



(12) 发明专利



(10) 授权公告号 CN 114375335 B

(45) 授权公告日 2025. 07. 08

(21) 申请号 202080064288.2

(22) 申请日 2020.07.17

(65) 同一申请的已公布的文献号
申请公布号 CN 114375335 A

(43) 申请公布日 2022.04.19

(30) 优先权数据
62/876,275 2019.07.19 US

(85) PCT国际申请进入国家阶段日
2022.03.14

(86) PCT国际申请的申请数据
PCT/US2020/042553 2020.07.17

(87) PCT国际申请的公布数据
W02021/016086 EN 2021.01.28

(73) 专利权人 成对植物服务股份有限公司
地址 美国北卡罗来纳

(72) 发明人 S·L·顾非 J·M·沃茨

(74) 专利代理机构 中国贸促会专利商标事务所
有限公司 11038
专利代理师 傅宇昌

(51) Int.Cl.
C12N 9/22 (2006.01)
C12N 9/78 (2006.01)
C12N 15/62 (2006.01)

(56) 对比文件
CN 116391034 A, 2023.07.04

审查员 倪志远

权利要求书3页 说明书34页
序列表269页 附图26页

(54) 发明名称
经优化的蛋白质连接体以及使用方法

(57) 摘要
本发明涉及肽连接体和包含被设计成用于优化其中所包含的蛋白质的活性的连接体的融合蛋白,以及用于使用其的方法。本发明进一步涉及新设计的基于Cas12a的胞嘧啶碱基编辑器。

A.

APOBEC1	L1	Cas12a	GS	UGI
APOBEC1	GS-XTEN-GS	Cas12a	L2	UGI

1. 多肽,其由SEQ ID NO: 1的氨基酸序列组成。
2. 融合蛋白,其包含Cas12a结构域、目的多肽和SEQ ID NO: 1的氨基酸序列,其中所述融合蛋白的结构如下:载脂蛋白B mRNA编辑复合物(APOBEC)结构域 - SEQ ID NO: 1 - Cas12a结构域 - GS连接体 - 尿嘧啶-DNA糖基化酶抑制剂(UGI),以N-末端至C-末端。
3. 权利要求2的融合蛋白,其中所述APOBEC结构域为大鼠或人APOBEC结构域。
4. 权利要求3的融合蛋白,其中所述APOBEC结构域为SEQ ID NO: 46的氨基酸序列。
5. 权利要求3的融合蛋白,其中所述APOBEC结构域为SEQ ID NO: 47的氨基酸序列。
6. 权利要求2的融合蛋白,其中所述GS连接体为(GSS)_n、S(GGS)_n、SGGS、SGGSGGSGGS、SGSETPGTSESATPES或SGGSSGGSSGSETPGTSESATPESSGGSSGGS。
7. 多核苷酸,其编码权利要求2至6中任一项的融合蛋白。
8. 权利要求7的多核苷酸,其中所述多核苷酸进行了密码子优化以用于在生物中表达。
9. 权利要求8的多核苷酸,其中所述生物为动物、植物、真菌、古细菌或细菌。
10. 复合物,其包含权利要求2至6中任一项的融合蛋白,和指导核酸。
11. 核酸构建体,其编码权利要求10的复合物。
12. 组合物,其包含权利要求2至6中任一项的融合蛋白,和指导核酸。
13. 表达盒或载体,其包含权利要求7至9中任一项的多核苷酸或者权利要求11的核酸构建体。
14. V型成簇规律间隔短回文重复序列相关(CRISPR-Cas)系统,其包含:
 - (a) 融合蛋白,其包含Cas12a结构域、由SEQ ID NO: 1的氨基酸序列组成的连接体和目的多肽,其中所述Cas12a结构域经由SEQ ID NO: 1的氨基酸序列与所述目的多肽相连接,并且其中所述融合蛋白为权利要求2至6中任一项的融合蛋白;或者编码所述融合蛋白的核酸;和
 - (b) 指导核酸,其包含间隔子序列和重复序列,其中所述指导核酸能够与所述融合蛋白的Cas12a结构域形成复合物,并且所述间隔子序列能够与靶核酸杂交,从而将所述Cas12a结构域和所述目的多肽引导至所述靶核酸,由此所述系统能够修饰或调节所述靶核酸。
15. 权利要求14的系统,其中将(a)和(b)包含在一个或多个表达盒和/或载体中。
16. 细胞,其包含权利要求7至9中任一项的多核苷酸、权利要求11的核酸构建体、权利要求13的表达盒或载体或者权利要求14至15中任一项的系统,其中所述细胞既不属于植物品种也不属于动物品种。
17. 修饰靶核酸的方法,其包括使所述靶核酸与下述项目相接触:
 - (a) (i) 权利要求2至6中任一项的融合蛋白,和(a) (ii) 指导核酸;
 - (b) 权利要求10的复合物,和指导核酸;
 - (c) 组合物,其包含权利要求2至6中任一项的融合蛋白和指导核酸;和/或
 - (d) 权利要求14的系统,从而修饰靶核酸,
其中所述方法不是疾病治疗方法。
18. 修饰靶核酸的方法,其包括在一定条件下使包含所述靶核酸的细胞或无细胞系统与下述项目相接触:

(a) (i) 编码权利要求2至6中任一项的融合蛋白的多核苷酸,或者包含其的表达盒或载体,和(a) (ii) 指导核酸,或者包含其的表达盒或载体;和/或

(b) 编码权利要求10的复合物的核酸构建体,或者包含其的表达盒或载体,从而修饰靶核酸,

所述条件为这样的条件,其中所述融合蛋白被表达并且与所述指导核酸形成复合物,所述复合物与所述靶核酸杂交,

其中所述方法不是疾病治疗方法。

19. 编辑靶核酸的方法,其包括使所述靶核酸与下述项目相接触:

(a) (i) 权利要求2至6中任一项的融合蛋白,和(a) (ii) 指导核酸;

(b) 权利要求10的复合物;

(c) 组合物,其包含权利要求2至6中任一项的融合蛋白和指导核酸;和/或

(d) 权利要求14的系统,

其中所述胞嘧啶脱氨酶结构域将在所述靶核酸中的胞嘧啶(C)转变为胸腺嘧啶(T),从而编辑所述靶核酸以产生突变,

其中所述方法不是疾病治疗方法。

20. 编辑靶核酸的方法,其包括在一定条件下使包含所述靶核酸的细胞或无细胞系统与下述项目相接触:

(a) (i) 编码权利要求2至6中任一项的融合蛋白的多核苷酸,或者包含其的表达盒或载体,和(a) (ii) 指导核酸,或者包含其的表达盒或载体;

(b) 编码权利要求10的复合物的核酸构建体,或者包含其的表达盒或载体;和/或

(c) 权利要求15的系统,

所述条件为这样的条件,其中所述融合蛋白被表达并且与所述指导核酸形成复合物,所述复合物与所述靶核酸杂交,

其中所述胞嘧啶脱氨酶结构域将在所述靶核酸中的胞嘧啶(C)转变为胸腺嘧啶(T),从而编辑所述靶核酸,

其中所述方法不是疾病治疗方法。

21. 权利要求19或20的方法,其中所述点突变为在所述靶核酸的有义链中的C→T转变,或者在所述靶核酸的反义链中的G→A转变。

22. 试剂盒,其包含权利要求2至6中任一项的融合蛋白。

23. 权利要求22的试剂盒,其进一步包含关于其使用的说明书。

24. 试剂盒,其包含权利要求7至9中任一项的多核苷酸和/或包含其的表达盒或载体。

25. 权利要求24的试剂盒,其进一步包含关于其使用的说明书。

26. 权利要求22至25中任一项的试剂盒,其进一步包含Cas12a指导核酸和/或包含其的表达盒或载体。

27. 权利要求26的试剂盒,其中所述指导核酸包含用于将与靶核酸序列相同或互补的核酸序列克隆到所述指导核酸的主链中的克隆位点。

28. 权利要求22至23中任一项的试剂盒,其中所述融合蛋白进一步包含一个或多个核定位信号。

29. 权利要求24至25中任一项的试剂盒,其中所述多核苷酸进一步编码一个或多个选

择标记。

30. 权利要求24至25中任一项的试剂盒,其中所述多核苷酸为mRNA并且编码一个或多个在所编码的融合蛋白之内的内含子。

经优化的蛋白质连接体以及使用方法

[0001] 关于电子提交序列表的声明

[0002] 代替纸质副本,提供了以ASCII文本格式的序列表,其按照37 C.F.R. §1.821递交,名称为1499-6W0_ST25.txt,大小为727,526个字节,于2020年7月17日生成,并且经由EFS-Web提交。该序列表通过关于其公开内容在说明书中提及而特此合并入本文。

[0003] 优先权声明

[0004] 本申请按照35 U.S.C. §119(e) 要求于2019年7月19日提交的美国临时申请号62/876,275 (其整个内容通过提及而合并入本文) 的权益。

发明领域

[0005] 本发明涉及肽连接体和包含被设计成用于优化其中所包含的蛋白质的活性的连接体的融合蛋白,以及用于使用其的方法。本发明进一步涉及新设计的基于Cas12a的胞嘧啶碱基编辑器。

[0006] 发明背景

[0007] 在过去六年中,基于CRISPR的基因编辑工具(特别是基于Cas9的那些)已变得越来越流行。虽然早期工具依赖于Cas9在DNA中生成平端双链断裂的能力以及双链断裂修复机制例如同源重组和非同源末端连接,但是已经开发出了更新的方法,其主要使用该核酸酶的经修饰的版本作为关于其他经共价连接的效应蛋白质的靶向工具。值得注意的是,通过将Cas9连接至脱氨酶结构域而开发出了第一个基于Cas9的碱基编辑器(参见,例如, Gaudelli等人, Nature 551:464-471 (2017))。最初的胞嘧啶碱基编辑器通过使用基于先前发表的非结构化XTEN蛋白的连接体将大鼠APOBEC1结构域(载脂蛋白B mRNA编辑酶)(其在RNA和DNA两者中使胞嘧啶脱氨为尿嘧啶)与Cas9的N-末端相连接来建立(Komor等人, Nature 533(7603):420-424 (2016))。将尿嘧啶-DNA糖基化酶抑制剂(UGI)结构域与Cas9的C-末端相连接以降低碱基切除修活性。Cas9胞嘧啶碱基编辑器(CBE)的后期版本通过添加柔韧的甘氨酸和丝氨酸残基而使这两个连接体的长度都加倍,并且添加了额外的UGI结构域。该碱基编辑器的最近版本已经通过密码子优化和经改善的核定位信号以及脱氨酶结构域的祖先重建而进行了优化以用于在人细胞中使用。

[0008] Cas12a(也称为Cpf1)是更近期发现的CRISPR内切核酸酶,其也已日益用作基因组编辑工具。Cas12a在几个方面不同于Cas9,包括例如,其大小、其核酸酶活性、指导RNA(guide RNA)的结构、该核酸酶结合其指导RNA所采取的定向和被识别的原间隔子邻近基序(PAM)。虽然已经测试到基于Cas12a的胞嘧啶碱基编辑器的一些变化,但是它们具有相比于基于Cas9的版本而言更低的活性。因此,为了克服本领域中的缺点,需要使用Cas12a的新的腺苷碱基编辑工具。

[0009] 发明概述

[0010] 现有技术的基于CRISPR的胞嘧啶碱基编辑器严重地基于Cas9,并且相比于基于Cas9的版本而言,基于Cas12a的胞嘧啶碱基编辑器的所发表的版本是相对无效的。该缺陷的一部分可能归因于相比于Cas9而言Cas12a的不同的构造和结合定向。基于Cas9的胞嘧啶

碱基编辑器依赖于简单的GS连接体或者先前设计的非结构化序列,并且其长度和组成已经就脱氨酶和UGI结构域相对于所编辑的DNA而言的最佳布置进行了设计。此外,源自Cas12a的碱基编辑器还未达到适合于商业应用的活性水平。本发明人已经设计了新型连接体序列并且优化了结构域构造以用于基于Cas12a的胞嘧啶碱基编辑器,其现在可以允许靶向新位点和/或扩大位点特异性碱基编辑工具的储库,和/或其可以适合于商业用途。还提供了通过使用本发明的融合蛋白和/或编码其的多核苷酸来修饰核酸的方法。这些编辑器可以用于原核生物和/或真核生物应用,包括编辑在商业上密切有关的作物的基因组。

[0011] 本发明的一个方面提供了多肽,其包含SEQ ID NO:1-24的氨基酸序列中的任一个(L1-L24)。

[0012] 本发明的第二个方面提供了多肽,其包含Cas12a结构域和SEQ ID NO:1-24的氨基酸序列中的任一个。

[0013] 本发明的第三个方面提供了融合蛋白,其包含Cas12a结构域、目的多肽和SEQ ID NO:1-24的氨基酸序列中的任一个。

[0014] 第四个方面提供了V型成簇规律间隔短回文重复序列(Clustered Regularly Interspaced Short Palindromic Repeats;CRISPR)-相关(Cas)(CRISPR-Cas)系统,其包含:(a)融合蛋白,其包含Cas12a结构域、包含SEQ ID NO:1-24中的任一个的氨基酸序列的连接体和目的多肽,其中所述Cas12a结构域经由SEQ ID NO:1-24的氨基酸序列中的任一个与所述目的多肽相连接;或者编码所述融合蛋白的核酸;和(b)指导核酸(guide nucleic acid)(CRISPR RNA、CRISPR DNA、crRNA、crDNA、gRNA),其包含间隔子序列和重复序列,其中所述指导核酸能够与所述融合蛋白的Cas12a结构域形成复合物,并且所述间隔子序列能够与靶核酸杂交,从而将所述Cas12a结构域和所述目的多肽引导至所述靶核酸,由此所述系统能够修饰或调节所述靶核酸。

[0015] 本发明的第五个方面提供了融合蛋白,其包含:(a)Cas12a结构域,其中当与所结合的指导核酸(例如,gRNA)相联合时,所述Cas12a结构域与靶核酸序列特异性地结合;(b)胞苷脱氨酶结构域,其中当与所述Cas12a结构域和所述gRNA相联合时,所述胞苷脱氨酶结构域使在所述靶核酸序列的单链部分中的胞嘧啶碱基脱氨;和(c)尿嘧啶糖基化酶抑制剂(UGI)结构域,其中所述UGI结构域抑制尿嘧啶-DNA糖基化酶,其中所述Cas12a结构域经由SEQ ID NO:1-24的氨基酸序列中的任一个与所述胞嘧啶脱氨酶结构域或所述UGI结构域相连接。

[0016] 第六个方面提供了融合蛋白,其包含:(a)胞嘧啶脱氨酶结构域;(b)Cas12a结构域;和(c)尿嘧啶-DNA糖基化酶抑制剂(UGI)结构域,其中所述胞嘧啶脱氨酶结构域的C-末端经由SEQ ID NO:1-5的氨基酸序列中的任一个与所述Cas12a结构域的N-末端相连接,并且所述Cas12a结构域的C-末端与所述UGI结构域的N-末端相连接,或者所述Cas12a结构域的C-末端经由SEQ ID NO:6-9的氨基酸序列中的任一个与所述UGI结构域的N-末端相连接,并且所述胞嘧啶脱氨酶结构域的C-末端与所述Cas12a结构域的N-末端相连接。

[0017] 第七个方面提供了融合蛋白,其包含:(a)Cas12a(Cpf1)结构域;(b)尿嘧啶-DNA糖基化酶抑制剂(UGI)结构域;和(c)胞嘧啶脱氨酶结构域,其中所述Cas12a结构域的C-末端经由SEQ ID NO:10-12的氨基酸序列中的任一个与所述UGI结构域的N-末端相连接,并且所述UGI结构域的C-末端经由SEQ ID NO:13-16的氨基酸序列中的任一个与所述胞嘧啶脱氨

酶结构域的N-末端相连接,其中独立地选择SEQ ID NO:10-12的氨基酸序列和SEQ ID NO:13-16的氨基酸序列。

[0018] 第八个方面提供了融合蛋白,其包含:(a) 尿嘧啶-DNA糖基化酶抑制剂(UGI)结构域;(b) Cas12a(Cpf1)结构域,其中所述Cas12a结构域在核酸酶活性位点中包含突变;和(c) 胞嘧啶脱氨酶结构域,其中所述UGI结构域的C-末端经由SEQ ID NO:17-19的氨基酸序列中的任一个与所述Cas12a结构域的N-末端相连接,并且所述Cas12a结构域的C-末端与所述胞嘧啶脱氨酶结构域的N-末端相连接,或者其中所述UGI结构域的C-末端与所述Cas12a结构域的N-末端相连接,并且所述Cas12a结构域的C-末端经由SEQ ID NO:20-24的氨基酸序列中的任一个与所述胞嘧啶脱氨酶结构域的N-末端相连接。

[0019] 本发明的第九个方面提供了修饰靶核酸的方法,所述方法包括使所述靶核酸与下述项目相接触:(a) (i) 本发明的融合蛋白,和(a) (ii) 指导核酸;(b) 复合物,其包含本发明的融合蛋白和指导核酸;(c) 组合物,其包含本发明的融合蛋白和指导核酸;和/或(d) 本发明的系统,从而修饰靶核酸。

[0020] 本发明的第十个方面提供了修饰靶核酸的方法,所述方法包括在一定条件下使包含所述靶核酸的细胞或无细胞系统与下述项目相接触:(a) (i) 编码本发明的多肽或融合蛋白的多核苷酸,或者包含其的表达盒或载体,和(a) (ii) 指导核酸,或者包含其的表达盒或载体;和/或(b) 编码包含本发明的融合蛋白和指导核酸的复合物的核酸构建体,或者包含其的表达盒或载体,从而修饰靶核酸,所述条件为这样的条件,其中当所述融合蛋白被表达并且与所述指导核酸形成复合物时,所述复合物与所述靶核酸杂交。

[0021] 本发明的第十一个方面提供了编辑靶核酸的方法,所述方法包括使所述靶核酸与下述项目相接触:(a) (i) 本发明的融合蛋白,和(a) (ii) 指导核酸;(b) 复合物,其包含本发明的融合蛋白和指导核酸;(c) 组合物,其包含(i) 本发明的融合蛋白和(ii) 指导核酸;和/或(d) (i) 本发明的系统,其中所述胞嘧啶脱氨酶结构域将在所述靶核酸中的胞嘧啶(C)转变为胸腺嘧啶(T),从而编辑所述靶核酸以产生(点)突变。

[0022] 本发明的第十二个方面提供了编辑靶核酸的方法,所述方法包括在一定条件下使包含所述靶核酸的细胞或无细胞系统与下述项目相接触:(a) (i) 编码本发明的融合蛋白的多核苷酸,或者包含其的表达盒或载体,和(a) (ii) 指导核酸,或者包含其的表达盒或载体;和/或(b) 编码包含本发明的融合蛋白和指导核酸的复合物的核酸构建体,或者包含其的表达盒或载体,所述条件为这样的条件,其中当所述融合蛋白被表达并且与所述指导核酸形成复合物时,所述复合物与所述靶核酸杂交,其中所述胞嘧啶脱氨酶结构域将在所述靶核酸中的胞嘧啶(C)转变为胸腺嘧啶(T),从而编辑所述靶核酸以产生(点)突变。

[0023] 本发明进一步提供了构建体、复合物、组合物、表达盒、载体和细胞,其包含本发明的多肽和/或融合蛋白,和/或编码本发明的融合蛋白和复合物的多核苷酸和核酸构建体。

[0024] 本发明的这些和其他方面在下面的对于本发明的描述中更详细地进行阐述。

[0025] 序列简述

[0026] SEQ ID NO:1-24为对于连接多肽来说有用的本发明的氨基酸序列。

[0027] SEQ ID NO:25-28为对于连接多肽来说有用的示例性的肽连接体的氨基酸序列。

[0028] SEQ ID NO:29-45为可用于本发明的实例性的Cas12a氨基酸序列。

[0029] SEQ ID NO:46-47和SEQ ID NO:76-82为可用于本发明的实例性的胞嘧啶脱氨酶

氨基酸序列。

[0030] SEQ ID NO:48为示例性的尿嘧啶-DNA糖基化酶抑制剂(UGI)。

[0031] SEQ ID NO:49-72和SEQ ID NO:91-107为实例性的融合蛋白。

[0032] SEQ ID NO:83-88为实例性的间隔子序列。

[0033] SEQ ID NO:89和SEQ ID NO:90分别为人和大豆的实例性的内含子序列。

[0034] 附图简述

[0035] 图1A-C提供了被选择用于在哺乳动物细胞中的实验筛选的本发明的基于Cas12a的胞嘧啶碱基编辑器的示例性结构域安排。对于在图1A(ACU)和图1C(UCA)中的构建体,每一个与APOBEC1或UGI的连接体独立地进行测试并且与对照连接体(8-残基GS连接体、XTEN连接体或者GS-XTEN-GS连接体)进行配对。对于在图1B(CUA)中的构建体,测试了连接体的所有组合。

[0036] 图2提供了用作为照的两种Cas12a胞嘧啶碱基编辑器设计。

[0037] 图3显示了使用EMX1间隔子1:TCATCTGTGCCCTCCCTCCCTG(SEQ ID NO:83)的C至T编辑的结果。Y轴指明了对于在间隔子内的特定位置处的给定的胞嘧啶所观察到的C->T编辑的水平。

[0038] 图4显示了使用RUNX1间隔子1:AGCCTCACCCCTCTAGCCCTACA(SEQ ID NO:84)的C至T编辑的结果。Y轴指明了对于在间隔子内的特定位置处的给定的胞嘧啶所观察到的C->T编辑的水平。

[0039] 图5显示了使用RUNX1间隔子2:TTCTCCCCTCTGCTGGATACCTC(SEQ ID NO:85)的C至T编辑的结果。Y轴指明了对于在间隔子内的特定位置处的给定的胞嘧啶所观察到的C->T编辑的水平。对于构建体UCA_L2_1、UCA_L2_1R、UCA_L2_4、CUA对照或Shanghai Tech对照,没有编辑数据是可得。

[0040] 图6显示了使用DNMT1间隔子1:CCTCACTCCTGCTCGGTGAATTT(SEQ ID NO:86)的C至T编辑的结果。Y轴指明了对于在间隔子内的特定位置处的给定的胞嘧啶所观察到的C->T编辑的水平。

[0041] 图7显示了使用DNMT1间隔子2:GCTCAGCAGGCACCTGCCTCAGC(SEQ ID NO:87)的C至T编辑的结果。Y轴指明了对于在间隔子内的特定位置处的给定的胞嘧啶所观察到的C->T编辑的水平。对于构建体ACU_L1_1,没有编辑数据是可得。

[0042] 图8显示了使用EMX1间隔子1:TCATCTGTGCCCTCCCTCCCTG(SEQ ID NO:83)的C至T编辑的结果。Y轴指明了对于在间隔子内的特定位置处的给定的胞嘧啶所观察到的C->T编辑的水平。

[0043] 图9显示了使用RUNX1间隔子1:AGCCTCACCCCTCTAGCCCTACA(SEQ ID NO:84)的C至T编辑的结果。

[0044] 图10显示了使用DNMT1间隔子1:CCTCACTCCTGCTCGGTGAATTT(SEQ ID NO:86)的C至T编辑的结果。Y轴指明了对于在间隔子内的特定位置处的给定的胞嘧啶所观察到的C->T编辑的水平。对于构建体ACU_L1_2、ACU_L2_2R,没有编辑数据是可得。

[0045] 图11显示了使用DNMT1间隔子2:GCTCAGCAGGCACCTGCCTCAGC(SEQ ID NO:87)的C至T编辑的结果。Y轴指明了对于在间隔子内的特定位置处的给定的胞嘧啶所观察到的C->T编辑的水平。

[0046] 图12显示了使用EMX1间隔子1:TCATCTGTGCCCCCTCCCTCCCTG (SEQ ID NO:83)的C至T编辑的结果。Y轴指明了对于在间隔子内的特定位置处的给定的胞嘧啶所观察到的C->T编辑的水平。

[0047] 图13显示了使用RUNX1间隔子1:AGCCTCACCCCTCTAGCCCTACA (SEQ ID NO:84)的C至T编辑的结果。Y轴指明了对于在间隔子内的特定位置处的给定的胞嘧啶所观察到的C->T编辑的水平。

[0048] 图14显示了使用RUNX1间隔子2:TTCTCCCCTCTGCTGGATACCTC (SEQ ID NO:85)的C至T编辑的结果。Y轴指明了对于在间隔子内的特定位置处的给定的胞嘧啶所观察到的C->T编辑的水平。对于构建体ACU_L1_1、ACU_L1_2、ACU_L1_3、ACU_L1_3R、ACU_L1_5R、CUA_L1_3_L2_1、UCA_L1_1、UCA_L2_1、UCA_L2_1R和UCA_L2_4,没有编辑数据是可得。

[0049] 图15显示了使用AAVS1间隔子1:TCTGTCCCCTCCACCCACAGTG (SEQ ID NO:88)的C至T编辑的结果。Y轴指明了对于在间隔子内的特定位置处的给定的胞嘧啶所观察到的C->T编辑的水平。

[0050] 图16显示了使用DNMT1间隔子1:CCTCACTCCTGCTCGGTGAATTT (SEQ ID NO:86)的C至T编辑的结果。Y轴指明了对于在间隔子内的特定位置处的给定的胞嘧啶所观察到的C->T编辑的水平。

[0051] 图17显示了使用EMX1间隔子1:TCATCTGTGCCCCCTCCCTCCCTG (SEQ ID NO:83)的C至T编辑的结果。Y轴指明了对于在间隔子内的特定位置处的给定的胞嘧啶所观察到的C->T编辑的水平。

[0052] 图18显示了使用RUNX1间隔子1:AGCCTCACCCCTCTAGCCCTACA (SEQ ID NO:84)的C至T编辑的结果。Y轴指明了对于在间隔子内的特定位置处的给定的胞嘧啶所观察到的C->T编辑的水平。

[0053] 图19显示了使用AAVS1间隔子1:TCTGTCCCCTCCACCCACAGTG (SEQ ID NO:88)的C至T编辑的结果。Y轴指明了对于在间隔子内的特定位置处的给定的胞嘧啶所观察到的C->T编辑的水平。

[0054] 图20显示了使用DNMT1间隔子1:CCTCACTCCTGCTCGGTGAATTT (SEQ ID NO:86)的C至T编辑的结果。Y轴指明了对于在间隔子内的特定位置处的给定的胞嘧啶所观察到的C->T编辑的水平。对于构建体ACU_L1_2 (A3A),没有编辑数据是可得。

[0055] 图21显示了使用EMX1间隔子1:TCATCTGTGCCCCCTCCCTCCCTG (SEQ ID NO:83)的C至T编辑的结果。Y轴指明了对于在间隔子内的特定位置处的给定的胞嘧啶所观察到的C->T编辑的水平。

[0056] 图22显示了使用AAVS1间隔子1:TCTGTCCCCTCCACCCACAGTG (SEQ ID NO:88)的C至T编辑的结果。Y轴指明了对于在间隔子内的特定位置处的给定的胞嘧啶所观察到的C->T编辑的水平。

[0057] 图23显示了使用RUNX1间隔子1:AGCCTCACCCCTCTAGCCCTACA (SEQ ID NO:84)的C至T编辑的结果。Y轴指明了对于在间隔子内的特定位置处的给定的胞嘧啶所观察到的C->T编辑的水平。对于构建体UC_L2_1 (A3A+内含子)和ACU对照,没有编辑数据 (ND)是可得。

[0058] 图24显示了使用RUNX1间隔子2:TTCTCCCCTCTGCTGGATACCTC (SEQ ID NO:85)的C至T编辑的结果。Y轴指明了对于在间隔子内的特定位置处的给定的胞嘧啶所观察到的C->T编辑的水平。

辑的水平。对于构建体UC_L2_4,没有编辑数据(ND)是可得的。

[0059] 图25显示了使用DNMT1间隔子1:CCTCACTCCTGCTCGGTGAATTT(SEQ ID NO:86)的C至T编辑的结果。Y轴指明了对于在间隔子内的特定位置处的给定的胞嘧啶所观察到的C->T编辑的水平。

[0060] 图26显示了使用本发明的编辑器构建体来编辑在大豆中的三个不同的核酸靶标(基因座1、基因座2、基因座3)的结果,如在实施例4中所描述的。

[0061] 发明详述

[0062] 现在,将会在下文中通过参考附图和实施例(在其中显示了本发明的实施方案)来描述本发明。该描述不是意在是本发明可以实施而所采取的所有不同方式或者可以添加至本发明的所有特征的详细编目。例如,关于一个实施方案所举例说明的特征可以合并入其他实施方案中,并且关于特定实施方案所举例说明的特征可以从那个实施方案中删除。因此,本发明考虑,在本发明的一些实施方案中,可以排除或省略在本文中所阐述的任何特征或特征组合。另外,鉴于本公开内容,在本文中所暗示的对各种实施方案的众多变化和添加对于本领域技术人员来说将会是明显的,其并不背离本发明。因此,下面的描述意在举例说明本发明的一些特别的实施方案,而不是穷尽地详细说明其所有排列、组合和变化。

[0063] 除非另外定义,在本文中所使用的所有技术和科学术语具有与本发明所属领域的普通技术人员通常所理解的相同的含义。在本文中的发明描述中所使用的术语仅是为了描述特定实施方案而并不意在限制本发明。

[0064] 在本文中所引用的所有出版物、专利申请、专利和其他参考文献通过提及而以其整体合并,以用于与其中呈现了该参考文献的句子和/或段落有关的教导。

[0065] 除非上下文另有说明,特别打算的是,在本文中所描述的本发明的各种特征可以以任何组合进行使用。此外,本发明还考虑,在本发明的一些实施方案中,可以排除或省略在本文中所阐述的任何特征或特征组合。为了举例说明,如果说明书陈述到组合物包含组分A、B和C,那么特别打算的是,A、B或C中的任一个或者其组合可以单独地或以任何组合被省略和放弃。

[0066] 如在本发明的描述和所附的权利要求书中所使用的,单数形式“a”、“an”和“the”意在也包括复数形式,除非上下文另有明确说明。

[0067] 此外,如在本文中所使用的,“和/或”是指并且涵盖相联系的所列条目中的一个或多个的任何和所有可能的组合,以及组合的缺乏,当以备选项进行解释(“或”)时。

[0068] 如在本文中所使用的,当涉及可测量的值例如量或浓度等时,术语“大约”意味着涵盖所指定的值的 $\pm 10\%$ 、 $\pm 5\%$ 、 $\pm 1\%$ 、 $\pm 0.5\%$ 或甚至 $\pm 0.1\%$ 的变化以及所指定的值。例如,“大约X”(其中X为可测量的值)意味着包括X,以及X的 $\pm 10\%$ 、 $\pm 5\%$ 、 $\pm 1\%$ 、 $\pm 0.5\%$ 或甚至 $\pm 0.1\%$ 的变化。在本文中对于可测量的值所提供的范围可以包括任何其他范围和/或其中的独个的值。

[0069] 如在本文中所使用的,短语例如“在X和Y之间”和“在大约X和Y之间”应当被解释为包括X和Y。如在本文中所使用的,短语例如“在大约X和Y之间”意指“在大约X和大约Y之间”,并且短语例如“从大约X至Y”意指“从大约X至大约Y”。

[0070] 如在本文中所使用的,术语“包含”、“含有”和“包括”明确说明了所陈述的特征、整数、步骤、操作、要素和/或组分的存在,但不排除一个或多个其他特征、整数、步骤、操作、要

素、组分和/或其群组的存在或添加。

[0071] 如在本文中所使用的,过渡性短语“基本上由.....组成”意味着,权利要求的范围将会被解释为涵盖在该权利要求中所记述的指定的材料或步骤,以及本质上不影响所要求保护的本发明的基本和新颖特征的那些。因此,当在本发明的权利要求中使用术语“基本上由.....组成”并不意在被解释为等价于“包含”。

[0072] 如在本文中所使用的,术语“增加”和“增强”(及其语法变化形式)描述了相比于对照而言至少大约25%、50%、75%、100%、150%、200%、300%、400%、500%或更多的提升。

[0073] 如在本文中所使用的,术语“降低”、“减小”和“减少”(及其语法变化形式)描述了例如,相比于对照而言至少大约5%、10%、15%、20%、25%、35%、50%、75%、80%、85%、90%、95%、97%、98%、99%或100%的减少。在特别的实施方案中,所述降低可以导致没有或基本上没有(即,不显著的量,例如小于大约10%或甚至5%)可检测的活性或量。

[0074] “异源(的)”或“重组(的)”核苷酸序列为不与其中引入了它的宿主细胞天然地相关联的核苷酸序列,包括天然出现的核苷酸序列的非天然出现的多个拷贝。

[0075] “天然(的)”或“野生型”核酸、核苷酸序列、多肽或氨基酸序列是指天然出现的或内源的核酸、核苷酸序列、多肽或氨基酸序列。因此,例如,“野生型mRNA”为在生物中天然出现的或对生物来说内源的mRNA。“同源(的)”核酸序列为与其中引入了它的宿主细胞天然地相关联的核苷酸序列。

[0076] 如在本文中所使用的,术语“核酸”、“核酸分子”、“核苷酸序列”和“多核苷酸”是指线性或支化的、单链或双链的RNA或DNA,或者其杂合体。该术语还涵盖RNA/DNA杂合体。当以合成方式来产生dsRNA时,较不常见的碱基(例如,肌苷、5-甲基胞嘧啶、6-甲基腺嘌呤、次黄嘌呤和其他)也可以用于反义dsRNA,和核酶配对。例如,包含尿苷和胞苷的C-5丙炔类似物的多核苷酸已显示出以高亲和力结合RNA并且是基因表达的强有力的反义抑制剂。也可以进行其他修饰,例如对于RNA的磷酸二酯主链或者在核糖基团中的2'-羟基的修饰。

[0077] 如在本文中所使用的,术语“核苷酸序列”是指核苷酸的杂聚物,或者从核酸分子的5'至3'末端的这些核苷酸的顺序,并且包括DNA或RNA分子,包括cDNA、DNA片段或部分、基因组DNA、合成的(例如,以化学方式合成的)DNA、质粒DNA、mRNA和反义RNA,其中的任一种可以是单链或双链的。术语“核苷酸序列”、“核酸”、“核酸分子”、“寡核苷酸”和“多核苷酸”在本文中也可以互换使用,以指核苷酸的杂聚物。在本文中所提供的核酸分子和/或核苷酸序列在本文中以5'至3'方向从左至右呈现,并且使用用于表示核苷酸字符的标准代码来表示,如在美国序列规则37 CFR §§1.821-1.825和世界知识产权组织(WIPO)标准ST.25中所阐述的。如在本文中所使用的,“5'区”可以意指最接近多核苷酸的5'末端的多核苷酸的区域。因此,例如,在多核苷酸的5'区中的元件可以位于从位于多核苷酸的5'末端处的第一个核苷酸至位于整个多核苷酸的中途的核苷酸的任何地方。如在本文中所使用的,“3'区”可以意指最接近多核苷酸的3'末端的多核苷酸的区域。因此,例如,在多核苷酸的3'区中的元件可以位于从位于多核苷酸的3'末端处的第一个核苷酸至位于整个多核苷酸的中途的核苷酸的任何地方。

[0078] 如在本文中所使用的,术语“基因”是指能够用于产生mRNA、反义RNA、miRNA、抗-微小RNA反义寡脱氧核糖核苷酸(AMO)等的核酸分子。基因可以或不能够用于产生功能性蛋白质或基因产物。基因可以包括编码区和非编码区(例如,内含子、调控元件、启动子、增

强子、终止序列和/或5'和3'非翻译区)两者。基因可以是“分离的”,其意味着这样的核酸,其实质上或基本上没有通常与处于其天然状态的该核酸相关联地发现的组分。此类组分包括其他细胞材料、来自重组生产的培养基和/或在以化学方式合成该核酸中所使用的各种化学品。

[0079] 作为例子,在本发明的构建体中有用的内含子包括但不限于SEQ ID NO:89或SEQ ID NO:90。

[0080] 术语“突变”是指点突变(例如、错义,或者无义,或者导致移码的单个碱基对的插入或缺失)、插入、缺失和/或截短。当突变为在氨基酸序列内的一个残基被置换为另一个残基或者在序列内的一个或多个残基的缺失或插入时,所述突变典型地通过下述方式来进行描述,即鉴定原始残基,随后为在该序列内该残基的位置和新置换的残基的身份。

[0081] 如在本文中所使用的,术语“互补(的)”或“互补性”是指通过碱基配对在许可的盐和温度条件下多核苷酸的天然结合。例如,序列“A-G-T”(5'至3')与互补序列“T-C-A”(3'至5')相结合。两个单链分子之间的互补性可以是“部分的”,其中仅一些核苷酸结合,或者它可以是完全的,当在单链分子之间存在完全互补性时。核酸链之间的互补性程度对于核酸链之间的杂交的效率和强度具有显著影响。

[0082] 如在本文中所使用的,“互补物”可以意指与比较者核苷酸序列的100%互补性,或者它可以意指小于100%的互补性(例如,大约70%、71%、72%、73%、74%、75%、76%、77%、78%、79%、80%、81%、82%、83%、84%、85%、86%、87%、88%、89%、90%、91%、92%、93%、94%、95%、96%、97%、98%、99%等的互补性)。

[0083] 本发明的核苷酸序列的“部分”或“片段”将会被理解为意指这样的核苷酸序列,其具有相对于参考核酸或核苷酸序列而言减少(例如,减少1、2、3、4、5、6、7、8、9、10、11、12、13、14、15、16、17、18、19、20或更多个核苷酸)的长度,并且包含下述核苷酸序列、基本上由下述核苷酸序列组成和/或由下述核苷酸序列组成:与参考核酸或核苷酸序列同一或几乎同一(例如,70%、71%、72%、73%、74%、75%、76%、77%、78%、79%、80%、81%、82%、83%、84%、85%、86%、87%、88%、89%、90%、91%、92%、93%、94%、95%、96%、97%、98%、99%同一)的邻接核苷酸的核苷酸序列。当合适时,根据本发明的此类核酸片段或部分可以被包括在它是其组成成分的更大的多核苷酸中。作为例子,本发明的指导核酸的重复序列可以包含野生型Cas12a重复序列的一部分。

[0084] 如在本文中关于多肽所使用的,术语“片段”或“部分”可以是指这样的多肽,其相对于参考多肽而言长度减少,并且包含下述氨基酸序列、基本上由下述氨基酸序列组成和/或由下述氨基酸序列组成:与参考多肽的相应部分同一或几乎同一(例如,90%、91%、92%、93%、94%、95%、96%、97%、98%、99%同一)的邻接氨基酸的氨基酸序列。当合适时,此类多肽片段可以被包括在它是其组成成分的更大的多肽中。在一些实施方案中,所述多肽片段包含下述氨基酸残基、基本上由下述氨基酸残基组成或由下述氨基酸残基组成:参考多肽的至少大约2、3、4、5、6、7、8、9、10、11、12、13、14、15、20、25、30、35、40、45、50、55、60、65、70、75、80、85、90、95、100、125、150、175、200、225、250、260、270、280、290或更多个连续氨基酸残基。

[0085] 具有同源性的不同核酸或蛋白质在本文中被称作“同源物”。术语“同源物”包括来自相同和其他物种的同源序列,和来自相同和其他物种的直向同源序列。“同源性”是指在

位置同一性百分比方面在两个或更多个核酸和/或氨基酸序列之间的相似性水平(例如,序列相似性或同一性)。同源性也指在不同的核酸或蛋白质之中相似的功能特性的概念。因此,本发明的组合物和方法进一步包含本发明的核苷酸序列和多肽序列的同源物。如在本文中所使用的,“直向同源(的)”是指在物种形成期间产生自共同祖先基因的在不同物种中的同源核苷酸序列和/或氨基酸序列。本发明的核苷酸序列的同源物与本发明的所述核苷酸序列具有实质上的序列同一性(例如,至少大约70%、71%、72%、73%、74%、75%、76%、77%、78%、79%、80%、81%、82%、83%、84%、85%、86%、87%、88%、89%、90%、91%、92%、93%、94%、95%、96%、97%、98%、99%、99.5%或100%)。

[0086] 如在本文中所使用的,“序列同一性”是指两个经最佳地比对的多核苷酸或多肽序列在整个组分(例如,核苷酸或氨基酸)比对窗中是不变的程度。“同一性”可以通过已知的方法容易地来进行计算,所述已知的方法包括但不限于在下列文献中所描述的那些: Computational Molecular Biology (Lesk, A.M., 编者) Oxford University Press, New York (1988); Biocomputing: Informatics and Genome Projects (Smith, D.W., 编者) Academic Press, New York (1993); Computer Analysis of Sequence Data, Part I (Griffin, A.M. 和 Griffin, H.G., 编者) Humana Press, New Jersey (1994); Sequence Analysis in Molecular Biology (von Heinje, G., 编者) Academic Press (1987); 和 Sequence Analysis Primer (Gribskov, M. 和 Devereux, J., 编者) Stockton Press, New York (1991)。

[0087] 如在本文中所使用的,术语“序列同一性百分比”或“同一性百分比”是指当以最佳方式比对两个序列时,相比于测试(“受试”)多核苷酸分子(或其互补链)而言在参考(“查询”)多核苷酸分子(或其互补链)的线性多核苷酸序列中相同的核苷酸的百分比。在一些实施方案中,“同一性百分比”可以是指相比于参考多肽而言在氨基酸序列中相同的氨基酸的百分比。

[0088] 如在本文中所使用的,在两个核酸分子、核苷酸序列或蛋白质序列的情景下,短语“实质上同一的”或“实质上的同一性”是指当就最大相应性进行比较和比对时,具有至少大约70%、71%、72%、73%、74%、75%、76%、77%、78%、79%、80%、81%、82%、83%、84%、85%、86%、87%、88%、89%、90%、91%、92%、93%、94%、95%、96%、97%、98%、99%、99.5%或100%核苷酸或氨基酸残基同一性的两个或更多个序列或子序列,如通过使用下列的序列比较算法之一或通过目视检查所测量的。在本发明的一些实施方案中,在长度为大约10个核苷酸至大约30个核苷酸、大约15个核苷酸至大约25个核苷酸、大约30个核苷酸至大约40个核苷酸、大约50个核苷酸至大约60个核苷酸、大约70个核苷酸至大约80个核苷酸、大约90个核苷酸至大约100个核苷酸或更多个核苷酸的本发明的核苷酸序列的连续核苷酸的区域,和其中任何范围,直至该序列的全长之上存在实质上的同一性。在一些实施方案中,所述核苷酸序列可以在至少大约20个核苷酸(例如,大约20、21、22、23、24、25、26、27、28、29、30、31、32、33、34、35、36、37、38、39、40个核苷酸)之上是实质上同一的。在一些实施方案中,实质上同一的核苷酸或蛋白质序列执行与它与之实质上同一的核苷酸序列(或所编码的蛋白质序列)实质上相同的功能。

[0089] 对于序列比较,一个序列典型地充当参考序列,测试序列与之进行比较。当使用序列比较算法时,将测试序列和参考序列输入计算机,指派子序列坐标(如果需要),并且指派

序列算法程序参数。然后,序列比较算法基于所指派的程序参数来计算相对于参考序列而言的关于测试序列的序列同一性百分比。

[0090] 用于比对比较窗的最佳序列比对是本领域技术人员众所周知的,并且可以通过诸如Smith和Waterman的局部同源性算法、Needleman和Wunsch的同源性比对算法、Pearson和Lipman的相似性搜索方法的工具,和任选地通过这些算法的计算机化实施例如GAP、BESTFIT、FASTA和TFASTA(其作为**GCG® Wisconsin Package®** (Accelrys Inc., San Diego, CA)的一部分而可得)来进行。关于测试序列和参考序列的所比对的区段的“同一性分数”为由两个所比对的序列所共享的相同组分的数目除以在参考序列区段(例如,整个参考序列或者参考序列的更小的所定义的部分)中的组分的总数目。将序列同一性百分比表示为同一性分数乘以100。一个或多个多核苷酸序列的比较可以是与全长多核苷酸序列或其部分,或者与更长的多核苷酸序列。对于本发明的目的,“同一性百分比”也可以通过使用BLASTX 2.0版(对于翻译的核苷酸序列)和BLASTN 2.0版(对于多核苷酸序列)来进行测定。

[0091] 当两个核苷酸序列在严紧条件下相互杂交时,也可以认为这两个序列是实质上互补的。在一些代表性的实施方案中,两个被认为是实质上互补的核苷酸序列在高度严紧条件下相互杂交。

[0092] 在核酸杂交实验例如Southern和Northern杂交的情景下的“严紧杂交条件”和“严紧杂交洗涤条件”是序列依赖性的,并且在不同的环境参数下是不同的。对于核酸杂交的详尽指南可见于Tijssen Laboratory Techniques in Biochemistry and Molecular Biology-Hybridization with Nucleic Acid Probes,第2章第I部分,“Overview of principles of hybridization and the strategy of nucleic acid probe assays”, Elsevier, New York(1993)。一般而言,高度严紧杂交和洗涤条件被选择为在规定的离子强度和pH下低于关于特定序列的热解链点(T_m)大约5℃。

[0093] T_m 为这样的温度,在该温度下靶序列的50%与完美匹配的探针杂交(在规定的离子强度和pH下)。非常严紧条件被选择为等于关于特定探针的 T_m 。关于在Southern或Northern印迹中在滤器上具有多于100个互补残基的互补核苷酸序列的杂交的严紧杂交条件的例子在为42℃下具有1mg的肝素的50%甲酰胺,其中杂交过夜进行。高度严紧洗涤条件的例子为在72℃下0.1 5M NaCl进行大约15分钟。严紧洗涤条件的例子为在65℃下0.2x SSC洗涤15分钟(参见, Sambrook(下文),见SSC缓冲液的描述)。经常,在高严紧性洗涤之前为低严紧性洗涤,以去除背景探针信号。关于例如多于100个核苷酸的双链体的中等严紧性洗涤的例子为在45℃下1x SSC进行15分钟。关于例如多于100个核苷酸的双链体的低严紧性洗涤的例子为在40℃下4-6x SSC进行15分钟。对于短探针(例如,大约10至50个核苷酸),严紧条件典型地涉及在pH 7.0至8.3下低于大约1.0M Na离子,典型地大约0.01至1.0M Na离子浓度(或其他盐)的盐浓度,并且温度典型地为至少大约30℃。严紧条件也可以通过添加去稳定试剂例如甲酰胺来取得。通常,在特定的杂交测定法中相比于对于不相关的探针所观察的那种而言2x(或更高)的信噪比表明检测到特异性杂交。在严紧条件下不相互杂交的核苷酸序列仍然是实质上同一的,如果它们所编码的蛋白质是实质上同一的。这可以例如当使用由遗传密码所允许的最大密码子简并性来产生核苷酸序列的拷贝时出现。

[0094] 本发明的任何核苷酸序列、多核苷酸和/或重组核酸构建体可以进行密码子优化,以用于在任何目的生物中表达。密码子优化是本领域中众所周知的,并且涉及通过使用物

种特异性密码子使用表格就密码子使用偏倚来修饰核苷酸序列。所述密码子使用表格是基于关于目的生物/物种的最高度表达的基因的序列分析而生成的。当要在细胞核中表达所述核苷酸序列时,所述密码子使用表格是基于关于目的物种的高度表达的核基因的序列分析而生成的。核苷酸序列的修饰通过将物种特异性密码子使用表格与在天然多核苷酸序列中存在的密码子进行比较来确定。如在本领域中所理解的,核苷酸序列的密码子优化导致这样的核苷酸序列,其与天然核苷酸序列具有小于100%的同一性(例如,70%、71%、72%、73%、74%、75%、76%、77%、78%、79%、80%、81%、82%、83%、84%、85%、86%、87%、88%、89%、90%、91%、92%、93%、94%、95%、96%、97%、98%、99%、99.5%或99.9%和其中的任何范围或值),但仍然编码具有与由原始的天然核苷酸序列所编码的多肽相同的功能的多肽。因此,在本发明的一些实施方案中,本发明的多核苷酸、核酸构建体、表达盒和/或载体(其包含/编码本发明的多肽、融合蛋白、复合物,例如Cas12a、目的多肽、胞嘧啶脱氨酶、连接体)可以进行密码子优化,以用于在特定目的物种例如特定植物物种、特定细菌物种、特定动物物种等中表达。在一些实施方案中,经密码子优化的本发明的多核苷酸、核酸构建体、表达盒和/或载体与未进行密码子优化的本发明的多核苷酸、核酸构建体、表达盒和/或载体具有大约70%至大约99.9%(例如,70%、71%、72%、73%、74%、75%、76%、77%、78%、79%、80%、81%、82%、83%、84%、85%、86%、87%、88%、89%、90%、91%、92%、93%、94%、95%、96%、97%、98%、99%、99.5%、99.9%或100%)的同一性或更多。

[0095] 在本文中所描述的实施方案的任一个之中,可以将本发明的多核苷酸或核酸构建体与各种各样的启动子或其他调控元件可运转地相关联,以用于在目的生物中和/或目的生物的细胞中表达。因此,在一些实施方案中,包含本发明的多核苷酸或核酸构建体的表达盒或载体可以进一步包含一个或多个与一个或多个多核苷酸或核酸构建体可操作地连接的启动子、增强子和/或终止子。

[0096] 如在本文中所使用的,“可操作地连接”或“可操作地相关联”意味着,所示元件在功能上相互联系,并且通常也在物理上相联系。因此,如在本文中所使用的,术语“可操作地连接”或“可操作地相关联”是指在功能上相关联的在单个核酸分子上的核苷酸序列。因此,与第二核苷酸序列可操作地连接的第一核苷酸序列意指当将所述第一核苷酸序列以与所述第二核苷酸序列具有功能关系的方式进行放置时的情况。例如,一个启动子与一个核苷酸序列可操作地相关联,如果所述启动子影响所述核苷酸序列的转录或表达。本领域技术人员将会意识到,控制序列(例如,启动子)不需要与它所与之可操作地相关联的核苷酸序列相邻接,只要所述控制序列发挥功能以指引其表达。因此,例如,间插性的非翻译(然而经转录)的序列可以存在于启动子和核苷酸序列之间,并且所述启动子仍然可以被认为与所述核苷酸序列“可操作地连接”。

[0097] 如在本文中所使用的,关于多肽,术语“连接”是指一个多肽附着至另一个多肽。多肽可以直接地(例如,经由肽键)或通过连接体与另一个多肽(在N-末端或C-末端处)相连接。

[0098] 术语“连接体”是本领域公认的,并且是指连接两个分子或部分(例如,融合蛋白的两个结构域,例如Cas12a结构域和核酸编辑结构域(例如,胞嘧啶脱氨酶))的键、化学基团或分子。连接体可以由单个连接分子(例如,氨基酸)构成,或者可以包含多于一个连接分

子。在一些实施方案中,所述连接体可以为有机分子、基团、聚合物或化学部分。在一些实施方案中,所述连接体可以为氨基酸或肽连接体。在一些实施方案中,肽连接体的长度可以为大约4、5至100个或更多个氨基酸,例如长度为4、5、6、7、8、9、10、11、12、13、14、15、16、17、18、19、20、21、22、23、24、25、26、27、28、29、30、30、31、32、33、34、35、36、37、38、39、40、41、42、43、44、45、46、47、48、49、50、51、52、53、54、55、56、57、58、59、60、61、62、63、64、65、66、67、68、69、70、71、72、73、74、75、76、77、78、79、80、81、82、83、84、85、86、87、88、89、90、91、92、93、94、95、96、97、98、99、100个或更多个氨基酸。在一些实施方案中,肽连接体可以为GS连接体。在一些实施方案中,所述连接体可以包含氨基酸序列SGGS (SEQ ID NO:25)、(GGG)_n、或S (GGG)_n (SEQ ID NO:25的一个或多个重复),其中n为1-20 (例如,1、2、3、4、5、6、7、8、9、10、11、12、13、14、15、16、17、18、19、20和其中的任何范围或值)。在一些实施方案中,所述连接体可以包含氨基酸序列SGGSGGSGGS (SEQ ID NO:26)。在一些实施方案中,所述连接体可以包含氨基酸序列SGSETPGTSESATPES (SEQ ID NO:27),也称为XTEN连接体。在一些实施方案中,连接体可以包含氨基酸序列SGGSSGGSSGSETPGTSESATPESSGGSSGGGS (SEQ ID NO:28),也称为GS-XTEN-GS连接体。在一些实施方案中,连接体包含下述氨基酸序列、基本上由下述氨基酸序列组成或由下述氨基酸序列组成:SEQ ID NO:1-24的氨基酸序列中的任一个。

[0099] “启动子”为控制或调控与该启动子可操作地相关联的核苷酸序列 (例如,编码序列) 的转录的核苷酸序列。由启动子控制或调控的编码序列可以编码多肽和/或功能性RNA。典型地,“启动子”是指包含用于RNA聚合酶II的结合位点并且指引转录起始的核苷酸序列。一般而言,启动子被发现处于相对于相应的编码序列的编码区的起始点而言的5'或上游。启动子区可以包含作为基因表达的调节物起作用的其他元件。这些包括TATA盒共有序列,和经常地,CAAT盒共有序列 (Breathnach和Chambon, (1981) Annu. Rev. Biochem. 50:349)。在植物中,CAAT盒可以被替换为AGGA盒 (Messing等人, (1983) Genetic Engineering of Plants, T. Kosuge, C. Meredith和A. Hollaender (编者), Plenum Press, 第211-227页)。

[0100] 启动子可以包括例如组成性的、诱导型的、在时间上受调控的、在发育上受调控的、以化学方式受调控的、组织优选的和/或组织特异性的启动子,其用于在制备重组核酸分子例如“合成的核酸构建体”或“蛋白质-RNA复合物”中使用。启动子的这些各种类型是本领域中已知的。

[0101] 启动子的选择可以取决于对于表达的时间和空间要求而变化,并且也可以基于待转化的宿主细胞而变化。用于许多不同生物的启动子是本领域中众所周知的。基于本领域中存在的详尽知识,可以为特定的目的宿主生物选择合适的启动子。因此,例如,关于在模式生物中高度组成性地表达的基因的上游的启动子知道很多,并且此类知识可以容易地获取并且在其他系统中施行 (在合适时)。

[0102] 在一些实施方案中,本发明的多核苷酸和/或核酸构建体可以为“表达盒”或者可以被包含在表达盒之内。如在本文中使用的,“表达盒”意指这样的重组核酸分子,其包含例如本发明的核酸构建体 (例如,其编码本发明的复合物 (例如,本发明的融合蛋白和指导核酸)), 其中所述核酸构建体与至少一个控制序列 (例如,启动子) 可操作地相关联。因此,本发明的一些实施方案提供了被设计成用于表达例如本发明的核酸构建体的表达盒。

[0103] 包含目的核苷酸序列的表达盒可以是嵌合的,这意味着其组分中的至少一个相关于其其他成分中的至少一个而言是异源的 (例如,与待在宿主生物中表达的目的多核苷酸

可操作地连接的来自宿主生物的启动子,其中所述目的多核苷酸来自不同于该宿主的生物或者通常不与那个启动子相关联地被发现)。表达盒也可以为天然出现但是已经以对于异源表达来说有用的重组形式获得的表达盒。

[0104] 表达盒任选地可以包括在所选择的宿主细胞中有功能的转录和/或翻译终止区(即,终止区)和/或增强子区。各种各样的转录终止子和/或增强子是可得的使用于在表达盒中使用,并且负责转录的终止和正确的mRNA多腺苷酸化。终止区和/或增强子区可以对于转录起始区来说是天然的,可以对于可操作地连接的目的核苷酸序列来说是天然的,可以对于宿主细胞来说是天然的,或者可以来自另一个来源(例如,对于启动子、目的核苷酸序列、宿主或其任何组合来说外源的或异源的)。

[0105] 本发明的表达盒也可以包括编码选择标记(其可以用于选择经转化的宿主细胞)的核苷酸序列。如在本文中所使用的,“选择标记”意指这样的核苷酸序列,其当被表达时,赋予表达所述标记的宿主细胞以不同的表型,并且因此允许此类经转化的细胞区别于不具有所述标记的那些细胞。此类核苷酸序列可以编码可选择或可筛选的标记,这取决于所述标记是否赋予可以通过化学手段,例如通过使用选择试剂(例如,抗生素等)进行选择的性状,或者取决于所述标记是否仅是通过观察或测试,例如通过筛选(例如,荧光)就可以鉴定的性状。合适的选择标记的许多例子是本领域中已知的,并且可以被用于在本文中所描述的表达盒之中。

[0106] 除了表达盒之外,在本文中所描述的核酸分子/构建体和多核苷酸序列也可以与载体相联系地进行使用。术语“载体”是指用于将核酸转移、递送或引入到细胞中的组合物。载体包含含有待转移、递送或引入的核苷酸序列的核酸分子。用于在宿主生物的转化中使用的载体是本领域中众所周知的。载体的一般类别的非限制性例子包括但不限于,病毒载体、质粒载体、噬菌体载体、噬菌粒载体、粘粒载体、F粘粒(fosmid)载体、噬菌体、人工染色体、小环或土壤杆菌二元载体,以双链或单链的线性或环状形式,其可以是或可以不是可自我传递的或可移动的。在一些实施方案中,病毒载体可以包括但不限于,逆转录病毒、慢病毒、腺病毒、腺伴随病毒或单纯疱疹病毒载体。在本文中所定义的载体可以通过整合到细胞基因组中或者在染色体外存在(例如,具有复制起点的自主复制质粒)来转化原核生物或真核生物宿主。另外还包括穿梭载体,其意指能够(天然地或通过设计)在两种不同的宿主生物中复制的DNA载体,所述宿主生物可以选自放线菌和相关物种、细菌和真核生物(例如,高等植物、哺乳动物、酵母或真菌细胞)。在一些实施方案中,在载体中的核酸处于合适的启动子或其他用于在宿主细胞中进行转录的调控元件的控制之下并且与之可操作地连接。所述载体可以为在多种宿主中发挥功能的双功能表达载体。在基因组DNA的情况下,这可以包含其自己的启动子或其他调控元件,和在cDNA的情况下,这可以处于合适的启动子或其他用于在宿主细胞中进行表达的调控元件的控制之下。因此,可以将本发明的多核苷酸和核酸构建体和/或包含其的表达盒包含在本文中所描述的和本领域中已知的载体之中。

[0107] 如在本文中所使用的,“接触”及其语法变化形式是指将所希望的反应的组分一起放置在适合于进行该所希望的反应(例如,转化、转录控制、基因组编辑、缺口产生和/或切割)的条件下。因此,例如,可以使靶核酸与本发明的融合蛋白和指导核酸相接触,从而修饰所述靶核酸。在一些实施方案中,可以在一定条件下使靶DNA与编码本发明的融合蛋白的多核苷酸或核酸构建体和指导核酸相接触,所述条件为这样的条件,其中所述融合蛋白被表

达并且与所述指导核酸形成复合物,所述复合物然后与所述靶核酸杂交以修饰所述靶核酸。

[0108] 如在本文中所使用的,关于靶核酸,“修饰”包括靶核酸的编辑(例如,突变)、共价修饰、交换/置换核酸/核苷酸碱基、删除、切割、缺口产生和/或转录控制。

[0109] 在目的多核苷酸的情景下,“引入”(及其语法变化形式)意指以这样的方式向宿主生物或所述生物的细胞(例如,宿主细胞)呈递目的核苷酸序列(例如,多核苷酸、核酸构建体、复合物(例如,蛋白质-RNA嵌合复合物)和/或指导核酸),从而使得所述核苷酸序列得以进入细胞的内部。因此,例如,可以将编码本发明的融合蛋白的多核苷酸和指导核酸引入到生物的细胞中,从而转化所述细胞。

[0110] 如在本文中所使用的,术语“转化”是指将异源核酸引入到细胞中。细胞的转化可以是稳定的或瞬时的。因此,在一些实施方案中,用本发明的核苷酸分子稳定地转化宿主细胞或宿主生物。在其他实施方案中,用本发明的重组核酸分子瞬时地转化宿主细胞或宿主生物。

[0111] 在多核苷酸的情景下,“瞬时转化”意味着,多核苷酸被引入到细胞中,并且不整合到细胞的基因组中。

[0112] 在被引入到细胞中的多核苷酸的情景下,“稳定地引入”意指,所引入的多核苷酸被稳定地掺入到细胞的基因组中,并且因此用所述多核苷酸稳定地转化所述细胞。

[0113] 如在本文中所使用的,“稳定转化”或“稳定地转化”意味着,核酸分子被引入到细胞中并且整合到细胞的基因组中。如此,所整合的核酸分子能够被其后代,更特别地被多个连续世代的后代遗传。如在本文中所使用的,“基因组”包括核基因组和质体基因组,并且因此包括核酸整合到例如叶绿体或线粒体基因组中。如在本文中所使用的,“稳定转化”也指在染色体外维持的转基因,例如作为微型染色体或质粒。

[0114] 瞬时转化可以通过例如酶联免疫吸附测定法(ELISA)或Western印迹来检测,其可以检测由被引入到生物中的一个或多个转基因所编码的肽或多肽的存在。细胞的稳定转化可以通过例如所述细胞的基因组DNA的Southern印迹杂交测定法来检测,其使用与被引入到生物(例如,植物)中的转基因的核苷酸序列特异性地杂交的核酸序列。细胞的稳定转化可以通过例如所述细胞的RNA的Northern印迹杂交测定法来检测,其使用与被引入到宿主生物中的转基因的核苷酸序列特异性地杂交的核酸序列。细胞的稳定转化也可以通过例如聚合酶链式反应(PCR)或其他扩增反应(如本领域中众所周知的)来检测,其采用与转基因的靶序列杂交的特异性引物序列,从而导致转基因序列的扩增,其可以根据标准方法来检测。转化也可以通过本领域中众所周知的直接测序和/或杂交实验方案来检测。

[0115] 因此,在一些实施方案中,可以瞬时地表达本发明的核苷酸序列、核酸构建体和/或表达盒,和/或可以将它们稳定地掺入到宿主生物的基因组中。因此,在一些实施方案中,可以将本发明的融合蛋白或编码其的多核苷酸引入到具有指导核酸的细胞中,并且如此没有DNA维持在所述细胞中。

[0116] 可以通过本领域技术人员已知的任何方法来将本发明的核酸构建体/多核苷酸引入到细胞中。在本发明的一些实施方案中,细胞的转化包括核转化。在其他实施方案中,细胞的转化包括质体转化(例如,叶绿体转化)。在进一步的实施方案中,可以经由常规育种技术将本发明的核酸构建体/多核苷酸引入到细胞中。

[0117] 用于转化真核和原核生物两者的程序是本领域中众所周知的和常规的,并且在文献各处作了描述(参见例如,Jiang等人,2013.Nat.Biotechnol.31:233-239;Ran等人,Nature Protocols 8:2281-2308(2013))。

[0118] 因此,可以以许多本领域中众所周知的方式将核苷酸序列引入到宿主生物或其细胞中。本发明的方法不依赖于特定的用于将一个或多个核苷酸序列引入到生物中的方法,只要它们得以进入所述生物的至少一个细胞的内部。当待引入多于一个核苷酸序列时,可以将它们装配作为单个核酸构建体的一部分,或者作为分开的核酸构建体,并且可以位于相同或不同的核酸构建体上。因此,可以在单个转化事件中或者在分开的转化事件中将核苷酸序列引入到目的细胞中,或者备选地,在相关的情况下,可以将核苷酸序列掺入到植物中,例如作为育种实验方案的一部分。

[0119] 本发明旨在多肽(例如,SEQ ID NO:1-24),其可以用于例如连接两个或多个蛋白质/蛋白质结构域。在一些实施方案中,本发明的多肽可以与SEQ ID NO:1-24的氨基酸序列中的任一个大约70%至100%同一(例如,70%、71%、72%、73%、74%、75%、76%、77%、78%、79%、80%、81%、82%、83%、84%、85%、86%、87%、88%、89%、90%、91%、92%、93%、94%、95%、96%、97%、98%、99%、99.5%或100%)。在一些实施方案中,本发明提供了编码SEQ ID NO:1-24的氨基酸序列中的任一个的多核苷酸,和/或与编码SEQ ID NO:1-24的氨基酸序列中的任一个的多核苷酸具有70%至100%同一性(例如,70%、71%、72%、73%、74%、75%、76%、77%、78%、79%、80%、81%、82%、83%、84%、85%、86%、87%、88%、89%、90%、91%、92%、93%、94%、95%、96%、97%、98%、99%、99.5%或100%同一的)的多核苷酸。在一些实施方案中,编码SEQ ID NO:1-24的氨基酸序列中的任一个的多核苷酸可以进行密码子优化以用于在生物中表达。

[0120] 本发明还旨在包含这些多肽的合成的融合蛋白。在一些实施方案中,本发明提供了多肽,其包含SEQ ID NO:1-24的氨基酸序列中的任一个和目的多肽。在一些实施方案中,可以将目的多肽在其C-末端和/或其N-末端处与SEQ ID NO:1-24的氨基酸序列中的任一个相连接,任选地在C-末端和/或N-末端处。在一些实施方案中,目的多肽可以包含两个或更多个目的多肽(例如,2、3、4、5、6、7个或更多个),其可以是相同的或不同的,其中可以将所述两个或更多个目的多肽中的至少两个经由SEQ ID NO:1-24的氨基酸序列中的任一个相互连接。

[0121] 对本发明来说有用的目的多肽可以包括但不限于具有下列活性的多肽或蛋白质结构域:脱氨酶(脱氨作用)活性(例如,胞嘧啶脱氨酶、腺嘌呤脱氨酶)、切口酶活性、重组酶活性、转座酶活性、甲基化酶活性、糖基化酶(DNA糖基化酶)活性、糖基化酶抑制剂活性(例如,尿嘧啶-DNA糖基化酶抑制剂(UGI))、脱甲基酶活性、转录激活活性、转录阻抑活性、转录释放因子活性、组蛋白修饰活性、核酸酶活性、单链RNA切割活性、双链RNA切割活性、限制性内切核酸酶活性(例如,Fok1)、核酸结合活性、甲基转移酶活性、DNA修复活性、DNA损伤活性、歧化酶活性、烷基化活性、脱嘌呤活性、氧化活性、嘧啶二聚体形成活性、整合酶活性、转座酶活性、聚合酶活性、连接酶活性、解旋酶活性和/或光裂合酶活性。在一些实施方案中,所述目的多肽为腺嘌呤脱氨酶、胞嘧啶脱氨酶、Fok1核酸酶或尿嘧啶-DNA糖基化酶抑制剂。在一些实施方案中,目的多核苷酸可以进行密码子优化以用于在生物中表达。

[0122] 在一些实施方案中,所述目的多肽为CRISPR Cas12a多肽或Cas12a结构域,其中所

述Cas12a在其C-末端和/或N-末端处与SEQ ID NO:1-24的氨基酸序列中的任一个的C-末端或N-末端相连接。

[0123] 在一些实施方案中,提供了融合蛋白,其包含Cas12a、目的多肽、和SEQ ID NO:1-24的氨基酸序列中的任一个。在一些实施方案中,SEQ ID NO:1-24的氨基酸序列使得Cas12a和一个或多个(例如,1、2、3、4、5、6、7个或更多)目的多肽(例如,胞嘧啶脱氨酶结构域、糖基化酶抑制剂(例如,尿嘧啶-DNA糖基化酶抑制剂(UGI))相对于Cas12a结构域而言的最佳布置成为可能。SEQ ID NO:1-24的氨基酸序列可以用于连接Cas12a和目的多肽,以允许接近非靶链的单链部分的方式,以用于例如核酸修饰,例如碱基编辑。

[0124] 在一些实施方案中,当用于连接Cas12a与目的多肽时,SEQ ID NO:1-24的氨基酸序列可以提供不同的用于核酸的修饰或编辑的窗口。例如,将目的多肽与Cas12a相连接的SEQ ID NO:1-24的氨基酸序列可以提供来自在靶核酸(例如,DNA)中的相应的PAM(原间隔子邻近基序)的1至大约25个核苷酸的用于编辑或修饰的窗口(例如,来自PAM的1、2、3、4、5、6、7、8、9、10、11、12、13、14、15、16、17、18、19、20、21、22、23、24或25个核苷酸以及其中的任何范围或值的编辑/修饰窗口)。在一些实施方案中,编辑或修饰窗口可以为来自PAM的1、2、3、4、5、6、7、8、9、10至大约11、12、13、14、15、16、17、18、19、20、21、22、23、24、25个核苷酸(例如,来自PAM的1至20、1至15、1至10、3至15、4至10、5至25、5至20、5至15、5至10、7至15个核苷酸等)。

[0125] Cas12a为V型成簇规律间隔短回文重复序列(CRISPR)-Cas核酸酶。Cas12a在几个方面不同于更熟知的II型CRISPR Cas9核酸酶。例如,Cas9识别处于其指导RNA(gRNA、sgRNA)结合位点(原间隔子(protospacer)、靶核酸、靶DNA)3'处的富含G的原间隔子邻近基序(PAM)(3'-NGG),而Cas12a识别位于靶核酸5'处的富含T的PAM(5'-ttN、5'TTN)。事实上,Cas9和Cas12a结合其指导RNA所采取的定向相关于其N和C末端而言是非常几乎相反的。进一步地,Cas12a酶使用单一指导RNA(gRNA、CRISPR阵列、crRNA),而不是在天然Cas9系统中发现的双重指导RNA(sgRNA(例如,crRNA和tracrRNA)),并且Cas12a加工其自己的gRNA。另外,Cas12a核酸酶活性产生错开的DNA双链断裂,而不是由Cas9核酸酶活性产生的平端,并且Cas12a依赖于单个RuvC结构域来切割两条DNA链,而Cas9利用HNH结构域和RuvC结构域来进行切割。

