106分别是来自其他空肠弯曲杆菌菌株的Cj0588蛋白同源物;并且SEQ ID NOS:10至43分别是来自其他空肠弯曲杆菌菌株的Cj0248蛋白同源物。

[0048] 表达载体可以编码所述蛋白质的“抗原性部分”。如本文所用,“抗原性部分”是在所述氨基酸序列中具有10个或更多个连续氨基酸的任何片段。在多种其他实施方案中,抗原性部分是本发明任何实施方案的具有所述氨基酸序列的15、20、25、30、40、50、75、100、125、150、175、200、225、250或275个连续氨基酸的任何片段。

[0049] 一种或多种分离的多核苷酸可以是单链或双链DNA、RNA、基因组DNA或cDNA。一种或多种分离的多核苷酸可以是编码所述的一种或多种蛋白质或其抗原性片段的任何核酸。在一个实施方案中,一种或多种分离的多核苷酸是SEQ ID NO:1 (Cj0998c基因)、SEQ ID NO:3 (Cj0588基因) 和SEQ ID NO:5 (Cj0248基因) 的一者或多者或其编码所述蛋白质的抗原性部分的部分。基于本文中的教导,本领域技术人员将显见何种多核苷酸序列将编码所述的多肽或其抗原性片段。

[0050] 如本文所用,“分离的多核苷酸”是已经从其在基因组中或在cDNA序列中的正常周围核酸序列取出的那些多核苷酸。这类分离的核酸序列可以包含可用于促进所编码蛋白质表达和/或纯化的额外序列,包括但不限于聚腺苷酸化序列、修饰的Kozak序列以及(如果对给定用途适宜)编码表位标签、输出信号、分泌信号、核定位信号和质膜定位信号的序列。

[0051] 适于预期用途的任何表达载体可以用于本发明的免疫原性组合物中。这类表达载

体可以是本领域已知的任何类型,包括但不限于质粒和基于病毒的表达载体。构建用于转染原核细胞的表达载体也是本领域熟知的并且因此可以通过标准技术完成。(见,例如, Sambrook、Fritsch和Maniatis,引自:Molecular Cloning, A Laboratory Manual, Cold Spring Harbor Laboratory Press, 1989; Gene Transfer and Expression Protocols, 第109-128页, E.J. Murray编著, The Humana Press Inc., Clifton, N.J.) 和 Ambion 1998年目录(Ambion, Austin, TX)。表达载体必须在宿主生物中作为附加体或通过整合至宿主染色体DNA中是可复制的。在一个优选实施方案中,表达载体包括质粒。然而,本发明是意在包括起到等同功能的其他表达载体,如病毒载体。表达载体的细节将取决于最终的所需用途。基于本文中的教导,针对预期用途设计适宜的表达载体完全处于本领域技术人员的能力范围内。

[0052] 可以使用可指导编码的蛋白质表达(即:“有效连接”)的任何合适启动子。术语“启动子”包括足以指导所编码蛋白质表达的任何核酸序列,包括诱导型启动子、阻遏型启动子和组成型启动子。如果诱导性启动子,则存在介导蛋白质表达调节的序列,从而多核苷酸仅当诱导物分子存在时才转录。用于已结合多核苷酸响应于环境信号的调节型表达的这类顺式活性序列是本领域熟知的。表达载体可以包含任何其他控制序列,如可以适于预期用途。控制序列不需要与核苷酸序列连续,只要它们发挥作用以指导其表达即可。因此,例如,不翻译但被转录的间插序列可以存在于启动子序列和核酸序列之间,并且该启动子序列仍可以视为“与编码序列有效连接”。其他这类控制序列包括但不限于多聚腺苷化信号、增强子、终止信号和核糖体结合位点。

[0053] 本发明的免疫原性组合物还可以包含任何其他合适的组分,如可用于给定的目的。在各种非限制性实施方案中,组合物还可以包含一种或多种表达载体,所述表达载体包含编码蛋白质或其抗原性片段的至少一种多核苷酸,所述蛋白质选自包含下述氨基酸序列的蛋白质,所述氨基酸序列与SEQ ID NO:142(Cj1534c蛋白;例如由SEQ ID NO:141编码)、SEQ ID NO:108(1656c蛋白;例如由SEQ ID NO:107编码)、SEQ ID NO:110(0428蛋白;例如由SEQ ID NO:109编码)、SEQ ID NO:112(0168c蛋白;例如由SEQ ID NO:111编码)、SEQ ID NO:114(0427蛋白;例如由SEQ ID NO:113编码)、SEQ ID NO:116(Cj0113蛋白;例如由SEQ ID NO:115编码)、SEQ ID NO:118(Cj0982c蛋白;例如由SEQ ID NO:117编码)、SEQ ID NO:120(Cj0921c蛋白;例如由SEQ ID NO:119编码)、SEQ ID NO:122(Cj1259蛋白;例如由SEQ ID NO:121编码)、SEQ ID NO:124(Cj1339c蛋白;例如由SEQ ID NO:123编码)、SEQ ID NO:126(Cj0034c蛋白;例如由SEQ ID NO:125编码)、SEQ ID NO:128(Cj0404蛋白;例如由SEQ ID NO:127编码)、SEQ ID NO:130(Cj0365c蛋白;例如由SEQ ID NO:129编码)、SEQ ID NO:132(Cj0755蛋白;例如由SEQ ID NO:131编码)和SEQ ID NO:134(Cj0420蛋白;例如由SEQ ID NO:133编码)的氨基酸序列至少80%相同。

[0054] 一种或多种表达载体可以是相同或不同的一种或多种表达载体,所述载体包含编码SEQ ID NO:2(Cj0998c蛋白)、SEQ ID NO:4(Cj0588蛋白)、SEQ ID NO:6(Cj0248蛋白)或其片段的至少一种多核苷酸。上文公开的一种或多种表达载体的全部实施方案均同等地适用于这些其它组分。通过非限制性例子,一种或多种表达载体可以是1、2、3或4种其它载体,所述的其它载体编码SEQ ID NO:142(Cj1534c蛋白)、SEQ ID NO:108(1656c蛋白)、SEQ ID NO:110(0428蛋白)、SEQ ID NO:112(0168c蛋白)和SEQ ID NO:114(0427蛋白)或其抗原性

片段。本领域技术人员将理解可以根据本发明方法使用的多种其他组合。基于本公开,根据全部本发明的实施方案制备表达载体完全处于本领域技术人员的能力范围内。

[0055] 与上文提及的免疫原相似,任选的蛋白质免疫原存在于不同空肠弯曲杆菌菌株之间高度保守的变体中,并且因此由一种或多种表达载体编码的蛋白质可以在所述氨基酸序列或其抗原性片段的全长范围内是至少80%相同。在多种其他实施方案中,由一种或多种表达载体编码的蛋白质在所述氨基酸序列或其抗原性片段的全长范围内至少81%、82%、83%、84%、85%、86%、87%、88%、89%、90%、91%、92%、93%、94%、95%、96%、97%、98%、99%或100%相同。

[0056] 通过使用标准方法如通过肠胃外递送作为裸DNA施用,本发明的免疫原性组合物可以用于诱导免疫反应。可选地,表达载体可以包括病毒表达载体,包括但不限于重组腺联病毒(AAV)基因递送载体。在这个实施方案中,表达载体在5'和3'末端上由有功能的AAV反向末端重复(ITR)序列界定。“有功能的AAV ITR序列”意指ITR序列如预期那样发挥拯救、复制和包装AAV病毒粒的作用。可以使用标准方法产生将本发明表达载体包入衣壳的重组AAV(rAAV)病毒粒。在一个实施方案中,将本发明AAV表达载体引入生产细胞中,随后引入AAV辅助构建体,其中辅助构建体包含能够在生产细胞中被表达并且补足AAV载体中缺少的AAV辅助病毒功能的AAV编码区。随后将辅助病毒和/或额外载体引入生产细胞中,其中辅助病毒和/或额外载体提供能够支持高效rAAV病毒产生的附属功能。随后培养生产细胞以产生rAAV。使用标准方法实施这些步骤。使用AAV包装细胞和包装技术,通过本领域已知的标准技术产生将本发明重组AAV载体包入衣壳的复制缺陷型AAV病毒粒。这些方法的例子可以例如在美国专利号5,436,146;5,753,500;6,040,183;6,093,570和6,548,286中找到,所述专利明确地通过引用的方式完整并入本文。用于包装的其他组合物和方法在Wang等人(US2002/0168342)中描述,所述文献也通过引用的方式完整并入本文。可以使用用于产生递送用病毒粒子的任何合适方法。

[0057] 在另一个实施方案中,一种或多种表达载体存在于载体细胞中,所述载体细胞包括但不限于无毒力、非弯曲杆菌属细菌载体细胞。活细菌疫苗“载体”(即:包含免疫原性组合物的细菌细胞)已经成功地用来激发有效免疫反应以阻止感染。已经改造减毒细菌细胞递送的重组疫苗以按高水平稳定表达保护性抗原。它们能够在无明显组织损伤或其他性能降低作用的情况下刺激强烈的初次体液免疫反应、粘膜免疫反应和持久性记忆免疫反应。在多种非限制性实施方案中,细菌载体细胞是选自减毒单核增生李斯特菌(*L.monocytogenes*)、减毒沙门氏菌属物种(*Salmonella* spp.)、减毒霍乱弧菌(*V.cholerae*)、减毒志贺氏菌属物种(*Shigella* spp.)、减毒牛分支杆菌卡介苗(*M.bovis* BCG)、减毒小肠结肠炎耶尔森氏菌(*Y.enterocolitica*)、减毒炭疽芽孢杆菌(*B.anthraxis*)、戈登链球菌(*S.gordonii*)、乳杆菌属物种(*Lactobacillus* spp.)和葡萄球菌属物种(*Staphylococcus* spp.)的无毒力细菌细胞。如本文所用,“减毒”意指与未减毒的细菌载体相比,细菌在对其递送细菌的宿主中造成疾病症状方面被减弱。合适的减毒细菌可以是任何物种或菌株,所述物种或菌株经充分减毒或可以经充分减毒以允许其以活细胞和/或死亡形式不致病地施用至人和/或动物。在一个实施方案中,使用减毒沙门氏菌物种。在示例性实施方案中,可以使用的沙门氏菌包括但不限于肠道沙门氏菌菌株,其选自鼠伤寒沙门氏菌(*S.typhimurium*)、肠炎沙门氏菌(*S.enteritidis*)、海德堡沙门氏菌

(S.Heidelberg)、鸡伤寒沙门氏菌(S.Gallinarum)、哈达尔沙门氏菌(S.hadar)、阿贡纳沙门氏菌(S.Agona)、肯塔基沙门氏菌(S.Kentucky)、伤寒沙门氏菌(S.typhi)、副伤寒沙门氏菌(S.Paratyphi)和婴儿沙门氏菌(S.Infantis)。鼠伤寒沙门氏菌特别地可用于接种目的,因为其基因组序列充分表征并且许多动物研究证实其安全的医学用途。已经构建重组减毒沙门氏菌疫苗(RASV)以递送来自其他病原体的抗原以在接种的宿主中诱导针对这些病原体的免疫力;见,例如,Curtiss等人,Crit Rev Immunol.2010;30(3):255-70;2010;Qiu等人,J.Virological Methods 188:108;Strugnelli等人,Infect.Immunol.1992,60:3994;Layton等人,Clinical and Vaccine Immunology march 2011,449-454;Al-Ojali等人, Microbial Pathogenesis 52:326(2012);和(Wyszynska等人,2004) Wyszynska等人,(2004)。在一个实施方案中,RASV包含在pmi(甘露糖-6-磷酸异构酶)基因、fur(铁吸收调节蛋白)基因和crp(cAMP调节蛋白)基因中的致弱突变(见,例如,Li等人,PNAS106:592-5972009,Curtiss等人,2009和US 8,133,493)。在另一个实施方案中,RASV包含US 8,133,493中公开的x9992载体。在另一个实施方案中,RASV是可商业获得的那一种,如 **Megan®Vac1** (Lohman Animal Health,US)。

[0058] 减毒的细菌细胞可以使用本领域标准技术,与一种或多种表达载体一起转染。

[0059] 在第二方面,本发明提供一种免疫原性组合物,其包含

[0060] (a) 一种或多种分离的蛋白质或其抗原性部分,所述分离的蛋白质选自包含与SEQ ID NO:2(Cj0998c蛋白)、SEQ ID NO:4(Cj0588蛋白)和SEQ ID NO:6(Cj0248蛋白)至少80%相同的氨基酸序列的蛋白质;和

[0061] (b) 可药用载体。

[0062] 如上文对本发明的第一方面所公开,本发明第二方面的免疫原性组合物可以例如用于面临空肠弯曲杆菌感染或定居风险的受试者中刺激免疫反应,所述受试者包括但不限于脊椎动物如鸡、火鸡、牛、羊、猪和人。

[0063] 在一个实施方案中,免疫原性组合物包含所述的蛋白质之一或其抗原性片段。在另一个实施方案中,免疫原性组合物包含所述蛋白质的两种或其抗原性片段,其中所述蛋白质包含与所述氨基酸序列(即:SEQ ID NO:2和SEQ ID NO:4;SEQ ID NO:2和SEQ ID NO:6;或SEQ ID NO:6和SEQ ID NO:8)至少80%相同的氨基酸序列。在又一个实施方案中,免疫原性组合物包含与所述的氨基酸序列(即:SEQ ID NO:2、SEQ ID NO:4和SEQ ID NO:6)至少80%相同的氨基酸序列的全部三种蛋白质或其抗原性片段。

[0064] Cj0998c、Cj0588和Cj0248蛋白存在于不同空肠弯曲杆菌菌株之间高度保守的变体中,并且因此这些蛋白质可以在所述氨基酸序列或其抗原性片段的全长范围内是至少80%相同的。在多种其他实施方案中,所述蛋白质在所述氨基酸序列或其抗原性片段的全长范围内至少81%、82%、83%、84%、85%、86%、87%、88%、89%、90%、91%、92%、93%、94%、95%、96%、97%、98%、99%或100%相同。

[0065] 在一个实施方案中,至少一种蛋白质选自以下或其抗原性片段:

[0066] (a) SEQ ID NO:7(Cj0998c类属)

[0067] MKK(I/V/F)(L/V)(V/A/L)S(V/I)(L/F)S(S/F)CLLASALSAVSFKEDSLK(I/V)SFEGYKTKDM(I/V)G(T/V/I/A)(K/R)GEFKNVEY(K/N)FSK(N/S)(I/T)KD(L/F)ASYLKGA KATI(K/E)PS(N/D)AFM(G/S)EG(N/L)D(I/V)ITNNITKVFVPALLG(D/N)(T/A)DIKVV FQD(V/A/M)I(A/V)

GE-X1ITMDKKSTI (V/I) PLTYTIKD (N/D) KFEAKGQ (L/F) DLH (T/A) FKN (G/A) SKALKALSD (V/A) A (A/T/P) GHGGISWPLVDISFNADL (A/T/V) E

[0068] 其中X1不存在或是

[0069] NKGVISAK (SEQ ID NO:135) ;

[0070] (b) SEQ ID NO:8: (Cj0588类属)

[0071] X1-(L/M) (D/N/E) LL (S/R) EIY (V/I) SRAALKLK (K/N) FLEEN (D/G/N) IE (I/V) (K/N) (H/Q/N) KNCLDIGSSTGGFVQILLEN (Q/K) ALKIT (A/T) LDVG (S/N) NQLH (P/S/L) (S/N) LR (V/A/T) NE (K/I) (I/V) IL (H/Y) EN (T/I) DLR (A/T/V) FKSEKFE (L/F) (V/I) TCDVSFISL (I/V) NLLYY (I/V) (D/N) NLAL (K/R) EIILLFKPQFEVGKN (I/V) KRDKKGVLKD (D/G) (K/R) (A/V) ILKA (R/K) MDFEK (A/E) CAKL (G/S) W (L/F/I) LKNTQKS (S/C) IKGKEGNVEYFYIYIKN

[0072] 其中X1不存在或是

[0073] M (R/I) (F/-) (D/-) FF (V/I) SKRL (N/D) ISRNKALELIE (N/S) EE (I/V) LLNGK (S/N) FKAS (F/C) DVKN (F/L) LENLKK (T/A/K) QDLN (P/L/S) E (D/E) (I/V) (L/Y) L (A/T/S) (N/D/K) (E/G) L (K/N) (SEQ ID NO:136) ; 和

[0074] (c) SEQ ID NO:9 (Cj0248类属)

[0075] (M/-) I (G/-) DMNELLLKSVEVLPLPDTVSKLRKYVSEANSNIETMKV (A/V) EIISSDPLMTAKLLQLANSPYYGFTREITTI (N/S) QVITLLG (V/I) GNIINIV (M/T) ADSI (R/K) D (N/S) FKIDVSPYGL (N/D) T (Q/K) (N/V) FL (K/R) (T/N) CN (E/D) EATFI (A/V/T) NWLNDEKDKLSHLLVPCAMLLRLGIVIFSNFLIQN (H/Y/F) (K/R) -X1

[0076] 其中X1不存在或是

[0077] (D/E) K (D/E) FL (A/T) FLN (-/E/K) (-/T) K (N/S/I)) EN (L/I) ALAENEFLGVDHISFLGFL (H/Y) RWNFD (V/I) LIESICFV (R/H) TPHAARE (K/E) VKKSAYALAITDHLF (A/T) PHDGSSPFN (A/V/T) KAAVALL (K/E) EAK-X2 (SEQ ID NO:137或138) ; 和

[0078] 其中X2不存在或选自

[0079] TQGINFDL (N/D) NLLSKLP (N/S) KAKENL (N/D) (K/E) ED (SEQ ID NO:139) 和

[0080] NSRN (SEQ ID NO:140) 。

[0081] 在多种其他实施方案中,至少一种多核苷酸编码选自SEQ ID NOS:10-106的蛋白质或其抗原性片段。SEQ ID NOS:44-82分别是来自其他空肠弯曲杆菌菌株的Cj0998c蛋白同源物(homolog);SEQ ID NOS:83-106分别是来自其他空肠弯曲杆菌菌株的Cj0588蛋白同源物;并且SEQ ID NOS:10-43分别是来自其他空肠弯曲杆菌菌株的Cj0248蛋白同源物。

[0082] 本发明的这个第二方面的任何实施方案的免疫原性组合物可以包含所述蛋白质的“抗原性部分”。如本文所用,“抗原性部分”是在所述氨基酸序列中具有10个或更多个连续氨基酸的任何片段。在多种其他实施方案中,抗原性部分是具有所述氨基酸序列的15、20、25、30、40、50、75、100、125、150、175、200、225、250或275个连续氨基酸的任何片段。

[0083] 本发明第二方面的免疫原性组合物可以包含以任何合适方式修饰的蛋白质。在一个实施方案中,处理组合物的蛋白质组分以延长体内半寿期,通过例如聚乙二醇化、羟基化、PAS化(PASylation)或糖基化。如认为适宜,蛋白质也可以使用本领域标准技术进行糖基化。在另一个实施方案中,免疫原性组合物中拥有N-糖基化序列(NXS或NXT)的那些蛋白质组分可以糖基化,以帮助进一步刺激免疫反应。

[0084] 本发明第二方面的免疫原性组合物还可以包含任何其他合适的组分,如可用于给定的目的。在各种非限制性实施方案中,组合物还可以包含一种或多种额外的蛋白质或其抗原性片段,所述蛋白质选自包含与SEQ ID NO:142(Cj1534c蛋白)、SEQ ID NO:108(Cj1656c蛋白)、SEQ ID NO:110(Cj0428蛋白)、SEQ ID NO:112(Cj0168c蛋白)、SEQ ID NO:114(Cj0427蛋白)、SEQ ID NO:116(Cj0113蛋白)、SEQ ID NO:118(Cj0982c蛋白)、SEQ ID NO:120(Cj0921c蛋白)、SEQ ID NO:122(Cj1259蛋白)、SEQ ID NO:124(Cj1339c蛋白)、SEQ ID NO:126(Cj0034c蛋白)、SEQ ID NO:128(Cj0404蛋白)、SEQ ID NO:130(Cj0365c蛋白)、SEQ ID NO:132(Cj0755蛋白)和SEQ ID NO:134(Cj0420蛋白)的氨基酸序列至少80%相同的氨基酸序列的蛋白质。与上文提及的免疫原相似,任选的蛋白质免疫原存在于不同空肠弯曲杆菌菌株之间高度保守的变体中,并且因此所述蛋白质可以在所述氨基酸序列或其抗原性片段的全长范围内是至少80%相同。在多种其他实施方案中,由一种或多种表达载体编码的蛋白质在所述氨基酸序列或其抗原性片段的全长范围内至少81%、82%、83%、84%、85%、86%、87%、88%、89%、90%、91%、92%、93%、94%、95%、96%、97%、98%、99%或100%相同。

[0085] 在另一个实施方案中,本发明第二方面的免疫原性组合物还可以包含如WO 2008/008092中所述的空肠弯曲杆菌菌毛蛋白,所述专利通过引用的方式完整并入本文。显示WO 2008/008092中描述的菌毛蛋白刺激针对空肠弯曲杆菌的免疫反应,并且因此它适于纳入本发明第二方面的免疫原性组合物。WO 2008/008092中描述了用于分离空肠弯曲杆菌菌毛蛋白的方法。

[0086] 本发明的免疫原性组合物可以包含任何合适量/剂量的确定为最适宜的组合物。在一个实施方案中,免疫原性组合物包含每个剂量约 10^6 - 10^{10} 个无毒力细菌细胞。在其中组合物包含免疫原性蛋白的另一个实施方案中,该组合物可以包含约0.1 μ g/kg-100mg/kg体重的蛋白质;可选地,它可以是0.5 μ g/kg至50mg/kg;1 μ g/kg至25mg/kg或5 μ g/kg至10mg/kg体重的蛋白质。

[0087] 可以通过本领域已知的任何手段配制本发明的免疫原性组合物(即:本发明第一方面和第二方面的任何实施方案或实施方案组合)。免疫原性组合物一般配制为药物组合物,如上文公开的那些,并且可以配制用于通过任何合适途径施用,所述途径包括经口、(作为注射剂)肠胃外地、通过吸入喷雾剂、鼻内、直肠、粘膜、局部途径,或用于通过经口灌胃或随意饲喂施用,例如,作为液体溶液剂或混悬剂在饮用水中,在含有常规可药用载体、佐剂和溶媒的剂量单位制剂中。如本文所用的术语“肠胃外”包括皮下、静脉内、动脉内、肌内、胸骨内、腱内、椎管内、颅内、胸腔内、输注技术或腹内。也可以制备在注射或其他施用之前适于液体中溶液剂或液体中混悬剂的固态形式。也可以将组合物例如乳化或在脂质体或微粒子中包囊化。免疫原性组合物也可以存在于转基因植物中和/或由转基因植物表达。

[0088] 本发明的免疫原性组合物还可以包含任何合适的佐剂。免疫佐剂通常包括以非特异性方式强化宿主的免疫反应的物质。许多不同的佐剂是本领域已知的。佐剂的例子是弗氏完全佐剂和不完全佐剂、维生素E、非离子型嵌段聚合物和多胺如硫酸葡聚糖、卡波普和吡喃、寡肽、乳化石蜡-EmulsigenTM(MVP Labs,Ralston,Nebr.)、含有氢氧化铝的L80佐剂(Reheis,N.J.)、Quil ATM(Superphos);表面活性物质如SpanTM、TweenTM、十六胺、溶血卵磷脂(lysolecitin)、甲氧基十六烷基甘油和皂素;肽类如胞壁酰二肽、二甲基甘氨酸和促吞

噬肽;免疫刺激复合物 (ISCOMS)、矿物油例如Bayol或Markol、植物油或其乳液、氢氧化铝; N-乙酰基-胞壁酰-L-苏氨酸-D-异谷氨酰胺 (thr-MDP); N-乙酰基-nor-胞壁酰-L-丙氨酸-D-异谷氨酰胺 (CGP11637, 称作nor-MDP); N-乙酰胞壁酰-L-丙氨酸-D-异谷氨酰胺基-L-丙氨酸-2-(1'-2'-二棕榈酰-sn-甘油酰-3-羟基磷酰基氧)-乙胺 (CGP19835A, 称作MTP-PE); 和在2%鲨烯/Tween 80乳液中含有从细菌提取的三种组分: 单磷酸酯类脂A、海藻糖二霉菌酸酯和细胞壁骨架 (MPL+TDM+CWS) 的RIBI。在设计用于粘膜施用的实施方案中, 免疫原性组合还可以包含佐剂, 包括但不限于如无毒霍乱毒素B亚基 (Sigma Chemical Company, St.Louis, Mo.) 和有机金属聚合物, 包括在聚合物末端或沿其长度与粒子或其核芯结合的线型、分枝或交联硅氧烷。这类聚硅氧烷可以在分子量方面从约400道尔顿直至约1,000,000道尔顿变动; 优选的长度范围是从约700道尔顿至约60,000道尔顿。合适的官能化硅氧烷包括 (三烷氧基甲硅烷基) 烷基封端的聚二烷基硅氧烷和三烷氧基甲硅烷基封端的聚二烷基硅氧烷, 例如, 3-(三乙氧基甲硅烷基) 丙基封端的聚二甲基硅氧烷。见通过引用方式并入本文的美国专利号5,571,531。也可以将磷腈 (phosphazene) 聚电解质掺入免疫原性组合中用于粘膜施用 (见, 例如, 美国专利号5,562,909)。

[0089] 本发明的免疫原性组合也可以包含防腐剂如叠氮钠、硫柳汞、庆大霉素、新霉素和多粘菌素。

[0090] 免疫原性组合可以与药学上可接受并与待使用的蛋白质免疫原相容的赋形剂或载体混合。合适的赋形剂包括但不限于水、盐水、右旋糖、甘油、乙醇等及其组合。这种免疫原性组合可以通过将蛋白质与可药用载体混合容易地制备。将可药用载体理解为是一种化合物, 所述化合物没有不利地影响待接种动物的健康, 至少不到这样的程度: 不良作用比动物不接种时所见到的作用更差。可药用载体可以例如是无菌水或无菌生理盐溶液。在更复杂的形式中, 载体可以是例如缓冲液。

[0091] 免疫原性组合还可以包含稳定剂, 例如以保护易降解组分免遭降解, 以增强组合物的货架期, 或以改善冷冻干燥效率。有用的稳定剂包括而不限于SPGA、脱脂乳、明胶、牛血清白蛋白或其他血清白蛋白、碳水化合物例如山梨醇、甘露醇、海藻糖、淀粉、蔗糖、葡聚糖或葡萄糖、蛋白质如白蛋白或酪蛋白或其降解产物和缓冲剂如碱金属磷酸盐。在使用白蛋白的情况下, 它合乎需要地来自与将施用含有白蛋白的免疫原性组合物的动物 (或人) 相同的物种。冷冻干燥是一种高效保存方法。冻干的材料可以稳定储存许多年。冻干材料的储存温度可以完全高于零度, 而不损害该材料。冷冻干燥可以根据全部熟知的标准冷冻干燥方法进行。然而, 本发明的免疫原性组合可以按任何适合的方式储存。例如, 可以将免疫原性组合冻干或稳定化并储存在食品或水中用于运输。

[0092] 在设计免疫原性组合用于施用至非人类受试者如鸡、火鸡、鸟、羊、猪、牛、犬或猫的一个示例性实施方案中, 将免疫原性组合配制用于粘膜施用, 如通过将组合与饮用水或食物混合, 或混合用作喷雾剂, 以在动物上方喷雾以便动物在梳理行为期间摄入免疫原性组合。然而, 任何合适的施用方法可以用于任何受试者。因而, 在多种实施方案中将免疫原性组合配制用于眼内、鼻内或经皮施用。

[0093] 在第三方面, 本发明提供用于刺激针对弯曲杆菌的免疫反应的方法, 所述方法包括向受试者施用有效量的根据本发明第一方面或第二方面的任何实施方案或实施方案组合的免疫原性组合以产生针对弯曲杆菌的免疫反应。

[0094] 在第四方面,本发明提供用于减少受试者中弯曲杆菌肠道定居的方法,包括施用有效量的根据本发明第一方面或第二方面的任何实施方案或实施方案组合的免疫原性组合物以减少受试者中的弯曲杆菌肠道定居。

[0095] 如本文中公开,发明人已经从空肠弯曲杆菌鉴定了三个新的推定性毒力基因(Cj0248、Cj0588和Cj0998c),所述基因编码来自细菌外膜的新蛋白质。发明人已经进一步发现,Cj0998c蛋白、Cj0588蛋白和Cj0248蛋白的每一者均是刺激针对空肠弯曲杆菌的有效免疫反应的强力免疫原。例如,如本文中详细公开,与未接种的对照禽的盲肠内容物中空肠弯曲杆菌数目相比时,采用表达Cj0988c蛋白的载体的两个独立鸡接种试验显示攻击后禽中的空肠弯曲杆菌数目降低平均2.5个对数CFU(几何平均数3个对数)。另外,接种试验显示鸡的盲肠内容物中空肠弯曲杆菌显著减少(1-4个对数)(采用异源菌株时1个对数并且采用同源菌株时4个对数),所述鸡用表达Cj0588蛋白的载体接种并攻击。每种蛋白质最初从空肠弯曲杆菌生物被膜的外膜(OMP)提取分离。

[0096] 弯曲杆菌病是通常主要由空肠弯曲杆菌引起的食源性疾病。罹患本疾病的主要风险因素是处置和消费家禽。然而,弯曲杆菌如空肠弯曲杆菌定居于家禽的流行病学是极端复杂的。禽在孵化14日以内被定居,在成长期末传播感染遍及群体。基于亚型和/或基因分型分析,在群体之间和在群体内部存在菌株差异。虽然一些群体保持不带弯曲杆菌,但是截至成长时,大部分群体具有50-100%定居的禽。然而,肉鸡(broiler)(即,根据重量在约5至8周龄待屠宰肉用的任一性别的鸡)遭弯曲杆菌如空肠弯曲杆菌污染,并且虽然这种微生物充当鸡中的正常菌群,但是轻微烹制的鸡是向人传播弯曲杆菌如空肠弯曲杆菌的主要媒介并且仍是明显的公共卫生问题。

[0097] 该方法可以对面临弯曲杆菌感染风险的任何合适受试者使用,所述受试者包括但不限于脊椎动物如鸡、火鸡、鸟、牛、羊、猪、犬、猫和人。在一个非限制性实施方案中,人类受试者可以是消费鸡肉、牛肉、火鸡或猪肉的任何人。在另一个实施方案中,人类受试者可以是与动物如鸡、火鸡、牛、羊和猪一起工作的一位受试者(即:农场工人、在屠宰场和肉类加工厂的工人等)。

[0098] 在另一个实施方案中,受试者是饲养动物如鸡、火鸡、牛、羊和猪。在一个优选的实施例中,受试者是人。在这些实施方案中,饲养动物可以具有任何合适的年龄。禽在孵化14日以内被空肠弯曲杆菌定居,在成长期之末传播感染遍及群体。因而,在一个实施方案中,这些方法在孵化后截至约14日开始实施。本领域技术人员将理解,可能在初始施用后需要额外的增强施用;这类增强施用可以在任何合适的时间实施,如截至孵化后约21日。

[0099] 在其中受试者是饲养动物的另一个非限制性实施方案中,这些方法在屠宰之前实施。然而,应当理解如果对给定用途适宜,则这些方法可以在任何合适的时间对鸡或火鸡使用。

[0100] 弯曲杆菌病目前是美国在人类中最常见的细菌性食源疾病之一并且是每年在美国造成估计130万病例的原因,经常伴发急性胃肠炎。疾病正在形成时的感染剂量是可变的并且范围从500至 10^6 个生物。感染剂量的变异据信归因于个体易感性或归因于该生物的相对毒力。潜伏时间是1日至7日,临床症状包括发热、严重腹部痉挛和志贺菌病常见的水样腹泻或痢疾样综合征。本病通常是自限性的,持续2日至7日,但是偶尔是致命的(每年120-360例死亡),主要地在婴儿和青少年中致命。严重并发症如关节炎出现于估计的1-5%病例中

并且Guillain-Barre综合征(神经肌肉瘫痪的一种形式)以每1,000位患者1例的比率出现。

[0101] 相反,弯曲杆菌如空肠弯曲杆菌作为共生物在不产生任何明显疾病体征的情况下定居于家禽。类似地,弯曲杆菌如空肠弯曲杆菌也可以作为共生物定居于其他饲养动物。但是,感染的牛可以遭遇腹泻、体重减轻并遭遇发热和增加的心率。

[0102] 本发明第三方面和第四方面的方法可以用来刺激针对弯曲杆菌属任何物种定居肠道的免疫反应或减少这种肠道定居。在优选的实施方案中,本发明第三方面和第四方面的方法用来刺激针对弯曲杆菌变异物种定居肠道的免疫反应或用来减少这种肠道定居,所述弯曲杆菌变异物种包括但不限于空肠弯曲杆菌、大肠弯曲杆菌(*C.coli*)、红嘴鸥弯曲杆菌(*C.lari*)和/或乌普萨拉弯曲杆菌(*C.upsaliensis*)。

[0103] 如本文所用,用于“刺激免疫反应”的方法对天然免疫或适应性免疫系统的细胞产生一种或多种影响(例如,成熟、增殖、直接呈递或交叉呈递抗原、基因表达谱)。例如,免疫反应可以涉及、影响天然免疫细胞或在其中检测到,所述天然免疫细胞例如是树突细胞、单核细胞、巨噬细胞、天然杀伤细胞和/或粒细胞(例如,嗜中性粒细胞、嗜碱性粒细胞或嗜酸性粒细胞)。免疫反应可以涉及、影响适应性免疫细胞或在其中检测到,所述适应性免疫细胞例如包括淋巴细胞(例如,T细胞和/或B细胞)。可以通过检测这类涉及或影响观察到免疫反应,所述涉及或影响例如包括,一种或多种免疫调节物的表达或活性的存在、不存在或改变(例如,增加或减少)。免疫反应可以刺激从头抗体反应或先前检测不到的抗体反应,或通过例如引起增加的抗体反应(例如,抗体的量、增加的亲和性/亲合力)或增加的细胞反应(例如,增加的活化T细胞数目和/或增加的T细胞受体的亲和性/亲合力),增强或抑制针对免疫原的现存应答。在某些实施方案中,免疫反应可以是保护性的,意指这种免疫反应可以能够阻止空肠弯曲杆菌感染的起始或持续或空肠弯曲杆菌在宿主内部生长和/或能够从宿主消除空肠弯曲杆菌。在一些情况下,从宿主消除病原体可以意味着该方法具有治疗性,从而该方法用来治疗已经被空肠弯曲杆菌感染的受试者。当该方法具有治疗性时,方法可以包括治疗空肠弯曲杆菌感染,其中“治疗”意指实现以下一项或多项:(a)减少感染的严重性;(b)限制或阻止作为该感染之特征的症状形成;(c)抑制作为该感染之特征的症状加重;(d)在先前已经具有感染的受试者中限制或防止疾病复发;和(e)在先前出现感染症状的受试者中限制或防止症状的复发。

[0104] 如本文所用,“减少弯曲杆菌肠道定居”意指减少在不施用本发明的一种或多种免疫原性组合物的情况下本来在受试者中会观察到的肠道定居水平。任何水平的减少有益于减少弯曲杆菌传播,例如,从家禽向消费家禽的人传播。在一个实施方案中,减少包括与不治疗的情况下的肠道定居相比,肠道定居减少至少10%;在多种其他实施方案中,与不治疗的情况下的肠道定居相比,肠道定居减少至少20%、25%、50%、75%、80%、85%、90%、95%或更多。用于定量弯曲杆菌肠道定居水平的技术是本领域熟知的并且包括但不限于检查盲肠或粪便的弯曲杆菌水平。也建立了在多个加工点(如冷却后)确定生产中粪便性弯曲杆菌污染以定量来自饲养动物(如家禽)的胴体淋洗的弯曲杆菌生物水平的技术。

[0105] 在本发明的第三方面和第四方面的优选实施方案中,一种或多种表达载体存在于载体细胞中,所述载体细胞包括但不限于非弯曲杆菌属细菌载体细胞。在多种非限制性实施方案中,细菌载体细胞是选自减毒单核增生李斯特菌、减毒沙门氏菌属物种、减毒霍乱弧菌、减毒志贺氏菌属物种、减毒牛分支杆菌卡介苗、减毒小肠结肠炎耶尔森氏菌、减毒炭疽

芽孢杆菌、戈登链球菌、乳杆菌属物种和葡萄球菌属物种的无毒力细菌细胞。在一个实施方案中,使用减毒沙门氏菌物种。在示例性实施方案中,可以使用的沙门氏菌包括但不限于肠道沙门氏菌菌株,其选自鼠伤寒沙门氏菌、肠炎沙门氏菌、海德堡沙门氏菌、鸡伤寒沙门氏菌、哈达尔沙门氏菌、阿贡纳沙门氏菌、肯塔基沙门氏菌、伤寒沙门氏菌、副伤寒沙门氏菌和婴儿沙门氏菌。鼠伤寒沙门氏菌特别地可用于接种目的,因为其基因组序列充分表征并且许多动物研究证实其安全的医学用途。已经构建重组减毒沙门氏菌疫苗(RASV)以递送来自其他病原体的抗原以在接种的宿主中诱导针对这些病原体的免疫力;见,例如,Curtiss等人,Crit Rev Immunol.2010;30(3):255-70;2010;Qiu等人,J.Virological Methods 188:108;Strugnell等人,Infect.Immunol.1992,60:3994;Layton等人,Clinical and Vaccine Immunology march 2011,449-454;Al-Ojali等人,Microbial Pathogenesis 52:326(2012);和Wyszyńska等人,(2004)。在一个实施方案中,RASV包含在pmi、fur和crp基因和US 8,133,493中的致弱突变。在另一个实施方案中,RASV包含US 8,133,493中公开的x9992载体。在另一个实施方案中,RASV是可商业获得的那一种,如**Megan®Vac1** (Lohman Animal Health,US)。

[0106] 免疫原性组合物可以通过任何合适途径施用,所述途径包括经口、(作为注射剂)肠胃外、通过吸入喷雾剂、鼻内、直肠、粘膜、局部途径,或通过经口灌胃或随意饲喂施用,例如,作为液体溶液剂或混悬剂在饮用水中,在含有常规可药用载体、佐剂和溶媒的剂量单位制剂中。如本文所用的术语“肠胃外”包括皮下、静脉内、动脉内、肌内、胸骨内、腱内、椎管内、颅内、胸腔内、输注技术或腹内。也可以制备在注射或其他施用之前适于液体中溶液剂或液体中混悬剂的固态形式。也可以将组合物例如乳化或在脂质体中包囊化。

[0107] 在受试者是非人类受试者如鸡、火鸡、鸟、羊、猪、牛、犬或猫时的一个示例性实施方案中,将免疫原性组合物经口或按粘膜方式施用,如通过将组合物与饮用水或食物混合,或混合用作喷雾剂,以在动物上方喷雾以便动物在梳理行为期间摄入免疫原性组合物。在其中受试者是人的示例性实施方案中,将免疫原性组合物经口或按粘膜方式施用。然而,任何合适的施用方法可以用于任何受试者。

[0108] 免疫原性组合物以与剂型相容的方式并且以这种量和方式施用,从而根据本领域已知,该组合物将在预防和/或治疗上有效。待施用的量取决于待治疗的受试者、受试者免疫系统的功能能力、所需的保护程度和其他因素。需要施用的有效成分的精确量可以取决于施用该免疫原性组合物的个体的判断并且可以对每位个体是独特的,但是基于本文中的教导,这种决定处于本领域技术人员的能力范围内。在一个实施方案中,可以施用每个剂量约 10^6 - 10^{10} 个无毒力细菌细胞。在施用免疫原性蛋白的另一个实施方案中,合适的剂量范围可以例如是 $0.1\mu\text{g/kg}$ - 100mg/kg 体重;可选地,它可以是 $0.5\mu\text{g/kg}$ 至 50mg/kg ; $1\mu\text{g/kg}$ 至 25mg/kg ,或 $5\mu\text{g/kg}$ 至 10mg/kg 体重。

[0109] 如确定为最适宜,免疫原性组合物可以按单剂量或多剂量施用,如一个双剂量方案,例如相隔2周至8周;或多次剂量方案或其他疫苗组合。多剂量方案是这样一种方案,其中首次接种过程可以包括1至10个或更多个分立剂量,随后是以所需要的后续时间间隔施用的其他剂量以维持和/或强化免疫反应,例如,在1至4个月施用第二个剂量,并且如果需要,在几个月后施用后续剂量。

[0110] 实施例1基于Cj0988c的免疫原性组合物

[0111] Cj0988c的DNA序列和蛋白质序列分别在SEQ ID NO:1和SEQ ID NO:2中提供。

[0112] 鼠伤寒沙门氏菌载体x9992:

[0113] 所用的载体是鼠伤寒沙门氏菌载体x9992(Curtiss等人,2009),其含有8个突变,其中三个突变是致弱性的:pmi基因、fur基因和crp基因。

[0114] 1) Δ pmi-2426-消除在甘露糖不存下终止LPS-O抗原合成的磷酸甘露糖异构酶;

[0115] 2) Δ gmd-fcl-减少生物被膜形成并阻止辅助asdA突变体存活的结缔酸形成;

[0116] 3) Δ asdA27-缺失编码对二氨基庚二酸(DAP)而言必需的酶的基因。菌株需要补充性DAP直至质粒引入。这些消除需要抗生素耐药性标记;

[0117] 4) Δ P_{fur77::TT araC} P_{BAD fur::TT araC} P_{BAD c2} Δ P_{crp527::TTaraC} P_{BAD crp}-仅在阿拉伯糖存在的情况下允许fur和crp基因表达,产生pYA3493(图1),一种在细胞分裂后显示减毒表型之前具有最大侵入性的菌株;

[0118] 5) Δ relA198::araC P_{BAD lacI} TT-消除relA基因以使生长与蛋白质合成解偶联并且提供LacI阻遏蛋白的阿拉伯糖依赖性合成以造成受调节的重组蛋白体内合成延迟,和

[0119] 6) Δ araE25 Δ araBAD23-消除沙门氏菌代谢阿拉伯糖的能力。允许阿拉伯糖在不利用的情况下留在细胞质中。

[0120] 载体质粒pYA3493含有asd基因以支持染色体性 Δ asdA27突变并确保该质粒将不在体内丢失。该质粒还使表达产物与 β -内酰胺酶信号序列融合以便蛋白质的周质分泌。最后,该质粒具有在P_{trc}中的强启动子(trp启动子-35区/lac启动子-10区)(图.1)。使用这个质粒不向沙门氏菌疫苗赋予抗生素耐药性。

[0121] 我们用于扩增质粒连同插入的空肠弯曲杆菌基因的载体是大肠杆菌x6212。这个菌株是Asd-允许扩增该质粒,随后将所述质粒提取并电穿孔至沙门氏菌x9992中。

[0122] 基因Cj0998c表达一种假定蛋白,所述假定蛋白是细菌外膜的部分。将基因Cj0998c单独克隆至质粒pYA3493中并且从沙门氏菌载体x9992表达。

[0123] A.Cj0998c基因克隆至沙门氏菌载体中

[0124] 作为载体使用的沙门氏菌菌株(x9992)具有导致其减毒的三个不同突变。该菌株安全并有免疫原性并且在免疫时充当表型上野生型的菌株,但在定居宿主组织后变得减毒。该质粒含有asd基因,所述asd基因因为使用不含DAP的培育含有质粒的菌株的培养基进行实验室区分提供标记。由于这个基因是载体在无DAP的情况下存活所需要的,所以在体内定居期间,质粒在载体中维持。将基因Cj0998c克隆至沙门氏菌x9992中。基本上,设计针对每个基因的引物并使用PCR扩增基因。将每种基因产物插入质粒pYA3493(asd⁺)中,克隆至大肠杆菌x6212(asd⁻)中并培养以便扩增。在培育后,将质粒从大肠杆菌菌株提取,克隆至鼠伤寒沙门氏菌载体中,并且将转化体涂布在无DAP的LB培养基上,在37℃在LB琼脂上培养,收获,并在-80℃冷冻贮藏。通过质粒提取和基因的序列分析,接着PCR和凝胶电泳,证实该基因存在于载体中。

[0125] B.体外培育沙门氏菌

[0126] 将表达Cj0998c蛋白的沙门氏菌载体和沙门氏菌空载体在37℃伴随振摇在补充有0.1%葡萄糖、0.05%甘露糖和0.1%阿拉伯糖的Luria Bertani(LB)培养液中培育24小时。在温育后,将过夜培养物沉淀并重悬于PBS中至终浓度 1×10^{10} CFU/ml。

[0127] C.接种家禽

[0128] 与未接种的对照禽的盲肠内空肠弯曲杆菌数相比时,用表达Cj0988c蛋白的沙门氏菌载体接种鸡2次降低禽中盲肠内空肠弯曲杆菌数平均2.5个对数CFU(几何平均数3.0个对数CFU)(表1)。在检查的31只禽中存在一个离群值1.00E+07(突出显示的细胞,表3)。Cornish X Rock鸡从McMurray Hatchery (IA) 获得并随机分配至独立的组。对鸡筛查粪便的空肠弯曲杆菌和/或沙门氏菌存在。将鸡在第10日和第16日用1ml表达Cj0988c蛋白的沙门氏菌载体(约 10^{10} CFU/ml)或沙门氏菌空载体经口接种,并且在第二次接种后10日用 10^5 CFU/ml的空肠弯曲杆菌菌株NCTC11168攻击。在接种和攻击之前,使鸡禁食8小时。接种/攻击后1小时恢复供食。除了这段时间外,食物和水是可随意获得的。在攻击感染后10日对鸡进行尸体剖检。将盲肠内容物稀释10倍并直接铺种在改良Campy Cefex琼脂平板上,所述琼脂平板在10%CO₂微需氧条件温育48小时用于弯曲杆菌计数。

[0129] 表1. 接种试验1和2的空肠弯曲杆菌合并数据

空肠弯曲杆菌 NCTC11168 攻击-试验 1 和 2			
	<i>Cj0998c</i>	对照-EV	对照
平均数	6.11E+05	6.75E+07	1.15E+08
几何均值	2.60E+04	4.41E+07	4.83E+07

[0131] 表2. 接种试验1-用表达基因Cj0998c的载体或仅沙门氏菌空载体(对照-EV) 接种2次的10日龄鸡或未接种的对照

空肠弯曲杆菌 NCTC11168 攻击-试验 1			
	<i>Cj0998c</i>	对照-EV	对照
	1.0E+03	1.0E+07	3.0E+08
	7.0E+04	1.2E+07	6.0E+07
	7.4E+04	1.0E+08	1.0E+07
	8.2E+04	2.0E+08	1.0E+07
	1.0E+04	7.0E+07	2.0E+08
	2.0E+04	9.0E+07	2.0E+07
	3.0E+04	1.0E+08	4.0E+08
	2.0E+03	1.0E+08	1.2E+08
	6.0E+04	2.0E+07	1.0E+07
	3.0E+04	1.0E+07	2.0E+07
平均数	3.79E+04	7.12E+07	1.15E+08
几何均值	1.98E+04	4.45E+07	4.83E+07

[0133] 表3. 接种试验2-用表达基因Cj0998c的载体(两个组)或仅沙门氏菌空载体(对照-EV) 接种2次的10日龄鸡

[0134]

空肠弯曲杆菌 NCTC11168 攻击-试验 2			
	<i>Cj0998c</i>	<i>Cj0998c</i>	对照-EV
	1.40E+04	2.00E+05	5.00E+07
	3.20E+03	1.70E+05	3.00E+07
	7.00E+04	3.00E+04	2.00E+07
	1.00E+02	2.70E+05	1.70E+08
	7.00E+04	3.00E+05	3.00E+07
	9.00E+03	2.40E+04	
	1.05E+04	1.50E+04	
	1.00E+00	5.00E+06	
	6.00E+03	2.30E+06	
	3.00E+03	1.00E+07	
	6.00E+04		
平均数	2.23E+04	1.83E+06	6.00E+07
几何平均数	3.78E+03	2.84E+05	4.33E+07

[0135] 实施例2. 基于Cj0588和Cj0248的免疫原性组合物

[0136] 1. Cj0588的DNA序列和蛋白质序列分别在SEQ ID NO:3和SEQ ID NO:4中提供。

[0137] 2. Cj0248的DNA序列和蛋白质序列分别在SEQ ID NO:5和SEQ ID NO:6中提供。

[0138] 3. 空肠弯曲杆菌基因的突变

[0139] 将基因Cj0588和Cj0248克隆并且通过在每个基因的中心插入氯霉素盒进行突变。基本上, 针对每种基因设计两组引物以产生由基因的初始15个碱基和终末15个碱基及其相关侧翼区组成的片段。将这些片段克隆至自杀载体中并安置在氯霉素乙酰转移酶 (CAT) 基因附近, 从而该抗生素盒处于基因的初始区域和末端区域之间, 占据每种基因约255个碱基。随后将含有CAT基因和每种基因的侧翼碱基的载体通过电穿孔引入空肠弯曲杆菌菌株M129 (Cj0588) 或菌株NCTC11168 (Cj0248) 中, 并且通过双交换将突变转移至基因组中。在电穿孔后, 将突变株铺种在含有氯霉素的Mueller Hinton琼脂上。随后通过PCR证实在选择性培养基上生长的菌落在染色体中含有处于正确方向的表达盒。随后收获菌落并贮存在-78℃。

[0140] 4. Cj0588突变对肉鸡定居的影响。

[0141] 对 Δ Cj0588突变体和M129空肠弯曲杆菌亲本菌株各自检验在家禽中的定居性状。实施4项独立研究。检测限是小于10个生物。在用M129::tlyA突变体接种的禽的定居方面存在显著减少, 表明空肠弯曲杆菌Cj0588基因在家禽的定居中是重要的。

[0142] 研究1:

[0143] 获得鸡并如上圈养。在第12日, 将鸡用1.0ml每毫升大约 1.0×10^5 个活空肠弯曲杆菌M129和M129::tlyA突变体经口接种。在第22日对禽进行尸体剖检, 并如上计数弯曲杆菌。在用M129::tlyA突变体接种的禽的定居方面存在显著减少。

[0144] 表4. 空肠弯曲杆菌亲本M129和M129::tlyA菌株对鸡的定居。

[0145]

M129::tlyA	M129::tlyA	M129	M129
52	ND	73	1.00E+02

53	ND	74	ND
54	ND	75	2.00E+02
55	ND	76	ND
56	ND	77	4.20E+03
57	ND	78	ND
58	ND	79	ND
59	ND	80	ND
60	ND	81	1.20E+04
61	ND	82	1.00E+04
总计	ND	平均数	5.30E+03

[0146] 研究2:

[0147] 获得鸡并如上圈养。在第14日,将禽用1.0ml每毫升大约 1.0×10^6 个活空肠弯曲杆菌M129和M129::tlyA突变体经口接种。在第28日对禽进行尸体剖检,并如上计数弯曲杆菌。在用M129::tlyA突变体接种的禽的定居方面存在显著减少。

[0148] 表5.空肠弯曲杆菌亲本M129和M129::tlyA菌株对鸡的定居。

[0149]

M129::tlyA	M129::tlyA	M129	M129
1	ND	1	2.30E+05
2	ND	2	1.40E+05
3	ND	3	1.50E+03
4	ND	4	ND
5	ND	5	ND
6	ND	6	1.30E+06
7	ND	7	ND
8	ND	8	1.90E+03
9	ND	9	1.80E+03
10	ND	10	ND
11	ND	11	8.70E+03
12	ND	12	ND

[0150]

13	ND	13	1.70E+03
14	ND	14	1.70E+03
15	ND	15	ND
16	ND	16	3.60E+03
17	ND	17	3.10E+03
总计	ND	平均数	1.54E+05

[0151] 研究3:

[0152] 获得鸡并如上圈养。在第14日,将禽用1.0ml每毫升大约 1.0×10^8 个活空肠弯曲杆菌M129和M129::tlyA突变体经口接种。在第28日对禽进行尸体剖检,并如上计数弯曲杆菌。

在用M129::tlyA突变体接种的禽的定居方面存在显著减少。

[0153] 表6.空肠弯曲杆菌亲本M129和M129::tlyA菌株对鸡的定居。

[0154]

M129::tlyA	M129::tlyA	M129	M129
1	ND	1	9.40E+04
2	ND	2	2.10E+03
3	ND	3	2.10E+03
4	ND	4	1.00E+02
5	ND	5	4.70E+03
6	ND	6	2.60E+07
7	ND	7	3.70E+03
8	ND	8	1.10E+03
9	ND	9	4.00E+03
10	ND	10	2.70E+03
11	ND	11	2.80E+03
12	ND	12	1.50E+04
13	ND	13	2.10E+03
14	ND	14	1.10E+03
15	ND	15	1.50E+05
16	ND	16	5.10E+03
		17	2.00E+02
总计	ND	平均数	1.55E+06

[0155] 研究4

[0156] 获得鸡并如上圈养。在第14日,将禽用1.0ml每毫升大约 1.0×10^8 个活空肠弯曲杆菌M129和M129::tlyA突变体经口接种。在第28日对禽进行尸体剖检,并如上计数弯曲杆菌。在用M129::tlyA突变体接种的禽的定居方面存在显著减少。

[0157] 表7.空肠弯曲杆菌亲本M129和M129::tlyA菌株对鸡的定居。

[0158]

M129::tlyA	M129::tlyA	M129	M129
1	ND	1	1.10E+03
2	ND	2	2.00E+04
3	ND	3	ND
4	ND	4	1.00E+02
5	ND	5	4.30E+03
6	ND	6	2.30E+03
7	ND	7	1.00E+02
8	ND	8	3.00E+02
9	ND	9	1.00E+02
10	ND	10	ND

11	ND	11	2.30E+03
12	ND	12	2.80E+03
13	ND	13	1.70E+06
14	ND	14	1.10E+03
15	ND	15	1.50E+03
16	ND	16	2.80E+03
17	ND	17	1.10E+04
18	ND	18	1.10E+03
19	ND	19	7.00E+02
20	ND	20	2.50E+05
21	ND	21	1.10E+06
22	ND	22	ND
23	ND	23	4.80E+03
总计	ND	平均数	1.35E+05

[0159] 5. Δ Cj0248突变对肉鸡定居的影响。

[0160] 对 Δ Cj0248突变体和NCTC11168空肠弯曲杆菌亲本菌株检验在家禽中的定居性状。获得鸡并如上圈养。在第14日,将禽用0.5ml每毫升大约 1.0×10^5 个活空肠弯曲杆菌菌株NCTC11168 ($n=31$)、 Δ Cj0248突变株 ($n=30$) 经口接种或充当阴性对照。在第24日对禽进行尸体剖检,并如上计数弯曲杆菌。在用 Δ Cj0248突变菌株接种的禽的定居方面存在显著减少。用野生型菌株NCTC11168接种的全部禽以平均数 $7.42E+07$ CFU/g被空肠弯曲杆菌突变株 Δ Cj0248定居,而30只禽中3只(<10 CFU) 平均数 $7.33E+01$ CFU/g被空肠弯曲杆菌突变株 Δ Cj0248定居(表8)。

[0161]

表 8.空肠弯曲杆菌 NCTC11168 野生型和突变体对肉鸡的定居						
	NCTC11168 野生型			NCTC11168 突变体 <i>Cj0248</i>		
对照	组 1	组 2	组 3	组 1	组 2	组 3
ND	3.30E+07	2.30E+08	4.60E+05	ND	ND	2.00E+02
ND	4.10E+08	3.20E+07	8.00E+03	ND	ND	ND
ND	1.60E+07	4.20E+05	1.00E+04	ND	1.90E+03	ND
ND	2.40E+07	7.10E+07	1.20E+04	ND	ND	ND
ND	9.30E+05	8.20E+04	3.40E+07	ND	ND	1.00E+02
ND	2.00E+06	9.50E+07	3.30E+05	ND	ND	ND
ND	1.40E+07	5.00E+06	3.10E+07	ND	ND	ND
ND	9.50E+08	5.30E+07	1.50E+06	ND	ND	ND
ND	5.90E+07	8.30E+07	1.00E+02	ND	ND	ND
ND	2.40E+07	2.30E+04	3.10E+03	ND	ND	
-	1.30E+08			ND		
平均数	1.51E+08	5.70E+07	6.73E+06	ND	1.90E+02	3.33E+01
	平均数: 野生型 $7.42E+07$; 突变体 $7.33E+01$; ND=未检测到, <10 CFU					

[0162] 6. 鼠伤寒沙门氏菌载体x9992:

[0163] 使用的载体是如上文所述的鼠伤寒沙门氏菌载体x9992。

[0164] 7. 空肠弯曲杆菌基因克隆至沙门氏菌载体中和在其中的表达。

[0165] 将两个基因Cj0588和Cj0248克隆至载体质粒pYA3493中并从减毒鼠伤寒沙门氏菌载体x9992表达,如上文所述。

[0166] 8. 用从质粒pYA3493表达Cj0588的减毒沙门氏菌载体接种鸡。

[0167] 如上获得鸡、圈养并接种。在末次接种后第10日,将试验1鸡用1.0ml同源空肠弯曲杆菌菌株M129 (约 1×10^7 CFU/ml) 经口攻击,并且将试验2鸡用1.0ml异源菌株空肠弯曲杆菌NCTC11168 (约 1×10^5 CFU/ml) 经口攻击。攻击后10日,对鸡进行尸体剖检鸡,并如上计数弯曲杆菌。

[0168] 在试验1中,与接受空载体 (EV) 疫苗的鸡相比,用同源M129菌株攻击后观察到用表达Cj0588蛋白的载体接种的鸡的盲肠内容物中空肠弯曲杆菌减少4个对数。与正常对照相比,当接种Cj0588时观察到空肠弯曲杆菌减少2个对数。在试验2中,与接受EV疫苗的鸡相比,用异源菌株NCTC11168攻击后观察到用Cj0588蛋白接种的鸡的盲肠内容物中空肠弯曲杆菌总体减少1个对数。这些试验展示在用表达Cj0588蛋白的载体接种并用同源菌株攻击的鸡的盲肠内容物中空肠弯曲杆菌显著减少。此外,在用异源菌株攻击的鸡中见到1个对数减少。如果不是因为三个离群值 (阴影框),更大减少本将出现在试验2中 (表9)。

[0169]

表 9. 接种(Cj0588)鸡和对照鸡中的盲肠内空肠弯曲杆菌数									
空肠弯曲杆菌 M129 攻击-试验 1					空肠弯曲杆菌 NCTC11168 攻击-试验 2				
Cj0588	对照-EV	对照		Cj0588	Cj0588	Cj0588	Cj0588	对照-EV	
6.00E+03	1.00E+04	2.00E+04		1.10E+03	5.00E+03	1.20E+05	5.00E+07		
7.00E+02	2.00E+04	7.00E+04		1.50E+03	9.00E+04	1.00E+00	3.00E+07		
7.00E+03	1.00E+04	1.00E+05		1.00E+02	3.00E+03	1.20E+04	2.00E+07		
3.30E+03	1.00E+05	3.00E+04		1.00E+02	1.00E+00	6.00E+04	1.70E+08		
2.00E+02	3.00E+04	3.00E+04		5.00E+03	4.00E+01	1.00E+02	3.00E+07		
7.00E+02	3.00E+04	7.00E+04		1.00E+03	3.00E+07	4.00E+07			
8.00E+03	1.00E+04	1.00E+04		2.00E+03	5.00E+01	2.70E+04			
3.00E+03	3.00E+04	1.00E+06		7.00E+02	1.70E+04	6.00E+02			
3.00E+03	3.00E+04	1.00E+04		2.00E+01	5.00E+07	7.00E+04			
3.20E+03	5.00E+04	1.00E+04		5.00E+04	2.00E+02	1.20E+05			
1.00E+03	2.30E+04	3.50E+05		7.00E+01	1.00E+00	2.00E+04			
4.00E+03	1.00E+04	7.00E+04		5.60E+03	1.00E+00	2.00E+04			
6.80E+03	1.00E+04	2.10E+06	平均数	5.60E+03	6.68E+06	3.37E+06	6.00E+07		
			几何						
2.30E+03	3.00E+08	7.00E+04	平均数	7.73E+02	1.24E+03	1.28E+04	4.33E+07		
1.40E+03	1.00E+04	3.00E+05							
7.00E+03		6.00E+05	联合试验 2 数据						
				Cj0588			对照-EV		
平均数	3.60E+03	2.00E+07	平均数	3.35E+06			6.00E+07		
几何			几何						
平均数	2.47E+03	3.83E+04	平均数	2.31E+03			4.33E+07		

[0170] 实施例3. 使用Cj0998c和Cj0588的双接种

[0171] 获得鸡, 圈养并如上接种, 例外是每只鸡在每次接种接受2ml疫苗, 每种抗原1ml。在末次接种后第10日, 将鸡用1.0ml同源空肠弯曲杆菌菌株NCTC11168 (约 1×10^5 CFU/ml) 经口攻击。攻击后10日, 对鸡进行尸体剖检鸡, 并如上计数弯曲杆菌。与空载体对照组和阳性对照组相比, 一个接种组显示弯曲杆菌定居的几乎总计约7个对数减少, 而在其他基团中定

居减少约1个对数。

[0172] 实施例4.使用Cj0998c的饮水接种

[0173] 如上获得鸡并圈养,例外是在接种前不遵循禁食期并且在接种之前2小时移走饮水。在第10日和第16日,将约 1×10^{10} cfu表达Cj0998c的沙门氏菌(如上制备)添加至可商业获得的喷泉饮水器中的约2L水。当全部疫苗已经耗尽时(8-12小时)恢复饮水。对照经口接受约 1×10^{10} cfu空载体沙门氏菌或不接受疫苗。在末次接种后第10日,将鸡用1.0ml同源空肠弯曲杆菌菌株NCTC11168(约 1×10^5 CFU/ml)经口攻击。在第36日,对鸡进行尸体剖检并如上计数弯曲杆菌。与空载体对照组和阳性对照组相比,接种组中弯曲杆菌定居减少大约2.5个对数。

[0174] 参考文献

[0175] Kong, Q., Six, D.A., Roland, K.L., Liu, Q., Gu, L., Reynolds, C.M., Wang, X., Raetz, C.R., Curtiss, R., 3rd, 2011. Salmonella synthesizing 1-dephosphorylated [corrected] lipopolysaccharide exhibits low endotoxic activity while retaining its immunogenicity. J Immunol 187, 412-423.

[0176] Wyszynska, A., Raczko, A., Lis, M., Jagusztyn-Krynicka, E.K., 2004. Oral immunization of chickens with avirulent Salmonella vaccine strain carrying C.jejuni 72Dz/92cjaA gene elicits specific humoral immune response associated with protection against challenge with wild-type Campylobacter. Vaccine 22, 1379-1389.

[0177] Scallan E, Hoekstra RM, Angulo FJ, Tauxe RV, Widdowson MA, Roy SL, et al. Foodborne illness acquired in the United States--major pathogens. Emerging infectious diseases. 2011; 17(1): 7-15. Epub 2011/01/05. doi:10.3201/eid1701.091101p1. PubMed PMID: 21192848.

[0178] Buzby JC, Allos BM, Roberts T. The economic burden of Campylobacter-associated Guillain-Barre syndrome. Journal of Infectious Diseases. 1997; 176: S192-S7. PubMed PMID: ISI:A1997YH50600023.

[0179] Pope JE, Krizova A, Garg AX, Thiessen-Philbrook H, Ouimet JM. Campylobacter reactive arthritis: a systematic review. Semin Arthritis Rheum. 2007; 37(1): 48-55. Epub 2007/03/16. doi: S0049-0172(07)00005-4 [pii]

[0180] Li, Y., Wang, S., Scarpellini, G., Gunn, B., Xin, W., Wanda, S.Y., Roland, K.L., Curtiss, R., 3rd, 2009. Evaluation of new generation Salmonella enterica serovar Typhimurium vaccines with regulated delayed attenuation to induce immune responses against PspA. Proceedings of the National Academy of Sciences of the United States of America 106, 593-598.

[0181] Curtiss III, R., S-Y. Wanda, B.M. Gunn, X. Zhang, S.A. Tinge, V. Ananthnarayan, H. Mo, S. Wang 和 W. Kong. 2009. Salmonella strains with regulated delayed attenuation in vivo. Infect. Immun. 77: 1071-1082.

序列表

<110> 代表亚利桑那大学的亚利桑那董事会
Joens, Lynn A.
Law, Bibiana
Armstrong, Alexandria E.

<120> 弯曲杆菌属免疫原性组合物及其用途

<130> 12-1515-PCT

<150> 61/632888

<151> 2012-02-01

<150> 61/689078

<151> 2012-05-29

<160> 142

<170> PatentIn version 3.5

<210> 1

<211> 573

<212> DNA

<213> Campylobacter jejuni

<400> 1

atgaaaaaaa ttcttgtaag tgttitaagt tcttcttctg tagcttcggc tttaagtget 60
gtatcttttta aagaagatag tttaaagatt tcttttgaag gatataaaac taaagatatg 120
ataggaacaa aaggtgaatt taaaaatgta gaatataaat ttcttaaaaa tataaaggat 180
ttggcaagtt atcttaaaagg cgtataaagc accataaagc caagcaatgc ttttatgggt 240
gaaggcaatg atattataac caataatatc acaaaaagtat ttttccttgc tttattggga 300
gatacggata ttaaagttgt ttttcaagat gtgattgcgg gtgaaaaata aggcggtatt 360
tcagcaaaaa ttactatgga taaaaaaagt actattgtac cttaacita taccatcaaa 420
gataataaat ttgaagctaa aggacaactt gatitgcata cttttaaaaa tggttctaaa 480
gcattaaaag cattaagcga tgttctgca ggacatggtg gaatttcttg gcccttagtg 540
gatatcagtt ttaatgctga tttagcagaa taa 573

[0001]

<210> 2

<211> 190

<212> PRT

<213> Campylobacter jejuni

<400> 2

Met Lys Lys Ile Leu Val Ser Val Leu Ser Ser Cys Leu Leu Ala Ser
1 5 10 15

Ala Leu Ser Ala Val Ser Phe Lys Glu Asp Ser Leu Lys Ile Ser Phe
20 25 30

Glu Gly Tyr Lys Thr Lys Asp Met Ile Gly Thr Lys Gly Glu Phe Lys
35 40 45

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

Leu Lys Gly Ala Lys Ala Thr Ile Lys Pro Ser Asn Ala Phe Met Gly
65 70 75 80

Glu Gly Asn Asp Ile Ile Thr Asn Asn Ile Thr Lys Val Phe Phe Pro

	85	90	95
	Ala Leu Leu Gly Asp Thr Asp Ile Lys Val Val Phe Gln Asp Val Ile 100 105 110		
	Ala Gly Glu Asn Lys Gly Val Ile Ser Ala Lys Ile Thr Met Asp Lys 115 120 125		
	Lys Ser Thr Ile Val Pro Leu Thr Tyr Thr Ile Lys Asp Asn Lys Phe 130 135 140		
	Glu Ala Lys Gly Gln Leu Asp Leu His Thr Phe Lys Asn Gly Ser Lys 145 150 155 160		
	Ala Leu Lys Ala Leu Ser Asp Val Ala Ala Gly His Gly Gly Ile Ser 165 170 175		
	Trp Pro Leu Val Asp Ile Ser Phe Asn Ala Asp Leu Ala Glu 180 185 190		
	<210> 3 <211> 762 <212> DNA <213> Campylobacter jejuni		
[0002]	<400> 3 atgagatttg atttttttgt ttcaaagcgt ttaaataatca gtagaaataa agcccttagag cttatagaaa atgaagagat ttactitaat ggtaagagtt ttaaagcttc ttttgatgtg aaaaattttt tagaaaaattt aaaaaaacg caagattttaa atcctgaaga tatactttta gccaatgagt taaaatttga tcttttaagt gaaatttatg tttcaagagc agctttgaaa ttaaaaaaat ttttagaaga aaatgatatt gaaataaaac ataaaaattg tcttgatata ggatctagta cggcggtttt tcttcaaaatt ttacttgaaa atcaggcttt aaaaatcact gctcttgatg tgggtagtaa tcaactccat ccaagttaa gagtaaatga aaaaattatc ttgcatgaaa atacagatct tagagctttt aaaagtgaag aaaaatttga acttgttact tgigatgtga gttttatttc tcttattaat ttactttatt atattgataa tttagcttta aaggaaatta ttttactttt taacctcag ttggaagtgg gaaaaaatat caaaagagat aaaaaaggtg ttttaaaaga tgataaggca atcttaaagg caagaatgga ttttgaaaaa gcatgtgcta aattgggttg gcttttaaaa aatacgcaaa aatcaagcat taaaggaaaag gaaggtaatg ttgaatatatt ttactactat atcaaaaatt aa	60 120 180 240 300 360 420 480 540 600 660 720 762	
	<210> 4 <211> 253 <212> PRT <213> Campylobacter jejuni		
	<400> 4 Met Arg Phe Asp Phe Phe Val Ser Lys Arg Leu Asn Ile Ser Arg Asn 1 5 10 15		
	Lys Ala Leu Glu Leu Ile Glu Asn Glu Glu Ile Leu Leu Asn Gly Lys 20 25 30		
	Ser Phe Lys Ala Ser Phe Asp Val Lys Asn Phe Leu Glu Asn Leu Lys		

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

[0003]

<210> 5
 <211> 858
 <212> DNA
 <213> Campylobacter jejuni

<400> 5
 atgattggag atatgaatga gcttttiatta aaaagcgttg aagtattgcc acctttacct 60
 gatactgtaa gtaagttaag aaaatatgtg agcgaggcta attcaaatat agaaactatg 120
 aaagttagctg aaatcatttc aagcgatccg ttgatgacgg ctaagctttt gcaattagea 180
 aattctcctt attatggttt tacaagagaa attacaacca taaatcaagt gattacttta 240
 ttaggcgttg gtaatatcat caatatagtt atggctgact ccattagaga taattttaaa 300
 atagacgttt cacccttatgg tttaaatact caaaattttt taaaaacgtg caatgaagag 360
 gcaactttta tcgcaaatgg gcttaatgat gaagataaaa aactttctca tcttttagtt 420
 ccttggtgcaa tgcctttaag gcttggtatt gttatttttt caaattttct tatacaaaat 480

```

cataaggaga aggatttttt agctttttta aataaaaatg aaaatcttgc tttagcggag      540
aatgaatttt taggcgtaga tcatatttct ttcttgggat tttgtttaca tcgttgggaat      600
tttgatgatg ttttgattga aagtataigt tttgttcgca ctctctcatgc tgcctcgcaa      660
aaagtgaaaa aatccgccta tgccttagca ataacagatc atctttttgc tccgcgatgat      720
ggttctttct catttaacgc aaaagctgca gtigtctttac ttaaagagggc aaaaactcaa      780
ggaattaatt ttgattttaaa caatctttta tctaagcttc ctaacaaagc taaggaaaaat      840
ttaaacaaag aagatttaa                                     858

```

```

<210> 6
<211> 285
<212> PRT
<213> Campylobacter jejuni.

```

```

<400> 6

```

```

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

```

```

Pro Pro Leu Pro Asp Thr Val Ser Lys Leu Arg Lys Tyr Val Ser Glu
          20           25           30

```

```

Ala Asn Ser Asn Ile Glu Thr Met Lys Val Ala Glu Ile Ile Ser Ser
          35           40           45

```

```

Asp Pro Leu Met Thr Ala Lys Leu Leu Gln Leu Ala Asn Ser Pro Tyr
          50           55           60

```

[0004]

```

Tyr Gly Phe Thr Arg Glu Ile Thr Thr Ile Asn Gln Val Ile Thr Leu
65           70           75           80

```

```

Leu Gly Val Gly Asn Ile Ile Asn Ile Val Met Ala Asp Ser Ile Arg
          85           90           95

```

```

Asp Asn Phe Lys Ile Asp Val Ser Pro Tyr Gly Leu Asn Thr Gln Asn
          100          105          110

```

```

Phe Leu Lys Thr Cys Asn Glu Glu Ala Thr Phe Ile Ala Asn Trp Leu
          115          120          125

```

```

Asn Asp Glu Asp Lys Lys Leu Ser His Leu Leu Val Pro Cys Ala Met
          130          135          140

```

```

Leu Leu Arg Leu Gly Ile Val Ile Phe Ser Asn Phe Leu Ile Gln Asn
          145          150          155          160

```

```

His Lys Asp Lys Asp Phe Leu Ala Phe Leu Asn Lys Asn Glu Asn Leu
          165          170          175

```

```

Ala Leu Ala Glu Asn Glu Phe Leu Gly Val Asp His Ile Ser Phe Leu
          180          185          190

```

```

Gly Phe Leu Leu His Arg Trp Asn Phe Asp Asp Val Leu Ile Glu Ser
          195          200          205

```

```

Ile Cys Phe Val Arg Thr Pro His Ala Ala Arg Glu Lys Val Lys Lys

```

210	215	220
Ser Ala Tyr Ala Leu Ala Ile Thr Asp His Leu Phe Ala Pro His Asp		
225	230	235 240
Gly Ser Ser Pro Phe Asn Ala Lys Ala Ala Val Ala Leu Leu Lys Glu		
	245	250 255
Ala Lys Thr Gln Gly Ile Asn Phe Asp Leu Asn Asn Leu Leu Ser Lys		
	260	265 270
Leu Pro Asn Lys Ala Lys Glu Asn Leu Asn Lys Glu Asp		
	275	280 285

<210> 7
 <211> 190
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic

<220>
 <221> MISC_FEATURE
 <222> (4)..(4)
 <223> X is I, V, or F

<220>
 <221> MISC_FEATURE
 <222> (5)..(5)
 <223> X is V or F

[0005]

<220>
 <221> MISC_FEATURE
 <222> (6)..(6)
 <223> X is V, A, or L

<220>
 <221> MISC_FEATURE
 <222> (8)..(8)
 <223> X is V or I

<220>
 <221> MISC_FEATURE
 <222> (9)..(9)
 <223> X is L or F

<220>
 <221> MISC_FEATURE
 <222> (11)..(11)
 <223> X is S or F

<220>
 <221> MISC_FEATURE
 <222> (30)..(30)
 <223> X is I or V

<220>
 <221> MISC_FEATURE
 <222> (41)..(41)
 <223> X is I or V

<220>
 <221> MISC_FEATURE
 <222> (43)..(43)
 <223> X is T, V, I or A

<220>
 <221> MISC_FEATURE
 <222> (44)..(44)

	<223> X is K or R
	<220>
	<221> MISC_FEATURE
	<222> (53)..(53)
	<223> X is K or N
	<220>
	<221> MISC_FEATURE
	<222> (57)..(57)
	<223> X is N or S
	<220>
	<221> MISC_FEATURE
	<222> (58)..(58)
	<223> X is I or T
	<220>
	<221> MISC_FEATURE
	<222> (61)..(61)
	<223> X is L or F
	<220>
	<221> MISC_FEATURE
	<222> (73)..(73)
	<223> X is K or E
	<220>
	<221> MISC_FEATURE
	<222> (76)..(76)
	<223> X is N or D
	<220>
	<221> MISC_FEATURE
	<222> (80)..(80)
	<223> X is G or S
[0006]	<220>
	<221> MISC_FEATURE
	<222> (83)..(83)
	<223> X is N or L
	<220>
	<221> MISC_FEATURE
	<222> (85)..(85)
	<223> X is I or V
	<220>
	<221> MISC_FEATURE
	<222> (101)..(101)
	<223> X is D or N
	<220>
	<221> MISC_FEATURE
	<222> (102)..(102)
	<223> X is T or A
	<220>
	<221> MISC_FEATURE
	<222> (111)..(111)
	<223> X is V, A or M
	<220>
	<221> MISC_FEATURE
	<222> (113)..(113)
	<223> X is V or A
	<220>
	<221> MISC_FEATURE
	<222> (116)..(123)
	<223> Amino Acid is optionally absent
	<220>
	<221> MISC_FEATURE
	<222> (133)..(133)
	<223> X is V or I

<220>
 <221> MISC_FEATURE
 <222> (142)..(142)
 <223> X is N or D

<220>
 <221> MISC_FEATURE
 <222> (150)..(150)
 <223> X is L or F

<220>
 <221> MISC_FEATURE
 <222> (154)..(154)
 <223> X is T or A

<220>
 <221> MISC_FEATURE
 <222> (158)..(158)
 <223> X is G or A

<220>
 <221> MISC_FEATURE
 <222> (168)..(168)
 <223> X is V or A

<220>
 <221> MISC_FEATURE
 <222> (170)..(170)
 <223> X is A, T or P

<220>
 <221> MISC_FEATURE
 <222> (189)..(189)
 <223> X is A, T or V

<400> 7

[0007]

Met Lys Lys Xaa Xaa Xaa Ser Xaa Xaa Ser Xaa Cys Leu Leu Ala Ser
 1 5 10 15

Ala Leu Ser Ala Val Ser Phe Lys Glu Asp Ser Leu Lys Xaa Ser Phe
 20 25 30

Glu Gly Tyr Lys Thr Lys Asp Met Xaa Gly Xaa Xaa Gly Glu Phe Lys
 35 40 45

Asn Val Glu Tyr Xaa Phe Ser Lys Xaa Xaa Lys Asp Xaa Ala Ser Tyr
 50 55 60

Leu Lys Gly Ala Lys Ala Thr Ile Xaa Pro Ser Xaa Ala Phe Met Xaa
 65 70 75 80

Glu Gly Xaa Asp Xaa Ile Thr Asn Asn Ile Thr Lys Val Phe Phe Pro
 85 90 95

Ala Leu Leu Gly Xaa Xaa Asp Ile Lys Val Val Phe Gln Asp Xaa Ile
 100 105 110

Xaa Gly Glu Asn Lys Gly Val Ile Ser Ala Lys Ile Thr Met Asp Lys
 115 120 125

Lys Ser Thr Ile Xaa Pro Leu Thr Tyr Thr Ile Lys Asp Xaa Lys Phe
 130 135 140

Glu Ala Lys Gly Gln Xaa Asp Leu His Xaa Phe Lys Asn Xaa Ser Lys
 145 150 155 160

Ala Leu Lys Ala Leu Ser Asp Xaa Ala Xaa Gly His Gly Gly Ile Ser
165 170 175

Trp Pro Leu Val Asp Ile Ser Phe Asn Ala Asp Leu Xaa Glu
180 185 190

<210> 8
<211> 253
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<220>
<221> MISC_FEATURE
<222> (1)..(65)
<223> Amino Acids are optionally absent

<220>
<221> MISC_FEATURE
<222> (2)..(2)
<223> X is R or I

<220>
<221> MISC_FEATURE
<222> (3)..(3)
<223> X is F or absent

<220>
<221> MISC_FEATURE
<222> (4)..(4)
<223> X is D or absent

[0008]

<220>
<221> MISC_FEATURE
<222> (7)..(7)
<223> X is V or I

<220>
<221> MISC_FEATURE
<222> (12)..(12)
<223> X is N or D

<220>
<221> MISC_FEATURE
<222> (24)..(24)
<223> X is N or S

<220>
<221> MISC_FEATURE
<222> (27)..(27)
<223> X is I or V

<220>
<221> MISC_FEATURE
<222> (33)..(33)
<223> X is S or N

<220>
<221> MISC_FEATURE
<222> (38)..(38)
<223> X is F or C

<220>
<221> MISC_FEATURE
<222> (43)..(43)
<223> X is F or L

<220>
<221> MISC_FEATURE

[0009]

<222> (50)..(50)
<223> X is T, A or K

<220>
<221> MISC_FEATURE
<222> (55)..(55)
<223> X is P, L or S

<220>
<221> MISC_FEATURE
<222> (57)..(57)
<223> X is D or E

<220>
<221> MISC_FEATURE
<222> (58)..(58)
<223> X is I or V

<220>
<221> MISC_FEATURE
<222> (59)..(59)
<223> X is L or Y

<220>
<221> MISC_FEATURE
<222> (61)..(61)
<223> X is A, T or S

<220>
<221> MISC_FEATURE
<222> (62)..(62)
<223> X is N, D or K

<220>
<221> MISC_FEATURE
<222> (63)..(63)
<223> X is E or G

<220>
<221> MISC_FEATURE
<222> (65)..(65)
<223> X is K or N

<220>
<221> MISC_FEATURE
<222> (66)..(66)
<223> X is L or M

<220>
<221> MISC_FEATURE
<222> (67)..(67)
<223> X is D, N or E

<220>
<221> MISC_FEATURE
<222> (70)..(70)
<223> X is S or R

<220>
<221> MISC_FEATURE
<222> (74)..(74)
<223> X is V or I

<220>
<221> MISC_FEATURE
<222> (83)..(83)
<223> X is K or N

<220>
<221> MISC_FEATURE
<222> (89)..(89)
<223> X is D, G or N

<220>
<221> MISC_FEATURE
<222> (92)..(92)

	<223> X is I or V
	<220>
	<221> MISC_FEATURE
	<222> (93)..(93)
	<223> X is K or N
	<220>
	<221> MISC_FEATURE
	<222> (94)..(94)
	<223> X is H, Q or N
	<220>
	<221> MISC_FEATURE
	<222> (115)..(115)
	<223> X is Q or K
	<220>
	<221> MISC_FEATURE
	<222> (121)..(121)
	<223> X is A or T
	<220>
	<221> MISC_FEATURE
	<222> (126)..(126)
	<223> X is S or N
	<220>
	<221> MISC_FEATURE
	<222> (131)..(131)
	<223> X is P, S or L
	<220>
	<221> MISC_FEATURE
	<222> (132)..(132)
	<223> X is S or N
[0010]	<220>
	<221> MISC_FEATURE
	<222> (135)..(135)
	<223> X is V, A or T
	<220>
	<221> MISC_FEATURE
	<222> (138)..(138)
	<223> X is K or I
	<220>
	<221> MISC_FEATURE
	<222> (139)..(139)
	<223> X is V or I
	<220>
	<221> MISC_FEATURE
	<222> (142)..(142)
	<223> X is H or Y
	<220>
	<221> MISC_FEATURE
	<222> (145)..(145)
	<223> X is T or I
	<220>
	<221> MISC_FEATURE
	<222> (149)..(149)
	<223> X is A, T or V
	<220>
	<221> MISC_FEATURE
	<222> (158)..(158)
	<223> X is L or F
	<220>
	<221> MISC_FEATURE
	<222> (159)..(159)
	<223> X is V or I

[0011]

<220>
 <221> MISC FEATURE
 <222> (169).. (169)
 <223> X is V or I

<220>
 <221> MISC FEATURE
 <222> (175).. (175)
 <223> X is V or I

<220>
 <221> MISC FEATURE
 <222> (176).. (176)
 <223> X is D or N

<220>
 <221> MISC FEATURE
 <222> (181).. (181)
 <223> X is K or R

<220>
 <221> MISC FEATURE
 <222> (197).. (197)
 <223> X is I or V

<220>
 <221> MISC FEATURE
 <222> (208).. (208)
 <223> X is D or G

<220>
 <221> MISC FEATURE
 <222> (209).. (209)
 <223> X is K or R

<220>
 <221> MISC FEATURE
 <222> (210).. (210)
 <223> X is A or V

<220>
 <221> MISC FEATURE
 <222> (215).. (215)
 <223> X is K or R

<220>
 <221> MISC FEATURE
 <222> (221).. (221)
 <223> X is A or E

<220>
 <221> MISC FEATURE
 <222> (226).. (226)
 <223> X is G or S

<220>
 <221> MISC FEATURE
 <222> (228).. (228)
 <223> X is L, F or I

<220>
 <221> MISC FEATURE
 <222> (236).. (236)
 <223> X is S or C

<400> 8

Met Xaa Xaa Xaa Phe Phe Xaa Ser Lys Arg Leu Xaa Ile Ser Arg Asn
 1 5 10 15

Lys Ala Leu Glu Leu Ile Glu Xaa Glu Glu Xaa Leu Leu Asn Gly Lys
 20 25 30

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

[0012]

<210> 9
 <211> 287
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic

<220>
 <221> MISC_FEATURE
 <222> (1)..(1)
 <223> X is M or absent

<220>
 <221> MISC_FEATURE
 <222> (3)..(3)
 <223> X is G or absent

<220>

[0013]

<221> MISC_FEATURE
<222> (43)..(43)
<223> X is A or V

<220>
<221> MISC_FEATURE
<222> (75)..(75)
<223> X is N or S

<220>
<221> MISC_FEATURE
<222> (83)..(83)
<223> X is V or I

<220>
<221> MISC_FEATURE
<222> (91)..(91)
<223> X is M or T

<220>
<221> MISC_FEATURE
<222> (96)..(96)
<223> X is K or R

<220>
<221> MISC_FEATURE
<222> (98)..(98)
<223> X is N or S

<220>
<221> MISC_FEATURE
<222> (109)..(109)
<223> X is N or D

<220>
<221> MISC_FEATURE
<222> (111)..(111)
<223> X is Q or K

<220>
<221> MISC_FEATURE
<222> (112)..(112)
<223> X is N or V

<220>
<221> MISC_FEATURE
<222> (115)..(115)
<223> X is K or R

<220>
<221> MISC_FEATURE
<222> (116)..(116)
<223> X is T or N

<220>
<221> MISC_FEATURE
<222> (119)..(119)
<223> X is E or D

<220>
<221> MISC_FEATURE
<222> (125)..(125)
<223> X is A, V or T

<220>
<221> MISC_FEATURE
<222> (161)..(161)
<223> X is H, Y or F

<220>
<221> MISC_FEATURE
<222> (162)..(162)
<223> X is K or R

<220>
<221> MISC_FEATURE

[0014]

<222> (163)..(163)
<223> X is D or E

<220>
<221> MISC FEATURE
<222> (163)..(260)
<223> amino acids are optionally absent

<220>
<221> MISC FEATURE
<222> (165)..(165)
<223> X is D or E

<220>
<221> MISC FEATURE
<222> (168)..(168)
<223> X is A or T

<220>
<221> MISC FEATURE
<222> (172)..(172)
<223> X is E, K or absent

<220>
<221> MISC FEATURE
<222> (173)..(173)
<223> X is T or absent

<220>
<221> MISC FEATURE
<222> (175)..(175)
<223> X is N, S or I

<220>
<221> MISC FEATURE
<222> (178)..(178)
<223> X is L or I

<220>
<221> MISC FEATURE
<222> (199)..(199)
<223> X is H or Y

<220>
<221> MISC FEATURE
<222> (206)..(206)
<223> X is V or I

<220>
<221> MISC FEATURE
<222> (215)..(215)
<223> X is R or H

<220>
<221> MISC FEATURE
<222> (223)..(223)
<223> X is K or E

<220>
<221> MISC FEATURE
<222> (239)..(239)
<223> X is A or T

<220>
<221> MISC FEATURE
<222> (249)..(249)
<223> X is A, V or T

<220>
<221> MISC FEATURE
<222> (257)..(257)
<223> X is K or E

<220>
<221> MISC FEATURE
<222> (261)..(287)

```

<223> Amino acids are optionally absent

<220>
<221> MISC_FEATURE
<222> (261)..(287)
<223> amino acids are optionally NSRN with the rest absent

<220>
<221> MISC_FEATURE
<222> (269)..(269)
<223> X is N or D

<220>
<221> MISC_FEATURE
<222> (277)..(277)
<223> X is N or D

<220>
<221> MISC_FEATURE
<222> (277)..(277)
<223> X is N or S

<220>
<221> MISC_FEATURE
<222> (284)..(284)
<223> X is N or D

<220>
<221> MISC_FEATURE
<222> (285)..(285)
<223> X is K or E

<400> 9

Xaa Ile Xaa Asp Met Asn Glu Leu Leu Leu Lys Ser Val Glu Val Leu
1      5      10      15

[0015] Pro Pro Leu Pro Asp Thr Val Ser Lys Leu Arg Lys Tyr Val Ser Glu
      20      25      30

Ala Asn Ser Asn Ile Glu Thr Met Lys Val Xaa Glu Ile Ile Ser Ser
      35      40      45

Asp Pro Leu Met Thr Ala Lys Leu Leu Gln Leu Ala Asn Ser Pro Tyr
      50      55      60

Tyr Gly Phe Thr Arg Glu Ile Thr Thr Ile Xaa Gln Val Ile Thr Leu
65      70      75      80

Leu Gly Xaa Gly Asn Ile Ile Asn Ile Val Xaa Ala Asp Ser Ile Xaa
      85      90      95

Asp Xaa Phe Lys Ile Asp Val Ser Pro Tyr Gly Leu Xaa Thr Xaa Xaa
      100      105      110

Phe Leu Xaa Xaa Cys Asn Xaa Glu Ala Thr Phe Ile Xaa Asn Trp Leu
      115      120      125

Asn Asp Glu Asp Lys Lys Leu Ser His Leu Leu Val Pro Cys Ala Met
      130      135      140

Leu Leu Arg Leu Gly Ile Val Ile Phe Ser Asn Phe Leu Ile Gln Asn
      145      150      155      160

Xaa Xaa Xaa Lys Xaa Phe Leu Xaa Phe Leu Asn Xaa Xaa Lys Xaa Glu
      165      170      175

```

Asn Xaa Ala Leu Ala Glu Asn Glu Phe Leu Gly Val Asp His Ile Ser
 180 185 190
 Phe Leu Gly Phe Leu Leu Xaa Arg Trp Asn Phe Asp Asp Xaa Leu Ile
 195 200 205
 Glu Ser Ile Cys Phe Val Xaa Thr Pro His Ala Ala Arg Glu Xaa Val
 210 215 220
 Lys Lys Ser Ala Tyr Ala Leu Ala Ile Thr Asp His Leu Phe Xaa Pro
 225 230 235 240
 His Asp Gly Ser Ser Pro Phe Asn Xaa Lys Ala Ala Val Ala Leu Leu
 245 250 255
 Xaa Glu Ala Lys Thr Gln Gly Ile Asn Phe Asp Leu Xaa Asn Leu Leu
 260 265 270
 Ser Lys Leu Pro Xaa Lys Ala Lys Glu Asn Leu Xaa Xaa Glu Asp
 275 280 285
 <210> 10
 <211> 298
 <212> PRT
 <213> Campylobacter jejuni
 <400> 10
 [0016] Met Gln Ile Ile Ile Ile Leu Ile Lys Asp Lys Leu Asn Met Ile Gly
 1 5 10 15
 Asp Met Asn Glu Leu Leu Leu Lys Ser Val Glu Val Leu Pro Pro Leu
 20 25 30
 Pro Asp Thr Val Ser Lys Leu Arg Lys Tyr Val Ser Glu Ala Asn Ser
 35 40 45
 Asn Ile Glu Thr Met Lys Val Ala Glu Ile Ile Ser Ser Asp Pro Leu
 50 55 60
 Met Thr Ala Lys Leu Leu Gln Leu Ala Asn Ser Pro Tyr Tyr Gly Phe
 65 70 75 80
 Thr Arg Glu Ile Thr Thr Ile Asn Gln Val Ile Thr Leu Leu Gly Val
 85 90 95
 Gly Asn Ile Ile Asn Ile Val Met Ala Asp Ser Ile Arg Asp Asn Phe
 100 105 110
 Lys Ile Asp Val Ser Pro Tyr Gly Leu Asn Thr Gln Asn Phe Leu Lys
 115 120 125
 Thr Cys Asn Glu Glu Ala Thr Phe Ile Ala Asn Trp Leu Asn Asp Glu
 130 135 140
 Asp Lys Lys Leu Ser His Leu Leu Val Pro Cys Ala Met Leu Leu Arg
 145 150 155 160

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

[0017]

<210> 11
 <211> 285
 <212> PRT
 <213> Campylobacter jejuni

<400> 11

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

Asn Asp Glu Asp Lys Lys Leu Ser His Leu Leu Val Pro Cys Ala Met
 130 135 140
 Leu Leu Arg Leu Gly Ile Val Ile Phe Ser Asn Phe Leu Ile Gln Asn
 145 150 155 160
 His Lys Asp Lys Asp Phe Leu Ala Phe Leu Asn Lys Asn Glu Asn Leu
 165 170 175
 Ala Leu Ala Glu Asn Glu Phe Leu Gly Val Asp His Ile Ser Phe Leu
 180 185 190
 Gly Phe Leu Leu His Arg Trp Asn Phe Asp Asp Val Leu Ile Glu Ser
 195 200 205
 Ile Cys Phe Val Arg Thr Pro His Ala Ala Arg Glu Lys Val Lys Lys
 210 215 220
 Ser Ala Tyr Ala Leu Ala Ile Thr Asp His Leu Phe Ala Pro His Asp
 225 230 235 240
 Gly Ser Ser Pro Phe Asn Ala Lys Ala Ala Val Ala Leu Leu Lys Glu
 245 250 255
 Ala Lys Thr Gln Gly Ile Asn Phe Asp Leu Asn Asn Leu Leu Ser Lys
 260 265 270
 Leu Pro Asn Lys Ala Lys Glu Asn Leu Asn Lys Glu Asp
 275 280 285

[0018]

<210> 12
 <211> 285
 <212> PRT
 <213> Campylobacter jejuni

<400> 12

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

115	120	125
Asn Asp Glu Asp Lys Lys Leu Ser His Leu Leu Val Pro Cys Ala Met 130	135	140
Leu Leu Arg Leu Gly Ile Val Ile Phe Ser Asn Phe Leu Ile Gln Asn 145	150	155 160
His Lys Asp Lys Asp Phe Leu Ala Phe Leu Asn Lys Ser Glu Asn Leu 165	170	175
Ala Leu Ala Glu Asn Glu Phe Leu Gly Val Asp His Ile Ser Phe Leu 180	185	190
Gly Phe Leu Leu His Arg Trp Asn Phe Asp Asp Val Leu Ile Glu Ser 195	200	205
Ile Cys Phe Val Arg Thr Pro His Ala Ala Arg Glu Lys Val Lys Lys 210	215	220
Ser Ala Tyr Ala Leu Ala Ile Thr Asp His Leu Phe Ala Pro His Asp 225	230	235 240
Gly Ser Ser Pro Phe Asn Ala Lys Ala Ala Val Ala Leu Leu Lys Glu 245	250	255
Ala Lys Thr Gln Gly Ile Asn Phe Asp Leu Asn Asn Leu Leu Ser Lys 260	265	270
Leu Pro Asn Lys Ala Lys Glu Asn Leu Asn Lys Glu Asp 275	280	285
<210> 13		
<211> 285		
<212> PRT		
<213> Campylobacter jejuni		
<400> 13		
Met Ile Gly Asp Met Asn Glu Leu Leu Leu Lys Ser Val Glu Val Leu 1	5	10 15
Pro Pro Leu Pro Asp Thr Val Ser Lys Leu Arg Lys Tyr Val Ser Glu 20	25	30
Ala Asn Ser Asn Ile Glu Thr Met Lys Val Ala Glu Ile Ile Ser Ser 35	40	45
Asp Pro Leu Met Thr Ala Lys Leu Leu Gln Leu Ala Asn Ser Pro Tyr 50	55	60
Tyr Gly Phe Thr Arg Glu Ile Thr Thr Ile Asn Gln Val Ile Thr Leu 65	70	75 80
Leu Gly Val Gly Asn Ile Ile Asn Ile Val Met Ala Asp Ser Ile Arg 85	90	95
Asp Asn Phe Lys Ile Asp Val Ser Pro Tyr Gly Leu Asn Thr Gln Asn 100	105	110

[0019]

Phe Leu Lys Thr Cys Asn Asp Glu Ala Thr Phe Ile Ala Asn Trp Leu
 115 120 125
 Asn Asp Glu Asp Lys Lys Leu Ser His Leu Leu Val Pro Cys Ala Met
 130 135 140
 Leu Leu Arg Leu Gly Ile Val Ile Phe Ser Asn Phe Leu Ile Gln Asn
 145 150 155 160
 His Lys Asp Lys Asp Phe Leu Ala Phe Leu Asn Lys Asn Glu Asn Leu
 165 170 175
 Ala Leu Ala Glu Asn Glu Phe Leu Gly Val Asp His Ile Ser Phe Leu
 180 185 190
 Gly Phe Leu Leu His Arg Trp Asn Phe Asp Asp Val Leu Ile Glu Ser
 195 200 205
 Ile Cys Phe Val Arg Thr Pro His Ala Ala Arg Glu Lys Val Lys Lys
 210 215 220
 Ser Ala Tyr Ala Leu Ala Ile Thr Asp His Leu Phe Ala Pro His Asp
 225 230 235 240
 Gly Ser Ser Pro Phe Asn Ala Lys Ala Ala Val Ala Leu Leu Lys Glu
 245 250 255
 [0020] Ala Lys Thr Gln Gly Ile Asn Phe Asp Leu Asn Asn Leu Leu Ser Lys
 260 265 270
 Leu Pro Asn Lys Ala Lys Glu Asn Leu Asn Lys Glu Asp
 275 280 285
 <210> 14
 <211> 285
 <212> PRT
 <213> Campylobacter jejuni
 <400> 14
 Met Ile Gly Asp Met Asn Glu Leu Leu Leu Lys Ser Val Glu Val Leu
 1 5 10 15
 Pro Pro Leu Pro Asp Thr Val Ser Lys Leu Arg Lys Tyr Val Ser Glu
 20 25 30
 Ala Asn Ser Asn Ile Glu Thr Met Lys Val Ala Glu Ile Ile Ser Ser
 35 40 45
 Asp Pro Leu Met Thr Ala Lys Leu Leu Gln Leu Ala Asn Ser Pro Tyr
 50 55 60
 Tyr Gly Phe Thr Arg Glu Ile Thr Thr Ile Asn Gln Val Ile Thr Leu
 65 70 75 80
 Leu Gly Val Gly Asn Ile Ile Asn Ile Val Met Ala Asp Ser Ile Arg
 85 90 95

	Asp	Asn	Phe	Lys	Ile	Asp	Val	Ser	Pro	Tyr	Gly	Leu	Asn	Thr	Gln	Asn	
				100					105						110		
	Phe	Leu	Lys	Thr	Cys	Asn	Glu	Glu	Ala	Thr	Phe	Ile	Ala	Asn	Trp	Leu	
			115						120					125			
	Asn	Asp	Glu	Asp	Lys	Lys	Leu	Ser	His	Leu	Leu	Val	Pro	Cys	Ala	Met	
			130						135					140			
	Leu	Leu	Arg	Leu	Gly	Ile	Val	Ile	Phe	Ser	Asn	Phe	Leu	Ile	Gln	Asn	
			145				150					155				160	
	His	Lys	Asp	Lys	Asp	Phe	Leu	Ala	Phe	Leu	Asn	Lys	Asn	Glu	Asn	Leu	
					165						170					175	
	Ala	Leu	Ala	Glu	Asn	Glu	Phe	Leu	Gly	Val	Asp	His	Ile	Ser	Phe	Leu	
				180						185					190		
	Gly	Phe	Leu	Leu	His	Arg	Trp	Asn	Phe	Asp	Asp	Val	Leu	Ile	Glu	Ser	
			195						200					205			
	Ile	Cys	Phe	Val	Arg	Thr	Pro	His	Ala	Ala	Arg	Glu	Lys	Val	Lys	Lys	
			210					215					220				
	Ser	Ala	Tyr	Ala	Leu	Ala	Ile	Thr	Asp	His	Leu	Phe	Ala	Pro	His	Asp	
			225				230					235				240	
[0021]	Gly	Ser	Ser	Pro	Phe	Asn	Ala	Lys	Ala	Ala	Val	Ala	Leu	Leu	Glu	Glu	
					245					250					255		
	Ala	Lys	Thr	Gln	Gly	Ile	Asn	Phe	Asp	Leu	Asn	Asn	Leu	Leu	Ser	Lys	
				260					265						270		
	Leu	Pro	Asn	Lys	Ala	Lys	Glu	Asn	Leu	Asn	Lys	Glu	Asp				
				275					280				285				
	<210>			15													
	<211>			285													
	<212>			PRT													
	<213>			Campylobacter jejuni													
	<400>			15													
	Met	Ile	Gly	Asp	Met	Asn	Glu	Leu	Leu	Leu	Lys	Ser	Val	Glu	Val	Leu	
	1				5					10					15		
	Pro	Pro	Leu	Pro	Asp	Thr	Val	Ser	Lys	Leu	Arg	Lys	Tyr	Val	Ser	Glu	
				20					25					30			
	Ala	Asn	Ser	Asn	Ile	Glu	Thr	Met	Lys	Val	Ala	Glu	Ile	Ile	Ser	Ser	
				35					40					45			
	Asp	Pro	Leu	Met	Thr	Ala	Lys	Leu	Leu	Gln	Leu	Ala	Asn	Ser	Pro	Tyr	
			50				55					60					
	Tyr	Gly	Phe	Thr	Arg	Glu	Ile	Thr	Thr	Ile	Asn	Gln	Val	Ile	Thr	Leu	
				65			70				75					80	

[0022]

Leu Gly Val Gly Asn Ile Ile Asn Ile Val Met Ala Asp Ser Ile Arg
 85 90 95
 Asp Asn Phe Lys Ile Asp Val Ser Pro Tyr Gly Leu Asn Thr Gln Asn
 100 105 110
 Phe Leu Lys Thr Cys Asn Glu Glu Ala Thr Phe Ile Ala Asn Trp Leu
 115 120 125
 Asn Asp Glu Asp Lys Lys Leu Ser His Leu Leu Val Pro Cys Ala Met
 130 135 140
 Leu Leu Arg Leu Gly Ile Val Ile Phe Ser Asn Phe Leu Ile Gln Asn
 145 150 155 160
 His Lys Asp Lys Asp Phe Leu Ala Phe Leu Asn Lys Asn Glu Asn Leu
 165 170 175
 Ala Leu Ala Glu Asn Glu Phe Leu Gly Val Asp His Ile Ser Phe Leu
 180 185 190
 Gly Phe Leu Leu His Arg Trp Asn Phe Asp Asp Val Leu Ile Glu Ser
 195 200 205
 Ile Cys Phe Val Arg Thr Pro His Ala Ala Arg Glu Lys Val Lys Lys
 210 215 220
 Ser Ala Tyr Ala Leu Ala Ile Thr Asp His Leu Phe Ala Pro His Asp
 225 230 235 240
 Gly Ser Ser Pro Phe Asn Ala Lys Ala Ala Val Ala Leu Leu Lys Glu
 245 250 255
 Ala Lys Thr Gln Gly Ile Asn Phe Asp Leu Asn Asn Leu Leu Ser Lys
 260 265 270
 Leu Pro Asn Lys Ala Lys Glu Asn Leu Asn Lys Lys Asp
 275 280 285
 <210> 16
 <211> 285
 <212> PRT
 <213> Campylobacter jejuni
 <400> 16
 Met Ile Gly Asp Met Asn Glu Leu Leu Leu Lys Ser Val Glu Val Leu
 1 5 10 15
 Pro Pro Leu Pro Asp Thr Val Ser Lys Leu Arg Lys Tyr Val Ser Glu
 20 25 30
 Ala Asn Ser Asn Ile Glu Thr Met Lys Val Ala Glu Ile Ile Ser Ser
 35 40 45
 Asp Pro Leu Met Thr Ala Lys Leu Leu Gln Leu Ala Asn Ser Pro Tyr
 50 55 60
 Tyr Gly Phe Thr Arg Glu Ile Thr Thr Ile Asn Gln Val Ile Thr Leu