[0126] 对本发明来说有用的CRISPR Cas12a多肽或CRISPR Cas12a结构域可以是任何已知的或后来鉴定出的Cas12a核酸酶(以前称为Cpf1)(参见例如,美国专利号9,790,490,其通过提及而合并,为了其关于Cpf1(Cas12a)序列的公开内容)。术语“Cas12a”、“Cas12a多肽”或“Cas12a结构域”是指包含Cas12a多肽或其片段(其包含Cas12a的指导核酸结合结构域,和/或Cas12a的有活性的、无活性的或部分有活性的DNA切割结构域)RNA-指导的核酸酶。在一些实施方案中,对本发明来说有用的Cas12a可以在核酸酶活性位点(例如,Cas12a结构域的RuvC位点)中包含突变。在其核酸酶活性位点中具有突变并因此不再包含核酸酶活性的Cas12a结构域或Cas12a多肽通常被称为deadCas12a(例如,dCas12a)。在一些实施方案中,在其核酸酶活性位点中具有突变的Cas12a结构域或Cas12a多肽可以具有受损的活性。

[0127] 在一些实施方案中,Cas12a结构域可以包括但不限于SEQ ID NO:29-45中的任一个(例如,SEQ ID NO:29、30、31、32、33、34、35、36、37、38、39、40、41、42、43、44、45、45)的氨

基酸序列;或者编码其的多核苷酸。在一些实施方案中,本发明的融合蛋白可以包含来自毛螺菌科(Lachnospiraceae)细菌ND2006 Cas12a (LbCas12a)的Cas12a结构域(例如,SEQ ID NO:29)。

[0128] 在一些实施方案中,编码Cas12a结构域的多核苷酸可以进行密码子优化以用于在生物中表达。因此,在一些实施方案中,本发明提供了与编码SEQ ID NO:29-45中的任一个的氨基酸序列的多核苷酸具有至少大约70%同一性(例如,大约70%、71%、72%、73%、74%、75%、76%、77%、78%、79%、80%、81%、82%、83%、84%、85%、86%、87%、88%、89%、90%、91%、92%、93%、94%、95%、96%、97%、98%、99%、100%同一性)的多核苷酸。

[0129] 在一些实施方案中,提供了V型成簇规律间隔短回文重复序列(CRISPR)-相关(Cas)(CRISPR-Cas)系统,该系统包含:(a)融合蛋白,其包含Cas12a结构域、包含SEQ ID NO:1-24的氨基酸序列中的任一个的连接体和目的多肽,或者编码所述融合蛋白的核酸,其中所述Cas12a结构域经由SEQ ID NO:1-24的氨基酸序列中的任一个与所述目的多肽相连接;和(b)指导核酸(CRISPR RNA、CRISPR DNA、crRNA、crDNA),其包含间隔子序列和重复序列,其中所述指导核酸能够与所述融合蛋白的Cas12a结构域形成复合物,并且所述间隔子序列能够与靶核酸杂交,从而将所述Cas12a结构域和所述目的多肽引导至所述靶核酸,由此所述系统能够修饰(例如,切割或编辑)或调节(例如,调节转录)所述靶核酸。

[0130] 在一些实施方案中,提供了融合蛋白,其包含Cas12a、目的多肽和SEQ ID NO:1-24的氨基酸序列中的任一个,其中所述目的多肽为胞嘧啶脱氨酶多肽或结构域。

[0131] 在一些实施方案中,本发明提供了融合蛋白,其包含:(a)Cas12a结构域,其中当与所结合的指导核酸(例如,gRNA)相联合时,所述Cas12a结构域与靶核酸序列特异性地结合;(b)胞嘧啶脱氨酶结构域,其中当与所述Cas12a结构域和所述gRNA相联合时,所述胞嘧啶脱氨酶结构域使在所述靶核酸序列的单链部分中的胞嘧啶碱基脱氨;和(c)尿嘧啶糖基化酶抑制剂(UGI)结构域,其中所述UGI结构域抑制尿嘧啶-DNA糖基化酶,其中所述Cas12a结构域经由SEQ ID NO:1-24的氨基酸序列中的任一个与所述胞嘧啶脱氨酶结构域或所述UGI结构域相连接。在一些实施方案中,所述Cas12a结构域的N-末端可以经由SEQ ID NO:1-5的氨基酸序列中的任一个与所述胞嘧啶脱氨酶结构域的C-末端相连接,所述Cas12a结构域的C-末端可以经由SEQ ID NO:6-12的氨基酸序列中的任一个与所述UGI结构域的N-末端相连接,所述胞嘧啶脱氨酶结构域的N-末端可以经由SEQ ID NO:13-16的氨基酸序列中的任一个与所述UGI结构域的C-末端相连接,所述Cas12a结构域的N-末端可以经由SEQ ID NO:17-19的氨基酸序列中的任一个与所述UGI结构域的C-末端相连接,和/或所述胞嘧啶脱氨酶结构域的N-末端可以经由SEQ ID NO:20-24的氨基酸序列中的任一个与所述Cas12a结构域的C-末端相连接。在一些实施方案中,当所述Cas12a结构域的N-末端经由SEQ ID NO:1-5的氨基酸序列中的任一个与所述胞嘧啶脱氨酶结构域的C-末端相连接时,所述Cas12a结构域的C-末端可以经由GS连接体与所述UGI结构域相连接。在一些实施方案中,当所述Cas12a结构域的C-末端经由SEQ ID NO:6-12的氨基酸序列中的任一个与所述UGI结构域的N-末端相连接时,所述Cas12a结构域的N-末端可以经由GS连接体与所述胞嘧啶脱氨酶结构域相连接。在一些实施方案中,当所述Cas12a结构域的N-末端经由SEQ ID NO:17-19的氨基酸序列中的任一个与所述UGI结构域的C-末端相连接时,所述Cas12a的C-末端可以经由GS连接体与所述胞

嘧啶脱氨酶相连接。在一些实施方案中,当所述胞嘧啶脱氨酶结构域的N-末端经由SEQ ID NO:20-24的氨基酸序列中的任一个与所述Cas12a结构域的C-末端相连接时,所述Cas12a的C-末端经由GS连接体与所述胞嘧啶脱氨酶相连接。本发明的实例性的融合蛋白包括但不限于,SEQ ID NO:49-72的氨基酸序列。

[0132] 在一些实施方案中,提供了融合蛋白,其包含:(a)胞嘧啶脱氨酶结构域;(b)Cas12a结构域;和(c)尿嘧啶-DNA糖基化酶抑制剂(UGI)结构域,其中所述胞嘧啶脱氨酶结构域的C-末端经由SEQ ID NO:1-5的氨基酸序列中的任一个与所述Cas12a结构域的N-末端相连接,并且所述Cas12a结构域的C-末端与所述UGI结构域的N-末端相连接,或者所述Cas12a结构域的C-末端经由SEQ ID NO:6-9的氨基酸序列中的任一个与所述UGI结构域的N-末端相连接,并且所述胞嘧啶脱氨酶结构域的C-末端与所述Cas12a结构域的N-末端相连接。在一些实施方案中,所述Cas12a结构域的C-末端可以经由GS连接体与所述UGI结构域的N-末端相连接。在一些实施方案中,所述胞嘧啶脱氨酶结构域的C-末端经由GS连接体与所述Cas12a结构域的N-末端相连接。在一些实施方案中,所述胞嘧啶脱氨酶结构域的C-末端经由SEQ ID NO:29的氨基酸序列与所述Cas12a结构域的N-末端相连接。本发明的实例性的融合蛋白包括但不限于,SEQ ID NO:64-72的氨基酸序列中的任一个。

[0133] 在一些实施方案中,提供了融合蛋白,其包含:(a)Cas12a(Cpf1)结构域;(b)尿嘧啶-DNA糖基化酶抑制剂(UGI)结构域;和(c)胞嘧啶脱氨酶结构域,其中所述Cas12a结构域的C-末端经由SEQ ID NO:10-12的氨基酸序列中的任一个与所述UGI结构域的N-末端相连接,并且所述UGI结构域的C-末端经由SEQ ID NO:13-16的氨基酸序列中的任一个与所述胞嘧啶脱氨酶结构域的N-末端相连接,其中独立地选择SEQ ID NO:10-12的氨基酸序列和SEQ ID NO:13-16的氨基酸序列。本发明的实例性的融合蛋白包括但不限于,SEQ ID NO:58-63的氨基酸序列中的任一个。

[0134] 在一些实施方案中,提供了融合蛋白,其包含:(a)尿嘧啶-DNA糖基化酶抑制剂(UGI)结构域;(b)Cas12a(Cpf1)结构域,其中所述Cas12a结构域在核酸酶活性位点中包含突变;和(c)胞嘧啶脱氨酶结构域,其中所述UGI结构域的C-末端经由SEQ ID NO:17-19的氨基酸序列中的任一个与所述Cas12a结构域的N-末端相连接,并且所述Cas12a结构域的C-末端与所述胞嘧啶脱氨酶结构域的N-末端相连接,或者其中所述UGI结构域的C-末端与所述Cas12a结构域的N-末端相连接,并且所述Cas12a结构域的C-末端经由SEQ ID NO:20-24的氨基酸序列中的任一个与所述胞嘧啶脱氨酶结构域的N-末端相连接。在一些实施方案中,所述Cas12a结构域的C-末端经由GS连接体与所述胞嘧啶脱氨酶结构域的N-末端相连接。在一些实施方案中,所述Cas12a结构域的C-末端经由SEQ ID NO:28的氨基酸序列与所述胞嘧啶脱氨酶结构域的N-末端相连接。在一些实施方案中,所述UGI结构域的C-末端经由GS连接体与所述Cas12a结构域的N-末端相连接。本发明的实例性的融合蛋白包括但不限于,SEQ ID NO:49-72的氨基酸序列中的任一个。

[0135] 对本发明来说有用的胞嘧啶脱氨酶(或胞苷脱氨酶)可以是任何已知的或后来鉴定出的来自任何生物的胞嘧啶脱氨酶(参见例如,美国专利号10,167,457;和Thuronyi等人,Nat.Biotechnol.37:1070-1079(2019),其各自通过提及而合并入本文,为了其关于胞嘧啶脱氨酶的公开内容。胞嘧啶脱氨酶可以分别催化胞苷或脱氧胞苷水解脱氨为尿苷或脱氧尿苷。在一些实施方案中,所述脱氨酶多肽或脱氨酶结构域为胞苷脱氨酶结构域,其催化

胞嘧啶水解脱氨为尿嘧啶。在一些实施方案中,胞嘧啶脱氨酶可以为天然出现的胞嘧啶脱氨酶的变体,包括但不限于灵长类(例如、人、猴子、黑猩猩、大猩猩)、狗、牛、大鼠或小鼠。因此,在一些实施方案中,对本发明来说有用的胞嘧啶脱氨酶可以与野生型胞嘧啶脱氨酶大约70%至100%同一(例如,与天然出现的胞嘧啶脱氨酶大约70%、71%、72%、73%、74%、75%、76%、77%、78%、79%、80%、81%、82%、83%、84%、85%、86%、87%、88%、89%、90%、91%、92%、93%、94%、95%、96%、97%、98%、99%或100%同一,以及其中的任何范围或值)。在一些实施方案中,编码胞嘧啶脱氨酶多肽/结构域的多核苷酸可以进行密码子优化以用于在生物中表达。

[0136] 在一些实施方案中,对本发明来说有用的胞嘧啶脱氨酶可以为载脂蛋白B mRNA编辑复合物(APOBEC)家族脱氨酶。在一些实施方案中,所述胞嘧啶脱氨酶可以为APOBEC1脱氨酶、APOBEC2脱氨酶、APOBEC3A脱氨酶、APOBEC3B脱氨酶、APOBEC3C脱氨酶、APOBEC3D脱氨酶、APOBEC3F脱氨酶、APOBEC3G脱氨酶、APOBEC3H脱氨酶、APOBEC4脱氨酶、人激活诱导的脱氨酶(hAID)、rAPOBEC1、FERNY和/或CDA1,任选地pmCDA1、atCDA1(例如,At2g19570)和/或其进化版本。在一些实施方案中,所述胞嘧啶脱氨酶可以为具有SEQ ID NO:46的氨基酸序列的APOBEC1脱氨酶。在一些实施方案中,所述胞嘧啶脱氨酶可以为具有SEQ ID NO:47的氨基酸序列的APOBEC3A脱氨酶。在一些实施方案中,对本发明来说有用的胞嘧啶脱氨酶可以与天然出现的胞嘧啶脱氨酶的氨基酸序列大约70%至100%同一(例如,70%、71%、72%、73%、74%、75%、76%、77%、78%、79%、80%、81%、82%、83%、84%、85%、86%、87%、88%、89%、90%、91%、92%、93%、94%、95%、96%、97%、98%、99%、99.5%或100%同一)。在一些实施方案中,对本发明来说有用的胞嘧啶脱氨酶可以与SEQ ID NO:46或SEQ ID NO:47的氨基酸序列大约70%至99.5%同一(例如,70%、71%、72%、73%、74%、75%、76%、77%、78%、79%、80%、81%、82%、83%、84%、85%、86%、87%、88%、89%、90%、91%、92%、93%、94%、95%、96%、97%、98%、99%或99.5%同一)(例如,与SEQ ID NO:46或SEQ ID NO:47的氨基酸序列至少80%、至少85%、至少90%、至少92%、至少95%、至少96%、至少97%、至少98%、至少99%或至少99.5%同一)。在一些实施方案中,编码胞嘧啶脱氨酶的多核苷酸可以进行密码子优化以用于在生物中表达,并且经密码子优化的多肽可以与参考多核苷酸大约70%至99.5%同一。

[0137] 对本发明来说有用的“尿嘧啶糖基化酶抑制剂”可以为任何能够抑制尿嘧啶-DNA糖基化酶碱基切除修复酶的蛋白质。在一些实施方案中,UGI结构域包含野生型UGI或其片段。在一些实施方案中,对本发明来说有用的UGI结构域可以与天然出现的UGI结构域的氨基酸序列大约70%至100%同一(例如,70%、71%、72%、73%、74%、75%、76%、77%、78%、79%、80%、81%、82%、83%、84%、85%、86%、87%、88%、89%、90%、91%、92%、93%、94%、95%、96%、97%、98%、99%、99.5%或100%同一,以及其中的任何范围或值)。在一些实施方案中,UGI结构域可以包含SEQ ID NO:48的氨基酸序列,或者与SEQ ID NO:48的氨基酸序列具有大约70%至99.5%同一性的多肽(例如,与SEQ ID NO:48的氨基酸序列至少80%、至少85%、至少90%、至少92%、至少95%、至少96%、至少97%、至少98%、至少99%或至少99.5%同一)。例如,在一些实施方案中,UGI结构域可以包含SEQ ID NO:48的氨基酸序列的片段,其与SEQ ID NO:48的氨基酸序列的一部分连续核苷酸(例如,10、15、20、25、30、35、40、45、50、55、60、65、70、75、80个连续核苷酸;例如,大约10、15、20、25、30、35、

40、45至大约50、55、60、65、70、75、80个连续核苷酸) 100%同一。在一些实施方案中, UGI结构域可以为已知的UGI (例如, SEQ ID NO: 48) 的变体, 其与该已知的UGI具有70%至99.5%同一性 (例如, 70%、71%、72%、73%、74%、75%、76%、77%、78%、79%、80%、81%、82%、83%、84%、85%、86%、87%、88%、89%、90%、91%、92%、93%、94%、95%、96%、97%、98%、99%、99.5%同一性, 以及其中的任何范围或值)。在一些实施方案中, 编码UGI的多核苷酸可以进行密码子优化以用于在生物中表达, 并且经密码子优化的多核苷酸可以与参考多核苷酸大约70%至99.5%同一。

[0138] 在本文中所描述的包含与目的多肽相连接的Cas12a结构域的本发明的融合蛋白可以与被设计成与Cas12a结构域一起发挥功能的指导RNA (gRNA、CRISPR阵列、CRISPR RNA、crRNA) 相组合地进行使用, 以修饰靶核酸。对本发明来说有用的指导核酸 (CRISPR RNA、CRISPR DNA、crRNA、crDNA) 包含间隔子序列和重复序列。所述指导核酸能够与所述融合蛋白的Cas12a结构域形成复合物, 并且所述间隔子序列能够与靶核酸杂交, 从而将所述Cas12a结构域和所述目的多肽引导至所述靶核酸, 其中所述靶核酸通过所述融合蛋白的目的多肽进行修饰 (例如, 切割或编辑) 或调节 (例如, 调节转录)。作为例子, 在本文中所描述的包含与胞嘧啶脱氨酶结构域相连接的Cas12a结构域的融合蛋白可以与Cas12a指导核酸相组合地进行使用以修饰靶核酸, 其中所述融合蛋白的胞嘧啶脱氨酶结构域使所述靶核酸中的胞嘧啶碱基脱氨, 从而编辑所述靶核酸。

[0139] 如在本文中所使用的, “指导核酸”、“指导RNA”、“gRNA”、“CRISPR RNA/DNA”、“crRNA”或“crDNA”意指这样的核酸, 其包含至少一个与靶DNA (例如, 原间隔子) 互补 (并且与之杂交) 的间隔子序列, 和至少一个重复序列 (例如, V型Cas12a CRISPR-Cas系统的重复序列, 或者其片段或部分), 其中所述重复序列与所述间隔子序列的5'末端相连接。本发明的gRNA的设计基于V型Cas12aCRISPR-Cas系统。在一些实施方案中, 用于Cas12a的gRNA可以包含 (从5'至3'): 重复序列 (全长或其部分 (“柄”); 例如, 假结样结构); 和间隔子序列。在一些实施方案中, 指导核酸可以包含多于一个重复序列-间隔子序列 (例如, 2、3、4、5、6、7、8、9、10或更多个重复序列-间隔子序列) (例如, 重复-间隔子-重复; 例如, 重复-间隔子-重复-间隔子-重复-间隔子-重复-间隔子-重复-间隔子, 等等)。本发明的指导核酸是合成的、人造的并且未在自然界中发现。gRNA可以是相当长的, 并且可以用作适配体 (例如在MS2募集策略中) 或者其他从间隔子上悬挂的RNA结构。

[0140] 如在本文中所使用的, “重复序列”是指例如, 野生型CRISPR Cas12a基因座的任何重复序列或者合成的crRNA的重复序列。对本发明来说有用的重复序列可以为任何已知的或后来鉴定出的CRISPR Cas12a基因座 (V型) 的重复序列, 或者它可以为被设计成在V型CRISPR-Cas系统中发挥功能的合成的重复序列。重复序列可以包含发夹结构和/或茎-环结构。在一些实施方案中, 重复序列可以在其5'末端处形成假结样结构 (即, “柄”)。因此, 在一些实施方案中, 重复序列可以与来自野生型V型CRISPR基因座的重复序列同一或实质上同一 (例如, 至少70%同一)。来自野生型Cas12a (V型) CRISPR基因座的重复序列可以通过已建立的算法来确定, 例如使用通过CRISPRdb提供的CRISPRfinder (参见Grissa等人, Nucleic Acids Res. 35(Web Server issue): W52-7)。在一些实施方案中, 重复序列或其部分与间隔子序列的5'末端相连接, 从而形成重复序列-间隔子序列 (例如, 指导RNA、crRNA)。

[0141] 在一些实施方案中, 重复序列包含至少10个核苷酸、基本上由至少10个核苷酸组

成或者由至少10个核苷酸组成,取决于特定的重复序列以及包含该重复序列的指导RNA是经加工的还是未加工的(例如,大约10、11、12、13、14、15、16、17、18、19、20、21、22、23、24、25、26、27、28、29、30、31、32、33、34、35、36、37、38、39、40、41、42、43、44、45、46、47、48、49、50至100个或更多个核苷酸,或者其中的任何范围或值)。在一些实施方案中,重复序列包含下述核苷酸、基本上由下述核苷酸组成或者由下述核苷酸组成:大约10至大约20、大约10至大约30、大约10至大约45、大约10至大约50、大约15至大约30、大约15至大约40、大约15至大约45、大约15至大约50、大约20至大约30、大约20至大约40、大约20至大约50、大约30至大约40、大约40至大约80、大约50至大约100或更多个核苷酸。

[0142] 与间隔子序列的5'末端相连接的重复序列可以包含重复序列的一部分(例如,野生型重复序列的5、6、7、8、9、10、11、12、13、14、15、16、17、18、19、20、21、22、23、24、25、26、27、28、29、30、31、32、33、34、35或更多个邻接核苷酸)。在一些实施方案中,与间隔子序列的5'末端相连接的重复序列的一部分的长度可以为大约五个至大约十个连续核苷酸(例如,大约5、6、7、8、9、10个核苷酸),并且与野生型Cas12a重复核苷酸序列的相同区域(例如,5'末端)具有至少90%同一性(例如,至少大约90%、91%、92%、93%、94%、95%、96%、97%、98%、99%或更多)。在一些实施方案中,重复序列的一部分在其5'末端处包含假结样结构(例如,“柄”)。

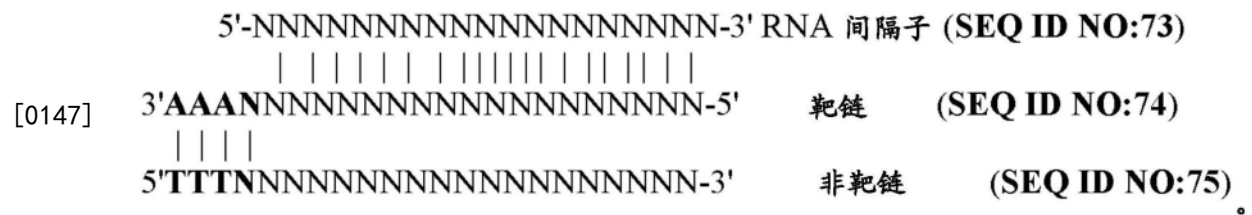
[0143] 如在本文中所使用的,“间隔子序列”为与靶核酸(例如,靶DNA)(例如,原间隔子)互补的核苷酸序列。所述间隔子序列可以与靶核酸完全互补或实质上互补(例如,至少大约70%互补(例如,大约70%、71%、72%、73%、74%、75%、76%、77%、78%、79%、80%、81%、82%、83%、84%、85%、86%、87%、88%、89%、90%、91%、92%、93%、94%、95%、96%、97%、98%、99%或更多))。因此,在一些实施方案中,所述间隔子序列可以相比于所述靶核酸而言具有一个、两个、三个、四个或五个错配,所述错配可以是邻接的或非邻接的。在一些实施方案中,所述间隔子序列可以与靶核酸具有70%互补性。在其他实施方案中,所述间隔子核苷酸序列可以与靶核酸具有80%互补性。在另外其他实施方案中,所述间隔子核苷酸序列可以与所述靶核酸(原间隔子)具有85%、90%、95%、96%、97%、98%、99%或99.5%互补性,等等。在一些实施方案中,所述间隔子序列与所述靶核酸100%互补。间隔子序列可以具有大约15个核苷酸至大约30个核苷酸(例如,15、16、17、18、19、20、21、22、23、24、25、26、27、28、29或30个核苷酸,或者其中的任何范围或值)的长度。因此,在一些实施方案中,间隔子序列可以在长度为至少大约15个核苷酸至大约30个核苷酸的靶核酸(例如,原间隔子)的区域上具有完全的互补性或实质上的互补性。在一些实施方案中,所述间隔子的长度为大约20个核苷酸。在一些实施方案中,所述间隔子的长度为大约23个核苷酸。

[0144] 在一些实施方案中,指导RNA的间隔子序列的5'区可以与靶DNA同一,而间隔子的3'区可以与靶DNA实质上同一,并且因此所述间隔子序列与所述靶DNA的总互补性可以小于100%。因此,例如,在例如具有20个核苷酸的间隔子序列的5'区中的前1、2、3、4、5、6、7、8等个核苷酸(即,种子区)可以与所述靶DNA 100%互补,而在所述间隔子序列的3'区中的其余核苷酸与所述靶DNA实质上互补(例如,至少大约70%互补)。在一些实施方案中,所述间隔子序列的5'末端的前1至8个核苷酸(例如,前1、2、3、4、5、6、7、8个核苷酸,以及其中的任何范围)可以与所述靶DNA 100%互补,而在所述间隔子序列的3'区中的其余核苷酸与所述靶DNA实质上互补(例如,至少大约50%互补(例如,50%、55%、60%、65%、70%、71%、72%、

73%、74%、75%、76%、77%、78%、79%、80%、81%、82%、83%、84%、85%、86%、87%、88%、89%、90%、91%、92%、93%、94%、95%、96%、97%、98%、99%或更多)。在一些实施方案中,间隔子的种子区的长度可以为大约5至6个核苷酸。在一些实施方案中,间隔子的种子区的长度为5个核苷酸。在一些实施方案中,间隔子的种子区的长度为6个核苷酸。

[0145] 如在本文中所使用的,“靶核酸”、“靶DNA”、“靶核苷酸序列”、“靶区域”或“基因组中的靶区域”是指与在本发明的指导RNA中的间隔子序列完全互补(100%互补)或实质上互补(例如,至少70%互补(例如,70%、71%、72%、73%、74%、75%、76%、77%、78%、79%、80%、81%、82%、83%、84%、85%、86%、87%、88%、89%、90%、91%、92%、93%、94%、95%、96%、97%、98%、99%或更多))的生物的基因组的区域。对于CRISPR-Cas12a系统来说有用的靶区域紧接地位于在生物的基因组中的PAM序列的3'。靶区域可以选自任何紧接地位于PAM序列邻近的至少15个连续核苷酸(例如,16、17、18、19、20、21、22、23、24、25、26、27、28、29、30个核苷酸,等等)。

[0146] “原间隔子序列”是指靶双链DNA,和特别地是指与CRISPR重复序列-间隔子序列(例如,指导RNA、CRISPR阵列、crRNA)的间隔子序列完全或实质上互补(并且杂交)的靶DNA(例如,基因组中的靶区域)的那一部分。在V型CRISPR-Cas Cas12a系统的情况下,所述原间隔子序列的侧翼为(紧邻)原间隔子邻近基序(PAM)。所述PAM位于在非靶链上的5'末端和靶链的3'末端(作为例子,参见下面)。



[0148] 规范的Cas12a PAM是富含T的。在一些实施方案中,规范的Cas12a PAM序列可以为5'-TTN、5'-TTTN或5'-TTTV。在一些实施方案中,可以使用非规范的PAM,但是它可能是效率较低的。

[0149] 另外的PAM序列可以由本领域技术人员通过已建立的实验和计算方法来确定。因此,例如,实验方法包括靶向侧翼为所有可能的核苷酸序列的序列,并且鉴定不经历靶向的序列成员,例如通过靶质粒DNA的转化(Esvelt等人,2013.Nat.Methods 10:1116-1121; Jiang等人,2013.Nat.Biotechnol.31:233-239)。在一些方面,计算方法可以包括进行天然间隔子的BLAST搜索以鉴定在噬菌体或质粒中的原始靶DNA序列,并且比对这些序列以确定邻近靶序列的保守序列(Briner和Barrangou.2014.Appl.Environ.Microbiol.80:994-1001;Mojica等人,2009.Microbiology 155:733-740)。

[0150] 在一些实施方案中,提供了复合物或组合物,其包含一种或多种(例如,1、2、3、4、5、6、7、8或更多种)本发明的融合蛋白和一种或多种(例如,1、2、3、4、5、6、7、8或更多种)指导核酸(例如,CRISPR RNA/DNA,例如crRNA/crDNA)。在一些实施方案中,提供了多核苷酸或核酸构建体,其编码本发明的多肽、融合蛋白、指导核酸和/或复合物。在一些实施方案中,提供了核酸构建体、表达盒和/或载体,其包含本发明的多核苷酸和/或一种或多种指导核酸。在一些实施方案中,编码本发明的融合蛋白的多核苷酸可以在与包含所述指导核酸的多核苷酸相同的或分开多核苷酸、核酸构建体、表达盒或载体上进行编码。当所述融合蛋

白在与包含所述指导核酸的多核苷酸分开的多核苷酸、核酸构建体、表达盒或载体上进行编码时,可以在提供所述指导核酸(例如,与靶核酸相接触)之前、同时或之后提供编码本发明的融合蛋白的多核苷酸、核酸构建体、表达盒或载体(例如,与靶核酸相接触)。

[0151] 在一些实施方案中,本发明的多核苷酸、核酸构建体、表达盒和/或载体可以进行密码子优化以用于在生物中表达。在一些实施方案中,经优化的本发明的多核苷酸、核酸构建体或表达盒可以与编码本发明的多肽、融合蛋白和复合物的多核苷酸、核酸构建体或表达盒大约70%至100%同一(例如,大约70%、71%、72%、73%、74%、75%、76%、77%、78%、79%、80%、81%、82%、83%、84%、85%、86%、87%、88%、89%、90%、91%、92%、93%、94%、95%、96%、97%、98%、99%、99.5%或100%)。

[0152] 在一些实施方案中,提供了细胞,其包含一种或多种本发明的多核苷酸、指导核酸、核酸构建体、表达盒或载体。

[0153] 本发明的多肽、融合蛋白、指导RNA、复合物和组合物以及编码其的多核苷酸/核酸构建体/表达盒/载体可以用于修饰靶核酸和/或其表达。

[0154] 在一些实施方案中,本发明的融合蛋白为用于在对靶核酸进行碱基编辑中进行使用的胞嘧啶碱基编辑器(ABE),其中所述融合蛋白包含与胞嘧啶脱氨酶结构域相连接的Cas12a结构域。

[0155] 在一些实施方案中,提供了修饰靶核酸的方法,所述方法包括使所述靶核酸与下述项目相接触:(a) (i) 本发明的融合蛋白,和(a) (ii) 指导核酸(例如,CRISPR RNA、CRISPR DNA、crRNA、crDNA); (b) 复合物,其包含本发明的融合蛋白和指导核酸; (c) 组合物,其包含本发明的融合蛋白和指导核酸;和/或(d) 本发明的系统,从而修饰靶核酸。可以在使靶核酸与所述指导核酸相接触之前、同时或之后使靶核酸与所述融合蛋白相接触。

[0156] 在一些实施方案中,提供了修饰靶核酸的方法,所述方法包括使所述靶核酸与包含SEQ ID NO:49-72的氨基酸序列中的任一个的融合蛋白和指导核酸相接触。可以在使靶核酸与所述指导核酸相接触之前、同时或之后使靶核酸与本发明的融合蛋白相接触。

[0157] 在一些实施方案中,提供了修饰靶核酸的方法,所述方法包括在一定条件下使包含所述靶核酸的细胞或无细胞系统与下述项目相接触:(a) (i) 编码本发明的多肽或本发明的融合蛋白的多核苷酸,或者包含其的表达盒或载体,和(a) (ii) 指导核酸,和/或包含其的表达盒或载体;和/或(b) 编码包含本发明的融合蛋白和指导核酸的复合物的核酸构建体,和/或包含其的表达盒或载体,从而修饰所述靶核酸,所述条件为这样的条件,其中所述融合蛋白被表达并且与所述指导核酸形成复合物,所述复合物与所述靶核酸杂交。当在分开的构建体上提供时,可以在使所述靶核酸与所述指导核酸相接触之前、同时或之后使所述靶核酸与编码所述融合蛋白的多核苷酸、核酸构建体、表达盒或载体相接触。

[0158] 在一些实施方案中,提供了修饰靶核酸的方法,所述方法包括在一定条件下使包含所述靶核酸的细胞或无细胞系统与下述项目相接触:编码包含SEQ ID NO:50-78的氨基酸序列中的任一个的融合蛋白的多核苷酸,或者包含其的表达盒或载体;和指导核酸,或者包含其的表达盒或载体,从而修饰所述靶核酸,所述条件为这样的条件,其中所述融合蛋白被表达并且与所述指导核酸形成复合物,所述复合物与所述靶核酸杂交。当在分开的构建体上提供时,可以在使所述靶核酸与所述指导核酸相接触之前、同时或之后使所述靶核酸与编码所述融合蛋白的多核苷酸、核酸构建体、表达盒或载体相接触。

[0159] 在一些实施方案中,本发明提供了编辑靶核酸的方法,所述方法包括使所述靶核酸与下述项目相接触:(a) (i) 本发明的融合蛋白,和(a) (ii) 指导核酸;(b) 复合物,其包含本发明的融合蛋白和指导核酸;(c) 组合物,其包含(i) 本发明的融合蛋白和(ii) 指导核酸;和/或(d) (i) 本发明的CRISPR-Cas系统,其中所述胞嘧啶脱氨酶结构域将在所述靶核酸中的胞嘧啶(C) 转变为胸腺嘧啶(T),从而编辑所述靶核酸以产生(点) 突变。可以在使靶核酸与所述指导核酸相接触之前、同时或之后使靶核酸与本发明的融合蛋白相接触。

[0160] 在一些实施方案中,提供了编辑靶核酸的方法,所述方法包括使所述靶核酸与包含SEQ ID NO:49-72的氨基酸序列中的任一个的融合蛋白和指导核酸相接触,从而编辑所述靶核酸。可以在使所述靶核酸与所述指导核酸相接触之前、同时或之后使所述靶核酸与本发明的融合蛋白相接触。

[0161] 在一些实施方案中,提供了编辑靶核酸的方法,所述方法包括在一定条件下使包含所述靶核酸的细胞或无细胞系统与下述项目相接触:(a) (i) 编码本发明的融合蛋白的多核苷酸,和/或包含其的表达盒或载体,和(a) (ii) 指导核酸,和/或包含(a) (i) 和/或(a) (ii) 的表达盒或载体;和/或(b) 编码包含本发明的融合蛋白和指导核酸的复合物的核酸构建体,或者包含其的表达盒或载体,所述条件为这样的条件,其中所述融合蛋白被表达并且与所述指导核酸形成复合物,所述复合物与所述靶核酸杂交,其中所述胞嘧啶脱氨酶结构域将在所述靶核酸中的胞嘧啶(C) 转变为胸腺嘧啶(T),从而编辑所述靶核酸以产生(点) 突变。当在分开的构建体上提供时,可以在使所述靶核酸与所述指导核酸相接触之前、同时或之后使所述靶核酸与所述融合蛋白相接触。

[0162] 在一些实施方案中,提供了编辑靶核酸的方法,所述方法包括在一定条件下使包含所述靶核酸的细胞或无细胞系统与下述项目相接触:编码包含SEQ ID NO:49-72的氨基酸序列中的任一个的融合蛋白的多核苷酸,或者包含其的表达盒或载体;和指导核酸,或者包含其的表达盒或载体,从而编辑所述靶核酸,所述条件为这样的条件,其中所述融合蛋白被表达并且与所述指导核酸形成复合物,所述复合物与所述靶核酸杂交。编码包含SEQ ID NO:49-72的氨基酸序列中的任一个的融合蛋白的多核苷酸可以存在于相同的包含所述指导核酸的表达盒或载体上。当编码包含SEQ ID NO:49-72的氨基酸序列中的任一个的融合蛋白的多核苷酸处于与包含所述指导核酸的多核苷酸分开的表达盒或载体上时,可以在使所述靶核酸与包含所述指导核酸的表达盒/载体相接触之前、同时或之后使所述靶核酸与包含所述融合蛋白的表达盒/载体相接触。

[0163] 在一些实施方案中,本发明提供了编辑对于可以用本发明进行使用的碱基编辑来说有用的靶结构域/多肽的方法。如在本文中所使用的,“胞嘧啶脱氨酶”和“胞苷脱氨酶”是指催化或能够催化胞嘧啶脱氨的多肽或其结构域,因为所述多肽或结构域催化或能够催化从胞嘧啶碱基上去除氨基基团。因此,胞嘧啶脱氨酶可以导致胞嘧啶转变为胸苷(通过尿嘧啶中间体),从而在基因组中引起C至T转变,或者G至A转变(在互补链中)。因此,在一些实施方案中,由本发明的多核苷酸所编码的胞嘧啶脱氨酶在所述靶核酸的有义(例如,“+”;模板)链中生成C→T转变,或者在所述靶核酸的反义(例如,“-”,互补)链中生成G→A转变。在一些实施方案中,由本发明的多核苷酸所编码的胞嘧啶脱氨酶在基因组中生成C至T或者G至A转变(在互补链中)。

[0164] 对本发明来说有用的胞嘧啶脱氨酶可以是任何已知的或后来鉴定出的来自任何

生物的胞嘧啶脱氨酶(参见例如,美国专利号10,167,457;和Thuronyi等人,Nat.Biotechnol.37:1070-1079(2019),其各自通过提及而合并入本文,为了其关于胞嘧啶脱氨酶的公开内容。胞嘧啶脱氨酶可以分别催化胞苷或脱氧胞苷水解脱氨为尿苷或脱氧尿苷。因此,在一些实施方案中,对本发明来说有用的脱氨酶或脱氨酶结构域可以为胞苷脱氨酶结构域,其催化胞嘧啶水解脱氨为尿嘧啶。在一些实施方案中,胞嘧啶脱氨酶可以为天然出现的胞嘧啶脱氨酶的变体,包括但不限于灵长类(例如、人、猴子、黑猩猩、大猩猩)、狗、牛、大鼠或小鼠。因此,在一些实施方案中,对本发明来说有用的胞嘧啶脱氨酶可以与野生型胞嘧啶脱氨酶大约70%至大约100%同一(例如,与天然出现的胞嘧啶脱氨酶大约70%、71%、72%、73%、74%、75%、76%、77%、78%、79%、80%、81%、82%、83%、84%、85%、86%、87%、88%、89%、90%、91%、92%、93%、94%、95%、96%、97%、98%、99%或100%同一,以及其中的任何范围或值)。

[0165] 在一些实施方案中,对本发明来说有用的胞嘧啶脱氨酶可以为载脂蛋白B mRNA编辑复合物(APOBEC)家族脱氨酶。在一些实施方案中,所述胞嘧啶脱氨酶可以为APOBEC1脱氨酶、APOBEC2脱氨酶、APOBEC3A脱氨酶、APOBEC3B脱氨酶、APOBEC3C脱氨酶、APOBEC3D脱氨酶、APOBEC3F脱氨酶、APOBEC3G脱氨酶、APOBEC3H脱氨酶、APOBEC4脱氨酶、人激活诱导的脱氨酶(hAID)、rAPOBEC1、FERNY和/或CDA1,任选地pmCDA1、atCDA1(例如,At2g19570)和其进化版本。在一些实施方案中,所述胞嘧啶脱氨酶可以为APOBEC1脱氨酶,其任选地具有SEQ ID NO:46或SEQ ID NO:79的氨基酸序列。在一些实施方案中,所述胞嘧啶脱氨酶可以为APOBEC3A脱氨酶,其任选地具有SEQ ID NO:47的氨基酸序列。在一些实施方案中,所述胞嘧啶脱氨酶可以为CDA1脱氨酶,任选地具有SEQ ID NO:76的氨基酸序列的CDA1。在一些实施方案中,所述胞嘧啶脱氨酶可以为FERNY脱氨酶,任选地具有SEQ ID NO:77或SEQ ID NO:80的氨基酸序列的FERNY。在一些实施方案中,所述胞嘧啶脱氨酶可以为hAID脱氨酶,任选地具有SEQ ID NO:81或SEQ ID NO:82的氨基酸序列的hAID。在一些实施方案中,对本发明来说有用的胞嘧啶脱氨酶可以与天然出现的胞嘧啶脱氨酶(例如,“进化的脱氨酶”)的氨基酸序列(参见例如,SEQ ID NO:78、SEQ ID NO:79、SEQ ID NO:80、SEQ ID NO:82)大约70%至大约100%同一(例如,70%、71%、72%、73%、74%、75%、76%、77%、78%、79%、80%、81%、82%、83%、84%、85%、86%、87%、88%、89%、90%、91%、92%、93%、94%、95%、96%、97%、98%、99%、99.5%或100%同一)。在一些实施方案中,对本发明来说有用的胞嘧啶脱氨酶可以与SEQ ID NO:46、SEQ ID NO:47、SEQ ID NO:76、SEQ ID NO:77、SEQ ID NO:78、SEQ ID NO:79、SEQ ID NO:80、SEQ ID NO:81或SEQ ID NO:82的氨基酸序列大约70%至大约99.5%同一(例如,大约70%、71%、72%、73%、74%、75%、76%、77%、78%、79%、80%、81%、82%、83%、84%、85%、86%、87%、88%、89%、90%、91%、92%、93%、94%、95%、96%、97%、98%、99%或99.5%同一)(例如,与SEQ ID NO:46、SEQ ID NO:47、SEQ ID NO:76、SEQ ID NO:77、SEQ ID NO:78、SEQ ID NO:79、SEQ ID NO:80、SEQ ID NO:81或SEQ ID NO:82的氨基酸序列至少80%、至少85%、至少90%、至少92%、至少95%、至少96%、至少97%、至少98%、至少99%或至少99.5%同一)。在一些实施方案中,编码胞嘧啶脱氨酶的多核苷酸可以进行密码子优化以用于在植物中表达,并且经密码子优化的多肽可以与参考多核苷酸大约70%至99.5%同一。

[0166] 本发明的融合蛋白和编码其的多核苷酸和核酸构建体可以与指导核酸相组合地

进行使用以修饰靶核酸,包括但不限于在靶核酸(包括但不限于,质粒序列)中生成C→T或G→A突变;在编码序列中生成C→T或G→A突变,以改变氨基酸同一性;在编码序列中生成C→T或G→A突变,以生成终止密码子;在编码序列中生成C→T或G→A突变,以破坏起始密码子;在基因组DNA中生成点突变,以破坏转录因子结合;在基因组DNA中生成点突变,以破坏剪接点;和/或通过包含经由氨基酸序列SEQ ID NO:1-24(例如,肽连接体)中的任一个与其他结构域(目的多肽)相融合的Cas12a结构域的融合蛋白而生成的其他核酸修饰。

[0167] 本发明的融合蛋白和编码其的多核苷酸和核酸构建体对于修饰任何生物的靶核酸来说可以是有用的,包括但不限于动物、植物、真菌、古细菌或细菌。动物可以包括但不限于,哺乳动物、昆虫、鱼类、鸟类等。

[0168] 对于其来说本发明可以是有用的示例性哺乳动物包括但不限于,灵长类(人和非人(例如,黑猩猩、狒狒、猴子、大猩猩等))、猫、狗、小鼠、大鼠、雪貂、沙鼠、仓鼠、牛、猪、马、山羊、驴或绵羊。

[0169] 可以使用本发明的融合蛋白和编码其的多核苷酸和核酸构建体来修饰任何植物或植物部分的靶核酸。在实施本发明中可以采用任何植物(或被分组为例如属或更高的目类别的植物组别),包括被子植物,裸子植物,单子叶植物,双子叶植物,C3、C4、CAM植物,苔藓植物,蕨类植物和/或拟蕨植物、微观藻类,和/或大型藻类。对本发明来说有用的植物和/或植物部分可以是任何植物物种/变种/栽培种的植物或植物部分。如在本文中所使用的,术语“植物部分”包括但不限于胚、花粉、胚珠、种子、叶、茎、苗、花、枝条、果实、谷粒、穗、穗轴、壳、柄、根、根尖、花药、植物细胞(包括在植物和/或植物部分中是完整的植物细胞)、植物原生质体、植物组织、植物细胞组织培养物、植物愈伤组织、植物团块等。如在本文中所使用的,“苗”是指包括叶和茎的地上部分。进一步地,如在本文中所使用的,“植物细胞”是指植物的结构和生理学单元,其包含细胞壁,并且也可以是指原生质体。植物细胞可以处于分离的单细胞的形式,或者可以是培养的细胞,或者可以是经更高地组织的单元(例如,植物组织或植物器官)的一部分。

[0170] 本发明的融合蛋白和编码其的多核苷酸和核酸构建体可以用于对任何植物或植物部分的靶核酸进行修饰(例如,碱基编辑、切割、缺口产生等)。对本发明来说有用的植物的非限制性例子包括:草坪草(例如,早熟禾、剪股颖、黑麦草、羊茅),羽毛芦苇草,发草,芒,芦竹,柳枝稷,蔬菜作物,包括洋葱,球茎甘蓝,芝麻菜,韭葱,芦笋,莴苣(例如,头型莴苣、叶莴苣、长叶莴苣),黄体芋,甜瓜类(例如,香瓜、西瓜、克兰省甜瓜、香蜜瓜、罗马甜瓜),芸苔类作物(例如,抱子甘蓝、卷心菜、花椰菜、球花甘蓝、羽衣甘蓝、无头甘蓝、大白菜、小白菜),菜蓟,胡萝卜,中国卷心菜(napa),秋葵,洋葱,芹菜,欧芹,鹰嘴豆,欧洲防风,菊苣,胡椒,马铃薯,葫芦类(例如,西葫芦,黄瓜,密生西葫芦,笋瓜,南瓜,蜜瓜,西瓜,罗马甜瓜),萝卜,干球洋葱,芜菁甘蓝,茄子,婆罗门参,苜蓿菜,青葱,荷兰莴苣,大蒜,菠菜,绿洋葱,笋瓜,绿叶蔬菜(greens),甜菜类(糖用甜菜和饲用甜菜),甘薯,蕓荳菜,辣根,番茄,芜菁,和香料;水果作物,例如苹果,杏,樱桃,油桃,桃,梨,李子,洋李,樱桃,榲桲,无花果,坚果类(例如,栗子、美洲山核桃、阿月浑子、榛子、阿月浑子、花生、胡桃、澳洲坚果、杏仁等),柑橘类(例如,克莱门氏小柑橘、金橘、橙子、葡萄柚、红橘、桔子、柠檬、来檬等),蓝莓,黑覆盆子,博伊森树莓,酸果蔓,茶藨子,鹅莓,罗甘莓,覆盆子,草莓,黑莓,葡萄(酿酒葡萄和食用葡萄),鳄梨,香蕉,猕猴桃,柿子,石榴,菠萝,热带水果,梨果,甜瓜,芒果,番木瓜,和荔枝,大田作物植物

例如三叶草,苜蓿,梯牧草,月见草,白芒花(meadow foam),玉米/玉蜀黍(大田玉米、甜玉米、爆花用玉米),蛇麻草,希蒙得木,荞麦,红花,昆诺阿藜,小麦,稻,大麦,黑麦,粟,高粱,燕麦,黑小麦,高粱,烟草,木棉花,豆科植物(豆类(例如,菜豆和干豆)、兵豆、豌豆、大豆),油料植物(油菜、卡诺拉油菜、芥菜、罂粟、橄榄、向日葵、椰子、蓖麻油植物、可可豆、落花生、油棕),浮萍,拟南芥属(*Arabidopsis*),纤维植物(棉花、亚麻、大麻、黄麻),大麻属(*Cannabis*) (例如,大麻(*Cannabis sativa*)、印度大麻(*Cannabis indica*)和莠草大麻(*Cannabis ruderalis*)),樟科(肉桂、樟树),或植物例如咖啡、甘蔗、茶和天然橡胶植物;和/或花坛植物例如有花植物、仙人掌、肉质植物和/或观赏植物(例如,蔷薇、郁金香、紫罗兰),以及树木例如林木(阔叶树和常绿树,例如针叶树;例如,榆树、白蜡树、橡树、槭树、冷杉、云杉、雪松、松树、桦树、柏树、桉树、柳树),以及灌木和其他圃育苗木。在一些实施方案中,本发明的融合蛋白和编码其的多核苷酸和核酸构建体可以用于修饰玉蜀黍、大豆、小麦、卡诺拉油菜、稻、番茄、胡椒、向日葵、覆盆子、黑莓、黑覆盆子和/或樱桃。

[0171] 本发明进一步包括用于实施本发明的方法的试剂盒。本发明的试剂盒可以包含用于混合、测量、分选、标记等的试剂、缓冲液和器具,以及说明书等,如将会适合于修饰靶核酸的。

[0172] 在一些实施方案中,本发明提供了试剂盒,其包含一种或多种本发明的多肽、一种或多种本发明的融合蛋白、一种或多种编码一种或多种本发明的融合蛋白的多核苷酸、本发明的CRISPR-Cas系统和/或包含其的表达盒或载体,以及任选的关于其使用的说明书。在一些实施方案中,试剂盒可以进一步包含:Cas12a指导核酸和/或包含其的表达盒或载体。在一些实施方案中,所述指导核酸可以提供在与编码本发明的融合蛋白的多核苷酸相同的表达盒或载体上。

[0173] 因此,在一些实施方案中,提供了试剂盒,其包含核酸构建体,所述核酸构建体包含:(a)在本文中提供的编码融合蛋白的多核苷酸;和(b)驱动(a)的多核苷酸的表达的启动子。在一些实施方案中,所述试剂盒可以进一步包含编码指导核酸的核酸构建体,其中所述构建体包含用于将与靶核酸序列同一或互补的核酸序列克隆到所述指导核酸的主链中的克隆位点。

[0174] 在一些实施方案中,所述试剂盒的多肽可以进一步包含一个或多个与所述融合蛋白相融合的核定位信号,或者编码其的多核苷酸。在一些实施方案中,所述试剂盒的多核苷酸可以进一步编码一个或多个对于鉴定转化体来说有用的选择标记(例如,编码抗生素抗性基因、除草剂抗性基因等的核酸)。在一些实施方案中,所述多核苷酸可以为mRNA,其可以在所编码的融合蛋白内编码一个或多个内含子。

[0175] 现在将会参考下面的实施例来描述本发明。应当意识到的是,这些实施例并不意在限制本发明的权利要求书的范围,而是意在作为某些实施方案的示例。对于技术人员而言而出现的在所例示的方法中的任何变化都意在落于本发明的范围之内。

实施例

[0176] 实施例1

[0177] 虽然已经测试到基于Cas12a的胞嘧啶碱基编辑器的一些变化,但是它们具有相比于基于Cas9的版本而言更低的活性。所有所测试的变体都使用在基于Cas9的胞嘧啶碱基编

辑器中所使用的相同的连接体套组 (GS连接体、XTEN连接体和GS-XTEN-GS连接体), 并且没有一个通过使用基于结构的技术来合理地或以计算方式进行优化。因此, 我们寻求通过基于rAPOBEC1和UGI结构域的理想布置为各种结构域构造设计最佳的连接体长度和序列来开发经优化的基于Cas12a的胞嘧啶碱基编辑器。

[0178] 初始的融合蛋白设计使用毛螺菌科细菌ND2006 Cas12a (LbCas12a) (例如, SEQ ID NO:29), 这是由于其较低的温度敏感性并且经证明的在植物细胞中的活性; 但是, 由于在不同的Cas12a内切核酸酶之间的高水平的结构相似性, 这些设计应当从其他物种 (例如, 氨基酸球菌属物种 (*Acidaminococcus* sp.) Cpf1 (AsCpf1)、新凶手弗朗西丝氏菌 (*Francisella novicida*) Cpf1 (FnCpf1) 和其他, 参见例如SEQ ID NO:30-45) 扩展至Cas12a酶。

[0179] 通过使用基于结构的方法, 我们开发出了几个连接体序列, 其被设计成使得胞嘧啶脱氨酶结构域相对于Cas12a而言的最佳布置成为可能, 以致于它们将能够接近用于碱基编辑的非靶链的单链部分。我们还设计了连接体序列以确保所述UGI结构域如此地安置, 从而它可以结合尿嘧啶-DNA糖基化酶, 而不干扰该碱基编辑器的其他组分。由于Cas12a的末端的布置和其指导RNA的定向, 对于这些布置的理想连接体显著地不同于在Cas9 CBE以及所发表的基于Cas12a的CBE的版本中所使用的现有技术连接体。这些连接体被设计成适应几种可能的碱基编辑器结构域构造, 其中将所述脱氨酶结构域与Cas12a的任一末端相连接。表1中提供了示例性的所设计的连接体。

[0180] 表1. 示例性连接体

连接体名称	长度	得分/ 残基	序列	SEQID NO/连 接体(L) 编号
ACU_1_1	36	-1.408	EKSKNDRSKPQPSDDRDRQPPSGEDYPEWKAPGEYE	1
ACU_1_2	34	-1.359	QEPKPQDQSSEVPPPPGSQKPGTKEPHDSKSSGP	2
ACU_1_3	34	-1.332	PDNSSGQKLQLPQPSDKPQDSREKSDSLPSDKRD	3
ACU_1_3R*	34	-1.020	PDNSTLQTLQLPQPTPSSTDTQQTSDTDPEDTTDVI	4
ACU_1_5R*	30	ND	STSQSDGSSVPADIDQSSDSQSSSQGQPG	5
ACU_2_1	14	-1.547	AKPDDESQKPPQDD	6
ACU_2_2	14	-1.511	LQLEPGPTTPEYPI	7
ACU_2_2R*	14	-1.351	IQLPPSDTTPENPI	8

[0182]

ACU_2_4	12	ND	ESNDNSQVPPSL	9
CUA_1_1	10	1.107	SEQQEYPGSG	10
CUA_1_1R*	10	-1.115	NNSEQQENPA	11
CUA_1_3	12	-1.015	STDGSGQPKHKP	12
CUA_2_1	20	-1.174	PKPSSESGERYEQPEPPPP	13
CUA_2_2	16	-1.134	KGGGGEPDEKRPSQSS	14
CUA_2_3	14	-1.013	YAGGTPKEPPPPNS	15
CUA_2_3R*	14	-0.860	PLVAGGTPFEPPPP	16
UCA_1_1	14	-1.404	PQPDERSQIPDNKE	17
UCA_1_3	10	-1.303	YTDEKPLPRS	18
UCA_1_4	12	ND	SHPPQEPPQSNL	19
UCA_2_1	16	-1.530	SESPSKQQPEPKSSKG	20
UCA_2_1R*	16	-1.166	SESPTNQQPEPQWTTD	21
UCA_2_2	16	-1.398	GGSKGPPPSPPPPQPE	22
UCA_2_2R*	16	-1.143	GPLPAPPPQPPPPQPN	23
UCA_2_3	14	-1.255	RPLPHDNNKQDYSK	24

[0183] 为了测试每个所设计的连接体序列的有效性(包括长度、柔韧性和对蛋白酶的易感性),生成了这样的构建体,其包含关于在用于在哺乳动物细胞中表达的载体中的特定构造的每个连接体序列。在图1A-C中提供了被选择用于实验筛选的基于Cas12a的胞嘧啶碱基编辑器的结构域安排,并且为测试而生成的实例性序列包括SEQ ID NO:49-72。

[0184] 在具有在图1A和图1C中所阐明的结构域安排的构建体的情况下,与APOBEC1和UGI的连接体相对于Cas12a而言是相互独立的;因此,将它们放置在分开的构建体中并且与长度匹配的对照连接体(8-残基GS、XTEN或GS-XTEN-GS)进行配对。对于在图1C中所阐明的结构域安排,由于这两个连接体都潜在地影响脱氨酶的位置,因而测试了所设计的连接体的所有组合。使用两个先前经测试的Cas12a胞嘧啶碱基编辑器设计作为对照(图2)。

[0185] 在哺乳动物细胞中进行筛选之后,选择对于每种构造来说最有效的连接体用于在稳定植物转化(例如,大豆)中进行测试。

[0186] 实施例2

[0187] HEK293T细胞测试

[0188] 将HEK293T细胞(人细胞系)接种到经胶原包被的48-孔平板(Corning)中,其中不存在抗生素,并且使用DMEM(Dulbecco改良的Eagle培养基)培养基。在70-80%汇合时,按照制造商的实验方案,使用750ng的碱基编辑器质粒和250ng的指导RNA质粒,用1.5μL的Lipofectamine 3000(ThermoFisher Scientific)转染细胞。在3天后,将细胞裂解,并且通过使用MagMax™ DNA提取试剂盒(Applied Biosystems)来提取DNA。

[0189] 如上面所描述的那样,在HEK293T细胞中在总共四个实验中测试了在表1中所列出的所有构建体。在下面的表2-5中和在图3-20中提供了关于所述四个实验中的每一个的结

果。表2-5中的百分比指明了在所示间隔子中在任一个碱基处所观察到的C->T编辑的最大量。

[0190] 在图3-20中,在X轴上列出了构建体,其中每个关于给定构建体的柱条表示在编辑窗口内的单个胞嘧啶处的编辑,如在图例中所描述的。Y轴指明了对于在窗口内的每个胞嘧啶所观察到的编辑水平。误差条表示在关于相同的构建体和指导的多个实验之间的标准偏差。当不存在误差条时,仅获取了一组测量值。对于某些构建体和间隔子(如在所述表格中标示为“ND=无数据”的),未测定编辑效率。

[0191] 所设计的连接体(特别是以ACU构型)显示出相对于对照构建体而言经改善的编辑效率。

[0192] 间隔子序列如下:

[0193] EMX1间隔子1:TCATCTGTGCCCCTCCCTCCCTG (SEQ ID NO:83)

[0194] RUNX1间隔子1:AGCCTCACCCCTCTAGCCCTACA (SEQ ID NO:84)

[0195] RUNX1间隔子2:TTCTCCCCTCTGCTGGATACCTC (SEQ ID NO:85)

[0196] DNMT1间隔子1:CCTCACTCCTGCTCGGTGAATTT (SEQ ID NO:86)

[0197] DNMT1间隔子2:GCTCAGCAGGCACCTGCCTCAGC (SEQ ID NO:87)

[0198] AAVS1间隔子1:TCTGTCCCCTCCACCCACAGTG (SEQ ID NO:88)

[0199] 表2:关于作为Apobec1融合物的Cas12a CBE构建体的初始编辑结果

构建体	峰值编辑 EMX1 间隔子 1	峰值编辑 RUNX1 间隔子 1	峰值编辑 RUNX1 间隔子 2	峰值编辑 DNMT1 间隔子 1	峰值编辑 DNMT1 间隔子 2
ACU_L1_1	0.6%	1.8%	2.3%	2.2%	ND
ACU_L1_2	1.0%	2.3%	2.9%	3.8%	0.2%
ACU_L1_3	0.9%	1.7%	3.7%	3.4%	0.7%
ACU_L1_3R	0.3%	1.4%	0%	3.6%	0.3%
ACU_L1_5R	0.9%	2.2%	4.0%	2.8%	0.2%
UCA_L1_4	0.3%	1.3%	2.0%	3.1%	0.1%
UCA_L2_1	0.8%	1.9%	ND	3.9%	0.2%
UCA_L2_1R	0%	0%	ND	0%	0%
UCA_L2_4	0%	0%	ND	0%	0%
CUA 对照	0.4%	1.5%	ND	2.7%	0.1%
Shanghai Tech 对照	0.2%	0.9%	ND	1.4%	0.2%

[0201] 表3:关于其余的作为Apobec1融合物的Cas12a CBE构建体的初始编辑结果

[0202]

构建体	峰值编辑 EMX1	峰值编辑 RUNX1 间 隔子 1	峰值编辑 DNMT1 间 隔子 1	峰值编辑 DNMT1 间 隔子 2
ACU_L2_1	ND	7.5%	7.8%	0.9%
ACU_L2_2	1.3%	3.2%	ND	0.6%
ACU_L2_2R	0.9%	4.7%	ND	0.5%
ACU_L2_4	2.3%	4.5%	3.6%	0.4%
CUA_L1_1R_L2_1	1.8%	3.3%	4.3%	0.5%
CUA_L1_1R_L2_2	1.5%	5.7%	4.7%	0.5%
CUA_L1_3_L2_2	1.6%	5.2%	6.5%	0.8%
CUA_L1_3_L2_3R	2.0%	4.5%	6.2%	0.7%
UCA_L1_3	ND	3.8%	4.3%	0.8%
CUA 对照	1.9%	4.0%	5.0%	0.7%

[0203]

ACU 对照	3.4%	6.1%	4.4%	0.6%
Shanghai Tech 对照	0.3%	2.6%	3.9%	0.4%

[0204] 表4:关于Cas12a CBE构建体的重复的编辑结果

[0205]

构建体	峰值编辑 EMX1	峰值编辑 RUNX1 间 隔子 1	峰值编辑 RUNX1 间 隔子 2	峰值编辑 AAVS1 间 隔子 1	峰值编辑 DNMT1 间 隔子 1
ACU_L1_1	1.7%	4.9%	ND	8.3%	5.4%
ACU_L1_2	0.9%	4.3%	ND	12.5%	6.7%
ACU_L1_3	0.7%	4.0%	ND	5.8%	6.8%
ACU_L1_3R	3.3%	4.2%	ND	8.8%	10.5%
ACU_L1_5R	2.5%	6.9%	ND	10.3%	8.8%
CUA_L1_3_L2_1	1.0%	3.3%	ND	3.1%	4.0%
UCA_L1_1	1.9%	3.4%	ND	5.2%	5.3%
UCA_L1_4	2.2%	0.1%	4.7%	2.5%	5.7%
UCA_L2_1	0%	0%	ND	1.7%	3.1%
UCA_L2_1R	0.6%	0%	ND	5.3%	4.5%
UCA_L2_2	1.3%	0.2%	3.3%	12.7%	5.8%
UCA_L2_2R	0.0%	0%	0%	0.0%	0.4%
UCA_L2_3	0.0%	0%	0%	0.7%	0%
UCA_L2_4	0.0%	0%	ND	0.0%	0%
CUA 对照	1.3%	4.0%	2.7%	3.1%	6.5%
ACU 对照	2.6%	2.4%	5.5%	5.0%	2.6%
Shanghai Tech 对照	0.3%	1.4%	6.4%	4.9%	3.8%

[0206] 表5:关于其余的Cas12a CBE构建体的重复的编辑结果

[0207]

构建体	峰值编辑 EMX1	峰值编辑 RUNX1 间隔 子 1	峰值编辑 AAVS1 间隔 子 1	峰值编辑 DNMT1 间 隔子 1
ACU_L1_1	2.0%	4.5%	9.3%	5.5%
ACU_L1_2	1.5%	3.2%	10.7%	5.7%
ACU_L1_2 (A3A)*	4.4%	4.6%	15.0%	ND
ACU_L1_3	0.8%	2.8%	7.3%	5.4%
ACU_L1_3R	4.1%	5.6%	9.4%	10.3%
ACU_L1_5R	2.8%	4.8%	12.3%	6.7%
CUA_L1_1R_L2_3R	1.7%	3.2%	8.3%	4.0%
CUA_L1_3_L2_1	1.7%	4.6%	12.0%	8.0%

[0208]

UCA_L1_1	3.0%	4.1%	9.9%	5.3%
UCA_L1_4	1.7%	1.6%	7.9%	7.7%
UCA_L2_1	0.9%	2.9%	8.0%	6.0%
UCA_L2_1R	0.6%	2.8%	7.9%	4.5%
UCA_L2_2	2.6%	3.1%	10.7%	6.3%
UCA_L2_2R	0%	0%	0%	0.2%
UCA_L2_3	0%	0.2%	0.8%	0.2%
UCA_L2_4	0%	0%	0.1%	0%
CUA 对照	1.5%	3.9%	7.8%	6.7%
ACU 对照	2.6%	3.0%	8.8%	3.5%
Shanghai Tech 对照	1.1%	1.6%	7.7%	5.2%

[0209] *该建体作为与A3A(而非Apobec1)的融合物进行测试。

[0210] 实施例3

[0211] 另外,作为与人A3A(一种先前已显示出使得有效的胞嘧啶碱基编辑成为可能的高活性脱氨酶)的融合物,测试了一个亚组的设计连同三个对照构建体一起。为了使这些构建体稳定化,在A3A的序列中包括内含子。两个另外的构建体,UCA_L2_2R和UCA_L2_4,过于不稳定而无法在没有内含子的情况下作为Apobec1融合物进行纯化,并因此在此显示为与在编码区中包含内含子的Apobec1的融合物。对于图21-25,Y轴指明了在由图例所示的胞嘧啶中的每一个处所取得的C至T编辑效率,并且在X轴上列出了构建体,其中在间隔子内的每个胞嘧啶用不同的柱条描绘。当指明“ND”时,它表示对于所指定的样品和间隔子未收集到数据。

[0212] 在下面的表6中和在图21-25中提供了关于该实施例的结果。表6中的百分比指明了在所示间隔子中在任一个碱基处所观察到的C->T编辑的最大量。

[0213] 表6

[0214]

构建体	峰值编辑 EMX1 间 隔子 1	峰值编辑 AAVS1 间隔子 1	峰值编辑 RUNX1 间隔子 1	峰值编辑 RUNX1 间隔子 2	峰值编辑 DNMT1 间隔子 1
ACU_L1_2 (A3A)*	11.1%	4.2%	6.1%	7.4%	6.3%
ACU_L1_2 (A3A+内含子)	7.1%	7.9%	6.4%	8.4%	9.7%
ACU_L1_3R	13.3%	6.7%	5.1%	6.4%	6.0%
ACU_L1_3R (A3A+内含子)	8.1%	9.1%	10.5%	9.5%	7.7%
ACU_L1_5R	3.9%	5.1%	3.5%	5.3%	6.3%
ACU_L1_5R (A3A+内含子)	30.2%	14.6%	18.6%	18.0%	18.6%
UCA_L2_1 (A3A+内含子)	24.3%	14.4%	ND	17.2%	17.6%
UCA_L2_2R (Apobec1+内含子)	3.8%	4.3%	3.2%	3.9%	6.8%
UCA_L2_4 (Apobec1+内含子)	9.9%	11.2%	11.6%	ND	9.4%
ACU 对照 (A3A+内含子)	15.3%	14.1%	14%	11.6%	13.9%
CUA 对照	4.6%	3.9%	4%	4.3%	4.1%
ACU 对照	11.5%	8.1%	ND	7.9%	12.3%
Shanghai Tech 对照	11.2%	8.6%	4.8%	6.1%	9.7%

[0215] *A3A=APOBEC3A

[0216] 实例性的编辑器构建体

[0217] ACU_L1_5R A3A(HCF版本):SEQ ID NO:91、93

[0218] ACU_L1_5R A3A(大豆版本):SEQ ID NO:92、94

[0219] ACU_L1_2 A3A(HCF版本):SEQ ID NO:95、96

[0220] ACU_L1_3R A3A(HCF版本):SEQ ID NO:97、98

[0221] UCA_L2_1 A3A(HCF版本):SEQ ID NO:99、100

[0222] CUA对照:SEQ ID NO:101

[0223] ACU对照:SEQ ID NO:102

[0224] Shanghai Tech对照:SEQ ID NO:103

[0225] ACU对照A3A(HCF版本):SEQ ID NO:104、105

[0226] UCA_L2_2R(Apobec1+内含子):SEQ ID NO:106

[0227] UCA_L2_4(Apobec1+内含子):SEQ ID NO:107

[0228] 实施例4

[0229] R-SODA实验方案

[0230] 对于快速稳定大豆测定法(R-SODA),通过使用超声处理,用包含在其T-DNA中编码合适的构建体和指导盒的质粒的根癌土壤杆菌(*Agrobacterium tumefaciens*)浸润经再水合的经干燥的大豆外植体。将外植体与根癌土壤杆菌一起共培养四天,并且转移至选择培养基。然后,将它们在选择培养基上培养四周,并且收集苗以用于筛选。通过使用下一代测序来评估在每个所取样的苗中的编辑。

[0231] 使用本发明的编辑器构建体(ACU_L1_5R(A3A)、ACU_L1_5R、ACU_L1_2),编辑了在大豆中的三个不同的核酸靶标(基因座1、基因座2、基因座3)。结果显示在图26中。

[0232] 上述内容举例说明了本发明,而不应被解释为限制了本发明。本发明由下面的权

利要求来定义,其中在那里包括这些权利要求的等价物。

[0001]	序列表
[0002]	<110> Pairwise Plants Services, Inc
[0003]	Guffy, Sharon Leigh
[0004]	Watts, Joseph Matthew
[0005]	<120> 经优化的蛋白质连接体以及使用方法
[0006]	<130> 1499-6W0
[0007]	<150> US 62/876,275
[0008]	<151> 2019-07-19
[0009]	<160> 107
[0010]	<170> PatentIn version 3.5
[0011]	<210> 1
[0012]	<211> 36
[0013]	<212> PRT
[0014]	<213> 人工的
[0015]	<220>
[0016]	<223> 连接体
[0017]	<400> 1
[0018]	Glu Lys Ser Lys Asn Asp Arg Ser Lys Pro Gln Pro Ser Asp Asp Arg
[0019]	1 5 10 15
[0020]	Asp Arg Gln Pro Pro Ser Gly Glu Asp Tyr Pro Glu Trp Lys Ala Pro
[0021]	20 25 30
[0022]	Gly Glu Tyr Glu
[0023]	35
[0024]	<210> 2
[0025]	<211> 34
[0026]	<212> PRT
[0027]	<213> 人工的
[0028]	<220>
[0029]	<223> 连接体
[0030]	<400> 2
[0031]	Gln Glu Pro Lys Pro Gln Asp Gln Ser Ser Glu Val Pro Pro Pro Pro
[0032]	1 5 10 15
[0033]	Gly Ser Gln Lys Pro Gly Thr Lys Glu Pro His Asp Ser Lys Ser Ser
[0034]	20 25 30
[0035]	Gly Pro
[0036]	<210> 3
[0037]	<211> 34
[0038]	<212> PRT
[0039]	<213> 人工的
[0040]	<220>
[0041]	<223> 连接体