65	70	75	80
Leu Gly Val Gly Asn Ile Ile Asn Ile Val Met Ala Asp Ser Ile Arg			
85	90	95	
Asp Asn Phe Lys Ile Asp Val Ser Pro Tyr Gly Leu Asn Thr Gln Asn			
100	105	110	
Phe Leu Lys Thr Cys Asn Glu Glu Ala Thr Phe Ile Ala Asn Trp Leu			
115	120	125	
Asn Asp Glu Asp Lys Lys Leu Ser His Leu Leu Val Pro Cys Ala Met			
130	135	140	
Leu Leu Arg Leu Gly Ile Val Ile Phe Ser Asn Phe Leu Ile Gln Asn			
145	150	155	160
His Lys Asp Lys Asp Phe Leu Ala Phe Leu Asn Lys Asn Glu Asn Leu			
165	170	175	
Ala Leu Ala Glu Asn Glu Phe Leu Gly Val Asp His Ile Ser Phe Leu			
180	185	190	
Gly Phe Leu Leu His Arg Trp Asn Phe Asp Asp Val Leu Ile Glu Ser			
195	200	205	
Ile Cys Phe Val His Thr Pro His Ala Ala Arg Glu Lys Val Lys Lys			
210	215	220	
Ser Ala Tyr Ala Leu Ala Ile Thr Asp His Leu Phe Ala Pro His Asp			
225	230	235	240
Gly Ser Ser Pro Phe Asn Ala Lys Ala Ala Val Ala Leu Leu Lys Glu			
245	250	255	
Ala Lys Thr Gln Gly Ile Asn Phe Asp Leu Asn Asn Leu Leu Ser Lys			
260	265	270	
Leu Pro Asn Lys Ala Lys Glu Asn Leu Asn Lys Glu Asp			
275	280	285	
<210> 17			
<211> 285			
<212> PRT			
<213> Campylobacter jejuni			
<400> 17			
Met Ile Gly Asp Met Asn Glu Leu Leu Leu Lys Ser Val Glu Val Leu			
1	5	10	15
Pro Pro Leu Pro Asp Thr Val Ser Lys Leu Arg Lys Tyr Val Ser Glu			
20	25	30	
Ala Asn Ser Asn Ile Glu Thr Met Lys Val Ala Glu Ile Ile Ser Ser			
35	40	45	
Asp Pro Leu Met Met Ala Lys Leu Leu Gln Leu Ala Asn Ser Pro Tyr			
50	55	60	

[0023]

Tyr Gly Phe Thr Arg Glu Ile Thr Thr Ile Asn Gln Val Ile Thr Leu
 65 70 75 80
 Leu Gly Val Gly Asn Ile Ile Asn Ile Val Met Ala Asp Ser Ile Arg
 85 90 95
 Asp Asn Phe Lys Ile Asp Val Ser Pro Tyr Gly Leu Asn Thr Gln Asn
 100 105 110
 Phe Leu Lys Thr Cys Asn Glu Glu Ala Thr Phe Ile Ala Asn Trp Leu
 115 120 125
 Asn Asp Glu Asp Lys Lys Leu Ser His Leu Leu Val Pro Cys Ala Met
 130 135 140
 Leu Leu Arg Leu Gly Ile Val Ile Phe Ser Asn Phe Leu Ile Gln Asn
 145 150 155 160
 His Lys Asp Lys Asp Phe Leu Ala Phe Leu Asn Lys Ser Glu Asn Leu
 165 170 175
 Ala Leu Ala Glu Asn Glu Phe Leu Gly Val Asp His Ile Ser Phe Leu
 180 185 190
 Gly Phe Leu Leu His Arg Trp Asn Phe Asp Asp Val Leu Ile Glu Ser
 195 200 205
 [0024] Ile Cys Phe Val Arg Thr Pro His Ala Ala Arg Glu Lys Val Lys Lys
 210 215 220
 Ser Ala Tyr Ala Leu Ala Ile Thr Asp His Leu Phe Ala Pro His Asp
 225 230 235 240
 Gly Ser Ser Pro Phe Asn Ala Lys Ala Ala Val Ala Leu Leu Lys Glu
 245 250 255
 Ala Lys Thr Gln Gly Ile Asn Phe Asp Leu Asn Asn Leu Leu Ser Lys
 260 265 270
 Leu Pro Asn Lys Ala Lys Glu Asn Leu Asn Lys Glu Asp
 275 280 285
 <210> 18
 <211> 285
 <212> PRT
 <213> Campylobacter jejuni
 <400> 18
 Met Ile Gly Asp Met Asn Glu Leu Leu Leu Lys Ser Val Glu Val Leu
 1 5 10 15
 Pro Pro Leu Pro Asp Thr Val Ser Lys Leu Arg Lys Tyr Val Ser Glu
 20 25 30
 Ala Asn Ser Asn Ile Glu Thr Met Lys Val Ala Glu Ile Ile Ser Ser
 35 40 45

Asp Pro Leu Met Met Ala Lys Leu Leu Gln Leu Ala Asn Ser Pro Tyr
 50 55 60
 Tyr Gly Phe Thr Arg Glu Ile Thr Thr Ile Asn Gln Val Ile Thr Leu
 65 70 75 80
 Leu Gly Val Gly Asn Ile Ile Asn Ile Val Met Ala Asp Ser Ile Arg
 85 90 95
 Asp Asn Phe Lys Ile Asp Val Ser Pro Tyr Gly Leu Asn Thr Gln Asn
 100 105 110
 Phe Leu Lys Thr Cys Asn Glu Glu Ala Thr Phe Ile Ala Asn Trp Leu
 115 120 125
 Asn Asp Glu Asp Lys Lys Leu Ser His Leu Leu Val Pro Cys Ala Met
 130 135 140
 Leu Leu Arg Leu Gly Ile Val Ile Phe Ser Asn Phe Leu Ile Gln Asn
 145 150 155 160
 His Lys Asp Lys Asp Phe Leu Ala Phe Leu Asn Lys Asn Glu Asn Leu
 165 170 175
 Ala Leu Ala Glu Asn Glu Phe Leu Gly Val Asp His Ile Ser Phe Leu
 180 185 190
 [0025] Gly Phe Leu Leu His Arg Trp Asn Phe Asp Asp Val Leu Ile Glu Ser
 195 200 205
 Ile Cys Phe Val Arg Thr Pro His Ala Ala Arg Glu Lys Val Lys Lys
 210 215 220
 Ser Ala Tyr Ala Leu Ala Ile Thr Asp His Leu Phe Ala Pro His Asp
 225 230 235 240
 Gly Ser Ser Pro Phe Asn Ala Lys Ala Ala Val Ala Leu Leu Lys Glu
 245 250 255
 Ala Lys Thr Gln Gly Ile Asn Phe Asp Leu Asn Asn Leu Leu Ser Lys
 260 265 270
 Leu Pro Ser Lys Ala Lys Glu Asn Leu Asn Lys Glu Asp
 275 280 285
 <210> 19
 <211> 285
 <212> PRT
 <213> Campylobacter jejuni
 <400> 19
 Met Ile Gly Asp Met Asn Glu Leu Leu Leu Lys Ser Val Glu Val Leu
 1 5 10 15
 Pro Pro Leu Pro Asp Thr Val Ser Lys Leu Arg Lys Tyr Val Ser Glu
 20 25 30

[0026]

Ala Asn Ser Asn Ile Glu Thr Met Lys Val Ala Glu Ile Ile Ser Ser
 35 40 45
 Asp Pro Leu Met Met Ala Lys Leu Leu Gln Leu Ala Asn Ser Pro Tyr
 50 55 60
 Tyr Gly Phe Thr Arg Glu Ile Thr Thr Ile Asn Gln Val Ile Thr Leu
 65 70 75 80
 Leu Gly Val Gly Asn Ile Ile Asn Ile Val Met Ala Asp Ser Ile Arg
 85 90 95
 Asp Asn Phe Lys Ile Asp Val Ser Pro Tyr Gly Leu Asn Thr Gln Asn
 100 105 110
 Phe Leu Lys Thr Cys Asn Glu Glu Ala Thr Phe Ile Val Asn Trp Leu
 115 120 125
 Asn Asp Glu Asp Lys Lys Leu Ser His Leu Leu Val Pro Cys Ala Met
 130 135 140
 Leu Leu Arg Leu Gly Ile Val Ile Phe Ser Asn Phe Leu Ile Gln Asn
 145 150 155 160
 His Lys Asp Lys Asp Phe Leu Ala Phe Leu Asn Lys Asn Glu Asn Leu
 165 170 175
 Ala Leu Ala Glu Asn Glu Phe Leu Gly Val Asp His Ile Ser Phe Leu
 180 185 190
 Gly Phe Leu Leu His Arg Trp Asn Phe Asp Asp Val Leu Ile Glu Ser
 195 200 205
 Ile Cys Phe Val Arg Thr Pro His Ala Ala Arg Glu Lys Val Lys Lys
 210 215 220
 Ser Ala Tyr Ala Leu Ala Ile Thr Asp His Leu Phe Ala Pro His Asp
 225 230 235 240
 Gly Ser Ser Pro Phe Asn Ala Lys Ala Ala Val Ala Leu Leu Lys Glu
 245 250 255
 Ala Lys Thr Gln Gly Ile Asn Phe Asp Leu Asn Asn Leu Leu Ser Lys
 260 265 270
 Leu Pro Asn Lys Ala Lys Glu Asn Leu Asn Lys Glu Asp
 275 280 285
 <210> 20
 <211> 285
 <212> PRT
 <213> Campylobacter jejuni
 <400> 20
 Met Ile Gly Asp Met Asn Glu Leu Leu Leu Lys Ser Val Glu Val Leu
 1 5 10 15
 Pro Pro Leu Pro Asp Thr Val Ser Lys Leu Arg Lys Tyr Val Ser Glu

	20	25	30
	Ala Asn Ser Asn Ile Glu Thr	Met Lys Val Ala Glu Ile	Ile Ser Ser
	35	40	45
	Asp Pro Leu Met Thr Ala Lys	Leu Leu Gln Leu Ala Asn	Ser Pro Tyr
	50	55	60
	Tyr Gly Phe Thr Arg Glu Ile Thr	Thr Thr Ile Asn Gln Val	Ile Thr Leu
	65	70	80
	Leu Gly Val Gly Asn Ile Ile Asn	Ile Val Thr Ala Asp	Ser Ile Arg
	85	90	95
	Asp Asn Phe Lys Ile Asp Val	Ser Pro Tyr Gly Leu Asn	Thr Gln Asn
	100	105	110
	Phe Leu Lys Thr Cys Asn Glu Glu	Ala Thr Phe Ile Thr Asn	Trp Leu
	115	120	125
	Asn Asp Glu Asp Lys Lys Leu Ser	His Leu Leu Val Pro Cys	Ala Met
	130	135	140
	Leu Leu Arg Leu Gly Ile Val Ile	Phe Ser Asn Phe Leu Ile	Gln Asn
	145	150	160
	His Lys Asp Lys Asp Phe Leu Ala	Phe Leu Asn Lys Ser Glu	Asn Leu
	165	170	175
[0027]	Ala Leu Ala Glu Asn Glu Phe Leu	Gly Val Asp His Ile Ser	Phe Leu
	180	185	190
	Gly Phe Leu Leu His Arg Trp Asn	Phe Asp Asp Val Leu Ile	Glu Ser
	195	200	205
	Ile Cys Phe Val Arg Thr Pro His	Ala Ala Arg Glu Glu Val	Lys Lys
	210	215	220
	Ser Ala Tyr Ala Leu Ala Ile Thr	Asp His Leu Phe Ala Pro	His Asp
	225	230	240
	Gly Ser Ser Pro Phe Asn Ala Lys	Ala Ala Val Ala Leu Leu	Lys Glu
	245	250	255
	Ala Lys Thr Gln Gly Ile Asn Phe	Asp Leu Asn Asn Leu Leu	Ser Lys
	260	265	270
	Leu Pro Asn Lys Ala Lys Glu Asn	Leu Asn Lys Glu Asp	
	275	280	285
	<210>	21	
	<211>	285	
	<212>	PRT	
	<213>	Campylobacter jejuni	
	<400>	21	
	Met Ile Gly Asp Met Asn Glu Leu	Leu Leu Leu Lys Ser Val	Glu Val Leu
	1	5	10
			15

[0028]

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

<210> 22
 <211> 285
 <212> PRT
 <213> Campylobacter jejuni
 <400> 22

Met Met Gly Asp Met Asn Glu Leu Leu Leu Lys Ser Val Glu Val Leu
 1 5 10 15
 Pro Pro Leu Pro Asp Thr Val Ser Lys Leu Arg Lys Tyr Val Ser Glu
 20 25 30
 Ala Asn Ser Asn Ile Glu Thr Met Lys Val Ala Glu Ile Ile Ser Ser
 35 40 45
 Asp Pro Leu Met Thr Ala Lys Leu Leu Gln Leu Ala Asn Ser Pro Tyr
 50 55 60
 Tyr Gly Phe Thr Arg Glu Ile Thr Thr Ile Asn Gln Val Ile Thr Leu
 65 70 75 80
 Leu Gly Val Gly Asn Ile Ile Asn Ile Val Thr Ala Asp Ser Ile Arg
 85 90 95
 Asp Asn Phe Lys Ile Asp Val Ser Pro Tyr Gly Leu Asn Thr Gln Asn
 100 105 110
 Phe Leu Lys Thr Cys Asn Glu Glu Ala Thr Phe Ile Thr Asn Trp Leu
 115 120 125
 Asn Asp Glu Asp Lys Lys Leu Ser His Leu Leu Val Pro Cys Ala Met
 130 135 140
 [0029] Leu Leu Arg Leu Gly Ile Val Ile Phe Ser Asn Phe Leu Ile Gln Asn
 145 150 155 160
 His Lys Asp Lys Asp Phe Leu Ala Phe Leu Asn Lys Asn Glu Asn Leu
 165 170 175
 Ala Leu Ala Glu Asn Glu Phe Leu Gly Val Asp His Ile Ser Phe Leu
 180 185 190
 Gly Phe Leu Leu His Arg Trp Asn Phe Asp Asp Val Leu Ile Glu Ser
 195 200 205
 Ile Cys Phe Val Arg Thr Pro His Ala Ala Arg Glu Glu Val Lys Lys
 210 215 220
 Ser Ala Tyr Ala Leu Ala Ile Thr Asp His Leu Phe Ala Pro His Asp
 225 230 235 240
 Gly Ser Ser Pro Phe Asn Ala Lys Ala Ala Val Ala Leu Leu Glu Glu
 245 250 255
 Ala Lys Thr Gln Gly Ile Asn Phe Asp Leu Asn Asn Leu Leu Ser Lys
 260 265 270
 Leu Pro Ser Lys Ala Lys Glu Asn Leu Asn Lys Glu Asp
 275 280 285
 <210> 23
 <211> 285
 <212> PRT

<213> Campylobacter jejuni

<400> 23

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

Pro Pro Leu Pro Asp Thr Val Ser Lys Leu Arg Lys Tyr Val Ser Glu
20 25 30

Ala Asn Ser Asn Ile Glu Thr Met Lys Val Ala Glu Ile Ile Ser Ser
35 40 45

Asp Pro Leu Met Thr Ala Lys Leu Leu Gln Leu Ala Asn Ser Pro Tyr
50 55 60

Tyr Gly Phe Thr Arg Glu Ile Thr Thr Ile Asn Gln Val Ile Thr Leu
65 70 75 80

Leu Gly Val Gly Asn Ile Ile Asn Ile Val Thr Ala Asp Ser Ile Arg
85 90 95

Asp Asn Phe Lys Ile Asp Val Ser Pro Tyr Gly Leu Asn Thr Gln Asn
100 105 110

Phe Leu Lys Thr Cys Asn Glu Glu Ala Thr Phe Ile Thr Asn Trp Leu
115 120 125

[0030]

Asn Asp Glu Asp Lys Lys Leu Ser His Leu Leu Val Pro Cys Ala Met
130 135 140

Leu Leu Arg Leu Gly Ile Val Ile Phe Ser Asn Phe Leu Ile Gln Asn
145 150 155 160

His Lys Asp Lys Asp Phe Leu Ala Phe Leu Asn Lys Asn Glu Asn Leu
165 170 175

Ala Leu Ala Glu Asn Glu Phe Leu Gly Val Asp His Ile Ser Phe Leu
180 185 190

Gly Phe Leu Leu His Arg Trp Asn Phe Asp Asp Val Leu Ile Glu Ser
195 200 205

Ile Cys Phe Val Arg Thr Pro His Ala Ala Arg Glu Glu Val Lys Lys
210 215 220

Ser Ala Tyr Ala Leu Ala Ile Thr Asp His Leu Phe Ala Pro His Asp
225 230 235 240

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

Ala Lys Thr Gln Gly Ile Asn Phe Asp Leu Asn Asn Leu Leu Ser Lys
260 265 270

Leu Pro Ser Lys Ala Lys Glu Asn Leu Asn Glu Glu Asp
275 280 285

<210> 24
 <211> 285
 <212> PRT
 <213> Campylobacter jejuni

<400> 24

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

Pro Pro Leu Pro Asp Thr Val Ser Lys Leu Arg Lys Tyr Val Ser Glu
 20 25 30

Ala Asn Leu Asn Ile Glu Thr Met Lys Val Ala Glu Ile Ile Ser Ser
 35 40 45

Asp Pro Leu Met Thr Ala Lys Leu Leu Gln Leu Ala Asn Ser Pro Tyr
 50 55 60

Tyr Gly Phe Thr Arg Glu Ile Thr Thr Ile Asn Gln Val Ile Thr Leu
 65 70 75 80

Leu Gly Val Gly Asn Ile Ile Asn Ile Val Thr Ala Asp Ser Ile Arg
 85 90 95

Asp Asn Phe Lys Ile Asp Val Ser Pro Tyr Gly Leu Asn Thr Gln Asn
 100 105 110

Phe Leu Lys Thr Cys Asn Glu Glu Ala Thr Phe Ile Ala Asn Trp Leu
 115 120 125

[0031]

Asn Asp Glu Asp Lys Lys Leu Ser His Leu Leu Val Pro Cys Ala Met
 130 135 140

Leu Leu Arg Leu Gly Ile Val Ile Phe Ser Asn Phe Leu Ile Gln Asn
 145 150 155 160

His Lys Asp Lys Asp Phe Leu Ala Phe Leu Asn Lys Asn Glu Asn Leu
 165 170 175

Ala Leu Ala Glu Asn Glu Phe Leu Gly Val Asp His Ile Ser Phe Leu
 180 185 190

Gly Phe Leu Leu His Arg Trp Asn Phe Asp Asp Val Leu Ile Glu Ser
 195 200 205

Ile Cys Phe Val Arg Thr Pro His Ala Ala Arg Glu Glu Val Lys Lys
 210 215 220

Ser Ala Tyr Ala Leu Ala Ile Thr Asp His Leu Phe Ala Pro His Asp
 225 230 235 240

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

Ala Lys Thr Gln Gly Ile Asn Phe Asp Leu Asn Asn Leu Leu Ser Lys
 260 265 270

Leu Pro Ser Lys Ala Lys Glu Asn Leu Asn Lys Glu Asp

	275	280	285
<210>	25		
<211>	285		
<212>	PRT		
<213>	Campylobacter jejuni		
<400>	25		
Met Ile Gly Asp Met Asn Glu Leu Leu Leu Lys Ser Val Glu Val Leu			
1	5	10	15
Pro Pro Leu Pro Asp Thr Val Ser Lys Leu Arg Lys Tyr Val Ser Glu			
	20	25	30
Ala Asn Leu Asn Ile Glu Thr Met Lys Val Ala Glu Ile Ile Ser Ser			
	35	40	45
Asp Pro Leu Met Thr Ala Lys Leu Leu Gln Leu Ala Asn Ser Pro Tyr			
	50	55	60
Tyr Gly Phe Thr Arg Glu Ile Thr Thr Ile Asn Gln Val Ile Thr Leu			
65	70	75	80
Leu Gly Val Gly Asn Ile Ile Asn Ile Val Thr Ala Asp Ser Ile Arg			
	85	90	95
Asp Asn Phe Lys Ile Asp Val Ser Pro Tyr Gly Leu Asn Thr Gln Asn			
	100	105	110
[0032] Phe Leu Lys Thr Cys Asn Glu Glu Ala Thr Phe Ile Thr Asn Trp Leu			
	115	120	125
Asn Asp Glu Asp Lys Lys Leu Ser His Leu Leu Val Pro Cys Ala Met			
	130	135	140
Leu Leu Arg Leu Gly Ile Val Ile Phe Ser Asn Phe Leu Ile Gln Asn			
145	150	155	160
His Lys Asp Lys Asp Phe Leu Ala Phe Leu Asn Lys Asn Glu Asn Leu			
	165	170	175
Ala Leu Ala Glu Asn Glu Phe Leu Gly Val Asp His Ile Ser Phe Leu			
	180	185	190
Gly Phe Leu Leu His Arg Trp Asn Phe Asp Asp Val Leu Ile Glu Ser			
	195	200	205
Ile Cys Phe Val Arg Thr Pro His Ala Ala Arg Glu Glu Val Lys Lys			
	210	215	220
Ser Ala Tyr Ala Leu Ala Ile Thr Asp His Leu Phe Ala Pro His Asp			
225	230	235	240
Gly Ser Ser Pro Phe Asn Ala Lys Ala Ala Val Ala Leu Leu Glu Glu			
	245	250	255
Ala Lys Thr Gln Gly Ile Asn Phe Asp Leu Asn Asn Leu Leu Ser Lys			
	260	265	270

Leu Pro Ser Lys Ala Lys Glu Asn Leu Asn Lys Glu Asp
275 280 285

<210> 26

<211> 285

<212> PRT

<213> Campylobacter jejuni

<400> 26

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

Pro Pro Leu Pro Asp Thr Val Ser Lys Leu Arg Lys Tyr Val Ser Glu
20 25 30

Ala Asn Ser Asn Ile Glu Thr Met Lys Val Ala Glu Ile Ile Ser Ser
35 40 45

Asp Pro Leu Met Thr Ala Lys Leu Leu Gln Leu Ala Asn Ser Pro Tyr
50 55 60

Tyr Gly Phe Thr Arg Glu Ile Thr Thr Ile Asn Gln Val Ile Thr Leu
65 70 75 80

Leu Gly Val Gly Asn Ile Ile Asn Ile Val Thr Ala Asp Ser Ile Arg
85 90 95

[0033]

Asp Asn Phe Lys Ile Asp Val Ser Pro Tyr Gly Leu Asn Thr Gln Asn
100 105 110

Phe Leu Lys Thr Cys Asn Glu Glu Ala Thr Phe Ile Thr Asn Trp Leu
115 120 125

Asn Asp Glu Asp Lys Lys Leu Ser His Leu Leu Val Pro Cys Ala Met
130 135 140

Leu Leu Arg Leu Gly Ile Val Ile Phe Ser Asn Phe Leu Ile Gln Asn
145 150 155 160

Tyr Lys Asp Lys Asp Phe Leu Ala Phe Leu Asn Lys Asn Glu Asn Leu
165 170 175

Ala Leu Ala Glu Asn Glu Phe Leu Gly Val Asp His Ile Ser Phe Leu
180 185 190

Gly Phe Leu Leu His Arg Trp Asn Phe Asp Asp Val Leu Ile Glu Ser
195 200 205

Ile Cys Phe Val Arg Thr Pro His Ala Ala Arg Glu Glu Val Lys Lys
210 215 220

Ser Ala Tyr Ala Leu Ala Ile Thr Asp His Leu Phe Ala Pro His Asp
225 230 235 240

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

Ala Lys Thr Gln Gly Ile Asn Phe Asp Leu Asn Asn Leu Leu Ser Lys
 260 265 270
 Leu Pro Ser Lys Ala Lys Glu Asn Leu Asn Glu Glu Asp
 275 280 285
 <210> 27
 <211> 285
 <212> PRT
 <213> Campylobacter jejuni
 <400> 27
 Met Ile Gly Asp Met Asn Glu Leu Leu Leu Lys Ser Val Glu Val Leu
 1 5 10 15
 Pro Pro Leu Pro Asp Thr Val Ser Lys Leu Arg Lys Tyr Val Ser Glu
 20 25 30
 Ala Asn Ser Asn Ile Glu Thr Met Lys Val Ala Glu Ile Ile Ser Ser
 35 40 45
 Asp Pro Leu Met Thr Ala Lys Leu Leu Gln Leu Ala Asn Ser Pro Tyr
 50 55 60
 Tyr Gly Phe Thr Arg Glu Ile Thr Thr Ile Asn Gln Val Ile Thr Leu
 65 70 75 80
 [0034] Leu Gly Val Gly Asn Ile Ile Asn Ile Val Thr Ala Asp Ser Ile Arg
 85 90 95
 Asp Asn Phe Lys Ile Asp Val Ser Pro Tyr Gly Leu Asn Thr Gln Asn
 100 105 110
 Phe Leu Lys Thr Cys Asn Glu Glu Ala Thr Phe Ile Thr Asn Trp Leu
 115 120 125
 Asn Asp Glu Asp Lys Lys Leu Ser His Leu Leu Val Pro Cys Ala Met
 130 135 140
 Leu Leu Arg Leu Gly Ile Val Ile Phe Ser Asn Phe Leu Ile Gln Asn
 145 150 155 160
 His Lys Asp Lys Asp Phe Leu Ala Phe Leu Asn Lys Asn Glu Asn Leu
 165 170 175
 Ala Leu Ala Glu Asn Glu Phe Leu Gly Val Asp His Ile Ser Phe Leu
 180 185 190
 Gly Phe Leu Leu His Arg Trp Asn Phe Asp Asp Val Leu Ile Glu Ser
 195 200 205
 Ile Cys Phe Val Arg Thr Pro His Ala Ala Arg Glu Glu Val Lys Lys
 210 215 220
 Ser Ala Tyr Ala Leu Ala Ile Thr Asp His Leu Phe Ala Pro His Asp
 225 230 235 240

Gly Ser Ser Pro Phe Asn Ala Lys Ala Ala Val Ala Leu Leu Glu Glu
 245 250 255
 Ala Lys Thr Gln Gly Ile Asn Phe Asp Leu Asp Asn Leu Leu Ser Lys
 260 265 270
 Leu Pro Ser Lys Ala Lys Glu Asn Leu Asp Lys Glu Asp
 275 280 285
 <210> 28
 <211> 285
 <212> PRT
 <213> Campylobacter jejuni
 <400> 28
 Met Ile Gly Asp Met Asn Glu Leu Leu Leu Lys Ser Val Glu Val Leu
 1 5 10 15
 Pro Pro Leu Pro Asp Thr Val Ser Lys Leu Arg Lys Tyr Val Ser Glu
 20 25 30
 Ala Asn Ser Asn Ile Glu Thr Met Lys Val Ala Glu Ile Ile Ser Ser
 35 40 45
 Asp Pro Leu Met Thr Ala Lys Leu Leu Gln Leu Ala Asn Ser Pro Tyr
 50 55 60
 Tyr Gly Phe Thr Arg Glu Ile Thr Thr Ile Asn Gln Val Ile Thr Leu
 65 70 75 80
 Leu Gly Ile Gly Asn Ile Ile Asn Ile Val Thr Ala Asp Ser Ile Arg
 85 90 95
 Asp Ser Phe Lys Ile Asp Val Ser Pro Tyr Gly Leu Asp Thr Gln Asn
 100 105 110
 Phe Leu Lys Thr Cys Asn Glu Glu Ala Thr Phe Ile Thr Asn Trp Leu
 115 120 125
 Asn Asp Glu Asp Lys Lys Leu Ser His Leu Leu Val Pro Cys Ala Met
 130 135 140
 Leu Leu Arg Leu Gly Ile Val Ile Phe Ser Asn Phe Leu Ile Gln Asn
 145 150 155 160
 His Lys Asp Lys Asp Phe Leu Ala Phe Leu Asn Lys Asn Glu Asn Leu
 165 170 175
 Ala Leu Ala Glu Asn Glu Phe Leu Gly Val Asp His Ile Ser Phe Leu
 180 185 190
 Gly Phe Leu Leu His Arg Trp Asn Phe Asp Asp Val Leu Ile Glu Ser
 195 200 205
 Ile Cys Phe Val Arg Thr Pro His Ala Ala Arg Glu Glu Val Lys Lys
 210 215 220
 Ser Ala Tyr Ala Leu Ala Ile Thr Asp His Leu Phe Ala Pro His Asp

[0035]

225	230	235	240
Gly Ser Ser Pro Phe	Asn Ala Lys Ala	Ala Val Ala Leu Leu	Glu Glu
	245	250	255
Ala Lys Thr Gln Gly Ile	Asn Phe Asp Leu Asn Asn Leu Leu	Ser Lys	
	260	265	270
Leu Pro Ser Lys Ala Lys Glu	Asn Leu Asn Lys Glu	Asp	
	275	280	285
<210>	29		
<211>	285		
<212>	PRT		
<213>	Campylobacter jejuni		
<400>	29		
Met Ile Gly Asp Met	Asn Glu Leu Leu Leu Lys Ser Val Glu Val Leu		
1	5	10	15
Pro Pro Leu Pro Asp Thr Val	Ser Lys Leu Arg Lys Tyr Val Ser Glu		
	20	25	30
Ala Asn Ser Asn Ile Glu Thr Met	Lys Val Ala Glu Ile Ile Ser Ser		
	35	40	45
Asp Pro Leu Met Thr Ala Lys	Leu Leu Gln Leu Ala Asn Ser Pro Tyr		
	50	55	60
[0036]			
Tyr Gly Phe Thr Arg Glu Ile Thr Thr	Ile Asn Gln Val Ile Thr Leu		
65	70	75	80
Leu Gly Ile Gly Asn Ile Ile Asn Ile	Val Thr Ala Asp Ser Ile Arg		
	85	90	95
Asp Ser Phe Lys Ile Asp Val Ser	Pro Tyr Gly Leu Asn Thr Gln Asn		
	100	105	110
Phe Leu Lys Thr Cys Asn Glu Glu Ala Thr Phe	Ile Thr Asn Trp Leu		
	115	120	125
Asn Asp Glu Asp Lys Lys Leu Ser His	Leu Leu Val Pro Cys Ala Met		
	130	135	140
Leu Leu Arg Leu Gly Ile Val Ile Phe Ser	Asn Phe Leu Ile Gln Asn		
	145	150	155
His Lys Asp Lys Asp Phe Leu Ala Phe	Leu Asn Lys Asn Glu Asn Leu		
	165	170	175
Ala Leu Ala Glu Asn Glu Phe Leu Gly	Val Asp His Ile Ser Phe Leu		
	180	185	190
Gly Phe Leu Leu His Arg Trp Asn Phe	Asp Asp Val Leu Ile Glu Ser		
	195	200	205
Ile Cys Phe Val Arg Thr Pro His	Ala Ala Arg Glu Glu Val Lys Lys		
	210	215	220

Ser Ala Tyr Ala Leu Ala Ile Thr Asp His Leu Phe Ala Pro His Asp
 225 230 235 240
 Gly Ser Ser Pro Phe Asn Val Lys Ala Ala Val Ala Leu Leu Glu Glu
 245 250 255
 Ala Lys Thr Gln Gly Ile Asn Phe Asp Leu Asn Asn Leu Leu Ser Lys
 260 265 270
 Leu Pro Ser Lys Ala Lys Glu Asn Leu Asn Lys Glu Asp
 275 280 285
 <210> 30
 <211> 283
 <212> PRT
 <213> Campylobacter jejuni
 <400> 30
 Met Asp Met Asn Glu Leu Leu Leu Lys Ser Val Glu Val Leu Pro Pro
 1 5 10 15
 Leu Pro Asp Thr Val Ser Lys Leu Arg Lys Tyr Val Ser Glu Ala Asn
 20 25 30
 Ser Asn Ile Glu Thr Met Lys Val Ala Glu Ile Ile Ser Ser Asp Pro
 35 40 45
 Leu Met Thr Ala Lys Leu Leu Gln Leu Ala Asn Ser Pro Tyr Tyr Gly
 50 55 60
 Phe Thr Arg Glu Ile Thr Thr Ile Asn Gln Val Ile Thr Leu Leu Gly
 65 70 75 80
 Val Gly Asn Ile Ile Asn Ile Val Thr Ala Asp Ser Ile Arg Asp Asn
 85 90 95
 Phe Lys Ile Asp Val Ser Pro Tyr Gly Leu Asn Thr Gln Asn Phe Leu
 100 105 110
 Lys Thr Cys Asn Glu Glu Ala Thr Phe Ile Thr Asn Trp Leu Asn Asp
 115 120 125
 Glu Asp Lys Lys Leu Ser His Leu Leu Val Pro Cys Ala Met Leu Leu
 130 135 140
 Arg Leu Gly Ile Val Ile Phe Ser Asn Phe Leu Ile Gln Asn His Lys
 145 150 155 160
 Asp Lys Asp Phe Leu Ala Phe Leu Asn Lys Asn Glu Asn Leu Ala Leu
 165 170 175
 Ala Glu Asn Glu Phe Leu Gly Val Asp His Ile Ser Phe Leu Gly Phe
 180 185 190
 Leu Leu His Arg Trp Asn Phe Asp Asp Val Leu Ile Glu Ser Ile Cys
 195 200 205

[0037]

Phe Val Arg Thr Pro His Ala Ala Arg Glu Glu Val Lys Lys Ser Ala
 210 215 220
 Tyr Ala Leu Ala Ile Thr Asp His Leu Phe Ala Pro His Asp Gly Ser
 225 230 235 240
 Ser Pro Phe Asn Ala Lys Ala Ala Val Ala Leu Leu Glu Glu Ala Lys
 245 250 255
 Thr Gln Gly Ile Asn Phe Asp Leu Asn Asn Leu Leu Ser Lys Leu Pro
 260 265 270
 Ser Lys Ala Lys Glu Asn Leu Asn Lys Glu Asp
 275 280

<210> 31
 <211> 297
 <212> PRT
 <213> Campylobacter jejuni

<220>
 <221> MISC_FEATURE
 <222> (1)..(1)
 <223> X can be any amino acid

<220>
 <221> MISC_FEATURE
 <222> (13)..(13)
 <223> X can be any amino acid

[0038]

<220>
 <221> MISC_FEATURE
 <222> (17)..(17)
 <223> X can be any amino acid

<220>
 <221> MISC_FEATURE
 <222> (52)..(52)
 <223> X can be any amino acid

<220>
 <221> MISC_FEATURE
 <222> (64)..(64)
 <223> X can be any amino acid

<220>
 <221> MISC_FEATURE
 <222> (103)..(103)
 <223> X can be any amino acid

<220>
 <221> MISC_FEATURE
 <222> (156)..(156)
 <223> X can be any amino acid

<400> 31

Xaa Gly Ser Asp Lys Ile His His His His His His Xaa Ile Gly Asp
 1 5 10 15

Xaa Asn Glu Leu Leu Leu Lys Ser Val Glu Val Leu Pro Pro Leu Pro
 20 25 30

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

[0039]

Ile Glu Thr Xaa Lys Val Ala Glu Ile Ile Ser Ser Asp Pro Leu Xaa
 50 55 60
 Thr Ala Lys Leu Leu Gln Leu Ala Asn Ser Pro Tyr Tyr Gly Phe Thr
 65 70 75 80
 Arg Glu Ile Thr Thr Ile Asn Gln Val Ile Thr Leu Leu Gly Val Gly
 85 90 95
 Asn Ile Ile Asn Ile Val Xaa Ala Asp Ser Ile Arg Asp Asn Phe Lys
 100 105 110
 Ile Asp Val Ser Pro Tyr Gly Leu Asn Thr Gln Asn Phe Leu Lys Thr
 115 120 125
 Cys Asn Glu Glu Ala Thr Phe Ile Ala Asn Trp Leu Asn Asp Glu Asp
 130 135 140
 Lys Lys Leu Ser His Leu Leu Val Pro Cys Ala Xaa Leu Leu Arg Leu
 145 150 155 160
 Gly Ile Val Ile Phe Ser Asn Phe Leu Ile Gln Asn His Lys Asp Lys
 165 170 175
 Asp Phe Leu Ala Phe Leu Asn Lys Asn Glu Asn Leu Ala Leu Ala Glu
 180 185 190
 Asn Glu Phe Leu Gly Val Asp His Ile Ser Phe Leu Gly Phe Leu Leu
 195 200 205
 His Arg Trp Asn Phe Asp Asp Val Leu Ile Glu Ser Ile Cys Phe Val
 210 215 220
 Arg Thr Pro His Ala Ala Arg Glu Lys Val Lys Lys Ser Ala Tyr Ala
 225 230 235 240
 Leu Ala Ile Thr Asp His Leu Phe Ala Pro His Asp Gly Ser Ser Pro
 245 250 255
 Phe Asn Ala Lys Ala Ala Val Ala Leu Leu Lys Glu Ala Lys Thr Gln
 260 265 270
 Gly Ile Asn Phe Asp Leu Asn Asn Leu Leu Ser Lys Leu Pro Asn Lys
 275 280 285
 Ala Lys Glu Asn Leu Asn Lys Glu Asp
 290 295
 <210> 32
 <211> 285
 <212> PRT
 <213> Campylobacter jejuni
 <400> 32
 Met Ile Gly Asp Met Asn Glu Leu Leu Leu Lys Ser Val Glu Val Leu
 1 5 10 15
 Pro Pro Leu Pro Asp Thr Val Ser Lys Leu Arg Lys Tyr Val Ser Glu

	20	25	30
	Ala Asn Ser Asn Ile Glu Thr	Met Lys Val Ala Glu Ile	Ile Ser Ser
	35	40	45
	Asp Pro Leu Met Thr Ala Lys	Leu Leu Gln Leu Ala Asn	Ser Pro Tyr
	50	55	60
	Tyr Gly Phe Thr Arg Glu Ile Thr	Thr Thr Ile Asn Gln Val	Ile Thr Leu
	65	70	80
	Leu Gly Val Ser Asn Ile Ile Asn	Ile Val Thr Ala Asp Ser	Ile Arg
	85	90	95
	Asp Ser Phe Lys Ile Asp Val Ser	Pro Tyr Gly Leu Asp Thr	Gln Val
	100	105	110
	Phe Leu Arg Asn Cys Asn Glu Glu	Ala Thr Phe Ile Thr Asn Trp	Leu
	115	120	125
	Asn Asp Glu Asp Lys Lys Leu Ser	His Leu Leu Val Pro Cys	Ala Met
	130	135	140
	Leu Leu Arg Phe Gly Ile Val Ile	Phe Ser Asn Phe Leu Ile	Gln Asn
	145	150	160
	His Lys Asp Lys Asp Phe Leu Ala	Phe Leu Asn Lys Asn Glu	Asn Leu
	165	170	175
[0040]	Ala Leu Ala Glu Asn Glu Phe Leu	Gly Val Asp His Ile Ser	Phe Leu
	180	185	190
	Gly Phe Leu Leu His Arg Trp Asn	Phe Asp Asp Val Leu Ile	Glu Ser
	195	200	205
	Ile Cys Phe Val Arg Thr Pro His	Ala Ala Arg Glu Glu Val	Lys Lys
	210	215	220
	Ser Ala Tyr Ala Leu Ala Ile Thr	Asp His Leu Phe Thr Pro	His Asp
	225	230	240
	Gly Ser Ser Pro Phe Asn Ala Lys	Ala Ala Val Ala Leu Leu	Glu Glu
	245	250	255
	Ala Lys Thr Gln Gly Ile Asn Phe	Asp Leu Asn Asn Leu Leu	Ser Lys
	260	265	270
	Leu Pro Ser Lys Ala Lys Glu Asn	Leu Asp Lys Glu Asp	
	275	280	285
	<210>	33	
	<211>	287	
	<212>	PRT	
	<213>	Campylobacter jejuni	
	<400>	33	
	Met Ile Gly Asp Met Asn Glu Leu	Leu Leu Lys Ser Val	Glu Val Leu
	1	5	10
			15

[0041]

Pro Pro Leu Pro Asp Thr Val Ser Lys Leu Arg Lys Tyr Val Ser Glu
 20 25 30
 Ala Asn Ser Asn Ile Glu Thr Met Lys Val Ala Glu Ile Ile Ser Ser
 35 40 45
 Asp Pro Leu Met Thr Ala Lys Leu Leu Gln Leu Ala Asn Ser Pro Tyr
 50 55 60
 Tyr Gly Phe Thr Arg Glu Ile Thr Thr Ile Asn Gln Val Ile Thr Leu
 65 70 75 80
 Leu Gly Val Gly Asn Ile Ile Asn Ile Val Thr Ala Asp Ser Ile Lys
 85 90 95
 Asp Ser Phe Lys Ile Asp Val Ser Pro Tyr Gly Leu Asp Thr Gln Val
 100 105 110
 Phe Leu Arg Asn Cys Asn Glu Glu Ala Thr Phe Ile Thr Asn Trp Leu
 115 120 125
 Asn Asp Glu Asp Lys Lys Leu Ser His Leu Leu Val Pro Cys Ala Met
 130 135 140
 Leu Leu Arg Leu Gly Ile Val Ile Phe Ser Asn Phe Leu Ile Gln Asn
 145 150 155 160
 His Arg Glu Lys Glu Phe Leu Thr Phe Leu Asn Glu Thr Lys Ile Glu
 165 170 175
 Asn Ile Ala Leu Ala Glu Asn Glu Phe Leu Gly Val Asp His Ile Ser
 180 185 190
 Phe Leu Gly Phe Leu Leu His Arg Trp Asn Phe Asp Asp Val Leu Ile
 195 200 205
 Glu Ser Ile Cys Phe Val Arg Thr Pro His Ala Ala Arg Glu Glu Val
 210 215 220
 Lys Lys Ser Ala Tyr Ala Leu Ala Ile Thr Asp His Leu Phe Ala Pro
 225 230 235 240
 His Asp Gly Ser Ser Pro Phe Asn Ala Lys Ala Ala Val Ala Leu Leu
 245 250 255
 Glu Glu Ala Lys Thr Gln Gly Ile Asn Phe Asp Leu Asn Asn Leu Leu
 260 265 270
 Ser Lys Leu Pro Ser Lys Ala Lys Glu Asn Leu Asn Lys Glu Asp
 275 280 285
 <210> 34
 <211> 287
 <212> PRT
 <213> Campylobacter jejuni
 <400> 34

[0042]

```

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

Pro Pro Leu Pro Asp Thr Val Ser Lys Leu Arg Lys Tyr Val Ser Glu
20     25     30

Ala Asn Ser Asn Ile Glu Thr Met Lys Val Val Glu Ile Ile Ser Ser
35     40     45

Asp Pro Leu Met Thr Ala Lys Leu Leu Gln Leu Ala Asn Ser Pro Tyr
50     55     60

Tyr Gly Phe Thr Arg Glu Ile Thr Thr Ile Ser Gln Val Ile Thr Leu
65     70     75     80

Leu Gly Ile Gly Asn Ile Ile Asn Ile Val Thr Ala Asp Ser Ile Arg
85     90     95

Asp Asn Phe Lys Ile Asp Val Ser Pro Tyr Gly Leu Asp Thr Lys Asn
100    105    110

Phe Leu Lys Thr Cys Asn Glu Glu Ala Thr Phe Ile Thr Asn Trp Leu
115    120    125

Asn Asp Glu Asp Lys Lys Leu Ser Phe Leu Leu Val Pro Cys Ala Met
130    135    140

Leu Leu Arg Leu Gly Ile Val Ile Phe Ser Asn Phe Leu Ile Gln Asn
145    150    155    160

His Lys Asp Lys Asp Phe Leu Ala Phe Leu Asn Lys Thr Lys Asn Glu
165    170    175

Asn Ile Ala Leu Ala Glu Asn Glu Phe Leu Gly Val Asp His Ile Ser
180    185    190

Phe Leu Gly Phe Leu Leu Tyr His Trp Asn Phe Asp Asp Ile Leu Ile
195    200    205

Glu Ser Ile Cys Phe Val Arg Thr Pro His Ala Ala Arg Glu Glu Val
210    215    220

Lys Lys Ser Ala Tyr Ala Leu Ala Ile Thr Asp His Leu Phe Ala Pro
225    230    235    240

His Asp Gly Ser Ser Pro Phe Asn Thr Lys Ala Ala Ile Ala Leu Leu
245    250    255

Glu Glu Ala Lys Thr Gln Gly Ile Asn Phe Asp Leu Asn Asn Leu Leu
260    265    270

Ser Lys Leu Pro Ser Lys Ala Lys Glu Asn Leu Asp Lys Glu Asp
275    280    285

<210> 35
<211> 264
<212> PRT

```

<213> Campylobacter jejuni

<400> 35

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

Pro Pro Leu Pro Asp Thr Val Ser Lys Leu Arg Lys Tyr Val Ser Glu
20 25 30

Ala Asn Ser Asn Ile Glu Thr Met Lys Val Ala Glu Ile Ile Ser Ser
35 40 45

Asp Pro Leu Met Thr Ala Lys Leu Leu Gln Leu Ala Asn Ser Pro Tyr
50 55 60

Tyr Gly Phe Thr Arg Glu Ile Thr Thr Ile Asn Gln Val Ile Thr Leu
65 70 75 80

Leu Gly Val Gly Asn Ile Ile Asn Ile Val Thr Ala Asp Ser Ile Lys
85 90 95

Asp Ser Phe Lys Ile Asp Val Ser Pro Tyr Gly Leu Asp Thr Gln Val
100 105 110

Phe Leu Arg Asn Cys Asn Glu Glu Ala Thr Phe Ile Thr Asn Trp Leu
115 120 125

[0043]

Asn Asp Glu Asp Lys Lys Leu Ser His Leu Leu Val Pro Cys Ala Met
130 135 140

Leu Leu Arg Leu Gly Ile Val Ile Phe Ser Asn Phe Leu Ile Gln Asn
145 150 155 160

His Arg Glu Lys Glu Phe Leu Thr Phe Leu Asn Glu Thr Lys Ile Glu
165 170 175

Asn Ile Ala Leu Ala Glu Asn Glu Phe Leu Gly Val Asp His Ile Ser
180 185 190

Phe Leu Gly Phe Leu Leu His Arg Trp Asn Phe Asp Asp Val Leu Ile
195 200 205

Glu Ser Ile Cys Phe Val Arg Thr Pro His Ala Ala Arg Glu Glu Val
210 215 220

Lys Lys Ser Ala Tyr Ala Leu Ala Ile Thr Asp His Leu Phe Ala Pro
225 230 235 240

His Asp Gly Ser Ser Pro Phe Asn Ala Lys Ala Ala Val Ala Leu Leu
245 250 255

Glu Glu Ala Lys Asn Ser Arg Asn
260

<210> 36

<211> 162

<212> PRT

<213> Campylobacter jejuni

<400> 36

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

Pro Pro Leu Pro Asp Thr Val Ser Lys Leu Arg Lys Tyr Val Ser Glu
20 25 30

Ala Asn Ser Asn Ile Glu Thr Met Lys Val Ala Glu Ile Ile Ser Ser
35 40 45

Asp Pro Leu Met Thr Ala Lys Leu Leu Gln Leu Ala Asn Ser Pro Tyr
50 55 60

Tyr Gly Phe Thr Arg Glu Ile Thr Thr Ile Asn Gln Val Ile Thr Leu
65 70 75 80

Leu Gly Val Gly Asn Ile Ile Asn Ile Val Met Ala Asp Ser Ile Arg
85 90 95

Asp Asn Phe Lys Ile Asp Val Ser Pro Tyr Gly Leu Asn Thr Gln Asn
100 105 110

Phe Leu Lys Thr Cys Asn Glu Glu Ala Thr Phe Ile Ala Asn Trp Leu
115 120 125

Asn Asp Glu Asp Lys Lys Leu Ser His Leu Leu Val Pro Cys Ala Met
130 135 140

[0044]

Leu Leu Arg Leu Gly Ile Val Ile Phe Ser Asn Phe Leu Ile Gln Asn
145 150 155 160

Phe Lys

<210> 37

<211> 298

<212> PRT

<213> *Campylobacter jejuni*

<400> 37

Met Asn Asn Leu Leu Glu Lys Asn Ile Asn Glu Ile Asn Glu Met Leu
1 5 10 15

Ile Lys Ser Leu Asp Asp Leu Pro Pro Leu Pro Glu Thr Ile Gln Lys
20 25 30

Leu Gln Glu Tyr Ile Ala Thr His Gly Ser Asn Ile Val Ile Asp Glu
35 40 45

Val Ala Asp Ile Ile Ser Thr Asp Pro Leu Ile Thr Ala Asn Leu Leu
50 55 60

His Leu Thr Asn Ser Ala Tyr Tyr Gly Phe Ser Lys Glu Ile Lys Thr
65 70 75 80

Val Asn Gln Ala Leu Val Leu Leu Gly Val Ser Asn Val Lys Asn Met
85 90 95

	Ile	Ile	Ala	Asp	Tyr	Ala	Lys	Ser	Ser	Phe	Val	Ile	Asn	Leu	Ser	Pro	
				100					105					110			
	Tyr	Gly	Ile	Glu	Thr	Asp	Arg	Phe	Leu	Thr	Leu	Ile	His	Glu	Gln	Thr	
		115					120						125				
	Asn	Phe	Ile	Ser	Thr	Trp	Leu	Ile	Glu	Glu	Asp	Arg	Ile	Leu	Cys	Tyr	
		130					135					140					
	Asn	Leu	Ile	Pro	Cys	Val	Met	Met	Leu	Arg	Leu	Gly	Ile	Met	Val	Phe	
	145					150					155					160	
	Ser	Asn	Phe	Leu	Ile	Gln	Asn	Asn	Ile	Asp	Lys	Lys	Phe	Leu	Leu	His	
				165						170						175	
	Leu	Ser	Lys	Asn	Asn	Phe	Asn	Asn	Ile	Leu	Arg	Leu	Glu	Arg	Glu	Phe	
				180					185					190			
	Leu	Gly	Val	Asp	His	Ile	Ser	Phe	Leu	Ser	Asn	Leu	Phe	Lys	Val	Trp	
		195						200					205				
	Asn	Leu	Asp	Glu	Asp	Leu	Ile	Glu	Ile	Ile	Ser	Ser	Leu	Asp	Tyr	Leu	
		210					215					220					
	Gly	Ser	Thr	Ser	Ala	Lys	Val	Lys	Lys	Glu	Thr	Tyr	Ala	Leu	Ala	Ala	
	225					230					235					240	
[0045]	Ile	Glu	Ala	Leu	Phe	Ser	Pro	Glu	Lys	Asn	Ala	Tyr	Asp	Asp	Phe	Cys	
				245						250					255		
	Val	Gln	Lys	Ala	Tyr	Gln	Ile	Leu	Lys	Asp	Gly	Lys	Ala	Asn	Gly	Val	
			260						265					270			
	Asp	Phe	Asn	Leu	Glu	Asn	Phe	Leu	Asn	Lys	Leu	Pro	Glu	Lys	Phe	Ile	
		275						280					285				
	Glu	Ile	Leu	Ser	Lys	Ser	Lys	Glu	Gln	Leu							
		290					295										
	<210>	38															
	<211>	127															
	<212>	PRT															
	<213>	Campylobacter jejuni															
	<400>	38															
	Met	Leu	Phe	Phe	Gln	Ile	Phe	Leu	Tyr	Lys	Ile	Leu	Asn	Lys	Asn	Glu	
	1				5					10					15		
	Asn	Leu	Ala	Leu	Ala	Glu	Asn	Glu	Phe	Leu	Gly	Val	Asp	His	Ile	Ser	
			20						25					30			
	Phe	Leu	Gly	Phe	Leu	Leu	His	Arg	Trp	Asn	Phe	Asp	Asp	Val	Leu	Ile	
		35						40					45				
	Glu	Ser	Ile	Cys	Phe	Val	Arg	Thr	Pro	His	Ala	Ala	Arg	Glu	Lys	Val	
		50					55					60					

Lys Lys Ser Ala Tyr Ala Leu Ala Ile Thr Asp His Leu Phe Ala Pro
 65 70 75 80
 His Asp Gly Ser Ser Pro Phe Asn Ala Lys Ala Ala Val Ala Leu Leu
 85 90 95
 Lys Glu Ala Lys Thr Gln Gly Ile Asn Phe Asp Leu Asn Asn Leu Leu
 100 105 110
 Ser Lys Leu Pro Asn Lys Ala Lys Glu Asn Leu Asn Lys Glu Asp
 115 120 125
 <210> 39
 <211> 202
 <212> PRT
 <213> Campylobacter jejuni
 <400> 39
 Met Asn Asn Leu Leu Glu Lys Asn Ile Asn Glu Val Asn Glu Met Leu
 1 5 10 15
 Ile Lys Ser Leu Asp Asp Leu Pro Pro Leu Pro Glu Thr Ile Gln Lys
 20 25 30
 Leu Gln Glu Tyr Ile Ala Thr His Gly Ser Asn Ile Ala Ile Asp Glu
 35 40 45
 Val Ala Asp Ile Ile Ser Thr Asp Pro Leu Ile Thr Ala Asn Leu Leu
 50 55 60
 His Leu Thr Asn Ser Ala Tyr Tyr Gly Phe Ser Lys Glu Ile Lys Thr
 65 70 75 80
 Val Asn Gln Ala Leu Val Leu Leu Gly Val Asn Asn Val Lys Asn Met
 85 90 95
 Ile Ile Ala Asp Tyr Ala Lys Ser Ser Phe Val Ile Asn Leu Ser Pro
 100 105 110
 Tyr Gly Ile Glu Thr Asp Arg Phe Leu Ala Leu Ile His Glu Gln Thr
 115 120 125
 Asp Phe Ile Ser Thr Trp Leu Met Lys Glu Asp Lys Met Leu Cys Leu
 130 135 140
 Asn Leu Ile Pro Cys Val Met Met Leu Arg Leu Gly Ile Met Val Phe
 145 150 155 160
 Ser Asn Phe Leu Ile Gln Asn Lys Ile Asp Lys Lys Phe Leu Leu His
 165 170 175
 Leu Ser Lys Asn Asn Phe Asn Asn Ile Leu Arg Leu Glu Arg Glu Phe
 180 185 190
 Leu Gly Ile Glu Val Val Trp Ala Arg Asn
 195 200

[0046]

<210> 40
 <211> 368
 <212> PRT
 <213> Campylobacter jejuni

<400> 40

Met Lys Glu Gln Ile Leu Glu Lys Leu Lys Thr Val Lys Tyr Pro Gly
 1 5 10 15

Phe Glu Lys Asp Ile Val Ser Phe Asn Phe Val Lys Asp Ile Lys Ile
 20 25 30

Gln Asp Asp Gly Val Phe Ile Asp Ile Glu Ile Val Ser Ala Asn Pro
 35 40 45

Glu Val Val Asn Glu Ile Arg Lys Asn Val Thr Glu Ala Leu Ser Ser
 50 55 60

Leu Ala Leu Lys Asn Ile Glu Leu Asn Ile Ile Thr Pro Lys Ile Pro
 65 70 75 80

Glu Glu Lys Ser Asn Ser Arg Ser Gly Lys Asn Ile Ala Pro Gln Val
 85 90 95

Lys Asn Phe Ile Met Val Ser Ser Gly Lys Gly Gly Val Gly Lys Ser
 100 105 110

Thr Thr Thr Val Asn Leu Ala Ile Ser Met Ala Lys Met Gly Lys Arg
 115 120 125

[0047]

Val Gly Ile Leu Asp Ala Asp Ile Tyr Gly Pro Asn Ile Pro Arg Met
 130 135 140

Leu Gly Glu Thr Lys Thr Gln Pro Glu Val Val Gly Gln Arg Leu Lys
 145 150 155 160

Pro Ile Leu Thr His Gly Val Tyr Met Met Ser Met Gly Val Leu Ile
 165 170 175

Glu Glu Gly Gln Gly Leu Met Trp Arg Gly Ala Met Ile Met Lys Ala
 180 185 190

Ile Glu Gln Leu Leu Ala Asp Val Ile Trp Pro Glu Leu Asp Val Leu
 195 200 205

Phe Leu Asp Met Pro Pro Gly Thr Gly Asp Ala Gln Ile Thr Ser Ala
 210 215 220

Gln Ser Ile Pro Ile Thr Ala Gly Val Cys Val Ser Thr Pro Gln Thr
 225 230 235 240

Val Ser Leu Asp Asp Ser Lys Arg Ala Leu Asp Met Phe Asn Lys Leu
 245 250 255

His Ile Pro Ile Ala Gly Val Ile Glu Asn Met Ser Gly Phe Leu Cys
 260 265 270

Pro Asp Asn Gly Lys Glu Tyr Asp Ile Phe Gly Lys Gly Thr Ala Glu

275	280	285
Asp Met Ala Lys Ala Tyr Lys Ser Glu Val Leu Ala Gln Ile Pro Ile		
290	295	300
Glu Met Ile Val Arg Glu Gly Gly Asp Glu Gly Lys Pro Val Ser Phe		
305	310	315
Tyr His Pro Glu Ser Val Ser Ser Lys Arg Tyr Leu Thr Ala Ala Glu		
325	330	335
Lys Ile Trp Ser Phe Ile Glu Lys Ile Asn Asn Glu Gly Gly Ala Asp		
340	345	350
Asn Ser Ala Ile Gln Pro Val Met Asn Gly Lys Ser Ala Cys Ser His		
355	360	365
<210> 41		
<211> 368		
<212> PKT		
<213> Campylobacter jejuni		
<400> 41		
Met Lys Glu Gln Ile Leu Glu Lys Leu Lys Thr Val Lys Tyr Pro Gly		
1	5	10
Phe Glu Lys Asp Ile Val Ser Phe Asn Phe Val Lys Asp Ile Lys Ile		
20	25	30
[0048]		
Gln Asp Asp Gly Val Phe Ile Asp Ile Glu Ile Val Ser Ala Asn Pro		
35	40	45
Glu Val Val Asn Glu Ile Arg Lys Asn Val Thr Glu Ala Leu Ser Ser		
50	55	60
Leu Ala Leu Lys Asn Ile Glu Leu Asn Ile Ile Thr Pro Lys Ile Pro		
65	70	75
Glu Glu Lys Ser Asn Ser Arg Ser Gly Lys Asn Ile Ala Pro Gln Val		
85	90	95
Lys Asn Phe Ile Met Val Ser Ser Gly Lys Gly Gly Val Gly Lys Ser		
100	105	110
Thr Thr Thr Val Asn Leu Ala Ile Ser Met Ala Lys Met Gly Lys Arg		
115	120	125
Val Gly Ile Leu Asp Ala Asp Ile Tyr Gly Pro Asn Ile Pro Arg Met		
130	135	140
Leu Gly Glu Thr Lys Thr Gln Pro Glu Val Val Gly Gln Arg Leu Lys		
145	150	155
Pro Ile Leu Thr His Gly Val Tyr Met Met Ser Met Gly Val Leu Ile		
165	170	175
Glu Glu Gly Gln Gly Leu Met Trp Arg Gly Ala Met Ile Met Lys Ala		
180	185	190

Ile	Glu	Gln	Leu	Leu	Ala	Asp	Val	Ile	Trp	Pro	Glu	Leu	Asp	Val	Leu	
		195					200					205				
Phe	Leu	Asp	Met	Pro	Pro	Gly	Thr	Gly	Asp	Ala	Gln	Ile	Thr	Ser	Ala	
	210					215					220					
Gln	Ser	Ile	Pro	Ile	Thr	Ala	Gly	Val	Cys	Val	Ser	Thr	Pro	Gln	Thr	
225					230				235						240	
Val	Ser	Leu	Asp	Asp	Ser	Lys	Arg	Ala	Leu	Asp	Met	Phe	Asn	Lys	Leu	
			245						250					255		
His	Ile	Pro	Ile	Ala	Gly	Val	Ile	Glu	Asn	Met	Ser	Gly	Phe	Leu	Cys	
		260						265					270			
Pro	Asp	Asn	Gly	Lys	Glu	Tyr	Asp	Ile	Phe	Gly	Lys	Gly	Thr	Ala	Glu	
	275						280					285				
Asp	Met	Ala	Lys	Ala	Tyr	Lys	Ser	Glu	Val	Leu	Ala	Gln	Ile	Pro	Ile	
	290					295					300					
Glu	Met	Ile	Val	Arg	Glu	Gly	Gly	Asp	Glu	Gly	Lys	Pro	Val	Ser	Phe	
305					310					315					320	
Tyr	His	Pro	Glu	Ser	Val	Ser	Ser	Lys	Arg	Tyr	Leu	Met	Ala	Ala	Glu	
			325						330					335		
[0049]	Lys	Ile	Trp	Ser	Phe	Ile	Glu	Lys	Ile	Asn	Asn	Glu	Gly	Gly	Ala	Asp
			340						345				350			
Asn	Ser	Ala	Ile	Gln	Pro	Val	Met	Asn	Gly	Lys	Ser	Ala	Cys	Ser	His	
		355					360					365				
<210>	42															
<211>	402															
<212>	PRT															
<213>	Campylobacter jejuni															
<400>	42															
Met	Asn	Leu	Lys	Gly	Ile	Phe	Arg	Lys	Ser	Phe	Arg	Glu	Ser	Lys	Lys	
1			5					10					15			
Gly	Tyr	Leu	His	Leu	Ile	Leu	Leu	His	Met	Ile	Leu	Ile	Tyr	Leu	Met	
		20						25					30			
Gln	Lys	Lys	Ser	Arg	His	Tyr	Ile	Phe	Leu	Lys	Leu	Cys	Ser	Tyr	Leu	
	35						40					45				
Ser	Lys	Val	Asn	Met	Lys	Thr	Val	Phe	Tyr	Tyr	Gln	Ala	Glu	Phe	Tyr	
	50					55					60					
Phe	Phe	Tyr	Ala	Glu	Tyr	Lys	Lys	Ala	Leu	Asn	Tyr	Ile	Asp	Leu	Phe	
65					70					75				80		
Leu	Glu	Lys	Tyr	Pro	Leu	Asn	Ile	Asp	Gly	Lys	Leu	Leu	Lys	Ile	Gln	
				85					90					95		

[0050]

Leu Leu Tyr Leu Leu Gly Asp Lys Thr Lys Ala Leu Tyr Glu Leu Glu
 100 105 110

Lys Ile Gln Gln Glu Ser Asn Arg Leu Lys Ile Trp Met Leu Met Ser
 115 120 125

Lys Leu Val Asn Thr Lys Ile Asp Leu Lys Asn Met Glu Lys Leu Tyr
 130 135 140

Leu Lys Tyr Ile Glu Lys Lys Arg Asn Ile Ser Thr Lys Ile Glu Ile
 145 150 155 160

Gln Lys Tyr Ile Ser Ser Ala Ala Ala Ser Ile Glu Ala Tyr Asp Ile
 165 170 175

Ala Glu Tyr Tyr Leu Lys Asn Ser Leu Lys Leu His Glu Lys Phe Ser
 180 185 190

Leu Lys Asn Thr Lys Lys Lys Tyr Phe Ser Lys Tyr Asp Ala Leu Ile
 195 200 205

Ala Leu Glu Asp Leu Ser Ser Val Phe Asn Ser Leu Asn Ile Lys Phe
 210 215 220

Phe Leu Val Ser Gly Thr Phe Leu Gly Cys Ile Arg Glu Asn Asn Phe
 225 230 235 240

Ile Ser Asn Asp Tyr Asp Ile Asp Val Gly Val Trp Glu Glu Asp Phe
 245 250 255

Ser Asn Glu Leu Lys Ile Ala Leu Glu Gln Tyr Gly Thr Phe Tyr Ile
 260 265 270

His Asp Pro Lys Trp Lys Gly Gly Ile Lys Leu Lys His Ile Asn Gly
 275 280 285

Ile Leu Ile Asp Ile Phe Ile His Tyr Lys Asp Gly Cys Lys His Tyr
 290 295 300

His Leu Gly Ser Ala Val Lys Trp Tyr Asn Ser Thr Phe Asp Leu Ile
 305 310 315 320

Lys Tyr Asp Phe Leu Gly Lys Glu Tyr Phe Gly Phe Lys Glu Tyr Asp
 325 330 335

Arg Tyr Leu Ser Glu Asn Tyr Gly Asp Trp Arg Ile Pro Lys Lys Asn
 340 345 350

Phe Asp Asn Ile Leu Asp Thr Pro Asn Ala Val Ile Phe Asn Glu Asn
 355 360 365

Asn Phe Ile Leu His Leu Tyr Ser Leu Leu Met Lys Gln Tyr Ala Ile
 370 375 380

Asp Tyr Lys Asn Thr Ile Leu Asp Leu Leu Lys Lys Tyr Lys Phe Arg
 385 390 395 400

Glu Asp

<210> 43

<211> 402

<212> PRT

<213> Campylobacter jejuni

<400> 43

Met Asn Leu Lys Gly Ile Phe Arg Lys Ser Phe Arg Glu Thr Lys Lys
1 5 10 15

Trp Tyr Leu His Met Ile Leu Leu His Met Ile Leu Ile Tyr Leu Met
20 25 30

Gln Lys Lys Ser Arg His Tyr Ile Phe Leu Lys Leu Cys Ile Tyr Leu
35 40 45

Ser Lys Val Asn Met Lys Thr Val Phe Tyr Tyr Gln Ala Glu Phe Tyr
50 55 60

Phe Phe Tyr Ala Glu Tyr Lys Lys Ala Leu Asn Tyr Ile Asp Leu Phe
65 70 75 80

Leu Glu Lys Tyr Pro Leu Asn Ile Asp Gly Lys Leu Leu Lys Ile Gln
85 90 95

[0051]

Leu Leu Tyr Leu Leu Gly Asp Lys Thr Lys Ala Leu Tyr Glu Leu Glu
100 105 110

Lys Ile Gln Gln Glu Ser Asn Arg Leu Lys Ile Trp Met Leu Met Ser
115 120 125

Lys Leu Val Asn Thr Lys Ile Asp Leu Lys Asn Met Glu Lys Leu Tyr
130 135 140

Leu Lys Tyr Ile Glu Lys Lys Arg Asn Ile Ser Thr Lys Ile Glu Ile
145 150 155 160

Gln Lys Tyr Ile Ser Ser Ala Ala Ala Ser Ile Glu Ala Tyr Asp Ile
165 170 175

Ala Glu Tyr Tyr Leu Lys Asn Ser Leu Lys Leu His Glu Lys Phe Ser
180 185 190

Leu Lys Asn Thr Lys Lys Lys Tyr Phe Ser Lys Tyr Asp Ala Leu Ile
195 200 205

Ala Leu Glu Asp Leu Ser Ser Val Phe Asn Ser Leu Asn Ile Lys Phe
210 215 220

Phe Leu Val Ser Gly Thr Phe Leu Gly Cys Ile Arg Glu Asn Asn Phe
225 230 235 240

Ile Ser Asn Asp Tyr Asp Ile Asp Val Gly Val Trp Glu Glu Asp Phe
245 250 255

Ser Asn Glu Leu Lys Ile Ala Leu Glu Gln Tyr Gly Thr Phe Tyr Ile
260 265 270

His Asp Pro Lys Trp Lys Gly Gly Ile Lys Leu Lys His Ile Asn Gly
275 280 285

Ile Leu Ile Asp Ile Phe Ile His Tyr Lys Asp Gly Cys Lys His Tyr
290 295 300

His Leu Gly Ser Ala Val Lys Trp Tyr Asn Ser Thr Phe Asp Leu Ile
305 310 315 320

Lys Tyr Asp Phe Leu Gly Lys Glu Tyr Phe Gly Phe Lys Glu Tyr Asp
325 330 335

Arg Tyr Leu Ser Glu Asn Tyr Gly Asp Trp Arg Ile Pro Lys Lys Asn
340 345 350

Phe Asp Asn Ile Leu Asp Thr Pro Asn Ala Val Ile Phe Asn Lys Asn
355 360 365

Asn Phe Ile Leu His Leu Tyr Ser Leu Leu Met Lys Gln Tyr Ala Ile
370 375 380

Asp Tyr Lys Asn Thr Ile Leu Asp Leu Leu Lys Lys Tyr Lys Phe Arg
385 390 395 400

Glu Asp

[0052]

<210> 44
<211> 190
<212> PRT
<213> Campylobacter jejuni

<400> 44

Met Lys Lys Ile Leu Val Ser Val Leu Ser Ser Cys Leu Leu Ala Ser
1 5 10 15

Ala Leu Ser Ala Val Ser Phe Lys Glu Asp Ser Leu Lys Ile Ser Phe
20 25 30

Glu Gly Tyr Lys Thr Lys Asp Met Ile Gly Thr Lys Gly Glu Phe Lys
35 40 45

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

Leu Lys Gly Ala Lys Ala Thr Ile Lys Pro Ser Asn Ala Phe Met Gly
65 70 75 80

Glu Gly Asn Asp Ile Ile Thr Asn Asn Ile Thr Lys Val Phe Phe Pro
85 90 95

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

Ala Gly Glu Asn Lys Gly Val Ile Ser Ala Lys Ile Thr Met Asp Lys

	115	120	125
	Lys Ser Thr Ile Val Pro Leu Thr Tyr Thr Ile Lys Asp Asn Lys Phe 130	135	140
	Glu Ala Lys Gly Gln Leu Asp Leu His Thr Phe Lys Asn Gly Ser Lys 145	150	155 160
	Ala Leu Lys Ala Leu Ser Asp Val Ala Ala Gly His Gly Gly Ile Ser 165	170	175
	Trp Pro Leu Val Asp Ile Ser Phe Asn Ala Asp Leu Ala Glu 180	185	190
<210>	45		
<211>	190		
<212>	PRT		
<213>	Campylobacter jejuni		
<400>	45		
	Met Lys Lys Ile Leu Val Ser Val Leu Ser Ser Cys Leu Leu Ala Ser 1	5 10	15
	Ala Leu Ser Ala Val Ser Phe Lys Glu Asp Ser Leu Lys Val Ser Phe 20	25	30
	Glu Gly Tyr Lys Thr Lys Asp Met Ile Gly Thr Lys Gly Glu Phe Lys 35	40	45
[0053]	Asn Val Glu Tyr Lys Phe Ser Lys Asn Ile Lys Asp Leu Ala Ser Tyr 50	55	60
	Leu Lys Gly Ala Lys Ala Thr Ile Lys Pro Ser Asn Ala Phe Met Gly 65	70	75 80
	Glu Gly Asn Asp Ile Ile Thr Asn Asn Ile Thr Lys Val Phe Phe Pro 85	90	95
	Ala Leu Leu Gly Asp Thr Asp Ile Lys Val Val Phe Gln Asp Val Ile 100	105	110
	Ala Gly Glu Asn Lys Gly Val Ile Ser Ala Lys Ile Thr Met Asp Lys 115	120	125
	Lys Ser Thr Ile Val Pro Leu Thr Tyr Thr Ile Lys Asp Asn Lys Phe 130	135	140
	Glu Ala Lys Gly Gln Leu Asp Leu His Thr Phe Lys Asn Gly Ser Lys 145	150	155 160
	Ala Leu Lys Ala Leu Ser Asp Val Ala Ala Gly His Gly Gly Ile Ser 165	170	175
	Trp Pro Leu Val Asp Ile Ser Phe Asn Ala Asp Leu Ala Glu 180	185	190
<210>	46		
<211>	190		

<212> PRT

<213> Campylobacter jejuni

<400> 46

Met Lys Lys Ile Leu Val Ser Val Leu Ser Ser Cys Leu Leu Ala Ser
1 5 10 15

Ala Leu Ser Ala Val Ser Phe Lys Glu Asp Ser Leu Lys Val Ser Phe
20 25 30

Glu Gly Tyr Lys Thr Lys Asp Met Ile Gly Thr Arg Gly Glu Phe Lys
35 40 45

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

Leu Lys Gly Ala Lys Ala Thr Ile Lys Pro Ser Asn Ala Phe Met Gly
65 70 75 80

Glu Gly Asn Asp Ile Ile Thr Asn Asn Ile Thr Lys Val Phe Phe Pro
85 90 95

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

Ala Gly Glu Asn Lys Gly Val Ile Ser Ala Lys Ile Thr Met Asp Lys
115 120 125

[0054]

Lys Ser Thr Ile Val Pro Leu Thr Tyr Thr Ile Lys Asp Asn Lys Phe
130 135 140

Glu Ala Lys Gly Gln Leu Asp Leu His Thr Phe Lys Asn Gly Ser Lys
145 150 155 160

Ala Leu Lys Ala Leu Ser Asp Val Ala Ala Gly His Gly Gly Ile Ser
165 170 175

Trp Pro Leu Val Asp Ile Ser Phe Asn Ala Asp Leu Ala Glu
180 185 190

<210> 47

<211> 190

<212> PRT

<213> Campylobacter jejuni

<400> 47

Met Lys Lys Ile Leu Val Ser Val Leu Ser Ser Cys Leu Leu Ala Ser
1 5 10 15

Ala Leu Ser Ala Val Ser Phe Lys Glu Asp Ser Leu Lys Val Ser Phe
20 25 30

Glu Gly Tyr Lys Thr Lys Asp Met Ile Gly Thr Lys Gly Glu Phe Lys
35 40 45

Asn Val Glu Tyr Lys Phe Ser Lys Asn Thr Lys Asp Leu Ala Ser Tyr
50 55 60

Leu Lys Gly Ala Lys Ala Thr Ile Lys Pro Ser Asn Ala Phe Met Gly
 65 70 75 80
 Glu Gly Asn Asp Ile Ile Thr Asn Asn Ile Thr Lys Val Phe Phe Pro
 85 90 95
 Ala Leu Leu Gly Asp Thr Asp Ile Lys Val Val Phe Gln Asp Val Ile
 100 105 110
 Ala Gly Glu Asn Lys Gly Val Ile Ser Ala Lys Ile Thr Met Asp Lys
 115 120 125
 Lys Ser Thr Ile Val Pro Leu Thr Tyr Thr Ile Lys Asp Asn Lys Phe
 130 135 140
 Glu Ala Lys Gly Gln Leu Asp Leu His Thr Phe Lys Asn Gly Ser Lys
 145 150 155 160
 Ala Leu Lys Ala Leu Ser Asp Val Ala Ala Gly His Gly Gly Ile Ser
 165 170 175
 Trp Pro Leu Val Asp Ile Ser Phe Asn Ala Asp Leu Ala Glu
 180 185 190

<210> 48
 <211> 190
 <212> PRT
 <213> Campylobacter jejuni

[0055]

<400> 48
 Met Lys Lys Ile Leu Val Ser Val Leu Ser Ser Cys Leu Leu Ala Ser
 1 5 10 15
 Ala Leu Ser Ala Val Ser Phe Lys Glu Asp Ser Leu Lys Val Ser Phe
 20 25 30
 Glu Gly Tyr Lys Thr Lys Asp Met Ile Gly Thr Lys Gly Glu Phe Lys
 35 40 45
 Asn Val Glu Tyr Lys Phe Ser Lys Asn Ile Lys Asp Leu Ala Ser Tyr
 50 55 60
 Leu Lys Gly Ala Lys Ala Thr Ile Lys Pro Ser Asn Ala Phe Met Gly
 65 70 75 80
 Glu Gly Asn Asp Ile Ile Thr Asn Asn Ile Thr Lys Val Phe Phe Pro
 85 90 95
 Ala Leu Leu Gly Asp Thr Asp Ile Lys Val Val Phe Gln Asp Val Ile
 100 105 110
 Ala Gly Glu Asn Lys Gly Val Ile Ser Ala Lys Ile Thr Met Asp Lys
 115 120 125
 Lys Ser Thr Ile Val Pro Leu Thr Tyr Thr Ile Lys Asp Asn Lys Phe
 130 135 140
 Glu Ala Lys Gly Gln Leu Asp Leu His Thr Phe Lys Asn Gly Ser Lys

145	150	155	160
Ala Leu Lys	Ala Leu Ser Asp Val	Ala Ala Gly His Gly Gly	Ile Ser
	165	170	175
Trp Pro Leu Val Asp Ile Ser Phe	Asn Ala Asn Leu Ala Glu		
	180	185	190
<210> 49			
<211> 190			
<212> PRT			
<213> Campylobacter jejuni			
<400> 49			
Met Lys Lys Ile Leu Val Ser Val Leu Ser Ser Cys Leu Leu Ala Ser			
1	5	10	15
Ala Leu Ser Ala Val Ser Phe Lys Glu Asp Ser Leu Lys Val Ser Phe			
	20	25	30
Glu Gly Tyr Lys Thr Lys Asp Met Ile Gly Thr Lys Gly Glu Phe Lys			
	35	40	45
Asn Val Glu Tyr Lys Phe Ser Lys Asn Ile Lys Asp Leu Ala Ser Tyr			
	50	55	60
Leu Lys Gly Ala Lys Ala Thr Ile Lys Pro Ser Asn Ala Phe Met Gly			
65	70	75	80
[0056]			
Glu Gly Asn Asp Ile Ile Thr Asn Asn Ile Thr Lys Val Phe Phe Pro			
	85	90	95
Ala Leu Leu Gly Asp Thr Asp Ile Lys Val Val Phe Gln Asp Val Ile			
	100	105	110
Ala Gly Glu Asn Lys Gly Val Ile Ser Ala Lys Ile Thr Met Asp Lys			
	115	120	125
Lys Ser Thr Ile Val Pro Leu Thr Tyr Thr Ile Lys Asp Asn Lys Phe			
	130	135	140
Glu Ala Lys Gly Gln Phe Asp Leu His Thr Phe Lys Asn Gly Ser Lys			
145	150	155	160
Ala Leu Lys Ala Leu Ser Asp Val Ala Ala Gly His Gly Gly Ile Ser			
	165	170	175
Trp Pro Leu Val Asp Ile Ser Phe Asn Ala Asp Leu Ala Glu			
	180	185	190
<210> 50			
<211> 190			
<212> PRT			
<213> Campylobacter jejuni			
<400> 50			
Met Lys Lys Ile Leu Ala Ser Val Leu Ser Ser Cys Leu Leu Ala Ser			
1	5	10	15

Ala Leu Ser Ala Val Ser Phe Lys Glu Asp Ser Leu Lys Val Ser Phe
20 25 30

Glu Gly Tyr Lys Thr Lys Asp Met Ile Gly Thr Lys Gly Glu Phe Lys
35 40 45

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

Leu Lys Gly Ala Lys Ala Thr Ile Lys Pro Ser Asn Ala Phe Met Gly
65 70 75 80

Glu Gly Asn Asp Ile Ile Thr Asn Asn Ile Thr Lys Val Phe Phe Pro
85 90 95

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

Ala Gly Glu Asn Lys Gly Val Ile Ser Ala Lys Ile Thr Met Asp Lys
115 120 125

Lys Ser Thr Ile Val Pro Leu Thr Tyr Thr Ile Lys Asp Asn Lys Phe
130 135 140

Glu Ala Lys Gly Gln Leu Asp Leu His Thr Phe Lys Asn Gly Ser Lys
145 150 155 160

[0057] Ala Leu Lys Ala Leu Ser Asp Val Ala Ala Gly His Gly Gly Ile Ser
165 170 175

Trp Pro Leu Val Asp Ile Ser Phe Asn Ala Asp Leu Ala Glu
180 185 190

<210> 51
<211> 190
<212> PRT
<213> *Campylobacter jejuni*

<400> 51

Met Lys Lys Ile Leu Val Ser Val Leu Ser Ser Cys Leu Leu Ala Ser
I 5 10 15

Ala Leu Ser Ala Val Ser Phe Lys Glu Asp Ser Leu Lys Val Ser Phe
20 25 30

Glu Gly Tyr Lys Thr Lys Asp Met Ile Gly Thr Lys Gly Glu Phe Lys
35 40 45

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

Leu Lys Gly Ala Lys Ala Thr Ile Lys Pro Ser Asn Ala Phe Met Gly
65 70 75 80

Glu Gly Asn Asp Ile Ile Thr Asn Asn Ile Thr Lys Val Phe Phe Pro
85 90 95

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

Ala Gly Glu Asn Lys Gly Val Ile Ser Ala Lys Ile Thr Met Asp Lys
115 120 125

Lys Ser Thr Ile Val Pro Leu Thr Tyr Thr Ile Lys Asp Asn Lys Phe
130 135 140

Glu Ala Lys Gly Gln Leu Asp Leu His Thr Phe Lys Asn Gly Ser Lys
145 150 155 160

Ala Leu Lys Ala Leu Ser Asp Val Ala Ala Gly His Gly Gly Ile Ser
165 170 175

Trp Pro Leu Val Asp Ile Ser Phe Asn Ala Asp Leu Ala Glu
180 185 190

<210> 52
<211> 190
<212> PRT
<213> Campylobacter jejuni

<400> 52

Met Lys Lys Val Leu Val Ser Val Leu Ser Ser Cys Leu Leu Ala Ser
1 5 10 15

Ala Leu Ser Ala Val Ser Phe Lys Glu Asp Ser Leu Lys Val Ser Phe
20 25 30

Glu Gly Tyr Lys Thr Lys Asp Met Ile Gly Thr Lys Gly Glu Phe Lys
35 40 45

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

Leu Lys Gly Ala Lys Ala Thr Ile Lys Pro Ser Asn Ala Phe Met Gly
65 70 75 80

Glu Gly Asn Asp Ile Ile Thr Asn Asn Ile Thr Lys Val Phe Phe Pro
85 90 95

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

Ala Gly Glu Asn Lys Gly Val Ile Ser Ala Lys Ile Thr Met Asp Lys
115 120 125

Lys Ser Thr Ile Val Pro Leu Thr Tyr Thr Ile Lys Asp Asn Lys Phe
130 135 140

Glu Ala Lys Gly Gln Phe Asp Leu His Thr Phe Lys Asn Gly Ser Lys
145 150 155 160

Ala Leu Lys Ala Leu Ser Asp Val Ala Ala Gly His Gly Gly Ile Ser
165 170 175

Trp Pro Leu Val Asp Ile Ser Phe Asn Ala Asp Leu Ala Glu

[0058]

	180	185	190
<210>	53		
<211>	190		
<212>	PRT		
<213>	Campylobacter jejuni		
<400>	53		
Met Lys Lys Ile Leu Ala Ser Val Leu Ser Ser Cys Leu Leu Ala Ser			
1	5	10	15
Ala Leu Ser Ala Val Ser Phe Lys Glu Asp Ser Leu Lys Val Ser Phe			
	20	25	30
Glu Gly Tyr Lys Thr Lys Asp Met Ile Gly Thr Lys Gly Glu Phe Lys			
	35	40	45
Asn Val Glu Tyr Lys Phe Ser Lys Asn Ile Lys Asp Leu Ala Ser Tyr			
	50	55	60
Leu Lys Gly Ala Lys Ala Thr Ile Glu Pro Ser Asn Ala Phe Met Gly			
65	70	75	80
Glu Gly Asn Asp Ile Ile Thr Asn Asn Ile Thr Lys Val Phe Phe Pro			
	85	90	95
Ala Leu Leu Gly Asp Thr Asp Ile Lys Val Val Phe Gln Asp Val Ile			
	100	105	110
[0059]			
Ala Gly Glu Asn Lys Gly Val Ile Ser Ala Lys Ile Thr Met Asp Lys			
	115	120	125
Lys Ser Thr Ile Val Pro Leu Thr Tyr Thr Ile Lys Asp Asn Lys Phe			
	130	135	140
Glu Ala Lys Gly Gln Leu Asp Leu His Thr Phe Lys Asn Gly Ser Lys			
145	150	155	160
Ala Leu Lys Ala Leu Ser Asp Val Ala Ala Gly His Gly Gly Ile Ser			
	165	170	175
Trp Pro Leu Val Asp Ile Ser Phe Asn Ala Asp Leu Ala Glu			
	180	185	190
<210>	54		
<211>	190		
<212>	PRT		
<213>	Campylobacter jejuni		
<400>	54		
Met Lys Lys Ile Leu Ala Ser Val Leu Ser Ser Cys Leu Leu Ala Ser			
1	5	10	15
Ala Leu Ser Ala Val Ser Phe Lys Glu Asp Ser Leu Lys Val Ser Phe			
	20	25	30
Glu Gly Tyr Lys Thr Lys Asp Met Ile Gly Thr Lys Gly Glu Phe Lys			
	35	40	45

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

[0060]

<210> 55
 <211> 190
 <212> PRT
 <213> *Campylobacter jejuni*

<400> 55

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

Lys Ser Thr Ile Val Pro Leu Thr Tyr Thr Ile Lys Asp Asn Lys Phe
130 135 140

Glu Ala Lys Gly Gln Leu Asp Leu His Thr Phe Lys Asn Gly Ser Lys
145 150 155 160

Ala Leu Lys Ala Leu Ser Asp Val Ala Ala Gly His Gly Gly Ile Ser
165 170 175

Trp Pro Leu Val Asp Ile Ser Phe Asn Ala Asn Leu Ala Glu
180 185 190

<210> 56

<211> 190

<212> PRT

<213> *Campylobacter jejuni*

<400> 56

Met Lys Lys Ile Leu Val Ser Val Leu Ser Ser Cys Leu Leu Ala Ser
1 5 10 15

Ala Leu Ser Ala Val Ser Phe Lys Glu Asp Ser Leu Lys Val Ser Phe
20 25 30

Glu Gly Tyr Lys Thr Lys Asp Met Ile Gly Ile Lys Gly Glu Phe Lys
35 40 45

Asn Val Glu Tyr Lys Phe Ser Lys Asn Thr Lys Asp Leu Ala Ser Tyr
50 55 60

[0061]

Leu Lys Gly Ala Lys Ala Thr Ile Lys Pro Ser Asn Ala Phe Met Gly
65 70 75 80

Glu Gly Asn Asp Ile Ile Thr Asn Asn Ile Thr Lys Val Phe Phe Pro
85 90 95

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

Ala Gly Glu Asn Lys Gly Val Ile Ser Ala Lys Ile Thr Met Asp Lys
115 120 125

Lys Ser Thr Ile Val Pro Leu Thr Tyr Thr Ile Lys Asp Asn Lys Phe
130 135 140

Glu Ala Lys Gly Gln Leu Asp Leu His Thr Phe Lys Asn Gly Ser Lys
145 150 155 160

Ala Leu Lys Ala Leu Ser Asp Val Ala Ala Gly His Gly Gly Ile Ser
165 170 175

Trp Pro Leu Val Asp Ile Ser Phe Asn Ala Asp Leu Ala Glu
180 185 190

<210> 57

<211> 190

<212> PRT

<213> *Campylobacter jejuni*

<400> 57

Met Lys Lys Ile Leu Val Ser Val Leu Ser Ser Cys Leu Leu Ala Ser
1 5 10 15

Ala Leu Ser Ala Val Ser Phe Lys Glu Asp Ser Leu Lys Val Ser Phe
20 25 30

Glu Gly Tyr Lys Thr Lys Asp Met Ile Gly Val Lys Gly Glu Phe Lys
35 40 45

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

Leu Lys Gly Ala Lys Ala Ile Ile Lys Pro Ser Asn Ala Phe Met Gly
65 70 75 80

Glu Gly Asn Asp Ile Ile Thr Asn Asn Ile Thr Lys Val Phe Phe Pro
85 90 95

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

Ala Gly Glu Asn Lys Gly Val Ile Ser Ala Lys Ile Thr Met Asp Lys
115 120 125

Lys Ser Thr Ile Val Pro Leu Thr Tyr Thr Ile Lys Asp Asn Lys Phe
130 135 140

[0062]

Glu Ala Lys Gly Gln Leu Asp Leu His Thr Phe Lys Asn Gly Ser Lys
145 150 155 160

Ala Leu Lys Ala Leu Ser Asp Val Ala Ala Gly His Gly Gly Ile Ser
165 170 175

Trp Pro Leu Val Asp Ile Ser Phe Asn Ala Asp Leu Ala Glu
180 185 190

<210> 58

<211> 190

<212> PRT

<213> *Campylobacter jejuni*

<400> 58

Met Lys Lys Ile Leu Val Ser Val Leu Ser Ser Cys Leu Leu Val Ser
1 5 10 15

Ala Leu Ser Ala Val Ser Phe Lys Glu Asp Ser Leu Lys Val Ser Phe
20 25 30

Glu Gly Tyr Lys Thr Lys Asp Met Ile Gly Ala Lys Gly Glu Phe Lys
35 40 45

Asn Val Glu Tyr Lys Phe Ser Lys Asn Thr Lys Asp Leu Ala Ser Tyr
50 55 60

Leu Lys Gly Ala Lys Ala Thr Ile Lys Pro Ser Asn Ala Phe Met Ser
65 70 75 80

Glu Gly Asn Asp Ile Ile Thr Asn Asn Ile Thr Lys Val Phe Phe Pro
 85 90 95
 Ala Leu Leu Gly Asp Thr Asp Ile Lys Val Val Phe Gln Asp Val Ile
 100 105 110
 Ala Gly Glu Asn Lys Gly Val Ile Ser Ala Lys Ile Thr Met Asp Lys
 115 120 125
 Lys Ser Thr Ile Val Pro Leu Thr Tyr Thr Ile Lys Asp Asn Lys Phe
 130 135 140
 Glu Ala Lys Gly Gln Leu Asp Leu His Thr Phe Lys Asn Gly Ser Lys
 145 150 155 160
 Ala Leu Lys Ala Leu Ser Asp Val Ala Ala Gly His Gly Gly Ile Ser
 165 170 175
 Trp Pro Leu Val Asp Ile Ser Phe Asn Ala Asp Leu Ala Glu
 180 185 190

<210> 59
 <211> 190
 <212> PRT
 <213> Campylobacter jejuni

<400> 59

[0063]

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

Ala Leu Lys Ala Leu Ser Asp Val Ala Thr Gly His Gly Gly Ile Ser
165 170 175

Trp Pro Leu Val Asp Ile Ser Phe Asn Ala Asp Leu Thr Glu
180 185 190

<210> 60

<211> 190

<212> PRT

<213> Campylobacter jejuni

<400> 60

Met Lys Lys Ile Val Leu Ser Ile Leu Ser Ser Cys Leu Leu Ala Ser
1 5 10 15

Ala Leu Ser Ala Val Ser Phe Lys Glu Asp Ser Leu Lys Ile Ser Phe
20 25 30

Glu Gly Tyr Lys Thr Lys Asp Met Val Gly Val Glu Gly Glu Phe Lys
35 40 45

Asn Val Glu Tyr Lys Phe Ser Lys Asn Thr Lys Asp Phe Ala Ser Tyr
50 55 60

Leu Lys Gly Ala Lys Ala Thr Ile Lys Pro Ser Asn Ala Phe Met Gly
65 70 75 80

Glu Gly Asn Asp Val Ile Thr Asn Asn Ile Thr Lys Val Phe Phe Pro
85 90 95

[0064]

Ala Leu Leu Gly Asn Ala Asp Ile Lys Val Val Phe Gln Asp Val Ile
100 105 110

Val Gly Glu Asn Lys Gly Val Ile Ser Ala Lys Ile Thr Met Asp Lys
115 120 125

Lys Ser Thr Ile Val Pro Leu Thr Tyr Thr Ile Lys Asp Asn Lys Phe
130 135 140

Glu Ala Lys Gly Gln Leu Asp Leu His Thr Phe Lys Asn Gly Ser Lys
145 150 155 160

Ala Leu Lys Ala Leu Ser Asp Ala Ala Pro Gly His Gly Gly Ile Ser
165 170 175

Trp Pro Leu Val Asp Ile Ser Phe Asn Ala Asp Leu Ala Glu
180 185 190

<210> 61

<211> 190

<212> PRT

<213> Campylobacter jejuni

<400> 61

Met Lys Lys Ile Val Leu Ser Ile Leu Ser Ser Cys Leu Leu Ala Ser
1 5 10 15

Ala Leu Ser Ala Val Ser Phe Lys Glu Asp Ser Leu Lys Ile Ser Phe
20 25 30

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

[0065]

Trp Pro Leu Val Asp Ile Ser Phe Asn Ala Asp Leu Ala Glu
 180 185 190

<210> 62
 <211> 190
 <212> PRT
 <213> Campylobacter jejuni

<400> 62

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

Val Gly Glu Asn Lys Gly Val Ile Ser Ala Lys Ile Thr Met Asp Lys
 115 120 125

Lys Ser Thr Ile Val Pro Leu Thr Tyr Thr Ile Lys Asp Asp Lys Phe
 130 135 140

Glu Ala Lys Gly Gln Leu Asp Leu His Thr Phe Lys Asn Ala Ser Lys
 145 150 155 160

Ala Leu Lys Ala Leu Ser Asp Val Ala Pro Gly His Gly Gly Ile Ser
 165 170 175

Trp Pro Leu Val Asp Ile Ser Phe Asn Ala Asp Leu Val Glu
 180 185 190

<210> 63
 <211> 719
 <212> PRT
 <213> Campylobacter jejuni

<400> 63

Met Ile Asn Thr Gln Leu Ala Ser Gln Ile Ala Asn Thr Gln Lys Asn
 1 5 10 15

Asp Leu Lys Val Asp Asn Ser Ala Ser Lys Asp Lys Thr Asn Leu Lys
 20 25 30

Asp Asn Pro Lys Glu Ala Leu Ala Gln Ala Leu Lys Gln Asn Leu Gly
 35 40 45

Leu Ser Lys Asp Ala Ser Ser Glu Glu Ile Leu Ala Lys Phe Val Gln
 50 55 60

Asn Glu Thr Gly Thr Lys Leu Lys Glu Leu Val Asn Lys Leu Leu Asp
 65 70 75 80

Gln Ile Asn Ala Gln Lys Asn Pro Asp Ser Pro Val Leu Lys Gln Gly
 85 90 95

Lys Asn Leu Asn Leu Ala Pro Asn Phe Ala Asn Glu Leu Lys Ile Leu
 100 105 110

Ser Thr Glu Leu Ala Lys Ser Asp Thr Phe Thr Gln Val Leu Asp Arg
 115 120 125

Leu Asn Gln Ile Leu Lys Pro Ala Ser Glu Ile Lys Asn Asn Asn Leu
 130 135 140

Ala Pro Leu Phe Lys Asn Ser Gly Val Phe Leu Glu Ala Lys Leu Lys
 145 150 155 160

Asp Ala Leu Asn Glu Glu Leu Leu Pro Lys Ser Phe His Ser Leu Leu
 165 170 175

Ser Thr Ile Lys Gly Leu Ser Ser Glu Lys Leu Ser Val Gln Ile Ala
 180 185 190

[0066]

[0067]

Gln Leu Ala Asn Thr Asn Leu Ser Pro Lys Asp Thr Leu Lys Glu Leu
 195 200 205
 Lys Asn Ile Ile Asn Ser Ser Lys Asn Glu Asn Lys Gln Ile Leu Asn
 210 215 220
 Gln Ser Ser Phe Lys Ala Leu Leu Asn Leu Ser Ser Lys Leu Glu Asn
 225 230 235 240
 Phe Lys Asn Tyr Ile Ser Lys Asn Pro Ser His Ala Gln Glu Lys Ile
 245 250 255
 Thr Pro Ile Ala Asn Lys Ile Leu Lys Glu Leu Asn Ser Ile Lys Asn
 260 265 270
 Asp Phe Phe Lys Ala Leu Asn Lys Pro Glu Asn Leu Met Ile Lys Asp
 275 280 285
 Pro Asn Ile Leu Lys Gln Thr Ala Thr Ala Phe Glu Lys Leu Glu Asn
 290 295 300
 Thr Leu Lys Asn Ile Leu Gly Asn Gln Ala Ser Lys Ile Gln Asp Lys
 305 310 315 320
 Glu Asn Ile Leu Glu Asn Leu Leu Ser Asn Lys Glu Asn Met Lys Glu
 325 330 335
 Glu Lys Leu Asn His Asn Thr Lys Asn Gln Asp Glu Glu Lys His Ile
 340 345 350
 Lys Ala Ser Lys Glu Asp Glu Asn Leu Asp Ser Gly Ile Lys Thr His
 355 360 365
 Glu Glu Asp Thr Gln Asp Thr Lys Asn Asp Ile Gln Asn Asn Glu Thr
 370 375 380
 Glu Asn Lys Pro Asp Asn Asp Ile Lys Asn Ser Thr Pro Asn Gln Glu
 385 390 395 400
 Lys Ile Lys Asp Glu Lys Gln Glu Lys Ser Lys Glu Asn Ile Lys Glu
 405 410 415
 Asn Pro Lys Phe Tyr Glu Thr Lys Thr Glu Asn Lys Thr Ser Ile Asn
 420 425 430
 Thr Asn Thr Asn Thr Ser Asn Pro Asn Thr Asn Asn Thr Gln Asn Leu
 435 440 445
 Asn Asn Thr Gln Asn Ile Gln Ser Asn Asn Asn Gln Thr Met Gln Asn
 450 455 460
 Ile Phe Lys Asn Gln Glu Phe Ile Lys Gln Asn Ile Val Lys Asn Leu
 465 470 475 480
 Ala Phe Asn Val Glu Asn Leu Asp Leu Glu Gln Val Gln Asp Leu Ser
 485 490 495

Lys Asn Leu Ser Asn Leu Ser Arg Arg Leu Asn Glu Ser Leu Lys Glu
 500 505 510
 Leu Glu Pro Tyr Thr Gln Asn Ala Lys Leu Asn Gln Ala Glu Leu Lys
 515 520 525
 Asn Leu Glu His Lys Leu Asn Leu Ser Ile Lys Asp Leu Ala Gln Ile
 530 535 540
 Lys Pro Lys Thr Glu Gln Asp Ile Ala Glu Ser Leu His His Asp Ala
 545 550 555 560
 Lys Ser Thr Leu Leu Gln Ile Ser Asn Leu Ala Lys Asn Glu Gly Asn
 565 570 575
 Glu Ala Val Tyr Asn Gln Ala Asn Arg Leu Leu Ala Gln Ile Glu Ile
 580 585 590
 Asn Gln Leu Met Ser Leu Ala Asn Asp Ser Ile Asn Thr Tyr Leu Pro
 595 600 605
 Phe Ser Trp Asp Asp Leu Asn Asp Ser Lys Ile Met Phe Arg Arg Gly
 610 615 620
 Lys Lys Asp Lys Phe Phe Ala Gln Ile Lys Leu Glu Phe Ala Lys Leu
 625 630 635 640
 Gly Asp Leu Glu Ile Leu Ile Ser Leu Asn Asn Glu Lys Tyr Ile Asp
 645 650 655
 Ile Asn Ile Met Ala Glu Asn Ile Glu Phe Arg Lys Thr Ile Tyr Glu
 660 665 670
 Asn Ala His Glu Leu Lys Arg Asn Ile Asn Lys Ala Gly Leu Leu Ser
 675 680 685
 Ala Asn Phe Phe Val Gly Asp Ile Ile Arg Ser Lys Phe Asp Thr Arg
 690 695 700
 Asn Met Lys Asn Leu Asp Leu Glu Met Gly Met Asp Lys Lys Val
 705 710 715
 <210> 64
 <211> 703
 <212> PRT
 <213> Campylobacter jejuni
 <400> 64
 Met Ile Asn Thr Gln Leu Ala Ser Gln Ile Ala Asn Thr Gln Lys Asn
 1 5 10 15
 Asp Leu Lys Val Asp Asn Ser Thr Ser Lys Asp Lys Thr Asn Leu Lys
 20 25 30
 Asp Asn Pro Lys Glu Ala Leu Ala Gln Ala Leu Lys Gln Asn Leu Gly
 35 40 45
 Leu Ser Lys Asp Ala Ser Ser Glu Glu Ile Leu Ala Lys Phe Val Gln

[0068]

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

[0069]

355	360	365
Lys Gln Asp Val Lys Asn Glu Glu Asn Leu Pro Lys Lys Glu Val Asn 370 375 380		
Ala Asn Leu Asp Ser Ser Thr Lys Thr His Glu Glu Asn Ile Lys Glu 385 390 395 400		
Asn Pro Lys Phe Tyr Glu Thr Lys Thr Glu Asn Lys Thr Ser Ile Asn 405 410 415		
Thr Asn Thr Asn Thr Ser Asn Pro Asn Thr Asn Asn Thr Gln Asn Leu 420 425 430		
Asn Asn Thr Gln Asn Ile Gln Ser Asn Asn Asn Gln Thr Met Gln Asn 435 440 445		
Ile Phe Lys Asn Gln Glu Phe Ile Lys Gln Asn Ile Val Lys Asn Leu 450 455 460		
Ala Phe Asn Val Glu Asn Leu Asp Leu Glu Gln Val Gln Asp Leu Ser 465 470 475 480		
Lys Asn Leu Ser Asn Leu Ser Arg Arg Leu Asn Glu Ser Leu Lys Glu 485 490 495		
Leu Glu Pro Tyr Thr Gln Asn Ala Lys Leu Asn Gln Ala Glu Leu Lys 500 505 510		
Asn Leu Glu His Lys Leu Asn Leu Ser Ile Lys Asp Leu Ala Gln Ile 515 520 525		
Lys Pro Lys Thr Glu Gln Asp Ile Ala Glu Ser Leu His His Asp Val 530 535 540		
Lys Ser Thr Leu Leu Gln Ile Ser Asn Leu Ala Lys Asn Glu Gly Asn 545 550 555 560		
Glu Ala Val Tyr Asn Gln Ala Asn Arg Leu Leu Ala Gln Ile Glu Ile 565 570 575		
Asn Gln Leu Met Ser Leu Ala Asn Asp Ser Ile Asn Thr Tyr Leu Pro 580 585 590		
Phe Ser Trp Asp Asp Leu Asn Asp Ser Lys Ile Met Phe Arg Arg Gly 595 600 605		
Lys Lys Asp Lys Phe Phe Ala Gln Ile Lys Leu Glu Phe Ala Lys Leu 610 615 620		
Gly Asp Leu Glu Ile Leu Ile Ser Leu Asn Asn Glu Lys Tyr Ile Asp 625 630 635 640		
Ile Asn Ile Met Ala Glu Asn Ile Glu Phe Arg Lys Thr Ile Tyr Glu 645 650 655		
Asn Ala His Glu Leu Lys Arg Asn Ile Asn Lys Ala Gly Leu Leu Ser		

[0070]

```

        660              665              670
Ala Asn Phe Phe Val Gly Asp Ile Ile Arg Ser Lys Phe Asp Thr Arg
   675              680              685

Asn Met Lys Asn Leu Asp Leu Glu Met Gly Met Asp Lys Lys Val
   690              695              700

<210> 65
<211> 720
<212> PRT
<213> Campylobacter jejuni

<400> 65
Met Met Ile Asn Thr Gln Leu Ala Ser Gln Ile Ala Asn Thr Gln Lys
 1              5              10              15

Asn Asp Leu Lys Val Asp Asn Ser Ala Ser Lys Asp Lys Thr Asn Leu
   20              25              30

Lys Asp Asn Pro Lys Glu Ala Leu Ala Gln Ala Leu Lys Gln Asn Leu
   35              40              45

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

Gln Asn Glu Thr Gly Thr Lys Leu Lys Glu Leu Val Asn Lys Leu Leu
   65              70              75              80

Asp Gln Ile Asn Ala Gln Lys Asn Pro Asp Ser Pro Val Leu Lys Gln
   85              90              95

Gly Lys Asn Leu Asn Leu Ala Pro Asn Phe Ala Asn Glu Leu Lys Ile
  100              105              110

Leu Ser Thr Glu Leu Ala Lys Ser Asp Thr Phe Thr Gln Val Leu Asp
  115              120              125

Arg Leu Asn Gln Ile Leu Lys Pro Ala Ser Glu Ile Lys Asn Asn Asn
  130              135              140

Leu Ala Pro Leu Phe Lys Asn Ser Gly Val Phe Leu Glu Ala Lys Leu
  145              150              155              160

Lys Asp Ala Leu Asn Glu Glu Leu Leu Pro Lys Ser Phe His Ser Leu
  165              170              175

Leu Ser Thr Ile Lys Gly Leu Ser Ser Glu Lys Leu Ser Val Gln Ile
  180              185              190

Ala Gln Leu Ala Asn Thr Asn Leu Ser Pro Lys Asp Thr Leu Lys Glu
  195              200              205

Leu Lys Asn Ile Ile Asn Ser Ser Lys Asn Glu Asn Lys Gln Ile Leu
  210              215              220

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