[0042]	<400>	3
[0043]	Pro Asp Asn Ser Ser Gly Gln Lys Leu Gln Leu Pro Gln Pro Ser Asp	
[0044]	1	5 10 15
[0045]	Lys Pro Gln Asp Ser Arg Glu Lys Ser Asp Ser Leu Pro Ser Asp Lys	
[0046]		20 25 30
[0047]	Arg Asp	
[0048]	<210>	4
[0049]	<211>	36
[0050]	<212>	PRT
[0051]	<213>	人工的
[0052]	<220>	
[0053]	<223>	连接体
[0054]	<400>	4
[0055]	Pro Asp Asn Ser Thr Leu Gln Thr Leu Gln Leu Pro Gln Pro Thr Pro	
[0056]	1	5 10 15
[0057]	Ser Ser Thr Asp Thr Gln Gln Thr Ser Asp Thr Asp Pro Glu Asp Thr	
[0058]		20 25 30
[0059]	Thr Asp Val Ile	
[0060]		35
[0061]	<210>	5
[0062]	<211>	30
[0063]	<212>	PRT
[0064]	<213>	人工的
[0065]	<220>	
[0066]	<223>	连接体
[0067]	<400>	5
[0068]	Ser Thr Ser Gln Ser Asp Gly Ser Ser Val Pro Ala Asp Ile Asp Gln	
[0069]	1	5 10 15
[0070]	Ser Ser Asp Ser Asp Gln Ser Ser Ser Gln Gly Gln Pro Gly	
[0071]		20 25 30
[0072]	<210>	6
[0073]	<211>	14
[0074]	<212>	PRT
[0075]	<213>	人工的
[0076]	<220>	
[0077]	<223>	连接体
[0078]	<400>	6
[0079]	Ala Lys Pro Asp Asp Glu Ser Gln Lys Pro Pro Gln Asp Asp	
[0080]	1	5 10
[0081]	<210>	7
[0082]	<211>	14
[0083]	<212>	PRT

[0084]	<213>	人工的
[0085]	<220>	
[0086]	<223>	连接体
[0087]	<400>	7
[0088]	Leu Gln Leu Glu Pro Gly Pro Thr Thr Pro Glu Tyr Pro Ile	
[0089]	1	5 10
[0090]	<210>	8
[0091]	<211>	14
[0092]	<212>	PRT
[0093]	<213>	人工的
[0094]	<220>	
[0095]	<223>	连接体
[0096]	<400>	8
[0097]	Ile Gln Leu Pro Pro Ser Asp Thr Thr Pro Glu Asn Pro Ile	
[0098]	1	5 10
[0099]	<210>	9
[0100]	<211>	12
[0101]	<212>	PRT
[0102]	<213>	人工的
[0103]	<220>	
[0104]	<223>	连接体
[0105]	<400>	9
[0106]	Glu Ser Asn Asp Asn Ser Gln Val Pro Pro Ser Leu	
[0107]	1	5 10
[0108]	<210>	10
[0109]	<211>	10
[0110]	<212>	PRT
[0111]	<213>	人工的
[0112]	<220>	
[0113]	<223>	连接体
[0114]	<400>	10
[0115]	Ser Glu Gln Gln Glu Tyr Pro Gly Ser Gly	
[0116]	1	5 10
[0117]	<210>	11
[0118]	<211>	10
[0119]	<212>	PRT
[0120]	<213>	人工的
[0121]	<220>	
[0122]	<223>	连接体
[0123]	<400>	11
[0124]	Asn Asn Ser Glu Gln Gln Glu Asn Pro Ala	
[0125]	1	5 10

[0126]	<210>	12
[0127]	<211>	12
[0128]	<212>	PRT
[0129]	<213>	人工的
[0130]	<220>	
[0131]	<223>	连接体
[0132]	<400>	12
[0133]		Ser Thr Asp Gly Ser Gly Gln Pro Lys His Lys Pro
[0134]		1 5 10
[0135]	<210>	13
[0136]	<211>	20
[0137]	<212>	PRT
[0138]	<213>	人工的
[0139]	<220>	
[0140]	<223>	连接体
[0141]	<400>	13
[0142]		Pro Lys Pro Ser Ser Glu Ser Gly Glu Arg Tyr Glu Gln Gln Pro Glu
[0143]		1 5 10 15
[0144]		Pro Pro Pro Pro
[0145]		20
[0146]	<210>	14
[0147]	<211>	16
[0148]	<212>	PRT
[0149]	<213>	人工的
[0150]	<220>	
[0151]	<223>	连接体
[0152]	<400>	14
[0153]		Lys Gly Gly Gly Gly Glu Pro Asp Glu Lys Arg Pro Ser Gln Ser Ser
[0154]		1 5 10 15
[0155]	<210>	15
[0156]	<211>	14
[0157]	<212>	PRT
[0158]	<213>	人工的
[0159]	<220>	
[0160]	<223>	连接体
[0161]	<400>	15
[0162]		Tyr Ala Gly Gly Thr Pro Lys Glu Pro Pro Pro Pro Asn Ser
[0163]		1 5 10
[0164]	<210>	16
[0165]	<211>	14
[0166]	<212>	PRT
[0167]	<213>	人工的

[0168]	<220>	
[0169]	<223>	连接体
[0170]	<400>	16
[0171]	Pro Leu Val Ala Gly Gly Thr Pro Phe Glu Pro Pro Pro Pro	
[0172]	1	5 10
[0173]	<210>	17
[0174]	<211>	14
[0175]	<212>	PRT
[0176]	<213>	人工的
[0177]	<220>	
[0178]	<223>	连接体
[0179]	<400>	17
[0180]	Pro Gln Pro Asp Glu Arg Ser Gln Ile Pro Asp Asn Lys Glu	
[0181]	1	5 10
[0182]	<210>	18
[0183]	<211>	10
[0184]	<212>	PRT
[0185]	<213>	人工的
[0186]	<220>	
[0187]	<223>	连接体
[0188]	<400>	18
[0189]	Tyr Thr Asp Glu Lys Pro Leu Pro Arg Ser	
[0190]	1	5 10
[0191]	<210>	19
[0192]	<211>	12
[0193]	<212>	PRT
[0194]	<213>	人工的
[0195]	<220>	
[0196]	<223>	连接体
[0197]	<400>	19
[0198]	Ser His Pro Pro Gln Glu Pro Pro Gln Ser Asn Leu	
[0199]	1	5 10
[0200]	<210>	20
[0201]	<211>	16
[0202]	<212>	PRT
[0203]	<213>	人工的
[0204]	<220>	
[0205]	<223>	连接体
[0206]	<400>	20
[0207]	Ser Glu Ser Pro Ser Lys Gln Gln Pro Glu Pro Lys Ser Ser Lys Gly	
[0208]	1	5 10 15
[0209]	<210>	21

[0210]	<211>	16
[0211]	<212>	PRT
[0212]	<213>	人工的
[0213]	<220>	
[0214]	<223>	连接体
[0215]	<400>	21
[0216]	Ser Glu Ser Pro Thr Asn Gln Gln Pro Glu Pro Gln Trp Thr Thr Asp	
[0217]	1	5 10 15
[0218]	<210>	22
[0219]	<211>	16
[0220]	<212>	PRT
[0221]	<213>	人工的
[0222]	<220>	
[0223]	<223>	连接体
[0224]	<400>	22
[0225]	Gly Gly Ser Lys Gly Pro Pro Pro Ser Pro Pro Pro Pro Gln Pro Glu	
[0226]	1	5 10 15
[0227]	<210>	23
[0228]	<211>	16
[0229]	<212>	PRT
[0230]	<213>	人工的
[0231]	<220>	
[0232]	<223>	连接体
[0233]	<400>	23
[0234]	Gly Pro Leu Pro Ala Pro Pro Pro Gln Pro Pro Pro Pro Gln Pro Asn	
[0235]	1	5 10 15
[0236]	<210>	24
[0237]	<211>	14
[0238]	<212>	PRT
[0239]	<213>	人工的
[0240]	<220>	
[0241]	<223>	连接体
[0242]	<400>	24
[0243]	Arg Pro Leu Pro His Asp Asn Asn Lys Gln Asp Tyr Ser Lys	
[0244]	1	5 10
[0245]	<210>	25
[0246]	<211>	4
[0247]	<212>	PRT
[0248]	<213>	人工的
[0249]	<220>	
[0250]	<223>	连接体
[0251]	<400>	25

[0252]	Ser Gly Gly Ser
[0253]	1
[0254]	<210> 26
[0255]	<211> 10
[0256]	<212> PRT
[0257]	<213> 人工的
[0258]	<220>
[0259]	<223> 连接体
[0260]	<400> 26
[0261]	Ser Gly Gly Ser Gly Gly Ser Gly Gly Ser
[0262]	1 5 10
[0263]	<210> 27
[0264]	<211> 16
[0265]	<212> PRT
[0266]	<213> 人工的
[0267]	<220>
[0268]	<223> 连接体
[0269]	<400> 27
[0270]	Ser Gly Ser Glu Thr Pro Gly Thr Ser Glu Ser Ala Thr Pro Glu Ser
[0271]	1 5 10 15
[0272]	<210> 28
[0273]	<211> 32
[0274]	<212> PRT
[0275]	<213> 人工的
[0276]	<220>
[0277]	<223> 连接体
[0278]	<400> 28
[0279]	Ser Gly Gly Ser Ser Gly Gly Ser Ser Gly Ser Glu Thr Pro Gly Thr
[0280]	1 5 10 15
[0281]	Ser Glu Ser Ala Thr Pro Glu Ser Ser Gly Gly Ser Ser Gly Gly Ser
[0282]	20 25 30
[0283]	<210> 29
[0284]	<211> 1227
[0285]	<212> PRT
[0286]	<213> 毛螺菌科(Lachnospiraceae)细菌
[0287]	<400> 29
[0288]	Ser Lys Leu Glu Lys Phe Thr Asn Cys Tyr Ser Leu Ser Lys Thr Leu
[0289]	1 5 10 15
[0290]	Arg Phe Lys Ala Ile Pro Val Gly Lys Thr Gln Glu Asn Ile Asp Asn
[0291]	20 25 30
[0292]	Lys Arg Leu Leu Val Glu Asp Glu Lys Arg Ala Glu Asp Tyr Lys Gly
[0293]	35 40 45

[0294]	Val	Lys	Lys	Leu	Leu	Asp	Arg	Tyr	Tyr	Leu	Ser	Phe	Ile	Asn	Asp	Val
[0295]	50						55					60				
[0296]	Leu	His	Ser	Ile	Lys	Leu	Lys	Asn	Leu	Asn	Asn	Tyr	Ile	Ser	Leu	Phe
[0297]	65					70					75				80	
[0298]	Arg	Lys	Lys	Thr	Arg	Thr	Glu	Lys	Glu	Asn	Lys	Glu	Leu	Glu	Asn	Leu
[0299]					85					90					95	
[0300]	Glu	Ile	Asn	Leu	Arg	Lys	Glu	Ile	Ala	Lys	Ala	Phe	Lys	Gly	Asn	Glu
[0301]					100					105					110	
[0302]	Gly	Tyr	Lys	Ser	Leu	Phe	Lys	Lys	Asp	Ile	Ile	Glu	Thr	Ile	Leu	Pro
[0303]					115					120					125	
[0304]	Glu	Phe	Leu	Asp	Asp	Lys	Asp	Glu	Ile	Ala	Leu	Val	Asn	Ser	Phe	Asn
[0305]	130							135							140	
[0306]	Gly	Phe	Thr	Thr	Ala	Phe	Thr	Gly	Phe	Phe	Asp	Asn	Arg	Glu	Asn	Met
[0307]	145							150						155		160
[0308]	Phe	Ser	Glu	Glu	Ala	Lys	Ser	Thr	Ser	Ile	Ala	Phe	Arg	Cys	Ile	Asn
[0309]						165					170					175
[0310]	Glu	Asn	Leu	Thr	Arg	Tyr	Ile	Ser	Asn	Met	Asp	Ile	Phe	Glu	Lys	Val
[0311]						180									185	190
[0312]	Asp	Ala	Ile	Phe	Asp	Lys	His	Glu	Val	Gln	Glu	Ile	Lys	Glu	Lys	Ile
[0313]						195									200	205
[0314]	Leu	Asn	Ser	Asp	Tyr	Asp	Val	Glu	Asp	Phe	Phe	Glu	Gly	Glu	Phe	Phe
[0315]	210							215							220	
[0316]	Asn	Phe	Val	Leu	Thr	Gln	Glu	Gly	Ile	Asp	Val	Tyr	Asn	Ala	Ile	Ile
[0317]	225							230							235	240
[0318]	Gly	Gly	Phe	Val	Thr	Glu	Ser	Gly	Glu	Lys	Ile	Lys	Gly	Leu	Asn	Glu
[0319]						245									250	255
[0320]	Tyr	Ile	Asn	Leu	Tyr	Asn	Gln	Lys	Thr	Lys	Gln	Lys	Leu	Pro	Lys	Phe
[0321]						260									265	270
[0322]	Lys	Pro	Leu	Tyr	Lys	Gln	Val	Leu	Ser	Asp	Arg	Glu	Ser	Leu	Ser	Phe
[0323]						275									280	285
[0324]	Tyr	Gly	Glu	Gly	Tyr	Thr	Ser	Asp	Glu	Glu	Val	Leu	Glu	Val	Phe	Arg
[0325]	290							295							300	
[0326]	Asn	Thr	Leu	Asn	Lys	Asn	Ser	Glu	Ile	Phe	Ser	Ser	Ile	Lys	Lys	Leu
[0327]	305							310							315	320
[0328]	Glu	Lys	Leu	Phe	Lys	Asn	Phe	Asp	Glu	Tyr	Ser	Ser	Ala	Gly	Ile	Phe
[0329]						325									330	335
[0330]	Val	Lys	Asn	Gly	Pro	Ala	Ile	Ser	Thr	Ile	Ser	Lys	Asp	Ile	Phe	Gly
[0331]						340									345	350
[0332]	Glu	Trp	Asn	Val	Ile	Arg	Asp	Lys	Trp	Asn	Ala	Glu	Tyr	Asp	Asp	Ile
[0333]						355									360	365
[0334]	His	Leu	Lys	Lys	Lys	Ala	Val	Val	Thr	Glu	Lys	Tyr	Glu	Asp	Asp	Arg
[0335]	370														375	380

[0336]	Arg Lys Ser Phe Lys Lys Ile Gly Ser Phe Ser Leu Glu Gln Leu Gln		
[0337]	385	390	395 400
[0338]	Glu Tyr Ala Asp Ala Asp Leu Ser Val Val Glu Lys Leu Lys Glu Ile		
[0339]	405	410	415
[0340]	Ile Ile Gln Lys Val Asp Glu Ile Tyr Lys Val Tyr Gly Ser Ser Glu		
[0341]	420	425	430
[0342]	Lys Leu Phe Asp Ala Asp Phe Val Leu Glu Lys Ser Leu Lys Lys Asn		
[0343]	435	440	445
[0344]	Asp Ala Val Val Ala Ile Met Lys Asp Leu Leu Asp Ser Val Lys Ser		
[0345]	450	455	460
[0346]	Phe Glu Asn Tyr Ile Lys Ala Phe Phe Gly Glu Gly Lys Glu Thr Asn		
[0347]	465	470	475 480
[0348]	Arg Asp Glu Ser Phe Tyr Gly Asp Phe Val Leu Ala Tyr Asp Ile Leu		
[0349]	485	490	495
[0350]	Leu Lys Val Asp His Ile Tyr Asp Ala Ile Arg Asn Tyr Val Thr Gln		
[0351]	500	505	510
[0352]	Lys Pro Tyr Ser Lys Asp Lys Phe Lys Leu Tyr Phe Gln Asn Pro Gln		
[0353]	515	520	525
[0354]	Phe Met Gly Gly Trp Asp Lys Asp Lys Glu Thr Asp Tyr Arg Ala Thr		
[0355]	530	535	540
[0356]	Ile Leu Arg Tyr Gly Ser Lys Tyr Tyr Leu Ala Ile Met Asp Lys Lys		
[0357]	545	550	555 560
[0358]	Tyr Ala Lys Cys Leu Gln Lys Ile Asp Lys Asp Asp Val Asn Gly Asn		
[0359]	565	570	575
[0360]	Tyr Glu Lys Ile Asn Tyr Lys Leu Leu Pro Gly Pro Asn Lys Met Leu		
[0361]	580	585	590
[0362]	Pro Lys Val Phe Phe Ser Lys Lys Trp Met Ala Tyr Tyr Asn Pro Ser		
[0363]	595	600	605
[0364]	Glu Asp Ile Gln Lys Ile Tyr Lys Asn Gly Thr Phe Lys Lys Gly Asp		
[0365]	610	615	620
[0366]	Met Phe Asn Leu Asn Asp Cys His Lys Leu Ile Asp Phe Phe Lys Asp		
[0367]	625	630	635 640
[0368]	Ser Ile Ser Arg Tyr Pro Lys Trp Ser Asn Ala Tyr Asp Phe Asn Phe		
[0369]	645	650	655
[0370]	Ser Glu Thr Glu Lys Tyr Lys Asp Ile Ala Gly Phe Tyr Arg Glu Val		
[0371]	660	665	670
[0372]	Glu Glu Gln Gly Tyr Lys Val Ser Phe Glu Ser Ala Ser Lys Lys Glu		
[0373]	675	680	685
[0374]	Val Asp Lys Leu Val Glu Glu Gly Lys Leu Tyr Met Phe Gln Ile Tyr		
[0375]	690	695	700
[0376]	Asn Lys Asp Phe Ser Asp Lys Ser His Gly Thr Pro Asn Leu His Thr		
[0377]	705	710	715 720

[0378]	Met Tyr Phe Lys Leu Leu Phe Asp Glu Asn Asn His Gly Gln Ile Arg		
[0379]		725	730 735
[0380]	Leu Ser Gly Gly Ala Glu Leu Phe Met Arg Arg Ala Ser Leu Lys Lys		
[0381]		740	745 750
[0382]	Glu Glu Leu Val Val His Pro Ala Asn Ser Pro Ile Ala Asn Lys Asn		
[0383]		755	760 765
[0384]	Pro Asp Asn Pro Lys Lys Thr Thr Thr Leu Ser Tyr Asp Val Tyr Lys		
[0385]		770	775 780
[0386]	Asp Lys Arg Phe Ser Glu Asp Gln Tyr Glu Leu His Ile Pro Ile Ala		
[0387]		785	790 795 800
[0388]	Ile Asn Lys Cys Pro Lys Asn Ile Phe Lys Ile Asn Thr Glu Val Arg		
[0389]		805	810 815
[0390]	Val Leu Leu Lys His Asp Asp Asn Pro Tyr Val Ile Gly Ile Ala Arg		
[0391]		820	825 830
[0392]	Gly Glu Arg Asn Leu Leu Tyr Ile Val Val Val Asp Gly Lys Gly Asn		
[0393]		835	840 845
[0394]	Ile Val Glu Gln Tyr Ser Leu Asn Glu Ile Ile Asn Asn Phe Asn Gly		
[0395]		850	855 860
[0396]	Ile Arg Ile Lys Thr Asp Tyr His Ser Leu Leu Asp Lys Lys Glu Lys		
[0397]		865	870 875 880
[0398]	Glu Arg Phe Glu Ala Arg Gln Asn Trp Thr Ser Ile Glu Asn Ile Lys		
[0399]		885	890 895
[0400]	Glu Leu Lys Ala Gly Tyr Ile Ser Gln Val Val His Lys Ile Cys Glu		
[0401]		900	905 910
[0402]	Leu Val Glu Lys Tyr Asp Ala Val Ile Ala Leu Glu Asp Leu Asn Ser		
[0403]		915	920 925
[0404]	Gly Phe Lys Asn Ser Arg Val Lys Val Glu Lys Gln Val Tyr Gln Lys		
[0405]		930	935 940
[0406]	Phe Glu Lys Met Leu Ile Asp Lys Leu Asn Tyr Met Val Asp Lys Lys		
[0407]		945	950 955 960
[0408]	Ser Asn Pro Cys Ala Thr Gly Gly Ala Leu Lys Gly Tyr Gln Ile Thr		
[0409]		965	970 975
[0410]	Asn Lys Phe Glu Ser Phe Lys Ser Met Ser Thr Gln Asn Gly Phe Ile		
[0411]		980	985 990
[0412]	Phe Tyr Ile Pro Ala Trp Leu Thr Ser Lys Ile Asp Pro Ser Thr Gly		
[0413]		995	1000 1005
[0414]	Phe Val Asn Leu Leu Lys Thr Lys Tyr Thr Ser Ile Ala Asp Ser		
[0415]		1010	1015 1020
[0416]	Lys Lys Phe Ile Ser Ser Phe Asp Arg Ile Met Tyr Val Pro Glu		
[0417]		1025	1030 1035
[0418]	Glu Asp Leu Phe Glu Phe Ala Leu Asp Tyr Lys Asn Phe Ser Arg		
[0419]		1040	1045 1050

[0420]	Thr Asp Ala Asp Tyr Ile Lys Lys Trp Lys Leu Tyr Ser Tyr Gly
[0421]	1055 1060 1065
[0422]	Asn Arg Ile Arg Ile Phe Arg Asn Pro Lys Lys Asn Asn Val Phe
[0423]	1070 1075 1080
[0424]	Asp Trp Glu Glu Val Cys Leu Thr Ser Ala Tyr Lys Glu Leu Phe
[0425]	1085 1090 1095
[0426]	Asn Lys Tyr Gly Ile Asn Tyr Gln Gln Gly Asp Ile Arg Ala Leu
[0427]	1100 1105 1110
[0428]	Leu Cys Glu Gln Ser Asp Lys Ala Phe Tyr Ser Ser Phe Met Ala
[0429]	1115 1120 1125
[0430]	Leu Met Ser Leu Met Leu Gln Met Arg Asn Ser Ile Thr Gly Arg
[0431]	1130 1135 1140
[0432]	Thr Asp Val Asp Phe Leu Ile Ser Pro Val Lys Asn Ser Asp Gly
[0433]	1145 1150 1155
[0434]	Ile Phe Tyr Asp Ser Arg Asn Tyr Glu Ala Gln Glu Asn Ala Ile
[0435]	1160 1165 1170
[0436]	Leu Pro Lys Asn Ala Asp Ala Asn Gly Ala Tyr Asn Ile Ala Arg
[0437]	1175 1180 1185
[0438]	Lys Val Leu Trp Ala Ile Gly Gln Phe Lys Lys Ala Glu Asp Glu
[0439]	1190 1195 1200
[0440]	Lys Leu Asp Lys Val Lys Ile Ala Ile Ser Asn Lys Glu Trp Leu
[0441]	1205 1210 1215
[0442]	Glu Tyr Ala Gln Thr Ser Val Lys His
[0443]	1220 1225
[0444]	<210> 30
[0445]	<211> 1307
[0446]	<212> PRT
[0447]	<213> 氨基酸球菌属物种(Acidaminococcus sp.)
[0448]	<400> 30
[0449]	Met Thr Gln Phe Glu Gly Phe Thr Asn Leu Tyr Gln Val Ser Lys Thr
[0450]	1 5 10 15
[0451]	Leu Arg Phe Glu Leu Ile Pro Gln Gly Lys Thr Leu Lys His Ile Gln
[0452]	20 25 30
[0453]	Glu Gln Gly Phe Ile Glu Glu Asp Lys Ala Arg Asn Asp His Tyr Lys
[0454]	35 40 45
[0455]	Glu Leu Lys Pro Ile Ile Asp Arg Ile Tyr Lys Thr Tyr Ala Asp Gln
[0456]	50 55 60
[0457]	Cys Leu Gln Leu Val Gln Leu Asp Trp Glu Asn Leu Ser Ala Ala Ile
[0458]	65 70 75 80
[0459]	Asp Ser Tyr Arg Lys Glu Lys Thr Glu Glu Thr Arg Asn Ala Leu Ile
[0460]	85 90 95
[0461]	Glu Glu Gln Ala Thr Tyr Arg Asn Ala Ile His Asp Tyr Phe Ile Gly

[0462]	100	105	110
[0463]	Arg Thr Asp Asn Leu Thr Asp Ala Ile Asn Lys Arg His Ala Glu Ile		
[0464]	115	120	125
[0465]	Tyr Lys Gly Leu Phe Lys Ala Glu Leu Phe Asn Gly Lys Val Leu Lys		
[0466]	130	135	140
[0467]	Gln Leu Gly Thr Val Thr Thr Thr Glu His Glu Asn Ala Leu Leu Arg		
[0468]	145	150	155
[0469]	Ser Phe Asp Lys Phe Thr Thr Tyr Phe Ser Gly Phe Tyr Glu Asn Arg		
[0470]	165	170	175
[0471]	Lys Asn Val Phe Ser Ala Glu Asp Ile Ser Thr Ala Ile Pro His Arg		
[0472]	180	185	190
[0473]	Ile Val Gln Asp Asn Phe Pro Lys Phe Lys Glu Asn Cys His Ile Phe		
[0474]	195	200	205
[0475]	Thr Arg Leu Ile Thr Ala Val Pro Ser Leu Arg Glu His Phe Glu Asn		
[0476]	210	215	220
[0477]	Val Lys Lys Ala Ile Gly Ile Phe Val Ser Thr Ser Ile Glu Glu Val		
[0478]	225	230	235
[0479]	Phe Ser Phe Pro Phe Tyr Asn Gln Leu Leu Thr Gln Thr Gln Ile Asp		
[0480]	245	250	255
[0481]	Leu Tyr Asn Gln Leu Leu Gly Gly Ile Ser Arg Glu Ala Gly Thr Glu		
[0482]	260	265	270
[0483]	Lys Ile Lys Gly Leu Asn Glu Val Leu Asn Leu Ala Ile Gln Lys Asn		
[0484]	275	280	285
[0485]	Asp Glu Thr Ala His Ile Ile Ala Ser Leu Pro His Arg Phe Ile Pro		
[0486]	290	295	300
[0487]	Leu Phe Lys Gln Ile Leu Ser Asp Arg Asn Thr Leu Ser Phe Ile Leu		
[0488]	305	310	315
[0489]	Glu Glu Phe Lys Ser Asp Glu Glu Val Ile Gln Ser Phe Cys Lys Tyr		
[0490]	325	330	335
[0491]	Lys Thr Leu Leu Arg Asn Glu Asn Val Leu Glu Thr Ala Glu Ala Leu		
[0492]	340	345	350
[0493]	Phe Asn Glu Leu Asn Ser Ile Asp Leu Thr His Ile Phe Ile Ser His		
[0494]	355	360	365
[0495]	Lys Lys Leu Glu Thr Ile Ser Ser Ala Leu Cys Asp His Trp Asp Thr		
[0496]	370	375	380
[0497]	Leu Arg Asn Ala Leu Tyr Glu Arg Arg Ile Ser Glu Leu Thr Gly Lys		
[0498]	385	390	395
[0499]	Ile Thr Lys Ser Ala Lys Glu Lys Val Gln Arg Ser Leu Lys His Glu		
[0500]	405	410	415
[0501]	Asp Ile Asn Leu Gln Glu Ile Ile Ser Ala Ala Gly Lys Glu Leu Ser		
[0502]	420	425	430
[0503]	Glu Ala Phe Lys Gln Lys Thr Ser Glu Ile Leu Ser His Ala His Ala		

[0504]	435	440	445
[0505]	Ala Leu Asp Gln Pro Leu Pro Thr Thr Leu Lys Lys Gln Glu Glu Lys		
[0506]	450	455	460
[0507]	Glu Ile Leu Lys Ser Gln Leu Asp Ser Leu Leu Gly Leu Tyr His Leu		
[0508]	465	470	475
[0509]	Leu Asp Trp Phe Ala Val Asp Glu Ser Asn Glu Val Asp Pro Glu Phe		
[0510]	485	490	495
[0511]	Ser Ala Arg Leu Thr Gly Ile Lys Leu Glu Met Glu Pro Ser Leu Ser		
[0512]	500	505	510
[0513]	Phe Tyr Asn Lys Ala Arg Asn Tyr Ala Thr Lys Lys Pro Tyr Ser Val		
[0514]	515	520	525
[0515]	Glu Lys Phe Lys Leu Asn Phe Gln Met Pro Thr Leu Ala Ser Gly Trp		
[0516]	530	535	540
[0517]	Asp Val Asn Lys Glu Lys Asn Asn Gly Ala Ile Leu Phe Val Lys Asn		
[0518]	545	550	555
[0519]	Gly Leu Tyr Tyr Leu Gly Ile Met Pro Lys Gln Lys Gly Arg Tyr Lys		
[0520]	565	570	575
[0521]	Ala Leu Ser Phe Glu Pro Thr Glu Lys Thr Ser Glu Gly Phe Asp Lys		
[0522]	580	585	590
[0523]	Met Tyr Tyr Asp Tyr Phe Pro Asp Ala Ala Lys Met Ile Pro Lys Cys		
[0524]	595	600	605
[0525]	Ser Thr Gln Leu Lys Ala Val Thr Ala His Phe Gln Thr His Thr Thr		
[0526]	610	615	620
[0527]	Pro Ile Leu Leu Ser Asn Asn Phe Ile Glu Pro Leu Glu Ile Thr Lys		
[0528]	625	630	635
[0529]	Glu Ile Tyr Asp Leu Asn Asn Pro Glu Lys Glu Pro Lys Lys Phe Gln		
[0530]	645	650	655
[0531]	Thr Ala Tyr Ala Lys Lys Thr Gly Asp Gln Lys Gly Tyr Arg Glu Ala		
[0532]	660	665	670
[0533]	Leu Cys Lys Trp Ile Asp Phe Thr Arg Asp Phe Leu Ser Lys Tyr Thr		
[0534]	675	680	685
[0535]	Lys Thr Thr Ser Ile Asp Leu Ser Ser Leu Arg Pro Ser Ser Gln Tyr		
[0536]	690	695	700
[0537]	Lys Asp Leu Gly Glu Tyr Tyr Ala Glu Leu Asn Pro Leu Leu Tyr His		
[0538]	705	710	715
[0539]	Ile Ser Phe Gln Arg Ile Ala Glu Lys Glu Ile Met Asp Ala Val Glu		
[0540]	725	730	735
[0541]	Thr Gly Lys Leu Tyr Leu Phe Gln Ile Tyr Asn Lys Asp Phe Ala Lys		
[0542]	740	745	750
[0543]	Gly His His Gly Lys Pro Asn Leu His Thr Leu Tyr Trp Thr Gly Leu		
[0544]	755	760	765
[0545]	Phe Ser Pro Glu Asn Leu Ala Lys Thr Ser Ile Lys Leu Asn Gly Gln		

[0546]	770	775	780
[0547]	Ala Glu Leu Phe Tyr Arg Pro Lys Ser Arg Met Lys Arg Met Ala His		
[0548]	785	790	795 800
[0549]	Arg Leu Gly Glu Lys Met Leu Asn Lys Lys Leu Lys Asp Gln Lys Thr		
[0550]	805	810	815
[0551]	Pro Ile Pro Asp Thr Leu Tyr Gln Glu Leu Tyr Asp Tyr Val Asn His		
[0552]	820	825	830
[0553]	Arg Leu Ser His Asp Leu Ser Asp Glu Ala Arg Ala Leu Leu Pro Asn		
[0554]	835	840	845
[0555]	Val Ile Thr Lys Glu Val Ser His Glu Ile Ile Lys Asp Arg Arg Phe		
[0556]	850	855	860
[0557]	Thr Ser Asp Lys Phe Phe Phe His Val Pro Ile Thr Leu Asn Tyr Gln		
[0558]	865	870	875 880
[0559]	Ala Ala Asn Ser Pro Ser Lys Phe Asn Gln Arg Val Asn Ala Tyr Leu		
[0560]	885	890	895
[0561]	Lys Glu His Pro Glu Thr Pro Ile Ile Gly Ile Asp Arg Gly Glu Arg		
[0562]	900	905	910
[0563]	Asn Leu Ile Tyr Ile Thr Val Ile Asp Ser Thr Gly Lys Ile Leu Glu		
[0564]	915	920	925
[0565]	Gln Arg Ser Leu Asn Thr Ile Gln Gln Phe Asp Tyr Gln Lys Lys Leu		
[0566]	930	935	940
[0567]	Asp Asn Arg Glu Lys Glu Arg Val Ala Ala Arg Gln Ala Trp Ser Val		
[0568]	945	950	955 960
[0569]	Val Gly Thr Ile Lys Asp Leu Lys Gln Gly Tyr Leu Ser Gln Val Ile		
[0570]	965	970	975
[0571]	His Glu Ile Val Asp Leu Met Ile His Tyr Gln Ala Val Val Val Leu		
[0572]	980	985	990
[0573]	Glu Asn Leu Asn Phe Gly Phe Lys Ser Lys Arg Thr Gly Ile Ala Glu		
[0574]	995	1000	1005
[0575]	Lys Ala Val Tyr Gln Gln Phe Glu Lys Met Leu Ile Asp Lys Leu		
[0576]	1010	1015	1020
[0577]	Asn Cys Leu Val Leu Lys Asp Tyr Pro Ala Glu Lys Val Gly Gly		
[0578]	1025	1030	1035
[0579]	Val Leu Asn Pro Tyr Gln Leu Thr Asp Gln Phe Thr Ser Phe Ala		
[0580]	1040	1045	1050
[0581]	Lys Met Gly Thr Gln Ser Gly Phe Leu Phe Tyr Val Pro Ala Pro		
[0582]	1055	1060	1065
[0583]	Tyr Thr Ser Lys Ile Asp Pro Leu Thr Gly Phe Val Asp Pro Phe		
[0584]	1070	1075	1080
[0585]	Val Trp Lys Thr Ile Lys Asn His Glu Ser Arg Lys His Phe Leu		
[0586]	1085	1090	1095
[0587]	Glu Gly Phe Asp Phe Leu His Tyr Asp Val Lys Thr Gly Asp Phe		

[0588]	1100	1105	1110
[0589]	Ile Leu His Phe Lys Met Asn Arg Asn Leu Ser Phe Gln Arg Gly		
[0590]	1115	1120	1125
[0591]	Leu Pro Gly Phe Met Pro Ala Trp Asp Ile Val Phe Glu Lys Asn		
[0592]	1130	1135	1140
[0593]	Glu Thr Gln Phe Asp Ala Lys Gly Thr Pro Phe Ile Ala Gly Lys		
[0594]	1145	1150	1155
[0595]	Arg Ile Val Pro Val Ile Glu Asn His Arg Phe Thr Gly Arg Tyr		
[0596]	1160	1165	1170
[0597]	Arg Asp Leu Tyr Pro Ala Asn Glu Leu Ile Ala Leu Leu Glu Glu		
[0598]	1175	1180	1185
[0599]	Lys Gly Ile Val Phe Arg Asp Gly Ser Asn Ile Leu Pro Lys Leu		
[0600]	1190	1195	1200
[0601]	Leu Glu Asn Asp Asp Ser His Ala Ile Asp Thr Met Val Ala Leu		
[0602]	1205	1210	1215
[0603]	Ile Arg Ser Val Leu Gln Met Arg Asn Ser Asn Ala Ala Thr Gly		
[0604]	1220	1225	1230
[0605]	Glu Asp Tyr Ile Asn Ser Pro Val Arg Asp Leu Asn Gly Val Cys		
[0606]	1235	1240	1245
[0607]	Phe Asp Ser Arg Phe Gln Asn Pro Glu Trp Pro Met Asp Ala Asp		
[0608]	1250	1255	1260
[0609]	Ala Asn Gly Ala Tyr His Ile Ala Leu Lys Gly Gln Leu Leu Leu		
[0610]	1265	1270	1275
[0611]	Asn His Leu Lys Glu Ser Lys Asp Leu Lys Leu Gln Asn Gly Ile		
[0612]	1280	1285	1290
[0613]	Ser Asn Gln Asp Trp Leu Ala Tyr Ile Gln Glu Leu Arg Asn		
[0614]	1295	1300	1305
[0615]	<210> 31		
[0616]	<211> 1241		
[0617]	<212> PRT		
[0618]	<213> 蛋白质破裂丁酸弧菌(Butyrivibrio proteoclasticus)		
[0619]	<400> 31		
[0620]	Met Leu Leu Tyr Glu Asn Tyr Thr Lys Arg Asn Gln Ile Thr Lys Ser		
[0621]	1 5 10 15		
[0622]	Leu Arg Leu Glu Leu Arg Pro Gln Gly Lys Thr Leu Arg Asn Ile Lys		
[0623]	20 25 30		
[0624]	Glu Leu Asn Leu Leu Glu Gln Asp Lys Ala Ile Tyr Ala Leu Leu Glu		
[0625]	35 40 45		
[0626]	Arg Leu Lys Pro Val Ile Asp Glu Gly Ile Lys Asp Ile Ala Arg Asp		
[0627]	50 55 60		
[0628]	Thr Leu Lys Asn Cys Glu Leu Ser Phe Glu Lys Leu Tyr Glu His Phe		
[0629]	65 70 75 80		

[0630]	Leu Ser Gly Asp Lys Lys Ala Tyr Ala Lys Glu Ser Glu Arg Leu Lys		
[0631]		85	90
[0632]	Lys Glu Ile Val Lys Thr Leu Ile Lys Asn Leu Pro Glu Gly Ile Gly		95
[0633]		100	105
[0634]	Lys Ile Ser Glu Ile Asn Ser Ala Lys Tyr Leu Asn Gly Val Leu Tyr		110
[0635]		115	120
[0636]	Asp Phe Ile Asp Lys Thr His Lys Asp Ser Glu Glu Lys Gln Asn Ile		125
[0637]		130	135
[0638]	Leu Ser Asp Ile Leu Glu Thr Lys Gly Tyr Leu Ala Leu Phe Ser Lys		140
[0639]		145	150
[0640]	Phe Leu Thr Ser Arg Ile Thr Thr Leu Glu Gln Ser Met Pro Lys Arg		155
[0641]		165	170
[0642]	Val Ile Glu Asn Phe Glu Ile Tyr Ala Ala Asn Ile Pro Lys Met Gln		175
[0643]		180	185
[0644]	Asp Ala Leu Glu Arg Gly Ala Val Ser Phe Ala Ile Glu Tyr Glu Ser		190
[0645]		195	200
[0646]	Ile Cys Ser Val Asp Tyr Tyr Asn Gln Ile Leu Ser Gln Glu Asp Ile		205
[0647]		210	215
[0648]	Asp Ser Tyr Asn Arg Leu Ile Ser Gly Ile Met Asp Glu Asp Gly Ala		220
[0649]		225	230
[0650]	Lys Glu Lys Gly Ile Asn Gln Thr Ile Ser Glu Lys Asn Ile Lys Ile		235
[0651]		245	250
[0652]	Lys Ser Glu His Leu Glu Glu Lys Pro Phe Arg Ile Leu Lys Gln Leu		255
[0653]		260	265
[0654]	His Lys Gln Ile Leu Glu Glu Arg Glu Lys Ala Phe Thr Ile Asp His		270
[0655]		275	280
[0656]	Ile Asp Ser Asp Glu Glu Val Val Gln Val Thr Lys Glu Ala Phe Glu		285
[0657]		290	295
[0658]	Gln Thr Lys Glu Gln Trp Glu Asn Ile Lys Lys Ile Asn Gly Phe Tyr		300
[0659]		305	310
[0660]	Ala Lys Asp Pro Gly Asp Ile Thr Leu Phe Ile Val Val Gly Pro Asn		315
[0661]		325	330
[0662]	Gln Thr His Val Leu Ser Gln Leu Ile Tyr Gly Glu His Asp Arg Ile		335
[0663]		340	345
[0664]	Arg Leu Leu Leu Glu Glu Tyr Glu Lys Asn Thr Leu Glu Val Leu Pro		350
[0665]		355	360
[0666]	Arg Arg Thr Lys Ser Glu Asp Ala Arg Tyr Asp Lys Phe Val Asn Ala		365
[0667]		370	375
[0668]	Val Pro Lys Lys Val Ala Lys Glu Ser His Thr Phe Asp Gly Leu Gln		380
[0669]		385	390
[0670]	Lys Met Thr Gly Asp Asp Arg Leu Phe Ile Leu Tyr Arg Asp Glu Leu		395
[0671]		405	410
			415

[0672]	Ala Arg Asn Tyr Met Arg Ile Lys Glu Ala Tyr Gly Thr Phe Glu Arg		
[0673]		420	425
[0674]	Asp Ile Leu Lys Ser Arg Arg Gly Ile Lys Gly Asn Arg Asp Val Gln		430
[0675]		435	440
[0676]	Glu Ser Leu Val Ser Phe Tyr Asp Glu Leu Thr Lys Phe Arg Ser Ala		445
[0677]		450	455
[0678]	Leu Arg Ile Ile Asn Ser Gly Asn Asp Glu Lys Ala Asp Pro Ile Phe		460
[0679]		465	470
[0680]	Tyr Asn Thr Phe Asp Gly Ile Phe Glu Lys Ala Asn Arg Thr Tyr Lys		475
[0681]		485	490
[0682]	Ala Glu Asn Leu Cys Arg Asn Tyr Val Thr Lys Ser Pro Ala Asp Asp		495
[0683]		500	505
[0684]	Ala Arg Ile Met Ala Ser Cys Leu Gly Thr Pro Ala Arg Leu Arg Thr		510
[0685]		515	520
[0686]	His Trp Trp Asn Gly Glu Glu Asn Phe Ala Ile Asn Asp Val Ala Met		525
[0687]		530	535
[0688]	Ile Arg Arg Gly Asp Glu Tyr Tyr Tyr Phe Val Leu Thr Pro Asp Val		540
[0689]		545	550
[0690]	Lys Pro Val Asp Leu Lys Thr Lys Asp Glu Thr Asp Ala Gln Ile Phe		555
[0691]		565	570
[0692]	Val Gln Arg Lys Gly Ala Lys Ser Phe Leu Gly Leu Pro Lys Ala Leu		575
[0693]		580	585
[0694]	Phe Lys Cys Ile Leu Glu Pro Tyr Phe Glu Ser Pro Glu His Lys Asn		590
[0695]		595	600
[0696]	Asp Lys Asn Cys Val Ile Glu Glu Tyr Val Ser Lys Pro Leu Thr Ile		605
[0697]		610	615
[0698]	Asp Arg Arg Ala Tyr Asp Ile Phe Lys Asn Gly Thr Phe Lys Lys Thr		620
[0699]		625	630
[0700]	Asn Ile Gly Ile Asp Gly Leu Thr Glu Glu Lys Phe Lys Asp Asp Cys		635
[0701]		645	650
[0702]	Arg Tyr Leu Ile Asp Val Tyr Lys Glu Phe Ile Ala Val Tyr Thr Arg		655
[0703]		660	665
[0704]	Tyr Ser Cys Phe Asn Met Ser Gly Leu Lys Arg Ala Asp Glu Tyr Asn		670
[0705]		675	680
[0706]	Asp Ile Gly Glu Phe Phe Ser Asp Val Asp Thr Arg Leu Cys Thr Met		685
[0707]		690	695
[0708]	Glu Trp Ile Pro Val Ser Phe Glu Arg Ile Asn Asp Met Val Asp Lys		700
[0709]		705	710
[0710]	Lys Glu Gly Leu Leu Phe Leu Val Arg Ser Met Phe Leu Tyr Asn Arg		715
[0711]		725	730
[0712]	Pro Arg Lys Pro Tyr Glu Arg Thr Phe Ile Gln Leu Phe Ser Asp Ser		735
[0713]		740	745
			750

[0714]	Asn Met Glu His Thr Ser Met Leu Leu Asn Ser Arg Ala Met Ile Gln		
[0715]	755	760	765
[0716]	Tyr Arg Ala Ala Ser Leu Pro Arg Arg Val Thr His Lys Lys Gly Ser		
[0717]	770	775	780
[0718]	Ile Leu Val Ala Leu Arg Asp Ser Asn Gly Glu His Ile Pro Met His		
[0719]	785	790	795 800
[0720]	Ile Arg Glu Ala Ile Tyr Lys Met Lys Asn Asn Phe Asp Ile Ser Ser		
[0721]	805	810	815
[0722]	Glu Asp Phe Ile Met Ala Lys Ala Tyr Leu Ala Glu His Asp Val Ala		
[0723]	820	825	830
[0724]	Ile Lys Lys Ala Asn Glu Asp Ile Ile Arg Asn Arg Arg Tyr Thr Glu		
[0725]	835	840	845
[0726]	Asp Lys Phe Phe Leu Ser Leu Ser Tyr Thr Lys Asn Ala Asp Ile Ser		
[0727]	850	855	860
[0728]	Ala Arg Thr Leu Asp Tyr Ile Asn Asp Lys Val Glu Glu Asp Thr Gln		
[0729]	865	870	875 880
[0730]	Asp Ser Arg Met Ala Val Ile Val Thr Arg Asn Leu Lys Asp Leu Thr		
[0731]	885	890	895
[0732]	Tyr Val Ala Val Val Asp Glu Lys Asn Asn Val Leu Glu Glu Lys Ser		
[0733]	900	905	910
[0734]	Leu Asn Glu Ile Asp Gly Val Asn Tyr Arg Glu Leu Leu Lys Glu Arg		
[0735]	915	920	925
[0736]	Thr Lys Ile Lys Tyr His Asp Lys Thr Arg Leu Trp Gln Tyr Asp Val		
[0737]	930	935	940
[0738]	Ser Ser Lys Gly Leu Lys Glu Ala Tyr Val Glu Leu Ala Val Thr Gln		
[0739]	945	950	955 960
[0740]	Ile Ser Lys Leu Ala Thr Lys Tyr Asn Ala Val Val Val Val Glu Ser		
[0741]	965	970	975
[0742]	Met Ser Ser Thr Phe Lys Asp Lys Phe Ser Phe Leu Asp Glu Gln Ile		
[0743]	980	985	990
[0744]	Phe Lys Ala Phe Glu Ala Arg Leu Cys Ala Arg Met Ser Asp Leu Ser		
[0745]	995	1000	1005
[0746]	Phe Asn Thr Ile Lys Glu Gly Glu Ala Gly Ser Ile Ser Asn Pro		
[0747]	1010	1015	1020
[0748]	Ile Gln Val Ser Asn Asn Asn Gly Asn Ser Tyr Gln Asp Gly Val		
[0749]	1025	1030	1035
[0750]	Ile Tyr Phe Leu Asn Asn Ala Tyr Thr Arg Thr Leu Cys Pro Asp		
[0751]	1040	1045	1050
[0752]	Thr Gly Phe Val Asp Val Phe Asp Lys Thr Arg Leu Ile Thr Met		
[0753]	1055	1060	1065
[0754]	Gln Ser Lys Arg Gln Phe Phe Ala Lys Met Lys Asp Ile Arg Ile		
[0755]	1070	1075	1080

[0756]	Asp Asp Gly Glu Met Leu Phe Thr Phe Asn Leu Glu Glu Tyr Pro		
[0757]	1085	1090	1095
[0758]	Thr Lys Arg Leu Leu Asp Arg Lys Glu Trp Thr Val Lys Ile Ala		
[0759]	1100	1105	1110
[0760]	Gly Asp Gly Ser Tyr Phe Asp Lys Asp Lys Gly Glu Tyr Val Tyr		
[0761]	1115	1120	1125
[0762]	Val Asn Asp Ile Val Arg Glu Gln Ile Ile Pro Ala Leu Leu Glu		
[0763]	1130	1135	1140
[0764]	Asp Lys Ala Val Phe Asp Gly Asn Met Ala Glu Lys Phe Leu Asp		
[0765]	1145	1150	1155
[0766]	Lys Thr Ala Ile Ser Gly Lys Ser Val Glu Leu Ile Tyr Lys Trp		
[0767]	1160	1165	1170
[0768]	Phe Ala Asn Ala Leu Tyr Gly Ile Ile Thr Lys Lys Asp Gly Glu		
[0769]	1175	1180	1185
[0770]	Lys Ile Tyr Arg Ser Pro Ile Thr Gly Thr Glu Ile Asp Val Ser		
[0771]	1190	1195	1200
[0772]	Lys Asn Thr Thr Tyr Asn Phe Gly Lys Lys Phe Met Phe Lys Gln		
[0773]	1205	1210	1215
[0774]	Glu Tyr Arg Gly Asp Gly Asp Phe Leu Asp Ala Phe Leu Asn Tyr		
[0775]	1220	1225	1230
[0776]	Met Gln Ala Gln Asp Ile Ala Val		
[0777]	1235	1240	
[0778]	<210> 32		
[0779]	<211> 1238		
[0780]	<212> PRT		
[0781]	<213> 候选的白蚁甲烷枝原体 (Candidatus Methanoplasma termitum)		
[0782]	<400> 32		
[0783]	Met Asn Asn Tyr Asp Glu Phe Thr Lys Leu Tyr Pro Ile Gln Lys Thr		
[0784]	1 5 10 15		
[0785]	Ile Arg Phe Glu Leu Lys Pro Gln Gly Arg Thr Met Glu His Leu Glu		
[0786]	20 25 30		
[0787]	Thr Phe Asn Phe Phe Glu Glu Asp Arg Asp Arg Ala Glu Lys Tyr Lys		
[0788]	35 40 45		
[0789]	Ile Leu Lys Glu Ala Ile Asp Glu Tyr His Lys Lys Phe Ile Asp Glu		
[0790]	50 55 60		
[0791]	His Leu Thr Asn Met Ser Leu Asp Trp Asn Ser Leu Lys Gln Ile Ser		
[0792]	65 70 75 80		
[0793]	Glu Lys Tyr Tyr Lys Ser Arg Glu Glu Lys Asp Lys Lys Val Phe Leu		
[0794]	85 90 95		
[0795]	Ser Glu Gln Lys Arg Met Arg Gln Glu Ile Val Ser Glu Phe Lys Lys		
[0796]	100 105 110		
[0797]	Asp Asp Arg Phe Lys Asp Leu Phe Ser Lys Lys Leu Phe Ser Glu Leu		

[0798]	115	120	125
[0799]	Leu Lys Glu Glu Ile Tyr Lys Lys Gly Asn His Gln Glu Ile Asp Ala		
[0800]	130	135	140
[0801]	Leu Lys Ser Phe Asp Lys Phe Ser Gly Tyr Phe Ile Gly Leu His Glu		
[0802]	145	150	155
[0803]	Asn Arg Lys Asn Met Tyr Ser Asp Gly Asp Glu Ile Thr Ala Ile Ser		
[0804]	165	170	175
[0805]	Asn Arg Ile Val Asn Glu Asn Phe Pro Lys Phe Leu Asp Asn Leu Gln		
[0806]	180	185	190
[0807]	Lys Tyr Gln Glu Ala Arg Lys Lys Tyr Pro Glu Trp Ile Ile Lys Ala		
[0808]	195	200	205
[0809]	Glu Ser Ala Leu Val Ala His Asn Ile Lys Met Asp Ile Val Phe Ser		
[0810]	210	215	220
[0811]	Leu Glu Tyr Phe Asn Lys Val Leu Asn Gln Glu Gly Ile Gln Arg Tyr		
[0812]	225	230	235
[0813]	Asn Leu Ala Leu Gly Gly Tyr Val Thr Lys Ser Gly Glu Lys Met Met		
[0814]	245	250	255
[0815]	Gly Leu Asn Asp Ala Leu Asn Leu Ala His Gln Ser Glu Lys Ser Ser		
[0816]	260	265	270
[0817]	Lys Gly Arg Ile His Met Thr Pro Leu Phe Lys Gln Ile Leu Ser Glu		
[0818]	275	280	285
[0819]	Lys Glu Ser Phe Ser Tyr Ile Pro Asp Val Phe Thr Glu Asp Ser Gln		
[0820]	290	295	300
[0821]	Leu Leu Pro Ser Ile Gly Gly Phe Phe Ala Gln Ile Glu Asn Asp Lys		
[0822]	305	310	315
[0823]	Asp Gly Asn Ile Phe Asp Arg Ala Leu Glu Leu Ile Ser Ser Tyr Ala		
[0824]	325	330	335
[0825]	Glu Tyr Asp Thr Glu Arg Ile Tyr Ile Arg Gln Ala Asp Ile Asn Arg		
[0826]	340	345	350
[0827]	Val Ser Asn Val Ile Phe Gly Glu Trp Gly Thr Leu Gly Gly Leu Met		
[0828]	355	360	365
[0829]	Arg Glu Tyr Lys Ala Asp Ser Ile Asn Asp Ile Asn Leu Glu Arg Thr		
[0830]	370	375	380
[0831]	Cys Lys Lys Val Asp Lys Trp Leu Asp Ser Lys Glu Phe Ala Leu Ser		
[0832]	385	390	395
[0833]	Asp Val Leu Glu Ala Ile Asp Arg Thr Gly Asn Asn Asp Ala Phe Asn		
[0834]	405	410	415
[0835]	Glu Tyr Ile Ser Lys Met Arg Thr Ala Arg Glu Lys Ile Asp Ala Ala		
[0836]	420	425	430
[0837]	Arg Lys Glu Met Lys Phe Ile Ser Glu Lys Ile Ser Gly Asp Glu Glu		
[0838]	435	440	445
[0839]	Ser Ile His Ile Ile Lys Thr Leu Leu Asp Ser Val Gln Gln Phe Leu		

[0840]	450	455	460
[0841]	His Phe Phe Asn Leu Phe Lys Ala Arg Gln Asp Ile Pro Leu Asp Gly		
[0842]	465	470	475 480
[0843]	Ala Phe Tyr Ala Glu Phe Asp Glu Val His Ser Lys Leu Phe Ala Ile		
[0844]		485	490 495
[0845]	Val Pro Leu Tyr Asn Lys Val Arg Asn Tyr Leu Thr Lys Asn Asn Leu		
[0846]		500	505 510
[0847]	Asn Thr Lys Lys Ile Lys Leu Asn Phe Lys Asn Pro Thr Leu Ala Asn		
[0848]		515	520 525
[0849]	Gly Trp Asp Gln Asn Lys Val Tyr Asp Tyr Ala Ser Leu Ile Phe Leu		
[0850]		530	535 540
[0851]	Arg Asp Gly Asn Tyr Tyr Leu Gly Ile Ile Asn Pro Lys Arg Lys Lys		
[0852]		545	550 555 560
[0853]	Asn Ile Lys Phe Glu Gln Gly Ser Gly Asn Gly Pro Phe Tyr Arg Lys		
[0854]		565	570 575
[0855]	Met Val Tyr Lys Gln Ile Pro Gly Pro Asn Lys Asn Leu Arg Pro Val		
[0856]		580	585 590
[0857]	Phe Leu Thr Ser Thr Lys Gly Lys Lys Glu Tyr Lys Pro Ser Lys Glu		
[0858]		595	600 605
[0859]	Ile Ile Glu Gly Tyr Glu Ala Asp Lys His Ile Arg Gly Asp Lys Phe		
[0860]		610	615 620
[0861]	Asp Leu Asp Phe Cys His Lys Leu Ile Asp Phe Phe Lys Glu Ser Ile		
[0862]		625	630 635 640
[0863]	Glu Lys His Lys Asp Trp Ser Lys Phe Asn Phe Tyr Phe Ser Pro Thr		
[0864]		645	650 655
[0865]	Glu Ser Tyr Gly Asp Ile Ser Glu Phe Tyr Leu Asp Val Glu Lys Gln		
[0866]		660	665 670
[0867]	Gly Tyr Arg Met His Phe Glu Asn Ile Ser Ala Glu Thr Ile Asp Glu		
[0868]		675	680 685
[0869]	Tyr Val Glu Lys Gly Asp Leu Phe Leu Phe Gln Ile Tyr Asn Lys Asp		
[0870]		690	695 700
[0871]	Phe Val Lys Ala Ala Thr Gly Lys Lys Asp Met His Thr Ile Tyr Trp		
[0872]		705	710 715 720
[0873]	Asn Ala Ala Phe Ser Pro Glu Asn Leu Gln Asp Val Val Val Lys Leu		
[0874]		725	730 735
[0875]	Asn Gly Glu Ala Glu Leu Phe Tyr Arg Asp Lys Ser Asp Ile Lys Glu		
[0876]		740	745 750
[0877]	Ile Val His Arg Glu Gly Glu Ile Leu Val Asn Arg Thr Tyr Asn Gly		
[0878]		755	760 765
[0879]	Arg Thr Pro Val Pro Asp Lys Ile His Lys Lys Leu Thr Asp Tyr His		
[0880]		770	775 780
[0881]	Asn Gly Arg Thr Lys Asp Leu Gly Glu Ala Lys Glu Tyr Leu Asp Lys		

[0882]	785	790	795	800
[0883]	Val Arg Tyr Phe Lys Ala His Tyr Asp Ile Thr Lys Asp Arg Arg Tyr			
[0884]		805	810	815
[0885]	Leu Asn Asp Lys Ile Tyr Phe His Val Pro Leu Thr Leu Asn Phe Lys			
[0886]		820	825	830
[0887]	Ala Asn Gly Lys Lys Asn Leu Asn Lys Met Val Ile Glu Lys Phe Leu			
[0888]		835	840	845
[0889]	Ser Asp Glu Lys Ala His Ile Ile Gly Ile Asp Arg Gly Glu Arg Asn			
[0890]		850	855	860
[0891]	Leu Leu Tyr Tyr Ser Ile Ile Asp Arg Ser Gly Lys Ile Ile Asp Gln			
[0892]		865	870	875
[0893]	Gln Ser Leu Asn Val Ile Asp Gly Phe Asp Tyr Arg Glu Lys Leu Asn			
[0894]		885	890	895
[0895]	Gln Arg Glu Ile Glu Met Lys Asp Ala Arg Gln Ser Trp Asn Ala Ile			
[0896]		900	905	910
[0897]	Gly Lys Ile Lys Asp Leu Lys Glu Gly Tyr Leu Ser Lys Ala Val His			
[0898]		915	920	925
[0899]	Glu Ile Thr Lys Met Ala Ile Gln Tyr Asn Ala Ile Val Val Met Glu			
[0900]		930	935	940
[0901]	Glu Leu Asn Tyr Gly Phe Lys Arg Gly Arg Phe Lys Val Glu Lys Gln			
[0902]		945	950	955
[0903]	Ile Tyr Gln Lys Phe Glu Asn Met Leu Ile Asp Lys Met Asn Tyr Leu			
[0904]		965	970	975
[0905]	Val Phe Lys Asp Ala Pro Asp Glu Ser Pro Gly Gly Val Leu Asn Ala			
[0906]		980	985	990
[0907]	Tyr Gln Leu Thr Asn Pro Leu Glu Ser Phe Ala Lys Leu Gly Lys Gln			
[0908]		995	1000	1005
[0909]	Thr Gly Ile Leu Phe Tyr Val Pro Ala Ala Tyr Thr Ser Lys Ile			
[0910]		1010	1015	1020
[0911]	Asp Pro Thr Thr Gly Phe Val Asn Leu Phe Asn Thr Ser Ser Lys			
[0912]		1025	1030	1035
[0913]	Thr Asn Ala Gln Glu Arg Lys Glu Phe Leu Gln Lys Phe Glu Ser			
[0914]		1040	1045	1050
[0915]	Ile Ser Tyr Ser Ala Lys Asp Gly Gly Ile Phe Ala Phe Ala Phe			
[0916]		1055	1060	1065
[0917]	Asp Tyr Arg Lys Phe Gly Thr Ser Lys Thr Asp His Lys Asn Val			
[0918]		1070	1075	1080
[0919]	Trp Thr Ala Tyr Thr Asn Gly Glu Arg Met Arg Tyr Ile Lys Glu			
[0920]		1085	1090	1095
[0921]	Lys Lys Arg Asn Glu Leu Phe Asp Pro Ser Lys Glu Ile Lys Glu			
[0922]		1100	1105	1110
[0923]	Ala Leu Thr Ser Ser Gly Ile Lys Tyr Asp Gly Gly Gln Asn Ile			

[0924]	1115	1120	1125
[0925]	Leu Pro Asp Ile Leu Arg Ser Asn Asn Asn Gly Leu Ile Tyr Thr		
[0926]	1130	1135	1140
[0927]	Met Tyr Ser Ser Phe Ile Ala Ala Ile Gln Met Arg Val Tyr Asp		
[0928]	1145	1150	1155
[0929]	Gly Lys Glu Asp Tyr Ile Ile Ser Pro Ile Lys Asn Ser Lys Gly		
[0930]	1160	1165	1170
[0931]	Glu Phe Phe Arg Thr Asp Pro Lys Arg Arg Glu Leu Pro Ile Asp		
[0932]	1175	1180	1185
[0933]	Ala Asp Ala Asn Gly Ala Tyr Asn Ile Ala Leu Arg Gly Glu Leu		
[0934]	1190	1195	1200
[0935]	Thr Met Arg Ala Ile Ala Glu Lys Phe Asp Pro Asp Ser Glu Lys		
[0936]	1205	1210	1215
[0937]	Met Ala Lys Leu Glu Leu Lys His Lys Asp Trp Phe Glu Phe Met		
[0938]	1220	1225	1230
[0939]	Gln Thr Arg Gly Asp		
[0940]	1235		
[0941]	<210> 33		
[0942]	<211> 1281		
[0943]	<212> PRT		
[0944]	<213> 挑剔真杆菌 (Eubacterium eligens)		
[0945]	<400> 33		
[0946]	Met Asn Gly Asn Arg Ser Ile Val Tyr Arg Glu Phe Val Gly Val Ile		
[0947]	1 5 10 15		
[0948]	Pro Val Ala Lys Thr Leu Arg Asn Glu Leu Arg Pro Val Gly His Thr		
[0949]	20 25 30		
[0950]	Gln Glu His Ile Ile Gln Asn Gly Leu Ile Gln Glu Asp Glu Leu Arg		
[0951]	35 40 45		
[0952]	Gln Glu Lys Ser Thr Glu Leu Lys Asn Ile Met Asp Asp Tyr Tyr Arg		
[0953]	50 55 60		
[0954]	Glu Tyr Ile Asp Lys Ser Leu Ser Gly Val Thr Asp Leu Asp Phe Thr		
[0955]	65 70 75 80		
[0956]	Leu Leu Phe Glu Leu Met Asn Leu Val Gln Ser Ser Pro Ser Lys Asp		
[0957]	85 90 95		
[0958]	Asn Lys Lys Ala Leu Glu Lys Glu Gln Ser Lys Met Arg Glu Gln Ile		
[0959]	100 105 110		
[0960]	Cys Thr His Leu Gln Ser Asp Ser Asn Tyr Lys Asn Ile Phe Asn Ala		
[0961]	115 120 125		
[0962]	Lys Leu Leu Lys Glu Ile Leu Pro Asp Phe Ile Lys Asn Tyr Asn Gln		
[0963]	130 135 140		
[0964]	Tyr Asp Val Lys Asp Lys Ala Gly Lys Leu Glu Thr Leu Ala Leu Phe		
[0965]	145 150 155 160		

[0966]	Asn Gly Phe Ser Thr Tyr Phe Thr Asp Phe Phe Glu Lys Arg Lys Asn		
[0967]		165	170 175
[0968]	Val Phe Thr Lys Glu Ala Val Ser Thr Ser Ile Ala Tyr Arg Ile Val		
[0969]		180	185 190
[0970]	His Glu Asn Ser Leu Ile Phe Leu Ala Asn Met Thr Ser Tyr Lys Lys		
[0971]		195	200 205
[0972]	Ile Ser Glu Lys Ala Leu Asp Glu Ile Glu Val Ile Glu Lys Asn Asn		
[0973]		210	215 220
[0974]	Gln Asp Lys Met Gly Asp Trp Glu Leu Asn Gln Ile Phe Asn Pro Asp		
[0975]		225	230 235 240
[0976]	Phe Tyr Asn Met Val Leu Ile Gln Ser Gly Ile Asp Phe Tyr Asn Glu		
[0977]		245	250 255
[0978]	Ile Cys Gly Val Val Asn Ala His Met Asn Leu Tyr Cys Gln Gln Thr		
[0979]		260	265 270
[0980]	Lys Asn Asn Tyr Asn Leu Phe Lys Met Arg Lys Leu His Lys Gln Ile		
[0981]		275	280 285
[0982]	Leu Ala Tyr Thr Ser Thr Ser Phe Glu Val Pro Lys Met Phe Glu Asp		
[0983]		290	295 300
[0984]	Asp Met Ser Val Tyr Asn Ala Val Asn Ala Phe Ile Asp Glu Thr Glu		
[0985]		305	310 315 320
[0986]	Lys Gly Asn Ile Ile Gly Lys Leu Lys Asp Ile Val Asn Lys Tyr Asp		
[0987]		325	330 335
[0988]	Glu Leu Asp Glu Lys Arg Ile Tyr Ile Ser Lys Asp Phe Tyr Glu Thr		
[0989]		340	345 350
[0990]	Leu Ser Cys Phe Met Ser Gly Asn Trp Asn Leu Ile Thr Gly Cys Val		
[0991]		355	360 365
[0992]	Glu Asn Phe Tyr Asp Glu Asn Ile His Ala Lys Gly Lys Ser Lys Glu		
[0993]		370	375 380
[0994]	Glu Lys Val Lys Lys Ala Val Lys Glu Asp Lys Tyr Lys Ser Ile Asn		
[0995]		385	390 395 400
[0996]	Asp Val Asn Asp Leu Val Glu Lys Tyr Ile Asp Glu Lys Glu Arg Asn		
[0997]		405	410 415
[0998]	Glu Phe Lys Asn Ser Asn Ala Lys Gln Tyr Ile Arg Glu Ile Ser Asn		
[0999]		420	425 430
[1000]	Ile Ile Thr Asp Thr Glu Thr Ala His Leu Glu Tyr Asp Asp His Ile		
[1001]		435	440 445
[1002]	Ser Leu Ile Glu Ser Glu Glu Lys Ala Asp Glu Met Lys Lys Arg Leu		
[1003]		450	455 460
[1004]	Asp Met Tyr Met Asn Met Tyr His Trp Ala Lys Ala Phe Ile Val Asp		
[1005]		465	470 475 480
[1006]	Glu Val Leu Asp Arg Asp Glu Met Phe Tyr Ser Asp Ile Asp Asp Ile		
[1007]		485	490 495

[1008]	Tyr Asn Ile Leu Glu Asn Ile Val Pro Leu Tyr Asn Arg Val Arg Asn
[1009]	500 505 510
[1010]	Tyr Val Thr Gln Lys Pro Tyr Asn Ser Lys Lys Ile Lys Leu Asn Phe
[1011]	515 520 525
[1012]	Gln Ser Pro Thr Leu Ala Asn Gly Trp Ser Gln Ser Lys Glu Phe Asp
[1013]	530 535 540
[1014]	Asn Asn Ala Ile Ile Leu Ile Arg Asp Asn Lys Tyr Tyr Leu Ala Ile
[1015]	545 550 555 560
[1016]	Phe Asn Ala Lys Asn Lys Pro Asp Lys Lys Ile Ile Gln Gly Asn Ser
[1017]	565 570 575
[1018]	Asp Lys Lys Asn Asp Asn Asp Tyr Lys Lys Met Val Tyr Asn Leu Leu
[1019]	580 585 590
[1020]	Pro Gly Ala Asn Lys Met Leu Pro Lys Val Phe Leu Ser Lys Lys Gly
[1021]	595 600 605
[1022]	Ile Glu Thr Phe Lys Pro Ser Asp Tyr Ile Ile Ser Gly Tyr Asn Ala
[1023]	610 615 620
[1024]	His Lys His Ile Lys Thr Ser Glu Asn Phe Asp Ile Ser Phe Cys Arg
[1025]	625 630 635 640
[1026]	Asp Leu Ile Asp Tyr Phe Lys Asn Ser Ile Glu Lys His Ala Glu Trp
[1027]	645 650 655
[1028]	Arg Lys Tyr Glu Phe Lys Phe Ser Ala Thr Asp Ser Tyr Ser Asp Ile
[1029]	660 665 670
[1030]	Ser Glu Phe Tyr Arg Glu Val Glu Met Gln Gly Tyr Arg Ile Asp Trp
[1031]	675 680 685
[1032]	Thr Tyr Ile Ser Glu Ala Asp Ile Asn Lys Leu Asp Glu Glu Gly Lys
[1033]	690 695 700
[1034]	Ile Tyr Leu Phe Gln Ile Tyr Asn Lys Asp Phe Ala Glu Asn Ser Thr
[1035]	705 710 715 720
[1036]	Gly Lys Glu Asn Leu His Thr Met Tyr Phe Lys Asn Ile Phe Ser Glu
[1037]	725 730 735
[1038]	Glu Asn Leu Asp Lys Ile Ile Lys Leu Asn Gly Gln Ala Glu Leu Phe
[1039]	740 745 750
[1040]	Tyr Arg Arg Ala Ser Val Lys Asn Pro Val Lys His Lys Lys Asp Ser
[1041]	755 760 765
[1042]	Val Leu Val Asn Lys Thr Tyr Lys Asn Gln Leu Asp Asn Gly Asp Val
[1043]	770 775 780
[1044]	Val Arg Ile Pro Ile Pro Asp Asp Ile Tyr Asn Glu Ile Tyr Lys Met
[1045]	785 790 795 800
[1046]	Tyr Asn Gly Tyr Ile Lys Glu Ser Asp Leu Ser Glu Ala Ala Lys Glu
[1047]	805 810 815
[1048]	Tyr Leu Asp Lys Val Glu Val Arg Thr Ala Gln Lys Asp Ile Val Lys
[1049]	820 825 830