```

[0071]

[0072]

Asn Phe Lys Asn Tyr Ile Ser Lys Asn Pro Ser His Ala Gln Glu Lys
 245 250 255
 Ile Thr Pro Ile Ala Asn Lys Ile Leu Lys Glu Leu Asn Ser Ile Lys
 260 265 270
 Asn Asp Phe Phe Lys Ala Leu Asn Lys Pro Glu Asn Leu Met Ile Lys
 275 280 285
 Asp Pro Asn Ile Leu Lys Gln Thr Ala Thr Ala Phe Glu Lys Leu Glu
 290 295 300
 Asn Thr Leu Lys Asn Ile Leu Gly Asn Gln Ala Ser Lys Ile Gln Asp
 305 310 315 320
 Lys Glu Asn Ile Leu Glu Asn Leu Leu Ser Asn Lys Glu Asn Ile Lys
 325 330 335
 Glu Glu Lys Leu Asn His Asn Thr Lys Asn Gln Asp Glu Glu Lys His
 340 345 350
 Ile Lys Ala Ser Lys Glu Asp Glu Asn Leu Asp Ser Gly Ile Lys Thr
 355 360 365
 His Glu Glu Asp Thr Gln Asp Thr Lys Asn Asp Ile Gln Asn Asn Glu
 370 375 380
 Thr Glu Asn Lys Pro Asp Asn Asp Ile Lys Asn Ser Thr Pro Asn Gln
 385 390 395 400
 Glu Lys Ile Lys Asp Glu Lys Gln Glu Lys Ser Lys Glu Asn Ile Lys
 405 410 415
 Glu Asn Pro Lys Phe Tyr Glu Thr Lys Thr Glu Asn Lys Thr Ser Ile
 420 425 430
 Asn Thr Asn Thr Asn Thr Ser Asn Pro Asn Thr Asn Asn Thr Gln Asn
 435 440 445
 Leu Asn Asn Thr Gln Asn Ile Gln Ser Asn Asn Asn Gln Thr Met Gln
 450 455 460
 Asn Ile Phe Lys Asn Gln Glu Phe Ile Lys Gln Asn Ile Val Lys Asn
 465 470 475 480
 Leu Ala Phe Asn Val Glu Asn Leu Asp Leu Glu Gln Val Gln Asp Leu
 485 490 495
 Ser Lys Lys Leu Ser Asn Leu Ser Arg Arg Leu Asn Glu Ser Leu Lys
 500 505 510
 Glu Leu Glu Pro Tyr Thr Gln Asn Ala Lys Leu Asn Gln Ala Glu Leu
 515 520 525
 Lys Asn Leu Glu His Lys Leu Asn Leu Ser Ile Lys Asp Leu Ala Gln
 530 535 540

Ile Lys Pro Lys Thr Glu Gln Asp Ile Ala Glu Ser Leu His His Asp
 545 550 555 560
 Val Lys Ser Thr Leu Leu Gln Ile Ser Asn Leu Ala Lys Asn Glu Gly
 565 570 575
 Asn Glu Ala Val Tyr Asn Gln Ala Asn Arg Leu Leu Ala Gln Ile Gln
 580 585 590
 Ile Asn Gln Leu Met Ser Leu Ala Asn Asp Ser Ile Asn Thr Tyr Leu
 595 600 605
 Pro Phe Ser Trp Asp Asp Leu Asn Asp Ser Lys Ile Met Phe Arg Arg
 610 615 620
 Gly Lys Lys Asp Lys Phe Phe Ala Gln Ile Lys Leu Glu Phe Ala Lys
 625 630 635 640
 Leu Gly Asp Leu Glu Ile Leu Ile Ser Leu Asn Asn Glu Lys Tyr Ile
 645 650 655
 Asp Ile Asn Ile Met Ala Glu Asn Ile Glu Phe Arg Lys Thr Ile Tyr
 660 665 670
 Glu Asn Ala His Glu Leu Lys Arg Asn Ile Asn Lys Ala Gly Leu Leu
 675 680 685
 [0073] Ser Ala Asn Phe Phe Val Gly Asp Ile Ile Arg Ser Lys Phe Asp Thr
 690 695 700
 Arg Asn Met Lys Asn Leu Asp Leu Glu Met Gly Met Asp Lys Lys Val
 705 710 715 720
 <210> 66
 <211> 703
 <212> PRT
 <213> Campylobacter jejuni
 <400> 66
 Met Ile Asn Thr Gln Leu Ala Ser Gln Ile Ala Asn Thr Gln Lys Asn
 1 5 10 15
 Asp Leu Lys Val Asp Asn Ser Ala Ser Lys Asp Lys Thr Asn Leu Lys
 20 25 30
 Asp Asn Pro Lys Glu Ala Leu Ala Gln Ala Leu Lys Gln Asn Leu Gly
 35 40 45
 Leu Ser Lys Asp Ala Ser Ser Glu Glu Ile Leu Ala Lys Phe Val Gln
 50 55 60
 Asn Glu Thr Gly Thr Lys Leu Lys Glu Leu Val Asn Lys Leu Leu Asp
 65 70 75 80
 Gln Ile Asn Ala Gln Lys Asn Pro Asp Ser Pro Val Leu Lys Gln Gly
 85 90 95

[0074]

Lys Asn Leu Asn Leu Ala Pro Asn Phe Ala Asn Glu Leu Lys Thr Leu
 100 105 110
 Ser Thr Glu Leu Ala Lys Ser Asp Thr Phe Thr Gln Val Leu Asp Arg
 115 120 125
 Leu Asn Gln Ile Leu Lys Pro Ala Ser Glu Ile Lys Asn Asn Asn Leu
 130 135 140
 Ala Pro Leu Phe Lys Asn Ser Gly Val Phe Leu Glu Ala Lys Leu Lys
 145 150 155 160
 Asp Ala Leu Asn Glu Glu Leu Leu Pro Lys Ser Phe His Ser Leu Leu
 165 170 175
 Ser Thr Ile Lys Gly Leu Ser Ser Glu Lys Leu Ser Val Gln Ile Ala
 180 185 190
 Gln Leu Ala Asn Thr Asn Leu Asn Pro Lys Asn Thr Leu Lys Glu Leu
 195 200 205
 Lys Asn Ile Ile Asn Ser Ser Lys Asn Glu Asn Lys Gln Ile Leu Asn
 210 215 220
 Gln Ser Ser Phe Lys Ala Leu Leu Asn Leu Ser Ser Lys Leu Glu Asn
 225 230 235 240
 Phe Lys Asn Tyr Ile Ser Lys Asn Pro Ser His Ala Gln Glu Lys Ile
 245 250 255
 Thr Pro Ile Ala Asn Lys Ile Leu Lys Glu Leu Asn Ser Ile Lys Asn
 260 265 270
 Asp Phe Phe Lys Ala Leu Asn Lys Pro Glu Asn Leu Met Ile Lys Asp
 275 280 285
 Pro Asn Ile Leu Lys Gln Thr Ala Thr Ala Phe Glu Lys Leu Glu Asn
 290 295 300
 Thr Leu Lys Asn Ile Leu Gly Asn Gln Ala Ser Lys Ile Gln Asp Lys
 305 310 315 320
 Glu Asn Ile Leu Glu Asn Leu Leu Ser Asn Lys Glu Asn Ile Lys Glu
 325 330 335
 Glu Gln Leu Asn His Asn Thr Lys Asn Gln Asp Glu Glu Lys His Ile
 340 345 350
 Lys Val Ser Lys Glu Glu Thr Leu Ala Asp Asp Ala Lys Thr Asp Ile
 355 360 365
 Lys Gln Asp Val Lys Asn Glu Glu Asn Leu Pro Lys Lys Glu Val Asn
 370 375 380
 Ala Asn Leu Asp Ser Ser Thr Lys Thr His Glu Glu Asn Ile Lys Glu
 385 390 395 400

[0075]

Asn Pro Lys Phe Tyr Glu Thr Lys Thr Glu Asn Lys Thr Ser Ile Asn
 405 410 415
 Thr Asn Thr Asn Thr Ser Asn Pro Asn Thr Asn Asn Thr Gln Asn Leu
 420 425 430
 Asn Asn Thr Gln Asn Ile Gln Ser Asn Asn Asn Gln Thr Met Gln Asn
 435 440 445
 Ile Phe Lys Asn Gln Glu Phe Ile Lys Gln Asn Ile Val Lys Asn Leu
 450 455 460
 Ala Phe Asn Val Glu Asn Leu Asp Leu Glu Gln Val Gln Asp Leu Ser
 465 470 475 480
 Lys Asn Leu Ser Asn Leu Ser Arg Arg Leu Asn Glu Ser Leu Lys Glu
 485 490 495
 Leu Glu Pro Tyr Thr Gln Asn Ala Lys Leu Asn Gln Ala Glu Leu Lys
 500 505 510
 Asn Leu Glu His Lys Leu Asn Leu Ser Ile Lys Asp Leu Ala Gln Ile
 515 520 525
 Lys Pro Lys Thr Glu Gln Asp Ile Ala Glu Ser Leu His His Asp Val
 530 535 540
 Lys Ser Thr Leu Leu Gln Ile Ser Asn Leu Ala Lys Asn Glu Gly Asn
 545 550 555 560
 Glu Ala Val Tyr Asn Gln Ala Asn Arg Leu Leu Ala Gln Ile Glu Ile
 565 570 575
 Asn Gln Leu Met Ser Leu Ala Asn Asp Ser Ile Asn Thr Tyr Leu Pro
 580 585 590
 Phe Ser Trp Asp Asp Leu Asn Asp Ser Lys Ile Met Phe Arg Arg Gly
 595 600 605
 Lys Lys Asp Lys Phe Phe Ala Gln Ile Lys Leu Glu Phe Ala Lys Leu
 610 615 620
 Gly Asp Leu Glu Ile Leu Ile Ser Leu Asn Asn Glu Lys Tyr Ile Asp
 625 630 635 640
 Ile Asn Ile Met Ala Glu Asn Ile Glu Phe Arg Lys Thr Ile Tyr Glu
 645 650 655
 Asn Ala His Glu Leu Lys Arg Asn Ile Asn Lys Ala Gly Leu Leu Ser
 660 665 670
 Ala Asn Phe Phe Val Gly Asp Ile Ile Arg Ser Lys Phe Asp Thr Arg
 675 680 685
 Asn Met Lys Asn Leu Asp Leu Glu Met Gly Met Asp Lys Lys Val
 690 695 700

<210> 67
 <211> 703
 <212> PRT
 <213> Campylobacter jejuni

<400> 67

Met Ile Asn Thr Gln Leu Ala Ser Gln Ile Ala Asn Thr Gln Lys Asn
 1 5 10 15

Asp Leu Lys Val Asp Asn Ser Ala Ser Lys Asp Lys Thr Asn Leu Lys
 20 25 30

Asp Asn Pro Lys Glu Ala Leu Ala Gln Ala Leu Lys Gln Asn Leu Gly
 35 40 45

Leu Ser Lys Asp Ala Ser Ser Glu Glu Ile Leu Ala Lys Phe Val Gln
 50 55 60

Asn Glu Thr Gly Thr Lys Leu Lys Glu Leu Val Asn Lys Leu Leu Asp
 65 70 75 80

Gln Ile Asn Ala Gln Lys Asn Pro Asp Ser Pro Val Leu Lys Gln Gly
 85 90 95

Lys Asn Leu Asn Leu Ala Pro Asn Phe Ala Asn Glu Leu Lys Ile Leu
 100 105 110

[0076]

Ser Thr Glu Leu Ala Lys Ser Asp Thr Phe Thr Gln Val Leu Asp Arg
 115 120 125

Leu Asn Gln Ile Leu Lys Pro Ala Ser Glu Ile Lys Asn Asn Asn Leu
 130 135 140

Ala Pro Leu Phe Lys Asn Ser Gly Val Phe Leu Glu Ala Lys Leu Lys
 145 150 155 160

Asp Ala Leu Asn Glu Glu Leu Leu Pro Lys Ser Phe His Ser Leu Leu
 165 170 175

Ser Thr Ile Lys Gly Leu Ser Ser Glu Lys Leu Ser Val Gln Ile Ala
 180 185 190

Gln Leu Ala Asn Thr Asn Leu Ser Pro Lys Asp Thr Leu Lys Glu Leu
 195 200 205

Lys Asn Ile Ile Asn Ser Ser Lys Asn Glu Asn Lys Gln Ile Leu Asn
 210 215 220

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

Phe Lys Asn Tyr Ile Ser Lys Asn Pro Ser His Ala Gln Glu Lys Ile
 245 250 255

Thr Pro Ile Ala Asn Lys Ile Leu Lys Glu Leu Asn Ser Ile Lys Asn
 260 265 270

	Asp	Phe	Phe	Lys	Ala	Leu	Asn	Lys	Pro	Glu	Asn	Leu	Met	Ile	Lys	Asp
	275							280					285			
	Pro	Asn	Ile	Leu	Lys	Gln	Thr	Ala	Thr	Ala	Phe	Glu	Lys	Leu	Glu	Asn
	290						295					300				
	Thr	Leu	Lys	Asn	Ile	Leu	Gly	Asn	Gln	Ala	Ser	Lys	Ile	Gln	Asp	Lys
	305					310					315					320
	Glu	Asn	Ile	Leu	Glu	Asn	Leu	Leu	Ser	Asn	Lys	Glu	Asn	Ile	Lys	Glu
					325					330					335	
	Glu	Lys	Leu	Asn	His	Asn	Thr	Lys	Asn	Gln	Asp	Glu	Glu	Lys	Tyr	Ile
				340					345					350		
	Lys	Val	Ser	Lys	Glu	Glu	Thr	Leu	Ala	Asp	Asp	Ala	Lys	Thr	Asp	Ile
			355					360					365			
	Lys	Gln	Asp	Val	Lys	Asn	Glu	Glu	Asn	Leu	Pro	Lys	Lys	Glu	Val	Asn
	370						375				380					
	Ala	Asn	Leu	Asp	Ser	Ser	Thr	Lys	Thr	His	Glu	Glu	Asn	Ile	Lys	Glu
	385					390					395					400
	Asn	Pro	Lys	Phe	Tyr	Glu	Thr	Lys	Thr	Glu	Asn	Lys	Thr	Ser	Ile	Asn
					405					410					415	
[0077]	Thr	Asn	Thr	Asn	Thr	Ser	Asn	Pro	Asn	Thr	Asn	Asn	Thr	Gln	Asn	Leu
				420					425					430		
	Asn	Asn	Thr	Gln	Asn	Ile	Gln	Ser	Asn	Asn	Asn	Gln	Thr	Met	Gln	Asn
			435					440					445			
	Ile	Phe	Lys	Asn	Gln	Glu	Phe	Ile	Lys	Gln	Asn	Ile	Val	Lys	Asn	Leu
	450						455					460				
	Ala	Phe	Asn	Val	Glu	Asn	Leu	Asp	Leu	Glu	Gln	Val	Gln	Asp	Leu	Ser
	465					470					475					480
	Lys	Asn	Leu	Ser	Asn	Leu	Ser	Arg	Arg	Leu	Asn	Glu	Ser	Leu	Lys	Glu
					485					490					495	
	Leu	Glu	Pro	Tyr	Thr	Gln	Asn	Ala	Lys	Leu	Asn	Gln	Ala	Glu	Leu	Lys
			500						505					510		
	Asn	Leu	Glu	His	Lys	Leu	Asn	Leu	Ser	Ile	Lys	Asp	Leu	Ala	Gln	Ile
			515					520					525			
	Lys	Pro	Lys	Thr	Glu	Gln	Asp	Ile	Ala	Glu	Ser	Leu	His	His	Asp	Val
	530						535					540				
	Lys	Ser	Thr	Leu	Leu	Gln	Ile	Ser	Asn	Leu	Ala	Lys	Asn	Glu	Gly	Asn
	545					550					555					560
	Glu	Ala	Val	Tyr	Asn	Gln	Ala	Asn	Arg	Leu	Leu	Ala	Gln	Ile	Glu	Ile
					565					570					575	

Asn Gln Leu Met Ser Leu Ala Asn Asp Ser Ile Asn Thr Tyr Leu Pro
 580 585 590
 Phe Ser Trp Asp Asp Leu Asn Asp Ser Lys Ile Met Phe Arg Arg Gly
 595 600 605
 Lys Lys Asp Lys Phe Phe Ala Gln Ile Lys Leu Glu Phe Ala Lys Leu
 610 615 620
 Gly Asp Leu Glu Ile Leu Ile Ser Leu Asn Asn Glu Lys Tyr Ile Asp
 625 630 635 640
 Ile Asn Ile Met Ala Glu Asn Ile Glu Phe Arg Lys Thr Ile Tyr Glu
 645 650 655
 Asn Ala His Glu Leu Lys Arg Asn Ile Asn Lys Ala Gly Leu Leu Ser
 660 665 670
 Ala Asn Phe Phe Val Gly Asp Ile Ile Arg Ser Lys Phe Asp Thr Arg
 675 680 685
 Asn Met Lys Asn Leu Asp Leu Glu Met Gly Met Asp Lys Lys Val
 690 695 700
 <210> 68
 <211> 719
 <212> PRT
 <213> Campylobacter jejuni
 [0078] <400> 68
 Met Ile Asn Thr Gln Leu Ala Ser Gln Ile Ala Asn Thr Gln Lys Asn
 1 5 10 15
 Asp Leu Lys Val Asp Asn Ser Ala Ser Lys Asp Lys Thr Asn Leu Lys
 20 25 30
 Asp Asn Pro Lys Glu Ala Leu Ala Gln Ala Leu Lys Gln Asn Leu Gly
 35 40 45
 Leu Ser Lys Asp Ala Ser Ser Glu Glu Ile Leu Ala Lys Phe Val Gln
 50 55 60
 Asn Glu Thr Gly Thr Lys Leu Lys Glu Leu Val Asn Lys Leu Leu Asp
 65 70 75 80
 Gln Ile Asn Ala Gln Lys Asn Pro Asp Ser Pro Val Leu Lys Gln Gly
 85 90 95
 Lys Asn Leu Asn Leu Ala Pro Asn Phe Ala Asn Glu Leu Lys Ile Leu
 100 105 110
 Ser Thr Glu Leu Ala Lys Ser Asp Thr Phe Thr Gln Val Leu Asp Arg
 115 120 125
 Leu Asn Gln Ile Leu Lys Pro Ala Ser Glu Ile Lys Asn Asn Asn Leu
 130 135 140
 Ala Pro Leu Phe Lys Asn Ser Gly Val Phe Leu Glu Ala Lys Leu Lys

145	150	155	160
Asp Ala Leu Asn Glu Glu Leu Leu Pro Lys Ser Phe His Ser Leu Leu			
165	170	175	
Ser Thr Ile Lys Gly Leu Ser Ser Glu Lys Leu Ser Val Gln Ile Ala			
180	185	190	
Gln Leu Ala Asn Thr Asn Leu Ser Pro Lys Asp Thr Leu Lys Glu Leu			
195	200	205	
Lys Asn Ile Ile Asn Ser Ser Lys Asn Glu Asn Lys Gln Ile Leu Asn			
210	215	220	
Gln Ser Ser Phe Lys Ala Leu Leu Asn Leu Ser Ser Lys Leu Glu Asn			
225	230	235	240
Phe Lys Asn Tyr Ile Ser Lys Asn Pro Ser His Ala Gln Glu Lys Ile			
245	250	255	
Thr Pro Ile Ala Asn Lys Ile Leu Lys Glu Leu Asn Ser Ile Lys Asn			
260	265	270	
Asp Phe Phe Lys Ala Leu Asn Lys Pro Glu Asn Leu Met Ile Lys Asp			
275	280	285	
Pro Asn Ile Leu Lys Gln Thr Ala Thr Ala Phe Glu Lys Leu Glu Asn			
290	295	300	
Thr Leu Lys Asn Ile Leu Gly Asn Gln Ala Ser Lys Ile Gln Asp Lys			
305	310	315	320
Glu Asn Ile Leu Glu Asn Leu Leu Ser Asn Lys Glu Asn Ile Lys Glu			
325	330	335	
Glu Lys Leu Asn His Asn Thr Lys Asn Gln Asp Glu Glu Lys His Ile			
340	345	350	
Lys Ala Ser Lys Glu Asp Glu Asn Leu Asn Ser Gly Ile Lys Thr His			
355	360	365	
Glu Glu Asp Thr Gln Asp Thr Lys Asn Asp Ile Gln Asn Asn Glu Thr			
370	375	380	
Glu Asn Lys Pro Asp Asn Asp Ile Lys Asn Ser Thr Pro Asn Gln Glu			
385	390	395	400
Lys Ile Lys Asp Glu Lys Gln Glu Lys Ser Lys Glu Asn Ile Lys Glu			
405	410	415	
Asn Pro Lys Phe Tyr Glu Thr Lys Thr Glu Asn Lys Thr Ser Ile Asn			
420	425	430	
Thr Asn Thr Asn Thr Ser Asn Pro Asn Thr Asn Asn Thr Gln Asn Leu			
435	440	445	
Asn Asn Thr Gln Asn Ile Gln Ser Asn Asn Asn Gln Thr Met Gln Asn			

[0079]

[0080]

450	455	460
Ile Phe Lys Asn Gln Glu Phe Ile Lys Gln Asn Ile Val Lys Asn Leu 465	470	475 480
Ala Phe Asn Val Glu Asn Leu Asp Leu Glu Gln Val Gln Asp Leu Ser 485	490	495
Lys Asn Leu Ser Asn Leu Ser Arg Arg Leu Asn Glu Ser Leu Lys Glu 500	505	510
Leu Glu Pro Tyr Thr Gln Asn Ala Lys Leu Asn Gln Ala Glu Leu Lys 515	520	525
Asn Leu Glu His Lys Leu Asn Leu Ser Ile Lys Asp Leu Ala Gln Ile 530	535	540
Lys Pro Lys Thr Glu Gln Asp Ile Ala Glu Ser Leu His His Asp Val 545	550	555 560
Lys Ser Thr Leu Leu Gln Ile Ser Asn Leu Ala Lys Asn Glu Gly Asn 565	570	575
Glu Ala Val Tyr Asn Gln Ala Asn Arg Leu Leu Ala Gln Ile Glu Ile 580	585	590
Asn Gln Leu Met Ser Leu Ala Asn Asp Ser Ile Asn Thr Tyr Leu Pro 595	600	605
Phe Ser Trp Asp Asp Leu Asn Asp Ser Lys Ile Met Phe Arg Arg Gly 610	615	620
Lys Lys Asp Lys Phe Phe Ala Gln Ile Lys Leu Glu Phe Ala Lys Leu 625	630	635 640
Gly Asp Leu Glu Ile Leu Ile Ser Leu Asn Asn Glu Lys Tyr Ile Asp 645	650	655
Ile Asn Ile Met Ala Glu Asn Ile Glu Phe Arg Lys Thr Ile Tyr Glu 660	665	670
Asn Ala His Glu Leu Lys Arg Asn Ile Asn Lys Ala Gly Leu Leu Ser 675	680	685
Ala Asn Phe Phe Val Gly Asp Ile Ile Arg Ser Lys Phe Asp Thr Arg 690	695	700
Asn Met Lys Asn Leu Asp Leu Glu Met Gly Met Asp Lys Lys Val 705	710	715
<210> 69		
<211> 719		
<212> PRT		
<213> Campylobacter jejuni		
<400> 69		
Met Ile Asn Thr Gln Leu Ala Ser Gln Ile Ala Asn Thr Gln Lys Asn 1	5	10 15

[0081]

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

	Glu Asn Ile Leu Glu Asn Leu Leu Ser Asn Lys Glu Asn Ile Lys Glu 325 330 335
	Glu Lys Leu Asn His Asn Thr Lys Asn Gln Asp Glu Glu Lys His Ile 340 345 350
	Lys Ala Ser Lys Glu Asp Glu Asn Leu Asp Ser Gly Ile Lys Thr His 355 360 365
	Glu Glu Asp Thr Gln Asp Thr Lys Asn Asp Ile Gln Asn Asn Glu Thr 370 375 380
	Glu Asn Lys Pro Asp Asn Asp Ile Lys Asn Ser Thr Pro Asn Gln Glu 385 390 395 400
	Lys Ile Lys Asp Glu Lys Gln Glu Lys Ser Lys Glu Asn Ile Lys Glu 405 410 415
	Asn Pro Lys Phe Tyr Glu Thr Lys Thr Glu Asn Lys Thr Ser Ile Asn 420 425 430
	Thr Asn Thr Asn Thr Ser Asn Pro Asn Thr Asn Asn Thr Gln Asn Leu 435 440 445
	Asn Asn Thr Gln Asn Ile Gln Ser Asn Asn Asn Gln Thr Met Gln Asn 450 455 460
[0082]	Ile Phe Lys Asn Gln Glu Phe Ile Lys Gln Asn Ile Val Lys Asn Leu 465 470 475 480
	Ala Phe Asn Val Glu Asn Leu Asp Leu Glu Gln Val Gln Asp Leu Ser 485 490 495
	Lys Asn Leu Ser Asn Leu Ser Arg Arg Leu Asn Glu Ser Leu Lys Glu 500 505 510
	Leu Glu Pro Tyr Thr Gln Asn Ala Lys Leu Asn Gln Ala Glu Leu Lys 515 520 525
	Asn Leu Glu His Lys Leu Asn Leu Ser Ile Lys Asp Leu Ala Gln Ile 530 535 540
	Lys Pro Lys Thr Glu Gln Asp Ile Ala Glu Ser Leu His His Asp Val 545 550 555 560
	Lys Ser Thr Leu Leu Gln Ile Ser Asn Leu Ala Lys Asn Glu Gly Asn 565 570 575
	Glu Ala Val Tyr Asn Gln Ala Asn Arg Leu Leu Ala Gln Ile Glu Ile 580 585 590
	Asn Gln Leu Met Ser Leu Ala Asn Asp Ser Ile Asn Thr Tyr Leu Pro 595 600 605
	Phe Ser Trp Asp Asp Leu Asn Asp Ser Lys Ile Met Phe Arg Arg Gly 610 615 620

Lys Lys Asp Lys Phe Phe Ala Gln Ile Lys Leu Glu Phe Ala Lys Leu
625 630 635 640

Gly Asp Leu Glu Ile Leu Ile Ser Leu Asn Asn Glu Lys Tyr Ile Asp
645 650 655

Ile Asn Ile Met Ala Glu Asn Ile Glu Phe Arg Lys Thr Ile Tyr Glu
660 665 670

Asn Ala His Glu Leu Lys Arg Asn Ile Asn Lys Ala Gly Leu Leu Ser
675 680 685

Ala Asn Phe Phe Val Gly Asp Ile Ile Arg Ser Lys Phe Asp Thr Arg
690 695 700

Asn Met Lys Asn Leu Asp Leu Glu Met Gly Met Asp Lys Lys Val
705 710 715

<210> 70

<211> 719

<212> PRT

<213> Campylobacter jejuni

<400> 70

Met Ile Asn Thr Gln Leu Ala Ser Gln Ile Ala Asn Thr Gln Lys Asn
1 5 10 15

[0083]

Asp Leu Lys Val Asp Asn Ser Ala Ser Lys Asp Lys Thr Asn Leu Lys
20 25 30

Asp Asn Pro Lys Glu Ala Leu Ala Gln Ala Leu Lys Gln Asn Leu Gly
35 40 45

Leu Ser Lys Asp Ala Ser Ser Glu Glu Ile Leu Ala Lys Phe Val Gln
50 55 60

Asn Glu Thr Gly Thr Lys Leu Lys Glu Leu Val Asn Lys Leu Leu Asp
65 70 75 80

Gln Ile Asn Ala Gln Lys Asn Pro Asp Ser Pro Val Leu Lys Gln Gly
85 90 95

Lys Asn Leu Asn Leu Ala Pro Asn Phe Ala Asn Glu Leu Lys Ile Leu
100 105 110

Ser Thr Glu Leu Ala Lys Ser Asp Thr Phe Thr Gln Val Leu Asp Arg
115 120 125

Leu Asn Gln Ile Leu Lys Pro Ala Ser Glu Ile Lys Asn Asn Asn Leu
130 135 140

Ala Pro Leu Phe Lys Asn Ser Gly Val Phe Leu Glu Ala Lys Leu Lys
145 150 155 160

Asp Ala Leu Asn Glu Glu Leu Leu Pro Lys Ser Phe His Ser Leu Leu
165 170 175

[0084]

Ser Thr Ile	Lys Gly Leu Ser Ser	Glu Lys Leu Ser Val	Gln Ile Ala
	180	185	190
Gln Leu Ala Asn Thr Asn Leu Ser	Pro Lys Asp Thr	Leu Lys Glu Leu	
	195	200	205
Lys Asn Ile Ile Asn Ser Ser Lys Asn Glu Asn Lys	Gln Ile Leu Asn		
	210	215	220
Gln Ser Ser Phe Lys Ala Leu Leu Asn Leu Ser Ser Lys Leu Glu Asn			
	225	230	235 240
Phe Lys Asn Tyr Ile Ser Lys Asn Pro Ser His Ala Gln Glu Lys Ile			
	245	250	255
Thr Pro Ile Ala Asn Lys Ile Leu Lys Glu Leu Asn Ser Ile Lys Asn			
	260	265	270
Asp Phe Phe Lys Ala Leu Asn Lys Pro Glu Asn Leu Met Ile Lys Asp			
	275	280	285
Pro Asn Ile Leu Lys Gln Thr Ala Thr Ala Phe Glu Lys Leu Glu Asn			
	290	295	300
Thr Leu Lys Asn Ile Leu Gly Asn Gln Ala Ser Lys Ile Gln Asp Lys			
	305	310	315 320
Glu Asn Ile Leu Glu Asn Leu Leu Ser Asn Lys Glu Asn Met Lys Glu			
	325	330	335
Glu Lys Leu Asn His Asn Thr Lys Asn Gln Asp Glu Glu Lys His Ile			
	340	345	350
Lys Ala Ser Lys Glu Asp Glu Asn Leu Asp Ser Gly Ile Lys Thr His			
	355	360	365
Glu Glu Asp Thr Gln Asp Thr Lys Asn Asp Ile Gln Asn Asn Glu Thr			
	370	375	380
Glu Asn Lys Pro Asp Asn Asp Ile Lys Asn Ser Thr Pro Asn Gln Glu			
	385	390	395 400
Lys Ile Lys Asp Glu Lys Gln Glu Lys Ser Lys Glu Asn Ile Lys Glu			
	405	410	415
Asn Pro Lys Phe Tyr Glu Thr Lys Thr Glu Asn Lys Thr Ser Ile Asn			
	420	425	430
Thr Asn Thr Asn Thr Ser Asn Pro Asn Thr Asn Asn Thr Gln Asn Leu			
	435	440	445
Asn Asn Thr Gln Asn Ile Gln Ser Asn Asn Asn Gln Thr Met Gln Asn			
	450	455	460
Ile Phe Lys Asn Gln Glu Phe Ile Lys Gln Asn Ile Val Lys Asn Leu			
	465	470	475 480

Ala Phe Asn Val Glu Asn Leu Asp Leu Glu Gln Val Gln Asp Leu Ser
 485 490 495
 Lys Asn Leu Ser Asn Leu Ser Arg Arg Leu Asn Glu Ser Leu Lys Glu
 500 505 510
 Leu Glu Pro Tyr Thr Gln Asn Ala Lys Leu Asn Gln Ala Glu Leu Lys
 515 520 525
 Asn Leu Glu His Lys Leu Asn Leu Ser Ile Lys Asp Leu Ala Gln Ile
 530 535 540
 Lys Pro Lys Thr Glu Gln Asp Ile Ala Glu Ser Leu His His Asp Val
 545 550 555 560
 Lys Ser Thr Leu Leu Gln Ile Ser Asn Leu Ala Lys Asn Glu Gly Asn
 565 570 575
 Glu Ala Val Tyr Asn Gln Ala Asn Arg Leu Leu Ala Gln Ile Glu Ile
 580 585 590
 Asn Gln Leu Met Ser Leu Ala Asn Asp Ser Ile Asn Thr Tyr Leu Pro
 595 600 605
 Phe Ser Trp Asp Asp Leu Asn Asp Ser Lys Ile Met Phe Arg Arg Gly
 610 615 620
 [0085] Lys Lys Asp Lys Phe Phe Ala Gln Ile Lys Leu Glu Phe Ala Lys Leu
 625 630 635 640
 Gly Asp Leu Glu Ile Leu Ile Ser Leu Asn Asn Glu Lys Tyr Ile Asp
 645 650 655
 Ile Asn Ile Met Ala Glu Asn Ile Glu Phe Arg Lys Thr Ile Tyr Glu
 660 665 670
 Asn Ala His Glu Leu Lys Arg Asn Ile Asn Lys Ala Gly Leu Leu Ser
 675 680 685
 Ala Asn Phe Phe Val Gly Asp Ile Ile Arg Ser Lys Phe Asp Thr Arg
 690 695 700
 Asn Met Lys Asn Leu Asp Leu Glu Met Gly Met Asp Lys Lys Val
 705 710 715
 <210> 71
 <211> 749
 <212> PRT
 <213> Campylobacter jejuni
 <400> 71
 Met Ile Asn Thr Gln Leu Ala Ser Gln Ile Ala Asn Thr Gln Lys Asn
 1 5 10 15
 Asp Leu Lys Val Asp Asn Ser Ala Ser Lys Asp Lys Thr Asn Leu Lys
 20 25 30

	Asp	Asn	Pro	Lys	Glu	Ala	Leu	Ala	Gln	Ala	Leu	Lys	Gln	Asn	Leu	Gly	
	35						40					45					
	Leu	Ser	Lys	Asp	Ala	Ser	Ser	Glu	Glu	Ile	Leu	Ala	Lys	Phe	Val	Gln	
	50					55					60						
	Asn	Glu	Thr	Gly	Val	Lys	Leu	Lys	Glu	Leu	Val	Asn	Lys	Leu	Leu	Asp	
	65				70				75					80			
	Gln	Ile	Asn	Ala	Gln	Lys	Asn	Pro	Asp	Ser	Pro	Val	Leu	Lys	Gln	Gly	
				85					90						95		
	Lys	Asn	Leu	Asn	Leu	Ala	Pro	Asn	Phe	Ala	Asn	Glu	Leu	Lys	Thr	Leu	
			100					105						110			
	Ser	Thr	Glu	Leu	Ala	Lys	Ser	Asp	Thr	Phe	Thr	Gln	Val	Leu	Asp	Arg	
		115					120					125					
	Leu	Asn	Gln	Ile	Leu	Lys	Pro	Ala	Ser	Glu	Ile	Lys	Asn	Asn	Asn	Leu	
	130					135					140						
	Ala	Pro	Leu	Phe	Lys	Asn	Ser	Gly	Val	Phe	Leu	Glu	Ala	Lys	Leu	Lys	
	145				150					155					160		
	Asp	Ala	Leu	Asn	Glu	Glu	Leu	Leu	Pro	Lys	Ser	Phe	His	Ser	Leu	Leu	
				165				170					175				
[0086]	Ser	Thr	Ile	Lys	Gly	Leu	Ser	Ser	Glu	Lys	Leu	Ser	Val	Gln	Ile	Ala	
			180					185					190				
	Gln	Leu	Ala	Asn	Thr	Asn	Leu	Ser	Pro	Lys	Asp	Thr	Leu	Lys	Glu	Leu	
		195					200					205					
	Lys	Asn	Ile	Ile	Asn	Ser	Ser	Lys	Asn	Glu	Asn	Lys	Gln	Ile	Leu	Asn	
	210				215					220							
	Gln	Ser	Ser	Phe	Lys	Ala	Leu	Leu	Asn	Leu	Ser	Ser	Lys	Leu	Glu	Asn	
	225				230				235						240		
	Phe	Lys	Asn	Tyr	Ile	Ser	Lys	Asn	Pro	Ser	His	Ala	Gln	Glu	Lys	Ile	
			245					250						255			
	Thr	Pro	Ile	Ala	Asn	Lys	Ile	Leu	Lys	Glu	Leu	Asn	Ser	Ile	Lys	Asn	
		260						265					270				
	Asp	Phe	Phe	Lys	Ala	Leu	Asn	Lys	Pro	Glu	Asn	Leu	Met	Ile	Lys	Asp	
		275					280					285					
	Pro	Asn	Ile	Leu	Lys	Gln	Thr	Ala	Thr	Ala	Phe	Glu	Lys	Leu	Glu	Asn	
	290					295					300						
	Thr	Leu	Lys	Asn	Ile	Leu	Gly	Asn	Gln	Ala	Ser	Lys	Ile	Gln	Asp	Lys	
	305				310				315					320			
	Glu	Asn	Ile	Leu	Glu	Asn	Leu	Leu	Ser	Asn	Lys	Glu	Asn	Met	Lys	Glu	
			325					330					335				

[0087]

Glu Lys Leu Asn His Asn Thr Lys Asn Gln Asp Glu Glu Lys His Ile
 340 345 350
 Lys Ala Ser Lys Glu Glu Thr Leu Thr Asp Asp Thr Lys Thr Asp Ile
 355 360 365
 Lys Gln Asp Ser Lys Asn Glu Glu Asn Ser His Ala Lys Glu Thr Asp
 370 375 380
 Ile Lys Glu Asp Glu Asn Leu Asp Ser Asp Ile Lys Thr His Glu Glu
 385 390 395 400
 Asp Thr Gln Asp Thr Lys Asn Asp Ile Gln Asn Asn Glu Thr Glu Asn
 405 410 415
 Lys Pro Asp Asn Asp Ile Lys Asn Ser Thr Pro Asn Gln Glu Lys Ile
 420 425 430
 Lys Asp Glu Lys Gln Glu Lys Ser Lys Glu Asn Ile Lys Glu Asn Pro
 435 440 445
 Lys Phe Tyr Glu Thr Lys Thr Glu Asn Lys Thr Ser Val Asn Thr Asn
 450 455 460
 Thr Asn Thr Ser Asn Pro Asn Thr Asn Asn Thr Gln Asn Leu Asn Asn
 465 470 475 480
 Ser Gln Asn Ile Gln Ser Asn Asn Asn Gln Thr Met Gln Asn Ile Phe
 485 490 495
 Lys Asn Gln Glu Phe Ile Lys Gln Asn Ile Val Lys Asn Leu Ala Phe
 500 505 510
 Asn Val Glu Asn Leu Asp Leu Glu Gln Val Gln Asp Leu Ser Lys Asn
 515 520 525
 Leu Ser Asn Leu Ser Arg Arg Leu Asn Glu Ser Leu Lys Glu Leu Glu
 530 535 540
 Pro Tyr Thr Gln Asn Ala Lys Leu Asn Gln Ala Glu Leu Lys Asn Leu
 545 550 555 560
 Glu His Lys Leu Asn Leu Ser Ile Lys Asp Leu Ala Gln Ile Lys Pro
 565 570 575
 Lys Thr Glu Gln Asp Ile Ala Glu Ser Leu His His Asp Val Lys Ser
 580 585 590
 Thr Leu Leu Gln Ile Ser Asn Leu Ala Lys Asn Glu Gly Asn Glu Ala
 595 600 605
 Val Tyr Asn Gln Ala Asn Arg Leu Leu Ala Gln Ile Glu Ile Asn Gln
 610 615 620
 Leu Met Ser Leu Ala Asn Asp Ser Ile Asn Thr Tyr Leu Pro Phe Ser
 625 630 635 640

Trp Asp Asp Leu Asn Asp Ser Lys Ile Met Phe Arg Arg Gly Lys Lys
 645 650 655
 Asp Lys Phe Phe Ala Gln Ile Lys Leu Glu Phe Ala Lys Leu Gly Asp
 660 665 670
 Leu Glu Ile Leu Ile Ser Leu Asn Asn Glu Lys Tyr Ile Asp Ile Asn
 675 680 685
 Ile Met Ala Glu Asn Ile Glu Phe Arg Lys Thr Ile Tyr Glu Asn Ala
 690 695 700
 His Glu Leu Lys Arg Asn Ile Asn Lys Ala Gly Leu Leu Ser Ala Asn
 705 710 715 720
 Phe Phe Val Gly Asp Ile Ile Arg Ser Lys Phe Asp Thr Arg Asn Met
 725 730 735
 Lys Asn Leu Asp Leu Glu Met Gly Met Asp Lys Lys Val
 740 745
 <210> 72
 <211> 719
 <212> PRT
 <213> Campylobacter jejuni
 <400> 72
 Met Ile Asn Thr Gln Leu Ala Ser Gln Ile Ala Asn Thr Gln Lys Asn
 1 5 10 15
 Asp Leu Lys Val Asp Asn Ser Ala Ser Lys Asp Lys Thr Asn Leu Lys
 20 25 30
 Asp Asn Pro Lys Glu Ala Leu Ala Gln Ala Leu Lys Gln Asn Leu Gly
 35 40 45
 Leu Ser Lys Asp Ala Ser Ser Glu Glu Ile Leu Ala Lys Phe Val Gln
 50 55 60
 Asn Glu Thr Gly Thr Lys Leu Lys Glu Leu Val Asn Lys Leu Leu Asp
 65 70 75 80
 Gln Ile Asn Ala Gln Lys Asn Pro Asp Ser Pro Val Phe Lys Gln Gly
 85 90 95
 Lys Asn Leu Asn Leu Ala Pro Asn Phe Ala Asn Glu Leu Lys Ile Leu
 100 105 110
 Ser Thr Glu Leu Ala Lys Ser Asp Thr Phe Thr Gln Val Leu Asp Arg
 115 120 125
 Leu Asn Gln Ile Leu Lys Pro Ala Ser Glu Ile Lys Asn Asn Asn Leu
 130 135 140
 Ala Pro Leu Phe Lys Asn Ser Gly Val Phe Leu Glu Ala Lys Leu Lys
 145 150 155 160
 Asp Ala Leu Asn Glu Glu Leu Leu Pro Lys Ser Phe His Ser Leu Leu

[0088]

	165	170	175
	Ser Thr Ile Lys Gly Leu Ser Ser Glu Lys Leu Ser Val Gln Ile Ala		
	180	185	190
	Gln Leu Ala Asn Thr Asn Leu Ser Pro Lys Asp Thr Leu Lys Glu Leu		
	195	200	205
	Lys Asn Ile Ile Asn Ser Ser Lys Asn Glu Asn Lys Gln Ile Leu Asn		
	210	215	220
	Gln Ser Ser Phe Lys Ala Leu Leu Asn Leu Ser Ser Lys Leu Glu Asn		
	225	230	235
	Phe Lys Asn Tyr Ile Ser Lys Asn Pro Ser His Ala Gln Glu Lys Ile		
	245	250	255
	Thr Pro Ile Ala Asn Lys Ile Leu Lys Glu Leu Asn Ser Ile Lys Asn		
	260	265	270
	Asp Phe Phe Lys Ala Leu Asn Lys Pro Glu Asn Leu Met Ile Lys Asp		
	275	280	285
	Pro Asn Ile Leu Lys Gln Thr Ala Thr Ala Phe Glu Lys Leu Glu Asn		
	290	295	300
	Thr Leu Lys Asn Ile Leu Gly Asn Gln Ala Ser Lys Ile Gln Asp Lys		
	305	310	315
[0089]	Glu Asn Ile Leu Glu Asn Leu Leu Ser Asn Lys Glu Asn Met Lys Glu		
	325	330	335
	Glu Lys Leu Asn His Asn Thr Lys Asn Gln Asp Glu Glu Lys His Ile		
	340	345	350
	Lys Ala Ser Lys Glu Asp Glu Asn Leu Asp Ser Gly Ile Lys Thr His		
	355	360	365
	Glu Glu Asp Thr Gln Asp Thr Lys Asn Asp Ile Gln Asn Asn Glu Thr		
	370	375	380
	Glu Asn Lys Pro Asp Asn Asp Ile Lys Asn Ser Thr Pro Asn Gln Glu		
	385	390	395
	Lys Ile Lys Asp Glu Lys Gln Glu Lys Ser Lys Glu Asn Ile Lys Glu		
	405	410	415
	Asn Pro Lys Phe Tyr Glu Thr Lys Thr Glu Asn Lys Thr Ser Ile Asn		
	420	425	430
	Thr Asn Thr Asn Thr Ser Asn Pro Asn Thr Asn Asn Thr Gln Asn Leu		
	435	440	445
	Asn Asn Thr Gln Asn Ile Gln Ser Asn Asn Asn Gln Thr Met Gln Asn		
	450	455	460
	Ile Phe Lys Asn Gln Glu Phe Ile Lys Gln Asn Ile Val Lys Asn Leu		

465	470	475	480
Ala Phe Asn Val Glu Asn Leu Asp Leu Glu Gln Val Gln Asp Leu Ser	485	490	495
Lys Asn Leu Ser Asn Leu Ser Arg Arg Leu Asn Glu Ser Leu Lys Glu	500	505	510
Leu Glu Pro Tyr Thr Gln Asn Ala Lys Leu Asn Gln Ala Glu Leu Lys	515	520	525
Asn Leu Glu His Lys Leu Asn Leu Ser Ile Lys Asp Leu Ala Gln Ile	530	535	540
Lys Pro Lys Thr Glu Gln Asp Ile Ala Glu Ser Leu His His Asp Val	545	550	555
Lys Ser Thr Leu Leu Gln Ile Ser Asn Leu Ala Lys Asn Glu Gly Asn	565	570	575
Glu Ala Val Tyr Asn Gln Ala Asn Arg Leu Leu Ala Gln Ile Glu Ile	580	585	590
Asn Gln Leu Met Ser Leu Ala Asn Asp Ser Ile Asn Thr Tyr Leu Pro	595	600	605
Phe Ser Trp Asp Asp Leu Asn Asp Ser Lys Ile Met Phe Arg Arg Gly	610	615	620
Lys Lys Asp Lys Phe Phe Ala Gln Ile Lys Leu Glu Phe Ala Lys Leu	625	630	635
Gly Asp Leu Glu Ile Leu Ile Ser Leu Asn Asn Glu Lys Tyr Ile Asp	645	650	655
Ile Asn Ile Met Ala Glu Asn Ile Glu Phe Arg Lys Thr Ile Tyr Glu	660	665	670
Asn Ala His Glu Leu Lys Arg Asn Ile Asn Lys Ala Gly Leu Leu Ser	675	680	685
Ala Asn Phe Phe Val Gly Asp Ile Ile Arg Ser Lys Phe Asp Thr Arg	690	695	700
Asn Met Lys Asn Leu Asp Leu Glu Met Gly Met Asp Lys Lys Val	705	710	715
<210> 73			
<211> 719			
<212> PRT			
<213> Campylobacter jejuni			
<400> 73			
Met Ile Asn Thr Gln Leu Ala Ser Gln Ile Ala Asn Thr Gln Lys Asn	1	5	10
Asp Leu Lys Val Asp Asn Ser Ala Ser Lys Asp Lys Thr Asn Leu Lys	20	25	30

[0090]

[0091]

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

[0092]

Glu Lys Leu Asn His Asn Thr Lys Asn Gln Asp Glu Glu Lys His Ile
 340 345 350
 Lys Ala Ser Lys Glu Asp Glu Asn Leu Asp Ser Gly Ile Lys Thr His
 355 360 365
 Glu Glu Asp Thr Gln Asp Thr Lys Asn Asp Ile Gln Asn Asn Glu Thr
 370 375 380
 Glu Asn Lys Pro Asp Asn Asp Ile Lys Asn Ser Thr Pro Asn Gln Glu
 385 390 395 400
 Lys Ile Lys Asp Glu Lys Gln Glu Lys Ser Lys Glu Asn Ile Lys Glu
 405 410 415
 Asn Pro Lys Phe Tyr Glu Thr Lys Thr Glu Asn Lys Thr Ser Ile Asn
 420 425 430
 Thr Asn Thr Asn Thr Ser Asn Pro Asn Thr Asn Asn Thr Gln Asn Leu
 435 440 445
 Asn Asn Thr Gln Asn Ile Gln Ser Asn Asn Asn Gln Thr Met Gln Asn
 450 455 460
 Ile Phe Lys Asn Gln Glu Phe Ile Lys Gln Asn Ile Val Lys Asn Leu
 465 470 475 480
 Ala Phe Asn Val Glu Asn Leu Asp Leu Glu Gln Val Gln Asp Leu Ser
 485 490 495
 Lys Asn Leu Ser Asn Leu Ser Arg Arg Leu Asn Glu Ser Leu Lys Glu
 500 505 510
 Leu Glu Pro Tyr Thr Gln Asn Ala Lys Leu Asn Gln Ala Glu Leu Lys
 515 520 525
 Asn Leu Glu His Lys Leu Asn Leu Ser Ile Lys Asp Leu Ala Gln Ile
 530 535 540
 Lys Pro Lys Thr Glu Gln Asp Ile Ala Glu Ser Leu His His Asp Val
 545 550 555 560
 Lys Ser Thr Leu Leu Gln Ile Ser Asn Leu Ala Lys Asn Glu Gly Asn
 565 570 575
 Glu Ala Val Tyr Asn Gln Ala Asn Arg Leu Leu Ala Gln Ile Glu Ile
 580 585 590
 Asn Gln Leu Met Ser Leu Ala Asn Asp Ser Ile Asn Thr Tyr Leu Pro
 595 600 605
 Phe Ser Trp Asp Asp Leu Asn Asp Ser Lys Ile Met Phe Arg Arg Gly
 610 615 620
 Lys Lys Asp Lys Phe Phe Ala Gln Ile Lys Leu Glu Phe Ala Lys Leu
 625 630 635 640

Gly Asp Leu Glu Ile Leu Ile Ser Leu Asn Asn Glu Lys Tyr Ile Asp
 645 650 655
 Ile Asn Ile Met Ala Glu Asn Ile Glu Phe Arg Lys Thr Ile Tyr Glu
 660 665 670
 Asn Ala His Glu Leu Lys Arg Asn Ile Asn Lys Ala Gly Leu Leu Ser
 675 680 685
 Ala Asn Phe Phe Val Gly Asp Ile Ile Arg Ser Lys Phe Asp Thr Arg
 690 695 700
 Asn Met Lys Asn Leu Asp Leu Glu Met Gly Met Asp Lys Lys Val
 705 710 715
 <210> 74
 <211> 323
 <212> PRT
 <213> Campylobacter jejuni
 <400> 74
 Met Lys Lys Tyr Ile Ser Ser Cys Leu Ala Ile Cys Cys Leu Ser Ser
 1 5 10 15
 Ala Ile Tyr Ala Asn Asp Val Lys Tyr Asp Ala Gln Lys Ile Ala Asp
 20 25 30
 Ile Phe Tyr Gln Leu Asn Ala Asp Pro Lys Asn Pro Lys Val Lys Val
 35 40 45
 Asn His Ala Lys Gly Phe Cys Ala Met Gly Thr Phe Glu Pro Ala Gln
 50 55 60
 Ser Ile Asn Lys Glu Ile Asp Val Pro Leu Leu Thr Tyr Lys Ser Leu
 65 70 75 80
 Pro Ile Gln Val Arg Tyr Ser Leu Gly Gly Ala Phe Lys Asp Asp Lys
 85 90 95
 Ser Lys Thr Arg Gly Met Ala Ile Arg Ile Thr Asp Pro Gln Asp Ser
 100 105 110
 Ala Ser Trp Thr Met Val Met Leu Asn Thr Glu Ile Asn Phe Ala Lys
 115 120 125
 Asn Leu Lys Glu Phe Gly Gln Phe Phe Glu Met Arg Leu Pro Val Asn
 130 135 140
 Gly Lys Val Asp Gln Glu Lys Ile Ser Lys Met Met Gln Glu Val Asp
 145 150 155 160
 Ser Tyr Arg Asn Phe Ala Ala Tyr Thr Asp Lys Ile Gly Ile Ser Lys
 165 170 175
 Ser Val Ala Asn Thr Pro Phe Phe Ser Ile His Thr Phe Tyr Phe Lys
 180 185 190