[1050]	Asp Tyr Arg Tyr Thr Val Asp Lys Tyr Phe Ile His Thr Pro Ile Thr		
[1051]	835	840	845
[1052]	Ile Asn Tyr Lys Val Thr Ala Arg Asn Asn Val Asn Asp Met Val Val		
[1053]	850	855	860
[1054]	Lys Tyr Ile Ala Gln Asn Asp Asp Ile His Val Ile Gly Ile Asp Arg		
[1055]	865	870	875 880
[1056]	Gly Glu Arg Asn Leu Ile Tyr Ile Ser Val Ile Asp Ser His Gly Asn		
[1057]	885	890	895
[1058]	Ile Val Lys Gln Lys Ser Tyr Asn Ile Leu Asn Asn Tyr Asp Tyr Lys		
[1059]	900	905	910
[1060]	Lys Lys Leu Val Glu Lys Glu Lys Thr Arg Glu Tyr Ala Arg Lys Asn		
[1061]	915	920	925
[1062]	Trp Lys Ser Ile Gly Asn Ile Lys Glu Leu Lys Glu Gly Tyr Ile Ser		
[1063]	930	935	940
[1064]	Gly Val Val His Glu Ile Ala Met Leu Ile Val Glu Tyr Asn Ala Ile		
[1065]	945	950	955 960
[1066]	Ile Ala Met Glu Asp Leu Asn Tyr Gly Phe Lys Arg Gly Arg Phe Lys		
[1067]	965	970	975
[1068]	Val Glu Arg Gln Val Tyr Gln Lys Phe Glu Ser Met Leu Ile Asn Lys		
[1069]	980	985	990
[1070]	Leu Asn Tyr Phe Ala Ser Lys Glu Lys Ser Val Asp Glu Pro Gly Gly		
[1071]	995	1000	1005
[1072]	Leu Leu Lys Gly Tyr Gln Leu Thr Tyr Val Pro Asp Asn Ile Lys		
[1073]	1010	1015	1020
[1074]	Asn Leu Gly Lys Gln Cys Gly Val Ile Phe Tyr Val Pro Ala Ala		
[1075]	1025	1030	1035
[1076]	Phe Thr Ser Lys Ile Asp Pro Ser Thr Gly Phe Ile Ser Ala Phe		
[1077]	1040	1045	1050
[1078]	Asn Phe Lys Ser Ile Ser Thr Asn Ala Ser Arg Lys Gln Phe Phe		
[1079]	1055	1060	1065
[1080]	Met Gln Phe Asp Glu Ile Arg Tyr Cys Ala Glu Lys Asp Met Phe		
[1081]	1070	1075	1080
[1082]	Ser Phe Gly Phe Asp Tyr Asn Asn Phe Asp Thr Tyr Asn Ile Thr		
[1083]	1085	1090	1095
[1084]	Met Gly Lys Thr Gln Trp Thr Val Tyr Thr Asn Gly Glu Arg Leu		
[1085]	1100	1105	1110
[1086]	Gln Ser Glu Phe Asn Asn Ala Arg Arg Thr Gly Lys Thr Lys Ser		
[1087]	1115	1120	1125
[1088]	Ile Asn Leu Thr Glu Thr Ile Lys Leu Leu Leu Glu Asp Asn Glu		
[1089]	1130	1135	1140
[1090]	Ile Asn Tyr Ala Asp Gly His Asp Ile Arg Ile Asp Met Glu Lys		
[1091]	1145	1150	1155

[1092]	Met Asp Glu Asp Lys Lys Ser Glu Phe Phe Ala Gln Leu Leu Ser
[1093]	1160 1165 1170
[1094]	Leu Tyr Lys Leu Thr Val Gln Met Arg Asn Ser Tyr Thr Glu Ala
[1095]	1175 1180 1185
[1096]	Glu Glu Gln Glu Asn Gly Ile Ser Tyr Asp Lys Ile Ile Ser Pro
[1097]	1190 1195 1200
[1098]	Val Ile Asn Asp Glu Gly Glu Phe Phe Asp Ser Asp Asn Tyr Lys
[1099]	1205 1210 1215
[1100]	Glu Ser Asp Asp Lys Glu Cys Lys Met Pro Lys Asp Ala Asp Ala
[1101]	1220 1225 1230
[1102]	Asn Gly Ala Tyr Cys Ile Ala Leu Lys Gly Leu Tyr Glu Val Leu
[1103]	1235 1240 1245
[1104]	Lys Ile Lys Ser Glu Trp Thr Glu Asp Gly Phe Asp Arg Asn Cys
[1105]	1250 1255 1260
[1106]	Leu Lys Leu Pro His Ala Glu Trp Leu Asp Phe Ile Gln Asn Lys
[1107]	1265 1270 1275
[1108]	Arg Tyr Glu
[1109]	1280
[1110]	<210> 34
[1111]	<211> 1300
[1112]	<212> PRT
[1113]	<213> 新凶手弗朗西丝氏菌(Francisella novicida)
[1114]	<400> 34
[1115]	Met Ser Ile Tyr Gln Glu Phe Val Asn Lys Tyr Ser Leu Ser Lys Thr
[1116]	1 5 10 15
[1117]	Leu Arg Phe Glu Leu Ile Pro Gln Gly Lys Thr Leu Glu Asn Ile Lys
[1118]	20 25 30
[1119]	Ala Arg Gly Leu Ile Leu Asp Asp Glu Lys Arg Ala Lys Asp Tyr Lys
[1120]	35 40 45
[1121]	Lys Ala Lys Gln Ile Ile Asp Lys Tyr His Gln Phe Phe Ile Glu Glu
[1122]	50 55 60
[1123]	Ile Leu Ser Ser Val Cys Ile Ser Glu Asp Leu Leu Gln Asn Tyr Ser
[1124]	65 70 75 80
[1125]	Asp Val Tyr Phe Lys Leu Lys Lys Ser Asp Asp Asp Asn Leu Gln Lys
[1126]	85 90 95
[1127]	Asp Phe Lys Ser Ala Lys Asp Thr Ile Lys Lys Gln Ile Ser Glu Tyr
[1128]	100 105 110
[1129]	Ile Lys Asp Ser Glu Lys Phe Lys Asn Leu Phe Asn Gln Asn Leu Ile
[1130]	115 120 125
[1131]	Asp Ala Lys Lys Gly Gln Glu Ser Asp Leu Ile Leu Trp Leu Lys Gln
[1132]	130 135 140
[1133]	Ser Lys Asp Asn Gly Ile Glu Leu Phe Lys Ala Asn Ser Asp Ile Thr

[1134]	145	150	155	160
[1135]	Asp Ile Asp Glu Ala Leu Glu Ile Ile Lys Ser Phe Lys Gly Trp Thr			
[1136]		165	170	175
[1137]	Thr Tyr Phe Lys Gly Phe His Glu Asn Arg Lys Val Asn Tyr Ser Ser			
[1138]		180	185	190
[1139]	Asn Asp Ile Pro Thr Ser Ile Ile Tyr Arg Ile Val Asp Asp Asn Leu			
[1140]		195	200	205
[1141]	Pro Lys Phe Leu Glu Asn Lys Ala Lys Tyr Glu Ser Leu Lys Asp Lys			
[1142]		210	215	220
[1143]	Ala Pro Glu Ala Ile Asn Tyr Glu Gln Ile Lys Lys Asp Leu Ala Glu			
[1144]	225	230	235	240
[1145]	Glu Leu Thr Phe Asp Ile Asp Tyr Lys Thr Ser Glu Val Asn Gln Arg			
[1146]		245	250	255
[1147]	Val Phe Ser Leu Asp Glu Val Phe Glu Ile Ala Asn Phe Asn Asn Tyr			
[1148]		260	265	270
[1149]	Leu Asn Gln Ser Gly Ile Thr Lys Phe Asn Thr Ile Ile Gly Gly Lys			
[1150]		275	280	285
[1151]	Phe Val Asn Gly Glu Asn Thr Lys Arg Lys Gly Ile Asn Glu Tyr Ile			
[1152]		290	295	300
[1153]	Asn Leu Tyr Ser Gln Gln Ile Asn Asp Lys Thr Leu Lys Lys Tyr Lys			
[1154]	305	310	315	320
[1155]	Met Ser Val Leu Phe Lys Gln Ile Leu Ser Asp Thr Glu Ser Lys Ser			
[1156]		325	330	335
[1157]	Phe Val Ile Asp Lys Leu Glu Asp Asp Ser Asp Val Val Thr Thr Met			
[1158]		340	345	350
[1159]	Gln Ser Phe Tyr Glu Gln Ile Ala Ala Phe Lys Thr Val Glu Glu Lys			
[1160]		355	360	365
[1161]	Ser Ile Lys Glu Thr Leu Ser Leu Leu Phe Asp Asp Leu Lys Ala Gln			
[1162]		370	375	380
[1163]	Lys Leu Asp Leu Ser Lys Ile Tyr Phe Lys Asn Asp Lys Ser Leu Thr			
[1164]	385	390	395	400
[1165]	Asp Leu Ser Gln Gln Val Phe Asp Asp Tyr Ser Val Ile Gly Thr Ala			
[1166]		405	410	415
[1167]	Val Leu Glu Tyr Ile Thr Gln Gln Ile Ala Pro Lys Asn Leu Asp Asn			
[1168]		420	425	430
[1169]	Pro Ser Lys Lys Glu Gln Glu Leu Ile Ala Lys Lys Thr Glu Lys Ala			
[1170]		435	440	445
[1171]	Lys Tyr Leu Ser Leu Glu Thr Ile Lys Leu Ala Leu Glu Glu Phe Asn			
[1172]		450	455	460
[1173]	Lys His Arg Asp Ile Asp Lys Gln Cys Arg Phe Glu Glu Ile Leu Ala			
[1174]	465	470	475	480
[1175]	Asn Phe Ala Ala Ile Pro Met Ile Phe Asp Glu Ile Ala Gln Asn Lys			

[1176]		485		490		495
[1177]	Asp Asn Leu Ala Gln Ile Ser Ile Lys Tyr Gln Asn Gln Gly Lys Lys					
[1178]		500		505		510
[1179]	Asp Leu Leu Gln Ala Ser Ala Glu Asp Asp Val Lys Ala Ile Lys Asp					
[1180]		515		520		525
[1181]	Leu Leu Asp Gln Thr Asn Asn Leu Leu His Lys Leu Lys Ile Phe His					
[1182]		530		535		540
[1183]	Ile Ser Gln Ser Glu Asp Lys Ala Asn Ile Leu Asp Lys Asp Glu His					
[1184]	545		550		555	560
[1185]	Phe Tyr Leu Val Phe Glu Glu Cys Tyr Phe Glu Leu Ala Asn Ile Val					
[1186]		565		570		575
[1187]	Pro Leu Tyr Asn Lys Ile Arg Asn Tyr Ile Thr Gln Lys Pro Tyr Ser					
[1188]		580		585		590
[1189]	Asp Glu Lys Phe Lys Leu Asn Phe Glu Asn Ser Thr Leu Ala Asn Gly					
[1190]		595		600		605
[1191]	Trp Asp Lys Asn Lys Glu Pro Asp Asn Thr Ala Ile Leu Phe Ile Lys					
[1192]		610		615		620
[1193]	Asp Asp Lys Tyr Tyr Leu Gly Val Met Asn Lys Lys Asn Asn Lys Ile					
[1194]	625		630		635	640
[1195]	Phe Asp Asp Lys Ala Ile Lys Glu Asn Lys Gly Glu Gly Tyr Lys Lys					
[1196]		645		650		655
[1197]	Ile Val Tyr Lys Leu Leu Pro Gly Ala Asn Lys Met Leu Pro Lys Val					
[1198]		660		665		670
[1199]	Phe Phe Ser Ala Lys Ser Ile Lys Phe Tyr Asn Pro Ser Glu Asp Ile					
[1200]		675		680		685
[1201]	Leu Arg Ile Arg Asn His Ser Thr His Thr Lys Asn Gly Ser Pro Gln					
[1202]		690		695		700
[1203]	Lys Gly Tyr Glu Lys Phe Glu Phe Asn Ile Glu Asp Cys Arg Lys Phe					
[1204]	705		710		715	720
[1205]	Ile Asp Phe Tyr Lys Gln Ser Ile Ser Lys His Pro Glu Trp Lys Asp					
[1206]		725		730		735
[1207]	Phe Gly Phe Arg Phe Ser Asp Thr Gln Arg Tyr Asn Ser Ile Asp Glu					
[1208]		740		745		750
[1209]	Phe Tyr Arg Glu Val Glu Asn Gln Gly Tyr Lys Leu Thr Phe Glu Asn					
[1210]		755		760		765
[1211]	Ile Ser Glu Ser Tyr Ile Asp Ser Val Val Asn Gln Gly Lys Leu Tyr					
[1212]		770		775		780
[1213]	Leu Phe Gln Ile Tyr Asn Lys Asp Phe Ser Ala Tyr Ser Lys Gly Arg					
[1214]	785		790		795	800
[1215]	Pro Asn Leu His Thr Leu Tyr Trp Lys Ala Leu Phe Asp Glu Arg Asn					
[1216]		805		810		815
[1217]	Leu Gln Asp Val Val Tyr Lys Leu Asn Gly Glu Ala Glu Leu Phe Tyr					

[1218]	820	825	830
[1219]	Arg Lys Gln Ser Ile Pro Lys Lys Ile Thr His Pro Ala Lys Glu Ala		
[1220]	835	840	845
[1221]	Ile Ala Asn Lys Asn Lys Asp Asn Pro Lys Lys Glu Ser Val Phe Glu		
[1222]	850	855	860
[1223]	Tyr Asp Leu Ile Lys Asp Lys Arg Phe Thr Glu Asp Lys Phe Phe Phe		
[1224]	865	870	875 880
[1225]	His Cys Pro Ile Thr Ile Asn Phe Lys Ser Ser Gly Ala Asn Lys Phe		
[1226]	885	890	895
[1227]	Asn Asp Glu Ile Asn Leu Leu Leu Lys Glu Lys Ala Asn Asp Val His		
[1228]	900	905	910
[1229]	Ile Leu Ser Ile Asp Arg Gly Glu Arg His Leu Ala Tyr Tyr Thr Leu		
[1230]	915	920	925
[1231]	Val Asp Gly Lys Gly Asn Ile Ile Lys Gln Asp Thr Phe Asn Ile Ile		
[1232]	930	935	940
[1233]	Gly Asn Asp Arg Met Lys Thr Asn Tyr His Asp Lys Leu Ala Ala Ile		
[1234]	945	950	955 960
[1235]	Glu Lys Asp Arg Asp Ser Ala Arg Lys Asp Trp Lys Lys Ile Asn Asn		
[1236]	965	970	975
[1237]	Ile Lys Glu Met Lys Glu Gly Tyr Leu Ser Gln Val Val His Glu Ile		
[1238]	980	985	990
[1239]	Ala Lys Leu Val Ile Glu Tyr Asn Ala Ile Val Val Phe Glu Asp Leu		
[1240]	995	1000	1005
[1241]	Asn Phe Gly Phe Lys Arg Gly Arg Phe Lys Val Glu Lys Gln Val		
[1242]	1010	1015	1020
[1243]	Tyr Gln Lys Leu Glu Lys Met Leu Ile Glu Lys Leu Asn Tyr Leu		
[1244]	1025	1030	1035
[1245]	Val Phe Lys Asp Asn Glu Phe Asp Lys Thr Gly Gly Val Leu Arg		
[1246]	1040	1045	1050
[1247]	Ala Tyr Gln Leu Thr Ala Pro Phe Glu Thr Phe Lys Lys Met Gly		
[1248]	1055	1060	1065
[1249]	Lys Gln Thr Gly Ile Ile Tyr Tyr Val Pro Ala Gly Phe Thr Ser		
[1250]	1070	1075	1080
[1251]	Lys Ile Cys Pro Val Thr Gly Phe Val Asn Gln Leu Tyr Pro Lys		
[1252]	1085	1090	1095
[1253]	Tyr Glu Ser Val Ser Lys Ser Gln Glu Phe Phe Ser Lys Phe Asp		
[1254]	1100	1105	1110
[1255]	Lys Ile Cys Tyr Asn Leu Asp Lys Gly Tyr Phe Glu Phe Ser Phe		
[1256]	1115	1120	1125
[1257]	Asp Tyr Lys Asn Phe Gly Asp Lys Ala Ala Lys Gly Lys Trp Thr		
[1258]	1130	1135	1140
[1259]	Ile Ala Ser Phe Gly Ser Arg Leu Ile Asn Phe Arg Asn Ser Asp		

[1260]	1145	1150	1155
[1261]	Lys Asn His Asn Trp Asp Thr Arg Glu Val Tyr Pro Thr Lys Glu		
[1262]	1160	1165	1170
[1263]	Leu Glu Lys Leu Leu Lys Asp Tyr Ser Ile Glu Tyr Gly His Gly		
[1264]	1175	1180	1185
[1265]	Glu Cys Ile Lys Ala Ala Ile Cys Gly Glu Ser Asp Lys Lys Phe		
[1266]	1190	1195	1200
[1267]	Phe Ala Lys Leu Thr Ser Val Leu Asn Thr Ile Leu Gln Met Arg		
[1268]	1205	1210	1215
[1269]	Asn Ser Lys Thr Gly Thr Glu Leu Asp Tyr Leu Ile Ser Pro Val		
[1270]	1220	1225	1230
[1271]	Ala Asp Val Asn Gly Asn Phe Phe Asp Ser Arg Gln Ala Pro Lys		
[1272]	1235	1240	1245
[1273]	Asn Met Pro Gln Asp Ala Asp Ala Asn Gly Ala Tyr His Ile Gly		
[1274]	1250	1255	1260
[1275]	Leu Lys Gly Leu Met Leu Leu Gly Arg Ile Lys Asn Asn Gln Glu		
[1276]	1265	1270	1275
[1277]	Gly Lys Lys Leu Asn Leu Val Ile Lys Asn Glu Glu Tyr Phe Glu		
[1278]	1280	1285	1290
[1279]	Phe Val Gln Asn Arg Asn Asn		
[1280]	1295	1300	
[1281]	<210> 35		
[1282]	<211> 1206		
[1283]	<212> PRT		
[1284]	<213> 毛螺菌科细菌		
[1285]	<400> 35		
[1286]	Met Tyr Tyr Glu Ser Leu Thr Lys Gln Tyr Pro Val Ser Lys Thr Ile		
[1287]	1 5 10 15		
[1288]	Arg Asn Glu Leu Ile Pro Ile Gly Lys Thr Leu Asp Asn Ile Arg Gln		
[1289]	20 25 30		
[1290]	Asn Asn Ile Leu Glu Ser Asp Val Lys Arg Lys Gln Asn Tyr Glu His		
[1291]	35 40 45		
[1292]	Val Lys Gly Ile Leu Asp Glu Tyr His Lys Gln Leu Ile Asn Glu Ala		
[1293]	50 55 60		
[1294]	Leu Asp Asn Cys Thr Leu Pro Ser Leu Lys Ile Ala Ala Glu Ile Tyr		
[1295]	65 70 75 80		
[1296]	Leu Lys Asn Gln Lys Glu Val Ser Asp Arg Glu Asp Phe Asn Lys Thr		
[1297]	85 90 95		
[1298]	Gln Asp Leu Leu Arg Lys Glu Val Val Glu Lys Leu Lys Ala His Glu		
[1299]	100 105 110		
[1300]	Asn Phe Thr Lys Ile Gly Lys Lys Asp Ile Leu Asp Leu Leu Glu Lys		
[1301]	115 120 125		

[1302]	Leu Pro Ser Ile Ser Glu Asp Asp Tyr Asn Ala Leu Glu Ser Phe Arg		
[1303]	130	135	140
[1304]	Asn Phe Tyr Thr Tyr Phe Thr Ser Tyr Asn Lys Val Arg Glu Asn Leu		
[1305]	145	150	155
[1306]	Tyr Ser Asp Lys Glu Lys Ser Ser Thr Val Ala Tyr Arg Leu Ile Asn		
[1307]	165	170	175
[1308]	Glu Asn Phe Pro Lys Phe Leu Asp Asn Val Lys Ser Tyr Arg Phe Val		
[1309]	180	185	190
[1310]	Lys Thr Ala Gly Ile Leu Ala Asp Gly Leu Gly Glu Glu Glu Gln Asp		
[1311]	195	200	205
[1312]	Ser Leu Phe Ile Val Glu Thr Phe Asn Lys Thr Leu Thr Gln Asp Gly		
[1313]	210	215	220
[1314]	Ile Asp Thr Tyr Asn Ser Gln Val Gly Lys Ile Asn Ser Ser Ile Asn		
[1315]	225	230	235
[1316]	Leu Tyr Asn Gln Lys Asn Gln Lys Ala Asn Gly Phe Arg Lys Ile Pro		
[1317]	245	250	255
[1318]	Lys Met Lys Met Leu Tyr Lys Gln Ile Leu Ser Asp Arg Glu Glu Ser		
[1319]	260	265	270
[1320]	Phe Ile Asp Glu Phe Gln Ser Asp Glu Val Leu Ile Asp Asn Val Glu		
[1321]	275	280	285
[1322]	Ser Tyr Gly Ser Val Leu Ile Glu Ser Leu Lys Ser Ser Lys Val Ser		
[1323]	290	295	300
[1324]	Ala Phe Phe Asp Ala Leu Arg Glu Ser Lys Gly Lys Asn Val Tyr Val		
[1325]	305	310	315
[1326]	Lys Asn Asp Leu Ala Lys Thr Ala Met Ser Val Ile Val Phe Glu Asn		
[1327]	325	330	335
[1328]	Trp Arg Thr Phe Asp Asp Leu Leu Asn Gln Glu Tyr Asp Leu Ala Asn		
[1329]	340	345	350
[1330]	Glu Asn Lys Lys Lys Asp Asp Lys Tyr Phe Glu Lys Arg Gln Lys Glu		
[1331]	355	360	365
[1332]	Leu Lys Lys Asn Lys Ser Tyr Ser Leu Glu His Leu Cys Asn Leu Ser		
[1333]	370	375	380
[1334]	Glu Asp Ser Cys Asn Leu Ile Glu Asn Tyr Ile His Gln Ile Ser Asp		
[1335]	385	390	395
[1336]	Asp Ile Glu Asn Ile Ile Ile Asn Asn Glu Thr Phe Leu Arg Ile Val		
[1337]	405	410	415
[1338]	Ile Asn Glu His Asp Arg Ser Arg Lys Leu Ala Lys Asn Arg Lys Ala		
[1339]	420	425	430
[1340]	Val Lys Ala Ile Lys Asp Phe Leu Asp Ser Ile Lys Val Leu Glu Arg		
[1341]	435	440	445
[1342]	Glu Leu Lys Leu Ile Asn Ser Ser Gly Gln Glu Leu Glu Lys Asp Leu		
[1343]	450	455	460

[1344]	Ile Val Tyr Ser Ala His Glu Glu Leu Leu Val Glu Leu Lys Gln Val		
[1345]	465	470	475 480
[1346]	Asp Ser Leu Tyr Asn Met Thr Arg Asn Tyr Leu Thr Lys Lys Pro Phe		
[1347]		485 490	495
[1348]	Ser Thr Glu Lys Val Lys Leu Asn Phe Asn Arg Ser Thr Leu Leu Asn		
[1349]		500 505	510
[1350]	Gly Trp Asp Arg Asn Lys Glu Thr Asp Asn Leu Gly Val Leu Leu Leu		
[1351]		515 520	525
[1352]	Lys Asp Gly Lys Tyr Tyr Leu Gly Ile Met Asn Thr Ser Ala Asn Lys		
[1353]		530 535	540
[1354]	Ala Phe Val Asn Pro Pro Val Ala Lys Thr Glu Lys Val Phe Lys Lys		
[1355]	545	550 555	560
[1356]	Val Asp Tyr Lys Leu Leu Pro Val Pro Asn Gln Met Leu Pro Lys Val		
[1357]		565 570	575
[1358]	Phe Phe Ala Lys Ser Asn Ile Asp Phe Tyr Asn Pro Ser Ser Glu Ile		
[1359]		580 585	590
[1360]	Tyr Ser Asn Tyr Lys Lys Gly Thr His Lys Lys Gly Asn Met Phe Ser		
[1361]		595 600	605
[1362]	Leu Glu Asp Cys His Asn Leu Ile Asp Phe Phe Lys Glu Ser Ile Ser		
[1363]		610 615	620
[1364]	Lys His Glu Asp Trp Ser Lys Phe Gly Phe Lys Phe Asp Thr Gln Ala		
[1365]	625	630 635	640
[1366]	Ser Tyr Asn Asp Ile Ser Glu Phe Tyr Arg Glu Val Glu Lys Gln Gly		
[1367]		645 650	655
[1368]	Tyr Lys Leu Thr Tyr Thr Asp Ile Asp Glu Thr Tyr Ile Asn Asp Leu		
[1369]		660 665	670
[1370]	Ile Glu Arg Asn Glu Leu Tyr Leu Phe Gln Ile Tyr Asn Lys Asp Phe		
[1371]		675 680	685
[1372]	Ser Met Tyr Ser Lys Gly Lys Leu Asn Leu His Thr Leu Tyr Phe Met		
[1373]		690 695	700
[1374]	Met Leu Phe Asp Gln Arg Asn Ile Asp Asp Val Val Tyr Lys Leu Asn		
[1375]	705	710 715	720
[1376]	Gly Glu Ala Glu Val Phe Tyr Arg Pro Ala Ser Ile Ser Glu Asp Glu		
[1377]		725 730	735
[1378]	Leu Ile Ile His Lys Ala Gly Glu Glu Ile Lys Asn Lys Asn Pro Asn		
[1379]		740 745	750
[1380]	Arg Ala Arg Thr Lys Glu Thr Ser Thr Phe Ser Tyr Asp Ile Val Lys		
[1381]		755 760	765
[1382]	Asp Lys Arg Tyr Ser Lys Asp Lys Phe Thr Leu His Ile Pro Ile Thr		
[1383]		770 775	780
[1384]	Met Asn Phe Gly Val Asp Glu Val Lys Arg Phe Asn Asp Ala Val Asn		
[1385]	785	790 795	800

[1386]	Ser	Ala	Ile	Arg	Ile	Asp	Glu	Asn	Val	Asn	Val	Ile	Gly	Ile	Asp	Arg
[1387]							805				810				815	
[1388]	Gly	Glu	Arg	Asn	Leu	Leu	Tyr	Val	Val	Val	Ile	Asp	Ser	Lys	Gly	Asn
[1389]							820				825				830	
[1390]	Ile	Leu	Glu	Gln	Ile	Ser	Leu	Asn	Ser	Ile	Ile	Asn	Lys	Glu	Tyr	Asp
[1391]							835				840				845	
[1392]	Ile	Glu	Thr	Asp	Tyr	His	Ala	Leu	Leu	Asp	Glu	Arg	Glu	Gly	Gly	Arg
[1393]							850				855				860	
[1394]	Asp	Lys	Ala	Arg	Lys	Asp	Trp	Asn	Thr	Val	Glu	Asn	Ile	Arg	Asp	Leu
[1395]							865				870				875	
[1396]	Lys	Ala	Gly	Leu	Tyr	Leu	Gln	Val	Val	Asn	Val	Val	Ala	Lys	Leu	Val
[1397]							885				890				895	
[1398]	Leu	Lys	Tyr	Asn	Ala	Ile	Ile	Cys	Leu	Glu	Asp	Leu	Asn	Phe	Gly	Phe
[1399]							900				905				910	
[1400]	Lys	Arg	Gly	Arg	Gln	Lys	Val	Glu	Lys	Gln	Val	Tyr	Gln	Lys	Phe	Glu
[1401]							915				920				925	
[1402]	Lys	Met	Leu	Ile	Asp	Lys	Leu	Asn	Tyr	Leu	Val	Ile	Asp	Lys	Ser	Arg
[1403]							930				935				940	
[1404]	Glu	Gln	Thr	Ser	Pro	Lys	Glu	Leu	Gly	Gly	Ala	Leu	Asn	Ala	Leu	Gln
[1405]							945				950				955	
[1406]	Leu	Thr	Ser	Lys	Phe	Lys	Ser	Phe	Lys	Glu	Leu	Gly	Lys	Gln	Ser	Gly
[1407]							965				970				975	
[1408]	Val	Ile	Tyr	Tyr	Val	Pro	Ala	Tyr	Leu	Thr	Ser	Lys	Ile	Asp	Pro	Thr
[1409]							980				985				990	
[1410]	Thr	Gly	Phe	Ala	Asn	Leu	Phe	Tyr	Met	Lys	Cys	Glu	Asn	Val	Glu	Lys
[1411]							995				1000				1005	
[1412]	Ser	Lys	Arg	Phe	Phe	Asp	Gly	Phe	Asp	Phe	Ile	Arg	Phe	Asn	Ala	
[1413]							1010				1015				1020	
[1414]	Leu	Glu	Asn	Val	Phe	Glu	Phe	Gly	Phe	Asp	Tyr	Arg	Ser	Phe	Thr	
[1415]							1025				1030				1035	
[1416]	Gln	Arg	Ala	Cys	Gly	Ile	Asn	Ser	Lys	Trp	Thr	Val	Cys	Thr	Asn	
[1417]							1040				1045				1050	
[1418]	Gly	Glu	Arg	Ile	Ile	Lys	Tyr	Arg	Asn	Pro	Asp	Lys	Asn	Asn	Met	
[1419]							1055				1060				1065	
[1420]	Phe	Asp	Glu	Lys	Val	Val	Val	Val	Thr	Asp	Glu	Met	Lys	Asn	Leu	
[1421]							1070				1075				1080	
[1422]	Phe	Glu	Gln	Tyr	Lys	Ile	Pro	Tyr	Glu	Asp	Gly	Arg	Asn	Val	Lys	
[1423]							1085				1090				1095	
[1424]	Asp	Met	Ile	Ile	Ser	Asn	Glu	Glu	Ala	Glu	Phe	Tyr	Arg	Arg	Leu	
[1425]							1100				1105				1110	
[1426]	Tyr	Arg	Leu	Leu	Gln	Gln	Thr	Leu	Gln	Met	Arg	Asn	Ser	Thr	Ser	
[1427]							1115				1120				1125	

[1428]	Asp Gly Thr Arg Asp Tyr Ile	Ile Ser Pro Val Lys	Asn Lys Arg
[1429]	1130	1135	1140
[1430]	Glu Ala Tyr Phe Asn Ser Glu	Leu Ser Asp Gly Ser	Val Pro Lys
[1431]	1145	1150	1155
[1432]	Asp Ala Asp Ala Asn Gly Ala	Tyr Asn Ile Ala Arg	Lys Gly Leu
[1433]	1160	1165	1170
[1434]	Trp Val Leu Glu Gln Ile Arg	Gln Lys Ser Glu Gly	Glu Lys Ile
[1435]	1175	1180	1185
[1436]	Asn Leu Ala Met Thr Asn Ala	Glu Trp Leu Glu Tyr	Ala Gln Thr
[1437]	1190	1195	1200
[1438]	His Leu Leu		
[1439]	1205		
[1440]	<210>	36	
[1441]	<211>	1233	
[1442]	<212>	PRT	
[1443]	<213>	毛螺菌科细菌	
[1444]	<400>	36	
[1445]	Met Asp Tyr Gly Asn Gly Gln Phe	Glu Arg Arg Ala Pro Leu Thr Lys	
[1446]	1	5	10 15
[1447]	Thr Ile Thr Leu Arg Leu Lys Pro	Ile Gly Glu Thr Arg Glu Thr Ile	
[1448]	20	25	30
[1449]	Arg Glu Gln Lys Leu Leu Glu Gln	Asp Ala Ala Phe Arg Lys Leu Val	
[1450]	35	40	45
[1451]	Glu Thr Val Thr Pro Ile Val Asp	Asp Cys Ile Arg Lys Ile Ala Asp	
[1452]	50	55	60
[1453]	Asn Ala Leu Cys His Phe Gly Thr	Glu Tyr Asp Phe Ser Cys Leu Gly	
[1454]	65	70	75 80
[1455]	Asn Ala Ile Ser Lys Asn Asp Ser	Lys Ala Ile Lys Lys Glu Thr Glu	
[1456]	85	90	95
[1457]	Lys Val Glu Lys Leu Leu Ala Lys	Val Leu Thr Glu Asn Leu Pro Asp	
[1458]	100	105	110
[1459]	Gly Leu Arg Lys Val Asn Asp Ile	Asn Ser Ala Ala Phe Ile Gln Asp	
[1460]	115	120	125
[1461]	Thr Leu Thr Ser Phe Val Gln Asp	Asp Ala Asp Lys Arg Val Leu Ile	
[1462]	130	135	140
[1463]	Gln Glu Leu Lys Gly Lys Thr Val	Leu Met Gln Arg Phe Leu Thr Thr	
[1464]	145	150	155 160
[1465]	Arg Ile Thr Ala Leu Thr Val Trp	Leu Pro Asp Arg Val Phe Glu Asn	
[1466]	165	170	175
[1467]	Phe Asn Ile Phe Ile Glu Asn Ala	Glu Lys Met Arg Ile Leu Leu Asp	
[1468]	180	185	190
[1469]	Ser Pro Leu Asn Glu Lys Ile Met	Lys Phe Asp Pro Asp Ala Glu Gln	

[1470]	195	200	205
[1471]	Tyr Ala Ser Leu Glu Phe Tyr Gly Gln Cys Leu Ser Gln Lys Asp Ile		
[1472]	210	215	220
[1473]	Asp Ser Tyr Asn Leu Ile Ile Ser Gly Ile Tyr Ala Asp Asp Glu Val		
[1474]	225	230	235
[1475]	Lys Asn Pro Gly Ile Asn Glu Ile Val Lys Glu Tyr Asn Gln Gln Ile		
[1476]	245	250	255
[1477]	Arg Gly Asp Lys Asp Glu Ser Pro Leu Pro Lys Leu Lys Lys Leu His		
[1478]	260	265	270
[1479]	Lys Gln Ile Leu Met Pro Val Glu Lys Ala Phe Phe Val Arg Val Leu		
[1480]	275	280	285
[1481]	Ser Asn Asp Ser Asp Ala Arg Ser Ile Leu Glu Lys Ile Leu Lys Asp		
[1482]	290	295	300
[1483]	Thr Glu Met Leu Pro Ser Lys Ile Ile Glu Ala Met Lys Glu Ala Asp		
[1484]	305	310	315
[1485]	Ala Gly Asp Ile Ala Val Tyr Gly Ser Arg Leu His Glu Leu Ser His		
[1486]	325	330	335
[1487]	Val Ile Tyr Gly Asp His Gly Lys Leu Ser Gln Ile Ile Tyr Asp Lys		
[1488]	340	345	350
[1489]	Glu Ser Lys Arg Ile Ser Glu Leu Met Glu Thr Leu Ser Pro Lys Glu		
[1490]	355	360	365
[1491]	Arg Lys Glu Ser Lys Lys Arg Leu Glu Gly Leu Glu Glu His Ile Arg		
[1492]	370	375	380
[1493]	Lys Ser Thr Tyr Thr Phe Asp Glu Leu Asn Arg Tyr Ala Glu Lys Asn		
[1494]	385	390	395
[1495]	Val Met Ala Ala Tyr Ile Ala Ala Val Glu Glu Ser Cys Ala Glu Ile		
[1496]	405	410	415
[1497]	Met Arg Lys Glu Lys Asp Leu Arg Thr Leu Leu Ser Lys Glu Asp Val		
[1498]	420	425	430
[1499]	Lys Ile Arg Gly Asn Arg His Asn Thr Leu Ile Val Lys Asn Tyr Phe		
[1500]	435	440	445
[1501]	Asn Ala Trp Thr Val Phe Arg Asn Leu Ile Arg Ile Leu Arg Arg Lys		
[1502]	450	455	460
[1503]	Ser Glu Ala Glu Ile Asp Ser Asp Phe Tyr Asp Val Leu Asp Asp Ser		
[1504]	465	470	475
[1505]	Val Glu Val Leu Ser Leu Thr Tyr Lys Gly Glu Asn Leu Cys Arg Ser		
[1506]	485	490	495
[1507]	Tyr Ile Thr Lys Lys Ile Gly Ser Asp Leu Lys Pro Glu Ile Ala Thr		
[1508]	500	505	510
[1509]	Tyr Gly Ser Ala Leu Arg Pro Asn Ser Arg Trp Trp Ser Pro Gly Glu		
[1510]	515	520	525
[1511]	Lys Phe Asn Val Lys Phe His Thr Ile Val Arg Arg Asp Gly Arg Leu		

[1512]	530	535	540
[1513]	Tyr Tyr Phe Ile Leu Pro Lys Gly Ala Lys Pro Val Glu Leu Glu Asp		
[1514]	545	550	555
[1515]	Met Asp Gly Asp Ile Glu Cys Leu Gln Met Arg Lys Ile Pro Asn Pro		
[1516]	565	570	575
[1517]	Thr Ile Phe Leu Pro Lys Leu Val Phe Lys Asp Pro Glu Ala Phe Phe		
[1518]	580	585	590
[1519]	Arg Asp Asn Pro Glu Ala Asp Glu Phe Val Phe Leu Ser Gly Met Lys		
[1520]	595	600	605
[1521]	Ala Pro Val Thr Ile Thr Arg Glu Thr Tyr Glu Ala Tyr Arg Tyr Lys		
[1522]	610	615	620
[1523]	Leu Tyr Thr Val Gly Lys Leu Arg Asp Gly Glu Val Ser Glu Glu Glu		
[1524]	625	630	635
[1525]	Tyr Lys Arg Ala Leu Leu Gln Val Leu Thr Ala Tyr Lys Glu Phe Leu		
[1526]	645	650	655
[1527]	Glu Asn Arg Met Ile Tyr Ala Asp Leu Asn Phe Gly Phe Lys Asp Leu		
[1528]	660	665	670
[1529]	Glu Glu Tyr Lys Asp Ser Ser Glu Phe Ile Lys Gln Val Glu Thr His		
[1530]	675	680	685
[1531]	Asn Thr Phe Met Cys Trp Ala Lys Val Ser Ser Ser Gln Leu Asp Asp		
[1532]	690	695	700
[1533]	Leu Val Lys Ser Gly Asn Gly Leu Leu Phe Glu Ile Trp Ser Glu Arg		
[1534]	705	710	715
[1535]	Leu Glu Ser Tyr Tyr Lys Tyr Gly Asn Glu Lys Val Leu Arg Gly Tyr		
[1536]	725	730	735
[1537]	Glu Gly Val Leu Leu Ser Ile Leu Lys Asp Glu Asn Leu Val Ser Met		
[1538]	740	745	750
[1539]	Arg Thr Leu Leu Asn Ser Arg Pro Met Leu Val Tyr Arg Pro Lys Glu		
[1540]	755	760	765
[1541]	Ser Ser Lys Pro Met Val Val His Arg Asp Gly Ser Arg Val Val Asp		
[1542]	770	775	780
[1543]	Arg Phe Asp Lys Asp Gly Lys Tyr Ile Pro Pro Glu Val His Asp Glu		
[1544]	785	790	795
[1545]	Leu Tyr Arg Phe Phe Asn Asn Leu Leu Ile Lys Glu Lys Leu Gly Glu		
[1546]	805	810	815
[1547]	Lys Ala Arg Lys Ile Leu Asp Asn Lys Lys Val Lys Val Lys Val Leu		
[1548]	820	825	830
[1549]	Glu Ser Glu Arg Val Lys Trp Ser Lys Phe Tyr Asp Glu Gln Phe Ala		
[1550]	835	840	845
[1551]	Val Thr Phe Ser Val Lys Lys Asn Ala Asp Cys Leu Asp Thr Thr Lys		
[1552]	850	855	860
[1553]	Asp Leu Asn Ala Glu Val Met Glu Gln Tyr Ser Glu Ser Asn Arg Leu		

[1554]	865	870	875	880
[1555]	Ile Leu Ile Arg Asn Thr Thr Asp Ile Leu Tyr Tyr Leu Val Leu Asp			
[1556]		885	890	895
[1557]	Lys Asn Gly Lys Val Leu Lys Gln Arg Ser Leu Asn Ile Ile Asn Asp			
[1558]		900	905	910
[1559]	Gly Ala Arg Asp Val Asp Trp Lys Glu Arg Phe Arg Gln Val Thr Lys			
[1560]		915	920	925
[1561]	Asp Arg Asn Glu Gly Tyr Asn Glu Trp Asp Tyr Ser Arg Thr Ser Asn			
[1562]		930	935	940
[1563]	Asp Leu Lys Glu Val Tyr Leu Asn Tyr Ala Leu Lys Glu Ile Ala Glu			
[1564]	945	950	955	960
[1565]	Ala Val Ile Glu Tyr Asn Ala Ile Leu Ile Ile Glu Lys Met Ser Asn			
[1566]		965	970	975
[1567]	Ala Phe Lys Asp Lys Tyr Ser Phe Leu Asp Asp Val Thr Phe Lys Gly			
[1568]		980	985	990
[1569]	Phe Glu Thr Lys Lys Leu Ala Lys Leu Ser Asp Leu His Phe Arg Gly			
[1570]		995	1000	1005
[1571]	Ile Lys Asp Gly Glu Pro Cys Ser Phe Thr Asn Pro Leu Gln Leu			
[1572]		1010	1015	1020
[1573]	Cys Gln Asn Asp Ser Asn Lys Ile Leu Gln Asp Gly Val Ile Phe			
[1574]		1025	1030	1035
[1575]	Met Val Pro Asn Ser Met Thr Arg Ser Leu Asp Pro Asp Thr Gly			
[1576]		1040	1045	1050
[1577]	Phe Ile Phe Ala Ile Asn Asp His Asn Ile Arg Thr Lys Lys Ala			
[1578]		1055	1060	1065
[1579]	Lys Leu Asn Phe Leu Ser Lys Phe Asp Gln Leu Lys Val Ser Ser			
[1580]		1070	1075	1080
[1581]	Glu Gly Cys Leu Ile Met Lys Tyr Ser Gly Asp Ser Leu Pro Thr			
[1582]		1085	1090	1095
[1583]	His Asn Thr Asp Asn Arg Val Trp Asn Cys Cys Cys Asn His Pro			
[1584]		1100	1105	1110
[1585]	Ile Thr Asn Tyr Asp Arg Glu Thr Lys Lys Val Glu Phe Ile Glu			
[1586]		1115	1120	1125
[1587]	Glu Pro Val Glu Glu Leu Ser Arg Val Leu Glu Glu Asn Gly Ile			
[1588]		1130	1135	1140
[1589]	Glu Thr Asp Thr Glu Leu Asn Lys Leu Asn Glu Arg Glu Asn Val			
[1590]		1145	1150	1155
[1591]	Pro Gly Lys Val Val Asp Ala Ile Tyr Ser Leu Val Leu Asn Tyr			
[1592]		1160	1165	1170
[1593]	Leu Arg Gly Thr Val Ser Gly Val Ala Gly Gln Arg Ala Val Tyr			
[1594]		1175	1180	1185
[1595]	Tyr Ser Pro Val Thr Gly Lys Lys Tyr Asp Ile Ser Phe Ile Gln			

[1596]	1190	1195	1200
[1597]	Ala Met Asn Leu Asn Arg Lys Cys Asp Tyr Tyr Arg Ile Gly Ser		
[1598]	1205	1210	1215
[1599]	Lys Glu Arg Gly Glu Trp Thr Asp Phe Val Ala Gln Leu Ile Asn		
[1600]	1220	1225	1230
[1601]	<210> 37		
[1602]	<211> 1227		
[1603]	<212> PRT		
[1604]	<213> 毛螺菌科细菌		
[1605]	<400> 37		
[1606]	Met Ser Lys Leu Glu Lys Phe Thr Asn Cys Tyr Ser Leu Ser Lys Thr		
[1607]	1 5 10 15		
[1608]	Leu Arg Phe Lys Ala Ile Pro Val Gly Lys Thr Gln Glu Asn Ile Asp		
[1609]	20 25 30		
[1610]	Asn Lys Arg Leu Leu Val Glu Asp Glu Lys Arg Ala Glu Asp Tyr Lys		
[1611]	35 40 45		
[1612]	Gly Val Lys Lys Leu Leu Asp Arg Tyr Tyr Leu Ser Phe Ile Asn Asp		
[1613]	50 55 60		
[1614]	Val Leu His Ser Ile Lys Leu Lys Asn Leu Asn Asn Tyr Ile Ser Leu		
[1615]	65 70 75 80		
[1616]	Phe Arg Lys Lys Thr Arg Thr Glu Lys Glu Asn Lys Glu Leu Glu Asn		
[1617]	85 90 95		
[1618]	Leu Glu Ile Asn Leu Arg Lys Glu Ile Ala Lys Ala Phe Lys Gly Asn		
[1619]	100 105 110		
[1620]	Glu Gly Tyr Lys Ser Leu Phe Lys Lys Asp Ile Ile Glu Thr Ile Leu		
[1621]	115 120 125		
[1622]	Pro Glu Phe Leu Asp Asp Lys Asp Glu Ile Ala Leu Val Asn Ser Phe		
[1623]	130 135 140		
[1624]	Asn Gly Phe Thr Thr Ala Phe Thr Gly Phe Phe Asp Asn Arg Glu Asn		
[1625]	145 150 155 160		
[1626]	Met Phe Ser Glu Glu Ala Lys Ser Thr Ser Ile Ala Phe Arg Cys Ile		
[1627]	165 170 175		
[1628]	Asn Glu Asn Leu Thr Arg Tyr Ile Ser Asn Met Asp Ile Phe Glu Lys		
[1629]	180 185 190		
[1630]	Val Asp Ala Ile Phe Asp Lys His Glu Val Gln Glu Ile Lys Glu Lys		
[1631]	195 200 205		
[1632]	Ile Leu Asn Ser Asp Tyr Asp Val Glu Asp Phe Phe Glu Gly Glu Phe		
[1633]	210 215 220		
[1634]	Phe Asn Phe Val Leu Thr Gln Glu Gly Ile Asp Val Tyr Asn Ala Ile		
[1635]	225 230 235 240		
[1636]	Ile Gly Gly Phe Val Thr Glu Ser Gly Glu Lys Ile Lys Gly Leu Asn		
[1637]	245 250 255		

[1638]	Glu Tyr Ile Asn Leu Tyr Asn Gln Lys Thr Lys Gln Lys Leu Pro Lys		
[1639]		260	265
[1640]	Phe Lys Pro Leu Tyr Lys Gln Val Leu Ser Asp Arg Glu Ser Leu Ser		270
[1641]		275	280
[1642]	Phe Tyr Gly Glu Gly Tyr Thr Ser Asp Glu Glu Val Leu Glu Val Phe		285
[1643]		290	295
[1644]	Arg Asn Thr Leu Asn Lys Asn Ser Glu Ile Phe Ser Ser Ile Lys Lys		300
[1645]		305	310
[1646]	Leu Glu Lys Leu Phe Lys Asn Phe Asp Glu Tyr Ser Ser Ala Gly Ile		315
[1647]		325	330
[1648]	Phe Val Lys Asn Gly Pro Ala Ile Ser Thr Ile Ser Lys Asp Ile Phe		320
[1649]		340	345
[1650]	Gly Glu Trp Asn Val Ile Arg Asp Lys Trp Asn Ala Glu Tyr Asp Asp		335
[1651]		355	360
[1652]	Ile His Leu Lys Lys Lys Ala Val Val Thr Glu Lys Tyr Glu Asp Asp		365
[1653]		370	375
[1654]	Arg Arg Lys Ser Phe Lys Lys Ile Gly Ser Phe Ser Leu Glu Gln Leu		380
[1655]		385	390
[1656]	Gln Glu Tyr Ala Asp Ala Asp Leu Ser Val Val Glu Lys Leu Lys Glu		395
[1657]		405	410
[1658]	Ile Ile Ile Gln Lys Val Asp Glu Ile Tyr Lys Val Tyr Gly Ser Ser		415
[1659]		420	425
[1660]	Glu Lys Leu Phe Asp Ala Asp Phe Val Leu Glu Lys Ser Leu Lys Lys		430
[1661]		435	440
[1662]	Asn Asp Ala Val Val Ala Ile Met Lys Asp Leu Leu Asp Ser Val Lys		445
[1663]		450	455
[1664]	Ser Phe Glu Asn Tyr Ile Lys Ala Phe Phe Gly Glu Gly Lys Glu Thr		460
[1665]		465	470
[1666]	Asn Arg Asp Glu Ser Phe Tyr Gly Asp Phe Val Leu Ala Tyr Asp Ile		475
[1667]		485	490
[1668]	Leu Leu Lys Val Asp His Ile Tyr Asp Ala Ile Arg Asn Tyr Val Thr		495
[1669]		500	505
[1670]	Gln Lys Pro Tyr Ser Lys Asp Lys Phe Lys Leu Tyr Phe Gln Asn Pro		510
[1671]		515	520
[1672]	Gln Phe Met Gly Gly Trp Asp Lys Asp Lys Glu Thr Asp Tyr Arg Ala		525
[1673]		530	535
[1674]	Thr Ile Leu Arg Tyr Gly Ser Lys Tyr Tyr Leu Ala Ile Met Asp Lys		540
[1675]		545	550
[1676]	Lys Tyr Ala Lys Cys Leu Gln Lys Ile Asp Lys Asp Asp Val Asn Gly		555
[1677]		565	570
[1678]	Asn Tyr Glu Lys Ile Asn Tyr Lys Leu Leu Pro Gly Pro Asn Lys Met		575
[1679]		580	585
			590

[1680]	Leu	Pro	Lys	Val	Phe	Phe	Ser	Lys	Lys	Trp	Met	Ala	Tyr	Tyr	Asn	Pro
[1681]			595					600					605			
[1682]	Ser	Glu	Asp	Ile	Gln	Lys	Ile	Tyr	Lys	Asn	Gly	Thr	Phe	Lys	Lys	Gly
[1683]		610					615				620					
[1684]	Asp	Met	Phe	Asn	Leu	Asn	Asp	Cys	His	Lys	Leu	Ile	Asp	Phe	Phe	Lys
[1685]	625				630					635						640
[1686]	Asp	Ser	Ile	Ser	Arg	Tyr	Pro	Lys	Trp	Ser	Asn	Ala	Tyr	Asp	Phe	Asn
[1687]				645					650					655		
[1688]	Phe	Ser	Glu	Thr	Glu	Lys	Tyr	Lys	Asp	Ile	Ala	Gly	Phe	Tyr	Arg	Glu
[1689]			660					665					670			
[1690]	Val	Glu	Glu	Gln	Gly	Tyr	Lys	Val	Ser	Phe	Glu	Ser	Ala	Ser	Lys	Lys
[1691]		675					680						685			
[1692]	Glu	Val	Asp	Lys	Leu	Val	Glu	Glu	Gly	Lys	Leu	Tyr	Met	Phe	Gln	Ile
[1693]		690				695					700					
[1694]	Tyr	Asn	Lys	Asp	Phe	Ser	Asp	Lys	Ser	His	Gly	Thr	Pro	Asn	Leu	His
[1695]	705				710					715						720
[1696]	Thr	Met	Tyr	Phe	Lys	Leu	Leu	Phe	Asp	Glu	Asn	Asn	His	Gly	Gln	Ile
[1697]				725					730					735		
[1698]	Arg	Leu	Ser	Gly	Gly	Ala	Glu	Leu	Phe	Met	Arg	Arg	Ala	Ser	Leu	Lys
[1699]			740						745					750		
[1700]	Lys	Glu	Glu	Leu	Val	Val	His	Pro	Ala	Asn	Ser	Pro	Ile	Ala	Asn	Lys
[1701]		755						760						765		
[1702]	Asn	Pro	Asp	Asn	Pro	Lys	Lys	Thr	Thr	Thr	Leu	Ser	Tyr	Asp	Val	Tyr
[1703]		770				775					780					
[1704]	Lys	Asp	Lys	Arg	Phe	Ser	Glu	Asp	Gln	Tyr	Glu	Leu	His	Ile	Pro	Ile
[1705]	785				790					795						800
[1706]	Ala	Asn	Ile	Asn	Lys	Cys	Pro	Lys	Asn	Ile	Phe	Lys	Ile	Asn	Thr	Glu
[1707]				805						810				815		
[1708]	Val	Arg	Val	Leu	Leu	Lys	His	Asp	Asp	Asn	Pro	Tyr	Val	Ile	Gly	Ile
[1709]			820						825					830		
[1710]	Asp	Arg	Gly	Glu	Arg	Asn	Leu	Leu	Tyr	Ile	Val	Val	Val	Asp	Gly	Lys
[1711]		835					840							845		
[1712]	Gly	Asn	Ile	Val	Glu	Gln	Tyr	Ser	Leu	Asn	Glu	Ile	Ile	Asn	Asn	Phe
[1713]		850				855					860					
[1714]	Asn	Gly	Ile	Arg	Ile	Lys	Thr	Asp	Tyr	His	Ser	Leu	Leu	Asp	Lys	Lys
[1715]	865				870					875						880
[1716]	Glu	Lys	Glu	Arg	Phe	Glu	Ala	Arg	Gln	Asn	Trp	Thr	Ser	Ile	Glu	Asn
[1717]				885						890				895		
[1718]	Ile	Lys	Glu	Leu	Lys	Ala	Gly	Tyr	Ile	Ser	Gln	Val	Val	His	Lys	Ile
[1719]			900						905					910		
[1720]	Cys	Glu	Leu	Val	Glu	Lys	Tyr	Asp	Ala	Val	Ile	Ala	Leu	Glu	Asp	Leu
[1721]		915						920					925			

[1722]	Asn Ser Gly Phe Lys Asn Ser Arg Val Lys Val Glu Lys Gln Val Tyr
[1723]	930 935 940
[1724]	Gln Lys Phe Glu Lys Met Leu Ile Asp Lys Leu Asn Tyr Met Val Asp
[1725]	945 950 955 960
[1726]	Lys Lys Ser Asn Pro Cys Ala Thr Gly Gly Ala Leu Lys Gly Tyr Gln
[1727]	965 970 975
[1728]	Ile Thr Asn Lys Phe Glu Ser Phe Lys Ser Met Ser Thr Gln Asn Gly
[1729]	980 985 990
[1730]	Phe Ile Phe Tyr Ile Pro Ala Trp Leu Thr Ser Lys Ile Asp Pro Ser
[1731]	995 1000 1005
[1732]	Thr Gly Phe Val Asn Leu Leu Lys Thr Lys Tyr Thr Ser Ile Ala
[1733]	1010 1015 1020
[1734]	Asp Lys Lys Phe Ile Ser Ser Phe Asp Arg Ile Met Tyr Val Pro
[1735]	1025 1030 1035
[1736]	Glu Glu Asp Leu Phe Glu Phe Ala Leu Asp Tyr Lys Asn Phe Ser
[1737]	1040 1045 1050
[1738]	Arg Thr Asp Ala Asp Tyr Ile Lys Lys Trp Lys Leu Tyr Ser Tyr
[1739]	1055 1060 1065
[1740]	Gly Asn Arg Ile Arg Ile Phe Arg Asn Pro Lys Lys Asn Asn Val
[1741]	1070 1075 1080
[1742]	Phe Asp Trp Glu Glu Val Cys Leu Thr Ser Ala Tyr Lys Glu Leu
[1743]	1085 1090 1095
[1744]	Phe Asn Lys Tyr Gly Ile Asn Tyr Gln Gln Gly Asp Ile Arg Ala
[1745]	1100 1105 1110
[1746]	Leu Leu Cys Glu Gln Ser Asp Lys Ala Phe Tyr Ser Ser Phe Met
[1747]	1115 1120 1125
[1748]	Ala Leu Met Ser Leu Met Leu Gln Met Arg Asn Ser Ile Thr Gly
[1749]	1130 1135 1140
[1750]	Arg Thr Asp Val Asp Phe Leu Ile Ser Pro Val Lys Asn Ser Asp
[1751]	1145 1150 1155
[1752]	Gly Ile Phe Tyr Asp Ser Arg Asn Tyr Glu Ala Gln Glu Asn Ala
[1753]	1160 1165 1170
[1754]	Ile Leu Pro Lys Asn Ala Asp Ala Asn Gly Ala Tyr Asn Ile Ala
[1755]	1175 1180 1185
[1756]	Arg Lys Val Leu Trp Ala Ile Gly Gln Phe Lys Lys Ala Glu Asp
[1757]	1190 1195 1200
[1758]	Glu Lys Leu Asp Lys Val Lys Ile Ala Ser Asn Lys Glu Trp Leu
[1759]	1205 1210 1215
[1760]	Glu Tyr Ala Gln Thr Ser Val Lys His
[1761]	1220 1225
[1762]	<210> 38
[1763]	<211> 1264

[1764]	<212>	PRT
[1765]	<213>	毛螺菌科细菌
[1766]	<400>	38
[1767]	Met Glu Asp Tyr Ser Gly Phe Val Asn Ile Tyr Ser Ile Gln Lys Thr	
[1768]	1	5 10 15
[1769]	Leu Arg Phe Glu Leu Lys Pro Val Gly Lys Thr Leu Glu His Ile Glu	
[1770]	20	25 30
[1771]	Lys Lys Gly Phe Leu Lys Lys Asp Lys Ile Arg Ala Glu Asp Tyr Lys	
[1772]	35	40 45
[1773]	Ala Val Lys Lys Ile Ile Asp Lys Tyr His Arg Ala Tyr Ile Glu Glu	
[1774]	50	55 60
[1775]	Val Phe Asp Ser Val Leu His Gln Lys Lys Lys Lys Asp Lys Thr Arg	
[1776]	65	70 75 80
[1777]	Phe Ser Thr Gln Phe Ile Lys Glu Ile Lys Glu Phe Ser Glu Leu Tyr	
[1778]	85	90 95
[1779]	Tyr Lys Thr Glu Lys Asn Ile Pro Asp Lys Glu Arg Leu Glu Ala Leu	
[1780]	100	105 110
[1781]	Ser Glu Lys Leu Arg Lys Met Leu Val Gly Ala Phe Lys Gly Glu Phe	
[1782]	115	120 125
[1783]	Ser Glu Glu Val Ala Glu Lys Tyr Asn Lys Asn Leu Phe Ser Lys Glu	
[1784]	130	135 140
[1785]	Leu Ile Arg Asn Glu Ile Glu Lys Phe Cys Glu Thr Asp Glu Glu Arg	
[1786]	145	150 155 160
[1787]	Lys Gln Val Ser Asn Phe Lys Ser Phe Thr Thr Tyr Phe Thr Gly Phe	
[1788]	165	170 175
[1789]	His Ser Asn Arg Gln Asn Ile Tyr Ser Asp Glu Lys Lys Ser Thr Ala	
[1790]	180	185 190
[1791]	Ile Gly Tyr Arg Ile Ile His Gln Asn Leu Pro Lys Phe Leu Asp Asn	
[1792]	195	200 205
[1793]	Leu Lys Ile Ile Glu Ser Ile Gln Arg Arg Phe Lys Asp Phe Pro Trp	
[1794]	210	215 220
[1795]	Ser Asp Leu Lys Lys Asn Leu Lys Lys Ile Asp Lys Asn Ile Lys Leu	
[1796]	225	230 235 240
[1797]	Thr Glu Tyr Phe Ser Ile Asp Gly Phe Val Asn Val Leu Asn Gln Lys	
[1798]	245	250 255
[1799]	Gly Ile Asp Ala Tyr Asn Thr Ile Leu Gly Gly Lys Ser Glu Glu Ser	
[1800]	260	265 270
[1801]	Gly Glu Lys Ile Gln Gly Leu Asn Glu Tyr Ile Asn Leu Tyr Arg Gln	
[1802]	275	280 285
[1803]	Lys Asn Asn Ile Asp Arg Lys Asn Pro Leu Asn Val Lys Ile Leu Phe	
[1804]	290	295 300
[1805]	Lys Gln Ile Leu Gly Asp Arg Glu Thr Lys Ser Phe Ile Pro Glu Ala	

[1806]	305	310	315	320
[1807]	Phe Pro Asp Asp Gln Ser Val Leu Asn Ser Ile Thr Glu Phe Ala Lys			
[1808]		325	330	335
[1809]	Tyr Leu Lys Leu Asp Lys Lys Lys Lys Ser Ile Ile Ala Glu Leu Lys			
[1810]		340	345	350
[1811]	Lys Phe Leu Ser Ser Phe Asn Arg Tyr Glu Leu Asp Gly Ile Tyr Leu			
[1812]		355	360	365
[1813]	Ala Asn Asp Asn Ser Leu Ala Ser Ile Ser Thr Phe Leu Phe Asp Asp			
[1814]		370	375	380
[1815]	Trp Ser Phe Ile Lys Lys Ser Val Ser Phe Lys Tyr Asp Glu Ser Val			
[1816]	385	390	395	400
[1817]	Gly Asp Pro Lys Lys Lys Ile Lys Ser Pro Leu Lys Tyr Glu Lys Glu			
[1818]		405	410	415
[1819]	Lys Glu Lys Trp Leu Lys Gln Lys Tyr Tyr Thr Ile Ser Phe Leu Asn			
[1820]		420	425	430
[1821]	Asp Ala Ile Glu Ser Tyr Ser Lys Ser Gln Asp Glu Lys Arg Val Lys			
[1822]		435	440	445
[1823]	Ile Arg Leu Glu Ala Tyr Phe Ala Glu Phe Lys Ser Lys Asp Asp Ala			
[1824]		450	455	460
[1825]	Lys Lys Gln Phe Asp Leu Leu Glu Arg Ile Glu Glu Ala Tyr Ala Ile			
[1826]	465	470	475	480
[1827]	Val Glu Pro Leu Leu Gly Ala Glu Tyr Pro Arg Asp Arg Asn Leu Lys			
[1828]		485	490	495
[1829]	Ala Asp Lys Lys Glu Val Gly Lys Ile Lys Asp Phe Leu Asp Ser Ile			
[1830]		500	505	510
[1831]	Lys Ser Leu Gln Phe Phe Leu Lys Pro Leu Leu Ser Ala Glu Ile Phe			
[1832]		515	520	525
[1833]	Asp Glu Lys Asp Leu Gly Phe Tyr Asn Gln Leu Glu Gly Tyr Tyr Glu			
[1834]		530	535	540
[1835]	Glu Ile Asp Ile Ser Gly His Leu Tyr Asn Lys Val Arg Asn Tyr Leu			
[1836]	545	550	555	560
[1837]	Thr Gly Lys Ile Tyr Ser Lys Glu Lys Phe Lys Leu Asn Phe Glu Asn			
[1838]		565	570	575
[1839]	Ser Thr Leu Leu Lys Gly Trp Asp Glu Asn Arg Glu Val Ala Asn Leu			
[1840]		580	585	590
[1841]	Cys Val Ile Phe Arg Glu Asp Gln Lys Tyr Tyr Leu Gly Val Met Asp			
[1842]		595	600	605
[1843]	Lys Glu Asn Asn Thr Ile Leu Ser Asp Ile Pro Lys Val Lys Pro Asn			
[1844]		610	615	620
[1845]	Glu Leu Phe Tyr Glu Lys Met Val Tyr Lys Leu Ile Pro Thr Pro His			
[1846]	625	630	635	640
[1847]	Met Gln Leu Pro Arg Ile Ile Phe Ser Ser Asp Asn Leu Ser Ile Tyr			

[1848]		645		650		655
[1849]	Asn Pro Ser Lys Ser Ile Leu Lys Ile Arg Glu Ala Lys Ser Phe Lys					
[1850]		660		665		670
[1851]	Glu Gly Lys Asn Phe Lys Leu Lys Asp Cys His Lys Phe Ile Asp Phe					
[1852]		675		680		685
[1853]	Tyr Lys Glu Ser Ile Ser Lys Asn Glu Asp Trp Ser Arg Phe Asp Phe					
[1854]		690		695		700
[1855]	Lys Phe Ser Lys Thr Ser Ser Tyr Glu Asn Ile Ser Glu Phe Tyr Arg					
[1856]	705		710		715	720
[1857]	Glu Val Glu Arg Gln Gly Tyr Asn Leu Asp Phe Lys Lys Val Ser Lys					
[1858]		725		730		735
[1859]	Phe Tyr Ile Asp Ser Leu Val Glu Asp Gly Lys Leu Tyr Leu Phe Gln					
[1860]		740		745		750
[1861]	Ile Tyr Asn Lys Asp Phe Ser Ile Phe Ser Lys Gly Lys Pro Asn Leu					
[1862]		755		760		765
[1863]	His Thr Ile Tyr Phe Arg Ser Leu Phe Ser Lys Glu Asn Leu Lys Asp					
[1864]		770		775		780
[1865]	Val Cys Leu Lys Leu Asn Gly Glu Ala Glu Met Phe Phe Arg Lys Lys					
[1866]	785		790		795	800
[1867]	Ser Ile Asn Tyr Asp Glu Lys Lys Lys Arg Glu Gly His His Pro Glu					
[1868]		805		810		815
[1869]	Leu Phe Glu Lys Leu Lys Tyr Pro Ile Leu Lys Asp Lys Arg Tyr Ser					
[1870]		820		825		830
[1871]	Glu Asp Lys Phe Gln Phe His Leu Pro Ile Ser Leu Asn Phe Lys Ser					
[1872]		835		840		845
[1873]	Lys Glu Arg Leu Asn Phe Asn Leu Lys Val Asn Glu Phe Leu Lys Arg					
[1874]		850		855		860
[1875]	Asn Lys Asp Ile Asn Ile Ile Gly Ile Asp Arg Gly Glu Arg Asn Leu					
[1876]	865		870		875	880
[1877]	Leu Tyr Leu Val Met Ile Asn Gln Lys Gly Glu Ile Leu Lys Gln Thr					
[1878]		885		890		895
[1879]	Leu Leu Asp Ser Met Gln Ser Gly Lys Gly Arg Pro Glu Ile Asn Tyr					
[1880]		900		905		910
[1881]	Lys Glu Lys Leu Gln Glu Lys Glu Ile Glu Arg Asp Lys Ala Arg Lys					
[1882]		915		920		925
[1883]	Ser Trp Gly Thr Val Glu Asn Ile Lys Glu Leu Lys Glu Gly Tyr Leu					
[1884]		930		935		940
[1885]	Ser Ile Val Ile His Gln Ile Ser Lys Leu Met Val Glu Asn Asn Ala					
[1886]	945		950		955	960
[1887]	Ile Val Val Leu Glu Asp Leu Asn Ile Gly Phe Lys Arg Gly Arg Gln					
[1888]		965		970		975
[1889]	Lys Val Glu Arg Gln Val Tyr Gln Lys Phe Glu Lys Met Leu Ile Asp					

[1890]	980	985	990
[1891]	Lys Leu Asn Phe Leu Val Phe Lys	Glu Asn Lys Pro Thr	Glu Pro Gly
[1892]	995	1000	1005
[1893]	Gly Val Leu Lys Ala Tyr Gln	Leu Thr Asp Glu Phe	Gln Ser Phe
[1894]	1010	1015	1020
[1895]	Glu Lys Leu Ser Lys Gln Thr	Gly Phe Leu Phe Tyr	Val Pro Ser
[1896]	1025	1030	1035
[1897]	Trp Asn Thr Ser Lys Ile Asp	Pro Arg Thr Gly Phe	Ile Asp Phe
[1898]	1040	1045	1050
[1899]	Leu His Pro Ala Tyr Glu Asn	Ile Glu Lys Ala Lys	Gln Trp Ile
[1900]	1055	1060	1065
[1901]	Asn Lys Phe Asp Ser Ile Arg	Phe Asn Ser Lys Met	Asp Trp Phe
[1902]	1070	1075	1080
[1903]	Glu Phe Thr Ala Asp Thr Arg	Lys Phe Ser Glu Asn	Leu Met Leu
[1904]	1085	1090	1095
[1905]	Gly Lys Asn Arg Val Trp Val	Ile Cys Thr Thr Asn	Val Glu Arg
[1906]	1100	1105	1110
[1907]	Tyr Phe Thr Ser Lys Thr Ala	Asn Ser Ser Ile Gln	Tyr Asn Ser
[1908]	1115	1120	1125
[1909]	Ile Gln Ile Thr Glu Lys Leu	Lys Glu Leu Phe Val	Asp Ile Pro
[1910]	1130	1135	1140
[1911]	Phe Ser Asn Gly Gln Asp Leu	Lys Pro Glu Ile Leu	Arg Lys Asn
[1912]	1145	1150	1155
[1913]	Asp Ala Val Phe Phe Lys Ser	Leu Leu Phe Tyr Ile	Lys Thr Thr
[1914]	1160	1165	1170
[1915]	Leu Ser Leu Arg Gln Asn Asn	Gly Lys Lys Gly Glu	Glu Glu Lys
[1916]	1175	1180	1185
[1917]	Asp Phe Ile Leu Ser Pro Val	Val Asp Ser Lys Gly	Arg Phe Phe
[1918]	1190	1195	1200
[1919]	Asn Ser Leu Glu Ala Ser Asp	Asp Glu Pro Lys Asp	Ala Asp Ala
[1920]	1205	1210	1215
[1921]	Asn Gly Ala Tyr His Ile Ala	Leu Lys Gly Leu Met	Asn Leu Leu
[1922]	1220	1225	1230
[1923]	Val Leu Asn Glu Thr Lys Glu	Glu Asn Leu Ser Arg	Pro Lys Trp
[1924]	1235	1240	1245
[1925]	Lys Ile Lys Asn Lys Asp Trp	Leu Glu Phe Val Trp	Glu Arg Asn
[1926]	1250	1255	1260
[1927]	Arg		
[1928]	<210>	39	
[1929]	<211>	1373	
[1930]	<212>	PRT	
[1931]	<213>	牛眼莫拉氏菌 (Moraxella bovoculi)	

[1932]	<400>	39														
[1933]	Met	Leu	Phe	Gln	Asp	Phe	Thr	His	Leu	Tyr	Pro	Leu	Ser	Lys	Thr	Val
[1934]	1				5					10					15	
[1935]	Arg	Phe	Glu	Leu	Phe	Ile	Asp	Arg	Thr	Leu	Glu	His	Ile	His	Ala	Lys
[1936]				20					25					30		
[1937]	Asn	Phe	Leu	Ser	Gln	Asp	Glu	Thr	Met	Ala	Asp	Met	His	Gln	Lys	Val
[1938]			35					40					45			
[1939]	Lys	Val	Ile	Leu	Asp	Asp	Tyr	His	Arg	Asp	Phe	Ile	Ala	Asp	Met	Met
[1940]		50					55					60				
[1941]	Gly	Glu	Val	Lys	Leu	Thr	Lys	Leu	Ala	Glu	Phe	Tyr	Asp	Val	Tyr	Leu
[1942]	65					70				75						80
[1943]	Lys	Phe	Arg	Lys	Asn	Pro	Lys	Asp	Asp	Glu	Leu	Gln	Lys	Ala	Gln	Leu
[1944]					85					90					95	
[1945]	Lys	Asp	Leu	Gln	Ala	Val	Leu	Arg	Lys	Glu	Ile	Val	Lys	Pro	Ile	Gly
[1946]				100					105					110		
[1947]	Asn	Gly	Gly	Lys	Tyr	Lys	Ala	Gly	Tyr	Asp	Arg	Leu	Phe	Gly	Ala	Lys
[1948]			115					120					125			
[1949]	Leu	Phe	Lys	Asp	Gly	Lys	Glu	Leu	Gly	Asp	Leu	Ala	Lys	Phe	Val	Ile
[1950]		130					135					140				
[1951]	Ala	Gln	Glu	Gly	Glu	Ser	Ser	Pro	Lys	Leu	Ala	His	Leu	Ala	His	Phe
[1952]	145					150					155					160
[1953]	Glu	Lys	Phe	Ser	Thr	Tyr	Phe	Thr	Gly	Phe	His	Asp	Asn	Arg	Lys	Asn
[1954]					165					170					175	
[1955]	Met	Tyr	Ser	Asp	Glu	Asp	Lys	His	Thr	Ala	Ile	Ala	Tyr	Arg	Leu	Ile
[1956]				180					185					190		
[1957]	His	Glu	Asn	Leu	Pro	Arg	Phe	Ile	Asp	Asn	Leu	Gln	Ile	Leu	Thr	Thr
[1958]			195					200					205			
[1959]	Ile	Lys	Gln	Lys	His	Ser	Ala	Leu	Tyr	Asp	Gln	Ile	Ile	Asn	Glu	Leu
[1960]		210					215					220				
[1961]	Thr	Ala	Ser	Gly	Leu	Asp	Val	Ser	Leu	Ala	Ser	His	Leu	Asp	Gly	Tyr
[1962]	225					230					235					240
[1963]	His	Lys	Leu	Leu	Thr	Gln	Glu	Gly	Ile	Thr	Ala	Tyr	Asn	Thr	Leu	Leu
[1964]					245					250					255	
[1965]	Gly	Gly	Ile	Ser	Gly	Glu	Ala	Gly	Ser	Pro	Lys	Ile	Gln	Gly	Ile	Asn
[1966]				260					265					270		
[1967]	Glu	Leu	Ile	Asn	Ser	His	His	Asn	Gln	His	Cys	His	Lys	Ser	Glu	Arg
[1968]			275					280					285			
[1969]	Ile	Ala	Lys	Leu	Arg	Pro	Leu	His	Lys	Gln	Ile	Leu	Ser	Asp	Gly	Met
[1970]		290					295					300				
[1971]	Ser	Val	Ser	Phe	Leu	Pro	Ser	Lys	Phe	Ala	Asp	Asp	Ser	Glu	Met	Cys
[1972]	305					310					315					320

[1974]	325							330							335			
[1975]	Val	Gln	Ser	Leu	Phe	Asp	Gly	Phe	Asp	Asp	His	Gln	Lys	Asp	Gly	Ile		
[1976]	340							345							350			
[1977]	Tyr	Val	Glu	His	Lys	Asn	Leu	Asn	Glu	Leu	Ser	Lys	Gln	Ala	Phe	Gly		
[1978]	355							360							365			
[1979]	Asp	Phe	Ala	Leu	Leu	Gly	Arg	Val	Leu	Asp	Gly	Tyr	Tyr	Val	Asp	Val		
[1980]	370							375							380			
[1981]	Val	Asn	Pro	Glu	Phe	Asn	Glu	Arg	Phe	Ala	Lys	Ala	Lys	Thr	Asp	Asn		
[1982]	385	390							395							400		
[1983]	Ala	Lys	Ala	Lys	Leu	Thr	Lys	Glu	Lys	Asp	Lys	Phe	Ile	Lys	Gly	Val		
[1984]	405							410							415			
[1985]	His	Ser	Leu	Ala	Ser	Leu	Glu	Gln	Ala	Ile	Glu	His	Tyr	Thr	Ala	Arg		
[1986]	420							425							430			
[1987]	His	Asp	Asp	Glu	Ser	Val	Gln	Ala	Gly	Lys	Leu	Gly	Gln	Tyr	Phe	Lys		
[1988]	435							440							445			
[1989]	His	Gly	Leu	Ala	Gly	Val	Asp	Asn	Pro	Ile	Gln	Lys	Ile	His	Asn	Asn		
[1990]	450							455							460			
[1991]	His	Ser	Thr	Ile	Lys	Gly	Phe	Leu	Glu	Arg	Glu	Arg	Pro	Ala	Gly	Glu		
[1992]	465	470							475							480		
[1993]	Arg	Ala	Leu	Pro	Lys	Ile	Lys	Ser	Gly	Lys	Asn	Pro	Glu	Met	Thr	Gln		
[1994]	485							490							495			
[1995]	Leu	Arg	Gln	Leu	Lys	Glu	Leu	Leu	Asp	Asn	Ala	Leu	Asn	Val	Ala	His		
[1996]	500							505							510			
[1997]	Phe	Ala	Lys	Leu	Leu	Thr	Thr	Lys	Thr	Thr	Leu	Asp	Asn	Gln	Asp	Gly		
[1998]	515							520							525			
[1999]	Asn	Phe	Tyr	Gly	Glu	Phe	Gly	Val	Leu	Tyr	Asp	Glu	Leu	Ala	Lys	Ile		
[2000]	530							535							540			
[2001]	Pro	Thr	Leu	Tyr	Asn	Lys	Val	Arg	Asp	Tyr	Leu	Ser	Gln	Lys	Pro	Phe		
[2002]	545	550							555							560		
[2003]	Ser	Thr	Glu	Lys	Tyr	Lys	Leu	Asn	Phe	Gly	Asn	Pro	Thr	Leu	Leu	Asn		
[2004]	565							570							575			
[2005]	Gly	Trp	Asp	Leu	Asn	Lys	Glu	Lys	Asp	Asn	Phe	Gly	Val	Ile	Leu	Gln		
[2006]	580							585							590			
[2007]	Lys	Asp	Gly	Cys	Tyr	Tyr	Leu	Ala	Leu	Leu	Asp	Lys	Ala	His	Lys	Lys		
[2008]	595							600							605			
[2009]	Val	Phe	Asp	Asn	Ala	Pro	Asn	Thr	Gly	Lys	Ser	Ile	Tyr	Gln	Lys	Met		
[2010]	610							615							620			
[2011]	Ile	Tyr	Lys	Tyr	Leu	Glu	Val	Arg	Lys	Gln	Phe	Pro	Lys	Val	Phe	Phe		
[2012]	625	630							635							640		
[2013]	Ser	Lys	Glu	Ala	Ile	Ala	Ile	Asn	Tyr	His	Pro	Ser	Lys	Glu	Leu	Val		
[2014]	645							650							655			
[2015]	Glu	Ile	Lys	Asp	Lys	Gly	Arg	Gln	Arg	Ser	Asp	Asp	Glu	Arg	Leu	Lys		

[2016]	660								665				670					
[2017]	Leu	Tyr	Arg	Phe	Ile	Leu	Glu	Cys	Leu	Lys	Ile	His	Pro	Lys	Tyr	Asp		
[2018]	675								680				685					
[2019]	Lys	Lys	Phe	Glu	Gly	Ala	Ile	Gly	Asp	Ile	Gln	Leu	Phe	Lys	Lys	Asp		
[2020]	690								695				700					
[2021]	Lys	Lys	Gly	Arg	Glu	Val	Pro	Ile	Ser	Glu	Lys	Asp	Leu	Phe	Lys	Asp		
[2022]	705		710								715				720			
[2023]	Ile	Asn	Gly	Ile	Phe	Ser	Ser	Lys	Pro	Lys	Leu	Glu	Met	Glu	Asp	Phe		
[2024]	725								730				735					
[2025]	Phe	Ile	Gly	Glu	Phe	Lys	Arg	Tyr	Asn	Pro	Ser	Gln	Asp	Leu	Val	Asp		
[2026]	740								745				750					
[2027]	Gln	Tyr	Asn	Ile	Tyr	Lys	Lys	Ile	Asp	Ser	Asn	Asp	Asn	Arg	Lys	Lys		
[2028]	755								760				765					
[2029]	Glu	Asn	Phe	Tyr	Asn	Asn	His	Pro	Lys	Phe	Lys	Lys	Asp	Leu	Val	Arg		
[2030]	770								775				780					
[2031]	Tyr	Tyr	Tyr	Glu	Ser	Met	Cys	Lys	His	Glu	Glu	Trp	Glu	Glu	Ser	Phe		
[2032]	785		790								795				800			
[2033]	Glu	Phe	Ser	Lys	Lys	Leu	Gln	Asp	Ile	Gly	Cys	Tyr	Val	Asp	Val	Asn		
[2034]	805								810				815					
[2035]	Glu	Leu	Phe	Thr	Glu	Ile	Glu	Thr	Arg	Arg	Leu	Asn	Tyr	Lys	Ile	Ser		
[2036]	820								825				830					
[2037]	Phe	Cys	Asn	Ile	Asn	Ala	Asp	Tyr	Ile	Asp	Glu	Leu	Val	Glu	Gln	Gly		
[2038]	835								840				845					
[2039]	Gln	Leu	Tyr	Leu	Phe	Gln	Ile	Tyr	Asn	Lys	Asp	Phe	Ser	Pro	Lys	Ala		
[2040]	850								855				860					
[2041]	His	Gly	Lys	Pro	Asn	Leu	His	Thr	Leu	Tyr	Phe	Lys	Ala	Leu	Phe	Ser		
[2042]	865		870								875				880			
[2043]	Glu	Asp	Asn	Leu	Ala	Asp	Pro	Ile	Tyr	Lys	Leu	Asn	Gly	Glu	Ala	Gln		
[2044]	885								890				895					
[2045]	Ile	Phe	Tyr	Arg	Lys	Ala	Ser	Leu	Asp	Met	Asn	Glu	Thr	Thr	Ile	His		
[2046]	900								905				910					
[2047]	Arg	Ala	Gly	Glu	Val	Leu	Glu	Asn	Lys	Asn	Pro	Asp	Asn	Pro	Lys	Lys		
[2048]	915								920				925					
[2049]	Arg	Gln	Phe	Val	Tyr	Asp	Ile	Ile	Lys	Asp	Lys	Arg	Tyr	Thr	Gln	Lys		
[2050]	930								935				940					
[2051]	Asp	Phe	Met	Leu	His	Val	Pro	Ile	Thr	Met	Asn	Phe	Gly	Val	Gln	Gly		
[2052]	945		950								955				960			
[2053]	Met	Thr	Ile	Lys	Glu	Phe	Asn	Lys	Lys	Val	Asn	Gln	Ser	Ile	Gln	Gln		
[2054]	965								970				975					
[2055]	Tyr	Asp	Glu	Val	Asn	Val	Ile	Gly	Ile	Asp	Arg	Gly	Glu	Arg	His	Leu		
[2056]	980								985				990					
[2057]	Leu	Tyr	Leu	Thr	Val	Ile	Asn	Ser	Lys	Gly	Glu	Ile	Leu	Glu	Gln	Cy		

[2058]	995	1000	1005
[2059]	Ser Leu Asn Asp Ile Thr Thr	Ala Ser Ala Asn Gly	Thr Gln Met
[2060]	1010	1015	1020
[2061]	Thr Thr Pro Tyr His Lys Ile	Leu Asp Lys Arg Glu	Ile Glu Arg
[2062]	1025	1030	1035
[2063]	Leu Asn Ala Arg Val Gly Trp	Gly Glu Ile Glu Thr	Ile Lys Glu
[2064]	1040	1045	1050
[2065]	Leu Lys Ser Gly Tyr Leu Ser	His Val Val His Gln	Ile Ser Gln
[2066]	1055	1060	1065
[2067]	Leu Met Leu Lys Tyr Asn Ala	Ile Val Val Leu Glu	Asp Leu Asn
[2068]	1070	1075	1080
[2069]	Phe Gly Phe Lys Arg Gly Arg	Phe Lys Val Glu Lys	Gln Ile Tyr
[2070]	1085	1090	1095
[2071]	Gln Asn Phe Glu Asn Ala Leu	Ile Lys Lys Leu Asn	His Leu Val
[2072]	1100	1105	1110
[2073]	Leu Lys Asp Lys Ala Asp Asp	Glu Ile Gly Ser Tyr	Lys Asn Ala
[2074]	1115	1120	1125
[2075]	Leu Gln Leu Thr Asn Asn Phe	Thr Asp Leu Lys Ser	Ile Gly Lys
[2076]	1130	1135	1140
[2077]	Gln Thr Gly Phe Leu Phe Tyr	Val Pro Ala Trp Asn	Thr Ser Lys
[2078]	1145	1150	1155
[2079]	Ile Asp Pro Glu Thr Gly Phe	Val Asp Leu Leu Lys	Pro Arg Tyr
[2080]	1160	1165	1170
[2081]	Glu Asn Ile Gln Ala Ser Gln	Ala Phe Phe Gly Lys	Phe Asp Lys
[2082]	1175	1180	1185
[2083]	Ile Cys Tyr Asn Ala Asp Lys	Asp Tyr Phe Glu Phe	His Ile Asp
[2084]	1190	1195	1200
[2085]	Tyr Ala Lys Phe Thr Asp Lys	Ala Lys Asn Ser Arg	Gln Ile Trp
[2086]	1205	1210	1215
[2087]	Thr Ile Cys Ser His Gly Asp	Lys Arg Tyr Val Tyr	Asp Lys Thr
[2088]	1220	1225	1230
[2089]	Ala Asn Gln Asn Lys Gly Ala	Ala Lys Gly Ile Asn	Val Asn Asp
[2090]	1235	1240	1245
[2091]	Ile Leu Lys Ser Leu Phe Ala	Arg His His Ile Asn	Glu Lys Gln
[2092]	1250	1255	1260
[2093]	Pro Asn Leu Val Met Asp Ile	Cys Gln Asn Asn Asp	Lys Glu Phe
[2094]	1265	1270	1275
[2095]	His Lys Ser Leu Met Tyr Leu	Leu Lys Thr Leu Leu	Ala Leu Arg
[2096]	1280	1285	1290
[2097]	Tyr Ser Asn Ala Ser Ser Asp	Glu Asp Phe Ile Leu	Ser Pro Val
[2098]	1295	1300	1305
[2099]	Ala Asn Asp Glu Gly Val Phe	Phe Asn Ser Ala Leu	Ala Asp Asp

[2100]	1310	1315	1320
[2101]	Thr Gln Pro Gln Asn Ala Asp	Ala Asn Gly Ala Tyr	His Ile Ala
[2102]	1325	1330	1335
[2103]	Leu Lys Gly Leu Trp Leu Leu	Asn Glu Leu Lys Asn	Ser Asp Asp
[2104]	1340	1345	1350
[2105]	Leu Asn Lys Val Lys Leu Ala	Ile Asp Asn Gln Thr	Trp Leu Asn
[2106]	1355	1360	1365
[2107]	Phe Ala Gln Asn Arg		
[2108]	1370		
[2109]	<210> 40		
[2110]	<211> 1352		
[2111]	<212> PRT		
[2112]	<213> Parcubacteria细菌		
[2113]	<400> 40		
[2114]	Met Glu Asn Ile Phe Asp Gln Phe	Ile Gly Lys Tyr Ser Leu Ser Lys	
[2115]	1	5	10 15
[2116]	Thr Leu Arg Phe Glu Leu Lys Pro	Val Gly Lys Thr Glu Asp Phe Leu	
[2117]	20	25	30
[2118]	Lys Ile Asn Lys Val Phe Glu Lys	Asp Gln Thr Ile Asp Asp Ser Tyr	
[2119]	35	40	45
[2120]	Asn Gln Ala Lys Phe Tyr Phe	Asp Ser Leu His Gln Lys Phe Ile Asp	
[2121]	50	55	60
[2122]	Ala Ala Leu Ala Ser Asp Lys Thr	Ser Glu Leu Ser Phe Gln Asn Phe	
[2123]	65	70	75 80
[2124]	Ala Asp Val Leu Glu Lys Gln Asn	Lys Ile Ile Leu Asp Lys Lys Arg	
[2125]	85	90	95
[2126]	Glu Met Gly Ala Leu Arg Lys Arg	Asp Lys Asn Ala Val Gly Ile Asp	
[2127]	100	105	110
[2128]	Arg Leu Gln Lys Glu Ile Asn Asp	Ala Glu Asp Ile Ile Gln Lys Glu	
[2129]	115	120	125
[2130]	Lys Glu Lys Ile Tyr Lys Asp Val	Arg Thr Leu Phe Asp Asn Glu Ala	
[2131]	130	135	140
[2132]	Glu Ser Trp Lys Thr Tyr Tyr Gln	Glu Arg Glu Val Asp Gly Lys Lys	
[2133]	145	150	155 160
[2134]	Ile Thr Glu Ser Lys Ala Asp Leu	Lys Gln Lys Gly Ala Asp Phe Leu	
[2135]	165	170	175
[2136]	Thr Ala Ala Gly Ile Leu Lys Val	Leu Lys Tyr Glu Phe Pro Glu Glu	
[2137]	180	185	190
[2138]	Lys Glu Lys Glu Phe Gln Ala Lys	Asn Gln Pro Ser Leu Phe Val Glu	
[2139]	195	200	205
[2140]	Glu Lys Glu Asn Pro Gly Gln Lys	Arg Tyr Ile Phe Asp Ser Phe Asp	
[2141]	210	215	220

[2142]	Lys Phe Ala Gly Tyr Leu Thr Lys Phe Gln Gln Thr Lys Lys Asn Leu		
[2143]	225	230	235 240
[2144]	Tyr Ala Ala Asp Gly Thr Ser Thr Ala Val Ala Thr Arg Ile Ala Asp		
[2145]	245	250	255
[2146]	Asn Phe Ile Ile Phe His Gln Asn Thr Lys Val Phe Arg Asp Lys Tyr		
[2147]	260	265	270
[2148]	Lys Asn Asn His Thr Asp Leu Gly Phe Asp Glu Glu Asn Ile Phe Glu		
[2149]	275	280	285
[2150]	Ile Glu Arg Tyr Lys Asn Cys Leu Leu Gln Arg Glu Ile Glu His Ile		
[2151]	290	295	300
[2152]	Lys Asn Glu Asn Ser Tyr Asn Lys Ile Ile Gly Arg Ile Asn Lys Lys		
[2153]	305	310	315 320
[2154]	Ile Lys Glu Tyr Arg Asp Gln Lys Ala Lys Asp Thr Lys Leu Thr Lys		
[2155]	325	330	335
[2156]	Ser Asp Phe Pro Phe Phe Lys Asn Leu Asp Lys Gln Ile Leu Gly Glu		
[2157]	340	345	350
[2158]	Val Glu Lys Glu Lys Gln Leu Ile Glu Lys Thr Arg Glu Lys Thr Glu		
[2159]	355	360	365
[2160]	Glu Asp Val Leu Ile Glu Arg Phe Lys Glu Phe Ile Glu Asn Asn Glu		
[2161]	370	375	380
[2162]	Glu Arg Phe Thr Ala Ala Lys Lys Leu Met Asn Ala Phe Cys Asn Gly		
[2163]	385	390	395 400
[2164]	Glu Phe Glu Ser Glu Tyr Glu Gly Ile Tyr Leu Lys Asn Lys Ala Ile		
[2165]	405	410	415
[2166]	Asn Thr Ile Ser Arg Arg Trp Phe Val Ser Asp Arg Asp Phe Glu Leu		
[2167]	420	425	430
[2168]	Lys Leu Pro Gln Gln Lys Ser Lys Asn Lys Ser Glu Lys Asn Glu Pro		
[2169]	435	440	445
[2170]	Lys Val Lys Lys Phe Ile Ser Ile Ala Glu Ile Lys Asn Ala Val Glu		
[2171]	450	455	460
[2172]	Glu Leu Asp Gly Asp Ile Phe Lys Ala Val Phe Tyr Asp Lys Lys Ile		
[2173]	465	470	475 480
[2174]	Ile Ala Gln Gly Gly Ser Lys Leu Glu Gln Phe Leu Val Ile Trp Lys		
[2175]	485	490	495
[2176]	Tyr Glu Phe Glu Tyr Leu Phe Arg Asp Ile Glu Arg Glu Asn Gly Glu		
[2177]	500	505	510
[2178]	Lys Leu Leu Gly Tyr Asp Ser Cys Leu Lys Ile Ala Lys Gln Leu Gly		
[2179]	515	520	525
[2180]	Ile Phe Pro Gln Glu Lys Glu Ala Arg Glu Lys Ala Thr Ala Val Ile		
[2181]	530	535	540
[2182]	Lys Asn Tyr Ala Asp Ala Gly Leu Gly Ile Phe Gln Met Met Lys Tyr		
[2183]	545	550	555 560

[2184]	Phe Ser Leu Asp Asp Lys Asp Arg Lys Asn Thr Pro Gly Gln Leu Ser
[2185]	565 570 575
[2186]	Thr Asn Phe Tyr Ala Glu Tyr Asp Gly Tyr Tyr Lys Asp Phe Glu Phe
[2187]	580 585 590
[2188]	Ile Lys Tyr Tyr Asn Glu Phe Arg Asn Phe Ile Thr Lys Lys Pro Phe
[2189]	595 600 605
[2190]	Asp Glu Asp Lys Ile Lys Leu Asn Phe Glu Asn Gly Ala Leu Leu Lys
[2191]	610 615 620
[2192]	Gly Trp Asp Glu Asn Lys Glu Tyr Asp Phe Met Gly Val Ile Leu Lys
[2193]	625 630 635 640
[2194]	Lys Glu Gly Arg Leu Tyr Leu Gly Ile Met His Lys Asn His Arg Lys
[2195]	645 650 655
[2196]	Leu Phe Gln Ser Met Gly Asn Ala Lys Gly Asp Asn Ala Asn Arg Tyr
[2197]	660 665 670
[2198]	Gln Lys Met Ile Tyr Lys Gln Ile Ala Asp Ala Ser Lys Asp Val Pro
[2199]	675 680 685
[2200]	Arg Leu Leu Leu Thr Ser Lys Lys Ala Met Glu Lys Phe Lys Pro Ser
[2201]	690 695 700
[2202]	Gln Glu Ile Leu Arg Ile Lys Lys Glu Lys Thr Phe Lys Arg Glu Ser
[2203]	705 710 715 720
[2204]	Lys Asn Phe Ser Leu Arg Asp Leu His Ala Leu Ile Glu Tyr Tyr Arg
[2205]	725 730 735
[2206]	Asn Cys Ile Pro Gln Tyr Ser Asn Trp Ser Phe Tyr Asp Phe Gln Phe
[2207]	740 745 750
[2208]	Gln Asp Thr Gly Lys Tyr Gln Asn Ile Lys Glu Phe Thr Asp Asp Val
[2209]	755 760 765
[2210]	Gln Lys Tyr Gly Tyr Lys Ile Ser Phe Arg Asp Ile Asp Asp Glu Tyr
[2211]	770 775 780
[2212]	Ile Asn Gln Ala Leu Asn Glu Gly Lys Met Tyr Leu Phe Glu Val Val
[2213]	785 790 795 800
[2214]	Asn Lys Asp Ile Tyr Asn Thr Lys Asn Gly Ser Lys Asn Leu His Thr
[2215]	805 810 815
[2216]	Leu Tyr Phe Glu His Ile Leu Ser Ala Glu Asn Leu Asn Asp Pro Val
[2217]	820 825 830
[2218]	Phe Lys Leu Ser Gly Met Ala Glu Ile Phe Gln Arg Gln Pro Ser Val
[2219]	835 840 845
[2220]	Asn Glu Arg Glu Lys Ile Thr Thr Gln Lys Asn Gln Cys Ile Leu Asp
[2221]	850 855 860
[2222]	Lys Gly Asp Arg Ala Tyr Lys Tyr Arg Arg Tyr Thr Glu Lys Lys Ile
[2223]	865 870 875 880
[2224]	Met Phe His Met Ser Leu Val Leu Asn Thr Gly Lys Gly Glu Ile Lys
[2225]	885 890 895

[2226]	Gln Val Gln Phe Asn Lys Ile Ile Asn Gln Arg Ile Ser Ser Ser Asp		
[2227]	900	905	910
[2228]	Asn Glu Met Arg Val Asn Val Ile Gly Ile Asp Arg Gly Glu Lys Asn		
[2229]	915	920	925
[2230]	Leu Leu Tyr Tyr Ser Val Val Lys Gln Asn Gly Glu Ile Ile Glu Gln		
[2231]	930	935	940
[2232]	Ala Ser Leu Asn Glu Ile Asn Gly Val Asn Tyr Arg Asp Lys Leu Ile		
[2233]	945	950	955 960
[2234]	Glu Arg Glu Lys Glu Arg Leu Lys Asn Arg Gln Ser Trp Lys Pro Val		
[2235]	965	970	975
[2236]	Val Lys Ile Lys Asp Leu Lys Lys Gly Tyr Ile Ser His Val Ile His		
[2237]	980	985	990
[2238]	Lys Ile Cys Gln Leu Ile Glu Lys Tyr Ser Ala Ile Val Val Leu Glu		
[2239]	995	1000	1005
[2240]	Asp Leu Asn Met Arg Phe Lys Gln Ile Arg Gly Gly Ile Glu Arg		
[2241]	1010	1015	1020
[2242]	Ser Val Tyr Gln Gln Phe Glu Lys Ala Leu Ile Asp Lys Leu Gly		
[2243]	1025	1030	1035
[2244]	Tyr Leu Val Phe Lys Asp Asn Arg Asp Leu Arg Ala Pro Gly Gly		
[2245]	1040	1045	1050
[2246]	Val Leu Asn Gly Tyr Gln Leu Ser Ala Pro Phe Val Ser Phe Glu		
[2247]	1055	1060	1065
[2248]	Lys Met Arg Lys Gln Thr Gly Ile Leu Phe Tyr Thr Gln Ala Glu		
[2249]	1070	1075	1080
[2250]	Tyr Thr Ser Lys Thr Asp Pro Ile Thr Gly Phe Arg Lys Asn Val		
[2251]	1085	1090	1095
[2252]	Tyr Ile Ser Asn Ser Ala Ser Leu Asp Lys Ile Lys Glu Ala Val		
[2253]	1100	1105	1110
[2254]	Lys Lys Phe Asp Ala Ile Gly Trp Asp Gly Lys Glu Gln Ser Tyr		
[2255]	1115	1120	1125
[2256]	Phe Phe Lys Tyr Asn Pro Tyr Asn Leu Ala Asp Glu Lys Tyr Lys		
[2257]	1130	1135	1140
[2258]	Asn Ser Thr Val Ser Lys Glu Trp Ala Ile Phe Ala Ser Ala Pro		
[2259]	1145	1150	1155
[2260]	Arg Ile Arg Arg Gln Lys Gly Glu Asp Gly Tyr Trp Lys Tyr Asp		
[2261]	1160	1165	1170
[2262]	Arg Val Lys Val Asn Glu Glu Phe Glu Lys Leu Leu Lys Val Trp		
[2263]	1175	1180	1185
[2264]	Asn Phe Val Asn Pro Lys Ala Thr Asp Ile Lys Gln Glu Ile Ile		
[2265]	1190	1195	1200
[2266]	Lys Lys Ile Lys Ala Gly Asp Leu Gln Gly Glu Lys Glu Leu Asp		
[2267]	1205	1210	1215

[2268]	Gly Arg Leu Arg Asn Phe Trp His Ser Phe Ile Tyr Leu Phe Asn
[2269]	1220 1225 1230
[2270]	Leu Val Leu Glu Leu Arg Asn Ser Phe Ser Leu Gln Ile Lys Ile
[2271]	1235 1240 1245
[2272]	Lys Ala Gly Glu Val Ile Ala Val Asp Glu Gly Val Asp Phe Ile
[2273]	1250 1255 1260
[2274]	Ala Ser Pro Val Lys Pro Phe Phe Thr Thr Pro Asn Pro Tyr Ile
[2275]	1265 1270 1275
[2276]	Pro Ser Asn Leu Cys Trp Leu Ala Val Glu Asn Ala Asp Ala Asn
[2277]	1280 1285 1290
[2278]	Gly Ala Tyr Asn Ile Ala Arg Lys Gly Val Met Ile Leu Lys Lys
[2279]	1295 1300 1305
[2280]	Ile Arg Glu His Ala Lys Lys Asp Pro Glu Phe Lys Lys Leu Pro
[2281]	1310 1315 1320
[2282]	Asn Leu Phe Ile Ser Asn Ala Glu Trp Asp Glu Ala Ala Arg Asp
[2283]	1325 1330 1335
[2284]	Trp Gly Lys Tyr Ala Gly Thr Thr Ala Leu Asn Leu Asp His
[2285]	1340 1345 1350
[2286]	<210> 41
[2287]	<211> 1260
[2288]	<212> PRT
[2289]	<213> 狗口腔卟啉单胞菌(Porphyromonas crevioricanis)
[2290]	<400> 41
[2291]	Met Asp Ser Leu Lys Asp Phe Thr Asn Leu Tyr Pro Val Ser Lys Thr
[2292]	1 5 10 15
[2293]	Leu Arg Phe Glu Leu Lys Pro Val Gly Lys Thr Leu Glu Asn Ile Glu
[2294]	20 25 30
[2295]	Lys Ala Gly Ile Leu Lys Glu Asp Glu His Arg Ala Glu Ser Tyr Arg
[2296]	35 40 45
[2297]	Arg Val Lys Lys Ile Ile Asp Thr Tyr His Lys Val Phe Ile Asp Ser
[2298]	50 55 60
[2299]	Ser Leu Glu Asn Met Ala Lys Met Gly Ile Glu Asn Glu Ile Lys Ala
[2300]	65 70 75 80
[2301]	Met Leu Gln Ser Phe Cys Glu Leu Tyr Lys Lys Asp His Arg Thr Glu
[2302]	85 90 95
[2303]	Gly Glu Asp Lys Ala Leu Asp Lys Ile Arg Ala Val Leu Arg Gly Leu
[2304]	100 105 110
[2305]	Ile Val Gly Ala Phe Thr Gly Val Cys Gly Arg Arg Glu Asn Thr Val
[2306]	115 120 125
[2307]	Gln Asn Glu Lys Tyr Glu Ser Leu Phe Lys Glu Lys Leu Ile Lys Glu
[2308]	130 135 140
[2309]	Ile Leu Pro Asp Phe Val Leu Ser Thr Glu Ala Glu Ser Leu Pro Phe

[2310]	145	150	155	160
[2311]	Ser Val Glu Glu Ala Thr Arg Ser Leu Lys Glu Phe Asp Ser Phe Thr			
[2312]		165	170	175
[2313]	Ser Tyr Phe Ala Gly Phe Tyr Glu Asn Arg Lys Asn Ile Tyr Ser Thr			
[2314]		180	185	190
[2315]	Lys Pro Gln Ser Thr Ala Ile Ala Tyr Arg Leu Ile His Glu Asn Leu			
[2316]		195	200	205
[2317]	Pro Lys Phe Ile Asp Asn Ile Leu Val Phe Gln Lys Ile Lys Glu Pro			
[2318]	210	215	220	
[2319]	Ile Ala Lys Glu Leu Glu His Ile Arg Ala Asp Phe Ser Ala Gly Gly			
[2320]	225	230	235	240
[2321]	Tyr Ile Lys Lys Asp Glu Arg Leu Glu Asp Ile Phe Ser Leu Asn Tyr			
[2322]		245	250	255
[2323]	Tyr Ile His Val Leu Ser Gln Ala Gly Ile Glu Lys Tyr Asn Ala Leu			
[2324]		260	265	270
[2325]	Ile Gly Lys Ile Val Thr Glu Gly Asp Gly Glu Met Lys Gly Leu Asn			
[2326]		275	280	285
[2327]	Glu His Ile Asn Leu Tyr Asn Gln Gln Arg Gly Arg Glu Asp Arg Leu			
[2328]	290	295	300	
[2329]	Pro Leu Phe Arg Pro Leu Tyr Lys Gln Ile Leu Ser Asp Arg Glu Gln			
[2330]	305	310	315	320
[2331]	Leu Ser Tyr Leu Pro Glu Ser Phe Glu Lys Asp Glu Glu Leu Leu Arg			
[2332]		325	330	335
[2333]	Ala Leu Lys Glu Phe Tyr Asp His Ile Ala Glu Asp Ile Leu Gly Arg			
[2334]		340	345	350
[2335]	Thr Gln Gln Leu Met Thr Ser Ile Ser Glu Tyr Asp Leu Ser Arg Ile			
[2336]		355	360	365
[2337]	Tyr Val Arg Asn Asp Ser Gln Leu Thr Asp Ile Ser Lys Lys Met Leu			
[2338]	370	375	380	
[2339]	Gly Asp Trp Asn Ala Ile Tyr Met Ala Arg Glu Arg Ala Tyr Asp His			
[2340]	385	390	395	400
[2341]	Glu Gln Ala Pro Lys Arg Ile Thr Ala Lys Tyr Glu Arg Asp Arg Ile			
[2342]		405	410	415
[2343]	Lys Ala Leu Lys Gly Glu Glu Ser Ile Ser Leu Ala Asn Leu Asn Ser			
[2344]		420	425	430
[2345]	Cys Ile Ala Phe Leu Asp Asn Val Arg Asp Cys Arg Val Asp Thr Tyr			
[2346]		435	440	445
[2347]	Leu Ser Thr Leu Gly Gln Lys Glu Gly Pro His Gly Leu Ser Asn Leu			
[2348]		450	455	460
[2349]	Val Glu Asn Val Phe Ala Ser Tyr His Glu Ala Glu Gln Leu Leu Ser			
[2350]	465	470	475	480
[2351]	Phe Pro Tyr Pro Glu Glu Asn Asn Leu Ile Gln Asp Lys Asp Asn Val			

[2352]	485							490							495				
[2353]	Val	Leu	Ile	Lys	Asn	Leu	Leu	Asp	Asn	Ile	Ser	Asp	Leu	Gln	Arg	Phe			
[2354]	500							505							510				
[2355]	Leu	Lys	Pro	Leu	Trp	Gly	Met	Gly	Asp	Glu	Pro	Asp	Lys	Asp	Glu	Arg			
[2356]	515							520							525				
[2357]	Phe	Tyr	Gly	Glu	Tyr	Asn	Tyr	Ile	Arg	Gly	Ala	Leu	Asp	Gln	Val	Ile			
[2358]	530							535							540				
[2359]	Pro	Leu	Tyr	Asn	Lys	Val	Arg	Asn	Tyr	Leu	Thr	Arg	Lys	Pro	Tyr	Ser			
[2360]	545							550							555			560	
[2361]	Thr	Arg	Lys	Val	Lys	Leu	Asn	Phe	Gly	Asn	Ser	Gln	Leu	Leu	Ser	Gly			
[2362]	565							570							575				
[2363]	Trp	Asp	Arg	Asn	Lys	Glu	Lys	Asp	Asn	Ser	Cys	Val	Ile	Leu	Arg	Lys			
[2364]	580							585							590				
[2365]	Gly	Gln	Asn	Phe	Tyr	Leu	Ala	Ile	Met	Asn	Asn	Arg	His	Lys	Arg	Ser			
[2366]	595							600							605				
[2367]	Phe	Glu	Asn	Lys	Met	Leu	Pro	Glu	Tyr	Lys	Glu	Gly	Glu	Pro	Tyr	Phe			
[2368]	610							615							620				
[2369]	Glu	Lys	Met	Asp	Tyr	Lys	Phe	Leu	Pro	Asp	Pro	Asn	Lys	Met	Leu	Pro			
[2370]	625							630							635			640	
[2371]	Lys	Val	Phe	Leu	Ser	Lys	Lys	Gly	Ile	Glu	Ile	Tyr	Lys	Pro	Ser	Pro			
[2372]	645							650							655				
[2373]	Lys	Leu	Leu	Glu	Gln	Tyr	Gly	His	Gly	Thr	His	Lys	Lys	Gly	Asp	Thr			
[2374]	660							665							670				
[2375]	Phe	Ser	Met	Asp	Asp	Leu	His	Glu	Leu	Ile	Asp	Phe	Phe	Lys	His	Ser			
[2376]	675							680							685				
[2377]	Ile	Glu	Ala	His	Glu	Asp	Trp	Lys	Gln	Phe	Gly	Phe	Lys	Phe	Ser	Asp			
[2378]	690							695							700				
[2379]	Thr	Ala	Thr	Tyr	Glu	Asn	Val	Ser	Ser	Phe	Tyr	Arg	Glu	Val	Glu	Asp			
[2380]	705							710							715			720	
[2381]	Gln	Gly	Tyr	Lys	Leu	Ser	Phe	Arg	Lys	Val	Ser	Glu	Ser	Tyr	Val	Tyr			
[2382]	725							730							735				
[2383]	Ser	Leu	Ile	Asp	Gln	Gly	Lys	Leu	Tyr	Leu	Phe	Gln	Ile	Tyr	Asn	Lys			
[2384]	740							745							750				
[2385]	Asp	Phe	Ser	Pro	Cys	Ser	Lys	Gly	Thr	Pro	Asn	Leu	His	Thr	Leu	Tyr			
[2386]	755							760							765				
[2387]	Trp	Arg	Met	Leu	Phe	Asp	Glu	Arg	Asn	Leu	Ala	Asp	Val	Ile	Tyr	Lys			
[2388]	770							775							780				
[2389]	Leu	Asp	Gly	Lys	Ala	Glu	Ile	Phe	Phe	Arg	Glu	Lys	Ser	Leu	Lys	Asn			
[2390]	785							790							795			800	
[2391]	Asp	His	Pro	Thr	His	Pro	Ala	Gly	Lys	Pro	Ile	Lys	Lys	Lys	Ser	Arg			
[2392]	805							810							815				
[2393]	Gln	Lys	Lys	Gly	Glu	Glu	Ser	Leu	Phe	Glu	Tyr	Asp	Leu	Val	Lys	Asp			

[2394]	820	825	830
[2395]	Arg Arg Tyr Thr Met Asp Lys Phe Gln Phe His Val Pro Ile Thr Met		
[2396]	835	840	845
[2397]	Asn Phe Lys Cys Ser Ala Gly Ser Lys Val Asn Asp Met Val Asn Ala		
[2398]	850	855	860
[2399]	His Ile Arg Glu Ala Lys Asp Met His Val Ile Gly Ile Asp Arg Gly		
[2400]	865	870	875
[2401]	Glu Arg Asn Leu Leu Tyr Ile Cys Val Ile Asp Ser Arg Gly Thr Ile		
[2402]	885	890	895
[2403]	Leu Asp Gln Ile Ser Leu Asn Thr Ile Asn Asp Ile Asp Tyr His Asp		
[2404]	900	905	910
[2405]	Leu Leu Glu Ser Arg Asp Lys Asp Arg Gln Gln Glu His Arg Asn Trp		
[2406]	915	920	925
[2407]	Gln Thr Ile Glu Gly Ile Lys Glu Leu Lys Gln Gly Tyr Leu Ser Gln		
[2408]	930	935	940
[2409]	Ala Val His Arg Ile Ala Glu Leu Met Val Ala Tyr Lys Ala Val Val		
[2410]	945	950	955
[2411]	Ala Leu Glu Asp Leu Asn Met Gly Phe Lys Arg Gly Arg Gln Lys Val		
[2412]	965	970	975
[2413]	Glu Ser Ser Val Tyr Gln Gln Phe Glu Lys Gln Leu Ile Asp Lys Leu		
[2414]	980	985	990
[2415]	Asn Tyr Leu Val Asp Lys Lys Lys Arg Pro Glu Asp Ile Gly Gly Leu		
[2416]	995	1000	1005
[2417]	Leu Arg Ala Tyr Gln Phe Thr Ala Pro Phe Lys Ser Phe Lys Glu		
[2418]	1010	1015	1020
[2419]	Met Gly Lys Gln Asn Gly Phe Leu Phe Tyr Ile Pro Ala Trp Asn		
[2420]	1025	1030	1035
[2421]	Thr Ser Asn Ile Asp Pro Thr Thr Gly Phe Val Asn Leu Phe His		
[2422]	1040	1045	1050
[2423]	Val Gln Tyr Glu Asn Val Asp Lys Ala Lys Ser Phe Phe Gln Lys		
[2424]	1055	1060	1065
[2425]	Phe Asp Ser Ile Ser Tyr Asn Pro Lys Lys Asp Trp Phe Glu Phe		
[2426]	1070	1075	1080
[2427]	Ala Phe Asp Tyr Lys Asn Phe Thr Lys Lys Ala Glu Gly Ser Arg		
[2428]	1085	1090	1095
[2429]	Ser Met Trp Ile Leu Cys Thr His Gly Ser Arg Ile Lys Asn Phe		
[2430]	1100	1105	1110
[2431]	Arg Asn Ser Gln Lys Asn Gly Gln Trp Asp Ser Glu Glu Phe Ala		
[2432]	1115	1120	1125
[2433]	Leu Thr Glu Ala Phe Lys Ser Leu Phe Val Arg Tyr Glu Ile Asp		
[2434]	1130	1135	1140
[2435]	Tyr Thr Ala Asp Leu Lys Thr Ala Ile Val Asp Glu Lys Gln Lys		

[2436]	1145	1150	1155
[2437]	Asp Phe Phe Val Asp Leu Leu Lys Leu Phe Lys Leu Thr Val Gln		
[2438]	1160	1165	1170
[2439]	Met Arg Asn Ser Trp Lys Glu Lys Asp Leu Asp Tyr Leu Ile Ser		
[2440]	1175	1180	1185
[2441]	Pro Val Ala Gly Ala Asp Gly Arg Phe Phe Asp Thr Arg Glu Gly		
[2442]	1190	1195	1200
[2443]	Asn Lys Ser Leu Pro Lys Asp Ala Asp Ala Asn Gly Ala Tyr Asn		
[2444]	1205	1210	1215
[2445]	Ile Ala Leu Lys Gly Leu Trp Ala Leu Arg Gln Ile Arg Gln Thr		
[2446]	1220	1225	1230
[2447]	Ser Glu Gly Gly Lys Leu Lys Leu Ala Ile Ser Asn Lys Glu Trp		
[2448]	1235	1240	1245
[2449]	Leu Gln Phe Val Gln Glu Arg Ser Tyr Glu Lys Asp		
[2450]	1250	1255	1260
[2451]	<210> 42		
[2452]	<211> 1324		
[2453]	<212> PRT		
[2454]	<213> 解糖豚普雷沃氏菌(<i>Prevotella disiens</i>)		
[2455]	<400> 42		
[2456]	Met Glu Asn Tyr Gln Glu Phe Thr Asn Leu Phe Gln Leu Asn Lys Thr		
[2457]	1 5 10 15		
[2458]	Leu Arg Phe Glu Leu Lys Pro Ile Gly Lys Thr Cys Glu Leu Leu Glu		
[2459]	20 25 30		
[2460]	Glu Gly Lys Ile Phe Ala Ser Gly Ser Phe Leu Glu Lys Asp Lys Val		
[2461]	35 40 45		
[2462]	Arg Ala Asp Asn Val Ser Tyr Val Lys Lys Glu Ile Asp Lys Lys His		
[2463]	50 55 60		
[2464]	Lys Ile Phe Ile Glu Glu Thr Leu Ser Ser Phe Ser Ile Ser Asn Asp		
[2465]	65 70 75 80		
[2466]	Leu Leu Lys Gln Tyr Phe Asp Cys Tyr Asn Glu Leu Lys Ala Phe Lys		
[2467]	85 90 95		
[2468]	Lys Asp Cys Lys Ser Asp Glu Glu Glu Val Lys Lys Thr Ala Leu Arg		
[2469]	100 105 110		
[2470]	Asn Lys Cys Thr Ser Ile Gln Arg Ala Met Arg Glu Ala Ile Ser Gln		
[2471]	115 120 125		
[2472]	Ala Phe Leu Lys Ser Pro Gln Lys Lys Leu Leu Ala Ile Lys Asn Leu		
[2473]	130 135 140		
[2474]	Ile Glu Asn Val Phe Lys Ala Asp Glu Asn Val Gln His Phe Ser Glu		
[2475]	145 150 155 160		
[2476]	Phe Thr Ser Tyr Phe Ser Gly Phe Glu Thr Asn Arg Glu Asn Phe Tyr		
[2477]	165 170 175		

[2478]	Ser Asp Glu Glu Lys Ser Thr Ser Ile Ala Tyr Arg Leu Val His Asp		
[2479]	180	185	190
[2480]	Asn Leu Pro Ile Phe Ile Lys Asn Ile Tyr Ile Phe Glu Lys Leu Lys		
[2481]	195	200	205
[2482]	Glu Gln Phe Asp Ala Lys Thr Leu Ser Glu Ile Phe Glu Asn Tyr Lys		
[2483]	210	215	220
[2484]	Leu Tyr Val Ala Gly Ser Ser Leu Asp Glu Val Phe Ser Leu Glu Tyr		
[2485]	225	230	235
[2486]	Phe Asn Asn Thr Leu Thr Gln Lys Gly Ile Asp Asn Tyr Asn Ala Val		
[2487]	245	250	255
[2488]	Ile Gly Lys Ile Val Lys Glu Asp Lys Gln Glu Ile Gln Gly Leu Asn		
[2489]	260	265	270
[2490]	Glu His Ile Asn Leu Tyr Asn Gln Lys His Lys Asp Arg Arg Leu Pro		
[2491]	275	280	285
[2492]	Phe Phe Ile Ser Leu Lys Lys Gln Ile Leu Ser Asp Arg Glu Ala Leu		
[2493]	290	295	300
[2494]	Ser Trp Leu Pro Asp Met Phe Lys Asn Asp Ser Glu Val Ile Asp Ala		
[2495]	305	310	315
[2496]	Leu Lys Gly Phe Tyr Ile Glu Asp Gly Phe Glu Asn Asn Val Leu Thr		
[2497]	325	330	335
[2498]	Pro Leu Ala Thr Leu Leu Ser Ser Leu Asp Lys Tyr Asn Leu Asn Gly		
[2499]	340	345	350
[2500]	Ile Phe Ile Arg Asn Asn Glu Ala Leu Ser Ser Leu Ser Gln Asn Val		
[2501]	355	360	365
[2502]	Tyr Arg Asn Phe Ser Ile Asp Glu Ala Ile Asp Ala Gln Asn Ala Glu		
[2503]	370	375	380
[2504]	Leu Gln Thr Phe Asn Asn Tyr Glu Leu Ile Ala Asn Ala Leu Arg Ala		
[2505]	385	390	395
[2506]	Lys Ile Lys Lys Glu Thr Lys Gln Gly Arg Lys Ser Phe Glu Lys Tyr		
[2507]	405	410	415
[2508]	Glu Glu Tyr Ile Asp Lys Lys Val Lys Ala Ile Asp Ser Leu Ser Ile		
[2509]	420	425	430
[2510]	Gln Glu Ile Asn Glu Leu Val Glu Asn Tyr Val Ser Glu Phe Asn Ser		
[2511]	435	440	445
[2512]	Asn Ser Gly Asn Met Pro Arg Lys Val Glu Asp Tyr Phe Ser Leu Met		
[2513]	450	455	460
[2514]	Arg Lys Gly Asp Phe Gly Ser Asn Asp Leu Ile Glu Asn Ile Lys Thr		
[2515]	465	470	475
[2516]	Lys Leu Ser Ala Ala Glu Lys Leu Leu Gly Thr Lys Tyr Gln Glu Thr		
[2517]	485	490	495
[2518]	Ala Lys Asp Ile Phe Lys Lys Asp Glu Asn Ser Lys Leu Ile Lys Glu		
[2519]	500	505	510

[2520]	Leu	Leu	Asp	Ala	Thr	Lys	Gln	Phe	Gln	His	Phe	Ile	Lys	Pro	Leu	Leu
[2521]				515				520					525			
[2522]	Gly	Thr	Gly	Glu	Glu	Ala	Asp	Arg	Asp	Leu	Val	Phe	Tyr	Gly	Asp	Phe
[2523]			530					535					540			
[2524]	Leu	Pro	Leu	Tyr	Glu	Lys	Phe	Glu	Glu	Leu	Thr	Leu	Leu	Tyr	Asn	Lys
[2525]	545					550					555					560
[2526]	Val	Arg	Asn	Arg	Leu	Thr	Gln	Lys	Pro	Tyr	Ser	Lys	Asp	Lys	Ile	Arg
[2527]					565					570						575
[2528]	Leu	Cys	Phe	Asn	Lys	Pro	Lys	Leu	Met	Thr	Gly	Trp	Val	Asp	Ser	Lys
[2529]					580					585					590	
[2530]	Thr	Glu	Lys	Ser	Asp	Asn	Gly	Thr	Gln	Tyr	Gly	Gly	Tyr	Leu	Phe	Arg
[2531]					595				600						605	
[2532]	Lys	Lys	Asn	Glu	Ile	Gly	Glu	Tyr	Asp	Tyr	Phe	Leu	Gly	Ile	Ser	Ser
[2533]			610					615					620			
[2534]	Lys	Ala	Gln	Leu	Phe	Arg	Lys	Asn	Glu	Ala	Val	Ile	Gly	Asp	Tyr	Glu
[2535]	625					630					635					640
[2536]	Arg	Leu	Asp	Tyr	Tyr	Gln	Pro	Lys	Ala	Asn	Thr	Ile	Tyr	Gly	Ser	Ala
[2537]					645					650					655	
[2538]	Tyr	Glu	Gly	Glu	Asn	Ser	Tyr	Lys	Glu	Asp	Lys	Lys	Arg	Leu	Asn	Lys
[2539]					660					665					670	
[2540]	Val	Ile	Ile	Ala	Tyr	Ile	Glu	Gln	Ile	Lys	Gln	Thr	Asn	Ile	Lys	Lys
[2541]					675					680					685	
[2542]	Ser	Ile	Ile	Glu	Ser	Ile	Ser	Lys	Tyr	Pro	Asn	Ile	Ser	Asp	Asp	Asp
[2543]					690					695				700		
[2544]	Lys	Val	Thr	Pro	Ser	Ser	Leu	Leu	Glu	Lys	Ile	Lys	Lys	Val	Ser	Ile
[2545]	705						710					715				720
[2546]	Asp	Ser	Tyr	Asn	Gly	Ile	Leu	Ser	Phe	Lys	Ser	Phe	Gln	Ser	Val	Asn
[2547]					725						730					735
[2548]	Lys	Glu	Val	Ile	Asp	Asn	Leu	Leu	Lys	Thr	Ile	Ser	Pro	Leu	Lys	Asn
[2549]					740					745					750	
[2550]	Lys	Ala	Glu	Phe	Leu	Asp	Leu	Ile	Asn	Lys	Asp	Tyr	Gln	Ile	Phe	Thr
[2551]					755					760					765	
[2552]	Glu	Val	Gln	Ala	Val	Ile	Asp	Glu	Ile	Cys	Lys	Gln	Lys	Thr	Phe	Ile
[2553]					770								780			
[2554]	Tyr	Phe	Pro	Ile	Ser	Asn	Val	Glu	Leu	Glu	Lys	Glu	Met	Gly	Asp	Lys
[2555]	785						790					795				800
[2556]	Asp	Lys	Pro	Leu	Cys	Leu	Phe	Gln	Ile	Ser	Asn	Lys	Asp	Leu	Ser	Phe
[2557]					805						810					815
[2558]	Ala	Lys	Thr	Phe	Ser	Ala	Asn	Leu	Arg	Lys	Lys	Arg	Gly	Ala	Glu	Asn
[2559]					820							825				830
[2560]	Leu	His	Thr	Met	Leu	Phe	Lys	Ala	Leu	Met	Glu	Gly	Asn	Gln	Asp	Asn
[2561]					835										840	845

[2562]	Leu Asp Leu Gly Ser Gly Ala Ile Phe Tyr Arg Ala Lys Ser Leu Asp
[2563]	850 855 860
[2564]	Gly Asn Lys Pro Thr His Pro Ala Asn Glu Ala Ile Lys Cys Arg Asn
[2565]	865 870 875 880
[2566]	Val Ala Asn Lys Asp Lys Val Ser Leu Phe Thr Tyr Asp Ile Tyr Lys
[2567]	885 890 895
[2568]	Asn Arg Arg Tyr Met Glu Asn Lys Phe Leu Phe His Leu Ser Ile Val
[2569]	900 905 910
[2570]	Gln Asn Tyr Lys Ala Ala Asn Asp Ser Ala Gln Leu Asn Ser Ser Ala
[2571]	915 920 925
[2572]	Thr Glu Tyr Ile Arg Lys Ala Asp Asp Leu His Ile Ile Gly Ile Asp
[2573]	930 935 940
[2574]	Arg Gly Glu Arg Asn Leu Leu Tyr Tyr Ser Val Ile Asp Met Lys Gly
[2575]	945 950 955 960
[2576]	Asn Ile Val Glu Gln Asp Ser Leu Asn Ile Ile Arg Asn Asn Asp Leu
[2577]	965 970 975
[2578]	Glu Thr Asp Tyr His Asp Leu Leu Asp Lys Arg Glu Lys Glu Arg Lys
[2579]	980 985 990
[2580]	Ala Asn Arg Gln Asn Trp Glu Ala Val Glu Gly Ile Lys Asp Leu Lys
[2581]	995 1000 1005
[2582]	Lys Gly Tyr Leu Ser Gln Ala Val His Gln Ile Ala Gln Leu Met
[2583]	1010 1015 1020
[2584]	Leu Lys Tyr Asn Ala Ile Ile Ala Leu Glu Asp Leu Gly Gln Met
[2585]	1025 1030 1035
[2586]	Phe Val Thr Arg Gly Gln Lys Ile Glu Lys Ala Val Tyr Gln Gln
[2587]	1040 1045 1050
[2588]	Phe Glu Lys Ser Leu Val Asp Lys Leu Ser Tyr Leu Val Asp Lys
[2589]	1055 1060 1065
[2590]	Lys Arg Pro Tyr Asn Glu Leu Gly Gly Ile Leu Lys Ala Tyr Gln
[2591]	1070 1075 1080
[2592]	Leu Ala Ser Ser Ile Thr Lys Asn Asn Ser Asp Lys Gln Asn Gly
[2593]	1085 1090 1095
[2594]	Phe Leu Phe Tyr Val Pro Ala Trp Asn Thr Ser Lys Ile Asp Pro
[2595]	1100 1105 1110
[2596]	Val Thr Gly Phe Thr Asp Leu Leu Arg Pro Lys Ala Met Thr Ile
[2597]	1115 1120 1125
[2598]	Lys Glu Ala Gln Asp Phe Phe Gly Ala Phe Asp Asn Ile Ser Tyr
[2599]	1130 1135 1140
[2600]	Asn Asp Lys Gly Tyr Phe Glu Phe Glu Thr Asn Tyr Asp Lys Phe
[2601]	1145 1150 1155
[2602]	Lys Ile Arg Met Lys Ser Ala Gln Thr Arg Trp Thr Ile Cys Thr
[2603]	1160 1165 1170

[2604]	Phe Gly Asn Arg Ile Lys Arg Lys Lys Asp Lys Asn Tyr Trp Asn		
[2605]	1175	1180	1185
[2606]	Tyr Glu Glu Val Glu Leu Thr Glu Glu Phe Lys Lys Leu Phe Lys		
[2607]	1190	1195	1200
[2608]	Asp Ser Asn Ile Asp Tyr Glu Asn Cys Asn Leu Lys Glu Glu Ile		
[2609]	1205	1210	1215
[2610]	Gln Asn Lys Asp Asn Arg Lys Phe Phe Asp Asp Leu Ile Lys Leu		
[2611]	1220	1225	1230
[2612]	Leu Gln Leu Thr Leu Gln Met Arg Asn Ser Asp Asp Lys Gly Asn		
[2613]	1235	1240	1245
[2614]	Asp Tyr Ile Ile Ser Pro Val Ala Asn Ala Glu Gly Gln Phe Phe		
[2615]	1250	1255	1260
[2616]	Asp Ser Arg Asn Gly Asp Lys Lys Leu Pro Leu Asp Ala Asp Ala		
[2617]	1265	1270	1275
[2618]	Asn Gly Ala Tyr Asn Ile Ala Arg Lys Gly Leu Trp Asn Ile Arg		
[2619]	1280	1285	1290
[2620]	Gln Ile Lys Gln Thr Lys Asn Lys Asp Asp Leu Asn Leu Ser Ile		
[2621]	1295	1300	1305
[2622]	Ser Ser Thr Glu Trp Leu Asp Phe Val Arg Glu Lys Pro Tyr Leu		
[2623]	1310	1315	1320
[2624]	Lys		
[2625]	<210> 43		
[2626]	<211> 1484		
[2627]	<212> PRT		
[2628]	<213> Peregrinibacteria细菌		
[2629]	<220>		
[2630]	<221> misc_feature		
[2631]	<222> (1073) .. (1073)		
[2632]	<223> Xaa可以为任何天然出现的氨基酸		
[2633]	<400> 43		
[2634]	Met Ser Asn Phe Phe Lys Asn Phe Thr Asn Leu Tyr Glu Leu Ser Lys		
[2635]	1 5 10 15		
[2636]	Thr Leu Arg Phe Glu Leu Lys Pro Val Gly Asp Thr Leu Thr Asn Met		
[2637]	20 25 30		
[2638]	Lys Asp His Leu Glu Tyr Asp Glu Lys Leu Gln Thr Phe Leu Lys Asp		
[2639]	35 40 45		
[2640]	Gln Asn Ile Asp Asp Ala Tyr Gln Ala Leu Lys Pro Gln Phe Asp Glu		
[2641]	50 55 60		
[2642]	Ile His Glu Glu Phe Ile Thr Asp Ser Leu Glu Ser Lys Lys Ala Lys		
[2643]	65 70 75 80		
[2644]	Glu Ile Asp Phe Ser Glu Tyr Leu Asp Leu Phe Gln Glu Lys Lys Glu		
[2645]	85 90 95		

[2646]	Leu Asn Asp Ser Glu Lys Lys Leu Arg Asn Lys Ile Gly Glu Thr Phe		
[2647]	100	105	110
[2648]	Asn Lys Ala Gly Glu Lys Trp Lys Lys Glu Lys Tyr Pro Gln Tyr Glu		
[2649]	115	120	125
[2650]	Trp Lys Lys Gly Ser Lys Ile Ala Asn Gly Ala Asp Ile Leu Ser Cys		
[2651]	130	135	140
[2652]	Gln Asp Met Leu Gln Phe Ile Lys Tyr Lys Asn Pro Glu Asp Glu Lys		
[2653]	145	150	155
[2654]	Ile Lys Asn Tyr Ile Asp Asp Thr Leu Lys Gly Phe Phe Thr Tyr Phe		
[2655]	165	170	175
[2656]	Gly Gly Phe Asn Gln Asn Arg Ala Asn Tyr Tyr Glu Thr Lys Lys Glu		
[2657]	180	185	190
[2658]	Ala Ser Thr Ala Val Ala Thr Arg Ile Val His Glu Asn Leu Pro Lys		
[2659]	195	200	205
[2660]	Phe Cys Asp Asn Val Ile Gln Phe Lys His Ile Ile Lys Arg Lys Lys		
[2661]	210	215	220
[2662]	Asp Gly Thr Val Glu Lys Thr Glu Arg Lys Thr Glu Tyr Leu Asn Ala		
[2663]	225	230	235
[2664]	Tyr Gln Tyr Leu Lys Asn Asn Asn Lys Ile Thr Gln Ile Lys Asp Ala		
[2665]	245	250	255
[2666]	Glu Thr Glu Lys Met Ile Glu Ser Thr Pro Ile Ala Glu Lys Ile Phe		
[2667]	260	265	270
[2668]	Asp Val Tyr Tyr Phe Ser Ser Cys Leu Ser Gln Lys Gln Ile Glu Glu		
[2669]	275	280	285
[2670]	Tyr Asn Arg Ile Ile Gly His Tyr Asn Leu Leu Ile Asn Leu Tyr Asn		
[2671]	290	295	300
[2672]	Gln Ala Lys Arg Ser Glu Gly Lys His Leu Ser Ala Asn Glu Lys Lys		
[2673]	305	310	315
[2674]	Tyr Lys Asp Leu Pro Lys Phe Lys Thr Leu Tyr Lys Gln Ile Gly Cys		
[2675]	325	330	335
[2676]	Gly Lys Lys Lys Asp Leu Phe Tyr Thr Ile Lys Cys Asp Thr Glu Glu		
[2677]	340	345	350
[2678]	Glu Ala Asn Lys Ser Arg Asn Glu Gly Lys Glu Ser His Ser Val Glu		
[2679]	355	360	365
[2680]	Glu Ile Ile Asn Lys Ala Gln Glu Ala Ile Asn Lys Tyr Phe Lys Ser		
[2681]	370	375	380
[2682]	Asn Asn Asp Cys Glu Asn Ile Asn Thr Val Pro Asp Phe Ile Asn Tyr		
[2683]	385	390	395
[2684]	Ile Leu Thr Lys Glu Asn Tyr Glu Gly Val Tyr Trp Ser Lys Ala Ala		
[2685]	405	410	415
[2686]	Met Asn Thr Ile Ser Asp Lys Tyr Phe Ala Asn Tyr His Asp Leu Gln		
[2687]	420	425	430

[2688]	Asp Arg Leu Lys Glu Ala Lys Val Phe Gln Lys Ala Asp Lys Lys Ser		
[2689]	435	440	445
[2690]	Glu Asp Asp Ile Lys Ile Pro Glu Ala Ile Glu Leu Ser Gly Leu Phe		
[2691]	450	455	460
[2692]	Gly Val Leu Asp Ser Leu Ala Asp Trp Gln Thr Thr Leu Phe Lys Ser		
[2693]	465	470	475 480
[2694]	Ser Ile Leu Ser Asn Glu Lys Leu Lys Ile Ile Thr Asp Ser Gln Thr		
[2695]	485	490	495
[2696]	Pro Ser Glu Ala Leu Leu Lys Met Ile Phe Asn Asp Ile Glu Lys Asn		
[2697]	500	505	510
[2698]	Met Glu Ser Phe Leu Lys Glu Thr Asn Asp Ile Ile Thr Leu Lys Lys		
[2699]	515	520	525
[2700]	Tyr Lys Gly Asn Lys Glu Gly Thr Glu Lys Ile Lys Gln Trp Phe Asp		
[2701]	530	535	540
[2702]	Tyr Thr Leu Ala Ile Asn Arg Met Leu Lys Tyr Phe Leu Val Lys Glu		
[2703]	545	550	555 560
[2704]	Asn Lys Ile Lys Gly Asn Ser Leu Asp Thr Asn Ile Ser Glu Ala Leu		
[2705]	565	570	575
[2706]	Lys Thr Leu Ile Tyr Ser Asp Asp Ala Glu Trp Phe Lys Trp Tyr Asp		
[2707]	580	585	590
[2708]	Ala Leu Arg Asn Tyr Leu Thr Gln Lys Pro Gln Asp Glu Ala Lys Glu		
[2709]	595	600	605
[2710]	Asn Lys Leu Lys Leu Asn Phe Asp Asn Pro Ser Leu Ala Gly Gly Trp		
[2711]	610	615	620
[2712]	Asp Val Asn Lys Glu Cys Ser Asn Phe Cys Val Ile Leu Lys Asp Lys		
[2713]	625	630	635 640
[2714]	Asn Glu Lys Lys Tyr Leu Ala Met Ile Lys Lys Gly Glu Asn Thr Leu		
[2715]	645	650	655
[2716]	Phe Gln Lys Glu Trp Thr Glu Gly Arg Gly Lys Asn Leu Thr Lys Lys		
[2717]	660	665	670
[2718]	Ser Asn Pro Leu Phe Glu Ile Asn Asn Cys Glu Ile Leu Ser Lys Met		
[2719]	675	680	685
[2720]	Glu Tyr Asp Phe Trp Ala Asp Val Ser Lys Met Ile Pro Lys Cys Ser		
[2721]	690	695	700
[2722]	Thr Gln Leu Lys Ala Val Val Asn His Phe Lys Gln Ser Asp Asn Glu		
[2723]	705	710	715 720
[2724]	Phe Ile Phe Pro Ile Gly Tyr Lys Val Thr Ser Gly Glu Lys Phe Arg		
[2725]	725	730	735
[2726]	Glu Glu Cys Lys Ile Ser Lys Gln Asp Phe Glu Leu Asn Asn Lys Val		
[2727]	740	745	750
[2728]	Phe Asn Lys Asn Glu Leu Ser Val Thr Ala Met Arg Tyr Asp Leu Ser		
[2729]	755	760	765

[2730]	Ser Thr Gln Glu Lys Gln Tyr Ile Lys Ala Phe Gln Lys Glu Tyr Trp
[2731]	770 775 780
[2732]	Glu Leu Leu Phe Lys Gln Glu Lys Arg Asp Thr Lys Leu Thr Asn Asn
[2733]	785 790 795 800
[2734]	Glu Ile Phe Asn Glu Trp Ile Asn Phe Cys Asn Lys Lys Tyr Ser Glu
[2735]	805 810 815
[2736]	Leu Leu Ser Trp Glu Arg Lys Tyr Lys Asp Ala Leu Thr Asn Trp Ile
[2737]	820 825 830
[2738]	Asn Phe Cys Lys Tyr Phe Leu Ser Lys Tyr Pro Lys Thr Thr Leu Phe
[2739]	835 840 845
[2740]	Asn Tyr Ser Phe Lys Glu Ser Glu Asn Tyr Asn Ser Leu Asp Glu Phe
[2741]	850 855 860
[2742]	Tyr Arg Asp Val Asp Ile Cys Ser Tyr Lys Leu Asn Ile Asn Thr Thr
[2743]	865 870 875 880
[2744]	Ile Asn Lys Ser Ile Leu Asp Arg Leu Val Glu Glu Gly Lys Leu Tyr
[2745]	885 890 895
[2746]	Leu Phe Glu Ile Lys Asn Gln Asp Ser Asn Asp Gly Lys Ser Ile Gly
[2747]	900 905 910
[2748]	His Lys Asn Asn Leu His Thr Ile Tyr Trp Asn Ala Ile Phe Glu Asn
[2749]	915 920 925
[2750]	Phe Asp Asn Arg Pro Lys Leu Asn Gly Glu Ala Glu Ile Phe Tyr Arg
[2751]	930 935 940
[2752]	Lys Ala Ile Ser Lys Asp Lys Leu Gly Ile Val Lys Gly Lys Lys Thr
[2753]	945 950 955 960
[2754]	Lys Asn Gly Thr Trp Ile Ile Lys Asn Tyr Arg Phe Ser Lys Glu Lys
[2755]	965 970 975
[2756]	Phe Ile Leu His Val Pro Ile Thr Leu Asn Phe Cys Ser Asn Asn Glu
[2757]	980 985 990
[2758]	Tyr Val Asn Asp Ile Val Asn Thr Lys Phe Tyr Asn Phe Ser Asn Leu
[2759]	995 1000 1005
[2760]	His Phe Leu Gly Ile Asp Arg Gly Glu Lys His Leu Ala Tyr Tyr
[2761]	1010 1015 1020
[2762]	Ser Leu Val Asn Lys Asn Gly Glu Ile Val Asp Gln Gly Thr Leu
[2763]	1025 1030 1035
[2764]	Asn Leu Pro Phe Thr Asp Lys Asp Gly Asn Gln Arg Ser Ile Lys
[2765]	1040 1045 1050
[2766]	Lys Glu Lys Tyr Phe Tyr Asn Lys Gln Glu Asp Lys Trp Glu Ala
[2767]	1055 1060 1065
[2768]	Lys Glu Val Asp Xaa Trp Asn Tyr Asn Asp Leu Leu Asp Ala Met
[2769]	1070 1075 1080
[2770]	Ala Ser Asn Arg Asp Met Ala Arg Lys Asn Trp Gln Arg Ile Gly
[2771]	1085 1090 1095