[0093]

Gln Thr Gly Ser Glu Asn Tyr Leu Pro Ala Arg Trp Lys Leu Val Pro
 195 200 205

Ser Glu Gly Val Ala Tyr Leu Asn Glu Ala Gln Met Lys Ser Ala Ser
 210 215 220

Ser Asp Phe Leu Lys Glu Asp Phe Glu Asp Arg Val Lys Thr Asn Lys
 225 230 235 240

Pro Val Glu Tyr Lys Met Tyr Leu Val Tyr Ala Asn Lys Asn Asp Ile
 245 250 255

Ile Asn Glu Thr Thr Ala Leu Trp Glu Gly Lys His Lys Glu Ser Leu
 260 265 270

Val Gly Thr Phe Lys Val Asn Ala Leu Ser Glu Glu Asp Cys Asn Phe
 275 280 285

Asn Val Tyr Phe Pro Ser Asp Ile Pro Gln Gly Val Asn Pro Pro Gln
 290 295 300

Asp Pro Leu Phe Asp Val Arg Asn Glu Thr Tyr Ala Ile Thr Phe Gly
 305 310 315 320

Met Arg Gln

[0094]

<210> 75
 <211> 495
 <212> PRT
 <213> Campylobacter jejuni

<400> 75

Gln Ser Ser Phe Lys Ala Leu Leu Asn Leu Ser Ser Lys Leu Glu Asn
 1 5 10 15

Phe Lys Asn Tyr Ile Ser Lys Asn Pro Ser His Ala Gln Glu Lys Ile
 20 25 30

Thr Pro Ile Ala Asn Lys Ile Leu Lys Glu Leu Asn Ser Ile Lys Asn
 35 40 45

Asp Phe Phe Lys Ala Leu Asn Lys Pro Glu Asn Leu Met Ile Lys Asp
 50 55 60

Pro Asn Ile Leu Lys Gln Thr Ala Thr Ala Phe Glu Lys Leu Glu Asn
 65 70 75 80

Thr Leu Lys Asn Ile Leu Gly Asn Gln Ala Ser Lys Ile Gln Asp Lys
 85 90 95

Glu Asn Ile Leu Glu Asn Leu Leu Ser Asn Lys Glu Asn Met Lys Glu
 100 105 110

Glu Lys Leu Asn His Asn Thr Lys Asn Gln Asp Glu Glu Lys His Ile
 115 120 125

[0095]

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

Ile Asn Ile Met Ala Glu Asn Ile Glu Phe Arg Lys Thr Ile Tyr Glu
 435 440 445
 Asn Ala His Glu Leu Lys Arg Asn Ile Asn Lys Ala Gly Leu Leu Ser
 450 455 460
 Ala Asn Phe Phe Val Gly Asp Ile Ile Arg Ser Lys Phe Asp Thr Arg
 465 470 475 480
 Asn Met Lys Asn Leu Asp Leu Glu Met Gly Met Asp Lys Lys Val
 485 490 495
 <210> 76
 <211> 749
 <212> PRT
 <213> Campylobacter jejuni
 <400> 76
 Met Ile Asn Thr Gln Leu Ala Ser Gln Ile Ala Asn Thr Gln Lys Asn
 1 5 10 15
 Asp Leu Lys Val Asp Asn Ser Thr Ser Lys Asp Lys Thr Asn Leu Lys
 20 25 30
 Asp Asn Pro Lys Glu Ala Leu Ala Gln Ala Leu Lys Gln Asn Leu Gly
 35 40 45
 Leu Ser Lys Asp Ala Ser Ser Glu Glu Ile Leu Ala Lys Phe Val Gln
 50 55 60
 Asn Glu Thr Gly Ile Lys Leu Lys Glu Leu Val Asn Lys Leu Leu Asp
 65 70 75 80
 Gln Ile Asn Ala Gln Lys Asn Pro Asp Ser Pro Val Leu Lys Gln Gly
 85 90 95
 Lys Asn Leu Asn Leu Ala Pro Asn Phe Ala Asn Glu Leu Lys Ile Leu
 100 105 110
 Ser Thr Glu Leu Ala Lys Ser Asp Thr Phe Thr Gln Val Leu Asp Arg
 115 120 125
 Leu Asn Gln Ile Leu Lys Pro Ala Ser Glu Ile Lys Asn Asn Asn Leu
 130 135 140
 Ala Pro Leu Phe Lys Asn Ser Gly Val Phe Leu Glu Ala Lys Leu Lys
 145 150 155 160
 Asp Ala Leu Asn Glu Glu Leu Leu Pro Lys Ser Phe His Ser Leu Leu
 165 170 175
 Ser Thr Ile Lys Gly Leu Ser Ser Glu Lys Leu Ser Val Gln Ile Ala
 180 185 190
 Gln Leu Ala Asn Thr Asn Leu Ser Pro Lys Asp Thr Leu Lys Glu Leu
 195 200 205
 Lys Asn Ile Ile Asn Ser Ser Lys Ile Glu Asn Lys Gln Ile Leu Asn

[0096]

210	215	220
Gln Ser Ser Phe Lys 225	Ala Leu Leu Asn Leu 230	Ser Ser Lys Leu Glu Asn 235 240
Phe Lys Asn Tyr 245	Ile Ser Lys Asn Pro Ser 250	His Ala Gln Glu Lys Ile 255
Thr Pro Ile 260	Ala Asn Lys Ile Leu Lys 265	Glu Leu Asn Ser Ile Lys Asn 270
Asp Phe Phe 275	Lys Ala Leu Asn Lys Pro 280	Glu Asn Leu Met Ile Lys Asp 285
Pro Asn Ile 290	Leu Lys Gln Thr Ala Thr 295	Ala Phe Glu Lys Leu Glu Asn 300
Thr Leu Lys 305	Asn Ile Leu Gly Asn Gln 310	Ala Ser Lys Ile Gln Asp Lys 315 320
Glu Asn Ile 325	Leu Glu Asn Leu Leu Ser 330	Asn Lys Glu Asn Met Lys Glu 335
Glu Lys Leu 340	Asn His Asn Thr Lys Asn 345	Gln Asp Glu Glu Lys His Ile 350
Lys Ala Ser 355	Lys Glu Glu Thr Leu Thr 360	Asp Asp Thr Lys Thr Asp Ile 365
Lys Gln Asp 370	Ser Lys Asn Glu Glu Asn 375	Ser His Ala Lys Glu Thr Asp 380
Ile Lys Glu 385	Asp Glu Asn Leu Asp Ser 390	Asp Ile Lys Thr His Glu Glu 395 400
Asp Thr Gln 405	Asp Thr Lys Asn Asp Ile 410	Gln Asn Asn Glu Thr Glu Asn 415
Lys Pro Asp 420	Asn Asp Ile Lys Asn Ser 425	Thr Pro Asn Gln Glu Lys Ile 430
Lys Asp Gly 435	Lys Lys Gln Glu Lys Ser 440	Lys Glu Asn Ile Lys Glu Asn Pro 445
Lys Phe Tyr 450	Glu Thr Lys Thr Glu Asn 455	Lys Thr Ser Ile Asn Thr Asn 460
Thr Asn Thr 465	Ser Asn Pro Asn Thr Asn 470	Asn Thr Gln Asn Leu Asn Asn 475 480
Ser Gln Asn 485	Ile Gln Ser Asn Asn Asn 490	Gln Thr Met Gln Asn Ile Phe 495
Lys Asn Gln 500	Glu Phe Ile Lys Gln Asn 505	Ile Val Lys Asn Leu Ala Phe 510
Asn Val Glu 515	Asn Leu Asp Leu Glu Gln 520	Val Gln Asp Leu Ser Lys Asn 525

[0097]

515	520	525
Leu Ser Asn Leu Ser Arg Arg	Leu Asn Glu Ser Leu Lys Glu Leu Glu	
530	535	540
Pro Tyr Thr Gln Asn Ala Lys	Leu Asn Gln Ala Glu Leu Lys Asn Leu	
545	550	555
Glu His Lys Leu Asn Leu Ser Thr	Lys Asp Leu Ala Gln Ile Lys Pro	
565	570	575
Lys Thr Glu Gln Asp Ile Ala Glu	Ser Leu His His Asp Val Lys Ser	
580	585	590
Thr Leu Leu Gln Ile Ser Asn	Leu Ala Lys Asn Glu Gly Asn Glu Ala	
595	600	605
Ile Tyr Asn Gln Ala Asn Arg	Leu Leu Ala Gln Ile Glu Ile Asn Gln	
610	615	620
Leu Met Ser Leu Ala Asn Asp Ser	Ile Asn Thr Tyr Leu Pro Phe Ser	
625	630	635
Trp Asp Asp Leu Asn Asp Ser Lys	Ile Met Phe Arg Arg Gly Lys Lys	
645	650	655
Asp Lys Phe Phe Ala Gln Ile Lys	Leu Glu Phe Ala Lys Leu Gly Asp	
660	665	670
Leu Glu Ile Leu Ile Ser Leu Asn	Asn Glu Lys Tyr Ile Asp Ile Asn	
675	680	685
Ile Met Ala Glu Asn Ile Glu Phe	Arg Lys Thr Ile Tyr Glu Asn Ala	
690	695	700
His Glu Leu Lys Arg Asn Ile Asn	Lys Ala Gly Leu Leu Ser Ala Asn	
705	710	715
Phe Phe Val Gly Asp Ile Ile Arg	Ser Lys Phe Asp Thr Arg Asn Met	
725	730	735
Lys Asn Leu Asp Leu Glu Met Gly	Met Asp Lys Lys Val	
740	745	
<210> 77		
<211> 749		
<212> PRT		
<213> Campylobacter jejuni		
<400> 77		
Met Ile Asn Thr Gln Leu Ala Ser	Gln Ile Ala Asn Thr Gln Lys Asn	
1	5	10
Asp Leu Lys Val Asp Asn Ser Ala	Ser Lys Asp Lys Thr Asn Leu Lys	
20	25	30
Asp Asn Pro Lys Glu Ala Leu Ala	Gln Ala Leu Lys Gln Asn Leu Gly	
35	40	45

[0098]

[0099]

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

[0100]

Lys Ala Ser Lys Glu Glu Thr Leu Thr Asp Asp Thr Lys Thr Asp Ile
 355 360 365
 Lys Gln Asp Leu Lys Asn Glu Glu Asn Ser His Ala Lys Glu Thr Asp
 370 375 380
 Ile Lys Glu Asp Glu Asn Leu Asp Ser Asp Ile Lys Thr His Glu Glu
 385 390 395 400
 Asp Thr Gln Asp Thr Lys Asn Asp Ile Gln Asn Asn Glu Thr Glu Asn
 405 410 415
 Lys Pro Asp Asn Asp Ile Lys Asn Phe Thr Pro Asn Gln Glu Lys Ile
 420 425 430
 Lys Asp Glu Lys Gln Glu Lys Ser Lys Glu Asn Ile Lys Glu Asn Pro
 435 440 445
 Lys Phe Tyr Glu Thr Lys Thr Glu Asn Lys Thr Ser Ile Asn Thr Asn
 450 455 460
 Thr Asn Thr Ser Asn Pro Asn Thr Asn Asn Thr Gln Asn Leu Asn Asn
 465 470 475 480
 Ser Gln Asn Ile Gln Ser Asn Asn Asn Gln Thr Met Gln Asn Ile Phe
 485 490 495
 Lys Asn Gln Glu Phe Ile Lys Gln Asn Ile Ile Lys Asn Leu Ala Phe
 500 505 510
 Asn Val Glu Asn Leu Asp Leu Glu Gln Val Gln Asp Leu Ser Lys Asn
 515 520 525
 Leu Ser Asn Leu Ser Arg Arg Leu Asn Glu Ser Leu Lys Glu Leu Glu
 530 535 540
 Pro Tyr Thr Gln Asn Ala Lys Leu Asn Gln Ala Glu Leu Lys Asn Leu
 545 550 555 560
 Glu His Lys Leu Asn Leu Ser Thr Lys Asp Leu Ala Gln Ile Lys Pro
 565 570 575
 Lys Thr Glu Gln Asp Ile Ala Glu Ser Leu His His Asp Val Lys Ser
 580 585 590
 Thr Leu Leu Gln Ile Ser Asn Leu Ala Lys Asn Glu Gly Asn Glu Ala
 595 600 605
 Ile Tyr Asn Gln Ala Asn Arg Leu Leu Ala Gln Ile Glu Ile Asn Gln
 610 615 620
 Leu Met Ser Leu Ala Asn Asp Ser Ile Asn Thr Tyr Leu Pro Phe Ser
 625 630 635 640
 Trp Asp Asp Leu Asn Asp Ser Lys Ile Met Phe Arg Arg Gly Lys Lys
 645 650 655

Asp Lys Phe Phe Ala Gln Ile Lys Leu Glu Phe Ala Lys Leu Gly Asp
 660 665 670
 Leu Glu Ile Leu Ile Ser Leu Asn Asn Glu Lys Tyr Val Asp Ile Asn
 675 680 685
 Ile Met Ala Glu Asn Ile Glu Phe Arg Lys Thr Ile Tyr Glu Asn Ala
 690 695 700
 His Glu Leu Lys Arg Asn Ile Asn Lys Ala Gly Leu Leu Ser Ala Asn
 705 710 715 720
 Phe Phe Val Gly Asp Ile Ile Arg Ser Lys Phe Asp Thr Arg Asn Met
 725 730 735
 Lys Asn Leu Asp Leu Glu Met Gly Met Asp Lys Lys Val
 740 745
 <210> 78
 <211> 749
 <212> PRT
 <213> Campylobacter jejuni
 <400> 78
 Met Ile Asn Thr Gln Leu Ala Ser Gln Ile Ala Asn Thr Gln Lys Asn
 1 5 10 15
 Asp Leu Lys Val Asp Asn Ser Ala Ser Lys Asp Lys Thr Asn Leu Lys
 20 25 30
 Asp Asn Pro Lys Glu Ala Leu Ala Gln Ala Leu Lys Gln Asn Leu Gly
 35 40 45
 Leu Ser Lys Asp Ala Ser Ser Glu Glu Ile Leu Ala Lys Phe Val Gln
 50 55 60
 Asn Glu Thr Gly Thr Lys Leu Lys Glu Leu Val Asn Lys Leu Leu Asp
 65 70 75 80
 Gln Ile Asn Ala Gln Lys Asn Pro Asp Ser Pro Val Leu Lys Gln Gly
 85 90 95
 Lys Asn Leu Asn Leu Ala Pro Asn Phe Ala Asn Glu Leu Lys Thr Leu
 100 105 110
 Ser Thr Glu Leu Ala Lys Ser Asp Thr Phe Thr Gln Val Leu Asp Arg
 115 120 125
 Leu Asn Gln Ile Leu Lys Pro Ala Ser Glu Ile Lys Asn Asn Asn Leu
 130 135 140
 Ala Pro Leu Phe Lys Asn Ser Gly Val Phe Leu Glu Ala Lys Leu Lys
 145 150 155 160
 Asp Ala Leu Asn Glu Glu Leu Leu Pro Lys Ser Phe His Ser Leu Leu
 165 170 175

[0101]

[0102]

Ser Thr Ile	Lys Gly Leu Ser Ser	Glu Lys Leu Ser Val	Gln Ile Ala
	180	185	190
Gln Leu Ala Asn Thr Asn Leu Ser	Pro Lys Asp Thr	Leu Lys Glu Leu	
	195	200	205
Lys Asn Ile Ile Asn Ser Ser Lys Ile Glu Asn Lys Gln Ile Leu Asn			
	210	215	220
Gln Ser Ser Phe Lys Ala Leu Leu Asn Leu Ser Ser Lys Leu Glu Asn			
	225	230	235 240
Phe Lys Asn Tyr Ile Ser Lys Asn Pro Ser His Ala Gln Glu Lys Ile			
	245	250	255
Thr Pro Ile Ala Asn Lys Ile Leu Lys Glu Leu Asn Ser Ile Lys Asn			
	260	265	270
Asp Phe Phe Lys Ala Leu Asn Lys Pro Glu Asn Leu Met Ile Lys Asp			
	275	280	285
Pro Asn Ile Leu Lys Gln Thr Ala Thr Ala Phe Glu Lys Leu Glu Asn			
	290	295	300
Thr Leu Lys Asn Ile Leu Gly Asn Gln Ala Ser Lys Ile Gln Asp Lys			
	305	310	315 320
Glu Asn Ile Leu Glu Asn Leu Leu Ser Asn Lys Glu Asn Met Lys Glu			
	325	330	335
Glu Lys Leu Asn His Asn Thr Lys Asn Gln Asp Glu Glu Lys His Ile			
	340	345	350
Lys Ala Ser Lys Glu Glu Thr Leu Thr Asp Asp Thr Lys Thr Asp Ile			
	355	360	365
Lys Gln Asp Leu Lys Asn Glu Glu Asn Ser His Ala Lys Glu Thr Asp			
	370	375	380
Ile Lys Glu Asp Glu Asn Leu Asp Ser Asp Ile Lys Thr His Glu Glu			
	385	390	395 400
Asp Thr Gln Asp Thr Lys Asn Asp Ile Gln Asn Asn Glu Thr Glu Asn			
	405	410	415
Lys Pro Asp Asn Asp Ile Lys Asn Phe Ala Pro Asn Gln Glu Lys Ile			
	420	425	430
Lys Asp Glu Lys Gln Glu Lys Ser Lys Glu Asn Ile Lys Glu Asn Pro			
	435	440	445
Lys Phe Tyr Glu Thr Lys Thr Glu Asn Lys Thr Ser Ile Asn Thr Asn			
	450	455	460
Thr Asn Thr Ser Asn Pro Asn Thr Asn Asn Thr Gln Asn Leu Asn Asn			
	465	470	475 480

	Ser	Gln	Asn	Ile	Gln	Ser	Asn	Asn	Asn	Gln	Thr	Met	Gln	Asn	Ile	Phe	
					485					490						495	
	Lys	Asn	Gln	Glu	Phe	Ile	Lys	Gln	Asn	Ile	Ile	Lys	Asn	Leu	Ala	Phe	
				500					505					510			
	Asn	Val	Glu	Asn	Leu	Asp	Leu	Glu	Gln	Val	Gln	Asp	Leu	Ser	Lys	Asn	
			515					520					525				
	Leu	Ser	Asn	Leu	Ser	Arg	Arg	Leu	Asn	Glu	Ser	Leu	Lys	Glu	Leu	Glu	
			530				535						540				
	Pro	Tyr	Thr	Gln	Asn	Ala	Lys	Leu	Asn	Gln	Ala	Glu	Leu	Lys	Asn	Leu	
	545					550				555						560	
	Glu	His	Lys	Leu	Asn	Leu	Ser	Thr	Lys	Asp	Leu	Ala	Gln	Ile	Lys	Pro	
				565					570						575		
	Lys	Thr	Glu	Gln	Asp	Ile	Ala	Glu	Ser	Leu	His	His	Asp	Val	Lys	Ser	
				580					585					590			
	Thr	Leu	Leu	Gln	Ile	Ser	Asn	Leu	Ala	Lys	Asn	Glu	Gly	Asn	Glu	Ala	
			595					600					605				
	Ile	Tyr	Asn	Gln	Ala	Asn	Arg	Leu	Leu	Ala	Gln	Ile	Glu	Ile	Asn	Gln	
		610					615						620				
[0103]	Leu	Met	Ser	Leu	Ala	Asn	Asp	Ser	Ile	Asn	Thr	Tyr	Leu	Pro	Phe	Ser	
	625					630					635					640	
	Trp	Asp	Asp	Leu	Asn	Asp	Ser	Lys	Ile	Met	Phe	Arg	Arg	Gly	Lys	Lys	
				645						650					655		
	Asp	Lys	Phe	Phe	Ala	Gln	Ile	Lys	Leu	Glu	Phe	Ala	Lys	Leu	Gly	Asp	
				660					665					670			
	Leu	Glu	Ile	Leu	Ile	Ser	Leu	Asn	Asn	Glu	Lys	Tyr	Val	Asp	Ile	Asn	
			675					680						685			
	Ile	Met	Ala	Glu	Asn	Ile	Glu	Phe	Arg	Lys	Thr	Ile	Tyr	Glu	Asn	Ala	
		690					695						700				
	His	Glu	Leu	Lys	Arg	Asn	Ile	Asn	Lys	Ala	Gly	Leu	Leu	Ser	Ala	Asn	
	705					710					715					720	
	Phe	Phe	Val	Gly	Asp	Ile	Ile	Arg	Ser	Lys	Phe	Asp	Thr	Arg	Asn	Met	
				725						730					735		
	Lys	Asn	Leu	Asp	Leu	Glu	Met	Gly	Met	Asp	Lys	Lys	Val				
				740					745								
	<210>	79															
	<211>	749															
	<212>	PRT															
	<213>	Campylobacter jejuni															
	<400>	79															

	Met	Ile	Asn	Thr	Gln	Leu	Ala	Ser	Gln	Ile	Ala	Asn	Thr	Gln	Lys	Asn	
	1				5				10					15			
	Asp	Leu	Lys	Val	Asp	Asn	Ser	Ala	Ser	Lys	Asp	Lys	Thr	Asn	Leu	Lys	
			20					25						30			
	Asp	Asn	Pro	Lys	Glu	Ala	Leu	Ala	Gln	Ala	Leu	Lys	Gln	Asn	Leu	Gly	
			35				40						45				
	Leu	Ser	Lys	Asp	Ala	Ser	Ser	Glu	Glu	Ile	Leu	Ala	Lys	Phe	Val	Gln	
		50					55					60					
	Asn	Glu	Thr	Gly	Thr	Lys	Leu	Lys	Glu	Leu	Val	Asn	Lys	Leu	Leu	Asp	
	65					70				75					80		
	Gln	Ile	Asn	Ala	Gln	Lys	Asn	Pro	Asp	Ser	Pro	Val	Leu	Lys	Gln	Gly	
					85				90						95		
	Lys	Asn	Leu	Asn	Leu	Ala	Pro	Asn	Phe	Ala	Asn	Glu	Leu	Lys	Thr	Leu	
			100						105						110		
	Ser	Thr	Glu	Leu	Ala	Lys	Ser	Asp	Thr	Phe	Thr	Gln	Val	Leu	Asp	Arg	
			115					120					125				
	Leu	Asn	Gln	Ile	Leu	Lys	Pro	Ala	Ser	Glu	Ile	Lys	Asn	Asn	Asn	Leu	
		130					135					140					
[0104]	Ala	Pro	Leu	Phe	Lys	Asn	Ser	Gly	Val	Phe	Leu	Glu	Ala	Lys	Leu	Lys	
	145					150					155				160		
	Asp	Ala	Leu	Asn	Glu	Glu	Leu	Leu	Pro	Lys	Ser	Phe	His	Ser	Leu	Leu	
				165					170						175		
	Ser	Thr	Ile	Lys	Gly	Leu	Ser	Ser	Glu	Lys	Leu	Ser	Val	Gln	Ile	Ala	
				180					185						190		
	Gln	Leu	Ala	Asn	Thr	Asn	Leu	Ser	Pro	Lys	Asp	Thr	Leu	Lys	Glu	Leu	
		195						200					205				
	Lys	Asn	Ile	Ile	Asn	Ser	Ser	Lys	Ile	Glu	Asn	Lys	Gln	Ile	Leu	Asn	
		210					215					220					
	Gln	Ser	Ser	Phe	Lys	Ala	Leu	Leu	Asn	Leu	Ser	Ser	Lys	Leu	Glu	Asn	
	225					230					235				240		
	Phe	Lys	Asn	Tyr	Ile	Ser	Lys	Asn	Pro	Ser	His	Ala	Gln	Glu	Lys	Ile	
				245					250						255		
	Thr	Pro	Ile	Ala	Asn	Lys	Ile	Leu	Lys	Glu	Leu	Asn	Ser	Ile	Lys	Asn	
			260						265					270			
	Asp	Phe	Phe	Lys	Ala	Leu	Asn	Lys	Pro	Glu	Asn	Leu	Met	Ile	Lys	Asp	
			275					280					285				
	Pro	Asn	Ile	Leu	Lys	Gln	Thr	Ala	Thr	Ala	Phe	Glu	Lys	Leu	Glu	Asn	
		290					295					300					

	Thr	Leu	Lys	Asn	Ile	Leu	Gly	Asn	Gln	Ala	Ser	Lys	Ile	Gln	Asp	Lys	305	310	315	320
	Glu	Asn	Ile	Leu	Glu	Asn	Leu	Leu	Ser	Asn	Lys	Glu	Asn	Met	Lys	Glu	325	330	335	
	Glu	Lys	Leu	Asn	His	Asn	Thr	Lys	Asn	Gln	Asp	Glu	Glu	Lys	His	Ile	340	345	350	
	Lys	Ala	Ser	Lys	Glu	Glu	Thr	Leu	Thr	Asp	Asp	Thr	Lys	Thr	Asp	Ile	355	360	365	
	Lys	Gln	Asp	Leu	Lys	Asn	Glu	Glu	Asn	Ser	His	Ala	Lys	Glu	Thr	Asp	370	375	380	
	Ile	Lys	Glu	Asp	Glu	Asn	Leu	Asp	Ser	Asp	Ile	Lys	Thr	His	Glu	Glu	385	390	395	400
	Asp	Thr	Gln	Asp	Thr	Lys	Asn	Asp	Ile	Gln	Asn	Asn	Glu	Thr	Glu	Asn	405	410	415	
	Lys	Pro	Asp	Asn	Asp	Ile	Lys	Asn	Phe	Thr	Pro	Asn	Gln	Glu	Lys	Ile	420	425	430	
	Lys	Asp	Glu	Lys	Gln	Glu	Lys	Ser	Lys	Glu	Asn	Ile	Lys	Glu	Asn	Pro	435	440	445	
[0105]	Lys	Phe	Tyr	Glu	Thr	Lys	Thr	Glu	Asn	Lys	Thr	Ser	Ile	Asn	Thr	Asn	450	455	460	
	Thr	Asn	Thr	Ser	Asn	Pro	Asn	Thr	Asn	Asn	Thr	Gln	Asn	Leu	Asn	Asn	465	470	475	480
	Ser	Gln	Asn	Ile	Gln	Ser	Asn	Asn	Asn	Gln	Thr	Met	Gln	Asn	Ile	Phe	485	490	495	
	Lys	Asn	Gln	Glu	Phe	Ile	Lys	Gln	Asn	Ile	Ile	Lys	Asn	Leu	Ala	Phe	500	505	510	
	Asn	Val	Glu	Asn	Leu	Asp	Leu	Glu	Gln	Val	Gln	Asp	Leu	Ser	Lys	Asn	515	520	525	
	Leu	Ser	Asn	Leu	Ser	Arg	Arg	Leu	Asn	Glu	Ser	Leu	Lys	Glu	Leu	Glu	530	535	540	
	Pro	Tyr	Thr	Gln	Asn	Ala	Lys	Leu	Asn	Gln	Ala	Glu	Leu	Lys	Asn	Leu	545	550	555	560
	Glu	His	Lys	Leu	Asn	Leu	Ser	Thr	Lys	Asp	Leu	Ala	Gln	Ile	Lys	Pro	565	570	575	
	Lys	Thr	Glu	Gln	Asp	Ile	Ala	Glu	Ser	Leu	His	His	Asp	Val	Lys	Ser	580	585	590	
	Thr	Leu	Leu	Gln	Ile	Ser	Asn	Leu	Ala	Lys	Asn	Glu	Gly	Asn	Glu	Ala	595	600	605	

Ile Tyr Asn Gln Ala Asn Arg Leu Leu Ala Gln Ile Glu Ile Asn Gln
 610 615 620
 Leu Met Ser Leu Ala Asn Asp Ser Ile Asn Thr Tyr Leu Pro Phe Ser
 625 630 635 640
 Trp Asp Asp Leu Asn Asp Ser Lys Ile Met Phe Arg Arg Gly Lys Lys
 645 650 655
 Asp Lys Phe Phe Ala Gln Ile Lys Leu Glu Phe Ala Lys Leu Gly Asp
 660 665 670
 Leu Glu Ile Leu Ile Ser Leu Asn Asn Glu Lys Tyr Ile Asp Ile Asn
 675 680 685
 Ile Met Ala Glu Asn Ile Glu Phe Arg Lys Thr Ile Tyr Glu Asn Ala
 690 695 700
 His Glu Leu Lys Arg Asn Ile Asn Lys Ala Gly Leu Leu Ser Ala Asn
 705 710 715 720
 Phe Phe Val Gly Asp Ile Ile Arg Ser Lys Phe Asp Thr Arg Asn Met
 725 730 735
 Lys Asn Leu Asp Leu Glu Met Gly Met Asp Lys Lys Val
 740 745

[0106]

<210> 80
 <211> 749
 <212> PRT
 <213> Campylobacter jejuni
 <400> 80
 Met Ile Asn Thr Gln Leu Ala Ser Gln Ile Ala Asn Thr Gln Lys Asn
 1 5 10 15
 Asp Leu Lys Val Asp Asn Ser Thr Ser Lys Asp Lys Thr Asn Leu Lys
 20 25 30
 Asp Asn Pro Lys Glu Ala Leu Ala Gln Ala Leu Lys Gln Asn Leu Gly
 35 40 45
 Leu Ser Lys Asp Ala Ser Ser Glu Glu Ile Leu Ala Lys Phe Ile Gln
 50 55 60
 Asn Glu Thr Gly Thr Lys Leu Lys Glu Leu Val Asn Lys Leu Leu Asp
 65 70 75 80
 Gln Ile Asn Ala Gln Lys Asn Pro Asp Ser Pro Ile Leu Lys Gln Gly
 85 90 95
 Lys Asn Leu Asn Leu Ala Pro Asn Phe Ala Asn Glu Leu Lys Thr Leu
 100 105 110
 Ser Thr Glu Leu Ala Lys Ser Asp Thr Phe Thr Gln Val Leu Asp Arg
 115 120 125
 Leu Asn Gln Ile Leu Lys Pro Ala Ser Glu Ile Lys Asn Asn Asn Leu

[0107]

130	135	140
Ala Pro Leu Phe Lys Asn Ser Gly Val Phe Leu Glu Ala Lys Leu Lys 145 150 155 160		
Asp Ala Leu Asn Glu Glu Leu Leu Pro Lys Ser Phe His Ser Leu Leu 165 170 175		
Ser Thr Ile Lys Gly Leu Ser Ser Glu Lys Leu Ser Val Gln Ile Ala 180 185 190		
Gln Leu Ala Asn Thr Asn Leu Ser Pro Lys Asp Thr Leu Lys Glu Leu 195 200 205		
Lys Asn Ile Ile Asn Ser Ser Lys Asn Glu Asn Lys Gln Ile Leu Asn 210 215 220		
Gln Ser Ser Phe Lys Ala Leu Leu Asn Leu Ser Ser Lys Leu Glu Asn 225 230 235 240		
Phe Lys Asn Tyr Ile Ser Lys Asn Pro Ser His Ala Gln Glu Lys Ile 245 250 255		
Thr Pro Ile Ala Asn Lys Ile Leu Lys Glu Leu Asn Ser Ile Lys Asn 260 265 270		
Asp Phe Phe Lys Ala Leu Asn Lys Pro Glu Asn Leu Met Ile Lys Asp 275 280 285		
Pro Asn Ile Leu Lys Gln Thr Ala Thr Ala Phe Glu Lys Leu Glu Asn 290 295 300		
Thr Leu Lys Asn Ile Leu Gly Asn Gln Ala Ser Lys Ile Gln Asp Lys 305 310 315 320		
Glu Asn Ile Leu Glu Asn Leu Leu Ser Asn Lys Glu Asn Met Lys Glu 325 330 335		
Glu Lys Leu Asn His Asn Thr Lys Asn Gln Asp Glu Glu Lys His Ile 340 345 350		
Lys Ala Ser Lys Glu Glu Thr Leu Thr Asp Asp Thr Lys Thr Asp Ile 355 360 365		
Lys Gln Asp Ser Lys Asn Glu Glu Asn Ser His Ala Lys Glu Thr Asp 370 375 380		
Ile Lys Glu Asp Glu Asn Leu Asp Ser Asp Ile Lys Thr His Glu Glu 385 390 395 400		
Asp Thr Gln Asp Thr Lys Asn Asp Ile Gln Asn Asn Glu Thr Glu Asn 405 410 415		
Lys Pro Asp Asn Asp Ile Lys Asn Ser Thr Pro Asn Gln Glu Lys Ile 420 425 430		
Lys Asp Gly Lys Gln Glu Lys Ser Lys Glu Asn Ile Lys Glu Asn Pro		

[0108]

	435		440		445	
Lys Phe Tyr Glu Thr	Lys Thr Glu Asn Lys Thr Ser Ile Asn Thr Asn					
450	455		460			
Thr Asn Thr Ser Asn Pro Asn Thr Asn Asn Thr Gln Asn Leu Asn Asn						
465	470		475		480	
Ser Gln Asn Ile Gln Ser Asn Asn Asn Gln Thr Met Gln Asn Ile Phe						
	485		490		495	
Lys Asn Gln Glu Phe Ile Lys Gln Asn Ile Val Lys Asn Leu Ala Phe						
	500		505		510	
Asn Val Glu Asn Leu Asp Leu Glu Gln Val Gln Asp Leu Ser Lys Asn						
	515		520		525	
Leu Ser Asn Leu Ser Arg Arg Leu Asn Glu Ser Leu Lys Glu Leu Glu						
	530		535		540	
Pro Tyr Thr Gln Asn Ala Lys Leu Asn Gln Ala Glu Leu Lys Asn Leu						
	545		550		555	560
Glu His Lys Leu Asn Leu Ser Thr Lys Asp Leu Ala Gln Ile Lys Pro						
	565		570		575	
Lys Thr Glu Gln Asp Ile Ala Glu Ser Leu His His Asp Val Lys Ser						
	580		585		590	
Thr Leu Leu Gln Ile Ser Asn Leu Ala Lys Asn Glu Gly Asn Glu Ala						
	595		600		605	
Ile Tyr Asn Gln Ala Asn Arg Leu Leu Ala Gln Ile Glu Ile Asn Gln						
	610		615		620	
Leu Met Ser Leu Ala Asn Asp Ser Ile Asn Thr Tyr Leu Pro Phe Ser						
	625		630		635	640
Trp Asp Asp Leu Asn Asp Ser Lys Ile Met Phe Arg Arg Gly Lys Lys						
	645		650		655	
Asp Lys Phe Phe Ala Gln Ile Lys Leu Lys Phe Ala Lys Leu Gly Asp						
	660		665		670	
Leu Glu Ile Leu Ile Ser Leu Asn Asn Glu Lys Tyr Ile Asp Ile Asn						
	675		680		685	
Ile Met Ala Glu Asn Ile Glu Phe Arg Lys Thr Ile Tyr Glu Asn Ala						
	690		695		700	
His Glu Leu Lys Arg Asn Ile Asn Lys Ala Gly Leu Leu Ser Ala Asn						
	705		710		715	720
Phe Phe Val Gly Asp Ile Ile Arg Ser Lys Phe Asp Thr Arg Asn Met						
	725		730		735	
Lys Asn Leu Asp Leu Glu Met Gly Met Asp Lys Lys Val						

740

745

<210> 81
 <211> 698
 <212> PRT
 <213> Campylobacter jejuni

<400> 81

Met Ile Asn Thr Gln Leu Ala Ser Gln Ile Ala Asn Thr Gln Lys Asn
 1 5 10 15

Asp Leu Lys Val Asp Asn Ser Ala Ser Lys Asp Lys Thr Asn Leu Lys
 20 25 30

Asp Asn Pro Lys Glu Ala Leu Ala Gln Ala Leu Lys Gln Asn Leu Gly
 35 40 45

Leu Ser Lys Asp Thr Ser Ser Glu Glu Ile Leu Ala Lys Phe Val Gln
 50 55 60

Asn Glu Thr Gly Ala Lys Leu Lys Glu Leu Val Asn Lys Leu Leu Asp
 65 70 75 80

Gln Ile Asn Ala Gln Lys Asn Pro Asp Ser Pro Val Leu Lys Gln Gly
 85 90 95

Lys Asn Leu Asn Leu Ala Pro Asn Phe Ala Asn Glu Leu Lys Thr Leu
 100 105 110

[0109]

Ser Thr Glu Leu Ala Lys Ser Asp Thr Phe Thr Gln Val Leu Asp Arg
 115 120 125

Leu Asn Gln Ile Leu Lys Pro Ala Ser Glu Ile Lys Asn Asn Asn Leu
 130 135 140

Ala Pro Leu Phe Lys Asn Ser Gly Val Phe Leu Glu Ala Lys Leu Lys
 145 150 155 160

Asp Ala Leu Asn Glu Glu Leu Leu Pro Lys Ser Phe His Ser Leu Leu
 165 170 175

Ser Thr Ile Lys Gly Leu Ser Ser Glu Lys Leu Ser Val Gln Ile Ala
 180 185 190

Gln Leu Ala Asn Thr Asn Leu Ser Pro Lys Asp Thr Leu Lys Glu Leu
 195 200 205

Lys Asn Ile Ile Asn Ser Ser Lys Asn Glu Asn Lys Gln Ile Leu Asn
 210 215 220

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

Phe Lys Asn Tyr Ile Ser Lys Asn Pro Ser His Ala Gln Glu Lys Ile
 245 250 255

Thr Pro Ile Ala Asn Lys Ile Leu Lys Glu Leu Asn Ser Val Lys Asn
 260 265 270

[0110]

Asp Phe Phe Lys Ala Leu Asn Lys Pro Glu Asn Leu Met Ile Lys Asp
 275 280 285
 Pro Asn Ile Leu Lys Gln Thr Ala Thr Ala Phe Glu Lys Leu Glu Asn
 290 295 300
 Thr Leu Lys Asn Ile Leu Gly Asn Gln Ala Ser Lys Ile Gln Asp Lys
 305 310 315 320
 Glu Asn Ile Leu Glu Asn Leu Leu Ser Asn Lys Glu Asn Ile Lys Glu
 325 330 335
 Glu Lys Leu Asn His Asn Thr Lys Asn Gln Asp Glu Glu Lys His Ile
 340 345 350
 Lys Val Ser Lys Glu Glu Thr Leu Ala Asp Asp Ala Lys Thr Asn Ile
 355 360 365
 Lys Gln Asp Val Lys Asn Glu Glu Asn Leu Pro Lys Lys Glu Val Asn
 370 375 380
 Ala Asn Leu Asp Ser Ser Thr Lys Thr His Glu Glu Ser Ile Lys Glu
 385 390 395 400
 Asn Pro Lys Phe Tyr Glu Thr Lys Thr Glu Ser Lys Thr Ser Ile Asn
 405 410 415
 Thr Asn Thr Asn Thr Asn Asn Thr Gln Asn Leu Asn Asn Ser Gln Asn
 420 425 430
 Ile Gln Ser Asn Asn Asn Gln Thr Met Gln Asn Ile Phe Lys Asn Gln
 435 440 445
 Glu Phe Ile Lys Gln Asn Ile Val Lys Asn Leu Ala Phe Asn Val Glu
 450 455 460
 Asn Leu Asp Leu Glu Gln Val Gln Asp Leu Ser Lys Asn Leu Ser Asn
 465 470 475 480
 Leu Ser Arg Arg Leu Asn Glu Ser Leu Lys Glu Leu Glu Pro Tyr Thr
 485 490 495
 Gln Asn Ala Lys Leu Asn Gln Ala Glu Leu Lys Asn Leu Glu His Lys
 500 505 510
 Leu Asn Leu Ser Ile Lys Asp Leu Val Gln Ile Lys Pro Lys Thr Glu
 515 520 525
 Gln Asp Ile Ala Glu Ser Leu His His Asp Val Lys Ser Thr Leu Leu
 530 535 540
 Gln Ile Ser Asn Leu Ala Lys Asn Glu Gly Asn Glu Ala Val Tyr Asn
 545 550 555 560
 Gln Ala Asn Arg Leu Leu Ala Gln Ile Glu Ile Asn Gln Leu Met Ser
 565 570 575

Leu Ala Asn Asp Ser Ile Asn Thr Tyr Leu Pro Phe Ser Trp Asp Asp
 580 585 590
 Leu Asn Asp Ser Lys Ile Met Phe Arg Arg Gly Lys Lys Asp Lys Phe
 595 600 605
 Phe Ala Gln Ile Lys Leu Glu Phe Ala Lys Leu Gly Asp Leu Glu Ile
 610 615 620
 Leu Ile Ser Leu Asn Asn Glu Lys Tyr Ile Asp Ile Asn Ile Met Ala
 625 630 635 640
 Glu Asn Ile Glu Phe Arg Lys Thr Ile Tyr Glu Asn Ala His Glu Leu
 645 650 655
 Lys Arg Asn Ile Asn Lys Ala Gly Leu Leu Ser Ala Asn Phe Phe Val
 660 665 670
 Gly Asp Ile Ile Arg Ser Lys Phe Asp Thr Arg Asn Met Lys Asn Leu
 675 680 685
 Asp Leu Glu Met Gly Met Asp Lys Lys Val
 690 695
 <210> 82
 <211> 698
 <212> PRT
 <213> *Campylobacter jejuni*
 [0111]
 <400> 82
 Met Ile Asn Thr Gln Leu Ala Ser Gln Ile Ala Asn Thr Gln Lys Asn
 1 5 10 15
 Asp Leu Lys Val Asp Asn Ser Ala Ser Lys Asp Lys Thr Asn Leu Lys
 20 25 30
 Asp Asn Pro Lys Glu Ala Leu Ala Gln Ala Leu Lys Gln Asn Leu Gly
 35 40 45
 Leu Ser Lys Asp Ala Ser Ser Glu Glu Ile Leu Ala Lys Phe Val Gln
 50 55 60
 Asn Glu Thr Gly Thr Lys Leu Lys Glu Leu Val Asn Lys Leu Leu Asp
 65 70 75 80
 Gln Ile Asn Ala Gln Lys Asn Pro Asp Ser Pro Val Leu Lys Gln Gly
 85 90 95
 Lys Asn Leu Asn Leu Ala Pro Asn Phe Ala Asn Glu Leu Lys Ile Leu
 100 105 110
 Ser Thr Glu Leu Ala Lys Ser Asp Thr Phe Thr Gln Val Leu Asp Arg
 115 120 125
 Leu Asn Gln Ile Leu Lys Pro Ala Ser Glu Ile Lys Asn Asn Asn Leu
 130 135 140

	Ala	Pro	Leu	Phe	Lys	Asn	Ser	Gly	Val	Phe	Leu	Glu	Ala	Lys	Leu	Lys	
	145					150					155					160	
	Asp	Ala	Leu	Asn	Glu	Glu	Leu	Leu	Pro	Lys	Ser	Phe	His	Ser	Leu	Leu	
				165						170					175		
	Ser	Thr	Ile	Lys	Gly	Leu	Ser	Ser	Glu	Lys	Leu	Ser	Val	Gln	Ile	Ala	
			180						185					190			
	Gln	Leu	Ala	Asn	Thr	Ile	Leu	Ser	Pro	Lys	Asp	Thr	Leu	Lys	Glu	Leu	
		195						200					205				
	Lys	Asn	Ile	Ile	Asn	Ser	Ser	Lys	Asn	Glu	Asn	Lys	Gln	Ile	Leu	Asn	
	210					215						220					
	Gln	Ser	Ser	Phe	Lys	Ala	Leu	Leu	Asn	Leu	Ser	Ser	Lys	Leu	Glu	Asn	
	225					230					235				240		
	Phe	Lys	Asn	Tyr	Ile	Ser	Lys	Asn	Pro	Ser	His	Ala	Gln	Glu	Lys	Ile	
			245						250					255			
	Thr	Pro	Ile	Ala	Asn	Lys	Ile	Leu	Lys	Glu	Leu	Asn	Ser	Ile	Lys	Asn	
			260						265					270			
	Asp	Phe	Phe	Lys	Ala	Leu	Asn	Lys	Pro	Glu	Asn	Leu	Met	Ile	Lys	Asp	
		275						280					285				
[0112]	Pro	Asn	Ile	Leu	Lys	Gln	Thr	Ala	Thr	Ala	Phe	Glu	Lys	Leu	Glu	Asn	
	290					295						300					
	Thr	Leu	Lys	Asn	Ile	Leu	Gly	Asn	Gln	Ala	Ser	Lys	Ile	Gln	Asp	Lys	
	305				310						315				320		
	Glu	Asn	Ile	Leu	Glu	Asn	Leu	Leu	Ser	Asn	Lys	Glu	Asn	Ile	Lys	Glu	
				325					330					335			
	Glu	Lys	Leu	Asn	His	Asn	Thr	Lys	Asn	Gln	Asp	Glu	Glu	Lys	Tyr	Ile	
			340						345					350			
	Lys	Val	Ser	Lys	Glu	Glu	Thr	Leu	Ala	Asp	Asp	Ala	Lys	Thr	Asn	Ile	
		355						360					365				
	Lys	Gln	Asp	Val	Lys	Asn	Glu	Glu	Asn	Leu	Pro	Lys	Lys	Glu	Val	Asn	
	370					375					380						
	Ala	Asn	Leu	Asp	Ser	Ser	Thr	Lys	Thr	His	Glu	Glu	Asn	Ile	Lys	Glu	
	385					390					395				400		
	Asn	Pro	Lys	Phe	Tyr	Glu	Thr	Lys	Thr	Glu	Ser	Lys	Thr	Ser	Ile	Asn	
			405						410					415			
	Thr	Asn	Thr	Asn	Thr	Asn	Asn	Thr	Gln	Asn	Leu	Asn	Asn	Ser	Gln	Asn	
			420					425						430			
	Ile	Gln	Ser	Asn	Asn	Asn	Gln	Thr	Met	Gln	Asn	Ile	Phe	Lys	Asn	Gln	
		435						440				445					

	Glu Phe Ile Lys Gln Asn Ile Val Lys Asn Leu Ala Phe Asn Val Glu	
	450	455 460
	Asn Leu Asp Leu Glu Gln Val Gln Asp Leu Ser Lys Asn Leu Ser Asn	
	465	470 475 480
	Leu Ser Arg Arg Leu Asn Glu Ser Leu Lys Glu Leu Glu Pro Tyr Thr	
		485 490 495
	Gln Asn Ala Lys Leu Asn Gln Ala Glu Leu Lys Asn Leu Glu His Lys	
		500 505 510
	Leu Asn Leu Ser Ile Lys Asp Leu Val Gln Ile Lys Pro Lys Thr Glu	
		515 520 525
	Gln Asp Ile Ala Glu Ser Leu His His Asp Val Lys Ser Thr Leu Leu	
		530 535 540
	Gln Ile Ser Asn Leu Ala Lys Asn Glu Gly Asn Glu Ala Val Tyr Asn	
		545 550 555 560
	Gln Ala Asn Arg Leu Leu Ala Gln Ile Glu Ile Asn Gln Leu Met Ser	
		565 570 575
	Leu Ala Asn Asp Ser Ile Asn Thr Tyr Leu Pro Phe Ser Trp Asp Asp	
		580 585 590
[0113]	Leu Asn Asp Ser Lys Ile Met Phe Arg Arg Gly Lys Lys Asp Lys Phe	
		595 600 605
	Phe Ala Gln Ile Lys Leu Glu Phe Ala Lys Leu Gly Asp Leu Glu Ile	
		610 615 620
	Leu Ile Ser Leu Asn Asn Glu Lys Tyr Ile Asp Ile Asn Ile Met Ala	
		625 630 635 640
	Glu Asn Ile Glu Phe Arg Lys Thr Ile Tyr Glu Asn Ala His Glu Leu	
		645 650 655
	Lys Arg Asn Ile Asn Lys Ala Gly Leu Leu Ser Ala Asn Phe Phe Val	
		660 665 670
	Gly Asp Ile Ile Arg Ser Lys Phe Asp Thr Arg Asn Met Lys Asn Leu	
		675 680 685
	Asp Leu Glu Met Gly Met Asp Lys Lys Val	
		690 695
	<210> 83	
	<211> 253	
	<212> PRT	
	<213> Campylobacter jejuni	
	<400> 83	
	Met Arg Phe Asp Phe Phe Val Ser Lys Arg Leu Asn Ile Ser Arg Asn	
	1	5 10 15

[0114]

Lys Ala Leu Glu Leu Ile Glu Asn Glu Glu Ile Leu Leu Asn Gly Lys
 20 25 30
 Ser Phe Lys Ala Ser Phe Asp Val Lys Asn Phe Leu Glu Asn Leu Lys
 35 40 45
 Lys Thr Gln Asp Leu Asn Pro Glu Asp Ile Leu Leu Ala Asn Glu Leu
 50 55 60
 Lys Leu Asp Leu Leu Ser Glu Ile Tyr Val Ser Arg Ala Ala Leu Lys
 65 70 75 80
 Leu Lys Lys Phe Leu Glu Glu Asn Asp Ile Glu Ile Lys His Lys Asn
 85 90 95
 Cys Leu Asp Ile Gly Ser Ser Thr Gly Gly Phe Val Gln Ile Leu Leu
 100 105 110
 Glu Asn Gln Ala Leu Lys Ile Thr Ala Leu Asp Val Gly Ser Asn Gln
 115 120 125
 Leu His Pro Ser Leu Arg Val Asn Glu Lys Ile Ile Leu His Glu Asn
 130 135 140
 Thr Asp Leu Arg Ala Phe Lys Ser Glu Glu Lys Phe Glu Leu Val Thr
 145 150 155 160
 Cys Asp Val Ser Phe Ile Ser Leu Ile Asn Leu Leu Tyr Tyr Ile Asp
 165 170 175
 Asn Leu Ala Leu Lys Glu Ile Ile Leu Leu Phe Lys Pro Gln Phe Glu
 180 185 190
 Val Gly Lys Asn Ile Lys Arg Asp Lys Lys Gly Val Leu Lys Asp Asp
 195 200 205
 Lys Ala Ile Leu Lys Ala Arg Met Asp Phe Glu Lys Ala Cys Ala Lys
 210 215 220
 Leu Gly Trp Leu Leu Lys Asn Thr Gln Lys Ser Ser Ile Lys Gly Lys
 225 230 235 240
 Glu Gly Asn Val Glu Tyr Phe Tyr Tyr Tyr Ile Lys Asn
 245 250
 <210> 84
 <211> 253
 <212> PRT
 <213> Campylobacter jejuni
 <400> 84
 Met Arg Phe Asp Phe Phe Val Ser Lys Arg Leu Asn Ile Ser Arg Asn
 1 5 10 15
 Lys Ala Leu Glu Leu Ile Glu Asn Glu Glu Ile Leu Leu Asn Gly Lys
 20 25 30
 Ser Phe Lys Ala Ser Phe Asp Val Lys Asn Phe Leu Glu Asn Leu Lys

[0115]