[2772]	Thr	Ile	Lys	Glu	Ala	Lys	Asn	Gly	Tyr	Val	Ser	Leu	Val	Ile	Arg
[2773]		1100					1105					1110			
[2774]	Lys	Ile	Ala	Asp	Leu	Ala	Val	Asn	Asn	Glu	Arg	Pro	Ala	Phe	Ile
[2775]		1115					1120					1125			
[2776]	Val	Leu	Glu	Asp	Leu	Asn	Thr	Gly	Phe	Lys	Arg	Ser	Arg	Gln	Lys
[2777]		1130					1135					1140			
[2778]	Ile	Asp	Lys	Ser	Val	Tyr	Gln	Lys	Phe	Glu	Leu	Ala	Leu	Ala	Lys
[2779]		1145					1150					1155			
[2780]	Lys	Leu	Asn	Phe	Leu	Val	Asp	Lys	Asn	Ala	Lys	Arg	Asp	Glu	Ile
[2781]		1160					1165					1170			
[2782]	Gly	Ser	Pro	Thr	Lys	Ala	Leu	Gln	Leu	Thr	Pro	Pro	Val	Asn	Asn
[2783]		1175					1180					1185			
[2784]	Tyr	Gly	Asp	Ile	Glu	Asn	Lys	Lys	Gln	Ala	Gly	Ile	Met	Leu	Tyr
[2785]		1190					1195					1200			
[2786]	Thr	Arg	Ala	Asn	Tyr	Thr	Ser	Gln	Thr	Asp	Pro	Ala	Thr	Gly	Trp
[2787]		1205					1210					1215			
[2788]	Arg	Lys	Thr	Ile	Tyr	Leu	Lys	Ala	Gly	Pro	Glu	Glu	Thr	Thr	Tyr
[2789]		1220					1225					1230			
[2790]	Lys	Lys	Asp	Gly	Lys	Ile	Lys	Asn	Lys	Ser	Val	Lys	Asp	Gln	Ile
[2791]		1235					1240					1245			
[2792]	Ile	Glu	Thr	Phe	Thr	Asp	Ile	Gly	Phe	Asp	Gly	Lys	Asp	Tyr	Tyr
[2793]		1250					1255					1260			
[2794]	Phe	Glu	Tyr	Asp	Lys	Gly	Glu	Phe	Val	Asp	Glu	Lys	Thr	Gly	Glu
[2795]		1265					1270					1275			
[2796]	Ile	Lys	Pro	Lys	Lys	Trp	Arg	Leu	Tyr	Ser	Gly	Glu	Asn	Gly	Lys
[2797]		1280					1285					1290			
[2798]	Ser	Leu	Asp	Arg	Phe	Arg	Gly	Glu	Arg	Glu	Lys	Asp	Lys	Tyr	Glu
[2799]		1295					1300					1305			
[2800]	Trp	Lys	Ile	Asp	Lys	Ile	Asp	Ile	Val	Lys	Ile	Leu	Asp	Asp	Leu
[2801]		1310					1315					1320			
[2802]	Phe	Val	Asn	Phe	Asp	Lys	Asn	Ile	Ser	Leu	Leu	Lys	Gln	Leu	Lys
[2803]		1325					1330					1335			
[2804]	Glu	Gly	Val	Glu	Leu	Thr	Arg	Asn	Asn	Glu	His	Gly	Thr	Gly	Glu
[2805]		1340					1345					1350			
[2806]	Ser	Leu	Arg	Phe	Ala	Ile	Asn	Leu	Ile	Gln	Gln	Ile	Arg	Asn	Thr
[2807]		1355					1360					1365			
[2808]	Gly	Asn	Asn	Glu	Arg	Asp	Asn	Asp	Phe	Ile	Leu	Ser	Pro	Val	Arg
[2809]		1370					1375					1380			
[2810]	Asp	Glu	Asn	Gly	Lys	His	Phe	Asp	Ser	Arg	Glu	Tyr	Trp	Asp	Lys
[2811]		1385					1390					1395			
[2812]	Glu	Thr	Lys	Gly	Glu	Lys	Ile	Ser	Met	Pro	Ser	Ser	Gly	Asp	Ala
[2813]		1400					1405					1410			

[2814]	Asn Gly Ala Phe Asn Ile Ala Arg Lys Gly Ile Ile Met Asn Ala
[2815]	1415 1420 1425
[2816]	His Ile Leu Ala Asn Ser Asp Ser Lys Asp Leu Ser Leu Phe Val
[2817]	1430 1435 1440
[2818]	Ser Asp Glu Glu Trp Asp Leu His Leu Asn Asn Lys Thr Glu Trp
[2819]	1445 1450 1455
[2820]	Lys Lys Gln Leu Asn Ile Phe Ser Ser Arg Lys Ala Met Ala Lys
[2821]	1460 1465 1470
[2822]	Arg Lys Lys Lys Arg Pro Ala Ala Thr Lys Lys
[2823]	1475 1480
[2824]	<210> 44
[2825]	<211> 1245
[2826]	<212> PRT
[2827]	<213> 猕猴卟啉单胞菌(Porphyromonas macacae)
[2828]	<400> 44
[2829]	Met Lys Thr Gln His Phe Phe Glu Asp Phe Thr Ser Leu Tyr Ser Leu
[2830]	1 5 10 15
[2831]	Ser Lys Thr Ile Arg Phe Glu Leu Lys Pro Ile Gly Lys Thr Leu Glu
[2832]	20 25 30
[2833]	Asn Ile Lys Lys Asn Gly Leu Ile Arg Arg Asp Glu Gln Arg Leu Asp
[2834]	35 40 45
[2835]	Asp Tyr Glu Lys Leu Lys Lys Val Ile Asp Glu Tyr His Glu Asp Phe
[2836]	50 55 60
[2837]	Ile Ala Asn Ile Leu Ser Ser Phe Ser Phe Ser Glu Glu Ile Leu Gln
[2838]	65 70 75 80
[2839]	Ser Tyr Ile Gln Asn Leu Ser Ile Ser Glu Ala Arg Ala Lys Ile Glu
[2840]	85 90 95
[2841]	Lys Thr Met Arg Asp Thr Leu Ala Lys Ala Phe Ser Glu Asp Glu Arg
[2842]	100 105 110
[2843]	Tyr Lys Ser Ile Phe Lys Lys Glu Leu Val Lys Lys Asp Ile Pro Val
[2844]	115 120 125
[2845]	Trp Cys Pro Ala Tyr Lys Ser Leu Cys Lys Lys Phe Asp Asn Phe Thr
[2846]	130 135 140
[2847]	Thr Ser Leu Val Pro Phe His Glu Asn Arg Lys Asn Leu Tyr Thr Ser
[2848]	145 150 155 160
[2849]	Asn Glu Ile Thr Ala Ser Ile Pro Tyr Arg Ile Val His Val Asn Leu
[2850]	165 170 175
[2851]	Pro Lys Phe Ile Gln Asn Ile Glu Ala Leu Cys Glu Leu Gln Lys Lys
[2852]	180 185 190
[2853]	Met Gly Ala Asp Leu Tyr Leu Glu Met Met Glu Asn Leu Arg Asn Val
[2854]	195 200 205
[2855]	Trp Pro Ser Phe Val Lys Thr Pro Asp Asp Leu Cys Asn Leu Lys Thr

[2856]	210	215	220
[2857]	Tyr Asn His Leu Met Val Gln Ser Ser Ile Ser Glu Tyr Asn Arg Phe		
[2858]	225	230	235
[2859]	Val Gly Gly Tyr Ser Thr Glu Asp Gly Thr Lys His Gln Gly Ile Asn		
[2860]		245	250
[2861]	Glu Trp Ile Asn Ile Tyr Arg Gln Arg Asn Lys Glu Met Arg Leu Pro		
[2862]		260	265
[2863]	Gly Leu Val Phe Leu His Lys Gln Ile Leu Ala Lys Val Asp Ser Ser		
[2864]		275	280
[2865]	Ser Phe Ile Ser Asp Thr Leu Glu Asn Asp Asp Gln Val Phe Cys Val		
[2866]	290	295	300
[2867]	Leu Arg Gln Phe Arg Lys Leu Phe Trp Asn Thr Val Ser Ser Lys Glu		
[2868]	305	310	315
[2869]	Asp Asp Ala Ala Ser Leu Lys Asp Leu Phe Cys Gly Leu Ser Gly Tyr		
[2870]		325	330
[2871]	Asp Pro Glu Ala Ile Tyr Val Ser Asp Ala His Leu Ala Thr Ile Ser		
[2872]		340	345
[2873]	Lys Asn Ile Phe Asp Arg Trp Asn Tyr Ile Ser Asp Ala Ile Arg Arg		
[2874]		355	360
[2875]	Lys Thr Glu Val Leu Met Pro Arg Lys Lys Glu Ser Val Glu Arg Tyr		
[2876]	370	375	380
[2877]	Ala Glu Lys Ile Ser Lys Gln Ile Lys Lys Arg Gln Ser Tyr Ser Leu		
[2878]	385	390	395
[2879]	Ala Glu Leu Asp Asp Leu Leu Ala His Tyr Ser Glu Glu Ser Leu Pro		
[2880]		405	410
[2881]	Ala Gly Phe Ser Leu Leu Ser Tyr Phe Thr Ser Leu Gly Gly Gln Lys		
[2882]		420	425
[2883]	Tyr Leu Val Ser Asp Gly Glu Val Ile Leu Tyr Glu Glu Gly Ser Asn		
[2884]		435	440
[2885]	Ile Trp Asp Glu Val Leu Ile Ala Phe Arg Asp Leu Gln Val Ile Leu		
[2886]	450	455	460
[2887]	Asp Lys Asp Phe Thr Glu Lys Lys Leu Gly Lys Asp Glu Glu Ala Val		
[2888]	465	470	475
[2889]	Ser Val Ile Lys Lys Ala Leu Asp Ser Ala Leu Arg Leu Arg Lys Phe		
[2890]		485	490
[2891]	Phe Asp Leu Leu Ser Gly Thr Gly Ala Glu Ile Arg Arg Asp Ser Ser		
[2892]		500	505
[2893]	Phe Tyr Ala Leu Tyr Thr Asp Arg Met Asp Lys Leu Lys Gly Leu Leu		
[2894]		515	520
[2895]	Lys Met Tyr Asp Lys Val Arg Asn Tyr Leu Thr Lys Lys Pro Tyr Ser		
[2896]	530	535	540
[2897]	Ile Glu Lys Phe Lys Leu His Phe Asp Asn Pro Ser Leu Leu Ser Gly		

[2898]	545	550	555	560
[2899]	Trp Asp Lys Asn Lys Glu Leu Asn Asn Leu Ser Val Ile Phe Arg Gln			
[2900]		565	570	575
[2901]	Asn Gly Tyr Tyr Tyr Leu Gly Ile Met Thr Pro Lys Gly Lys Asn Leu			
[2902]		580	585	590
[2903]	Phe Lys Thr Leu Pro Lys Leu Gly Ala Glu Glu Met Phe Tyr Glu Lys			
[2904]		595	600	605
[2905]	Met Glu Tyr Lys Lys Gln Ile Ala Glu Pro Met Leu Met Leu Pro Lys Val			
[2906]		610	615	620
[2907]	Phe Phe Pro Lys Lys Thr Lys Pro Ala Phe Ala Pro Asp Gln Ser Val			
[2908]	625	630	635	640
[2909]	Val Asp Ile Tyr Asn Lys Lys Thr Phe Lys Thr Gly Gln Lys Gly Phe			
[2910]		645	650	655
[2911]	Asn Lys Lys Asp Leu Tyr Arg Leu Ile Asp Phe Tyr Lys Glu Ala Leu			
[2912]		660	665	670
[2913]	Thr Val His Glu Trp Lys Leu Phe Asn Phe Ser Phe Ser Pro Thr Glu			
[2914]		675	680	685
[2915]	Gln Tyr Arg Asn Ile Gly Glu Phe Phe Asp Glu Val Arg Glu Gln Ala			
[2916]		690	695	700
[2917]	Tyr Lys Val Ser Met Val Asn Val Pro Ala Ser Tyr Ile Asp Glu Ala			
[2918]	705	710	715	720
[2919]	Val Glu Asn Gly Lys Leu Tyr Leu Phe Gln Ile Tyr Asn Lys Asp Phe			
[2920]		725	730	735
[2921]	Ser Pro Tyr Ser Lys Gly Ile Pro Asn Leu His Thr Leu Tyr Trp Lys			
[2922]		740	745	750
[2923]	Ala Leu Phe Ser Glu Gln Asn Gln Ser Arg Val Tyr Lys Leu Cys Gly			
[2924]		755	760	765
[2925]	Gly Gly Glu Leu Phe Tyr Arg Lys Ala Ser Leu His Met Gln Asp Thr			
[2926]		770	775	780
[2927]	Thr Val His Pro Lys Gly Ile Ser Ile His Lys Lys Asn Leu Asn Lys			
[2928]	785	790	795	800
[2929]	Lys Gly Glu Thr Ser Leu Phe Asn Tyr Asp Leu Val Lys Asp Lys Arg			
[2930]		805	810	815
[2931]	Phe Thr Glu Asp Lys Phe Phe Phe His Val Pro Ile Ser Ile Asn Tyr			
[2932]		820	825	830
[2933]	Lys Asn Lys Lys Ile Thr Asn Val Asn Gln Met Val Arg Asp Tyr Ile			
[2934]		835	840	845
[2935]	Ala Gln Asn Asp Asp Leu Gln His Gly Ile Asp Arg Gly Glu Arg Asn			
[2936]		850	855	860
[2937]	Leu Leu Tyr Ile Ser Arg Ile Asp Thr Arg Gly Asn Leu Leu Glu Gln			
[2938]	865	870	875	880
[2939]	Phe Ser Leu Asn Val Ile Glu Ser Asp Lys Gly Asp Leu Arg Thr Asp			

[2940]	885	890	895
[2941]	Tyr Gln Lys Ile Leu Gly Asp Arg Glu Gln Glu Arg Leu Arg Arg Arg		
[2942]	900	905	910
[2943]	Gln Glu Trp Lys Ser Ile Glu Ser Ile Lys Asp Leu Lys Asp Gly Tyr		
[2944]	915	920	925
[2945]	Met Ser Gln Val Val His Lys Ile Cys Asn Met Val Val Glu His Lys		
[2946]	930	935	940
[2947]	Ala Ile Val Val Leu Glu Asn Leu Asn Leu Ser Phe Met Lys Gly Arg		
[2948]	945	950	955
[2949]	Lys Lys Val Glu Lys Ser Val Tyr Glu Lys Phe Glu Arg Met Leu Val		
[2950]	965	970	975
[2951]	Asp Lys Leu Asn Tyr Leu Val Val Asp Lys Lys Asn Leu Ser Asn Glu		
[2952]	980	985	990
[2953]	Pro Gly Gly Leu Tyr Ala Ala Tyr Gln Leu Thr Asn Pro Leu Phe Ser		
[2954]	995	1000	1005
[2955]	Phe Glu Glu Leu His Arg Tyr Pro Gln Ser Gly Ile Leu Phe Phe		
[2956]	1010	1015	1020
[2957]	Val Asp Pro Trp Asn Thr Ser Leu Thr Asp Pro Ser Thr Gly Phe		
[2958]	1025	1030	1035
[2959]	Val Asn Leu Leu Gly Arg Ile Asn Tyr Thr Asn Val Gly Asp Ala		
[2960]	1040	1045	1050
[2961]	Arg Lys Phe Phe Asp Arg Phe Asn Ala Ile Arg Tyr Asp Gly Lys		
[2962]	1055	1060	1065
[2963]	Gly Asn Ile Leu Phe Asp Leu Asp Leu Ser Arg Phe Asp Val Arg		
[2964]	1070	1075	1080
[2965]	Val Glu Thr Gln Arg Lys Leu Trp Thr Leu Thr Thr Phe Gly Ser		
[2966]	1085	1090	1095
[2967]	Arg Ile Ala Lys Ser Lys Lys Ser Gly Lys Trp Met Val Glu Arg		
[2968]	1100	1105	1110
[2969]	Ile Glu Asn Leu Ser Leu Cys Phe Leu Glu Leu Phe Glu Gln Phe		
[2970]	1115	1120	1125
[2971]	Asn Ile Gly Tyr Arg Val Glu Lys Asp Leu Lys Lys Ala Ile Leu		
[2972]	1130	1135	1140
[2973]	Ser Gln Asp Arg Lys Glu Phe Tyr Val Arg Leu Ile Tyr Leu Phe		
[2974]	1145	1150	1155
[2975]	Asn Leu Met Met Gln Ile Arg Asn Ser Asp Gly Glu Glu Asp Tyr		
[2976]	1160	1165	1170
[2977]	Ile Leu Ser Pro Ala Leu Asn Glu Lys Asn Leu Gln Phe Asp Ser		
[2978]	1175	1180	1185
[2979]	Arg Leu Ile Glu Ala Lys Asp Leu Pro Val Asp Ala Asp Ala Asn		
[2980]	1190	1195	1200
[2981]	Gly Ala Tyr Asn Val Ala Arg Lys Gly Leu Met Val Val Gln Arg		

[2982]	1205	1210	1215
[2983]	Ile Lys Arg Gly Asp His Glu Ser Ile His Arg Ile Gly Arg Ala		
[2984]	1220	1225	1230
[2985]	Gln Trp Leu Arg Tyr Val Gln Glu Gly Ile Val Glu		
[2986]	1235	1240	1245
[2987]	<210> 45		
[2988]	<211> 1250		
[2989]	<212> PRT		
[2990]	<213> 史密斯氏菌属物种(Smithella sp.)		
[2991]	<400> 45		
[2992]	Met Gln Thr Leu Phe Glu Asn Phe Thr Asn Gln Tyr Pro Val Ser Lys		
[2993]	1 5 10 15		
[2994]	Thr Leu Arg Phe Glu Leu Ile Pro Gln Gly Lys Thr Lys Asp Phe Ile		
[2995]	20 25 30		
[2996]	Glu Gln Lys Gly Leu Leu Lys Lys Asp Glu Asp Arg Ala Glu Lys Tyr		
[2997]	35 40 45		
[2998]	Lys Lys Val Lys Asn Ile Ile Asp Glu Tyr His Lys Asp Phe Ile Glu		
[2999]	50 55 60		
[3000]	Lys Ser Leu Asn Gly Leu Lys Leu Asp Gly Leu Glu Lys Tyr Lys Thr		
[3001]	65 70 75 80		
[3002]	Leu Tyr Leu Lys Gln Glu Lys Asp Asp Lys Asp Lys Lys Ala Phe Asp		
[3003]	85 90 95		
[3004]	Lys Glu Lys Glu Asn Leu Arg Lys Gln Ile Ala Asn Ala Phe Arg Asn		
[3005]	100 105 110		
[3006]	Asn Glu Lys Phe Lys Thr Leu Phe Ala Lys Glu Leu Ile Lys Asn Asp		
[3007]	115 120 125		
[3008]	Leu Met Ser Phe Ala Cys Glu Glu Asp Lys Lys Asn Val Lys Glu Phe		
[3009]	130 135 140		
[3010]	Glu Ala Phe Thr Thr Tyr Phe Thr Gly Phe His Gln Asn Arg Ala Asn		
[3011]	145 150 155 160		
[3012]	Met Tyr Val Ala Asp Glu Lys Arg Thr Ala Ile Ala Ser Arg Leu Ile		
[3013]	165 170 175		
[3014]	His Glu Asn Leu Pro Lys Phe Ile Asp Asn Ile Lys Ile Phe Glu Lys		
[3015]	180 185 190		
[3016]	Met Lys Lys Glu Ala Pro Glu Leu Leu Ser Pro Phe Asn Gln Thr Leu		
[3017]	195 200 205		
[3018]	Lys Asp Met Lys Asp Val Ile Lys Gly Thr Thr Leu Glu Glu Ile Phe		
[3019]	210 215 220		
[3020]	Ser Leu Asp Tyr Phe Asn Lys Thr Leu Thr Gln Ser Gly Ile Asp Ile		
[3021]	225 230 235 240		
[3022]	Tyr Asn Ser Val Ile Gly Gly Arg Thr Pro Glu Glu Gly Lys Thr Lys		
[3023]	245 250 255		

[3024]	Ile Lys Gly Leu Asn Glu Tyr Ile Asn Thr Asp Phe Asn Gln Lys Gln		
[3025]	260	265	270
[3026]	Thr Asp Lys Lys Lys Arg Gln Pro Lys Phe Lys Gln Leu Tyr Lys Gln		
[3027]	275	280	285
[3028]	Ile Leu Ser Asp Arg Gln Ser Leu Ser Phe Ile Ala Glu Ala Phe Lys		
[3029]	290	295	300
[3030]	Asn Asp Thr Glu Ile Leu Glu Ala Ile Glu Lys Phe Tyr Val Asn Glu		
[3031]	305	310	315
[3032]	Leu Leu His Phe Ser Asn Glu Gly Lys Ser Thr Asn Val Leu Asp Ala		
[3033]	325	330	335
[3034]	Ile Lys Asn Ala Val Ser Asn Leu Glu Ser Phe Asn Leu Thr Lys Met		
[3035]	340	345	350
[3036]	Tyr Phe Arg Ser Gly Ala Ser Leu Thr Asp Val Ser Arg Lys Val Phe		
[3037]	355	360	365
[3038]	Gly Glu Trp Ser Ile Ile Asn Arg Ala Leu Asp Asn Tyr Tyr Ala Thr		
[3039]	370	375	380
[3040]	Thr Tyr Pro Ile Lys Pro Arg Glu Lys Ser Glu Lys Tyr Glu Glu Arg		
[3041]	385	390	395
[3042]	Lys Glu Lys Trp Leu Lys Gln Asp Phe Asn Val Ser Leu Ile Gln Thr		
[3043]	405	410	415
[3044]	Ala Ile Asp Glu Tyr Asp Asn Glu Thr Val Lys Gly Lys Asn Ser Gly		
[3045]	420	425	430
[3046]	Lys Val Ile Ala Asp Tyr Phe Ala Lys Phe Cys Asp Asp Lys Glu Thr		
[3047]	435	440	445
[3048]	Asp Leu Ile Gln Lys Val Asn Glu Gly Tyr Ile Ala Val Lys Asp Leu		
[3049]	450	455	460
[3050]	Leu Asn Thr Pro Cys Pro Glu Asn Glu Lys Leu Gly Ser Asn Lys Asp		
[3051]	465	470	475
[3052]	Gln Val Lys Gln Ile Lys Ala Phe Met Asp Ser Ile Met Asp Ile Met		
[3053]	485	490	495
[3054]	His Phe Val Arg Pro Leu Ser Leu Lys Asp Thr Asp Lys Glu Lys Asp		
[3055]	500	505	510
[3056]	Glu Thr Phe Tyr Ser Leu Phe Thr Pro Leu Tyr Asp His Leu Thr Gln		
[3057]	515	520	525
[3058]	Thr Ile Ala Leu Tyr Asn Lys Val Arg Asn Tyr Leu Thr Gln Lys Pro		
[3059]	530	535	540
[3060]	Tyr Ser Thr Glu Lys Ile Lys Leu Asn Phe Glu Asn Ser Thr Leu Leu		
[3061]	545	550	555
[3062]	Gly Gly Trp Asp Leu Asn Lys Glu Thr Asp Asn Thr Ala Ile Ile Leu		
[3063]	565	570	575
[3064]	Arg Lys Asp Asn Leu Tyr Tyr Leu Gly Ile Met Asp Lys Arg His Asn		
[3065]	580	585	590

[3066]	Arg	Ile	Phe	Arg	Asn	Val	Pro	Lys	Ala	Asp	Lys	Lys	Asp	Phe	Cys	Tyr
[3067]						595				600						605
[3068]	Glu	Lys	Met	Val	Tyr	Lys	Leu	Leu	Pro	Gly	Ala	Asn	Lys	Met	Leu	Pro
[3069]						610				615						620
[3070]	Lys	Val	Phe	Phe	Ser	Gln	Ser	Arg	Ile	Gln	Glu	Phe	Thr	Pro	Ser	Ala
[3071]						625				630						640
[3072]	Lys	Leu	Leu	Glu	Asn	Tyr	Ala	Asn	Glu	Thr	His	Lys	Lys	Gly	Asp	Asn
[3073]						645				650						655
[3074]	Phe	Asn	Leu	Asn	His	Cys	His	Lys	Leu	Ile	Asp	Phe	Phe	Lys	Asp	Ser
[3075]						660				665						670
[3076]	Ile	Asn	Lys	His	Glu	Asp	Trp	Lys	Asn	Phe	Asp	Phe	Arg	Phe	Ser	Ala
[3077]						675				680						685
[3078]	Thr	Ser	Thr	Tyr	Ala	Asp	Leu	Ser	Gly	Phe	Tyr	His	Glu	Val	Glu	His
[3079]						690				695						700
[3080]	Gln	Gly	Tyr	Lys	Ile	Ser	Phe	Gln	Ser	Val	Ala	Asp	Ser	Phe	Ile	Asp
[3081]						705				710						720
[3082]	Asp	Leu	Val	Asn	Glu	Gly	Lys	Leu	Tyr	Leu	Phe	Gln	Ile	Tyr	Asn	Lys
[3083]						725				730						735
[3084]	Asp	Phe	Ser	Pro	Phe	Ser	Lys	Gly	Lys	Pro	Asn	Leu	His	Thr	Leu	Tyr
[3085]						740				745						750
[3086]	Trp	Lys	Met	Leu	Phe	Asp	Glu	Asn	Asn	Leu	Lys	Asp	Val	Val	Tyr	Lys
[3087]						755				760						765
[3088]	Leu	Asn	Gly	Glu	Ala	Glu	Val	Phe	Tyr	Arg	Lys	Lys	Ser	Ile	Ala	Glu
[3089]						770				775						780
[3090]	Lys	Asn	Thr	Thr	Ile	His	Lys	Ala	Asn	Glu	Ser	Ile	Ile	Asn	Lys	Asn
[3091]						785				790						800
[3092]	Pro	Asp	Asn	Pro	Lys	Ala	Thr	Ser	Thr	Phe	Asn	Tyr	Asp	Ile	Val	Lys
[3093]						805				810						815
[3094]	Asp	Lys	Arg	Tyr	Thr	Ile	Asp	Lys	Phe	Gln	Phe	His	Ile	Pro	Ile	Thr
[3095]						820				825						830
[3096]	Met	Asn	Phe	Lys	Ala	Glu	Gly	Ile	Phe	Asn	Met	Asn	Gln	Arg	Val	Asn
[3097]						835				840						845
[3098]	Gln	Phe	Leu	Lys	Ala	Asn	Pro	Asp	Ile	Asn	Ile	Ile	Gly	Ile	Asp	Arg
[3099]						850				855						860
[3100]	Gly	Glu	Arg	His	Leu	Leu	Tyr	Tyr	Ala	Leu	Ile	Asn	Gln	Lys	Gly	Lys
[3101]						865				870						880
[3102]	Ile	Leu	Lys	Gln	Asp	Thr	Leu	Asn	Val	Ile	Ala	Asn	Glu	Lys	Gln	Lys
[3103]						885				890						895
[3104]	Val	Asp	Tyr	His	Asn	Leu	Leu	Asp	Lys	Lys	Glu	Gly	Asp	Arg	Ala	Thr
[3105]						900				905						910
[3106]	Ala	Arg	Gln	Glu	Trp	Gly	Val	Ile	Glu	Thr	Ile	Lys	Glu	Leu	Lys	Glu
[3107]						915				920						925

[3108]	Gly Tyr Leu Ser Gln Val Ile His Lys Leu Thr Asp Leu Met Ile Glu		
[3109]	930	935	940
[3110]	Asn Asn Ala Ile Ile Val Met Glu Asp Leu Asn Phe Gly Phe Lys Arg		
[3111]	945	950	955 960
[3112]	Gly Arg Gln Lys Val Glu Lys Gln Val Tyr Gln Lys Phe Glu Lys Met		
[3113]	965	970	975
[3114]	Leu Ile Asp Lys Leu Asn Tyr Leu Val Asp Lys Asn Lys Lys Ala Asn		
[3115]	980	985	990
[3116]	Glu Leu Gly Gly Leu Leu Asn Ala Phe Gln Leu Ala Asn Lys Phe Glu		
[3117]	995	1000	1005
[3118]	Ser Phe Gln Lys Met Gly Lys Gln Asn Gly Phe Ile Phe Tyr Val		
[3119]	1010	1015	1020
[3120]	Pro Ala Trp Asn Thr Ser Lys Thr Asp Pro Ala Thr Gly Phe Ile		
[3121]	1025	1030	1035
[3122]	Asp Phe Leu Lys Pro Arg Tyr Glu Asn Leu Asn Gln Ala Lys Asp		
[3123]	1040	1045	1050
[3124]	Phe Phe Glu Lys Phe Asp Ser Ile Arg Leu Asn Ser Lys Ala Asp		
[3125]	1055	1060	1065
[3126]	Tyr Phe Glu Phe Ala Phe Asp Phe Lys Asn Phe Thr Glu Lys Ala		
[3127]	1070	1075	1080
[3128]	Asp Gly Gly Arg Thr Lys Trp Thr Val Cys Thr Thr Asn Glu Asp		
[3129]	1085	1090	1095
[3130]	Arg Tyr Gln Trp Asn Arg Ala Leu Asn Asn Asn Arg Gly Ser Gln		
[3131]	1100	1105	1110
[3132]	Glu Lys Tyr Asp Ile Thr Ala Glu Leu Lys Ser Leu Phe Asp Gly		
[3133]	1115	1120	1125
[3134]	Lys Val Asp Tyr Lys Ser Gly Lys Asp Leu Lys Gln Gln Ile Ala		
[3135]	1130	1135	1140
[3136]	Ser Gln Glu Ser Ala Asp Phe Phe Lys Ala Leu Met Lys Asn Leu		
[3137]	1145	1150	1155
[3138]	Ser Ile Thr Leu Ser Leu Arg His Asn Asn Gly Glu Lys Gly Asp		
[3139]	1160	1165	1170
[3140]	Asn Glu Gln Asp Tyr Ile Leu Ser Pro Val Ala Asp Ser Lys Gly		
[3141]	1175	1180	1185
[3142]	Arg Phe Phe Asp Ser Arg Lys Ala Asp Asp Asp Met Pro Lys Asn		
[3143]	1190	1195	1200
[3144]	Ala Asp Ala Asn Gly Ala Tyr His Ile Ala Leu Lys Gly Leu Trp		
[3145]	1205	1210	1215
[3146]	Cys Leu Glu Gln Ile Ser Lys Thr Asp Asp Leu Lys Lys Val Lys		
[3147]	1220	1225	1230
[3148]	Leu Ala Ile Ser Asn Lys Glu Trp Leu Glu Phe Val Gln Thr Leu		
[3149]	1235	1240	1245

[3150]	Lys Gly
[3151]	1250
[3152]	<210> 46
[3153]	<211> 228
[3154]	<212> PRT
[3155]	<213> 褐家鼠 (Rattus norvegicus)
[3156]	<400> 46
[3157]	Ser Ser Glu Thr Gly Pro Val Ala Val Asp Pro Thr Leu Arg Arg Arg
[3158]	1 5 10 15
[3159]	Ile Glu Pro His Glu Phe Glu Val Phe Phe Asp Pro Arg Glu Leu Arg
[3160]	20 25 30
[3161]	Lys Glu Thr Cys Leu Leu Tyr Glu Ile Asn Trp Gly Gly Arg His Ser
[3162]	35 40 45
[3163]	Ile Trp Arg His Thr Ser Gln Asn Thr Asn Lys His Val Glu Val Asn
[3164]	50 55 60
[3165]	Phe Ile Glu Lys Phe Thr Thr Glu Arg Tyr Phe Cys Pro Asn Thr Arg
[3166]	65 70 75 80
[3167]	Cys Ser Ile Thr Trp Phe Leu Ser Trp Ser Pro Cys Gly Glu Cys Ser
[3168]	85 90 95
[3169]	Arg Ala Ile Thr Glu Phe Leu Ser Arg Tyr Pro His Val Thr Leu Phe
[3170]	100 105 110
[3171]	Ile Tyr Ile Ala Arg Leu Tyr His His Ala Asp Pro Arg Asn Arg Gln
[3172]	115 120 125
[3173]	Gly Leu Arg Asp Leu Ile Ser Ser Gly Val Thr Ile Gln Ile Met Thr
[3174]	130 135 140
[3175]	Glu Gln Glu Ser Gly Tyr Cys Trp Arg Asn Phe Val Asn Tyr Ser Pro
[3176]	145 150 155 160
[3177]	Ser Asn Glu Ala His Trp Pro Arg Tyr Pro His Leu Trp Val Arg Leu
[3178]	165 170 175
[3179]	Tyr Val Leu Glu Leu Tyr Cys Ile Ile Leu Gly Leu Pro Pro Cys Leu
[3180]	180 185 190
[3181]	Asn Ile Leu Arg Arg Lys Gln Pro Gln Leu Thr Phe Phe Thr Ile Ala
[3182]	195 200 205
[3183]	Leu Gln Ser Cys His Tyr Gln Arg Leu Pro Pro His Ile Leu Trp Ala
[3184]	210 215 220
[3185]	Thr Gly Leu Lys
[3186]	225
[3187]	<210> 47
[3188]	<211> 199
[3189]	<212> PRT
[3190]	<213> 智人 (Homo sapiens)
[3191]	<400> 47

[3192]	Met Glu Ala Ser Pro Ala Ser Gly Pro Arg His Leu Met Asp Pro His
[3193]	1 5 10 15
[3194]	Ile Phe Thr Ser Asn Phe Asn Asn Gly Ile Gly Arg His Lys Thr Tyr
[3195]	20 25 30
[3196]	Leu Cys Tyr Glu Val Glu Arg Leu Asp Asn Gly Thr Ser Val Lys Met
[3197]	35 40 45
[3198]	Asp Gln His Arg Gly Phe Leu His Asn Gln Ala Lys Asn Leu Leu Cys
[3199]	50 55 60
[3200]	Gly Phe Tyr Gly Arg His Ala Glu Leu Arg Phe Leu Asp Leu Val Pro
[3201]	65 70 75 80
[3202]	Ser Leu Gln Leu Asp Pro Ala Gln Ile Tyr Arg Val Thr Trp Phe Ile
[3203]	85 90 95
[3204]	Ser Trp Ser Pro Cys Phe Ser Trp Gly Cys Ala Gly Glu Val Arg Ala
[3205]	100 105 110
[3206]	Phe Leu Gln Glu Asn Thr His Val Arg Leu Arg Ile Phe Ala Ala Arg
[3207]	115 120 125
[3208]	Ile Tyr Asp Tyr Asp Pro Leu Tyr Lys Glu Ala Leu Gln Met Leu Arg
[3209]	130 135 140
[3210]	Asp Ala Gly Ala Gln Val Ser Ile Met Thr Tyr Asp Glu Phe Lys His
[3211]	145 150 155 160
[3212]	Cys Trp Asp Thr Phe Val Asp His Gln Gly Cys Pro Phe Gln Pro Trp
[3213]	165 170 175
[3214]	Asp Gly Leu Asp Glu His Ser Gln Ala Leu Ser Gly Arg Leu Arg Ala
[3215]	180 185 190
[3216]	Ile Leu Gln Asn Gln Gly Asn
[3217]	195
[3218]	<210> 48
[3219]	<211> 83
[3220]	<212> PRT
[3221]	<213> 杆菌噬菌体
[3222]	<400> 48
[3223]	Thr Asn Leu Ser Asp Ile Ile Glu Lys Glu Thr Gly Lys Gln Leu Val
[3224]	1 5 10 15
[3225]	Ile Gln Glu Ser Ile Leu Met Leu Pro Glu Glu Val Glu Glu Val Ile
[3226]	20 25 30
[3227]	Gly Asn Lys Pro Glu Ser Asp Ile Leu Val His Thr Ala Tyr Asp Glu
[3228]	35 40 45
[3229]	Ser Thr Asp Glu Asn Val Met Leu Leu Thr Ser Asp Ala Pro Glu Tyr
[3230]	50 55 60
[3231]	Lys Pro Trp Ala Leu Val Ile Gln Asp Ser Asn Gly Glu Asn Lys Ile
[3232]	65 70 75 80
[3233]	Lys Met Leu

[3234]	<210>	49
[3235]	<211>	1596
[3236]	<212>	PRT
[3237]	<213>	人工的
[3238]	<220>	
[3239]	<223>	碱基编辑器融合蛋白
[3240]	<400>	49
[3241]	Met Lys Arg Thr Ala Asp Gly Ser Glu Phe Glu Ser Pro Lys Lys Lys	
[3242]	1 5 10 15	
[3243]	Arg Lys Val Thr Asn Leu Ser Asp Ile Ile Glu Lys Glu Thr Gly Lys	
[3244]	20 25 30	
[3245]	Gln Leu Val Ile Gln Glu Ser Ile Leu Met Leu Pro Glu Glu Val Glu	
[3246]	35 40 45	
[3247]	Glu Val Ile Gly Asn Lys Pro Glu Ser Asp Ile Leu Val His Thr Ala	
[3248]	50 55 60	
[3249]	Tyr Asp Glu Ser Thr Asp Glu Asn Val Met Leu Leu Thr Ser Asp Ala	
[3250]	65 70 75 80	
[3251]	Pro Glu Tyr Lys Pro Trp Ala Leu Val Ile Gln Asp Ser Asn Gly Glu	
[3252]	85 90 95	
[3253]	Asn Lys Ile Lys Met Leu Ser Gly Gly Ser Gly Gly Ser Gly Gly Ser	
[3254]	100 105 110	
[3255]	Ser Lys Leu Glu Lys Phe Thr Asn Cys Tyr Ser Leu Ser Lys Thr Leu	
[3256]	115 120 125	
[3257]	Arg Phe Lys Ala Ile Pro Val Gly Lys Thr Gln Glu Asn Ile Asp Asn	
[3258]	130 135 140	
[3259]	Lys Arg Leu Leu Val Glu Asp Glu Lys Arg Ala Glu Asp Tyr Lys Gly	
[3260]	145 150 155 160	
[3261]	Val Lys Lys Leu Leu Asp Arg Tyr Tyr Leu Ser Phe Ile Asn Asp Val	
[3262]	165 170 175	
[3263]	Leu His Ser Ile Lys Leu Lys Asn Leu Asn Asn Tyr Ile Ser Leu Phe	
[3264]	180 185 190	
[3265]	Arg Lys Lys Thr Arg Thr Glu Lys Glu Asn Lys Glu Leu Glu Asn Leu	
[3266]	195 200 205	
[3267]	Glu Ile Asn Leu Arg Lys Glu Ile Ala Lys Ala Phe Lys Gly Asn Glu	
[3268]	210 215 220	
[3269]	Gly Tyr Lys Ser Leu Phe Lys Lys Asp Ile Ile Glu Thr Ile Leu Pro	
[3270]	225 230 235 240	
[3271]	Glu Phe Leu Asp Asp Lys Asp Glu Ile Ala Leu Val Asn Ser Phe Asn	
[3272]	245 250 255	
[3273]	Gly Phe Thr Thr Ala Phe Thr Gly Phe Phe Asp Asn Arg Glu Asn Met	
[3274]	260 265 270	
[3275]	Phe Ser Glu Glu Ala Lys Ser Thr Ser Ile Ala Phe Arg Cys Ile Asn	

[3276]	275	280	285
[3277]	Glu Asn Leu Thr Arg Tyr Ile Ser Asn Met Asp Ile Phe Glu Lys Val		
[3278]	290	295	300
[3279]	Asp Ala Ile Phe Asp Lys His Glu Val Gln Glu Ile Lys Glu Lys Ile		
[3280]	305	310	315
[3281]	Leu Asn Ser Asp Tyr Asp Val Glu Asp Phe Phe Glu Gly Glu Phe Phe		
[3282]	325	330	335
[3283]	Asn Phe Val Leu Thr Gln Glu Gly Ile Asp Val Tyr Asn Ala Ile Ile		
[3284]	340	345	350
[3285]	Gly Gly Phe Val Thr Glu Ser Gly Glu Lys Ile Lys Gly Leu Asn Glu		
[3286]	355	360	365
[3287]	Tyr Ile Asn Leu Tyr Asn Gln Lys Thr Lys Gln Lys Leu Pro Lys Phe		
[3288]	370	375	380
[3289]	Lys Pro Leu Tyr Lys Gln Val Leu Ser Asp Arg Glu Ser Leu Ser Phe		
[3290]	385	390	395
[3291]	Tyr Gly Glu Gly Tyr Thr Ser Asp Glu Glu Val Leu Glu Val Phe Arg		
[3292]	405	410	415
[3293]	Asn Thr Leu Asn Lys Asn Ser Glu Ile Phe Ser Ser Ile Lys Lys Leu		
[3294]	420	425	430
[3295]	Glu Lys Leu Phe Lys Asn Phe Asp Glu Tyr Ser Ser Ala Gly Ile Phe		
[3296]	435	440	445
[3297]	Val Lys Asn Gly Pro Ala Ile Ser Thr Ile Ser Lys Asp Ile Phe Gly		
[3298]	450	455	460
[3299]	Glu Trp Asn Val Ile Arg Asp Lys Trp Asn Ala Glu Tyr Asp Asp Ile		
[3300]	465	470	475
[3301]	His Leu Lys Lys Lys Ala Val Val Thr Glu Lys Tyr Glu Asp Asp Arg		
[3302]	485	490	495
[3303]	Arg Lys Ser Phe Lys Lys Ile Gly Ser Phe Ser Leu Glu Gln Leu Gln		
[3304]	500	505	510
[3305]	Glu Tyr Ala Asp Ala Asp Leu Ser Val Val Glu Lys Leu Lys Glu Ile		
[3306]	515	520	525
[3307]	Ile Ile Gln Lys Val Asp Glu Ile Tyr Lys Val Tyr Gly Ser Ser Glu		
[3308]	530	535	540
[3309]	Lys Leu Phe Asp Ala Asp Phe Val Leu Glu Lys Ser Leu Lys Lys Asn		
[3310]	545	550	555
[3311]	Asp Ala Val Val Ala Ile Met Lys Asp Leu Leu Asp Ser Val Lys Ser		
[3312]	565	570	575
[3313]	Phe Glu Asn Tyr Ile Lys Ala Phe Phe Gly Glu Gly Lys Glu Thr Asn		
[3314]	580	585	590
[3315]	Arg Asp Glu Ser Phe Tyr Gly Asp Phe Val Leu Ala Tyr Asp Ile Leu		
[3316]	595	600	605
[3317]	Leu Lys Val Asp His Ile Tyr Asp Ala Ile Arg Asn Tyr Val Thr Gln		

[3318]	610	615	620
[3319]	Lys Pro Tyr Ser Lys Asp Lys Phe Lys Leu Tyr Phe Gln Asn Pro Gln		
[3320]	625	630	635 640
[3321]	Phe Met Gly Gly Trp Asp Lys Asp Lys Glu Thr Asp Tyr Arg Ala Thr		
[3322]		645	650 655
[3323]	Ile Leu Arg Tyr Gly Ser Lys Tyr Tyr Leu Ala Ile Met Asp Lys Lys		
[3324]		660	665 670
[3325]	Tyr Ala Lys Cys Leu Gln Lys Ile Asp Lys Asp Asp Val Asn Gly Asn		
[3326]		675	680 685
[3327]	Tyr Glu Lys Ile Asn Tyr Lys Leu Leu Pro Gly Pro Asn Lys Met Leu		
[3328]	690	695	700
[3329]	Pro Lys Val Phe Phe Ser Lys Lys Trp Met Ala Tyr Tyr Asn Pro Ser		
[3330]	705	710	715 720
[3331]	Glu Asp Ile Gln Lys Ile Tyr Lys Asn Gly Thr Phe Lys Lys Gly Asp		
[3332]		725	730 735
[3333]	Met Phe Asn Leu Asn Asp Cys His Lys Leu Ile Asp Phe Phe Lys Asp		
[3334]		740	745 750
[3335]	Ser Ile Ser Arg Tyr Pro Lys Trp Ser Asn Ala Tyr Asp Phe Asn Phe		
[3336]		755	760 765
[3337]	Ser Glu Thr Glu Lys Tyr Lys Asp Ile Ala Gly Phe Tyr Arg Glu Val		
[3338]	770	775	780
[3339]	Glu Glu Gln Gly Tyr Lys Val Ser Phe Glu Ser Ala Ser Lys Lys Glu		
[3340]	785	790	795 800
[3341]	Val Asp Lys Leu Val Glu Glu Gly Lys Leu Tyr Met Phe Gln Ile Tyr		
[3342]		805	810 815
[3343]	Asn Lys Asp Phe Ser Asp Lys Ser His Gly Thr Pro Asn Leu His Thr		
[3344]		820	825 830
[3345]	Met Tyr Phe Lys Leu Leu Phe Asp Glu Asn Asn His Gly Gln Ile Arg		
[3346]		835	840 845
[3347]	Leu Ser Gly Gly Ala Glu Leu Phe Met Arg Arg Ala Ser Leu Lys Lys		
[3348]	850	855	860
[3349]	Glu Glu Leu Val Val His Pro Ala Asn Ser Pro Ile Ala Asn Lys Asn		
[3350]	865	870	875 880
[3351]	Pro Asp Asn Pro Lys Lys Thr Thr Thr Leu Ser Tyr Asp Val Tyr Lys		
[3352]		885	890 895
[3353]	Asp Lys Arg Phe Ser Glu Asp Gln Tyr Glu Leu His Ile Pro Ile Ala		
[3354]		900	905 910
[3355]	Ile Asn Lys Cys Pro Lys Asn Ile Phe Lys Ile Asn Thr Glu Val Arg		
[3356]		915	920 925
[3357]	Val Leu Leu Lys His Asp Asp Asn Pro Tyr Val Ile Gly Ile Ala Arg		
[3358]	930	935	940
[3359]	Gly Glu Arg Asn Leu Leu Tyr Ile Val Val Val Asp Gly Lys Gly Asn		

[3360]	945	950	955	960
[3361]	Ile Val Glu Gln Tyr Ser Leu Asn Glu Ile Ile Asn Asn Phe Asn Gly			
[3362]		965	970	975
[3363]	Ile Arg Ile Lys Thr Asp Tyr His Ser Leu Leu Asp Lys Lys Glu Lys			
[3364]		980	985	990
[3365]	Glu Arg Phe Glu Ala Arg Gln Asn Trp Thr Ser Ile Glu Asn Ile Lys			
[3366]		995	1000	1005
[3367]	Glu Leu Lys Ala Gly Tyr Ile Ser Gln Val Val His Lys Ile Cys			
[3368]		1010	1015	1020
[3369]	Glu Leu Val Glu Lys Tyr Asp Ala Val Ile Ala Leu Glu Asp Leu			
[3370]		1025	1030	1035
[3371]	Asn Ser Gly Phe Lys Asn Ser Arg Val Lys Val Glu Lys Gln Val			
[3372]		1040	1045	1050
[3373]	Tyr Gln Lys Phe Glu Lys Met Leu Ile Asp Lys Leu Asn Tyr Met			
[3374]		1055	1060	1065
[3375]	Val Asp Lys Lys Ser Asn Pro Cys Ala Thr Gly Gly Ala Leu Lys			
[3376]		1070	1075	1080
[3377]	Gly Tyr Gln Ile Thr Asn Lys Phe Glu Ser Phe Lys Ser Met Ser			
[3378]		1085	1090	1095
[3379]	Thr Gln Asn Gly Phe Ile Phe Tyr Ile Pro Ala Trp Leu Thr Ser			
[3380]		1100	1105	1110
[3381]	Lys Ile Asp Pro Ser Thr Gly Phe Val Asn Leu Leu Lys Thr Lys			
[3382]		1115	1120	1125
[3383]	Tyr Thr Ser Ile Ala Asp Ser Lys Lys Phe Ile Ser Ser Phe Asp			
[3384]		1130	1135	1140
[3385]	Arg Ile Met Tyr Val Pro Glu Glu Asp Leu Phe Glu Phe Ala Leu			
[3386]		1145	1150	1155
[3387]	Asp Tyr Lys Asn Phe Ser Arg Thr Asp Ala Asp Tyr Ile Lys Lys			
[3388]		1160	1165	1170
[3389]	Trp Lys Leu Tyr Ser Tyr Gly Asn Arg Ile Arg Ile Phe Arg Asn			
[3390]		1175	1180	1185
[3391]	Pro Lys Lys Asn Asn Val Phe Asp Trp Glu Glu Val Cys Leu Thr			
[3392]		1190	1195	1200
[3393]	Ser Ala Tyr Lys Glu Leu Phe Asn Lys Tyr Gly Ile Asn Tyr Gln			
[3394]		1205	1210	1215
[3395]	Gln Gly Asp Ile Arg Ala Leu Leu Cys Glu Gln Ser Asp Lys Ala			
[3396]		1220	1225	1230
[3397]	Phe Tyr Ser Ser Phe Met Ala Leu Met Ser Leu Met Leu Gln Met			
[3398]		1235	1240	1245
[3399]	Arg Asn Ser Ile Thr Gly Arg Thr Asp Val Asp Phe Leu Ile Ser			
[3400]		1250	1255	1260
[3401]	Pro Val Lys Asn Ser Asp Gly Ile Phe Tyr Asp Ser Arg Asn Tyr			

[3402]	1265	1270	1275
[3403]	Glu Ala Gln Glu Asn Ala Ile Leu Pro Lys Asn Ala Asp Ala Asn		
[3404]	1280	1285	1290
[3405]	Gly Ala Tyr Asn Ile Ala Arg Lys Val Leu Trp Ala Ile Gly Gln		
[3406]	1295	1300	1305
[3407]	Phe Lys Lys Ala Glu Asp Glu Lys Leu Asp Lys Val Lys Ile Ala		
[3408]	1310	1315	1320
[3409]	Ile Ser Asn Lys Glu Trp Leu Glu Tyr Ala Gln Thr Ser Val Lys		
[3410]	1325	1330	1335
[3411]	His Asp Ser Pro Glu Ile Pro Gly Glu Pro Pro Pro Pro Ile Pro		
[3412]	1340	1345	1350
[3413]	Pro Glu Ser Ser Glu Thr Gly Pro Val Ala Val Asp Pro Thr Leu		
[3414]	1355	1360	1365
[3415]	Arg Arg Arg Ile Glu Pro His Glu Phe Glu Val Phe Phe Asp Pro		
[3416]	1370	1375	1380
[3417]	Arg Glu Leu Arg Lys Glu Thr Cys Leu Leu Tyr Glu Ile Asn Trp		
[3418]	1385	1390	1395
[3419]	Gly Gly Arg His Ser Ile Trp Arg His Thr Ser Gln Asn Thr Asn		
[3420]	1400	1405	1410
[3421]	Lys His Val Glu Val Asn Phe Ile Glu Lys Phe Thr Thr Glu Arg		
[3422]	1415	1420	1425
[3423]	Tyr Phe Cys Pro Asn Thr Arg Cys Ser Ile Thr Trp Phe Leu Ser		
[3424]	1430	1435	1440
[3425]	Trp Ser Pro Cys Gly Glu Cys Ser Arg Ala Ile Thr Glu Phe Leu		
[3426]	1445	1450	1455
[3427]	Ser Arg Tyr Pro His Val Thr Leu Phe Ile Tyr Ile Ala Arg Leu		
[3428]	1460	1465	1470
[3429]	Tyr His His Ala Asp Pro Arg Asn Arg Gln Gly Leu Arg Asp Leu		
[3430]	1475	1480	1485
[3431]	Ile Ser Ser Gly Val Thr Ile Gln Ile Met Thr Glu Gln Glu Ser		
[3432]	1490	1495	1500
[3433]	Gly Tyr Cys Trp Arg Asn Phe Val Asn Tyr Ser Pro Ser Asn Glu		
[3434]	1505	1510	1515
[3435]	Ala His Trp Pro Arg Tyr Pro His Leu Trp Val Arg Leu Tyr Val		
[3436]	1520	1525	1530
[3437]	Leu Glu Leu Tyr Cys Ile Ile Leu Gly Leu Pro Pro Cys Leu Asn		
[3438]	1535	1540	1545
[3439]	Ile Leu Arg Arg Lys Gln Pro Gln Leu Thr Phe Phe Thr Ile Ala		
[3440]	1550	1555	1560
[3441]	Leu Gln Ser Cys His Tyr Gln Arg Leu Pro Pro His Ile Leu Trp		
[3442]	1565	1570	1575
[3443]	Ala Thr Gly Leu Lys Ser Gly Gly Ser Lys Arg Thr Ala Asp Gly		

[3444]	1580	1585	1590
[3445]	Ser Glu Phe		
[3446]	1595		
[3447]	<210> 50		
[3448]	<211> 1594		
[3449]	<212> PRT		
[3450]	<213> 人工的		
[3451]	<220>		
[3452]	<223> 碱基编辑器融合蛋白		
[3453]	<400> 50		
[3454]	Met Lys Arg Thr Ala Asp Gly Ser Glu Phe Glu Ser Pro Lys Lys Lys		
[3455]	1 5 10 15		
[3456]	Arg Lys Val Thr Asn Leu Ser Asp Ile Ile Glu Lys Glu Thr Gly Lys		
[3457]	20 25 30		
[3458]	Gln Leu Val Ile Gln Glu Ser Ile Leu Met Leu Pro Glu Glu Val Glu		
[3459]	35 40 45		
[3460]	Glu Val Ile Gly Asn Lys Pro Glu Ser Asp Ile Leu Val His Thr Ala		
[3461]	50 55 60		
[3462]	Tyr Asp Glu Ser Thr Asp Glu Asn Val Met Leu Leu Thr Ser Asp Ala		
[3463]	65 70 75 80		
[3464]	Pro Glu Tyr Lys Pro Trp Ala Leu Val Ile Gln Asp Ser Asn Gly Glu		
[3465]	85 90 95		
[3466]	Asn Lys Ile Lys Met Leu Ser Gly Gly Ser Gly Gly Ser Gly Gly Ser		
[3467]	100 105 110		
[3468]	Ser Lys Leu Glu Lys Phe Thr Asn Cys Tyr Ser Leu Ser Lys Thr Leu		
[3469]	115 120 125		
[3470]	Arg Phe Lys Ala Ile Pro Val Gly Lys Thr Gln Glu Asn Ile Asp Asn		
[3471]	130 135 140		
[3472]	Lys Arg Leu Leu Val Glu Asp Glu Lys Arg Ala Glu Asp Tyr Lys Gly		
[3473]	145 150 155 160		
[3474]	Val Lys Lys Leu Leu Asp Arg Tyr Tyr Leu Ser Phe Ile Asn Asp Val		
[3475]	165 170 175		
[3476]	Leu His Ser Ile Lys Leu Lys Asn Leu Asn Asn Tyr Ile Ser Leu Phe		
[3477]	180 185 190		
[3478]	Arg Lys Lys Thr Arg Thr Glu Lys Glu Asn Lys Glu Leu Glu Asn Leu		
[3479]	195 200 205		
[3480]	Glu Ile Asn Leu Arg Lys Glu Ile Ala Lys Ala Phe Lys Gly Asn Glu		
[3481]	210 215 220		
[3482]	Gly Tyr Lys Ser Leu Phe Lys Lys Asp Ile Ile Glu Thr Ile Leu Pro		
[3483]	225 230 235 240		
[3484]	Glu Phe Leu Asp Asp Lys Asp Glu Ile Ala Leu Val Asn Ser Phe Asn		
[3485]	245 250 255		

[3486]	Gly	Phe	Thr	Thr	Ala	Phe	Thr	Gly	Phe	Phe	Asp	Asn	Arg	Glu	Asn	Met
[3487]					260				265					270		
[3488]	Phe	Ser	Glu	Glu	Ala	Lys	Ser	Thr	Ser	Ile	Ala	Phe	Arg	Cys	Ile	Asn
[3489]					275				280					285		
[3490]	Glu	Asn	Leu	Thr	Arg	Tyr	Ile	Ser	Asn	Met	Asp	Ile	Phe	Glu	Lys	Val
[3491]					290				295					300		
[3492]	Asp	Ala	Ile	Phe	Asp	Lys	His	Glu	Val	Gln	Glu	Ile	Lys	Glu	Lys	Ile
[3493]					305				310					315		320
[3494]	Leu	Asn	Ser	Asp	Tyr	Asp	Val	Glu	Asp	Phe	Phe	Glu	Gly	Glu	Phe	Phe
[3495]					325					330					335	
[3496]	Asn	Phe	Val	Leu	Thr	Gln	Glu	Gly	Ile	Asp	Val	Tyr	Asn	Ala	Ile	Ile
[3497]					340					345					350	
[3498]	Gly	Gly	Phe	Val	Thr	Glu	Ser	Gly	Glu	Lys	Ile	Lys	Gly	Leu	Asn	Glu
[3499]					355					360					365	
[3500]	Tyr	Ile	Asn	Leu	Tyr	Asn	Gln	Lys	Thr	Lys	Gln	Lys	Leu	Pro	Lys	Phe
[3501]					370					375					380	
[3502]	Lys	Pro	Leu	Tyr	Lys	Gln	Val	Leu	Ser	Asp	Arg	Glu	Ser	Leu	Ser	Phe
[3503]					385					390					395	400
[3504]	Tyr	Gly	Glu	Gly	Tyr	Thr	Ser	Asp	Glu	Glu	Val	Leu	Glu	Val	Phe	Arg
[3505]					405					410					415	
[3506]	Asn	Thr	Leu	Asn	Lys	Asn	Ser	Glu	Ile	Phe	Ser	Ser	Ile	Lys	Lys	Leu
[3507]					420					425					430	
[3508]	Glu	Lys	Leu	Phe	Lys	Asn	Phe	Asp	Glu	Tyr	Ser	Ser	Ala	Gly	Ile	Phe
[3509]					435					440					445	
[3510]	Val	Lys	Asn	Gly	Pro	Ala	Ile	Ser	Thr	Ile	Ser	Lys	Asp	Ile	Phe	Gly
[3511]					450					455					460	
[3512]	Glu	Trp	Asn	Val	Ile	Arg	Asp	Lys	Trp	Asn	Ala	Glu	Tyr	Asp	Asp	Ile
[3513]					465									470		480
[3514]	His	Leu	Lys	Lys	Lys	Ala	Val	Val	Thr	Glu	Lys	Tyr	Glu	Asp	Asp	Arg
[3515]					485					490					495	
[3516]	Arg	Lys	Ser	Phe	Lys	Lys	Ile	Gly	Ser	Phe	Ser	Leu	Glu	Gln	Leu	Gln
[3517]					500					505					510	
[3518]	Glu	Tyr	Ala	Asp	Ala	Asp	Leu	Ser	Val	Val	Glu	Lys	Leu	Lys	Glu	Ile
[3519]					515					520					525	
[3520]	Ile	Ile	Gln	Lys	Val	Asp	Glu	Ile	Tyr	Lys	Val	Tyr	Gly	Ser	Ser	Glu
[3521]					530					535					540	
[3522]	Lys	Leu	Phe	Asp	Ala	Asp	Phe	Val	Leu	Glu	Lys	Ser	Leu	Lys	Lys	Asn
[3523]					545					550					555	560
[3524]	Asp	Ala	Val	Val	Ala	Ile	Met	Lys	Asp	Leu	Leu	Asp	Ser	Val	Lys	Ser
[3525]					565					570					575	
[3526]	Phe	Glu	Asn	Tyr	Ile	Lys	Ala	Phe	Phe	Gly	Glu	Gly	Lys	Glu	Thr	Asn
[3527]					580					585					590	

[3528]	Arg Asp Glu Ser Phe Tyr Gly Asp Phe Val Leu Ala Tyr Asp Ile Leu		
[3529]	595	600	605
[3530]	Leu Lys Val Asp His Ile Tyr Asp Ala Ile Arg Asn Tyr Val Thr Gln		
[3531]	610	615	620
[3532]	Lys Pro Tyr Ser Lys Asp Lys Phe Lys Leu Tyr Phe Gln Asn Pro Gln		
[3533]	625	630	635 640
[3534]	Phe Met Gly Gly Trp Asp Lys Asp Lys Glu Thr Asp Tyr Arg Ala Thr		
[3535]	645	650	655
[3536]	Ile Leu Arg Tyr Gly Ser Lys Tyr Tyr Leu Ala Ile Met Asp Lys Lys		
[3537]	660	665	670
[3538]	Tyr Ala Lys Cys Leu Gln Lys Ile Asp Lys Asp Asp Val Asn Gly Asn		
[3539]	675	680	685
[3540]	Tyr Glu Lys Ile Asn Tyr Lys Leu Leu Pro Gly Pro Asn Lys Met Leu		
[3541]	690	695	700
[3542]	Pro Lys Val Phe Phe Ser Lys Lys Trp Met Ala Tyr Tyr Asn Pro Ser		
[3543]	705	710	715 720
[3544]	Glu Asp Ile Gln Lys Ile Tyr Lys Asn Gly Thr Phe Lys Lys Gly Asp		
[3545]	725	730	735
[3546]	Met Phe Asn Leu Asn Asp Cys His Lys Leu Ile Asp Phe Phe Lys Asp		
[3547]	740	745	750
[3548]	Ser Ile Ser Arg Tyr Pro Lys Trp Ser Asn Ala Tyr Asp Phe Asn Phe		
[3549]	755	760	765
[3550]	Ser Glu Thr Glu Lys Tyr Lys Asp Ile Ala Gly Phe Tyr Arg Glu Val		
[3551]	770	775	780
[3552]	Glu Glu Gln Gly Tyr Lys Val Ser Phe Glu Ser Ala Ser Lys Lys Glu		
[3553]	785	790	795 800
[3554]	Val Asp Lys Leu Val Glu Glu Gly Lys Leu Tyr Met Phe Gln Ile Tyr		
[3555]	805	810	815
[3556]	Asn Lys Asp Phe Ser Asp Lys Ser His Gly Thr Pro Asn Leu His Thr		
[3557]	820	825	830
[3558]	Met Tyr Phe Lys Leu Leu Phe Asp Glu Asn Asn His Gly Gln Ile Arg		
[3559]	835	840	845
[3560]	Leu Ser Gly Gly Ala Glu Leu Phe Met Arg Arg Ala Ser Leu Lys Lys		
[3561]	850	855	860
[3562]	Glu Glu Leu Val Val His Pro Ala Asn Ser Pro Ile Ala Asn Lys Asn		
[3563]	865	870	875 880
[3564]	Pro Asp Asn Pro Lys Lys Thr Thr Thr Leu Ser Tyr Asp Val Tyr Lys		
[3565]	885	890	895
[3566]	Asp Lys Arg Phe Ser Glu Asp Gln Tyr Glu Leu His Ile Pro Ile Ala		
[3567]	900	905	910
[3568]	Ile Asn Lys Cys Pro Lys Asn Ile Phe Lys Ile Asn Thr Glu Val Arg		
[3569]	915	920	925

[3570]	Val	Leu	Leu	Lys	His	Asp	Asp	Asn	Pro	Tyr	Val	Ile	Gly	Ile	Ala	Arg
[3571]	930							935					940			
[3572]	Gly	Glu	Arg	Asn	Leu	Leu	Tyr	Ile	Val	Val	Val	Asp	Gly	Lys	Gly	Asn
[3573]	945					950						955				960
[3574]	Ile	Val	Glu	Gln	Tyr	Ser	Leu	Asn	Glu	Ile	Ile	Asn	Asn	Phe	Asn	Gly
[3575]					965					970					975	
[3576]	Ile	Arg	Ile	Lys	Thr	Asp	Tyr	His	Ser	Leu	Leu	Asp	Lys	Lys	Glu	Lys
[3577]				980					985						990	
[3578]	Glu	Arg	Phe	Glu	Ala	Arg	Gln	Asn	Trp	Thr	Ser	Ile	Glu	Asn	Ile	Lys
[3579]			995					1000						1005		
[3580]	Glu	Leu	Lys	Ala	Gly	Tyr	Ile	Ser	Gln	Val	Val	His	Lys	Ile	Cys	
[3581]	1010							1015						1020		
[3582]	Glu	Leu	Val	Glu	Lys	Tyr	Asp	Ala	Val	Ile	Ala	Leu	Glu	Asp	Leu	
[3583]	1025							1030						1035		
[3584]	Asn	Ser	Gly	Phe	Lys	Asn	Ser	Arg	Val	Lys	Val	Glu	Lys	Gln	Val	
[3585]	1040							1045						1050		
[3586]	Tyr	Gln	Lys	Phe	Glu	Lys	Met	Leu	Ile	Asp	Lys	Leu	Asn	Tyr	Met	
[3587]	1055							1060						1065		
[3588]	Val	Asp	Lys	Lys	Ser	Asn	Pro	Cys	Ala	Thr	Gly	Gly	Ala	Leu	Lys	
[3589]	1070							1075						1080		
[3590]	Gly	Tyr	Gln	Ile	Thr	Asn	Lys	Phe	Glu	Ser	Phe	Lys	Ser	Met	Ser	
[3591]	1085							1090						1095		
[3592]	Thr	Gln	Asn	Gly	Phe	Ile	Phe	Tyr	Ile	Pro	Ala	Trp	Leu	Thr	Ser	
[3593]	1100							1105						1110		
[3594]	Lys	Ile	Asp	Pro	Ser	Thr	Gly	Phe	Val	Asn	Leu	Leu	Lys	Thr	Lys	
[3595]	1115							1120						1125		
[3596]	Tyr	Thr	Ser	Ile	Ala	Asp	Ser	Lys	Lys	Phe	Ile	Ser	Ser	Phe	Asp	
[3597]	1130							1135						1140		
[3598]	Arg	Ile	Met	Tyr	Val	Pro	Glu	Glu	Asp	Leu	Phe	Glu	Phe	Ala	Leu	
[3599]	1145							1150						1155		
[3600]	Asp	Tyr	Lys	Asn	Phe	Ser	Arg	Thr	Asp	Ala	Asp	Tyr	Ile	Lys	Lys	
[3601]	1160							1165						1170		
[3602]	Trp	Lys	Leu	Tyr	Ser	Tyr	Gly	Asn	Arg	Ile	Arg	Ile	Phe	Arg	Asn	
[3603]	1175							1180						1185		
[3604]	Pro	Lys	Lys	Asn	Asn	Val	Phe	Asp	Trp	Glu	Glu	Val	Cys	Leu	Thr	
[3605]	1190							1195						1200		
[3606]	Ser	Ala	Tyr	Lys	Glu	Leu	Phe	Asn	Lys	Tyr	Gly	Ile	Asn	Tyr	Gln	
[3607]	1205							1210						1215		
[3608]	Gln	Gly	Asp	Ile	Arg	Ala	Leu	Leu	Cys	Glu	Gln	Ser	Asp	Lys	Ala	
[3609]	1220							1225						1230		
[3610]	Phe	Tyr	Ser	Ser	Phe	Met	Ala	Leu	Met	Ser	Leu	Met	Leu	Gln	Met	
[3611]	1235							1240						1245		

[3612]	Arg Asn Ser Ile Thr Gly Arg Thr Asp Val Asp Phe Leu Ile Ser
[3613]	1250 1255 1260
[3614]	Pro Val Lys Asn Ser Asp Gly Ile Phe Tyr Asp Ser Arg Asn Tyr
[3615]	1265 1270 1275
[3616]	Glu Ala Gln Glu Asn Ala Ile Leu Pro Lys Asn Ala Asp Ala Asn
[3617]	1280 1285 1290
[3618]	Gly Ala Tyr Asn Ile Ala Arg Lys Val Leu Trp Ala Ile Gly Gln
[3619]	1295 1300 1305
[3620]	Phe Lys Lys Ala Glu Asp Glu Lys Leu Asp Lys Val Lys Ile Ala
[3621]	1310 1315 1320
[3622]	Ile Ser Asn Lys Glu Trp Leu Glu Tyr Ala Gln Thr Ser Val Lys
[3623]	1325 1330 1335
[3624]	His Arg Pro Leu Pro His Asp Asn Asn Lys Gln Asp Tyr Ser Lys
[3625]	1340 1345 1350
[3626]	Ser Ser Glu Thr Gly Pro Val Ala Val Asp Pro Thr Leu Arg Arg
[3627]	1355 1360 1365
[3628]	Arg Ile Glu Pro His Glu Phe Glu Val Phe Phe Asp Pro Arg Glu
[3629]	1370 1375 1380
[3630]	Leu Arg Lys Glu Thr Cys Leu Leu Tyr Glu Ile Asn Trp Gly Gly
[3631]	1385 1390 1395
[3632]	Arg His Ser Ile Trp Arg His Thr Ser Gln Asn Thr Asn Lys His
[3633]	1400 1405 1410
[3634]	Val Glu Val Asn Phe Ile Glu Lys Phe Thr Thr Glu Arg Tyr Phe
[3635]	1415 1420 1425
[3636]	Cys Pro Asn Thr Arg Cys Ser Ile Thr Trp Phe Leu Ser Trp Ser
[3637]	1430 1435 1440
[3638]	Pro Cys Gly Glu Cys Ser Arg Ala Ile Thr Glu Phe Leu Ser Arg
[3639]	1445 1450 1455
[3640]	Tyr Pro His Val Thr Leu Phe Ile Tyr Ile Ala Arg Leu Tyr His
[3641]	1460 1465 1470
[3642]	His Ala Asp Pro Arg Asn Arg Gln Gly Leu Arg Asp Leu Ile Ser
[3643]	1475 1480 1485
[3644]	Ser Gly Val Thr Ile Gln Ile Met Thr Glu Gln Glu Ser Gly Tyr
[3645]	1490 1495 1500
[3646]	Cys Trp Arg Asn Phe Val Asn Tyr Ser Pro Ser Asn Glu Ala His
[3647]	1505 1510 1515
[3648]	Trp Pro Arg Tyr Pro His Leu Trp Val Arg Leu Tyr Val Leu Glu
[3649]	1520 1525 1530
[3650]	Leu Tyr Cys Ile Ile Leu Gly Leu Pro Pro Cys Leu Asn Ile Leu
[3651]	1535 1540 1545
[3652]	Arg Arg Lys Gln Pro Gln Leu Thr Phe Phe Thr Ile Ala Leu Gln
[3653]	1550 1555 1560