	35	40	45
Lys Thr Gln Asp Leu Asn Pro Glu Asp Ile Leu Leu Ala Asn Glu Leu			
50	55	60	
Lys Leu Asp Leu Leu Ser Glu Ile Tyr Val Ser Arg Ala Ala Leu Lys			
65	70	75	80
Leu Lys Lys Phe Leu Glu Glu Asn Asp Ile Glu Ile Lys His Lys Asn			
85	90	95	
Cys Leu Asp Ile Gly Ser Ser Thr Gly Gly Phe Val Gln Ile Leu Leu			
100	105	110	
Glu Asn Gln Ala Leu Lys Ile Thr Ala Leu Asp Val Gly Ser Asn Gln			
115	120	125	
Leu His Pro Ser Leu Arg Val Asn Glu Lys Ile Ile Leu His Glu Asn			
130	135	140	
Thr Asp Leu Arg Ala Phe Lys Ser Glu Glu Lys Phe Glu Leu Val Thr			
145	150	155	160
Cys Asp Val Ser Phe Ile Ser Leu Ile Asn Leu Leu Tyr Tyr Ile Asp			
165	170	175	
Asn Leu Ala Leu Lys Glu Ile Ile Leu Leu Phe Lys Pro Gln Phe Glu			
180	185	190	
Val Gly Lys Asn Ile Lys Arg Asp Lys Lys Gly Val Leu Lys Asp Asp			
195	200	205	
Lys Ala Ile Leu Lys Ala Arg Met Asp Phe Glu Lys Ala Cys Ala Lys			
210	215	220	
Leu Gly Trp Leu Leu Lys Asn Thr Gln Lys Ser Ser Ile Lys Gly Lys			
225	230	235	240
Glu Gly Asn Val Glu Tyr Phe Tyr Tyr Tyr Phe Lys Asn			
245	250		
<210> 85			
<211> 253			
<212> PRT			
<213> Campylobacter jejuni			
<400> 85			
Met Arg Phe Asp Phe Phe Val Ser Lys Arg Leu Asn Ile Ser Arg Asn			
1	5	10	15
Lys Ala Leu Glu Leu Ile Glu Asn Glu Glu Ile Leu Leu Asn Gly Lys			
20	25	30	
Ser Phe Lys Ala Ser Phe Asp Val Lys Asn Phe Leu Glu Asn Leu Lys			
35	40	45	
Lys Thr Gln Asp Leu Asn Pro Glu Asp Ile Leu Leu Ala Asn Glu Leu			
50	55	60	

Lys Leu Asp Leu Leu Ser Glu Ile Tyr Val Ser Arg Ala Ala Leu Lys
 65 70 75 80
 Leu Lys Lys Phe Leu Glu Glu Asn Asp Ile Glu Ile Lys His Lys Asn
 85 90 95
 Cys Leu Asp Ile Gly Ser Ser Thr Gly Gly Phe Val Gln Ile Leu Leu
 100 105 110
 Glu Asn Gln Ala Leu Lys Ile Thr Ala Leu Asp Val Gly Ser Asn Gln
 115 120 125
 Leu His Pro Ser Leu Arg Ala Asn Glu Lys Ile Ile Leu His Glu Asn
 130 135 140
 Thr Asp Leu Arg Ala Phe Lys Ser Glu Glu Lys Phe Glu Leu Val Thr
 145 150 155 160
 Cys Asp Val Ser Phe Ile Ser Leu Ile Asn Leu Leu Tyr Tyr Val Asp
 165 170 175
 Asn Leu Ala Leu Lys Glu Ile Ile Leu Leu Phe Lys Pro Gln Phe Glu
 180 185 190
 Val Gly Lys Asn Ile Lys Arg Asp Lys Lys Gly Val Leu Lys Asp Asp
 195 200 205
 [0116] Lys Ala Ile Leu Lys Ala Arg Met Asp Phe Glu Lys Glu Cys Ala Lys
 210 215 220
 Leu Gly Trp Leu Leu Lys Asn Thr Gln Lys Ser Ser Ile Lys Gly Lys
 225 230 235 240
 Glu Gly Asn Val Glu Tyr Phe Tyr Tyr Tyr Ile Lys Asn
 245 250
 <210> 86
 <211> 253
 <212> PRT
 <213> Campylobacter jejuni
 <400> 86
 Met Arg Phe Asp Phe Phe Val Ser Lys Arg Leu Asn Ile Ser Arg Asn
 1 5 10 15
 Lys Ala Leu Glu Leu Ile Glu Asn Glu Glu Ile Leu Leu Asn Gly Lys
 20 25 30
 Ser Phe Lys Ala Ser Phe Asp Val Lys Asn Phe Leu Glu Asn Leu Lys
 35 40 45
 Lys Thr Gln Asp Leu Asn Pro Glu Asp Ile Leu Leu Ala Asn Glu Leu
 50 55 60
 Lys Leu Asp Leu Leu Ser Glu Ile Tyr Val Ser Arg Ala Ala Leu Lys
 65 70 75 80

Leu Lys Lys Phe Leu Glu Glu Asn Asp Ile Glu Ile Lys His Lys Asn	85	90	95
Cys Leu Asp Ile Gly Ser Ser Thr Gly Gly Phe Val Gln Ile Leu Leu	100	105	110
Glu Asn Gln Ala Leu Lys Ile Thr Ala Leu Asp Val Gly Ser Asn Gln	115	120	125
Leu His Pro Ser Leu Arg Ala Asn Glu Lys Ile Ile Leu His Glu Asn	130	135	140
Thr Asp Leu Arg Ala Phe Lys Ser Lys Glu Lys Phe Glu Leu Val Thr	145	150	155
Cys Asp Val Ser Phe Ile Ser Leu Ile Asn Leu Leu Tyr Tyr Val Asp	165	170	175
Asn Leu Ala Leu Lys Glu Ile Ile Leu Leu Phe Lys Pro Gln Phe Glu	180	185	190
Val Gly Lys Asn Ile Lys Arg Asp Lys Lys Gly Val Leu Lys Asp Asp	195	200	205
Lys Ala Ile Leu Lys Ala Arg Met Asp Phe Glu Lys Glu Cys Ala Lys	210	215	220
[0117] Leu Gly Trp Leu Leu Lys Asn Thr Gln Lys Ser Ser Ile Lys Gly Lys	225	230	235
Glu Gly Asn Val Glu Tyr Phe Tyr Tyr Tyr Ile Lys Asn	245	250	
<210>	87		
<211>	253		
<212>	PRT		
<213>	Campylobacter jejuni		
<400>	87		
Met Arg Phe Asp Phe Phe Val Ser Lys Arg Leu Asn Ile Ser Arg Asn	1	5	10
Lys Ala Leu Glu Leu Ile Glu Asn Glu Glu Ile Leu Leu Asn Gly Lys	20	25	30
Ser Phe Lys Ala Ser Phe Asp Val Lys Asn Phe Leu Glu Asn Leu Lys	35	40	45
Lys Thr Gln Asp Leu Asn Pro Glu Asp Ile Leu Leu Ala Asn Glu Leu	50	55	60
Lys Leu Asp Leu Leu Ser Glu Ile Tyr Val Ser Arg Ala Ala Leu Lys	65	70	75
Leu Lys Lys Phe Leu Glu Glu Asn Asp Ile Glu Ile Lys His Lys Asn	85	90	95

Cys Leu Asp Ile Gly Ser Ser Thr Gly Gly Phe Val Gln Ile Leu Leu
 100 105 110
 Glu Asn Gln Ala Leu Lys Ile Thr Ala Leu Asp Val Gly Ser Asn Gln
 115 120 125
 Leu His Pro Ser Leu Arg Ala Asn Glu Lys Ile Ile Leu His Glu Asn
 130 135 140
 Thr Asp Leu Arg Ala Phe Lys Ser Glu Glu Lys Phe Glu Leu Val Thr
 145 150 155 160
 Cys Asp Val Ser Phe Ile Ser Leu Ile Asn Leu Leu Tyr Tyr Val Asp
 165 170 175
 Asn Leu Ala Leu Lys Glu Ile Ile Leu Leu Phe Lys Pro Gln Phe Glu
 180 185 190
 Val Gly Lys Asn Ile Lys Arg Asp Lys Lys Gly Val Leu Lys Asp Asp
 195 200 205
 Lys Ala Ile Leu Lys Ala Arg Met Asp Phe Glu Lys Glu Cys Ala Lys
 210 215 220
 Leu Gly Trp Leu Leu Lys Asn Thr Gln Lys Ser Ser Ile Lys Gly Lys
 225 230 235 240
 Glu Gly Asn Val Glu Tyr Phe Tyr Tyr Tyr Phe Lys Asn
 245 250

[0118]

<210> 88
 <211> 253
 <212> PRT
 <213> Campylobacter jejuni

<400> 88

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

	115	120	125
	Leu His Pro Ser Leu Arg Ala Asn Glu Lys Ile Ile Leu His Glu Asn 130	135	140
	Thr Asp Leu Arg Ala Phe Lys Ser Glu Glu Lys Phe Glu Leu Val Thr 145	150	155 160
	Cys Asp Val Ser Phe Ile Ser Leu Ile Asn Leu Leu Tyr Tyr Val Asp 165	170	175
	Asn Leu Ala Leu Lys Glu Ile Ile Leu Leu Phe Lys Pro Gln Phe Glu 180	185	190
	Val Gly Lys Asn Ile Lys Arg Asp Lys Lys Gly Val Leu Lys Asp Asp 195	200	205
	Lys Ala Ile Leu Lys Ala Arg Met Asp Phe Glu Lys Glu Cys Ala Lys 210	215	220
	Leu Ser Trp Leu Leu Lys Asn Thr Gln Lys Ser Ser Ile Lys Gly Lys 225	230	235 240
	Glu Gly Asn Val Glu Tyr Phe Tyr Tyr Tyr Ile Lys Asn 245	250	
[0119]	<210> 89		
	<211> 253		
	<212> PRT		
	<213> Campylobacter jejuni		
	<400> 89		
	Met Arg Phe Asp Phe Phe Val Ser Lys Arg Leu Asn Ile Ser Arg Asn 1	5	10 15
	Lys Ala Leu Glu Leu Ile Glu Asn Glu Glu Ile Leu Leu Asn Gly Lys 20	25	30
	Ser Phe Lys Ala Ser Phe Asp Val Lys Asn Phe Leu Glu Asn Leu Lys 35	40	45
	Lys Thr Gln Asp Leu Asn Pro Glu Asp Ile Leu Leu Ala Asn Glu Leu 50	55	60
	Lys Leu Asp Leu Leu Ser Glu Ile Tyr Val Ser Arg Ala Ala Leu Lys 65	70	75 80
	Leu Lys Asn Phe Leu Glu Glu Asn Asp Ile Glu Ile Lys His Lys Asn 85	90	95
	Cys Leu Asp Ile Gly Ser Ser Thr Gly Gly Phe Val Gln Ile Leu Leu 100	105	110
	Glu Asn Gln Ala Leu Lys Ile Thr Ala Leu Asp Val Gly Ser Asn Gln 115	120	125
	Leu His Ser Ser Leu Arg Val Asn Glu Lys Ile Ile Leu Tyr Glu Asn 130	135	140

Thr Asp Leu Arg Thr Phe Lys Ser Glu Glu Lys Phe Glu Leu Val Thr
145 150 155 160

Cys Asp Val Ser Phe Ile Ser Leu Ile Asn Leu Leu Tyr Tyr Ile Asp
165 170 175

Asn Leu Ala Leu Lys Glu Ile Ile Leu Leu Phe Lys Pro Gln Phe Glu
180 185 190

Val Gly Lys Asn Ile Lys Arg Asp Lys Lys Gly Val Leu Lys Asp Asp
195 200 205

Lys Ala Ile Leu Lys Ala Arg Met Asp Phe Glu Lys Ala Cys Ala Lys
210 215 220

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

Glu Gly Asn Val Glu Tyr Phe Tyr Tyr Tyr Ile Lys Asn
245 250

<210> 90

<211> 253

<212> PRT

<213> Campylobacter jejuni

<400> 90

[0120]

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

Lys Ala Leu Glu Leu Ile Glu Asn Glu Glu Ile Leu Leu Asn Gly Lys
20 25 30

Ser Phe Lys Ala Ser Phe Asp Val Lys Asn Phe Leu Glu Asn Leu Lys
35 40 45

Lys Thr Gln Asp Leu Asn Leu Glu Asp Ile Leu Leu Ala Asn Glu Leu
50 55 60

Lys Leu Asp Leu Leu Ser Glu Ile Tyr Val Ser Arg Ala Ala Leu Lys
65 70 75 80

Leu Lys Asn Phe Leu Glu Glu Asn Asp Ile Glu Ile Lys His Lys Asn
85 90 95

Cys Leu Asp Ile Gly Ser Ser Thr Gly Gly Phe Val Gln Ile Leu Leu
100 105 110

Glu Asn Gln Ala Leu Lys Ile Thr Ala Leu Asp Val Gly Ser Asn Gln
115 120 125

Leu His Ser Ser Leu Arg Val Asn Glu Lys Ile Ile Leu His Glu Asn
130 135 140

Thr Asp Leu Arg Ala Phe Lys Ser Glu Glu Lys Phe Glu Leu Val Thr
145 150 155 160

Cys Asp Val Ser Phe Ile Ser Leu Ile Asn Leu Leu Tyr Tyr Ile Asp
 165 170 175
 Asn Leu Ala Leu Lys Glu Ile Ile Leu Leu Phe Lys Pro Gln Phe Glu
 180 185 190
 Val Gly Lys Asn Ile Lys Arg Asp Lys Lys Gly Val Leu Lys Asp Asp
 195 200 205
 Lys Ala Ile Leu Lys Ala Arg Met Asp Phe Glu Lys Ala Cys Ala Lys
 210 215 220
 Leu Gly Trp Leu Leu Lys Asn Thr Gln Lys Ser Ser Ile Lys Gly Lys
 225 230 235 240
 Glu Gly Asn Val Glu Tyr Phe Tyr Tyr Tyr Ile Lys Asn
 245 250
 <210> 91
 <211> 253
 <212> PRT
 <213> Campylobacter jejuni
 <400> 91
 Met Arg Phe Asp Phe Phe Val Ser Lys Arg Leu Asn Ile Ser Arg Asn
 1 5 10 15
 Lys Ala Leu Glu Leu Ile Glu Asn Glu Glu Val Leu Leu Asn Gly Lys
 20 25 30
 Ser Phe Lys Ala Ser Phe Asp Val Lys Asn Phe Leu Glu Asn Leu Lys
 35 40 45
 Lys Thr Gln Asp Leu Asn Pro Glu Asp Ile Leu Leu Ala Asp Glu Leu
 50 55 60
 Lys Leu Asp Leu Leu Ser Glu Ile Tyr Val Ser Arg Ala Ala Leu Lys
 65 70 75 80
 Leu Lys Asn Phe Leu Glu Glu Asn Asp Ile Glu Ile Lys His Lys Asn
 85 90 95
 Cys Leu Asp Ile Gly Ser Ser Thr Gly Gly Phe Val Gln Ile Leu Leu
 100 105 110
 Glu Asn Gln Ala Leu Lys Ile Thr Ala Leu Asp Val Gly Ser Asn Gln
 115 120 125
 Leu His Pro Ser Leu Arg Ala Asn Glu Lys Ile Ile Leu His Glu Asn
 130 135 140
 Ile Asp Leu Arg Ala Phe Lys Ser Glu Glu Lys Phe Glu Leu Val Thr
 145 150 155 160
 Cys Asp Val Ser Phe Ile Ser Leu Ile Asn Leu Leu Tyr Tyr Ile Asp
 165 170 175

[0121]

Asn Leu Ala Leu Lys Glu Ile Ile Leu Leu Phe Lys Pro Gln Phe Glu
 180 185 190
 Val Gly Lys Asn Ile Lys Arg Asp Lys Lys Gly Val Leu Lys Asp Asp
 195 200 205
 Lys Ala Ile Leu Lys Ala Arg Met Asp Phe Glu Lys Glu Cys Ala Lys
 210 215 220
 Leu Gly Trp Leu Leu Lys Asn Thr Gln Lys Ser Ser Ile Lys Gly Lys
 225 230 235 240
 Glu Gly Asn Val Glu Tyr Phe Tyr Tyr Tyr Ile Lys Asn
 245 250
 <210> 92
 <211> 253
 <212> PRT
 <213> *Campylobacter jejuni*
 <400> 92
 Met Arg Phe Asp Phe Phe Val Ser Lys Arg Leu Asn Ile Ser Arg Asn
 1 5 10 15
 Lys Ala Leu Glu Leu Ile Glu Asn Glu Glu Ile Leu Leu Asn Gly Lys
 20 25 30
 Ser Phe Lys Ala Ser Phe Asp Val Lys Asn Phe Leu Glu Asn Leu Lys
 35 40 45
 Lys Thr Gln Asp Leu Asn Leu Glu Asp Ile Leu Leu Ala Asn Glu Leu
 50 55 60
 Lys Leu Asp Leu Leu Ser Glu Ile Tyr Val Ser Arg Ala Ala Leu Lys
 65 70 75 80
 Leu Lys Asn Phe Leu Glu Glu Asn Asp Ile Glu Ile Lys His Lys Asn
 85 90 95
 Cys Leu Asp Ile Gly Ser Ser Thr Gly Gly Phe Val Gln Ile Leu Leu
 100 105 110
 Glu Asn Gln Ala Leu Lys Ile Thr Ala Leu Asp Val Gly Ser Asn Gln
 115 120 125
 Leu His Ser Ser Leu Arg Val Asn Glu Lys Ile Ile Leu His Glu Asn
 130 135 140
 Thr Asp Leu Arg Thr Phe Lys Ser Glu Glu Lys Phe Glu Leu Val Thr
 145 150 155 160
 Cys Asp Val Ser Phe Ile Ser Leu Ile Asn Leu Leu Tyr Tyr Ile Asp
 165 170 175
 Asn Leu Ala Leu Lys Glu Ile Ile Leu Leu Phe Lys Pro Gln Phe Glu
 180 185 190
 Val Gly Lys Asn Ile Lys Arg Asp Lys Lys Gly Val Leu Lys Asp Asp

[0122]

	195	200	205
	Lys Ala Ile Leu Lys Ala Arg Met Asp Phe Glu Lys Ala Cys Ala Lys		
	210	215	220
	Leu Gly Trp Leu Leu Lys Asn Thr Gln Lys Ser Ser Ile Lys Gly Lys		
	225	230	235 240
	Glu Gly Asn Val Glu Tyr Phe Tyr Tyr Tyr Ile Lys Asn		
	245	250	
	<210> 93		
	<211> 253		
	<212> PRT		
	<213> Campylobacter jejuni		
	<400> 93		
	Met Arg Phe Asp Phe Phe Val Ser Lys Arg Leu Asn Ile Ser Arg Asn		
	1	5	10 15
	Lys Ala Leu Glu Leu Ile Glu Asn Glu Glu Val Leu Leu Asn Gly Lys		
	20	25	30
	Ser Phe Lys Ala Ser Phe Asp Val Lys Asn Phe Leu Glu Asn Leu Lys		
	35	40	45
	Lys Thr Gln Asp Leu Asn Pro Glu Asp Ile Leu Leu Ala Asn Glu Leu		
	50	55	60
[0123]	Lys Leu Asp Leu Leu Arg Glu Ile Tyr Val Ser Arg Ala Ala Leu Lys		
	65	70	75 80
	Leu Lys Asn Phe Leu Glu Glu Asn Asp Ile Glu Ile Lys His Lys Asn		
	85	90	95
	Cys Leu Asp Ile Gly Ser Ser Thr Gly Gly Phe Val Gln Ile Leu Leu		
	100	105	110
	Glu Asn Gln Ala Leu Lys Ile Thr Ala Leu Asp Val Gly Ser Asn Gln		
	115	120	125
	Leu His Pro Ser Leu Arg Ala Asn Glu Lys Ile Ile Leu His Glu Asn		
	130	135	140
	Thr Asp Leu Arg Ala Phe Lys Ser Glu Glu Lys Phe Glu Phe Ile Thr		
	145	150	155 160
	Cys Asp Val Ser Phe Ile Ser Leu Ile Asn Leu Leu Tyr Tyr Ile Asp		
	165	170	175
	Asn Leu Ala Leu Lys Glu Ile Ile Leu Leu Phe Lys Pro Gln Phe Glu		
	180	185	190
	Val Gly Lys Asn Ile Lys Arg Asp Lys Lys Gly Val Leu Lys Asp Gly		
	195	200	205
	Lys Ala Ile Leu Lys Ala Arg Met Asp Phe Glu Lys Ala Cys Ala Lys		
	210	215	220

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

Glu Gly Asn Val Glu Tyr Phe Tyr Tyr Tyr Ile Lys Asn
245 250

<210> 94

<211> 253

<212> PRT

<213> Campylobacter jejuni

<400> 94

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

Lys Ala Leu Glu Leu Ile Glu Asn Glu Glu Val Leu Leu Asn Gly Lys
20 25 30

Ser Phe Lys Ala Ser Phe Asp Val Lys Asn Phe Leu Glu Asn Leu Lys
35 40 45

Lys Thr Gln Asp Leu Asn Pro Glu Asp Ile Leu Leu Ala Asp Glu Leu
50 55 60

Lys Leu Asp Leu Leu Ser Glu Ile Tyr Val Ser Arg Ala Ala Leu Lys
65 70 75 80

[0124]

Leu Lys Asn Phe Leu Glu Glu Asn Asp Ile Glu Ile Lys His Lys Asn
85 90 95

Cys Leu Asp Ile Gly Ser Ser Thr Gly Gly Phe Val Gln Ile Leu Leu
100 105 110

Glu Asn Gln Ala Leu Lys Ile Thr Ala Leu Asp Val Gly Ser Asn Gln
115 120 125

Leu His Pro Ser Leu Arg Ala Asn Glu Lys Ile Ile Leu His Glu Asn
130 135 140

Ile Asp Leu Arg Ala Phe Lys Ser Glu Glu Lys Phe Glu Leu Val Thr
145 150 155 160

Cys Asp Val Ser Phe Ile Ser Leu Ile Asn Leu Leu Tyr Tyr Ile Asp
165 170 175

Asn Leu Ala Leu Lys Glu Ile Ile Leu Leu Phe Lys Pro Gln Phe Glu
180 185 190

Val Gly Lys Asn Ile Lys Arg Asp Lys Lys Gly Val Leu Lys Asp Asp
195 200 205

Lys Ala Ile Leu Lys Ala Arg Met Asp Phe Glu Lys Glu Cys Ala Lys
210 215 220

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

[0125]

Glu Gly Asn Val Glu Tyr Phe Tyr Tyr Tyr Ile Lys Asn
 245 250
 <210> 95
 <211> 253
 <212> PRT
 <213> Campylobacter jejuni
 <400> 95
 Met Arg Phe Asp Phe Phe Val Ser Lys Arg Leu Asn Ile Ser Arg Asn
 1 5 10 15
 Lys Ala Leu Glu Leu Ile Glu Asn Glu Glu Ile Leu Leu Asn Gly Lys
 20 25 30
 Ser Phe Lys Ala Ser Phe Asp Val Lys Asn Phe Leu Glu Asn Leu Lys
 35 40 45
 Lys Thr Gln Asp Leu Asn Leu Glu Asp Ile Leu Leu Ala Asn Glu Leu
 50 55 60
 Lys Leu Asp Leu Leu Ser Glu Ile Tyr Val Ser Arg Ala Ala Leu Lys
 65 70 75 80
 Leu Lys Asn Phe Leu Glu Glu Asn Asp Ile Glu Ile Lys His Lys Asn
 85 90 95
 Cys Leu Asp Ile Gly Ser Ser Thr Gly Gly Phe Val Gln Ile Leu Leu
 100 105 110
 Glu Asn Gln Ala Leu Lys Ile Thr Thr Leu Asp Val Gly Ser Asn Gln
 115 120 125
 Leu His Pro Ser Leu Arg Ala Asn Glu Ile Ile Ile Leu His Glu Asn
 130 135 140
 Thr Asp Leu Arg Ala Phe Lys Ser Glu Glu Lys Phe Glu Leu Val Thr
 145 150 155 160
 Cys Asp Val Ser Phe Ile Ser Leu Ile Asn Leu Leu Tyr Tyr Ile Asp
 165 170 175
 Asn Leu Ala Leu Lys Glu Ile Ile Leu Leu Phe Lys Pro Gln Phe Glu
 180 185 190
 Val Gly Lys Asn Ile Lys Arg Asp Lys Lys Gly Val Leu Lys Asp Asp
 195 200 205
 Lys Ala Ile Leu Lys Ala Arg Met Asp Phe Glu Lys Ala Cys Ala Lys
 210 215 220
 Leu Gly Trp Leu Leu Lys Asn Thr Gln Lys Ser Ser Ile Lys Gly Lys
 225 230 235 240
 Glu Gly Asn Val Glu Tyr Phe Tyr Tyr Tyr Ile Lys Asn
 245 250

<210> 96
 <211> 251
 <212> PRT
 <213> Campylobacter jejuni

<400> 96

Met Ile Phe Phe Val Ser Lys Arg Leu Asn Ile Ser Arg Asn Lys Ala
 1 5 10 15

Leu Glu Leu Ile Glu Asn Glu Glu Ile Leu Leu Asn Gly Lys Ser Phe
 20 25 30

Lys Ala Ser Phe Asp Val Lys Asn Phe Leu Glu Asn Leu Lys Lys Thr
 35 40 45

Gln Asp Leu Asn Pro Glu Asp Ile Leu Leu Ala Asn Glu Leu Lys Leu
 50 55 60

Asp Leu Leu Ser Glu Ile Tyr Val Ser Arg Ala Ala Leu Lys Leu Lys
 65 70 75 80

Lys Phe Leu Glu Glu Asn Asp Ile Glu Ile Lys His Lys Asn Cys Leu
 85 90 95

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

Gln Ala Leu Lys Ile Thr Ala Leu Asp Val Gly Ser Asn Gln Leu His
 115 120 125

[0126]

Pro Ser Leu Arg Ala Asn Glu Lys Ile Ile Leu His Glu Asn Thr Asp
 130 135 140

Leu Arg Ala Phe Lys Ser Glu Glu Lys Phe Glu Leu Val Thr Cys Asp
 145 150 155 160

Val Ser Phe Ile Ser Leu Ile Asn Leu Leu Tyr Tyr Val Asp Asn Leu
 165 170 175

Ala Leu Lys Glu Ile Ile Leu Leu Phe Lys Pro Gln Phe Glu Val Gly
 180 185 190

Lys Asn Ile Lys Arg Asp Lys Lys Gly Val Leu Lys Asp Asp Lys Ala
 195 200 205

Ile Leu Lys Ala Arg Met Asp Phe Glu Lys Glu Cys Ala Lys Leu Gly
 210 215 220

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

Asn Val Glu Tyr Phe Tyr Tyr Tyr Ile Lys Asn
 245 250

<210> 97
 <211> 253
 <212> PRT
 <213> Campylobacter jejuni

<400> 97

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

Lys Ala Leu Glu Leu Ile Glu Asn Glu Glu Ile Leu Leu Asn Gly Lys
20 25 30

Ser Phe Lys Ala Ser Phe Asp Val Lys Asn Phe Leu Glu Asn Leu Lys
35 40 45

Lys Thr Gln Asp Leu Asn Leu Glu Asp Ile Leu Leu Ala Asn Glu Leu
50 55 60

Lys Leu Asp Leu Leu Ser Glu Ile Tyr Val Ser Arg Ala Ala Leu Lys
65 70 75 80

Leu Lys Asn Phe Leu Glu Glu Asn Asp Ile Glu Ile Lys His Lys Asn
85 90 95

Cys Leu Asp Ile Gly Ser Ser Thr Gly Gly Phe Val Gln Ile Leu Leu
100 105 110

Glu Asn Gln Ala Leu Lys Ile Thr Ala Leu Asp Val Gly Ser Asn Glu
115 120 125

Leu His Ser Ser Leu Arg Val Asn Glu Lys Ile Ile Leu Tyr Glu Asn
130 135 140

[0127]

Thr Asp Leu Arg Thr Phe Lys Ser Glu Glu Lys Phe Glu Leu Val Thr
145 150 155 160

Cys Asp Val Ser Phe Ile Ser Leu Ile Asn Leu Leu Tyr Tyr Ile Asp
165 170 175

Asn Leu Ala Leu Lys Glu Ile Ile Leu Leu Phe Lys Pro Gln Phe Glu
180 185 190

Val Gly Lys Asn Ile Lys Arg Asp Lys Lys Gly Val Leu Lys Asp Asp
195 200 205

Lys Ala Ile Leu Lys Ala Arg Met Asp Phe Glu Lys Ala Cys Ala Lys
210 215 220

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

Glu Gly Asn Val Glu Tyr Phe Tyr Tyr Tyr Ile Lys Asn
245 250

<210> 98

<211> 253

<212> PRT

<213> Campylobacter jejuni

<400> 98

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

	Lys	Ala	Leu	Glu	Leu	Ile	Glu	Asn	Glu	Glu	Val	Leu	Leu	Asn	Gly	Lys	
			20					25						30			
	Ser	Phe	Lys	Ala	Ser	Phe	Asp	Val	Lys	Asn	Phe	Leu	Glu	Asn	Leu	Lys	
		35					40						45				
	Lys	Ala	Gln	Asp	Leu	Asn	Pro	Glu	Asp	Val	Leu	Leu	Thr	Asp	Glu	Leu	
		50				55						60					
	Lys	Leu	Asp	Leu	Leu	Ser	Glu	Ile	Tyr	Val	Ser	Arg	Ala	Ala	Leu	Lys	
	65				70					75					80		
	Leu	Lys	Asn	Phe	Leu	Glu	Glu	Asn	Asp	Ile	Glu	Ile	Lys	His	Lys	Asn	
			85					90						95			
	Cys	Leu	Asp	Ile	Gly	Ser	Ser	Thr	Gly	Gly	Phe	Val	Gln	Ile	Leu	Leu	
		100						105					110				
	Glu	Asn	Gln	Ala	Leu	Lys	Ile	Thr	Ala	Leu	Asp	Val	Gly	Asn	Asn	Gln	
		115					120					125					
	Leu	His	Pro	Ser	Leu	Arg	Thr	Asn	Glu	Lys	Ile	Ile	Leu	His	Glu	Asn	
		130				135						140					
	Thr	Asp	Leu	Arg	Ala	Phe	Lys	Ser	Glu	Glu	Lys	Phe	Glu	Leu	Ile	Thr	
	145				150				155					160			
[0128]	Cys	Asp	Val	Ser	Phe	Ile	Ser	Leu	Ile	Asn	Leu	Leu	Tyr	Tyr	Ile	Asp	
		165						170					175				
	Asn	Leu	Ala	Leu	Lys	Glu	Ile	Ile	Leu	Leu	Phe	Lys	Pro	Gln	Phe	Glu	
		180						185					190				
	Val	Gly	Lys	Asn	Ile	Lys	Arg	Asp	Lys	Lys	Gly	Val	Leu	Lys	Asp	Asp	
		195					200					205					
	Lys	Ala	Ile	Leu	Lys	Ala	Arg	Met	Asp	Phe	Glu	Lys	Glu	Cys	Ala	Lys	
		210				215					220						
	Leu	Gly	Trp	Leu	Leu	Lys	Asn	Thr	Gln	Lys	Ser	Ser	Ile	Lys	Gly	Lys	
	225				230				235				240				
	Glu	Gly	Asn	Val	Glu	Tyr	Phe	Tyr	Tyr	Tyr	Ile	Lys	Asn				
		245						250									
	<210>	99															
	<211>	251															
	<212>	PRT															
	<213>	Campylobacter jejuni															
	<400>	99															
	Met	Ile	Phe	Phe	Val	Ser	Lys	Arg	Leu	Asn	Ile	Ser	Arg	Asn	Lys	Ala	
	1				5				10					15			
	Leu	Glu	Leu	Ile	Glu	Asn	Glu	Glu	Ile	Leu	Leu	Asn	Gly	Lys	Ser	Phe	
		20						25					30				

[0129]

Lys Ala Ser Phe Asp Val Lys Asn Phe Leu Glu Asn Leu Lys Lys Thr
 35 40 45
 Gln Asp Leu Asn Pro Glu Asp Ile Leu Leu Ala Asn Glu Leu Lys Leu
 50 55 60
 Asp Leu Leu Ser Glu Ile Tyr Val Ser Arg Ala Ala Leu Lys Leu Lys
 65 70 75 80
 Lys Phe Leu Glu Glu Asn Asp Ile Glu Ile Lys His Lys Asn Cys Leu
 85 90 95
 Asp Ile Gly Ser Ser Thr Gly Gly Phe Val Gln Ile Leu Leu Glu Asn
 100 105 110
 Gln Ala Leu Lys Ile Thr Ala Leu Asp Val Gly Ser Asn Gln Leu His
 115 120 125
 Pro Ser Leu Arg Ala Asn Glu Lys Ile Ile Leu His Glu Asn Thr Asp
 130 135 140
 Leu Arg Ala Phe Lys Ser Glu Glu Lys Phe Glu Leu Val Thr Cys Asp
 145 150 155 160
 Val Ser Phe Ile Ser Leu Ile Asn Leu Leu Tyr Tyr Val Asp Asn Leu
 165 170 175
 Ala Leu Lys Glu Ile Ile Leu Leu Phe Lys Pro Gln Phe Glu Val Gly
 180 185 190
 Lys Asn Ile Lys Arg Asp Lys Lys Gly Val Leu Lys Asp Asp Arg Ala
 195 200 205
 Ile Leu Lys Ala Arg Met Asp Phe Glu Lys Glu Cys Ala Lys Leu Gly
 210 215 220
 Trp Phe Leu Lys Asn Thr Gln Lys Ser Ser Ile Lys Gly Lys Glu Gly
 225 230 235 240
 Asn Val Glu Tyr Phe Tyr Tyr Tyr Ile Lys Asn
 245 250
 <210> 100
 <211> 253
 <212> PRT
 <213> Campylobacter jejuni
 <400> 100
 Met Arg Phe Asp Phe Phe Val Ser Lys Arg Leu Asn Ile Ser Arg Asn
 1 5 10 15
 Lys Ala Leu Glu Leu Ile Glu Ser Glu Glu Val Leu Leu Asn Gly Lys
 20 25 30
 Ser Phe Lys Ala Ser Phe Asp Val Lys Asn Phe Leu Glu Asn Leu Lys
 35 40 45
 Lys Thr Gln Asp Leu Asn Pro Glu Asp Ile Leu Leu Ala Asn Glu Leu

50	55	60
Lys Leu Asn Leu Leu Ser Glu Ile Tyr Val Ser Arg Ala Ala Leu Lys		
65	70	75 80
Leu Lys Asn Phe Leu Glu Glu Asn Asp Ile Glu Ile Lys Gln Lys Asn		
	85	90 95
Cys Leu Asp Ile Gly Ser Ser Thr Gly Gly Phe Val Gln Ile Leu Leu		
	100	105 110
Glu Asn Gln Ala Leu Lys Ile Thr Ala Leu Asp Val Gly Ser Asn Gln		
	115	120 125
Leu His Ser Asn Leu Arg Thr Asn Glu Lys Val Ile Leu His Glu Asn		
	130	135 140
Thr Asp Leu Arg Ala Phe Lys Ser Glu Glu Lys Phe Glu Phe Ile Thr		
	145	150 155 160
Cys Asp Val Ser Phe Ile Ser Leu Ile Asn Leu Leu Tyr Tyr Ile Asp		
	165	170 175
Asn Leu Ala Leu Lys Glu Ile Ile Leu Leu Phe Lys Pro Gln Phe Glu		
	180	185 190
Val Gly Lys Asn Ile Lys Arg Asp Lys Lys Gly Val Leu Lys Asp Asp		
	195	200 205
Lys Ala Ile Leu Lys Ala Arg Met Asp Phe Glu Lys Ala Cys Ala Lys		
	210	215 220
Leu Gly Trp Leu Leu Lys Asn Thr Gln Lys Ser Ser Ile Lys Gly Lys		
	225	230 235 240
Glu Gly Asn Val Glu Tyr Phe Tyr Tyr Tyr Ile Lys Asn		
	245	250
<210> 101		
<211> 253		
<212> PRT		
<213> Campylobacter jejuni		
<400> 101		
Met Arg Phe Asp Phe Phe Val Ser Lys Arg Leu Asn Ile Ser Arg Asn		
1	5	10 15
Lys Ala Leu Glu Leu Ile Glu Asn Glu Glu Val Leu Leu Asn Gly Lys		
	20	25 30
Ser Phe Lys Ala Ser Phe Asp Val Lys Asn Phe Leu Glu Asn Leu Lys		
	35	40 45
Lys Thr Gln Asp Leu Asn Pro Glu Asp Ile Leu Leu Thr Asp Gly Leu		
	50	55 60
Lys Leu Asp Leu Leu Ser Glu Ile Tyr Val Ser Arg Ala Ala Leu Lys		
	65	70 75 80

[0130]

Leu Lys Asn Phe Leu Glu Glu Asn Asp Ile Glu Ile Lys His Lys Asn
 85 90 95
 Cys Leu Asp Ile Gly Ser Ser Thr Gly Gly Phe Val Glu Ile Leu Leu
 100 105 110
 Glu Asn Gln Ala Leu Lys Ile Thr Ala Leu Asp Val Gly Asn Asn Gln
 115 120 125
 Leu His Leu Ser Leu Arg Thr Asn Glu Lys Ile Ile Leu His Glu Asn
 130 135 140
 Thr Asp Leu Arg Ala Phe Lys Ser Glu Glu Lys Phe Glu Leu Ile Thr
 145 150 155 160
 Cys Asp Val Ser Phe Ile Ser Leu Ile Asn Leu Leu Tyr Tyr Ile Asp
 165 170 175
 Asn Leu Ala Leu Lys Glu Ile Ile Leu Leu Phe Lys Pro Gln Phe Glu
 180 185 190
 Val Gly Lys Asn Ile Lys Arg Asp Lys Lys Gly Val Leu Lys Asp Asp
 195 200 205
 Lys Ala Ile Leu Lys Ala Arg Met Asp Phe Glu Lys Glu Cys Ala Lys
 210 215 220
 [0131] Leu Gly Trp Leu Leu Lys Asn Thr Gln Lys Ser Ser Ile Lys Gly Lys
 225 230 235 240
 Glu Gly Asn Val Glu Tyr Phe Tyr Tyr Tyr Ile Lys Asn
 245 250
 <210> 102
 <211> 253
 <212> PRT
 <213> Campylobacter jejuni
 <400> 102
 Met Arg Phe Asp Phe Phe Ile Ser Lys Arg Leu Asn Ile Ser Arg Asn
 1 5 10 15
 Lys Ala Leu Glu Leu Ile Glu Asn Glu Glu Val Leu Leu Asn Gly Lys
 20 25 30
 Asn Phe Lys Ala Ser Cys Asp Val Lys Asn Phe Leu Glu Asn Leu Lys
 35 40 45
 Lys Ala Gln Asp Leu Asn Pro Glu Asp Val Leu Leu Ala Asp Glu Leu
 50 55 60
 Lys Leu Asp Leu Leu Ser Glu Ile Tyr Val Ser Arg Ala Ala Leu Lys
 65 70 75 80
 Leu Lys Asn Phe Leu Glu Glu Asn Asp Ile Glu Val Lys His Lys Asn
 85 90 95

Cys Leu Asp Ile Gly Ser Ser Thr Gly Gly Phe Val Gln Ile Leu Leu
 100 105 110
 Glu Asn Lys Ala Leu Lys Ile Thr Ala Leu Asp Val Gly Ser Asn Gln
 115 120 125
 Leu His Pro Ser Leu Arg Thr Asn Glu Lys Val Ile Leu His Glu Asn
 130 135 140
 Thr Asp Leu Arg Ala Phe Lys Ser Glu Glu Lys Phe Glu Leu Ile Thr
 145 150 155 160
 Cys Asp Val Ser Phe Ile Ser Leu Val Asn Leu Leu Tyr Tyr Ile Asn
 165 170 175
 Asn Leu Ala Leu Lys Glu Met Ile Leu Leu Phe Lys Pro Gln Phe Glu
 180 185 190
 Val Gly Lys Asn Ile Lys Arg Asp Lys Lys Gly Val Leu Lys Asp Asp
 195 200 205
 Lys Ala Ile Leu Lys Ala Arg Met Asp Phe Glu Lys Ala Cys Ala Lys
 210 215 220
 Leu Gly Trp Leu Leu Lys Asn Thr Gln Lys Ser Ser Ile Lys Gly Lys
 225 230 235 240

[0132] Glu Gly Asn Val Glu Tyr Phe Tyr Tyr Tyr Ile Lys Asn
 245 250

<210> 103
 <211> 253
 <212> PRT
 <213> Campylobacter jejuni

<400> 103

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

Glu Asn Gln Ala Leu Lys Ile Thr Ala Leu Asp Val Gly Asn Asn Gln
 115 120 125
 Leu His Leu Ser Leu Arg Thr Asn Glu Lys Ile Ile Leu His Glu Asn
 130 135 140
 Thr Asp Leu Arg Thr Phe Lys Ser Glu Glu Lys Phe Glu Leu Ile Thr
 145 150 155 160
 Cys Asp Val Ser Phe Ile Ser Leu Ile Asn Leu Leu Tyr Tyr Ile Asp
 165 170 175
 Asn Leu Ala Leu Lys Glu Ile Ile Leu Leu Phe Lys Pro Gln Phe Glu
 180 185 190
 Val Gly Lys Asn Ile Lys Arg Asp Lys Lys Gly Val Leu Lys Asp Asp
 195 200 205
 Lys Ala Ile Leu Lys Ala Arg Met Asp Phe Glu Lys Ala Cys Ala Lys
 210 215 220
 Leu Gly Trp Leu Leu Lys Asn Thr Gln Lys Ser Ser Ile Lys Gly Lys
 225 230 235 240
 Glu Gly Asn Val Glu Tyr Phe Tyr Tyr Tyr Ile Lys Asn
 245 250

[0133]

<210> 104
 <211> 253
 <212> PRT
 <213> Campylobacter jejuni

<400> 104

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

130	135	140
Thr Asp Leu Arg Val Phe Lys Ser Glu Glu Lys Phe Glu Phe Ile Thr		
145	150	155 160
Cys Asp Val Ser Phe Ile Ser Leu Val Asn Leu Leu Tyr Tyr Ile Asn		
	165	170 175
Asn Leu Ala Leu Arg Glu Ile Ile Leu Leu Phe Lys Pro Gln Phe Glu		
	180	185 190
Val Gly Lys Asn Val Lys Arg Asp Lys Lys Gly Val Leu Lys Asp Asp		
	195	200 205
Lys Val Ile Leu Lys Ala Lys Met Asp Phe Glu Lys Glu Cys Ala Lys		
	210	215 220
Leu Gly Trp Ile Leu Lys Asn Thr Gln Lys Ser Cys Ile Lys Gly Lys		
	225	230 235 240
Glu Gly Asn Val Glu Tyr Phe Tyr Tyr Tyr Ile Lys Asn		
	245	250
<210> 105		
<211> 188		
<212> PRT		
<213> Campylobacter jejuni		
<400> 105		

[0134]

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

Gly Trp Leu Leu Lys Asn Thr Gln Lys Ser Ser Ile Lys Gly Lys Glu
165 170 175

Gly Asn Val Glu Tyr Phe Tyr Tyr Tyr Ile Lys Asn
180 185

<210> 106

<211> 52

<212> PRT

<213> Campylobacter jejuni

<400> 106

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

Lys Ala Leu Glu Leu Ile Glu Asn Glu Glu Ile Leu Leu Asn Gly Lys
20 25 30

Ser Phe Lys Ala Ser Phe Asp Val Lys Asn Phe Leu Glu Asn Leu Lys
35 40 45

Lys Arg Lys Ile
50

<210> 107

<211> 183

<212> DNA

<213> Campylobacter jejuni

[0135]

<400> 107

atggtttcag atgtttctat gggtaatgtt aatttaatga ctgctgttaa tacttcagtt 60

ttgaaaaaat ctatggacac aaacgaggca ttgatgaatg aactcatcga aggtatggaa 120

gggtgtctctc aagcctccgc tccacaagct tctagctcta gtggtttggg tatttacgct 180

taa 183

<210> 108

<211> 60

<212> PRT

<213> Campylobacter jejuni

<400> 108

Met Val Ser Asp Val Ser Met Gly Asn Val Asn Leu Met Thr Ala Val
1 5 10 15

Asn Thr Ser Val Leu Lys Lys Ser Met Asp Thr Asn Glu Ala Leu Met
20 25 30

Asn Glu Leu Ile Glu Gly Met Glu Gly Val Ser Gln Ala Ser Ala Pro
35 40 45

Gln Ala Ser Ser Ser Ser Gly Leu Asp Ile Tyr Ala
50 55 60

<210> 109

<211> 384

<212> DNA

<213> Campylobacter jejuni

<400> 109
 atgcaggtaa attatagaac gattagctcg tatgaatacg atgctattag tggtcagtat 60
 aaacaggtagg ataacagat tgaagattat tcttcactcg gagattctga ttttatggat 120
 atgttaaata aggeggaatga gaagtcaagc ggagatgctt taaattctag cagtagtttt 180
 caaagcaatg cgcaaaaactc aaattcaaat ttaagtaatt atgctcaaat gtcaaaigtt 240
 tacgcttate gttttagaca aaatgaagge gagctgtcta tgagagctca aagtgcctagc 300
 gttcataatg atcttacaaca acaangtgca aatgaacaaa gtaagaataa tacttttgta 360
 aatgatttat tgaacgeaat ttaa 384

<210> 110
 <211> 127
 <212> PRT
 <213> Campylobacter jejuni

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

[0136]

<210> 111
 <211> 168
 <212> DNA
 <213> Campylobacter jejuni

<400> 111
 atgaaaaaag ttgtactaat ctcagcatta ctaggcgctt tcgcagctaa tgtttttgca 60
 gctaatactc caagcgatgt aaatcaaca catacaaaag ctaaagctga taaaaaacat 120
 gaagctaaaa ctcacaaaaa aacaaaagag caaacaccag ctcaataa 168

<210> 112
 <211> 55
 <212> PRT
 <213> Campylobacter jejuni

<400> 112
 Met Lys Lys Val Val Leu Ile Ser Ala Leu Leu Gly Ala Phe Ala Ala

1	5	10	15
Asn Val Phe Ala Ala Asn Thr Pro Ser Asp Val Asn Gln Thr His Thr	20	25	30
Lys Ala Lys Ala Asp Lys Lys His Glu Ala Lys Thr His Lys Lys Thr	35	40	45
Lys Glu Gln Thr Pro Ala Gln	50	55	
<210> 113			
<211> 336			
<212> DNA			
<213> Campylobacter jejuni			
<400> 113			
atgatggcta aaattagaat tcaatacagc gcaggttttg ggcactatac gcaaaateac		60	
aagggttttg gacctacgat ttatatagaa gaggtcgtag agtttgataa tggcaaggat		120	
tattttgaet atatagattt ttataaaaact tattcaaaga gcgatgatac ttattttcat		180	
atcagttttt tagaagatag acctctaagc gataaagaaa tcaccattcg caatgaatac		240	
cgcaaaatgc gtgatgaaaa ctgtaaaaaa gccaaaggagg aatttatagc caacaatgag		300	
cttgatgtgg agcatttgcc tactcaccat gattaa		336	
<210> 114			
<211> 111			
<212> PRT			
<213> Campylobacter jejuni			
<400> 114			
Met Met Ala Lys Phe Arg Ile Gln Tyr Ser Ala Gly Phe Gly His Tyr	1	5	10 15
Thr Gln Asn His Lys Gly Phe Gly Pro Thr Ile Tyr Ile Glu Glu Val	20	25	30
Val Glu Phe Asp Asn Gly Lys Asp Tyr Phe Asp Tyr Ile Asp Phe Tyr	35	40	45
Lys Thr Tyr Ser Lys Ser Asp Asp Thr Tyr Phe His Ile Ser Phe Leu	50	55	60
Glu Asp Arg Pro Leu Ser Asp Lys Glu Ile Thr Ile Arg Asn Glu Tyr	65	70	75 80
Arg Lys Met Arg Asp Glu Asn Cys Lys Lys Ala Lys Glu Glu Phe Ile	85	90	95
Ala Asn Asn Glu Leu Asp Val Glu His Leu Pro Thr His His Asp	100	105	110
<210> 115			
<211> 498			
<212> DNA			
<213> Campylobacter jejuni			
<400> 115			
atgaaaaaaa ttcttttttac ttcaatcgca gctcttgtag ttgttattag tggttgtagc		60	

[0137]

acaaaaagca ctagcgtaag cggatgtagt agtgttgatt caaatcgtgg ttacaggtgga 120
 agtgatgggt gggatattga ttcaaaaatt tctcaactta atgatacttt aaataaagta 180
 tattttgatt ttgataaatt caacattcgt cctgatatgc aaaatgttgt aagcacaaat 240
 gctaataattt ttaacactga agtaagcggg gtaagtatta ctgttgaagg aaacigcgat 300
 gagtggggaa cegatgaata taaccaagct ctaggtttaa aaagagcaaa agctgtaaaa 360
 gaagctttta tcgctaaagg tgtaaatgct gatagaattg ctgttaaaag ctatggagaa 420
 acaaatccgt tgtgcactga aaaaactaaa gcttgcgatg cgcaaatag acgtgctgaa 480
 tttaaattat caagataa 498

<210> 116
 <211> 165
 <212> PRT
 <213> Campylobacter jejuni

<400> 116

Met Lys Lys Ile Leu Phe Thr Ser Ile Ala Ala Leu Ala Val Val Ile
1 5 10 15

Ser Gly Cys Ser Thr Lys Ser Thr Ser Val Ser Gly Asp Ser Ser Val
20 25 30

Asp Ser Asn Arg Gly Ser Gly Gly Ser Asp Gly Trp Asp Ile Asp Ser
35 40 45

[0138]

Lys Ile Ser Gln Leu Asn Asp Thr Leu Asn Lys Val Tyr Phe Asp Phe
50 55 60

Asp Lys Phe Asn Ile Arg Pro Asp Met Gln Asn Val Val Ser Thr Asn
65 70 75 80

Ala Asn Ile Phe Asn Thr Glu Val Ser Gly Val Ser Ile Thr Val Glu
85 90 95

Gly Asn Cys Asp Glu Trp Gly Thr Asp Glu Tyr Asn Gln Ala Leu Gly
100 105 110

Leu Lys Arg Ala Lys Ala Val Lys Glu Ala Leu Ile Ala Lys Gly Val
115 120 125

Asn Ala Asp Arg Ile Ala Val Lys Ser Tyr Gly Glu Thr Asn Pro Val
130 135 140

Cys Thr Glu Lys Thr Lys Ala Cys Asp Ala Gln Asn Arg Arg Ala Glu
145 150 155 160

Phe Lys Leu Ser Arg
165

<210> 117
 <211> 840
 <212> DNA
 <213> Campylobacter jejuni

<400> 117

atgaaaaaaa tacttctaag tgttttaacg gccittgttg cagtagtatt ggctgcttgt 60

```

ggaggaaatt ctgactctaa aacttttaaat tctcttgata agatcaagca aaatggagtt      120
gttaggattg gggttatttg cgataaacca ccttttggtt atgtggatga aaaaggaaac      180
aatcaaggct atgatatagc tttagctaaa cgcatagcaa aagaactttt tggcgaatgaa      240
aataaggtgc aatttgttct tgttgaagct gcaaataggg ttgagttttt aaaaatcaaat      300
aaagtagaia ttatttttgc taatttttact caaactccgc aaagggcaga gcaggttgat      360
ttttgctcgc cttatatgaa ggtagcttta ggcgtagctg taccaaagga tagtaatata      420
actagcgtag aagattttaa agataaaacc ttgcttttaa acaaaggcac aacagcagat      480
gettattttt cgaaaatta tcctaattatt aaaactttta aatatgatca aaataccgaa      540
acctttgccc cttttagtga taaaagagcg gatgctttta gtcagtataa taccttactt      600
tttgcttggg tgaagatca tcctgatttt asaattggga ttaaagagtt aggtaacaaa      660
gatgttatcg caccagcggg taaaaaagcg gataaagaac tttaagaatt tatcgataat      720
ttgatcatca aactaggcca agagcagttt ttccacaagg cttatgatga aactttaaaa      780
gtcatttttg gagatgatgt taaggccgat gatgtagtga ttgaaggtgg aaaaatttaa      840