[3654]	Ser Cys His Tyr Gln Arg Leu Pro Pro His Ile Leu Trp Ala Thr
[3655]	1565 1570 1575
[3656]	Gly Leu Lys Ser Gly Gly Ser Lys Arg Thr Ala Asp Gly Ser Glu
[3657]	1580 1585 1590
[3658]	Phe
[3659]	<210> 51
[3660]	<211> 1596
[3661]	<212> PRT
[3662]	<213> 人工的
[3663]	<220>
[3664]	<223> 碱基编辑器融合蛋白
[3665]	<400> 51
[3666]	Met Lys Arg Thr Ala Asp Gly Ser Glu Phe Glu Ser Pro Lys Lys Lys
[3667]	1 5 10 15
[3668]	Arg Lys Val Thr Asn Leu Ser Asp Ile Ile Glu Lys Glu Thr Gly Lys
[3669]	20 25 30
[3670]	Gln Leu Val Ile Gln Glu Ser Ile Leu Met Leu Pro Glu Glu Val Glu
[3671]	35 40 45
[3672]	Glu Val Ile Gly Asn Lys Pro Glu Ser Asp Ile Leu Val His Thr Ala
[3673]	50 55 60
[3674]	Tyr Asp Glu Ser Thr Asp Glu Asn Val Met Leu Leu Thr Ser Asp Ala
[3675]	65 70 75 80
[3676]	Pro Glu Tyr Lys Pro Trp Ala Leu Val Ile Gln Asp Ser Asn Gly Glu
[3677]	85 90 95
[3678]	Asn Lys Ile Lys Met Leu Ser Gly Gly Ser Gly Gly Ser Gly Gly Ser
[3679]	100 105 110
[3680]	Ser Lys Leu Glu Lys Phe Thr Asn Cys Tyr Ser Leu Ser Lys Thr Leu
[3681]	115 120 125
[3682]	Arg Phe Lys Ala Ile Pro Val Gly Lys Thr Gln Glu Asn Ile Asp Asn
[3683]	130 135 140
[3684]	Lys Arg Leu Leu Val Glu Asp Glu Lys Arg Ala Glu Asp Tyr Lys Gly
[3685]	145 150 155 160
[3686]	Val Lys Lys Leu Leu Asp Arg Tyr Tyr Leu Ser Phe Ile Asn Asp Val
[3687]	165 170 175
[3688]	Leu His Ser Ile Lys Leu Lys Asn Leu Asn Asn Tyr Ile Ser Leu Phe
[3689]	180 185 190
[3690]	Arg Lys Lys Thr Arg Thr Glu Lys Glu Asn Lys Glu Leu Glu Asn Leu
[3691]	195 200 205
[3692]	Glu Ile Asn Leu Arg Lys Glu Ile Ala Lys Ala Phe Lys Gly Asn Glu
[3693]	210 215 220
[3694]	Gly Tyr Lys Ser Leu Phe Lys Lys Asp Ile Ile Glu Thr Ile Leu Pro
[3695]	225 230 235 240

[3696]	Glu Phe Leu Asp Asp Lys Asp Glu Ile Ala Leu Val Asn Ser Phe Asn		
[3697]		245	250 255
[3698]	Gly Phe Thr Thr Ala Phe Thr Gly Phe Phe Asp Asn Arg Glu Asn Met		
[3699]		260	265 270
[3700]	Phe Ser Glu Glu Ala Lys Ser Thr Ser Ile Ala Phe Arg Cys Ile Asn		
[3701]		275	280 285
[3702]	Glu Asn Leu Thr Arg Tyr Ile Ser Asn Met Asp Ile Phe Glu Lys Val		
[3703]		290	295 300
[3704]	Asp Ala Ile Phe Asp Lys His Glu Val Gln Glu Ile Lys Glu Lys Ile		
[3705]	305	310	315 320
[3706]	Leu Asn Ser Asp Tyr Asp Val Glu Asp Phe Phe Glu Gly Glu Phe Phe		
[3707]		325	330 335
[3708]	Asn Phe Val Leu Thr Gln Glu Gly Ile Asp Val Tyr Asn Ala Ile Ile		
[3709]		340	345 350
[3710]	Gly Gly Phe Val Thr Glu Ser Gly Glu Lys Ile Lys Gly Leu Asn Glu		
[3711]		355	360 365
[3712]	Tyr Ile Asn Leu Tyr Asn Gln Lys Thr Lys Gln Lys Leu Pro Lys Phe		
[3713]		370	375 380
[3714]	Lys Pro Leu Tyr Lys Gln Val Leu Ser Asp Arg Glu Ser Leu Ser Phe		
[3715]	385	390	395 400
[3716]	Tyr Gly Glu Gly Tyr Thr Ser Asp Glu Glu Val Leu Glu Val Phe Arg		
[3717]		405	410 415
[3718]	Asn Thr Leu Asn Lys Asn Ser Glu Ile Phe Ser Ser Ile Lys Lys Leu		
[3719]		420	425 430
[3720]	Glu Lys Leu Phe Lys Asn Phe Asp Glu Tyr Ser Ser Ala Gly Ile Phe		
[3721]		435	440 445
[3722]	Val Lys Asn Gly Pro Ala Ile Ser Thr Ile Ser Lys Asp Ile Phe Gly		
[3723]		450	455 460
[3724]	Glu Trp Asn Val Ile Arg Asp Lys Trp Asn Ala Glu Tyr Asp Asp Ile		
[3725]	465	470	475 480
[3726]	His Leu Lys Lys Lys Ala Val Val Thr Glu Lys Tyr Glu Asp Asp Arg		
[3727]		485	490 495
[3728]	Arg Lys Ser Phe Lys Lys Ile Gly Ser Phe Ser Leu Glu Gln Leu Gln		
[3729]		500	505 510
[3730]	Glu Tyr Ala Asp Ala Asp Leu Ser Val Val Glu Lys Leu Lys Glu Ile		
[3731]		515	520 525
[3732]	Ile Ile Gln Lys Val Asp Glu Ile Tyr Lys Val Tyr Gly Ser Ser Glu		
[3733]		530	535 540
[3734]	Lys Leu Phe Asp Ala Asp Phe Val Leu Glu Lys Ser Leu Lys Lys Asn		
[3735]	545	550	555 560
[3736]	Asp Ala Val Val Ala Ile Met Lys Asp Leu Leu Asp Ser Val Lys Ser		
[3737]		565	570 575

[3738]	Phe	Glu	Asn	Tyr	Ile	Lys	Ala	Phe	Phe	Gly	Glu	Gly	Lys	Glu	Thr	Asn
[3739]						580				585						590
[3740]	Arg	Asp	Glu	Ser	Phe	Tyr	Gly	Asp	Phe	Val	Leu	Ala	Tyr	Asp	Ile	Leu
[3741]						595				600						605
[3742]	Leu	Lys	Val	Asp	His	Ile	Tyr	Asp	Ala	Ile	Arg	Asn	Tyr	Val	Thr	Gln
[3743]			610							615						620
[3744]	Lys	Pro	Tyr	Ser	Lys	Asp	Lys	Phe	Lys	Leu	Tyr	Phe	Gln	Asn	Pro	Gln
[3745]			625							630						640
[3746]	Phe	Met	Gly	Gly	Trp	Asp	Lys	Asp	Lys	Glu	Thr	Asp	Tyr	Arg	Ala	Thr
[3747]						645										655
[3748]	Ile	Leu	Arg	Tyr	Gly	Ser	Lys	Tyr	Tyr	Leu	Ala	Ile	Met	Asp	Lys	Lys
[3749]						660										670
[3750]	Tyr	Ala	Lys	Cys	Leu	Gln	Lys	Ile	Asp	Lys	Asp	Asp	Val	Asn	Gly	Asn
[3751]						675										685
[3752]	Tyr	Glu	Lys	Ile	Asn	Tyr	Lys	Leu	Leu	Pro	Gly	Pro	Asn	Lys	Met	Leu
[3753]						690										700
[3754]	Pro	Lys	Val	Phe	Phe	Ser	Lys	Lys	Trp	Met	Ala	Tyr	Tyr	Asn	Pro	Ser
[3755]						705										720
[3756]	Glu	Asp	Ile	Gln	Lys	Ile	Tyr	Lys	Asn	Gly	Thr	Phe	Lys	Lys	Gly	Asp
[3757]						725										735
[3758]	Met	Phe	Asn	Leu	Asn	Asp	Cys	His	Lys	Leu	Ile	Asp	Phe	Phe	Lys	Asp
[3759]						740										750
[3760]	Ser	Ile	Ser	Arg	Tyr	Pro	Lys	Trp	Ser	Asn	Ala	Tyr	Asp	Phe	Asn	Phe
[3761]						755										765
[3762]	Ser	Glu	Thr	Glu	Lys	Tyr	Lys	Asp	Ile	Ala	Gly	Phe	Tyr	Arg	Glu	Val
[3763]						770										780
[3764]	Glu	Glu	Gln	Gly	Tyr	Lys	Val	Ser	Phe	Glu	Ser	Ala	Ser	Lys	Lys	Glu
[3765]						785										800
[3766]	Val	Asp	Lys	Leu	Val	Glu	Glu	Gly	Lys	Leu	Tyr	Met	Phe	Gln	Ile	Tyr
[3767]						805										815
[3768]	Asn	Lys	Asp	Phe	Ser	Asp	Lys	Ser	His	Gly	Thr	Pro	Asn	Leu	His	Thr
[3769]						820										830
[3770]	Met	Tyr	Phe	Lys	Leu	Leu	Phe	Asp	Glu	Asn	Asn	His	Gly	Gln	Ile	Arg
[3771]						835										845
[3772]	Leu	Ser	Gly	Gly	Ala	Glu	Leu	Phe	Met	Arg	Arg	Ala	Ser	Leu	Lys	Lys
[3773]						850										860
[3774]	Glu	Glu	Leu	Val	Val	His	Pro	Ala	Asn	Ser	Pro	Ile	Ala	Asn	Lys	Asn
[3775]						865										880
[3776]	Pro	Asp	Asn	Pro	Lys	Lys	Thr	Thr	Thr	Leu	Ser	Tyr	Asp	Val	Tyr	Lys
[3777]						885										895
[3778]	Asp	Lys	Arg	Phe	Ser	Glu	Asp	Gln	Tyr	Glu	Leu	His	Ile	Pro	Ile	Ala
[3779]						900										910

[3780]	Ile Asn Lys Cys Pro Lys Asn Ile Phe Lys Ile Asn Thr Glu Val Arg		
[3781]	915	920	925
[3782]	Val Leu Leu Lys His Asp Asp Asn Pro Tyr Val Ile Gly Ile Ala Arg		
[3783]	930	935	940
[3784]	Gly Glu Arg Asn Leu Leu Tyr Ile Val Val Val Asp Gly Lys Gly Asn		
[3785]	945	950	955 960
[3786]	Ile Val Glu Gln Tyr Ser Leu Asn Glu Ile Ile Asn Asn Phe Asn Gly		
[3787]	965	970	975
[3788]	Ile Arg Ile Lys Thr Asp Tyr His Ser Leu Leu Asp Lys Lys Glu Lys		
[3789]	980	985	990
[3790]	Glu Arg Phe Glu Ala Arg Gln Asn Trp Thr Ser Ile Glu Asn Ile Lys		
[3791]	995	1000	1005
[3792]	Glu Leu Lys Ala Gly Tyr Ile Ser Gln Val Val His Lys Ile Cys		
[3793]	1010	1015	1020
[3794]	Glu Leu Val Glu Lys Tyr Asp Ala Val Ile Ala Leu Glu Asp Leu		
[3795]	1025	1030	1035
[3796]	Asn Ser Gly Phe Lys Asn Ser Arg Val Lys Val Glu Lys Gln Val		
[3797]	1040	1045	1050
[3798]	Tyr Gln Lys Phe Glu Lys Met Leu Ile Asp Lys Leu Asn Tyr Met		
[3799]	1055	1060	1065
[3800]	Val Asp Lys Lys Ser Asn Pro Cys Ala Thr Gly Gly Ala Leu Lys		
[3801]	1070	1075	1080
[3802]	Gly Tyr Gln Ile Thr Asn Lys Phe Glu Ser Phe Lys Ser Met Ser		
[3803]	1085	1090	1095
[3804]	Thr Gln Asn Gly Phe Ile Phe Tyr Ile Pro Ala Trp Leu Thr Ser		
[3805]	1100	1105	1110
[3806]	Lys Ile Asp Pro Ser Thr Gly Phe Val Asn Leu Leu Lys Thr Lys		
[3807]	1115	1120	1125
[3808]	Tyr Thr Ser Ile Ala Asp Ser Lys Lys Phe Ile Ser Ser Phe Asp		
[3809]	1130	1135	1140
[3810]	Arg Ile Met Tyr Val Pro Glu Glu Asp Leu Phe Glu Phe Ala Leu		
[3811]	1145	1150	1155
[3812]	Asp Tyr Lys Asn Phe Ser Arg Thr Asp Ala Asp Tyr Ile Lys Lys		
[3813]	1160	1165	1170
[3814]	Trp Lys Leu Tyr Ser Tyr Gly Asn Arg Ile Arg Ile Phe Arg Asn		
[3815]	1175	1180	1185
[3816]	Pro Lys Lys Asn Asn Val Phe Asp Trp Glu Glu Val Cys Leu Thr		
[3817]	1190	1195	1200
[3818]	Ser Ala Tyr Lys Glu Leu Phe Asn Lys Tyr Gly Ile Asn Tyr Gln		
[3819]	1205	1210	1215
[3820]	Gln Gly Asp Ile Arg Ala Leu Leu Cys Glu Gln Ser Asp Lys Ala		
[3821]	1220	1225	1230

[3822]	Phe Tyr Ser Ser Phe Met Ala Leu Met Ser Leu Met Leu Gln Met
[3823]	1235 1240 1245
[3824]	Arg Asn Ser Ile Thr Gly Arg Thr Asp Val Asp Phe Leu Ile Ser
[3825]	1250 1255 1260
[3826]	Pro Val Lys Asn Ser Asp Gly Ile Phe Tyr Asp Ser Arg Asn Tyr
[3827]	1265 1270 1275
[3828]	Glu Ala Gln Glu Asn Ala Ile Leu Pro Lys Asn Ala Asp Ala Asn
[3829]	1280 1285 1290
[3830]	Gly Ala Tyr Asn Ile Ala Arg Lys Val Leu Trp Ala Ile Gly Gln
[3831]	1295 1300 1305
[3832]	Phe Lys Lys Ala Glu Asp Glu Lys Leu Asp Lys Val Lys Ile Ala
[3833]	1310 1315 1320
[3834]	Ile Ser Asn Lys Glu Trp Leu Glu Tyr Ala Gln Thr Ser Val Lys
[3835]	1325 1330 1335
[3836]	His Gly Pro Leu Pro Ala Pro Pro Pro Gln Pro Pro Pro Pro Gln
[3837]	1340 1345 1350
[3838]	Pro Asn Ser Ser Glu Thr Gly Pro Val Ala Val Asp Pro Thr Leu
[3839]	1355 1360 1365
[3840]	Arg Arg Arg Ile Glu Pro His Glu Phe Glu Val Phe Phe Asp Pro
[3841]	1370 1375 1380
[3842]	Arg Glu Leu Arg Lys Glu Thr Cys Leu Leu Tyr Glu Ile Asn Trp
[3843]	1385 1390 1395
[3844]	Gly Gly Arg His Ser Ile Trp Arg His Thr Ser Gln Asn Thr Asn
[3845]	1400 1405 1410
[3846]	Lys His Val Glu Val Asn Phe Ile Glu Lys Phe Thr Thr Glu Arg
[3847]	1415 1420 1425
[3848]	Tyr Phe Cys Pro Asn Thr Arg Cys Ser Ile Thr Trp Phe Leu Ser
[3849]	1430 1435 1440
[3850]	Trp Ser Pro Cys Gly Glu Cys Ser Arg Ala Ile Thr Glu Phe Leu
[3851]	1445 1450 1455
[3852]	Ser Arg Tyr Pro His Val Thr Leu Phe Ile Tyr Ile Ala Arg Leu
[3853]	1460 1465 1470
[3854]	Tyr His His Ala Asp Pro Arg Asn Arg Gln Gly Leu Arg Asp Leu
[3855]	1475 1480 1485
[3856]	Ile Ser Ser Gly Val Thr Ile Gln Ile Met Thr Glu Gln Glu Ser
[3857]	1490 1495 1500
[3858]	Gly Tyr Cys Trp Arg Asn Phe Val Asn Tyr Ser Pro Ser Asn Glu
[3859]	1505 1510 1515
[3860]	Ala His Trp Pro Arg Tyr Pro His Leu Trp Val Arg Leu Tyr Val
[3861]	1520 1525 1530
[3862]	Leu Glu Leu Tyr Cys Ile Ile Leu Gly Leu Pro Pro Cys Leu Asn
[3863]	1535 1540 1545

[3864]	Ile Leu Arg Arg Lys Gln Pro Gln Leu Thr Phe Phe Thr Ile Ala
[3865]	1550 1555 1560
[3866]	Leu Gln Ser Cys His Tyr Gln Arg Leu Pro Pro His Ile Leu Trp
[3867]	1565 1570 1575
[3868]	Ala Thr Gly Leu Lys Ser Gly Gly Ser Lys Arg Thr Ala Asp Gly
[3869]	1580 1585 1590
[3870]	Ser Glu Phe
[3871]	1595
[3872]	<210> 52
[3873]	<211> 1596
[3874]	<212> PRT
[3875]	<213> 人工的
[3876]	<220>
[3877]	<223> 碱基编辑器融合蛋白
[3878]	<400> 52
[3879]	Met Lys Arg Thr Ala Asp Gly Ser Glu Phe Glu Ser Pro Lys Lys Lys
[3880]	1 5 10 15
[3881]	Arg Lys Val Thr Asn Leu Ser Asp Ile Ile Glu Lys Glu Thr Gly Lys
[3882]	20 25 30
[3883]	Gln Leu Val Ile Gln Glu Ser Ile Leu Met Leu Pro Glu Glu Val Glu
[3884]	35 40 45
[3885]	Glu Val Ile Gly Asn Lys Pro Glu Ser Asp Ile Leu Val His Thr Ala
[3886]	50 55 60
[3887]	Tyr Asp Glu Ser Thr Asp Glu Asn Val Met Leu Leu Thr Ser Asp Ala
[3888]	65 70 75 80
[3889]	Pro Glu Tyr Lys Pro Trp Ala Leu Val Ile Gln Asp Ser Asn Gly Glu
[3890]	85 90 95
[3891]	Asn Lys Ile Lys Met Leu Ser Gly Gly Ser Gly Gly Ser Gly Gly Ser
[3892]	100 105 110
[3893]	Ser Lys Leu Glu Lys Phe Thr Asn Cys Tyr Ser Leu Ser Lys Thr Leu
[3894]	115 120 125
[3895]	Arg Phe Lys Ala Ile Pro Val Gly Lys Thr Gln Glu Asn Ile Asp Asn
[3896]	130 135 140
[3897]	Lys Arg Leu Leu Val Glu Asp Glu Lys Arg Ala Glu Asp Tyr Lys Gly
[3898]	145 150 155 160
[3899]	Val Lys Lys Leu Leu Asp Arg Tyr Tyr Leu Ser Phe Ile Asn Asp Val
[3900]	165 170 175
[3901]	Leu His Ser Ile Lys Leu Lys Asn Leu Asn Asn Tyr Ile Ser Leu Phe
[3902]	180 185 190
[3903]	Arg Lys Lys Thr Arg Thr Glu Lys Glu Asn Lys Glu Leu Glu Asn Leu
[3904]	195 200 205
[3905]	Glu Ile Asn Leu Arg Lys Glu Ile Ala Lys Ala Phe Lys Gly Asn Glu

[3906]	210	215	220
[3907]	Gly Tyr Lys Ser Leu Phe Lys Lys Asp Ile Ile Glu Thr Ile Leu Pro		
[3908]	225	230	235 240
[3909]	Glu Phe Leu Asp Asp Lys Asp Glu Ile Ala Leu Val Asn Ser Phe Asn		
[3910]	245	250	255
[3911]	Gly Phe Thr Thr Ala Phe Thr Gly Phe Phe Asp Asn Arg Glu Asn Met		
[3912]	260	265	270
[3913]	Phe Ser Glu Glu Ala Lys Ser Thr Ser Ile Ala Phe Arg Cys Ile Asn		
[3914]	275	280	285
[3915]	Glu Asn Leu Thr Arg Tyr Ile Ser Asn Met Asp Ile Phe Glu Lys Val		
[3916]	290	295	300
[3917]	Asp Ala Ile Phe Asp Lys His Glu Val Gln Glu Ile Lys Glu Lys Ile		
[3918]	305	310	315 320
[3919]	Leu Asn Ser Asp Tyr Asp Val Glu Asp Phe Phe Glu Gly Glu Phe Phe		
[3920]	325	330	335
[3921]	Asn Phe Val Leu Thr Gln Glu Gly Ile Asp Val Tyr Asn Ala Ile Ile		
[3922]	340	345	350
[3923]	Gly Gly Phe Val Thr Glu Ser Gly Glu Lys Ile Lys Gly Leu Asn Glu		
[3924]	355	360	365
[3925]	Tyr Ile Asn Leu Tyr Asn Gln Lys Thr Lys Gln Lys Leu Pro Lys Phe		
[3926]	370	375	380
[3927]	Lys Pro Leu Tyr Lys Gln Val Leu Ser Asp Arg Glu Ser Leu Ser Phe		
[3928]	385	390	395 400
[3929]	Tyr Gly Glu Gly Tyr Thr Ser Asp Glu Glu Val Leu Glu Val Phe Arg		
[3930]	405	410	415
[3931]	Asn Thr Leu Asn Lys Asn Ser Glu Ile Phe Ser Ser Ile Lys Lys Leu		
[3932]	420	425	430
[3933]	Glu Lys Leu Phe Lys Asn Phe Asp Glu Tyr Ser Ser Ala Gly Ile Phe		
[3934]	435	440	445
[3935]	Val Lys Asn Gly Pro Ala Ile Ser Thr Ile Ser Lys Asp Ile Phe Gly		
[3936]	450	455	460
[3937]	Glu Trp Asn Val Ile Arg Asp Lys Trp Asn Ala Glu Tyr Asp Asp Ile		
[3938]	465	470	475 480
[3939]	His Leu Lys Lys Lys Ala Val Val Thr Glu Lys Tyr Glu Asp Asp Arg		
[3940]	485	490	495
[3941]	Arg Lys Ser Phe Lys Lys Ile Gly Ser Phe Ser Leu Glu Gln Leu Gln		
[3942]	500	505	510
[3943]	Glu Tyr Ala Asp Ala Asp Leu Ser Val Val Glu Lys Leu Lys Glu Ile		
[3944]	515	520	525
[3945]	Ile Ile Gln Lys Val Asp Glu Ile Tyr Lys Val Tyr Gly Ser Ser Glu		
[3946]	530	535	540
[3947]	Lys Leu Phe Asp Ala Asp Phe Val Leu Glu Lys Ser Leu Lys Lys Asn		

[3948]	545	550	555	560
[3949]	Asp Ala Val Val Ala Ile Met Lys Asp Leu Leu Asp Ser Val Lys Ser			
[3950]		565	570	575
[3951]	Phe Glu Asn Tyr Ile Lys Ala Phe Phe Gly Glu Gly Lys Glu Thr Asn			
[3952]		580	585	590
[3953]	Arg Asp Glu Ser Phe Tyr Gly Asp Phe Val Leu Ala Tyr Asp Ile Leu			
[3954]		595	600	605
[3955]	Leu Lys Val Asp His Ile Tyr Asp Ala Ile Arg Asn Tyr Val Thr Gln			
[3956]		610	615	620
[3957]	Lys Pro Tyr Ser Lys Asp Lys Phe Lys Leu Tyr Phe Gln Asn Pro Gln			
[3958]	625	630	635	640
[3959]	Phe Met Gly Gly Trp Asp Lys Asp Lys Glu Thr Asp Tyr Arg Ala Thr			
[3960]		645	650	655
[3961]	Ile Leu Arg Tyr Gly Ser Lys Tyr Tyr Leu Ala Ile Met Asp Lys Lys			
[3962]		660	665	670
[3963]	Tyr Ala Lys Cys Leu Gln Lys Ile Asp Lys Asp Asp Val Asn Gly Asn			
[3964]		675	680	685
[3965]	Tyr Glu Lys Ile Asn Tyr Lys Leu Leu Pro Gly Pro Asn Lys Met Leu			
[3966]		690	695	700
[3967]	Pro Lys Val Phe Phe Ser Lys Lys Trp Met Ala Tyr Tyr Asn Pro Ser			
[3968]	705	710	715	720
[3969]	Glu Asp Ile Gln Lys Ile Tyr Lys Asn Gly Thr Phe Lys Lys Gly Asp			
[3970]		725	730	735
[3971]	Met Phe Asn Leu Asn Asp Cys His Lys Leu Ile Asp Phe Phe Lys Asp			
[3972]		740	745	750
[3973]	Ser Ile Ser Arg Tyr Pro Lys Trp Ser Asn Ala Tyr Asp Phe Asn Phe			
[3974]		755	760	765
[3975]	Ser Glu Thr Glu Lys Tyr Lys Asp Ile Ala Gly Phe Tyr Arg Glu Val			
[3976]		770	775	780
[3977]	Glu Glu Gln Gly Tyr Lys Val Ser Phe Glu Ser Ala Ser Lys Lys Glu			
[3978]	785	790	795	800
[3979]	Val Asp Lys Leu Val Glu Glu Gly Lys Leu Tyr Met Phe Gln Ile Tyr			
[3980]		805	810	815
[3981]	Asn Lys Asp Phe Ser Asp Lys Ser His Gly Thr Pro Asn Leu His Thr			
[3982]		820	825	830
[3983]	Met Tyr Phe Lys Leu Leu Phe Asp Glu Asn Asn His Gly Gln Ile Arg			
[3984]		835	840	845
[3985]	Leu Ser Gly Gly Ala Glu Leu Phe Met Arg Arg Ala Ser Leu Lys Lys			
[3986]		850	855	860
[3987]	Glu Glu Leu Val Val His Pro Ala Asn Ser Pro Ile Ala Asn Lys Asn			
[3988]	865	870	875	880
[3989]	Pro Asp Asn Pro Lys Lys Thr Thr Thr Leu Ser Tyr Asp Val Tyr Lys			

[3990]	885	890	895
[3991]	Asp Lys Arg Phe Ser Glu Asp Gln Tyr Glu Leu His Ile Pro Ile Ala		
[3992]	900	905	910
[3993]	Ile Asn Lys Cys Pro Lys Asn Ile Phe Lys Ile Asn Thr Glu Val Arg		
[3994]	915	920	925
[3995]	Val Leu Leu Lys His Asp Asp Asn Pro Tyr Val Ile Gly Ile Ala Arg		
[3996]	930	935	940
[3997]	Gly Glu Arg Asn Leu Leu Tyr Ile Val Val Val Asp Gly Lys Gly Asn		
[3998]	945	950	955
[3999]	Ile Val Glu Gln Tyr Ser Leu Asn Glu Ile Ile Asn Asn Phe Asn Gly		
[4000]	965	970	975
[4001]	Ile Arg Ile Lys Thr Asp Tyr His Ser Leu Leu Asp Lys Lys Glu Lys		
[4002]	980	985	990
[4003]	Glu Arg Phe Glu Ala Arg Gln Asn Trp Thr Ser Ile Glu Asn Ile Lys		
[4004]	995	1000	1005
[4005]	Glu Leu Lys Ala Gly Tyr Ile Ser Gln Val Val His Lys Ile Cys		
[4006]	1010	1015	1020
[4007]	Glu Leu Val Glu Lys Tyr Asp Ala Val Ile Ala Leu Glu Asp Leu		
[4008]	1025	1030	1035
[4009]	Asn Ser Gly Phe Lys Asn Ser Arg Val Lys Val Glu Lys Gln Val		
[4010]	1040	1045	1050
[4011]	Tyr Gln Lys Phe Glu Lys Met Leu Ile Asp Lys Leu Asn Tyr Met		
[4012]	1055	1060	1065
[4013]	Val Asp Lys Lys Ser Asn Pro Cys Ala Thr Gly Gly Ala Leu Lys		
[4014]	1070	1075	1080
[4015]	Gly Tyr Gln Ile Thr Asn Lys Phe Glu Ser Phe Lys Ser Met Ser		
[4016]	1085	1090	1095
[4017]	Thr Gln Asn Gly Phe Ile Phe Tyr Ile Pro Ala Trp Leu Thr Ser		
[4018]	1100	1105	1110
[4019]	Lys Ile Asp Pro Ser Thr Gly Phe Val Asn Leu Leu Lys Thr Lys		
[4020]	1115	1120	1125
[4021]	Tyr Thr Ser Ile Ala Asp Ser Lys Lys Phe Ile Ser Ser Phe Asp		
[4022]	1130	1135	1140
[4023]	Arg Ile Met Tyr Val Pro Glu Glu Asp Leu Phe Glu Phe Ala Leu		
[4024]	1145	1150	1155
[4025]	Asp Tyr Lys Asn Phe Ser Arg Thr Asp Ala Asp Tyr Ile Lys Lys		
[4026]	1160	1165	1170
[4027]	Trp Lys Leu Tyr Ser Tyr Gly Asn Arg Ile Arg Ile Phe Arg Asn		
[4028]	1175	1180	1185
[4029]	Pro Lys Lys Asn Asn Val Phe Asp Trp Glu Glu Val Cys Leu Thr		
[4030]	1190	1195	1200
[4031]	Ser Ala Tyr Lys Glu Leu Phe Asn Lys Tyr Gly Ile Asn Tyr Gln		

[4032]	1205	1210	1215
[4033]	Gln Gly Asp Ile Arg Ala Leu	Leu Cys Glu Gln Ser	Asp Lys Ala
[4034]	1220	1225	1230
[4035]	Phe Tyr Ser Ser Phe Met Ala	Leu Met Ser Leu Met	Leu Gln Met
[4036]	1235	1240	1245
[4037]	Arg Asn Ser Ile Thr Gly Arg	Thr Asp Val Asp Phe	Leu Ile Ser
[4038]	1250	1255	1260
[4039]	Pro Val Lys Asn Ser Asp Gly	Ile Phe Tyr Asp Ser	Arg Asn Tyr
[4040]	1265	1270	1275
[4041]	Glu Ala Gln Glu Asn Ala Ile	Leu Pro Lys Asn Ala	Asp Ala Asn
[4042]	1280	1285	1290
[4043]	Gly Ala Tyr Asn Ile Ala Arg	Lys Val Leu Trp Ala	Ile Gly Gln
[4044]	1295	1300	1305
[4045]	Phe Lys Lys Ala Glu Asp Glu	Lys Leu Asp Lys Val	Lys Ile Ala
[4046]	1310	1315	1320
[4047]	Ile Ser Asn Lys Glu Trp Leu	Glu Tyr Ala Gln Thr	Ser Val Lys
[4048]	1325	1330	1335
[4049]	His Gly Gly Ser Lys Gly Pro	Pro Pro Ser Pro Pro	Pro Pro Gln
[4050]	1340	1345	1350
[4051]	Pro Glu Ser Ser Glu Thr Gly	Pro Val Ala Val Asp	Pro Thr Leu
[4052]	1355	1360	1365
[4053]	Arg Arg Arg Ile Glu Pro His	Glu Phe Glu Val Phe	Phe Asp Pro
[4054]	1370	1375	1380
[4055]	Arg Glu Leu Arg Lys Glu Thr	Cys Leu Leu Tyr Glu	Ile Asn Trp
[4056]	1385	1390	1395
[4057]	Gly Gly Arg His Ser Ile Trp	Arg His Thr Ser Gln	Asn Thr Asn
[4058]	1400	1405	1410
[4059]	Lys His Val Glu Val Asn Phe	Ile Glu Lys Phe Thr	Thr Glu Arg
[4060]	1415	1420	1425
[4061]	Tyr Phe Cys Pro Asn Thr Arg	Cys Ser Ile Thr Trp	Phe Leu Ser
[4062]	1430	1435	1440
[4063]	Trp Ser Pro Cys Gly Glu Cys	Ser Arg Ala Ile Thr	Glu Phe Leu
[4064]	1445	1450	1455
[4065]	Ser Arg Tyr Pro His Val Thr	Leu Phe Ile Tyr Ile	Ala Arg Leu
[4066]	1460	1465	1470
[4067]	Tyr His His Ala Asp Pro Arg	Asn Arg Gln Gly Leu	Arg Asp Leu
[4068]	1475	1480	1485
[4069]	Ile Ser Ser Gly Val Thr Ile	Gln Ile Met Thr Glu	Gln Glu Ser
[4070]	1490	1495	1500
[4071]	Gly Tyr Cys Trp Arg Asn Phe	Val Asn Tyr Ser Pro	Ser Asn Glu
[4072]	1505	1510	1515
[4073]	Ala His Trp Pro Arg Tyr Pro	His Leu Trp Val Arg	Leu Tyr Val

[4074]	1520	1525	1530
[4075]	Leu Glu Leu Tyr Cys Ile Ile	Leu Gly Leu Pro Pro	Cys Leu Asn
[4076]	1535	1540	1545
[4077]	Ile Leu Arg Arg Lys Gln Pro	Gln Leu Thr Phe Phe	Thr Ile Ala
[4078]	1550	1555	1560
[4079]	Leu Gln Ser Cys His Tyr Gln	Arg Leu Pro Pro His	Ile Leu Trp
[4080]	1565	1570	1575
[4081]	Ala Thr Gly Leu Lys Ser Gly	Gly Ser Lys Arg Thr	Ala Asp Gly
[4082]	1580	1585	1590
[4083]	Ser Glu Phe		
[4084]	1595		
[4085]	<210> 53		
[4086]	<211> 1596		
[4087]	<212> PRT		
[4088]	<213> 人工的		
[4089]	<220>		
[4090]	<223> 碱基编辑器融合蛋白		
[4091]	<400> 53		
[4092]	Met Lys Arg Thr Ala Asp Gly Ser Glu Phe Glu Ser Pro Lys Lys Lys		
[4093]	1 5 10 15		
[4094]	Arg Lys Val Thr Asn Leu Ser Asp Ile Ile Glu Lys Glu Thr Gly Lys		
[4095]	20 25 30		
[4096]	Gln Leu Val Ile Gln Glu Ser Ile Leu Met Leu Pro Glu Glu Val Glu		
[4097]	35 40 45		
[4098]	Glu Val Ile Gly Asn Lys Pro Glu Ser Asp Ile Leu Val His Thr Ala		
[4099]	50 55 60		
[4100]	Tyr Asp Glu Ser Thr Asp Glu Asn Val Met Leu Leu Thr Ser Asp Ala		
[4101]	65 70 75 80		
[4102]	Pro Glu Tyr Lys Pro Trp Ala Leu Val Ile Gln Asp Ser Asn Gly Glu		
[4103]	85 90 95		
[4104]	Asn Lys Ile Lys Met Leu Ser Gly Gly Ser Gly Gly Ser Gly Gly Ser		
[4105]	100 105 110		
[4106]	Ser Lys Leu Glu Lys Phe Thr Asn Cys Tyr Ser Leu Ser Lys Thr Leu		
[4107]	115 120 125		
[4108]	Arg Phe Lys Ala Ile Pro Val Gly Lys Thr Gln Glu Asn Ile Asp Asn		
[4109]	130 135 140		
[4110]	Lys Arg Leu Leu Val Glu Asp Glu Lys Arg Ala Glu Asp Tyr Lys Gly		
[4111]	145 150 155 160		
[4112]	Val Lys Lys Leu Leu Asp Arg Tyr Tyr Leu Ser Phe Ile Asn Asp Val		
[4113]	165 170 175		
[4114]	Leu His Ser Ile Lys Leu Lys Asn Leu Asn Asn Tyr Ile Ser Leu Phe		
[4115]	180 185 190		

[4116]	Arg	Lys	Lys	Thr	Arg	Thr	Glu	Lys	Glu	Asn	Lys	Glu	Leu	Glu	Asn	Leu
[4117]				195					200					205		
[4118]	Glu	Ile	Asn	Leu	Arg	Lys	Glu	Ile	Ala	Lys	Ala	Phe	Lys	Gly	Asn	Glu
[4119]				210					215					220		
[4120]	Gly	Tyr	Lys	Ser	Leu	Phe	Lys	Lys	Asp	Ile	Ile	Glu	Thr	Ile	Leu	Pro
[4121]				225					230					235		240
[4122]	Glu	Phe	Leu	Asp	Asp	Lys	Asp	Glu	Ile	Ala	Leu	Val	Asn	Ser	Phe	Asn
[4123]									245					250		255
[4124]	Gly	Phe	Thr	Thr	Ala	Phe	Thr	Gly	Phe	Phe	Asp	Asn	Arg	Glu	Asn	Met
[4125]									260					265		270
[4126]	Phe	Ser	Glu	Glu	Ala	Lys	Ser	Thr	Ser	Ile	Ala	Phe	Arg	Cys	Ile	Asn
[4127]									275					280		285
[4128]	Glu	Asn	Leu	Thr	Arg	Tyr	Ile	Ser	Asn	Met	Asp	Ile	Phe	Glu	Lys	Val
[4129]									290					295		300
[4130]	Asp	Ala	Ile	Phe	Asp	Lys	His	Glu	Val	Gln	Glu	Ile	Lys	Glu	Lys	Ile
[4131]									305					310		315
[4132]	Leu	Asn	Ser	Asp	Tyr	Asp	Val	Glu	Asp	Phe	Phe	Glu	Gly	Glu	Phe	Phe
[4133]														325		330
[4134]	Asn	Phe	Val	Leu	Thr	Gln	Glu	Gly	Ile	Asp	Val	Tyr	Asn	Ala	Ile	Ile
[4135]									340					345		350
[4136]	Gly	Gly	Phe	Val	Thr	Glu	Ser	Gly	Glu	Lys	Ile	Lys	Gly	Leu	Asn	Glu
[4137]									355					360		365
[4138]	Tyr	Ile	Asn	Leu	Tyr	Asn	Gln	Lys	Thr	Lys	Gln	Lys	Leu	Pro	Lys	Phe
[4139]									370					375		380
[4140]	Lys	Pro	Leu	Tyr	Lys	Gln	Val	Leu	Ser	Asp	Arg	Glu	Ser	Leu	Ser	Phe
[4141]									385					390		395
[4142]	Tyr	Gly	Glu	Gly	Tyr	Thr	Ser	Asp	Glu	Glu	Val	Leu	Glu	Val	Phe	Arg
[4143]														405		410
[4144]	Asn	Thr	Leu	Asn	Lys	Asn	Ser	Glu	Ile	Phe	Ser	Ser	Ile	Lys	Lys	Leu
[4145]									420					425		430
[4146]	Glu	Lys	Leu	Phe	Lys	Asn	Phe	Asp	Glu	Tyr	Ser	Ser	Ala	Gly	Ile	Phe
[4147]									435					440		445
[4148]	Val	Lys	Asn	Gly	Pro	Ala	Ile	Ser	Thr	Ile	Ser	Lys	Asp	Ile	Phe	Gly
[4149]									450					455		460
[4150]	Glu	Trp	Asn	Val	Ile	Arg	Asp	Lys	Trp	Asn	Ala	Glu	Tyr	Asp	Asp	Ile
[4151]									465					470		475
[4152]	His	Leu	Lys	Lys	Lys	Ala	Val	Val	Thr	Glu	Lys	Tyr	Glu	Asp	Asp	Arg
[4153]														485		490
[4154]	Arg	Lys	Ser	Phe	Lys	Lys	Ile	Gly	Ser	Phe	Ser	Leu	Glu	Gln	Leu	Gln
[4155]									500					505		510
[4156]	Glu	Tyr	Ala	Asp	Ala	Asp	Leu	Ser	Val	Val	Glu	Lys	Leu	Lys	Glu	Ile
[4157]									515					520		525

[4158]	Ile Ile Gln Lys Val Asp Glu Ile Tyr Lys Val Tyr Gly Ser Ser Glu		
[4159]	530	535	540
[4160]	Lys Leu Phe Asp Ala Asp Phe Val Leu Glu Lys Ser Leu Lys Lys Asn		
[4161]	545	550	555 560
[4162]	Asp Ala Val Val Ala Ile Met Lys Asp Leu Leu Asp Ser Val Lys Ser		
[4163]	565	570	575
[4164]	Phe Glu Asn Tyr Ile Lys Ala Phe Phe Gly Glu Gly Lys Glu Thr Asn		
[4165]	580	585	590
[4166]	Arg Asp Glu Ser Phe Tyr Gly Asp Phe Val Leu Ala Tyr Asp Ile Leu		
[4167]	595	600	605
[4168]	Leu Lys Val Asp His Ile Tyr Asp Ala Ile Arg Asn Tyr Val Thr Gln		
[4169]	610	615	620
[4170]	Lys Pro Tyr Ser Lys Asp Lys Phe Lys Leu Tyr Phe Gln Asn Pro Gln		
[4171]	625	630	635 640
[4172]	Phe Met Gly Gly Trp Asp Lys Asp Lys Glu Thr Asp Tyr Arg Ala Thr		
[4173]	645	650	655
[4174]	Ile Leu Arg Tyr Gly Ser Lys Tyr Tyr Leu Ala Ile Met Asp Lys Lys		
[4175]	660	665	670
[4176]	Tyr Ala Lys Cys Leu Gln Lys Ile Asp Lys Asp Asp Val Asn Gly Asn		
[4177]	675	680	685
[4178]	Tyr Glu Lys Ile Asn Tyr Lys Leu Leu Pro Gly Pro Asn Lys Met Leu		
[4179]	690	695	700
[4180]	Pro Lys Val Phe Phe Ser Lys Lys Trp Met Ala Tyr Tyr Asn Pro Ser		
[4181]	705	710	715 720
[4182]	Glu Asp Ile Gln Lys Ile Tyr Lys Asn Gly Thr Phe Lys Lys Gly Asp		
[4183]	725	730	735
[4184]	Met Phe Asn Leu Asn Asp Cys His Lys Leu Ile Asp Phe Phe Lys Asp		
[4185]	740	745	750
[4186]	Ser Ile Ser Arg Tyr Pro Lys Trp Ser Asn Ala Tyr Asp Phe Asn Phe		
[4187]	755	760	765
[4188]	Ser Glu Thr Glu Lys Tyr Lys Asp Ile Ala Gly Phe Tyr Arg Glu Val		
[4189]	770	775	780
[4190]	Glu Glu Gln Gly Tyr Lys Val Ser Phe Glu Ser Ala Ser Lys Lys Glu		
[4191]	785	790	795 800
[4192]	Val Asp Lys Leu Val Glu Glu Gly Lys Leu Tyr Met Phe Gln Ile Tyr		
[4193]	805	810	815
[4194]	Asn Lys Asp Phe Ser Asp Lys Ser His Gly Thr Pro Asn Leu His Thr		
[4195]	820	825	830
[4196]	Met Tyr Phe Lys Leu Leu Phe Asp Glu Asn Asn His Gly Gln Ile Arg		
[4197]	835	840	845
[4198]	Leu Ser Gly Gly Ala Glu Leu Phe Met Arg Arg Ala Ser Leu Lys Lys		
[4199]	850	855	860

[4200]	Glu Glu Leu Val Val His Pro Ala Asn Ser Pro Ile Ala Asn Lys Asn
[4201]	865 870 875 880
[4202]	Pro Asp Asn Pro Lys Lys Thr Thr Thr Leu Ser Tyr Asp Val Tyr Lys
[4203]	885 890 895
[4204]	Asp Lys Arg Phe Ser Glu Asp Gln Tyr Glu Leu His Ile Pro Ile Ala
[4205]	900 905 910
[4206]	Ile Asn Lys Cys Pro Lys Asn Ile Phe Lys Ile Asn Thr Glu Val Arg
[4207]	915 920 925
[4208]	Val Leu Leu Lys His Asp Asp Asn Pro Tyr Val Ile Gly Ile Ala Arg
[4209]	930 935 940
[4210]	Gly Glu Arg Asn Leu Leu Tyr Ile Val Val Val Asp Gly Lys Gly Asn
[4211]	945 950 955 960
[4212]	Ile Val Glu Gln Tyr Ser Leu Asn Glu Ile Ile Asn Asn Phe Asn Gly
[4213]	965 970 975
[4214]	Ile Arg Ile Lys Thr Asp Tyr His Ser Leu Leu Asp Lys Lys Glu Lys
[4215]	980 985 990
[4216]	Glu Arg Phe Glu Ala Arg Gln Asn Trp Thr Ser Ile Glu Asn Ile Lys
[4217]	995 1000 1005
[4218]	Glu Leu Lys Ala Gly Tyr Ile Ser Gln Val Val His Lys Ile Cys
[4219]	1010 1015 1020
[4220]	Glu Leu Val Glu Lys Tyr Asp Ala Val Ile Ala Leu Glu Asp Leu
[4221]	1025 1030 1035
[4222]	Asn Ser Gly Phe Lys Asn Ser Arg Val Lys Val Glu Lys Gln Val
[4223]	1040 1045 1050
[4224]	Tyr Gln Lys Phe Glu Lys Met Leu Ile Asp Lys Leu Asn Tyr Met
[4225]	1055 1060 1065
[4226]	Val Asp Lys Lys Ser Asn Pro Cys Ala Thr Gly Gly Ala Leu Lys
[4227]	1070 1075 1080
[4228]	Gly Tyr Gln Ile Thr Asn Lys Phe Glu Ser Phe Lys Ser Met Ser
[4229]	1085 1090 1095
[4230]	Thr Gln Asn Gly Phe Ile Phe Tyr Ile Pro Ala Trp Leu Thr Ser
[4231]	1100 1105 1110
[4232]	Lys Ile Asp Pro Ser Thr Gly Phe Val Asn Leu Leu Lys Thr Lys
[4233]	1115 1120 1125
[4234]	Tyr Thr Ser Ile Ala Asp Ser Lys Lys Phe Ile Ser Ser Phe Asp
[4235]	1130 1135 1140
[4236]	Arg Ile Met Tyr Val Pro Glu Glu Asp Leu Phe Glu Phe Ala Leu
[4237]	1145 1150 1155
[4238]	Asp Tyr Lys Asn Phe Ser Arg Thr Asp Ala Asp Tyr Ile Lys Lys
[4239]	1160 1165 1170
[4240]	Trp Lys Leu Tyr Ser Tyr Gly Asn Arg Ile Arg Ile Phe Arg Asn
[4241]	1175 1180 1185

[4242]	Pro	Lys	Lys	Asn	Asn	Val	Phe	Asp	Trp	Glu	Glu	Val	Cys	Leu	Thr
[4243]		1190					1195						1200		
[4244]	Ser	Ala	Tyr	Lys	Glu	Leu	Phe	Asn	Lys	Tyr	Gly	Ile	Asn	Tyr	Gln
[4245]		1205					1210						1215		
[4246]	Gln	Gly	Asp	Ile	Arg	Ala	Leu	Leu	Cys	Glu	Gln	Ser	Asp	Lys	Ala
[4247]		1220					1225						1230		
[4248]	Phe	Tyr	Ser	Ser	Phe	Met	Ala	Leu	Met	Ser	Leu	Met	Leu	Gln	Met
[4249]		1235					1240						1245		
[4250]	Arg	Asn	Ser	Ile	Thr	Gly	Arg	Thr	Asp	Val	Asp	Phe	Leu	Ile	Ser
[4251]		1250					1255						1260		
[4252]	Pro	Val	Lys	Asn	Ser	Asp	Gly	Ile	Phe	Tyr	Asp	Ser	Arg	Asn	Tyr
[4253]		1265					1270						1275		
[4254]	Glu	Ala	Gln	Glu	Asn	Ala	Ile	Leu	Pro	Lys	Asn	Ala	Asp	Ala	Asn
[4255]		1280					1285						1290		
[4256]	Gly	Ala	Tyr	Asn	Ile	Ala	Arg	Lys	Val	Leu	Trp	Ala	Ile	Gly	Gln
[4257]		1295					1300						1305		
[4258]	Phe	Lys	Lys	Ala	Glu	Asp	Glu	Lys	Leu	Asp	Lys	Val	Lys	Ile	Ala
[4259]		1310					1315						1320		
[4260]	Ile	Ser	Asn	Lys	Glu	Trp	Leu	Glu	Tyr	Ala	Gln	Thr	Ser	Val	Lys
[4261]		1325					1330						1335		
[4262]	His	Ser	Glu	Ser	Pro	Thr	Asn	Gln	Gln	Pro	Glu	Pro	Gln	Trp	Thr
[4263]		1340					1345						1350		
[4264]	Thr	Asp	Ser	Ser	Glu	Thr	Gly	Pro	Val	Ala	Val	Asp	Pro	Thr	Leu
[4265]		1355					1360						1365		
[4266]	Arg	Arg	Arg	Ile	Glu	Pro	His	Glu	Phe	Glu	Val	Phe	Phe	Asp	Pro
[4267]		1370					1375						1380		
[4268]	Arg	Glu	Leu	Arg	Lys	Glu	Thr	Cys	Leu	Leu	Tyr	Glu	Ile	Asn	Trp
[4269]		1385					1390						1395		
[4270]	Gly	Gly	Arg	His	Ser	Ile	Trp	Arg	His	Thr	Ser	Gln	Asn	Thr	Asn
[4271]		1400					1405						1410		
[4272]	Lys	His	Val	Glu	Val	Asn	Phe	Ile	Glu	Lys	Phe	Thr	Thr	Glu	Arg
[4273]		1415					1420						1425		
[4274]	Tyr	Phe	Cys	Pro	Asn	Thr	Arg	Cys	Ser	Ile	Thr	Trp	Phe	Leu	Ser
[4275]		1430					1435						1440		
[4276]	Trp	Ser	Pro	Cys	Gly	Glu	Cys	Ser	Arg	Ala	Ile	Thr	Glu	Phe	Leu
[4277]		1445					1450						1455		
[4278]	Ser	Arg	Tyr	Pro	His	Val	Thr	Leu	Phe	Ile	Tyr	Ile	Ala	Arg	Leu
[4279]		1460					1465						1470		
[4280]	Tyr	His	His	Ala	Asp	Pro	Arg	Asn	Arg	Gln	Gly	Leu	Arg	Asp	Leu
[4281]		1475					1480						1485		
[4282]	Ile	Ser	Ser	Gly	Val	Thr	Ile	Gln	Ile	Met	Thr	Glu	Gln	Glu	Ser
[4283]		1490					1495						1500		

[4284]	Gly Tyr Cys Trp Arg Asn Phe Val Asn Tyr Ser Pro Ser Asn Glu
[4285]	1505 1510 1515
[4286]	Ala His Trp Pro Arg Tyr Pro His Leu Trp Val Arg Leu Tyr Val
[4287]	1520 1525 1530
[4288]	Leu Glu Leu Tyr Cys Ile Ile Leu Gly Leu Pro Pro Cys Leu Asn
[4289]	1535 1540 1545
[4290]	Ile Leu Arg Arg Lys Gln Pro Gln Leu Thr Phe Phe Thr Ile Ala
[4291]	1550 1555 1560
[4292]	Leu Gln Ser Cys His Tyr Gln Arg Leu Pro Pro His Ile Leu Trp
[4293]	1565 1570 1575
[4294]	Ala Thr Gly Leu Lys Ser Gly Gly Ser Lys Arg Thr Ala Asp Gly
[4295]	1580 1585 1590
[4296]	Ser Glu Phe
[4297]	1595
[4298]	<210> 54
[4299]	<211> 1596
[4300]	<212> PRT
[4301]	<213> 人工的
[4302]	<220>
[4303]	<223> 碱基编辑器融合蛋白
[4304]	<400> 54
[4305]	Met Lys Arg Thr Ala Asp Gly Ser Glu Phe Glu Ser Pro Lys Lys Lys
[4306]	1 5 10 15
[4307]	Arg Lys Val Thr Asn Leu Ser Asp Ile Ile Glu Lys Glu Thr Gly Lys
[4308]	20 25 30
[4309]	Gln Leu Val Ile Gln Glu Ser Ile Leu Met Leu Pro Glu Glu Val Glu
[4310]	35 40 45
[4311]	Glu Val Ile Gly Asn Lys Pro Glu Ser Asp Ile Leu Val His Thr Ala
[4312]	50 55 60
[4313]	Tyr Asp Glu Ser Thr Asp Glu Asn Val Met Leu Leu Thr Ser Asp Ala
[4314]	65 70 75 80
[4315]	Pro Glu Tyr Lys Pro Trp Ala Leu Val Ile Gln Asp Ser Asn Gly Glu
[4316]	85 90 95
[4317]	Asn Lys Ile Lys Met Leu Ser Gly Gly Ser Gly Gly Ser Gly Gly Ser
[4318]	100 105 110
[4319]	Ser Lys Leu Glu Lys Phe Thr Asn Cys Tyr Ser Leu Ser Lys Thr Leu
[4320]	115 120 125
[4321]	Arg Phe Lys Ala Ile Pro Val Gly Lys Thr Gln Glu Asn Ile Asp Asn
[4322]	130 135 140
[4323]	Lys Arg Leu Leu Val Glu Asp Glu Lys Arg Ala Glu Asp Tyr Lys Gly
[4324]	145 150 155 160
[4325]	Val Lys Lys Leu Leu Asp Arg Tyr Tyr Leu Ser Phe Ile Asn Asp Val

[4326]		165		170		175
[4327]	Leu His Ser Ile Lys Leu Lys Asn Leu Asn Asn Tyr Ile Ser Leu Phe					
[4328]		180		185		190
[4329]	Arg Lys Lys Thr Arg Thr Glu Lys Glu Asn Lys Glu Leu Glu Asn Leu					
[4330]		195		200		205
[4331]	Glu Ile Asn Leu Arg Lys Glu Ile Ala Lys Ala Phe Lys Gly Asn Glu					
[4332]		210		215		220
[4333]	Gly Tyr Lys Ser Leu Phe Lys Lys Asp Ile Ile Glu Thr Ile Leu Pro					
[4334]	225		230		235	240
[4335]	Glu Phe Leu Asp Asp Lys Asp Glu Ile Ala Leu Val Asn Ser Phe Asn					
[4336]		245		250		255
[4337]	Gly Phe Thr Thr Ala Phe Thr Gly Phe Phe Asp Asn Arg Glu Asn Met					
[4338]		260		265		270
[4339]	Phe Ser Glu Glu Ala Lys Ser Thr Ser Ile Ala Phe Arg Cys Ile Asn					
[4340]		275		280		285
[4341]	Glu Asn Leu Thr Arg Tyr Ile Ser Asn Met Asp Ile Phe Glu Lys Val					
[4342]		290		295		300
[4343]	Asp Ala Ile Phe Asp Lys His Glu Val Gln Glu Ile Lys Glu Lys Ile					
[4344]	305		310		315	320
[4345]	Leu Asn Ser Asp Tyr Asp Val Glu Asp Phe Phe Glu Gly Glu Phe Phe					
[4346]		325		330		335
[4347]	Asn Phe Val Leu Thr Gln Glu Gly Ile Asp Val Tyr Asn Ala Ile Ile					
[4348]		340		345		350
[4349]	Gly Gly Phe Val Thr Glu Ser Gly Glu Lys Ile Lys Gly Leu Asn Glu					
[4350]		355		360		365
[4351]	Tyr Ile Asn Leu Tyr Asn Gln Lys Thr Lys Gln Lys Leu Pro Lys Phe					
[4352]		370		375		380
[4353]	Lys Pro Leu Tyr Lys Gln Val Leu Ser Asp Arg Glu Ser Leu Ser Phe					
[4354]	385		390		395	400
[4355]	Tyr Gly Glu Gly Tyr Thr Ser Asp Glu Glu Val Leu Glu Val Phe Arg					
[4356]		405		410		415
[4357]	Asn Thr Leu Asn Lys Asn Ser Glu Ile Phe Ser Ser Ile Lys Lys Leu					
[4358]		420		425		430
[4359]	Glu Lys Leu Phe Lys Asn Phe Asp Glu Tyr Ser Ser Ala Gly Ile Phe					
[4360]		435		440		445
[4361]	Val Lys Asn Gly Pro Ala Ile Ser Thr Ile Ser Lys Asp Ile Phe Gly					
[4362]		450		455		460
[4363]	Glu Trp Asn Val Ile Arg Asp Lys Trp Asn Ala Glu Tyr Asp Asp Ile					
[4364]	465		470		475	480
[4365]	His Leu Lys Lys Lys Ala Val Val Thr Glu Lys Tyr Glu Asp Asp Arg					
[4366]		485		490		495
[4367]	Arg Lys Ser Phe Lys Lys Ile Gly Ser Phe Ser Leu Glu Gln Leu Gln					

[4368]	500	505	510
[4369]	Glu Tyr Ala Asp Ala Asp Leu Ser Val Val Glu Lys Leu Lys Glu Ile		
[4370]	515	520	525
[4371]	Ile Ile Gln Lys Val Asp Glu Ile Tyr Lys Val Tyr Gly Ser Ser Glu		
[4372]	530	535	540
[4373]	Lys Leu Phe Asp Ala Asp Phe Val Leu Glu Lys Ser Leu Lys Lys Asn		
[4374]	545	550	555
[4375]	Asp Ala Val Val Ala Ile Met Lys Asp Leu Leu Asp Ser Val Lys Ser		
[4376]	565	570	575
[4377]	Phe Glu Asn Tyr Ile Lys Ala Phe Phe Gly Glu Gly Lys Glu Thr Asn		
[4378]	580	585	590
[4379]	Arg Asp Glu Ser Phe Tyr Gly Asp Phe Val Leu Ala Tyr Asp Ile Leu		
[4380]	595	600	605
[4381]	Leu Lys Val Asp His Ile Tyr Asp Ala Ile Arg Asn Tyr Val Thr Gln		
[4382]	610	615	620
[4383]	Lys Pro Tyr Ser Lys Asp Lys Phe Lys Leu Tyr Phe Gln Asn Pro Gln		
[4384]	625	630	635
[4385]	Phe Met Gly Gly Trp Asp Lys Asp Lys Glu Thr Asp Tyr Arg Ala Thr		
[4386]	645	650	655
[4387]	Ile Leu Arg Tyr Gly Ser Lys Tyr Tyr Leu Ala Ile Met Asp Lys Lys		
[4388]	660	665	670
[4389]	Tyr Ala Lys Cys Leu Gln Lys Ile Asp Lys Asp Asp Val Asn Gly Asn		
[4390]	675	680	685
[4391]	Tyr Glu Lys Ile Asn Tyr Lys Leu Leu Pro Gly Pro Asn Lys Met Leu		
[4392]	690	695	700
[4393]	Pro Lys Val Phe Phe Ser Lys Lys Trp Met Ala Tyr Tyr Asn Pro Ser		
[4394]	705	710	715
[4395]	Glu Asp Ile Gln Lys Ile Tyr Lys Asn Gly Thr Phe Lys Lys Gly Asp		
[4396]	725	730	735
[4397]	Met Phe Asn Leu Asn Asp Cys His Lys Leu Ile Asp Phe Phe Lys Asp		
[4398]	740	745	750
[4399]	Ser Ile Ser Arg Tyr Pro Lys Trp Ser Asn Ala Tyr Asp Phe Asn Phe		
[4400]	755	760	765
[4401]	Ser Glu Thr Glu Lys Tyr Lys Asp Ile Ala Gly Phe Tyr Arg Glu Val		
[4402]	770	775	780
[4403]	Glu Glu Gln Gly Tyr Lys Val Ser Phe Glu Ser Ala Ser Lys Lys Glu		
[4404]	785	790	795
[4405]	Val Asp Lys Leu Val Glu Glu Gly Lys Leu Tyr Met Phe Gln Ile Tyr		
[4406]	805	810	815
[4407]	Asn Lys Asp Phe Ser Asp Lys Ser His Gly Thr Pro Asn Leu His Thr		
[4408]	820	825	830
[4409]	Met Tyr Phe Lys Leu Leu Phe Asp Glu Asn Asn His Gly Gln Ile Arg		

[4410]	835	840	845
[4411]	Leu Ser Gly Gly Ala Glu Leu Phe Met Arg Arg Ala Ser Leu Lys Lys		
[4412]	850	855	860
[4413]	Glu Glu Leu Val Val His Pro Ala Asn Ser Pro Ile Ala Asn Lys Asn		
[4414]	865	870	875
[4415]	Pro Asp Asn Pro Lys Lys Thr Thr Thr Leu Ser Tyr Asp Val Tyr Lys		
[4416]	885	890	895
[4417]	Asp Lys Arg Phe Ser Glu Asp Gln Tyr Glu Leu His Ile Pro Ile Ala		
[4418]	900	905	910
[4419]	Ile Asn Lys Cys Pro Lys Asn Ile Phe Lys Ile Asn Thr Glu Val Arg		
[4420]	915	920	925
[4421]	Val Leu Leu Lys His Asp Asp Asn Pro Tyr Val Ile Gly Ile Ala Arg		
[4422]	930	935	940
[4423]	Gly Glu Arg Asn Leu Leu Tyr Ile Val Val Val Asp Gly Lys Gly Asn		
[4424]	945	950	955
[4425]	Ile Val Glu Gln Tyr Ser Leu Asn Glu Ile Ile Asn Asn Phe Asn Gly		
[4426]	965	970	975
[4427]	Ile Arg Ile Lys Thr Asp Tyr His Ser Leu Leu Asp Lys Lys Glu Lys		
[4428]	980	985	990
[4429]	Glu Arg Phe Glu Ala Arg Gln Asn Trp Thr Ser Ile Glu Asn Ile Lys		
[4430]	995	1000	1005
[4431]	Glu Leu Lys Ala Gly Tyr Ile Ser Gln Val Val His Lys Ile Cys		
[4432]	1010	1015	1020
[4433]	Glu Leu Val Glu Lys Tyr Asp Ala Val Ile Ala Leu Glu Asp Leu		
[4434]	1025	1030	1035
[4435]	Asn Ser Gly Phe Lys Asn Ser Arg Val Lys Val Glu Lys Gln Val		
[4436]	1040	1045	1050
[4437]	Tyr Gln Lys Phe Glu Lys Met Leu Ile Asp Lys Leu Asn Tyr Met		
[4438]	1055	1060	1065
[4439]	Val Asp Lys Lys Ser Asn Pro Cys Ala Thr Gly Gly Ala Leu Lys		
[4440]	1070	1075	1080
[4441]	Gly Tyr Gln Ile Thr Asn Lys Phe Glu Ser Phe Lys Ser Met Ser		
[4442]	1085	1090	1095
[4443]	Thr Gln Asn Gly Phe Ile Phe Tyr Ile Pro Ala Trp Leu Thr Ser		
[4444]	1100	1105	1110
[4445]	Lys Ile Asp Pro Ser Thr Gly Phe Val Asn Leu Leu Lys Thr Lys		
[4446]	1115	1120	1125
[4447]	Tyr Thr Ser Ile Ala Asp Ser Lys Lys Phe Ile Ser Ser Phe Asp		
[4448]	1130	1135	1140
[4449]	Arg Ile Met Tyr Val Pro Glu Glu Asp Leu Phe Glu Phe Ala Leu		
[4450]	1145	1150	1155
[4451]	Asp Tyr Lys Asn Phe Ser Arg Thr Asp Ala Asp Tyr Ile Lys Lys		

[4452]	1160	1165	1170
[4453]	Trp Lys Leu Tyr Ser Tyr Gly Asn Arg Ile Arg Ile Phe Arg Asn		
[4454]	1175	1180	1185
[4455]	Pro Lys Lys Asn Asn Val Phe Asp Trp Glu Glu Val Cys Leu Thr		
[4456]	1190	1195	1200
[4457]	Ser Ala Tyr Lys Glu Leu Phe Asn Lys Tyr Gly Ile Asn Tyr Gln		
[4458]	1205	1210	1215
[4459]	Gln Gly Asp Ile Arg Ala Leu Leu Cys Glu Gln Ser Asp Lys Ala		
[4460]	1220	1225	1230
[4461]	Phe Tyr Ser Ser Phe Met Ala Leu Met Ser Leu Met Leu Gln Met		
[4462]	1235	1240	1245
[4463]	Arg Asn Ser Ile Thr Gly Arg Thr Asp Val Asp Phe Leu Ile Ser		
[4464]	1250	1255	1260
[4465]	Pro Val Lys Asn Ser Asp Gly Ile Phe Tyr Asp Ser Arg Asn Tyr		
[4466]	1265	1270	1275
[4467]	Glu Ala Gln Glu Asn Ala Ile Leu Pro Lys Asn Ala Asp Ala Asn		
[4468]	1280	1285	1290
[4469]	Gly Ala Tyr Asn Ile Ala Arg Lys Val Leu Trp Ala Ile Gly Gln		
[4470]	1295	1300	1305
[4471]	Phe Lys Lys Ala Glu Asp Glu Lys Leu Asp Lys Val Lys Ile Ala		
[4472]	1310	1315	1320
[4473]	Ile Ser Asn Lys Glu Trp Leu Glu Tyr Ala Gln Thr Ser Val Lys		
[4474]	1325	1330	1335
[4475]	His Ser Glu Ser Pro Ser Lys Gln Gln Pro Glu Pro Lys Ser Ser		
[4476]	1340	1345	1350
[4477]	Lys Gly Ser Ser Glu Thr Gly Pro Val Ala Val Asp Pro Thr Leu		
[4478]	1355	1360	1365
[4479]	Arg Arg Arg Ile Glu Pro His Glu Phe Glu Val Phe Phe Asp Pro		
[4480]	1370	1375	1380
[4481]	Arg Glu Leu Arg Lys Glu Thr Cys Leu Leu Tyr Glu Ile Asn Trp		
[4482]	1385	1390	1395
[4483]	Gly Gly Arg His Ser Ile Trp Arg His Thr Ser Gln Asn Thr Asn		
[4484]	1400	1405	1410
[4485]	Lys His Val Glu Val Asn Phe Ile Glu Lys Phe Thr Thr Glu Arg		
[4486]	1415	1420	1425
[4487]	Tyr Phe Cys Pro Asn Thr Arg Cys Ser Ile Thr Trp Phe Leu Ser		
[4488]	1430	1435	1440
[4489]	Trp Ser Pro Cys Gly Glu Cys Ser Arg Ala Ile Thr Glu Phe Leu		
[4490]	1445	1450	1455
[4491]	Ser Arg Tyr Pro His Val Thr Leu Phe Ile Tyr Ile Ala Arg Leu		
[4492]	1460	1465	1470
[4493]	Tyr His His Ala Asp Pro Arg Asn Arg Gln Gly Leu Arg Asp Leu		