```

<210> 118

<211> 279

<212> PRT

<213> Campylobacter jejuni

<400> 118

```

Met Lys Lys Ile Leu Leu Ser Val Leu Thr Ala Phe Val Ala Val Val
1           5           10           15

```

[0139]

```

Leu Ala Ala Cys Gly Gly Asn Ser Asp Ser Lys Thr Leu Asn Ser Leu
           20           25           30

```

```

Asp Lys Ile Lys Gln Asn Gly Val Val Arg Ile Gly Val Phe Gly Asp
           35           40           45

```

```

Lys Pro Pro Phe Gly Tyr Val Asp Glu Lys Gly Asn Asn Gln Gly Tyr
           50           55           60

```

```

Asp Ile Ala Leu Ala Lys Arg Ile Ala Lys Glu Leu Phe Gly Asp Glu
65           70           75           80

```

```

Asn Lys Val Gln Phe Val Leu Val Glu Ala Ala Asn Arg Val Glu Phe
           85           90           95

```

```

Leu Lys Ser Asn Lys Val Asp Ile Ile Leu Ala Asn Phe Thr Gln Thr
           100          105          110

```

```

Pro Gln Arg Ala Glu Gln Val Asp Phe Cys Ser Pro Tyr Met Lys Val
           115          120          125

```

```

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

```

```

Asp Leu Lys Asp Lys Thr Leu Leu Leu Asn Lys Gly Thr Thr Ala Asp
           145          150          155          160

```

```

Ala Tyr Phe Thr Gln Asn Tyr Pro Asn Ile Lys Thr Leu Lys Tyr Asp

```

	165	170	175
	Gln Asn Thr Glu Thr Phe Ala Ala Leu Met Asp Lys Arg Gly Asp Ala 180 185 190		
	Leu Ser His Asp Asn Thr Leu Leu Phe Ala Trp Val Lys Asp His Pro 195 200 205		
	Asp Phe Lys Met Gly Ile Lys Glu Leu Gly Asn Lys Asp Val Ile Ala 210 215 220		
	Pro Ala Val Lys Lys Gly Asp Lys Glu Leu Lys Glu Phe Ile Asp Asn 225 230 235 240		
	Leu Ile Ile Lys Leu Gly Gln Glu Gln Phe Phe His Lys Ala Tyr Asp 245 250 255		
	Glu Thr Leu Lys Ala His Phe Gly Asp Asp Val Lys Ala Asp Asp Val 260 265 270		
	Val Ile Glu Gly Gly Lys Ile 275		
	<210> 119 <211> 780 <212> DNA <213> Campylobacter jejuni		
[0140]	<400> 119 atgggttttta gaaaatcttt gttaaagttg gcagtttttg ctctagggtc ttgtgttgca 60 tttagcaatg ctaatgcagc agaaggtaaa cttgagtcta tttaaactta aggacaatta 120 atagttgggtg ttaaaaaatga tgttccgeat tatgctttac ttgatcaagc aacaggtgaa 180 attaaaggtt tcgaagtaga tgttgccaaa ttgctagcta aaagtatat gggatgatgat 240 aaaaaaataa aactagttgc agttaatget aaaacaagag gccctttgct tgataatggt 300 agtgtagatg cggatgatgc aacttttact attactecag agagaaaaag aatttataat 360 ttctcagagc cttattatca agatgtata gggtttttgg ttttaaaaga aaaaaaatat 420 aaatcttttag ctgatatgaa aggtgcaaat attggagtgg ctcaagctgc aactacaaaa 480 aaagctatag gtgaagctgc taaaaaaatt ggcattgatg ttaaatftag tgaatttcct 540 gattatccaa gtataaaagc tgcttttagat gctaaaagag ttgatgcgtt ttctgtagac 600 aatcaatat tgttaggtta tgtggaigat aaaagtgaat ttttgccaga tagttttgaa 660 ccacaaagtt atggtaattgt aacaaaaaaa gatgatecag cttttgcaaa atatgttgat 720 gattttgtaa aagaacataa aaatgaaatt gatgcttttag cgaaaaaatg gggtttataa 780		
	<210> 120 <211> 259 <212> PRT <213> Campylobacter jejuni		
	<400> 120		
	Met Val Phe Arg Lys Ser Leu Leu Lys Leu Ala Val Phe Ala Leu Gly 1 5 10 15		
	Ala Cys Val Ala Phe Ser Asn Ala Asn Ala Ala Glu Gly Lys Leu Glu		

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

[0141]

<210> 121
 <211> 1275
 <212> DNA
 <213> *Campylobacter jejuni*

<400> 121
 atgaaactag ttaaacttag ttagttgca gctcttgctg cagggtcctt ttcagcagct 60
 aacgctactc cacttgaaga agcgatcaaa gatgttgatg tatcagggtg attaagatac 120
 agatacgata caggtaattt tgataaaaat ttcgtaaca actcaaattt aaacaacagc 180
 aaacaagatc acaaatatag agcacaagtt aacitcagtg ctgctatagc tgataacttc 240

```

aaagcttttg ttcaatttga ctataatgct gcctgatggcg gttatgggtgc taatggaata 300
aaaaatgacg aaaaaggact ttttggttct caattatact taacttatac aaatgaagat 360
gttgctacaa ggtgaatcgc tggtaaacaa caattaaacc ttatctggac ggataacgct 420
attgatgggt tagttggcac aggtgttata gtagtaata acagcatcga tggtttaact 480
ctagctgctt ttgctgtaga tagcttcatg gcctgcagagc aagggtgcaga ttattagaa 540
catagtaata ttcaacaac atcaaatcaa gcctcttita aagtagattc agtaggaat 600
ctttacggcg ctgctgctgt aggttcttat gatcttctg gttgacaatt caaccacaa 660
ttatggttag ctattggga tcaagtagca ttctctatg ctgtagatgc agcttatagt 720
acaactatct ttgatggaat caactggaca ctgaaggcg ctacttagg aaatagcctt 780
gatagcgaac ttgatgataa aacacacgct aatggcaatt tatttgcctt aaaaggtagc 840
attgaagtaa atggttggga tgctagcctt ggtggtttat actacggta taaagaaaaa 900
gcttctacag tigtatcga agatcaaggc aatcttgggt cttaacttgc aggtgaggaa 960
attttctata ctactggctc aagactaat ggtgatactg gtagaataat ctteggttat 1020
gtaactggcg gatatactt caacgaaaca gttcgcgttg gtgctgactt cgtatatggt 1080
ggaacaaaaa cagaagctgc taatcattta ggtggtggta aaaaacttga agctgttgca 1140
agagtagatt acaatactc tccaaaactt aacttctcag cattctattc ttatgtgaac 1200
ctagatcaag ggtgaaacac taatgaaagt gcctgatcata gcactgtaag acttcaagct 1260
ctttacaaat tctaa 1275

```

[0142]

<210> 122
 <211> 424
 <212> PRT
 <213> Campylobacter jejuni

<400> 122

Met Lys Leu Val Lys Leu Ser Leu Val Ala Ala Leu Ala Ala Gly Ala
1 5 10 15

Phe Ser Ala Ala Asn Ala Thr Pro Leu Glu Glu Ala Ile Lys Asp Val
20 25 30

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

Lys Asn Phe Val Asn Asn Ser Asn Leu Asn Asn Asn Lys Gln Asp His
50 55 60

Lys Tyr Arg Ala Gln Val Asn Phe Ser Ala Ala Ile Ala Asp Asn Phe
65 70 75 80

Lys Ala Phe Ile Gln Phe Asp Tyr Asn Ala Val Asp Gly Gly Thr Gly
85 90 95

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

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

[0143]

Lys Gln Gln Leu Asn Leu Ile Trp Thr Asp Asn Ala Ile Asp Gly Leu
 130 135 140
 Val Gly Thr Gly Ile Lys Val Val Asn Asn Ser Ile Asp Gly Leu Thr
 145 150 155 160
 Leu Ala Ala Phe Ala Val Asp Ser Phe Met Ala Glu Glu Gln Gly Ala
 165 170 175
 Asp Leu Leu Gly Gln Ser Thr Ile Ser Thr Thr Gln Lys Ala Ala Pro
 180 185 190
 Phe Lys Val Asp Ser Val Gly Asn Leu Tyr Gly Ala Ala Ala Val Gly
 195 200 205
 Ser Tyr Asp Leu Ala Gly Gly Gln Phe Asn Pro Gln Leu Trp Leu Ala
 210 215 220
 Tyr Trp Asp Gln Val Ala Phe Phe Tyr Ala Val Asp Ala Ala Tyr Ser
 225 230 235 240
 Thr Thr Ile Phe Asp Gly Ile Asn Trp Thr Leu Glu Gly Ala Tyr Leu
 245 250 255
 Gly Asn Ser Leu Asp Ser Glu Leu Asp Asp Lys Thr His Ala Asn Gly
 260 265 270
 Asn Leu Phe Ala Leu Lys Gly Ser Ile Glu Val Asn Gly Trp Asp Ala
 275 280 285
 Ser Leu Gly Gly Leu Tyr Tyr Gly Asp Lys Glu Lys Ala Ser Thr Val
 290 295 300
 Val Ile Glu Asp Gln Gly Asn Leu Gly Ser Leu Leu Ala Gly Glu Glu
 305 310 315 320
 Ile Phe Tyr Thr Thr Gly Ser Arg Leu Asn Gly Asp Thr Gly Arg Asn
 325 330 335
 Ile Phe Gly Tyr Val Thr Gly Gly Tyr Thr Phe Asn Glu Thr Val Arg
 340 345 350
 Val Gly Ala Asp Phe Val Tyr Gly Gly Thr Lys Thr Glu Asp Thr Ala
 355 360 365
 His Val Gly Gly Gly Lys Lys Leu Glu Ala Val Ala Arg Val Asp Tyr
 370 375 380
 Lys Tyr Ser Pro Lys Leu Asn Phe Ser Ala Phe Tyr Ser Tyr Val Asn
 385 390 395 400
 Leu Asp Gln Gly Val Asn Thr Asn Glu Ser Ala Asp His Ser Thr Val
 405 410 415
 Arg Leu Gln Ala Leu Tyr Lys Phe
 420

Met Gly Phe Arg Ile Asn Thr Asn Val Ala Ala Leu Asn Ala Lys Ala
1 5 10 15

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

[0146]

Ala Asp Met Lys Glu Asn Tyr Gly Arg Leu Ser Leu Val Lys Asn Asp
 325 330 335
 Gly Lys Asp Ile Leu Ile Ser Gly Ser Asn Leu Ser Ser Ala Gly Phe
 340 345 350
 Gly Ala Thr Gln Phe Ile Ser Gln Ala Ser Val Ser Leu Arg Glu Ser
 355 360 365
 Lys Gly Gln Ile Asp Ala Asn Ile Ala Asp Ala Met Gly Phe Gly Ser
 370 375 380
 Ala Asn Lys Gly Val Val Leu Gly Gly Tyr Ser Ser Val Ser Ala Tyr
 385 390 395 400
 Met Ser Ser Ala Gly Ser Gly Phe Ser Ser Gly Ser Gly Tyr Ser Val
 405 410 415
 Gly Ser Gly Lys Asn Tyr Ser Thr Gly Phe Ala Asn Ala Ile Ala Ile
 420 425 430
 Ser Ala Ala Ser Gln Leu Ser Thr Val Tyr Asn Val Ser Ala Gly Ser
 435 440 445
 Gly Phe Ser Ser Gly Ser Thr Leu Ser Gln Phe Ala Thr Met Lys Thr
 450 455 460
 Thr Ala Phe Gly Val Lys Asp Glu Thr Ala Gly Val Thr Thr Leu Lys
 465 470 475 480
 Gly Ala Met Ala Val Met Asp Ile Ala Glu Thr Ala Ile Thr Asn Leu
 485 490 495
 Asp Gln Ile Arg Ala Asp Ile Gly Ser Val Gln Asn Gln Val Thr Ser
 500 505 510
 Thr Ile Asn Asn Ile Thr Val Thr Gln Val Asn Val Lys Ala Ala Glu
 515 520 525
 Ser Gln Ile Arg Asp Val Asp Phe Ala Ala Glu Ser Ala Asn Tyr Ser
 530 535 540
 Lys Ala Asn Ile Leu Ala Gln Ser Gly Ser Tyr Ala Met Ala Gln Ala
 545 550 555 560
 Asn Ser Val Gln Gln Asn Val Leu Arg Leu Leu Gln
 565 570

<210> 125

<211> 702

<212> DNA

<213> *Campylobacter jejuni*

<400> 125

atgaaaacaa ataatatett tatggcttta gccatagttt tggcaagttt gattctagct 60

tttggattta acaaggcttt aagtgatit aaacacttg aaagaagtgt aagtgtaaag 120

ggtttaagtc aaaaagaagt cgaageggat actttgatac ttccataaaa attcacaaga 180

```

tcaaacaaca atcttaca aa tttatacgaa gaactagaac aagataaaga aaatatcatc 240
aaatttttag aaaaacaagg cataaaagaa gatgagatca gctacaactc gccaaatatac 300
atagategtt taagcgatcc ttatagcaac gacactcaag ctgcataccg atacatagge 360
actgcgaatt tactcateta tactcaaaat gtaangcttg gaaaaagcat actagaaaac 420
atttcaagtc ttgcaaaatt tggatatagta acaaaaateg atgattatga tatagaatac 480
ctttacacca agctaaatga tataaaacca caaatgatag aagaagcaac gctcaatgct 540
agaaatgcag cgataaaatt cgcacaagac tcaaacagcc atctaggeaa gataaaaaag 600
gcttctcaag gacaatttag cattagcaac agagataaaa acacccctta tatcaaaacc 660
ataagagtgg tttctactat agaatactac ttaaaagact ga 702

```

<210> 126
 <211> 233
 <212> PRT
 <213> Campylobacter jejuni

<400> 126

Met Lys Thr Asn Asn Ile Phe Met Ala Leu Ala Ile Val Leu Ala Ser
1 5 10 15

Leu Ile Leu Ala Phe Gly Phe Asn Lys Ala Leu Ser Asp Phe Lys Thr
20 25 30

Leu Glu Arg Ser Val Ser Val Lys Gly Leu Ser Gln Lys Glu Val Glu
35 40 45

[0147]

Ala Asp Thr Leu Ile Leu Pro Ile Lys Phe Thr Arg Ser Asn Asn Asn
50 55 60

Leu Thr Asn Leu Tyr Glu Glu Leu Glu Gln Asp Lys Glu Asn Ile Ile
65 70 75 80

Lys Phe Leu Glu Lys Gln Gly Ile Lys Glu Asp Glu Ile Ser Tyr Asn
85 90 95

Ser Pro Asn Ile Ile Asp Arg Leu Ser Asp Pro Tyr Ser Asn Asp Thr
100 105 110

Gln Ala Ala Tyr Arg Tyr Ile Gly Thr Ala Asn Leu Leu Ile Tyr Thr
115 120 125

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

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

Leu Tyr Thr Lys Leu Asn Asp Ile Lys Pro Gln Met Ile Glu Glu Ala
165 170 175

Thr Leu Asn Ala Arg Asn Ala Ala Ile Lys Phe Ala Gln Asp Ser Asn
180 185 190

Ser His Leu Gly Lys Ile Lys Lys Ala Ser Gln Gly Gln Phe Ser Ile

	195	200	205
	Ser Asn Arg Asp Lys Asn Thr Pro Tyr Ile Lys Thr Ile Arg Val Val 210 215 220		
	Ser Thr Ile Glu Tyr Tyr Leu Lys Asp 225 230		
	<210> 127 <211> 837 <212> DNA <213> Campylobacter jejuni		
	<400> 127		
	atggaaaatc aaaaaaatga atttgatgat attatitttag aaaaagtaa taaaagtga	60	
	aaagtaaaaa aaattctttt acgagttatt gctttagtta ttttgttttt agctatcatg	120	
	atagttatga agcttattaa tggtagtggg gatgaaaata cgcaaaatca aagtgtattg	180	
	ccaagtgaac ciatagcaac tcaagacaat aacaatgata cttctitttg aagtatgcca	240	
	attacagata atacttcagc agaagatcna tttagggcat taagaaaaca atttcaagat	300	
	gaacaaaaa caacicaaaa tacaacaacc tctagttcaa alaacaafga tactacaaat	360	
	tttgetatgc ctgatcaaga agttccagca gaaccaacag caactacttc agcaaatacc	420	
	actccacaag caagtactcc taaacaagaa gtaacacaaa ctgcaaaatc taaagaagaa	480	
	gcaaaaaaac aaacagctgt aaaaaaagaa aaagaaagtg caaaacaaac ccctaaaaaa	540	
	gaacaaaatg caaatgattt atttaaaaaa gttgatgcta aacctgtaca tccaagtggg	600	
[0148]	ttagcatcgg gtattttatgt gcaaatittc tcagtaagta atttggatca aaaatcaaaa	660	
	gaacttgctt ctgtaaagca aaaaggitat gattataaac tttataaaac tacagttgga	720	
	agtaaagaaa ttaccaaggt tttaatagga ccatttgaaa aggcagatat tgcagcagaa	780	
	cttgctaaaa tccgtaagga tattgcaaaa gatgcttttt cttttacttt aaaatga	837	
	<210> 128 <211> 278 <212> PRT <213> Campylobacter jejuni		
	<400> 128		
	Met Glu Asn Gln Lys Asn Glu Phe Asp Asp Ile Ile Leu Glu Lys Ser 1 5 10 15		
	Asn Lys Ser Glu Lys Val Lys Lys Ile Leu Leu Arg Val Ile Ala Leu 20 25 30		
	Val Ile Leu Phe Leu Ala Ile Met Ile Val Met Lys Leu Ile Asn Gly 35 40 45		
	Ser Gly Asp Glu Asn Thr Gln Asn Gln Ser Val Leu Pro Ser Glu Pro 50 55 60		
	Ile Ala Thr Gln Asp Asn Asn Asn Asp Thr Ser Phe Glu Ser Met Pro 65 70 75 80		
	Ile Thr Asp Asn Thr Ser Ala Glu Asp Gln Phe Glu Ala Leu Arg Lys 85 90 95		

Gln Phe Gln Asp Glu Gln Asn Thr Thr Gln Asn Thr Thr Thr Ser Ser
 100 105 110
 Ser Asn Asn Asn Asp Thr Thr Asn Phe Ala Met Pro Asp Gln Glu Val
 115 120 125
 Pro Ala Glu Pro Thr Ala Thr Thr Ser Ala Asn Thr Thr Pro Gln Ala
 130 135 140
 Ser Thr Pro Lys Gln Glu Val Thr Gln Thr Ala Lys Ser Lys Glu Glu
 145 150 155 160
 Ala Lys Lys Gln Thr Ala Val Lys Lys Glu Lys Glu Ser Ala Lys Gln
 165 170 175
 Thr Pro Lys Lys Glu Gln Asn Ala Asn Asp Leu Phe Lys Asn Val Asp
 180 185 190
 Ala Lys Pro Val His Pro Ser Gly Leu Ala Ser Gly Ile Tyr Val Gln
 195 200 205
 Ile Phe Ser Val Ser Asn Leu Asp Gln Lys Ser Lys Glu Leu Ala Ser
 210 215 220
 Val Lys Gln Lys Gly Tyr Asp Tyr Lys Leu Tyr Lys Thr Thr Val Gly
 225 230 235 240
 Ser Lys Glu Ile Thr Lys Val Leu Ile Gly Pro Phe Glu Lys Ala Asp
 245 250 255
 Ile Ala Ala Glu Leu Ala Lys Ile Arg Lys Asp Ile Ala Lys Asp Ala
 260 265 270
 Phe Ser Phe Thr Leu Lys
 275

[0149]

<210> 129
 <211> 1479
 <212> DNA
 <213> Campylobacter jejuni

<400> 129
 atgaataaaa taatttcaat tagtgcata gcaagtttta ctctttgat ttcagcttgc 60
 tctttaagtc caaatTTaaa tattcccgaa gcaaactata gcattgataa taagcttgga 120
 gccttatctt gggaaaaaga aaacaatagc tctatcaca aaaattgggtg gaaagacttt 180
 gatgatgaaa atttaaataa agtgggtgat ttagcacita aaaataataa tgattTaaaa 240
 cttgccttca tacacatgga acaagctgct gctcaattag gtatagattt tagcagtttg 300
 ttgccaaaat ttgatgtag cgcaagcgga agtcgtgcaa aaacagctat aaatgtcca 360
 agcaatcgaa ctggggaagt aagttacggt aatgatttta aaatgggact taatttaage 420
 tatgaaatcg atctttgggg aaaatatcgc gatacatatc gcgectcaaa atcaggcttt 480
 aaagcaagtg agtatgatta tgaagctgca agacittctg ttatttcaaa tacagttcaa 540
 acttatTTta atcttgtaaa tgcctatgaa aatgaaaalg ctctTaaaga agccTataaa 600
 tctgcaaaag aaatttatag gattaatgat gaaaaatttc aagttgggtgc tntaggtgaa 660

```

tatgaacttg ctcaagcaag agccaactta gaaagtatgg ctttgcaata taatgaagca 720
aagttaaata aagaaaatta ccttaaagct ttaaaaattt taacttcaaa tgatttaaat 780
gacatacttt acaaaaaatca aagctatcaa gtitttaatc ttaaagaatt tgacattcca 840
actggaattt caagtaccat cttgcttcaa cgccagata ttggctcttc tttagaaaaa 900
ttaactcagc aaaattatct tgttggagta gctcgacagg ctttcttacc tagcctttct 960
ttaacaggat tatttgggatt tgaaagcggg gatttagata ccttgggtta aggaggttct 1020
aagacttggg atataggttg aaactttact ctgcctatit ttcattgggg tgaaatttac 1080
caaaatgtaa atttagccaa gcttaataaa gatgaagcct ttgtaaatta tcaaaatact 1140
tigattactg cttttggaga aattcgctat gctttagtag ctagaanaac tatacgctta 1200
caatacgata atgcacaagc aagcgaacaa tcttacaaaa gaatttatga aattgctaaa 1260
gaacgctatg atataggaga aatgtctttg caagattatt tagaggcacg tcaaaatttg 1320
cttaatgctg cggttgcttt taataatatt aaatatcttt atgccaattc catagtagat 1380
gtaatcaaag catttgggtg aggatttgag caaagtgaag atacgagtaa aatatataaa 1440
gaagaatcaa aaaattttaga tatgtcttti agagaatag 1479

```

<210> 130
 <211> 492
 <212> PRT
 <213> Campylobacter jejuni

<400> 130

[0150]

```

Met Asn Lys Ile Ile Ser Ile Ser Ala Ile Ala Ser Phe Thr Leu Leu
1          5          10          15

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

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

Asn Ser Ser Ile Thr Lys Asn Trp Trp Lys Asp Phe Asp Asp Glu Asn
50        55        60

Leu Asn Lys Val Val Asp Leu Ala Leu Lys Asn Asn Asn Asp Leu Lys
65        70        75        80

Leu Ala Phe Ile His Met Glu Gln Ala Ala Ala Gln Leu Gly Ile Asp
85          90          95

Phe Ser Ser Leu Leu Pro Lys Phe Asp Gly Ser Ala Ser Gly Ser Arg
100       105       110

Ala Lys Thr Ala Ile Asn Ala Pro Ser Asn Arg Thr Gly Glu Val Ser
115       120       125

Tyr Gly Asn Asp Phe Lys Met Gly Leu Asn Leu Ser Tyr Glu Ile Asp
130       135       140

Leu Trp Gly Lys Tyr Arg Asp Thr Tyr Arg Ala Ser Lys Ser Gly Phe
145       150       155       160

```

[0151]

Lys Ala Ser Glu Tyr Asp Tyr Glu Ala Ala Arg Leu Ser Val Ile Ser
 165 170 175
 Asn Thr Val Gln Thr Tyr Phe Asn Leu Val Asn Ala Tyr Glu Asn Glu
 180 185 190
 Asn Ala Leu Lys Glu Ala Tyr Lys Ser Ala Lys Glu Ile Tyr Arg Ile
 195 200 205
 Asn Asp Glu Lys Phe Gln Val Gly Ala Val Gly Glu Tyr Glu Leu Ala
 210 215 220
 Gln Ala Arg Ala Asn Leu Glu Ser Met Ala Leu Gln Tyr Asn Glu Ala
 225 230 235 240
 Lys Leu Asn Lys Glu Asn Tyr Leu Lys Ala Leu Lys Ile Leu Thr Ser
 245 250 255
 Asn Asp Leu Asn Asp Ile Leu Tyr Lys Asn Gln Ser Tyr Gln Val Phe
 260 265 270
 Asn Leu Lys Glu Phe Asp Ile Pro Thr Gly Ile Ser Ser Thr Ile Leu
 275 280 285
 Leu Gln Arg Pro Asp Ile Gly Ser Ser Leu Glu Lys Leu Thr Gln Gln
 290 295 300
 Asn Tyr Leu Val Gly Val Ala Arg Thr Ala Phe Leu Pro Ser Leu Ser
 305 310 315 320
 Leu Thr Gly Leu Leu Gly Phe Glu Ser Gly Asp Leu Asp Thr Leu Val
 325 330 335
 Lys Gly Gly Ser Lys Thr Trp Asn Ile Gly Gly Asn Phe Thr Leu Pro
 340 345 350
 Ile Phe His Trp Gly Glu Ile Tyr Gln Asn Val Asn Leu Ala Lys Leu
 355 360 365
 Asn Lys Asp Glu Ala Phe Val Asn Tyr Gln Asn Thr Leu Ile Thr Ala
 370 375 380
 Phe Gly Glu Ile Arg Tyr Ala Leu Val Ala Arg Lys Thr Ile Arg Leu
 385 390 395 400
 Gln Tyr Asp Asn Ala Gln Ala Ser Glu Gln Ser Tyr Lys Arg Ile Tyr
 405 410 415
 Glu Ile Ala Lys Glu Arg Tyr Asp Ile Gly Glu Met Ser Leu Gln Asp
 420 425 430
 Tyr Leu Glu Ala Arg Gln Asn Trp Leu Asn Ala Ala Val Ala Phe Asn
 435 440 445
 Asn Ile Lys Tyr Ser Tyr Ala Asn Ser Ile Val Asp Val Ile Lys Ala
 450 455 460

Phe Gly Gly Gly Phe Glu Gln Ser Glu Asp Thr Ser Lys Asn Ile Lys
465 470 475 480

Glu Glu Ser Lys Asn Leu Asp Met Ser Phe Arg Glu
485 490

<210> 131
<211> 2091
<212> DNA
<213> Campylobacter jejuni

[0152]

<400> 131
atgaaaaaaa tatgtctatc agtttgcgcc attggtctct taagctccaa tgcataatcg 60
caaaatgtag aactagatag ctcaatcggt agtgcttctg gctttaccca agataattaaa 120
gaagctctcg ctactatcaa tgitatcact asaaaagaat tacaagtaa gccttataga 180
gatgttcgag aggetatcgc agatatccca ggcgttgatt tatatgctag caagggaanaa 240
acaggttcct ataatatcac tatgaggggt attactggat atactttggt ttgattgat 300
ggcgctcgtc agggatttgg cggagagggt ggccctaata gttttaatga aatttcaaat 360
ttttcttacc ctccgallc tagtatagaa aggalagaag ttatataaagg tctatgagi 420
actttatatg gctetgaage tttaggcggg gtggtaaata tcattaccaaaaagtaagt 480
gataaatggg aaacttctgt aagtttggat gctcttttaa atgaaaaata agattggggt 540
aatacttatg gaacaagtat ttattctagt ggtccttga tgaatgacaa attgggtcta 600
acacttcgat ttagagaatt ttacagacag caatctaata ttgaatttac aaatggaagt 660
ggacaaaagag ttcaaggaga tcaagctcaa agtcctacaa aggcaataa ttttaacata 720
ggaacaagaa ttagttatit ggctaagtat tataataact ttatatitga tatagattit 780
tcaagaatec attatgataa taaacaaggt caattaggaa ccatcacaaag tccaggtaga 840
acaccaggta gcttaacggg tggttatgca gatattatgg aagttgataa atttgigact 900
tatttaagtc atgagggtgt ttatgaaaaa tttctatca cttctgggtt gcaatataat 960
agagttagca atgatggccg cgaagtcgta gggcaatcta cacagccgtt ttggggagaa 1020
aatagagata tagtcgcaga agatattatc ttagatacta agtctgttat tctctagga 1080
caaagtcata ttttaagcgt aggcggtgaa tataggcttg aaaaaatgca agataaata 1140
gctagtctca ctaattitga tcagtattta ttggcaattt ttgcagagga tgagtatagt 1200
ataaaaagatg atttaagact tacttttga gcaagatata atcatcatga aatttttga 1260
aacaatgttt cgccaagagc ttaigtgggt tataatccta ctaatgagct tactttaaaa 1320
ggcggtgtat ctacaggett tagaaccctt tatgcaaac gtttgataaa tggaaacttac 1380
agttatagtg gccaaaggcag atttctaca tatggaaatc ctgattttaa agaagagaca 1440
tctttaaact atgaaatagc agctatttac aataatgatt tattttatgt ttacgaaca 1500
ggttttttaa cgaattttta agataaaatt tcaagtcaaa gttataataa tagcgaacca 1560
atcccaggta ttggcacttg tgatgetgat agatgttcta gagcaatcna tentggcaag 1620
gttgaataca aaggigtaga acitggagca gggataagcc ctcttgataa tttaaatga 1680
aattttgctt atacttatct tgatactgaa gttaaagaag cacaagatag aagtgtgata 1740
gglaaacctg aacaagalag ttlaaaacac aataatcatgt laaaaaccga atacagcttc 1800
tataataaaa ttacccttg gataaaagcg gattggcaaa tagatcgcta tatgggtgat 1860

actaatatca atagagaata ttacaaggat atcttttttag cttccaatggg tgtgcgttat 1920
 gatatcaaca aacaatggag tatcaatgca gctattttata atcttttttga caaaagcittt 1980
 acaaatggct gggaatctta tgcaatggg agtggttagca cttgggtaaa tacctataac 2040
 cgtatagaag aaggaagaag aatgtataatt tctatcaatg gtaactttta a 2091

<210> 132
 <211> 696
 <212> PRT
 <213> Campylobacter jejuni

<400> 132

Met Lys Lys Ile Cys Leu Ser Val Cys Ala Ile Gly Leu Leu Ser Ser
 1 5 10 15

Asn Ala Ile Ser Gln Asn Val Glu Leu Asp Ser Ser Ile Val Ser Ala
 20 25 30

Ser Gly Phe Thr Gln Asp Ile Lys Glu Ala Pro Ala Thr Ile Asn Val
 35 40 45

Ile Thr Lys Lys Glu Leu Gln Ser Lys Pro Tyr Arg Asp Val Ala Glu
 50 55 60

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

[0153]

Thr Gly Ser Tyr Asn Ile Thr Met Arg Gly Ile Thr Gly Tyr Thr Leu
 85 90 95

Val Leu Ile Asp Gly Arg Arg Gln Gly Ile Gly Gly Glu Val Gly Pro
 100 105 110

Asn Gly Phe Asn Glu Ile Ser Asn Ser Phe Leu Pro Pro Ile Ser Ser
 115 120 125

Ile Glu Arg Ile Glu Val Ile Lys Gly Pro Met Ser Thr Leu Tyr Gly
 130 135 140

Ser Glu Ala Leu Gly Gly Val Val Asn Ile Ile Thr Lys Lys Val Ser
 145 150 155 160

Asp Lys Trp Glu Thr Ser Val Ser Leu Asp Ala Leu Leu Asn Glu Asn
 165 170 175

Lys Asp Trp Gly Asn Thr Tyr Gly Thr Ser Ile Tyr Ser Ser Gly Pro
 180 185 190

Leu Met Asn Asp Lys Leu Gly Leu Thr Leu Arg Phe Arg Glu Phe Tyr
 195 200 205

Arg Gln Gln Ser Asn Val Glu Phe Thr Asn Gly Ser Gly Gln Arg Val
 210 215 220

Gln Gly Asp Gln Ala Gln Ser Pro Thr Lys Ala Asn Asn Phe Asn Ile
 225 230 235 240

[0154]

Gly Thr Arg Ile Ser Tyr Leu Ala Asn Asp Tyr Asn Thr Phe Ile Phe
 245 250 255
 Asp Ile Asp Phe Ser Arg Asn His Tyr Asp Asn Lys Gln Gly Gln Leu
 260 265 270
 Gly Thr Ile Thr Ser Pro Gly Arg Thr Pro Gly Ser Leu Thr Gly Gly
 275 280 285
 Tyr Ala Asp Ile Met Glu Val Asp Lys Phe Val Thr Tyr Leu Ser His
 290 295 300
 Glu Gly Val Tyr Glu Asn Phe Ser Ile Thr Ser Gly Leu Gln Tyr Asn
 305 310 315 320
 Arg Val Ser Asn Asp Gly Arg Glu Val Val Gly Gln Ser Thr Gln Pro
 325 330 335
 Phe Leu Gly Glu Asn Arg Asp Ile Val Ala Glu Asp Ile Ile Leu Asp
 340 345 350
 Thr Lys Ser Val Ile Pro Leu Gly Gln Ser His Ile Leu Ser Val Gly
 355 360 365
 Gly Glu Tyr Arg Leu Glu Lys Met Gln Asp Lys Ile Ala Ser Pro Thr
 370 375 380
 Asn Phe Asp Gln Tyr Leu Leu Ala Ile Phe Ala Glu Asp Glu Tyr Ser
 385 390 395 400
 Ile Lys Asp Asp Leu Arg Leu Thr Phe Gly Ala Arg Tyr Asn His His
 405 410 415
 Glu Ile Phe Gly Asn Asn Val Ser Pro Arg Ala Tyr Val Val Tyr Asn
 420 425 430
 Pro Thr Asn Glu Leu Thr Leu Lys Gly Gly Val Ser Thr Gly Phe Arg
 435 440 445
 Thr Pro Tyr Ala Asn Arg Leu Ile Asn Gly Thr Tyr Ser Tyr Ser Gly
 450 455 460
 Gln Gly Arg Phe Pro Thr Tyr Gly Asn Pro Asp Leu Lys Glu Glu Thr
 465 470 475 480
 Ser Leu Asn Tyr Glu Ile Ala Ala Ile Tyr Asn Asn Asp Leu Phe Tyr
 485 490 495
 Val Ser Ala Thr Gly Phe Leu Thr Asn Phe Lys Asp Lys Ile Ser Ser
 500 505 510
 Gln Ser Tyr Asn Asn Ser Glu Pro Ile Pro Gly Ile Gly Thr Cys Asp
 515 520 525
 Ala Asp Arg Cys Ser Arg Ala Ile Asn His Gly Lys Val Glu Tyr Lys
 530 535 540

Gly Val Glu Leu Gly Ala Gly Ile Ser Pro Leu Asp Asn Leu Asn Val
 545 550 555 560
 Asn Phe Ala Tyr Thr Tyr Leu Asp Thr Glu Val Lys Glu Ala Gln Asp
 565 570 575
 Arg Ser Val Ile Gly Lys Pro Glu Gln Asp Ser Leu Lys His Asn Ile
 580 585 590
 Met Leu Lys Thr Glu Tyr Ser Phe Tyr Asn Lys Ile Thr Pro Trp Ile
 595 600 605
 Lys Gly Glu Trp Gln Ile Asp Arg Tyr Met Gly Asp Thr Asn Ile Asn
 610 615 620
 Arg Glu Tyr Tyr Lys Asp Ile Phe Leu Ala Ser Met Gly Val Arg Tyr
 625 630 635 640
 Asp Ile Asn Lys Gln Trp Ser Ile Asn Ala Ala Ile Tyr Asn Leu Phe
 645 650 655
 Asp Lys Ser Phe Thr Asn Gly Trp Glu Ser Tyr Ala Ser Gly Ser Gly
 660 665 670
 Ser Thr Trp Val Asn Thr Tyr Asn Arg Ile Glu Glu Gly Arg Arg Met
 675 680 685
 Tyr Ile Ser Ile Asn Gly Asn Phe
 690 695

[0155]

<210> 133
 <211> 573
 <212> DNA
 <213> Campylobacter jejuni
 <400> 133
 atgaaaaaag ttttattgag ttcatlgtgt gcggtgtctt tgttaagcac aggtttgttt 60
 gctaangaat atacttttaga taaagcacat acagatgtag gttttaaaat caaacattta 120
 caaattagca atgtaaaagg aaatttcaaa gattattctg cggatgattga ttttgatcct 180
 gcgagtgtctg aattttaaaaa gcttgatgta actataaaaa tcgcatctgt aaatacagaa 240
 aatcaaacaa gagataatca cttacaacaa gatgattttt tcaaagcaaa aaaataatct 300
 gatatgactt ttacaatgaa aaaatatgaa aaaatcgata atgaaaaagg caaaatgaca 360
 ggaactttta ctafagctgg agtttctaaa gatafcgttt tagatgcitga aatcgggcgt 420
 gtagctaaag gcaaagatgg aaaagaaaaa ataggatttt ctttaaatgg aaaaatcaaa 480
 cgetctgatt ttaaatttgc aacaagtact tcaactatta ctttaagtga tgatattaat 540
 ttaaataatcg aagtgaagc gaacgaaaaa taa 573
 <210> 134
 <211> 190
 <212> PRT
 <213> Campylobacter jejuni
 <400> 134
 Met Lys Lys Val Leu Leu Ser Ser Leu Val Ala Val Ser Leu Leu Ser

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

[0156]

<210> 135
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 135

Asn Lys Gly Val Ile Ser Ala Lys
1 5

<210> 136
<211> 65
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<220>
<221> MISC_FEATURE
<222> (2)..(2)
<223> X is R or I

<220>

	<221> MISC_FEATURE
	<222> (3)..(3)
	<223> X is F or absent
	<220>
	<221> MISC_FEATURE
	<222> (4)..(4)
	<223> X is D or absent
	<220>
	<221> MISC_FEATURE
	<222> (7)..(7)
	<223> X is V or I
	<220>
	<221> MISC_FEATURE
	<222> (12)..(12)
	<223> X is N or D
	<220>
	<221> MISC_FEATURE
	<222> (24)..(24)
	<223> X is N or S
	<220>
	<221> MISC_FEATURE
	<222> (27)..(27)
	<223> X is I or V
	<220>
	<221> MISC_FEATURE
	<222> (33)..(33)
	<223> X is S or N
	<220>
[0157]	<221> MISC_FEATURE
	<222> (38)..(38)
	<223> X is F or C
	<220>
	<221> MISC_FEATURE
	<222> (43)..(43)
	<223> X is F or L
	<220>
	<221> MISC_FEATURE
	<222> (50)..(50)
	<223> X is T, A or K
	<220>
	<221> MISC_FEATURE
	<222> (55)..(55)
	<223> X is P, L or S
	<220>
	<221> MISC_FEATURE
	<222> (57)..(57)
	<223> X is D or E
	<220>
	<221> MISC_FEATURE
	<222> (58)..(58)
	<223> X is I or V
	<220>
	<221> MISC_FEATURE
	<222> (59)..(59)
	<223> X is L or Y
	<220>
	<221> MISC_FEATURE
	<222> (61)..(61)
	<223> X is A, T or S
	<220>
	<221> MISC_FEATURE

[0158]

<222> (62)..(62)
 <223> X is N, D or K

 <220>
 <221> MISC_FEATURE
 <222> (63)..(63)
 <223> X is E or G

 <220>
 <221> MISC_FEATURE
 <222> (65)..(65)
 <223> X is K or N

 <400> I36
 Met Xaa Xaa Xaa Phe Phe Xaa Ser Lys Arg Leu Xaa Ile Ser Arg Asn
 1 5 10 15

 Lys Ala Leu Glu Leu Ile Glu Xaa Glu Glu Xaa Leu Leu Asn Gly Lys
 20 25 30

 Xaa Phe Lys Ala Ser Xaa Asp Val Lys Asn Xaa Leu Glu Asn Leu Lys
 35 40 45

 Lys Xaa Gln Asp Leu Asn Xaa Glu Xaa Xaa Xaa Leu Xaa Xaa Xaa Leu
 50 55 60

 Xaa
 65

 <210> I37
 <211> I25
 <212> PRT
 <213> Artificial Sequence

 <220>
 <223> Synthetic

 <220>
 <221> MISC_FEATURE
 <222> (1)..(1)
 <223> X is D or E

 <220>
 <221> MISC_FEATURE
 <222> (3)..(3)
 <223> X is D or E

 <220>
 <221> MISC_FEATURE
 <222> (6)..(6)
 <223> X is A or T

 <220>
 <221> MISC_FEATURE
 <222> (10)..(10)
 <223> X is E, K or absent

 <220>
 <221> MISC_FEATURE
 <222> (11)..(11)
 <223> X is T or absent

 <220>
 <221> MISC_FEATURE
 <222> (13)..(13)
 <223> X is N, S or I

 <220>
 <221> MISC_FEATURE

[0159]

```

<222> (16).. (16)
<223> X is L or I

<220>
<221> MISC FEATURE
<222> (37).. (37)
<223> X is H or Y

<220>
<221> MISC FEATURE
<222> (44).. (44)
<223> X is V or I

<220>
<221> MISC FEATURE
<222> (53).. (53)
<223> X is R or H

<220>
<221> MISC FEATURE
<222> (61).. (61)
<223> X is K or E

<220>
<221> MISC FEATURE
<222> (77).. (77)
<223> X is A or T

<220>
<221> MISC FEATURE
<222> (87).. (87)
<223> X is A, V or T

<220>
<221> MISC FEATURE
<222> (95).. (95)
<223> X is K or E

<220>
<221> MISC FEATURE
<222> (99).. (125)
<223> Amino Acids are optionally absent

<220>
<221> MISC FEATURE
<222> (107).. (107)
<223> X is N or D

<220>
<221> MISC FEATURE
<222> (115).. (115)
<223> X is N or S

<220>
<221> MISC FEATURE
<222> (122).. (122)
<223> X is N or D

<220>
<221> MISC FEATURE
<222> (123).. (123)
<223> X is K or E

<400> 137

Xaa Lys Xaa Phe Leu Xaa Phe Leu Asn Xaa Xaa Lys Xaa Glu Asn Xaa
1          5          10          15

Ala Leu Ala Glu Asn Glu Phe Leu Gly Val Asp His Ile Ser Phe Leu
20          25          30

Gly Phe Leu Leu Xaa Arg Trp Asn Phe Asp Asp Xaa Leu Ile Glu Ser
35          40          45

```

Ile Cys Phe Val Xaa Thr Pro His Ala Ala Arg Glu Xaa Val Lys Lys
 50 55 60

Ser Ala Tyr Ala Leu Ala Ile Thr Asp His Leu Phe Xaa Pro His Asp
 65 70 75 80

Gly Ser Ser Pro Phe Asn Xaa Lys Ala Ala Val Ala Leu Leu Xaa Glu
 85 90 95

Ala Lys Thr Gln Gly Ile Asn Phe Asp Leu Xaa Asn Leu Leu Ser Lys
 100 105 110

Leu Pro Xaa Lys Ala Lys Glu Asn Leu Xaa Xaa Glu Asp
 115 120 125

<210> 138
 <211> 102
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic

<220>
 <221> MISC_FEATURE
 <222> (1)..(1)
 <223> X is D or E

[0160]

<220>
 <221> MISC_FEATURE
 <222> (3)..(3)
 <223> X is D or E

<220>
 <221> MISC_FEATURE
 <222> (6)..(6)
 <223> X is A or T

<220>
 <221> MISC_FEATURE
 <222> (10)..(10)
 <223> X is E, K or absent

<220>
 <221> MISC_FEATURE
 <222> (11)..(11)
 <223> X is T or absent

<220>
 <221> MISC_FEATURE
 <222> (13)..(13)
 <223> X is N, S, or I

<220>
 <221> MISC_FEATURE
 <222> (16)..(16)
 <223> X is L or I

<220>
 <221> MISC_FEATURE
 <222> (37)..(37)
 <223> X is H or Y

<220>
 <221> MISC_FEATURE
 <222> (44)..(44)
 <223> X is V or I

<220>

<221> MISC_FEATURE
<222> (53)..(53)
<223> X is R or H

<220>
<221> MISC_FEATURE
<222> (61)..(61)
<223> X is K or E

<220>
<221> MISC_FEATURE
<222> (77)..(77)
<223> X is A or T

<220>
<221> MISC_FEATURE
<222> (87)..(87)
<223> X is A, V or T

<220>
<221> MISC_FEATURE
<222> (95)..(95)
<223> X is K or E

<220>
<221> MISC_FEATURE
<222> (99)..(102)
<223> Amino Acids are optionally absent

<400> 138

Xaa Lys Xaa Phe Leu Xaa Phe Leu Asn Xaa Xaa Lys Xaa Glu Asn Xaa
1 5 10 15

Ala Leu Ala Glu Asn Glu Phe Leu Gly Val Asp His Ile Ser Phe Leu
20 25 30

Gly Phe Leu Leu Xaa Arg Trp Asn Phe Asp Asp Xaa Leu Ile Glu Ser
35 40 45

Ile Cys Phe Val Xaa Thr Pro His Ala Ala Arg Glu Xaa Val Lys Lys
50 55 60

Ser Ala Tyr Ala Leu Ala Ile Thr Asp His Leu Phe Xaa Pro His Asp
65 70 75 80

Gly Ser Ser Pro Phe Asn Xaa Lys Ala Ala Val Ala Leu Leu Xaa Glu
85 90 95

Ala Lys Asn Ser Arg Asn
100

<210> 139
<211> 27
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<220>
<221> MISC_FEATURE
<222> (9)..(9)
<223> X is N or D

<220>
<221> MISC_FEATURE
<222> (17)..(17)

[0161]

<223> X is N or S

<220>

<221> MISC_FEATURE

<222> (24).. (24)

<223> X is N or D

<220>

<221> MISC_FEATURE

<222> (25).. (25)

<223> X is K or E

<400> 139

Thr Gln Gly Ile Asn Phe Asp Leu Xaa Asn Leu Leu Ser Lys Leu Pro
1 5 10 15

Xaa Lys Ala Lys Glu Asn Leu Xaa Xaa Glu Asp
20 25

<210> 140

<211> 4

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic

<400> 140

Asn Ser Arg Asn
1

[0162]

<210> 141

<211> 450

<212> DNA

<213> Campylobacter jejuni

<400> 141

atgtcagtta caaaacaatt attacaaatg caagcagatg ctcacattt atgggttaaa 60
tttcataatt atcactggaa tglaaaagg ttgcaatttt ttctataca cgaglacaca 120
gaaaaagctt atgaagaaat gccagaactt ttgatagtt gfgctgaaag agttttacaa 180
cttggcgaaa aagctatcac ttgccaaaaa gtittaatgg aaaatgcaaa aagtcacaaa 240
gttgcaaaag attgctttac tccgcttgaa gtcatagaac tgaatcaaca agattatgaa 300
tatcttttag cagaatttaa aaactcaat gaagcagcag aaaaaganag tgatactaca 360
acagctgett ttgcacaaga aaatatcgca aaatatgaaa aaagtetttg gatgataggc 420
gctactttac aaggctgcttg caaaatgtaa 450

<210> 142

<211> 149

<212> PRT

<213> Campylobacter jejuni

<400> 142

Met Ser Val Thr Lys Gln Leu Leu Gln Met Gln Ala Asp Ala His His
1 5 10 15

Leu Trp Val Lys Phe His Asn Tyr His Trp Asn Val Lys Gly Leu Gln
20 25 30

Phe Phe Ser Ile His Glu Tyr Thr Glu Lys Ala Tyr Glu Glu Met Ala
35 40 45

Glu Leu Phe Asp Ser Cys Ala Glu Arg Val Leu Gln Leu Gly Glu Lys
50 55 60

Ala Ile Thr Cys Gln Lys Val Leu Met Glu Asn Ala Lys Ser Pro Lys
65 70 75 80

Val Ala Lys Asp Cys Phe Thr Pro Leu Glu Val Ile Glu Leu Ile Lys
85 90 95

[0163] Gln Asp Tyr Glu Tyr Leu Leu Ala Glu Phe Lys Lys Leu Asn Glu Ala
100 105 110

Ala Glu Lys Glu Ser Asp Thr Thr Thr Ala Ala Phe Ala Gln Glu Asn
115 120 125

Ile Ala Lys Tyr Glu Lys Ser Leu Trp Met Ile Gly Ala Thr Leu Gln
130 135 140

Gly Ala Cys Lys Met
145

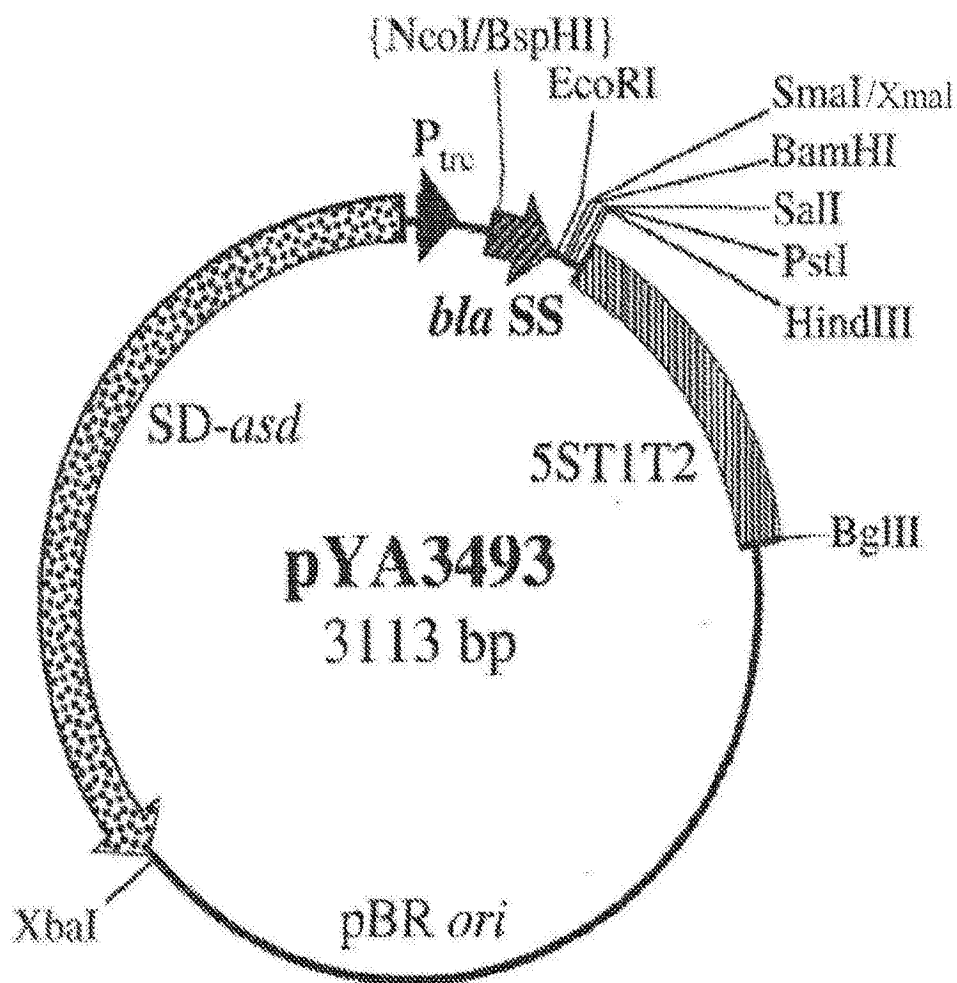


图1