[4494]	1475	1480	1485
[4495]	Ile Ser Ser Gly Val Thr Ile Gln Ile Met Thr Glu Gln Glu Ser		
[4496]	1490	1495	1500
[4497]	Gly Tyr Cys Trp Arg Asn Phe Val Asn Tyr Ser Pro Ser Asn Glu		
[4498]	1505	1510	1515
[4499]	Ala His Trp Pro Arg Tyr Pro His Leu Trp Val Arg Leu Tyr Val		
[4500]	1520	1525	1530
[4501]	Leu Glu Leu Tyr Cys Ile Ile Leu Gly Leu Pro Pro Cys Leu Asn		
[4502]	1535	1540	1545
[4503]	Ile Leu Arg Arg Lys Gln Pro Gln Leu Thr Phe Phe Thr Ile Ala		
[4504]	1550	1555	1560
[4505]	Leu Gln Ser Cys His Tyr Gln Arg Leu Pro Pro His Ile Leu Trp		
[4506]	1565	1570	1575
[4507]	Ala Thr Gly Leu Lys Ser Gly Gly Ser Lys Arg Thr Ala Asp Gly		
[4508]	1580	1585	1590
[4509]	Ser Glu Phe		
[4510]	1595		
[4511]	<210> 55		
[4512]	<211> 1598		
[4513]	<212> PRT		
[4514]	<213> 人工的		
[4515]	<220>		
[4516]	<223> 碱基编辑器融合蛋白		
[4517]	<400> 55		
[4518]	Met Lys Arg Thr Ala Asp Gly Ser Glu Phe Glu Ser Pro Lys Lys Lys		
[4519]	1 5 10 15		
[4520]	Arg Lys Val Thr Asn Leu Ser Asp Ile Ile Glu Lys Glu Thr Gly Lys		
[4521]	20 25 30		
[4522]	Gln Leu Val Ile Gln Glu Ser Ile Leu Met Leu Pro Glu Glu Val Glu		
[4523]	35 40 45		
[4524]	Glu Val Ile Gly Asn Lys Pro Glu Ser Asp Ile Leu Val His Thr Ala		
[4525]	50 55 60		
[4526]	Tyr Asp Glu Ser Thr Asp Glu Asn Val Met Leu Leu Thr Ser Asp Ala		
[4527]	65 70 75 80		
[4528]	Pro Glu Tyr Lys Pro Trp Ala Leu Val Ile Gln Asp Ser Asn Gly Glu		
[4529]	85 90 95		
[4530]	Asn Lys Ile Lys Met Leu Ser His Pro Pro Gln Glu Pro Pro Gln Ser		
[4531]	100 105 110		
[4532]	Asn Leu Ser Lys Leu Glu Lys Phe Thr Asn Cys Tyr Ser Leu Ser Lys		
[4533]	115 120 125		
[4534]	Thr Leu Arg Phe Lys Ala Ile Pro Val Gly Lys Thr Gln Glu Asn Ile		
[4535]	130 135 140		

[4536]	Asp Asn Lys Arg Leu Leu Val Glu Asp Glu Lys Arg Ala Glu Asp Tyr		
[4537]	145	150	155 160
[4538]	Lys Gly Val Lys Lys Leu Leu Asp Arg Tyr Tyr Leu Ser Phe Ile Asn		
[4539]	165	170	175
[4540]	Asp Val Leu His Ser Ile Lys Leu Lys Asn Leu Asn Asn Tyr Ile Ser		
[4541]	180	185	190
[4542]	Leu Phe Arg Lys Lys Thr Arg Thr Glu Lys Glu Asn Lys Glu Leu Glu		
[4543]	195	200	205
[4544]	Asn Leu Glu Ile Asn Leu Arg Lys Glu Ile Ala Lys Ala Phe Lys Gly		
[4545]	210	215	220
[4546]	Asn Glu Gly Tyr Lys Ser Leu Phe Lys Lys Asp Ile Ile Glu Thr Ile		
[4547]	225	230	235 240
[4548]	Leu Pro Glu Phe Leu Asp Asp Lys Asp Glu Ile Ala Leu Val Asn Ser		
[4549]	245	250	255
[4550]	Phe Asn Gly Phe Thr Thr Ala Phe Thr Gly Phe Phe Asp Asn Arg Glu		
[4551]	260	265	270
[4552]	Asn Met Phe Ser Glu Glu Ala Lys Ser Thr Ser Ile Ala Phe Arg Cys		
[4553]	275	280	285
[4554]	Ile Asn Glu Asn Leu Thr Arg Tyr Ile Ser Asn Met Asp Ile Phe Glu		
[4555]	290	295	300
[4556]	Lys Val Asp Ala Ile Phe Asp Lys His Glu Val Gln Glu Ile Lys Glu		
[4557]	305	310	315 320
[4558]	Lys Ile Leu Asn Ser Asp Tyr Asp Val Glu Asp Phe Phe Glu Gly Glu		
[4559]	325	330	335
[4560]	Phe Phe Asn Phe Val Leu Thr Gln Glu Gly Ile Asp Val Tyr Asn Ala		
[4561]	340	345	350
[4562]	Ile Ile Gly Gly Phe Val Thr Glu Ser Gly Glu Lys Ile Lys Gly Leu		
[4563]	355	360	365
[4564]	Asn Glu Tyr Ile Asn Leu Tyr Asn Gln Lys Thr Lys Gln Lys Leu Pro		
[4565]	370	375	380
[4566]	Lys Phe Lys Pro Leu Tyr Lys Gln Val Leu Ser Asp Arg Glu Ser Leu		
[4567]	385	390	395 400
[4568]	Ser Phe Tyr Gly Glu Gly Tyr Thr Ser Asp Glu Glu Val Leu Glu Val		
[4569]	405	410	415
[4570]	Phe Arg Asn Thr Leu Asn Lys Asn Ser Glu Ile Phe Ser Ser Ile Lys		
[4571]	420	425	430
[4572]	Lys Leu Glu Lys Leu Phe Lys Asn Phe Asp Glu Tyr Ser Ser Ala Gly		
[4573]	435	440	445
[4574]	Ile Phe Val Lys Asn Gly Pro Ala Ile Ser Thr Ile Ser Lys Asp Ile		
[4575]	450	455	460
[4576]	Phe Gly Glu Trp Asn Val Ile Arg Asp Lys Trp Asn Ala Glu Tyr Asp		
[4577]	465	470	475 480

[4578]	Asp	Ile	His	Leu	Lys	Lys	Lys	Ala	Val	Val	Thr	Glu	Lys	Tyr	Glu	Asp
[4579]					485					490					495	
[4580]	Asp	Arg	Arg	Lys	Ser	Phe	Lys	Lys	Ile	Gly	Ser	Phe	Ser	Leu	Glu	Gln
[4581]				500					505						510	
[4582]	Leu	Gln	Glu	Tyr	Ala	Asp	Ala	Asp	Leu	Ser	Val	Val	Glu	Lys	Leu	Lys
[4583]			515					520					525			
[4584]	Glu	Ile	Ile	Ile	Gln	Lys	Val	Asp	Glu	Ile	Tyr	Lys	Val	Tyr	Gly	Ser
[4585]		530					535					540				
[4586]	Ser	Glu	Lys	Leu	Phe	Asp	Ala	Asp	Phe	Val	Leu	Glu	Lys	Ser	Leu	Lys
[4587]	545				550					555					560	
[4588]	Lys	Asn	Asp	Ala	Val	Val	Ala	Ile	Met	Lys	Asp	Leu	Leu	Asp	Ser	Val
[4589]			565						570						575	
[4590]	Lys	Ser	Phe	Glu	Asn	Tyr	Ile	Lys	Ala	Phe	Phe	Gly	Glu	Gly	Lys	Glu
[4591]			580						585						590	
[4592]	Thr	Asn	Arg	Asp	Glu	Ser	Phe	Tyr	Gly	Asp	Phe	Val	Leu	Ala	Tyr	Asp
[4593]		595						600					605			
[4594]	Ile	Leu	Leu	Lys	Val	Asp	His	Ile	Tyr	Asp	Ala	Ile	Arg	Asn	Tyr	Val
[4595]		610						615					620			
[4596]	Thr	Gln	Lys	Pro	Tyr	Ser	Lys	Asp	Lys	Phe	Lys	Leu	Tyr	Phe	Gln	Asn
[4597]	625				630						635				640	
[4598]	Pro	Gln	Phe	Met	Gly	Gly	Trp	Asp	Lys	Asp	Lys	Glu	Thr	Asp	Tyr	Arg
[4599]			645						650						655	
[4600]	Ala	Thr	Ile	Leu	Arg	Tyr	Gly	Ser	Lys	Tyr	Tyr	Leu	Ala	Ile	Met	Asp
[4601]			660						665						670	
[4602]	Lys	Lys	Tyr	Ala	Lys	Cys	Leu	Gln	Lys	Ile	Asp	Lys	Asp	Asp	Val	Asn
[4603]			675						680						685	
[4604]	Gly	Asn	Tyr	Glu	Lys	Ile	Asn	Tyr	Lys	Leu	Leu	Pro	Gly	Pro	Asn	Lys
[4605]		690							695						700	
[4606]	Met	Leu	Pro	Lys	Val	Phe	Phe	Ser	Lys	Lys	Trp	Met	Ala	Tyr	Tyr	Asn
[4607]	705				710						715				720	
[4608]	Pro	Ser	Glu	Asp	Ile	Gln	Lys	Ile	Tyr	Lys	Asn	Gly	Thr	Phe	Lys	Lys
[4609]				725						730					735	
[4610]	Gly	Asp	Met	Phe	Asn	Leu	Asn	Asp	Cys	His	Lys	Leu	Ile	Asp	Phe	Phe
[4611]			740						745						750	
[4612]	Lys	Asp	Ser	Ile	Ser	Arg	Tyr	Pro	Lys	Trp	Ser	Asn	Ala	Tyr	Asp	Phe
[4613]			755						760						765	
[4614]	Asn	Phe	Ser	Glu	Thr	Glu	Lys	Tyr	Lys	Asp	Ile	Ala	Gly	Phe	Tyr	Arg
[4615]		770							775						780	
[4616]	Glu	Val	Glu	Glu	Gln	Gly	Tyr	Lys	Val	Ser	Phe	Glu	Ser	Ala	Ser	Lys
[4617]	785				790						795				800	
[4618]	Lys	Glu	Val	Asp	Lys	Leu	Val	Glu	Glu	Gly	Lys	Leu	Tyr	Met	Phe	Gln
[4619]				805						810					815	

[4620]	Ile Tyr Asn Lys Asp Phe Ser Asp Lys Ser His Gly Thr Pro Asn Leu		
[4621]		820	825 830
[4622]	His Thr Met Tyr Phe Lys Leu Leu Phe Asp Glu Asn Asn His Gly Gln		
[4623]		835	840 845
[4624]	Ile Arg Leu Ser Gly Gly Ala Glu Leu Phe Met Arg Arg Ala Ser Leu		
[4625]		850	855 860
[4626]	Lys Lys Glu Glu Leu Val Val His Pro Ala Asn Ser Pro Ile Ala Asn		
[4627]		865	870 875 880
[4628]	Lys Asn Pro Asp Asn Pro Lys Lys Thr Thr Thr Leu Ser Tyr Asp Val		
[4629]		885	890 895
[4630]	Tyr Lys Asp Lys Arg Phe Ser Glu Asp Gln Tyr Glu Leu His Ile Pro		
[4631]		900	905 910
[4632]	Ile Ala Ile Asn Lys Cys Pro Lys Asn Ile Phe Lys Ile Asn Thr Glu		
[4633]		915	920 925
[4634]	Val Arg Val Leu Leu Lys His Asp Asp Asn Pro Tyr Val Ile Gly Ile		
[4635]		930	935 940
[4636]	Ala Arg Gly Glu Arg Asn Leu Leu Tyr Ile Val Val Val Asp Gly Lys		
[4637]		945	950 955 960
[4638]	Gly Asn Ile Val Glu Gln Tyr Ser Leu Asn Glu Ile Ile Asn Asn Phe		
[4639]		965	970 975
[4640]	Asn Gly Ile Arg Ile Lys Thr Asp Tyr His Ser Leu Leu Asp Lys Lys		
[4641]		980	985 990
[4642]	Glu Lys Glu Arg Phe Glu Ala Arg Gln Asn Trp Thr Ser Ile Glu Asn		
[4643]		995	1000 1005
[4644]	Ile Lys Glu Leu Lys Ala Gly Tyr Ile Ser Gln Val Val His Lys		
[4645]		1010	1015 1020
[4646]	Ile Cys Glu Leu Val Glu Lys Tyr Asp Ala Val Ile Ala Leu Glu		
[4647]		1025	1030 1035
[4648]	Asp Leu Asn Ser Gly Phe Lys Asn Ser Arg Val Lys Val Glu Lys		
[4649]		1040	1045 1050
[4650]	Gln Val Tyr Gln Lys Phe Glu Lys Met Leu Ile Asp Lys Leu Asn		
[4651]		1055	1060 1065
[4652]	Tyr Met Val Asp Lys Lys Ser Asn Pro Cys Ala Thr Gly Gly Ala		
[4653]		1070	1075 1080
[4654]	Leu Lys Gly Tyr Gln Ile Thr Asn Lys Phe Glu Ser Phe Lys Ser		
[4655]		1085	1090 1095
[4656]	Met Ser Thr Gln Asn Gly Phe Ile Phe Tyr Ile Pro Ala Trp Leu		
[4657]		1100	1105 1110
[4658]	Thr Ser Lys Ile Asp Pro Ser Thr Gly Phe Val Asn Leu Leu Lys		
[4659]		1115	1120 1125
[4660]	Thr Lys Tyr Thr Ser Ile Ala Asp Ser Lys Lys Phe Ile Ser Ser		
[4661]		1130	1135 1140

[4662]	Phe Asp Arg Ile Met Tyr Val	Pro Glu Glu Asp Leu	Phe Glu Phe
[4663]	1145	1150	1155
[4664]	Ala Leu Asp Tyr Lys Asn Phe	Ser Arg Thr Asp Ala	Asp Tyr Ile
[4665]	1160	1165	1170
[4666]	Lys Lys Trp Lys Leu Tyr Ser	Tyr Gly Asn Arg Ile	Arg Ile Phe
[4667]	1175	1180	1185
[4668]	Arg Asn Pro Lys Lys Asn Asn	Val Phe Asp Trp Glu	Glu Val Cys
[4669]	1190	1195	1200
[4670]	Leu Thr Ser Ala Tyr Lys Glu	Leu Phe Asn Lys Tyr	Gly Ile Asn
[4671]	1205	1210	1215
[4672]	Tyr Gln Gln Gly Asp Ile Arg	Ala Leu Leu Cys Glu	Gln Ser Asp
[4673]	1220	1225	1230
[4674]	Lys Ala Phe Tyr Ser Ser Phe	Met Ala Leu Met Ser	Leu Met Leu
[4675]	1235	1240	1245
[4676]	Gln Met Arg Asn Ser Ile Thr	Gly Arg Thr Asp Val	Asp Phe Leu
[4677]	1250	1255	1260
[4678]	Ile Ser Pro Val Lys Asn Ser	Asp Gly Ile Phe Tyr	Asp Ser Arg
[4679]	1265	1270	1275
[4680]	Asn Tyr Glu Ala Gln Glu Asn	Ala Ile Leu Pro Lys	Asn Ala Asp
[4681]	1280	1285	1290
[4682]	Ala Asn Gly Ala Tyr Asn Ile	Ala Arg Lys Val Leu	Trp Ala Ile
[4683]	1295	1300	1305
[4684]	Gly Gln Phe Lys Lys Ala Glu	Asp Glu Lys Leu Asp	Lys Val Lys
[4685]	1310	1315	1320
[4686]	Ile Ala Ile Ser Asn Lys Glu	Trp Leu Glu Tyr Ala	Gln Thr Ser
[4687]	1325	1330	1335
[4688]	Val Lys His Ser Gly Ser Glu	Thr Pro Gly Thr Ser	Glu Ser Ala
[4689]	1340	1345	1350
[4690]	Thr Pro Glu Ser Ser Ser Glu	Thr Gly Pro Val Ala	Val Asp Pro
[4691]	1355	1360	1365
[4692]	Thr Leu Arg Arg Arg Ile Glu	Pro His Glu Phe Glu	Val Phe Phe
[4693]	1370	1375	1380
[4694]	Asp Pro Arg Glu Leu Arg Lys	Glu Thr Cys Leu Leu	Tyr Glu Ile
[4695]	1385	1390	1395
[4696]	Asn Trp Gly Gly Arg His Ser	Ile Trp Arg His Thr	Ser Gln Asn
[4697]	1400	1405	1410
[4698]	Thr Asn Lys His Val Glu Val	Asn Phe Ile Glu Lys	Phe Thr Thr
[4699]	1415	1420	1425
[4700]	Glu Arg Tyr Phe Cys Pro Asn	Thr Arg Cys Ser Ile	Thr Trp Phe
[4701]	1430	1435	1440
[4702]	Leu Ser Trp Ser Pro Cys Gly	Glu Cys Ser Arg Ala	Ile Thr Glu
[4703]	1445	1450	1455

[4704]	Phe Leu Ser Arg Tyr Pro His Val Thr Leu Phe Ile Tyr Ile Ala
[4705]	1460 1465 1470
[4706]	Arg Leu Tyr His His Ala Asp Pro Arg Asn Arg Gln Gly Leu Arg
[4707]	1475 1480 1485
[4708]	Asp Leu Ile Ser Ser Gly Val Thr Ile Gln Ile Met Thr Glu Gln
[4709]	1490 1495 1500
[4710]	Glu Ser Gly Tyr Cys Trp Arg Asn Phe Val Asn Tyr Ser Pro Ser
[4711]	1505 1510 1515
[4712]	Asn Glu Ala His Trp Pro Arg Tyr Pro His Leu Trp Val Arg Leu
[4713]	1520 1525 1530
[4714]	Tyr Val Leu Glu Leu Tyr Cys Ile Ile Leu Gly Leu Pro Pro Cys
[4715]	1535 1540 1545
[4716]	Leu Asn Ile Leu Arg Arg Lys Gln Pro Gln Leu Thr Phe Phe Thr
[4717]	1550 1555 1560
[4718]	Ile Ala Leu Gln Ser Cys His Tyr Gln Arg Leu Pro Pro His Ile
[4719]	1565 1570 1575
[4720]	Leu Trp Ala Thr Gly Leu Lys Ser Gly Gly Ser Lys Arg Thr Ala
[4721]	1580 1585 1590
[4722]	Asp Gly Ser Glu Phe
[4723]	1595
[4724]	<210> 56
[4725]	<211> 1596
[4726]	<212> PRT
[4727]	<213> 人工的
[4728]	<220>
[4729]	<223> 碱基编辑器融合蛋白
[4730]	<400> 56
[4731]	Met Lys Arg Thr Ala Asp Gly Ser Glu Phe Glu Ser Pro Lys Lys Lys
[4732]	1 5 10 15
[4733]	Arg Lys Val Thr Asn Leu Ser Asp Ile Ile Glu Lys Glu Thr Gly Lys
[4734]	20 25 30
[4735]	Gln Leu Val Ile Gln Glu Ser Ile Leu Met Leu Pro Glu Glu Val Glu
[4736]	35 40 45
[4737]	Glu Val Ile Gly Asn Lys Pro Glu Ser Asp Ile Leu Val His Thr Ala
[4738]	50 55 60
[4739]	Tyr Asp Glu Ser Thr Asp Glu Asn Val Met Leu Leu Thr Ser Asp Ala
[4740]	65 70 75 80
[4741]	Pro Glu Tyr Lys Pro Trp Ala Leu Val Ile Gln Asp Ser Asn Gly Glu
[4742]	85 90 95
[4743]	Asn Lys Ile Lys Met Leu Tyr Thr Asp Glu Lys Pro Leu Pro Arg Ser
[4744]	100 105 110
[4745]	Ser Lys Leu Glu Lys Phe Thr Asn Cys Tyr Ser Leu Ser Lys Thr Leu

[4746]	115	120	125
[4747]	Arg Phe Lys Ala Ile Pro Val Gly Lys Thr Gln Glu Asn Ile Asp Asn		
[4748]	130	135	140
[4749]	Lys Arg Leu Leu Val Glu Asp Glu Lys Arg Ala Glu Asp Tyr Lys Gly		
[4750]	145	150	155
[4751]	Val Lys Lys Leu Leu Asp Arg Tyr Tyr Leu Ser Phe Ile Asn Asp Val		
[4752]	165	170	175
[4753]	Leu His Ser Ile Lys Leu Lys Asn Leu Asn Asn Tyr Ile Ser Leu Phe		
[4754]	180	185	190
[4755]	Arg Lys Lys Thr Arg Thr Glu Lys Glu Asn Lys Glu Leu Glu Asn Leu		
[4756]	195	200	205
[4757]	Glu Ile Asn Leu Arg Lys Glu Ile Ala Lys Ala Phe Lys Gly Asn Glu		
[4758]	210	215	220
[4759]	Gly Tyr Lys Ser Leu Phe Lys Lys Asp Ile Ile Glu Thr Ile Leu Pro		
[4760]	225	230	235
[4761]	Glu Phe Leu Asp Asp Lys Asp Glu Ile Ala Leu Val Asn Ser Phe Asn		
[4762]	245	250	255
[4763]	Gly Phe Thr Thr Ala Phe Thr Gly Phe Phe Asp Asn Arg Glu Asn Met		
[4764]	260	265	270
[4765]	Phe Ser Glu Glu Ala Lys Ser Thr Ser Ile Ala Phe Arg Cys Ile Asn		
[4766]	275	280	285
[4767]	Glu Asn Leu Thr Arg Tyr Ile Ser Asn Met Asp Ile Phe Glu Lys Val		
[4768]	290	295	300
[4769]	Asp Ala Ile Phe Asp Lys His Glu Val Gln Glu Ile Lys Glu Lys Ile		
[4770]	305	310	315
[4771]	Leu Asn Ser Asp Tyr Asp Val Glu Asp Phe Phe Glu Gly Glu Phe Phe		
[4772]	325	330	335
[4773]	Asn Phe Val Leu Thr Gln Glu Gly Ile Asp Val Tyr Asn Ala Ile Ile		
[4774]	340	345	350
[4775]	Gly Gly Phe Val Thr Glu Ser Gly Glu Lys Ile Lys Gly Leu Asn Glu		
[4776]	355	360	365
[4777]	Tyr Ile Asn Leu Tyr Asn Gln Lys Thr Lys Gln Lys Leu Pro Lys Phe		
[4778]	370	375	380
[4779]	Lys Pro Leu Tyr Lys Gln Val Leu Ser Asp Arg Glu Ser Leu Ser Phe		
[4780]	385	390	395
[4781]	Tyr Gly Glu Gly Tyr Thr Ser Asp Glu Glu Val Leu Glu Val Phe Arg		
[4782]	405	410	415
[4783]	Asn Thr Leu Asn Lys Asn Ser Glu Ile Phe Ser Ser Ile Lys Lys Leu		
[4784]	420	425	430
[4785]	Glu Lys Leu Phe Lys Asn Phe Asp Glu Tyr Ser Ser Ala Gly Ile Phe		
[4786]	435	440	445
[4787]	Val Lys Asn Gly Pro Ala Ile Ser Thr Ile Ser Lys Asp Ile Phe Gly		

[4788]	450	455	460
[4789]	Glu Trp Asn Val Ile Arg Asp Lys Trp Asn Ala Glu Tyr Asp Asp Ile		
[4790]	465	470	475 480
[4791]	His Leu Lys Lys Lys Ala Val Val Thr Glu Lys Tyr Glu Asp Asp Arg		
[4792]	485	490	495
[4793]	Arg Lys Ser Phe Lys Lys Ile Gly Ser Phe Ser Leu Glu Gln Leu Gln		
[4794]	500	505	510
[4795]	Glu Tyr Ala Asp Ala Asp Leu Ser Val Val Glu Lys Leu Lys Glu Ile		
[4796]	515	520	525
[4797]	Ile Ile Gln Lys Val Asp Glu Ile Tyr Lys Val Tyr Gly Ser Ser Glu		
[4798]	530	535	540
[4799]	Lys Leu Phe Asp Ala Asp Phe Val Leu Glu Lys Ser Leu Lys Lys Asn		
[4800]	545	550	555 560
[4801]	Asp Ala Val Val Ala Ile Met Lys Asp Leu Leu Asp Ser Val Lys Ser		
[4802]	565	570	575
[4803]	Phe Glu Asn Tyr Ile Lys Ala Phe Phe Gly Glu Gly Lys Glu Thr Asn		
[4804]	580	585	590
[4805]	Arg Asp Glu Ser Phe Tyr Gly Asp Phe Val Leu Ala Tyr Asp Ile Leu		
[4806]	595	600	605
[4807]	Leu Lys Val Asp His Ile Tyr Asp Ala Ile Arg Asn Tyr Val Thr Gln		
[4808]	610	615	620
[4809]	Lys Pro Tyr Ser Lys Asp Lys Phe Lys Leu Tyr Phe Gln Asn Pro Gln		
[4810]	625	630	635 640
[4811]	Phe Met Gly Gly Trp Asp Lys Asp Lys Glu Thr Asp Tyr Arg Ala Thr		
[4812]	645	650	655
[4813]	Ile Leu Arg Tyr Gly Ser Lys Tyr Tyr Leu Ala Ile Met Asp Lys Lys		
[4814]	660	665	670
[4815]	Tyr Ala Lys Cys Leu Gln Lys Ile Asp Lys Asp Asp Val Asn Gly Asn		
[4816]	675	680	685
[4817]	Tyr Glu Lys Ile Asn Tyr Lys Leu Leu Pro Gly Pro Asn Lys Met Leu		
[4818]	690	695	700
[4819]	Pro Lys Val Phe Phe Ser Lys Lys Trp Met Ala Tyr Tyr Asn Pro Ser		
[4820]	705	710	715 720
[4821]	Glu Asp Ile Gln Lys Ile Tyr Lys Asn Gly Thr Phe Lys Lys Gly Asp		
[4822]	725	730	735
[4823]	Met Phe Asn Leu Asn Asp Cys His Lys Leu Ile Asp Phe Phe Lys Asp		
[4824]	740	745	750
[4825]	Ser Ile Ser Arg Tyr Pro Lys Trp Ser Asn Ala Tyr Asp Phe Asn Phe		
[4826]	755	760	765
[4827]	Ser Glu Thr Glu Lys Tyr Lys Asp Ile Ala Gly Phe Tyr Arg Glu Val		
[4828]	770	775	780
[4829]	Glu Glu Gln Gly Tyr Lys Val Ser Phe Glu Ser Ala Ser Lys Lys Glu		

[4830]	785	790	795	800
[4831]	Val Asp Lys Leu Val Glu Glu Gly Lys Leu Tyr Met Phe Gln Ile Tyr			
[4832]		805	810	815
[4833]	Asn Lys Asp Phe Ser Asp Lys Ser His Gly Thr Pro Asn Leu His Thr			
[4834]		820	825	830
[4835]	Met Tyr Phe Lys Leu Leu Phe Asp Glu Asn Asn His Gly Gln Ile Arg			
[4836]		835	840	845
[4837]	Leu Ser Gly Gly Ala Glu Leu Phe Met Arg Arg Ala Ser Leu Lys Lys			
[4838]		850	855	860
[4839]	Glu Glu Leu Val Val His Pro Ala Asn Ser Pro Ile Ala Asn Lys Asn			
[4840]	865	870	875	880
[4841]	Pro Asp Asn Pro Lys Lys Thr Thr Thr Leu Ser Tyr Asp Val Tyr Lys			
[4842]		885	890	895
[4843]	Asp Lys Arg Phe Ser Glu Asp Gln Tyr Glu Leu His Ile Pro Ile Ala			
[4844]		900	905	910
[4845]	Ile Asn Lys Cys Pro Lys Asn Ile Phe Lys Ile Asn Thr Glu Val Arg			
[4846]		915	920	925
[4847]	Val Leu Leu Lys His Asp Asp Asn Pro Tyr Val Ile Gly Ile Ala Arg			
[4848]		930	935	940
[4849]	Gly Glu Arg Asn Leu Leu Tyr Ile Val Val Val Asp Gly Lys Gly Asn			
[4850]	945	950	955	960
[4851]	Ile Val Glu Gln Tyr Ser Leu Asn Glu Ile Ile Asn Asn Phe Asn Gly			
[4852]		965	970	975
[4853]	Ile Arg Ile Lys Thr Asp Tyr His Ser Leu Leu Asp Lys Lys Glu Lys			
[4854]		980	985	990
[4855]	Glu Arg Phe Glu Ala Arg Gln Asn Trp Thr Ser Ile Glu Asn Ile Lys			
[4856]		995	1000	1005
[4857]	Glu Leu Lys Ala Gly Tyr Ile Ser Gln Val Val His Lys Ile Cys			
[4858]		1010	1015	1020
[4859]	Glu Leu Val Glu Lys Tyr Asp Ala Val Ile Ala Leu Glu Asp Leu			
[4860]		1025	1030	1035
[4861]	Asn Ser Gly Phe Lys Asn Ser Arg Val Lys Val Glu Lys Gln Val			
[4862]		1040	1045	1050
[4863]	Tyr Gln Lys Phe Glu Lys Met Leu Ile Asp Lys Leu Asn Tyr Met			
[4864]		1055	1060	1065
[4865]	Val Asp Lys Lys Ser Asn Pro Cys Ala Thr Gly Gly Ala Leu Lys			
[4866]		1070	1075	1080
[4867]	Gly Tyr Gln Ile Thr Asn Lys Phe Glu Ser Phe Lys Ser Met Ser			
[4868]		1085	1090	1095
[4869]	Thr Gln Asn Gly Phe Ile Phe Tyr Ile Pro Ala Trp Leu Thr Ser			
[4870]		1100	1105	1110
[4871]	Lys Ile Asp Pro Ser Thr Gly Phe Val Asn Leu Leu Lys Thr Lys			

[4872]	1115	1120	1125
[4873]	Tyr Thr Ser Ile Ala Asp Ser	Lys Lys Phe Ile Ser	Ser Phe Asp
[4874]	1130	1135	1140
[4875]	Arg Ile Met Tyr Val Pro Glu	Glu Asp Leu Phe Glu	Phe Ala Leu
[4876]	1145	1150	1155
[4877]	Asp Tyr Lys Asn Phe Ser Arg	Thr Asp Ala Asp Tyr	Ile Lys Lys
[4878]	1160	1165	1170
[4879]	Trp Lys Leu Tyr Ser Tyr Gly	Asn Arg Ile Arg Ile	Phe Arg Asn
[4880]	1175	1180	1185
[4881]	Pro Lys Lys Asn Asn Val Phe	Asp Trp Glu Glu Val	Cys Leu Thr
[4882]	1190	1195	1200
[4883]	Ser Ala Tyr Lys Glu Leu Phe	Asn Lys Tyr Gly Ile	Asn Tyr Gln
[4884]	1205	1210	1215
[4885]	Gln Gly Asp Ile Arg Ala Leu	Leu Cys Glu Gln Ser	Asp Lys Ala
[4886]	1220	1225	1230
[4887]	Phe Tyr Ser Ser Phe Met Ala	Leu Met Ser Leu Met	Leu Gln Met
[4888]	1235	1240	1245
[4889]	Arg Asn Ser Ile Thr Gly Arg	Thr Asp Val Asp Phe	Leu Ile Ser
[4890]	1250	1255	1260
[4891]	Pro Val Lys Asn Ser Asp Gly	Ile Phe Tyr Asp Ser	Arg Asn Tyr
[4892]	1265	1270	1275
[4893]	Glu Ala Gln Glu Asn Ala Ile	Leu Pro Lys Asn Ala	Asp Ala Asn
[4894]	1280	1285	1290
[4895]	Gly Ala Tyr Asn Ile Ala Arg	Lys Val Leu Trp Ala	Ile Gly Gln
[4896]	1295	1300	1305
[4897]	Phe Lys Lys Ala Glu Asp Glu	Lys Leu Asp Lys Val	Lys Ile Ala
[4898]	1310	1315	1320
[4899]	Ile Ser Asn Lys Glu Trp Leu	Glu Tyr Ala Gln Thr	Ser Val Lys
[4900]	1325	1330	1335
[4901]	His Ser Gly Ser Glu Thr Pro	Gly Thr Ser Glu Ser	Ala Thr Pro
[4902]	1340	1345	1350
[4903]	Glu Ser Ser Ser Glu Thr Gly	Pro Val Ala Val Asp	Pro Thr Leu
[4904]	1355	1360	1365
[4905]	Arg Arg Arg Ile Glu Pro His	Glu Phe Glu Val Phe	Phe Asp Pro
[4906]	1370	1375	1380
[4907]	Arg Glu Leu Arg Lys Glu Thr	Cys Leu Leu Tyr Glu	Ile Asn Trp
[4908]	1385	1390	1395
[4909]	Gly Gly Arg His Ser Ile Trp	Arg His Thr Ser Gln	Asn Thr Asn
[4910]	1400	1405	1410
[4911]	Lys His Val Glu Val Asn Phe	Ile Glu Lys Phe Thr	Thr Glu Arg
[4912]	1415	1420	1425
[4913]	Tyr Phe Cys Pro Asn Thr Arg	Cys Ser Ile Thr Trp	Phe Leu Ser

[4914]	1430	1435	1440
[4915]	Trp Ser Pro Cys Gly Glu Cys Ser Arg Ala Ile Thr Glu Phe Leu		
[4916]	1445	1450	1455
[4917]	Ser Arg Tyr Pro His Val Thr Leu Phe Ile Tyr Ile Ala Arg Leu		
[4918]	1460	1465	1470
[4919]	Tyr His His Ala Asp Pro Arg Asn Arg Gln Gly Leu Arg Asp Leu		
[4920]	1475	1480	1485
[4921]	Ile Ser Ser Gly Val Thr Ile Gln Ile Met Thr Glu Gln Glu Ser		
[4922]	1490	1495	1500
[4923]	Gly Tyr Cys Trp Arg Asn Phe Val Asn Tyr Ser Pro Ser Asn Glu		
[4924]	1505	1510	1515
[4925]	Ala His Trp Pro Arg Tyr Pro His Leu Trp Val Arg Leu Tyr Val		
[4926]	1520	1525	1530
[4927]	Leu Glu Leu Tyr Cys Ile Ile Leu Gly Leu Pro Pro Cys Leu Asn		
[4928]	1535	1540	1545
[4929]	Ile Leu Arg Arg Lys Gln Pro Gln Leu Thr Phe Phe Thr Ile Ala		
[4930]	1550	1555	1560
[4931]	Leu Gln Ser Cys His Tyr Gln Arg Leu Pro Pro His Ile Leu Trp		
[4932]	1565	1570	1575
[4933]	Ala Thr Gly Leu Lys Ser Gly Gly Ser Lys Arg Thr Ala Asp Gly		
[4934]	1580	1585	1590
[4935]	Ser Glu Phe		
[4936]	1595		
[4937]	<210> 57		
[4938]	<211> 1600		
[4939]	<212> PRT		
[4940]	<213> 人工的		
[4941]	<220>		
[4942]	<223> 碱基编辑器融合蛋白		
[4943]	<400> 57		
[4944]	Met Lys Arg Thr Ala Asp Gly Ser Glu Phe Glu Ser Pro Lys Lys Lys		
[4945]	1 5 10 15		
[4946]	Arg Lys Val Thr Asn Leu Ser Asp Ile Ile Glu Lys Glu Thr Gly Lys		
[4947]	20 25 30		
[4948]	Gln Leu Val Ile Gln Glu Ser Ile Leu Met Leu Pro Glu Glu Val Glu		
[4949]	35 40 45		
[4950]	Glu Val Ile Gly Asn Lys Pro Glu Ser Asp Ile Leu Val His Thr Ala		
[4951]	50 55 60		
[4952]	Tyr Asp Glu Ser Thr Asp Glu Asn Val Met Leu Leu Thr Ser Asp Ala		
[4953]	65 70 75 80		
[4954]	Pro Glu Tyr Lys Pro Trp Ala Leu Val Ile Gln Asp Ser Asn Gly Glu		
[4955]	85 90 95		

[4956]	Asn Lys Ile Lys Met Leu Pro Gln Pro Asp Glu Arg Ser Gln Ile Pro
[4957]	100 105 110
[4958]	Asp Asn Lys Glu Ser Lys Leu Glu Lys Phe Thr Asn Cys Tyr Ser Leu
[4959]	115 120 125
[4960]	Ser Lys Thr Leu Arg Phe Lys Ala Ile Pro Val Gly Lys Thr Gln Glu
[4961]	130 135 140
[4962]	Asn Ile Asp Asn Lys Arg Leu Leu Val Glu Asp Glu Lys Arg Ala Glu
[4963]	145 150 155 160
[4964]	Asp Tyr Lys Gly Val Lys Lys Leu Leu Asp Arg Tyr Tyr Leu Ser Phe
[4965]	165 170 175
[4966]	Ile Asn Asp Val Leu His Ser Ile Lys Leu Lys Asn Leu Asn Asn Tyr
[4967]	180 185 190
[4968]	Ile Ser Leu Phe Arg Lys Lys Thr Arg Thr Glu Lys Glu Asn Lys Glu
[4969]	195 200 205
[4970]	Leu Glu Asn Leu Glu Ile Asn Leu Arg Lys Glu Ile Ala Lys Ala Phe
[4971]	210 215 220
[4972]	Lys Gly Asn Glu Gly Tyr Lys Ser Leu Phe Lys Lys Asp Ile Ile Glu
[4973]	225 230 235 240
[4974]	Thr Ile Leu Pro Glu Phe Leu Asp Asp Lys Asp Glu Ile Ala Leu Val
[4975]	245 250 255
[4976]	Asn Ser Phe Asn Gly Phe Thr Thr Ala Phe Thr Gly Phe Phe Asp Asn
[4977]	260 265 270
[4978]	Arg Glu Asn Met Phe Ser Glu Glu Ala Lys Ser Thr Ser Ile Ala Phe
[4979]	275 280 285
[4980]	Arg Cys Ile Asn Glu Asn Leu Thr Arg Tyr Ile Ser Asn Met Asp Ile
[4981]	290 295 300
[4982]	Phe Glu Lys Val Asp Ala Ile Phe Asp Lys His Glu Val Gln Glu Ile
[4983]	305 310 315 320
[4984]	Lys Glu Lys Ile Leu Asn Ser Asp Tyr Asp Val Glu Asp Phe Phe Glu
[4985]	325 330 335
[4986]	Gly Glu Phe Phe Asn Phe Val Leu Thr Gln Glu Gly Ile Asp Val Tyr
[4987]	340 345 350
[4988]	Asn Ala Ile Ile Gly Gly Phe Val Thr Glu Ser Gly Glu Lys Ile Lys
[4989]	355 360 365
[4990]	Gly Leu Asn Glu Tyr Ile Asn Leu Tyr Asn Gln Lys Thr Lys Gln Lys
[4991]	370 375 380
[4992]	Leu Pro Lys Phe Lys Pro Leu Tyr Lys Gln Val Leu Ser Asp Arg Glu
[4993]	385 390 395 400
[4994]	Ser Leu Ser Phe Tyr Gly Glu Gly Tyr Thr Ser Asp Glu Glu Val Leu
[4995]	405 410 415
[4996]	Glu Val Phe Arg Asn Thr Leu Asn Lys Asn Ser Glu Ile Phe Ser Ser
[4997]	420 425 430

[4998]	Ile Lys Lys Leu Glu Lys Leu Phe Lys Asn Phe Asp Glu Tyr Ser Ser	
[4999]	435	440 445
[5000]	Ala Gly Ile Phe Val Lys Asn Gly Pro Ala Ile Ser Thr Ile Ser Lys	
[5001]	450	455 460
[5002]	Asp Ile Phe Gly Glu Trp Asn Val Ile Arg Asp Lys Trp Asn Ala Glu	
[5003]	465	470 475 480
[5004]	Tyr Asp Asp Ile His Leu Lys Lys Lys Ala Val Val Thr Glu Lys Tyr	
[5005]	485	490 495
[5006]	Glu Asp Asp Arg Arg Lys Ser Phe Lys Lys Ile Gly Ser Phe Ser Leu	
[5007]	500	505 510
[5008]	Glu Gln Leu Gln Glu Tyr Ala Asp Ala Asp Leu Ser Val Val Glu Lys	
[5009]	515	520 525
[5010]	Leu Lys Glu Ile Ile Ile Gln Lys Val Asp Glu Ile Tyr Lys Val Tyr	
[5011]	530	535 540
[5012]	Gly Ser Ser Glu Lys Leu Phe Asp Ala Asp Phe Val Leu Glu Lys Ser	
[5013]	545	550 555 560
[5014]	Leu Lys Lys Asn Asp Ala Val Val Ala Ile Met Lys Asp Leu Leu Asp	
[5015]	565	570 575
[5016]	Ser Val Lys Ser Phe Glu Asn Tyr Ile Lys Ala Phe Phe Gly Glu Gly	
[5017]	580	585 590
[5018]	Lys Glu Thr Asn Arg Asp Glu Ser Phe Tyr Gly Asp Phe Val Leu Ala	
[5019]	595	600 605
[5020]	Tyr Asp Ile Leu Leu Lys Val Asp His Ile Tyr Asp Ala Ile Arg Asn	
[5021]	610	615 620
[5022]	Tyr Val Thr Gln Lys Pro Tyr Ser Lys Asp Lys Phe Lys Leu Tyr Phe	
[5023]	625	630 635 640
[5024]	Gln Asn Pro Gln Phe Met Gly Gly Trp Asp Lys Asp Lys Glu Thr Asp	
[5025]	645	650 655
[5026]	Tyr Arg Ala Thr Ile Leu Arg Tyr Gly Ser Lys Tyr Tyr Leu Ala Ile	
[5027]	660	665 670
[5028]	Met Asp Lys Lys Tyr Ala Lys Cys Leu Gln Lys Ile Asp Lys Asp Asp	
[5029]	675	680 685
[5030]	Val Asn Gly Asn Tyr Glu Lys Ile Asn Tyr Lys Leu Leu Pro Gly Pro	
[5031]	690	695 700
[5032]	Asn Lys Met Leu Pro Lys Val Phe Phe Ser Lys Lys Trp Met Ala Tyr	
[5033]	705	710 715 720
[5034]	Tyr Asn Pro Ser Glu Asp Ile Gln Lys Ile Tyr Lys Asn Gly Thr Phe	
[5035]	725	730 735
[5036]	Lys Lys Gly Asp Met Phe Asn Leu Asn Asp Cys His Lys Leu Ile Asp	
[5037]	740	745 750
[5038]	Phe Phe Lys Asp Ser Ile Ser Arg Tyr Pro Lys Trp Ser Asn Ala Tyr	
[5039]	755	760 765

[5040]	Asp Phe Asn Phe Ser Glu Thr Glu Lys Tyr Lys Asp Ile Ala Gly Phe		
[5041]	770	775	780
[5042]	Tyr Arg Glu Val Glu Glu Gln Gly Tyr Lys Val Ser Phe Glu Ser Ala		
[5043]	785	790	795 800
[5044]	Ser Lys Lys Glu Val Asp Lys Leu Val Glu Glu Gly Lys Leu Tyr Met		
[5045]	805	810	815
[5046]	Phe Gln Ile Tyr Asn Lys Asp Phe Ser Asp Lys Ser His Gly Thr Pro		
[5047]	820	825	830
[5048]	Asn Leu His Thr Met Tyr Phe Lys Leu Leu Phe Asp Glu Asn Asn His		
[5049]	835	840	845
[5050]	Gly Gln Ile Arg Leu Ser Gly Gly Ala Glu Leu Phe Met Arg Arg Ala		
[5051]	850	855	860
[5052]	Ser Leu Lys Lys Glu Glu Leu Val Val His Pro Ala Asn Ser Pro Ile		
[5053]	865	870	875 880
[5054]	Ala Asn Lys Asn Pro Asp Asn Pro Lys Lys Thr Thr Thr Leu Ser Tyr		
[5055]	885	890	895
[5056]	Asp Val Tyr Lys Asp Lys Arg Phe Ser Glu Asp Gln Tyr Glu Leu His		
[5057]	900	905	910
[5058]	Ile Pro Ile Ala Ile Asn Lys Cys Pro Lys Asn Ile Phe Lys Ile Asn		
[5059]	915	920	925
[5060]	Thr Glu Val Arg Val Leu Leu Lys His Asp Asp Asn Pro Tyr Val Ile		
[5061]	930	935	940
[5062]	Gly Ile Ala Arg Gly Glu Arg Asn Leu Leu Tyr Ile Val Val Val Asp		
[5063]	945	950	955 960
[5064]	Gly Lys Gly Asn Ile Val Glu Gln Tyr Ser Leu Asn Glu Ile Ile Asn		
[5065]	965	970	975
[5066]	Asn Phe Asn Gly Ile Arg Ile Lys Thr Asp Tyr His Ser Leu Leu Asp		
[5067]	980	985	990
[5068]	Lys Lys Glu Lys Glu Arg Phe Glu Ala Arg Gln Asn Trp Thr Ser Ile		
[5069]	995	1000	1005
[5070]	Glu Asn Ile Lys Glu Leu Lys Ala Gly Tyr Ile Ser Gln Val Val		
[5071]	1010	1015	1020
[5072]	His Lys Ile Cys Glu Leu Val Glu Lys Tyr Asp Ala Val Ile Ala		
[5073]	1025	1030	1035
[5074]	Leu Glu Asp Leu Asn Ser Gly Phe Lys Asn Ser Arg Val Lys Val		
[5075]	1040	1045	1050
[5076]	Glu Lys Gln Val Tyr Gln Lys Phe Glu Lys Met Leu Ile Asp Lys		
[5077]	1055	1060	1065
[5078]	Leu Asn Tyr Met Val Asp Lys Lys Ser Asn Pro Cys Ala Thr Gly		
[5079]	1070	1075	1080
[5080]	Gly Ala Leu Lys Gly Tyr Gln Ile Thr Asn Lys Phe Glu Ser Phe		
[5081]	1085	1090	1095

[5082]	Lys	Ser	Met	Ser	Thr	Gln	Asn	Gly	Phe	Ile	Phe	Tyr	Ile	Pro	Ala
[5083]	1100						1105					1110			
[5084]	Trp	Leu	Thr	Ser	Lys	Ile	Asp	Pro	Ser	Thr	Gly	Phe	Val	Asn	Leu
[5085]	1115						1120					1125			
[5086]	Leu	Lys	Thr	Lys	Tyr	Thr	Ser	Ile	Ala	Asp	Ser	Lys	Lys	Phe	Ile
[5087]	1130						1135					1140			
[5088]	Ser	Ser	Phe	Asp	Arg	Ile	Met	Tyr	Val	Pro	Glu	Glu	Asp	Leu	Phe
[5089]	1145						1150					1155			
[5090]	Glu	Phe	Ala	Leu	Asp	Tyr	Lys	Asn	Phe	Ser	Arg	Thr	Asp	Ala	Asp
[5091]	1160						1165					1170			
[5092]	Tyr	Ile	Lys	Lys	Trp	Lys	Leu	Tyr	Ser	Tyr	Gly	Asn	Arg	Ile	Arg
[5093]	1175						1180					1185			
[5094]	Ile	Phe	Arg	Asn	Pro	Lys	Lys	Asn	Asn	Val	Phe	Asp	Trp	Glu	Glu
[5095]	1190						1195					1200			
[5096]	Val	Cys	Leu	Thr	Ser	Ala	Tyr	Lys	Glu	Leu	Phe	Asn	Lys	Tyr	Gly
[5097]	1205						1210					1215			
[5098]	Ile	Asn	Tyr	Gln	Gln	Gly	Asp	Ile	Arg	Ala	Leu	Leu	Cys	Glu	Gln
[5099]	1220						1225					1230			
[5100]	Ser	Asp	Lys	Ala	Phe	Tyr	Ser	Ser	Phe	Met	Ala	Leu	Met	Ser	Leu
[5101]	1235						1240					1245			
[5102]	Met	Leu	Gln	Met	Arg	Asn	Ser	Ile	Thr	Gly	Arg	Thr	Asp	Val	Asp
[5103]	1250						1255					1260			
[5104]	Phe	Leu	Ile	Ser	Pro	Val	Lys	Asn	Ser	Asp	Gly	Ile	Phe	Tyr	Asp
[5105]	1265						1270					1275			
[5106]	Ser	Arg	Asn	Tyr	Glu	Ala	Gln	Glu	Asn	Ala	Ile	Leu	Pro	Lys	Asn
[5107]	1280						1285					1290			
[5108]	Ala	Asp	Ala	Asn	Gly	Ala	Tyr	Asn	Ile	Ala	Arg	Lys	Val	Leu	Trp
[5109]	1295						1300					1305			
[5110]	Ala	Ile	Gly	Gln	Phe	Lys	Lys	Ala	Glu	Asp	Glu	Lys	Leu	Asp	Lys
[5111]	1310						1315					1320			
[5112]	Val	Lys	Ile	Ala	Ile	Ser	Asn	Lys	Glu	Trp	Leu	Glu	Tyr	Ala	Gln
[5113]	1325						1330					1335			
[5114]	Thr	Ser	Val	Lys	His	Ser	Gly	Ser	Glu	Thr	Pro	Gly	Thr	Ser	Glu
[5115]	1340						1345					1350			
[5116]	Ser	Ala	Thr	Pro	Glu	Ser	Ser	Ser	Glu	Thr	Gly	Pro	Val	Ala	Val
[5117]	1355						1360					1365			
[5118]	Asp	Pro	Thr	Leu	Arg	Arg	Arg	Ile	Glu	Pro	His	Glu	Phe	Glu	Val
[5119]	1370						1375					1380			
[5120]	Phe	Phe	Asp	Pro	Arg	Glu	Leu	Arg	Lys	Glu	Thr	Cys	Leu	Leu	Tyr
[5121]	1385						1390					1395			
[5122]	Glu	Ile	Asn	Trp	Gly	Gly	Arg	His	Ser	Ile	Trp	Arg	His	Thr	Ser
[5123]	1400						1405					1410			

[5124]	Gln Asn Thr Asn Lys His Val Glu Val Asn Phe Ile Glu Lys Phe
[5125]	1415 1420 1425
[5126]	Thr Thr Glu Arg Tyr Phe Cys Pro Asn Thr Arg Cys Ser Ile Thr
[5127]	1430 1435 1440
[5128]	Trp Phe Leu Ser Trp Ser Pro Cys Gly Glu Cys Ser Arg Ala Ile
[5129]	1445 1450 1455
[5130]	Thr Glu Phe Leu Ser Arg Tyr Pro His Val Thr Leu Phe Ile Tyr
[5131]	1460 1465 1470
[5132]	Ile Ala Arg Leu Tyr His His Ala Asp Pro Arg Asn Arg Gln Gly
[5133]	1475 1480 1485
[5134]	Leu Arg Asp Leu Ile Ser Ser Gly Val Thr Ile Gln Ile Met Thr
[5135]	1490 1495 1500
[5136]	Glu Gln Glu Ser Gly Tyr Cys Trp Arg Asn Phe Val Asn Tyr Ser
[5137]	1505 1510 1515
[5138]	Pro Ser Asn Glu Ala His Trp Pro Arg Tyr Pro His Leu Trp Val
[5139]	1520 1525 1530
[5140]	Arg Leu Tyr Val Leu Glu Leu Tyr Cys Ile Ile Leu Gly Leu Pro
[5141]	1535 1540 1545
[5142]	Pro Cys Leu Asn Ile Leu Arg Arg Lys Gln Pro Gln Leu Thr Phe
[5143]	1550 1555 1560
[5144]	Phe Thr Ile Ala Leu Gln Ser Cys His Tyr Gln Arg Leu Pro Pro
[5145]	1565 1570 1575
[5146]	His Ile Leu Trp Ala Thr Gly Leu Lys Ser Gly Gly Ser Lys Arg
[5147]	1580 1585 1590
[5148]	Thr Ala Asp Gly Ser Glu Phe
[5149]	1595 1600
[5150]	<210> 58
[5151]	<211> 1596
[5152]	<212> PRT
[5153]	<213> 人工的
[5154]	<220>
[5155]	<223> 碱基编辑器融合蛋白
[5156]	<400> 58
[5157]	Met Lys Arg Thr Ala Asp Gly Ser Glu Phe Glu Ser Pro Lys Lys Lys
[5158]	1 5 10 15
[5159]	Arg Lys Val Ser Lys Leu Glu Lys Phe Thr Asn Cys Tyr Ser Leu Ser
[5160]	20 25 30
[5161]	Lys Thr Leu Arg Phe Lys Ala Ile Pro Val Gly Lys Thr Gln Glu Asn
[5162]	35 40 45
[5163]	Ile Asp Asn Lys Arg Leu Leu Val Glu Asp Glu Lys Arg Ala Glu Asp
[5164]	50 55 60
[5165]	Tyr Lys Gly Val Lys Lys Leu Leu Asp Arg Tyr Tyr Leu Ser Phe Ile

[5166]	65	70	75	80
[5167]	Asn Asp Val Leu His Ser Ile Lys Leu Lys Asn Leu Asn Asn Tyr Ile			
[5168]		85	90	95
[5169]	Ser Leu Phe Arg Lys Lys Thr Arg Thr Glu Lys Glu Asn Lys Glu Leu			
[5170]		100	105	110
[5171]	Glu Asn Leu Glu Ile Asn Leu Arg Lys Glu Ile Ala Lys Ala Phe Lys			
[5172]		115	120	125
[5173]	Gly Asn Glu Gly Tyr Lys Ser Leu Phe Lys Lys Asp Ile Ile Glu Thr			
[5174]		130	135	140
[5175]	Ile Leu Pro Glu Phe Leu Asp Asp Lys Asp Glu Ile Ala Leu Val Asn			
[5176]	145	150	155	160
[5177]	Ser Phe Asn Gly Phe Thr Thr Ala Phe Thr Gly Phe Phe Asp Asn Arg			
[5178]		165	170	175
[5179]	Glu Asn Met Phe Ser Glu Glu Ala Lys Ser Thr Ser Ile Ala Phe Arg			
[5180]		180	185	190
[5181]	Cys Ile Asn Glu Asn Leu Thr Arg Tyr Ile Ser Asn Met Asp Ile Phe			
[5182]		195	200	205
[5183]	Glu Lys Val Asp Ala Ile Phe Asp Lys His Glu Val Gln Glu Ile Lys			
[5184]		210	215	220
[5185]	Glu Lys Ile Leu Asn Ser Asp Tyr Asp Val Glu Asp Phe Phe Glu Gly			
[5186]	225	230	235	240
[5187]	Glu Phe Phe Asn Phe Val Leu Thr Gln Glu Gly Ile Asp Val Tyr Asn			
[5188]		245	250	255
[5189]	Ala Ile Ile Gly Gly Phe Val Thr Glu Ser Gly Glu Lys Ile Lys Gly			
[5190]		260	265	270
[5191]	Leu Asn Glu Tyr Ile Asn Leu Tyr Asn Gln Lys Thr Lys Gln Lys Leu			
[5192]		275	280	285
[5193]	Pro Lys Phe Lys Pro Leu Tyr Lys Gln Val Leu Ser Asp Arg Glu Ser			
[5194]		290	295	300
[5195]	Leu Ser Phe Tyr Gly Glu Gly Tyr Thr Ser Asp Glu Glu Val Leu Glu			
[5196]	305	310	315	320
[5197]	Val Phe Arg Asn Thr Leu Asn Lys Asn Ser Glu Ile Phe Ser Ser Ile			
[5198]		325	330	335
[5199]	Lys Lys Leu Glu Lys Leu Phe Lys Asn Phe Asp Glu Tyr Ser Ser Ala			
[5200]		340	345	350
[5201]	Gly Ile Phe Val Lys Asn Gly Pro Ala Ile Ser Thr Ile Ser Lys Asp			
[5202]		355	360	365
[5203]	Ile Phe Gly Glu Trp Asn Val Ile Arg Asp Lys Trp Asn Ala Glu Tyr			
[5204]		370	375	380
[5205]	Asp Asp Ile His Leu Lys Lys Lys Ala Val Val Thr Glu Lys Tyr Glu			
[5206]	385	390	395	400
[5207]	Asp Asp Arg Arg Lys Ser Phe Lys Lys Ile Gly Ser Phe Ser Leu Glu			

[5208]	405							410							415			
[5209]	Gln	Leu	Gln	Glu	Tyr	Ala	Asp	Ala	Asp	Leu	Ser	Val	Val	Glu	Lys	Leu		
[5210]	420							425							430			
[5211]	Lys	Glu	Ile	Ile	Ile	Gln	Lys	Val	Asp	Glu	Ile	Tyr	Lys	Val	Tyr	Gly		
[5212]	435							440							445			
[5213]	Ser	Ser	Glu	Lys	Leu	Phe	Asp	Ala	Asp	Phe	Val	Leu	Glu	Lys	Ser	Leu		
[5214]	450							455							460			
[5215]	Lys	Lys	Asn	Asp	Ala	Val	Val	Ala	Ile	Met	Lys	Asp	Leu	Leu	Asp	Ser		
[5216]	465	470							475							480		
[5217]	Val	Lys	Ser	Phe	Glu	Asn	Tyr	Ile	Lys	Ala	Phe	Phe	Gly	Glu	Gly	Lys		
[5218]	485							490							495			
[5219]	Glu	Thr	Asn	Arg	Asp	Glu	Ser	Phe	Tyr	Gly	Asp	Phe	Val	Leu	Ala	Tyr		
[5220]	500							505							510			
[5221]	Asp	Ile	Leu	Leu	Lys	Val	Asp	His	Ile	Tyr	Asp	Ala	Ile	Arg	Asn	Tyr		
[5222]	515							520							525			
[5223]	Val	Thr	Gln	Lys	Pro	Tyr	Ser	Lys	Asp	Lys	Phe	Lys	Leu	Tyr	Phe	Gln		
[5224]	530							535							540			
[5225]	Asn	Pro	Gln	Phe	Met	Gly	Gly	Trp	Asp	Lys	Asp	Lys	Glu	Thr	Asp	Tyr		
[5226]	545	550							555							560		
[5227]	Arg	Ala	Thr	Ile	Leu	Arg	Tyr	Gly	Ser	Lys	Tyr	Tyr	Leu	Ala	Ile	Met		
[5228]	565							570							575			
[5229]	Asp	Lys	Lys	Tyr	Ala	Lys	Cys	Leu	Gln	Lys	Ile	Asp	Lys	Asp	Asp	Val		
[5230]	580							585							590			
[5231]	Asn	Gly	Asn	Tyr	Glu	Lys	Ile	Asn	Tyr	Lys	Leu	Leu	Pro	Gly	Pro	Asn		
[5232]	595							600							605			
[5233]	Lys	Met	Leu	Pro	Lys	Val	Phe	Phe	Ser	Lys	Lys	Trp	Met	Ala	Tyr	Tyr		
[5234]	610							615							620			
[5235]	Asn	Pro	Ser	Glu	Asp	Ile	Gln	Lys	Ile	Tyr	Lys	Asn	Gly	Thr	Phe	Lys		
[5236]	625	630							635							640		
[5237]	Lys	Gly	Asp	Met	Phe	Asn	Leu	Asn	Asp	Cys	His	Lys	Leu	Ile	Asp	Phe		
[5238]	645							650							655			
[5239]	Phe	Lys	Asp	Ser	Ile	Ser	Arg	Tyr	Pro	Lys	Trp	Ser	Asn	Ala	Tyr	Asp		
[5240]	660							665							670			
[5241]	Phe	Asn	Phe	Ser	Glu	Thr	Glu	Lys	Tyr	Lys	Asp	Ile	Ala	Gly	Phe	Tyr		
[5242]	675							680							685			
[5243]	Arg	Glu	Val	Glu	Glu	Gln	Gly	Tyr	Lys	Val	Ser	Phe	Glu	Ser	Ala	Ser		
[5244]	690							695							700			
[5245]	Lys	Lys	Glu	Val	Asp	Lys	Leu	Val	Glu	Glu	Gly	Lys	Leu	Tyr	Met	Phe		
[5246]	705	710							715							720		
[5247]	Gln	Ile	Tyr	Asn	Lys	Asp	Phe	Ser	Asp	Lys	Ser	His	Gly	Thr	Pro	Asn		
[5248]	725							730							735			
[5249]	Leu	His	Thr	Met	Tyr	Phe	Lys	Leu	Leu	Phe	Asp	Glu	Asn	Asn	His	Gly		

[5250]	740	745	750
[5251]	Gln Ile Arg Leu Ser Gly Gly Ala Glu Leu Phe Met Arg Arg Ala Ser		
[5252]	755	760	765
[5253]	Leu Lys Lys Glu Glu Leu Val Val His Pro Ala Asn Ser Pro Ile Ala		
[5254]	770	775	780
[5255]	Asn Lys Asn Pro Asp Asn Pro Lys Lys Thr Thr Thr Leu Ser Tyr Asp		
[5256]	785	790	795 800
[5257]	Val Tyr Lys Asp Lys Arg Phe Ser Glu Asp Gln Tyr Glu Leu His Ile		
[5258]	805	810	815
[5259]	Pro Ile Ala Ile Asn Lys Cys Pro Lys Asn Ile Phe Lys Ile Asn Thr		
[5260]	820	825	830
[5261]	Glu Val Arg Val Leu Leu Lys His Asp Asp Asn Pro Tyr Val Ile Gly		
[5262]	835	840	845
[5263]	Ile Ala Arg Gly Glu Arg Asn Leu Leu Tyr Ile Val Val Val Asp Gly		
[5264]	850	855	860
[5265]	Lys Gly Asn Ile Val Glu Gln Tyr Ser Leu Asn Glu Ile Ile Asn Asn		
[5266]	865	870	875 880
[5267]	Phe Asn Gly Ile Arg Ile Lys Thr Asp Tyr His Ser Leu Leu Asp Lys		
[5268]	885	890	895
[5269]	Lys Glu Lys Glu Arg Phe Glu Ala Arg Gln Asn Trp Thr Ser Ile Glu		
[5270]	900	905	910
[5271]	Asn Ile Lys Glu Leu Lys Ala Gly Tyr Ile Ser Gln Val Val His Lys		
[5272]	915	920	925
[5273]	Ile Cys Glu Leu Val Glu Lys Tyr Asp Ala Val Ile Ala Leu Glu Asp		
[5274]	930	935	940
[5275]	Leu Asn Ser Gly Phe Lys Asn Ser Arg Val Lys Val Glu Lys Gln Val		
[5276]	945	950	955 960
[5277]	Tyr Gln Lys Phe Glu Lys Met Leu Ile Asp Lys Leu Asn Tyr Met Val		
[5278]	965	970	975
[5279]	Asp Lys Lys Ser Asn Pro Cys Ala Thr Gly Gly Ala Leu Lys Gly Tyr		
[5280]	980	985	990
[5281]	Gln Ile Thr Asn Lys Phe Glu Ser Phe Lys Ser Met Ser Thr Gln Asn		
[5282]	995	1000	1005
[5283]	Gly Phe Ile Phe Tyr Ile Pro Ala Trp Leu Thr Ser Lys Ile Asp		
[5284]	1010	1015	1020
[5285]	Pro Ser Thr Gly Phe Val Asn Leu Leu Lys Thr Lys Tyr Thr Ser		
[5286]	1025	1030	1035
[5287]	Ile Ala Asp Ser Lys Lys Phe Ile Ser Ser Phe Asp Arg Ile Met		
[5288]	1040	1045	1050
[5289]	Tyr Val Pro Glu Glu Asp Leu Phe Glu Phe Ala Leu Asp Tyr Lys		
[5290]	1055	1060	1065
[5291]	Asn Phe Ser Arg Thr Asp Ala Asp Tyr Ile Lys Lys Trp Lys Leu		

[5292]	1070	1075	1080
[5293]	Tyr Ser Tyr Gly Asn Arg Ile Arg Ile Phe Arg Asn Pro Lys Lys		
[5294]	1085	1090	1095
[5295]	Asn Asn Val Phe Asp Trp Glu Glu Val Cys Leu Thr Ser Ala Tyr		
[5296]	1100	1105	1110
[5297]	Lys Glu Leu Phe Asn Lys Tyr Gly Ile Asn Tyr Gln Gln Gly Asp		
[5298]	1115	1120	1125
[5299]	Ile Arg Ala Leu Leu Cys Glu Gln Ser Asp Lys Ala Phe Tyr Ser		
[5300]	1130	1135	1140
[5301]	Ser Phe Met Ala Leu Met Ser Leu Met Leu Gln Met Arg Asn Ser		
[5302]	1145	1150	1155
[5303]	Ile Thr Gly Arg Thr Asp Val Asp Phe Leu Ile Ser Pro Val Lys		
[5304]	1160	1165	1170
[5305]	Asn Ser Asp Gly Ile Phe Tyr Asp Ser Arg Asn Tyr Glu Ala Gln		
[5306]	1175	1180	1185
[5307]	Glu Asn Ala Ile Leu Pro Lys Asn Ala Asp Ala Asn Gly Ala Tyr		
[5308]	1190	1195	1200
[5309]	Asn Ile Ala Arg Lys Val Leu Trp Ala Ile Gly Gln Phe Lys Lys		
[5310]	1205	1210	1215
[5311]	Ala Glu Asp Glu Lys Leu Asp Lys Val Lys Ile Ala Ile Ser Asn		
[5312]	1220	1225	1230
[5313]	Lys Glu Trp Leu Glu Tyr Ala Gln Thr Ser Val Lys His Ser Thr		
[5314]	1235	1240	1245
[5315]	Asp Gly Ser Gly Gln Pro Lys His Lys Pro Thr Asn Leu Ser Asp		
[5316]	1250	1255	1260
[5317]	Ile Ile Glu Lys Glu Thr Gly Lys Gln Leu Val Ile Gln Glu Ser		
[5318]	1265	1270	1275
[5319]	Ile Leu Met Leu Pro Glu Glu Val Glu Glu Val Ile Gly Asn Lys		
[5320]	1280	1285	1290
[5321]	Pro Glu Ser Asp Ile Leu Val His Thr Ala Tyr Asp Glu Ser Thr		
[5322]	1295	1300	1305
[5323]	Asp Glu Asn Val Met Leu Leu Thr Ser Asp Ala Pro Glu Tyr Lys		
[5324]	1310	1315	1320
[5325]	Pro Trp Ala Leu Val Ile Gln Asp Ser Asn Gly Glu Asn Lys Ile		
[5326]	1325	1330	1335
[5327]	Lys Met Leu Val Ala Gly Gly Thr Pro Phe Glu Pro Pro Pro Pro		
[5328]	1340	1345	1350
[5329]	Asn Ser Ser Ser Glu Thr Gly Pro Val Ala Val Asp Pro Thr Leu		
[5330]	1355	1360	1365
[5331]	Arg Arg Arg Ile Glu Pro His Glu Phe Glu Val Phe Phe Asp Pro		
[5332]	1370	1375	1380
[5333]	Arg Glu Leu Arg Lys Glu Thr Cys Leu Leu Tyr Glu Ile Asn Trp		

[5334]	1385	1390	1395
[5335]	Gly Gly Arg His Ser Ile Trp	Arg His Thr Ser Gln Asn Thr Asn	
[5336]	1400	1405	1410
[5337]	Lys His Val Glu Val Asn Phe	Ile Glu Lys Phe Thr Thr Glu Arg	
[5338]	1415	1420	1425
[5339]	Tyr Phe Cys Pro Asn Thr Arg	Cys Ser Ile Thr Trp Phe Leu Ser	
[5340]	1430	1435	1440
[5341]	Trp Ser Pro Cys Gly Glu Cys	Ser Arg Ala Ile Thr Glu Phe Leu	
[5342]	1445	1450	1455
[5343]	Ser Arg Tyr Pro His Val Thr	Leu Phe Ile Tyr Ile Ala Arg Leu	
[5344]	1460	1465	1470
[5345]	Tyr His His Ala Asp Pro Arg	Asn Arg Gln Gly Leu Arg Asp Leu	
[5346]	1475	1480	1485
[5347]	Ile Ser Ser Gly Val Thr Ile	Gln Ile Met Thr Glu Gln Glu Ser	
[5348]	1490	1495	1500
[5349]	Gly Tyr Cys Trp Arg Asn Phe	Val Asn Tyr Ser Pro Ser Asn Glu	
[5350]	1505	1510	1515
[5351]	Ala His Trp Pro Arg Tyr Pro	His Leu Trp Val Arg Leu Tyr Val	
[5352]	1520	1525	1530
[5353]	Leu Glu Leu Tyr Cys Ile Ile	Leu Gly Leu Pro Pro Cys Leu Asn	
[5354]	1535	1540	1545
[5355]	Ile Leu Arg Arg Lys Gln Pro	Gln Leu Thr Phe Phe Thr Ile Ala	
[5356]	1550	1555	1560
[5357]	Leu Gln Ser Cys His Tyr Gln	Arg Leu Pro Pro His Ile Leu Trp	
[5358]	1565	1570	1575
[5359]	Ala Thr Gly Leu Lys Ser Gly	Gly Ser Lys Arg Thr Ala Asp Gly	
[5360]	1580	1585	1590
[5361]	Ser Glu Phe		
[5362]	1595		
[5363]	<210> 59		
[5364]	<211> 1598		
[5365]	<212> PRT		
[5366]	<213> 人工的		
[5367]	<220>		
[5368]	<223> 碱基编辑器融合蛋白		
[5369]	<400> 59		
[5370]	Met Lys Arg Thr Ala Asp Gly Ser Glu Phe Glu Ser Pro Lys Lys Lys		
[5371]	1 5 10 15		
[5372]	Arg Lys Val Ser Lys Leu Glu Lys Phe Thr Asn Cys Tyr Ser Leu Ser		
[5373]	20 25 30		
[5374]	Lys Thr Leu Arg Phe Lys Ala Ile Pro Val Gly Lys Thr Gln Glu Asn		
[5375]	35 40 45		

[5376]	Ile Asp Asn Lys Arg Leu Leu Val Glu Asp Glu Lys Arg Ala Glu Asp		
[5377]	50	55	60
[5378]	Tyr Lys Gly Val Lys Lys Leu Leu Asp Arg Tyr Tyr Leu Ser Phe Ile		
[5379]	65	70	75
[5380]	Asn Asp Val Leu His Ser Ile Lys Leu Lys Asn Leu Asn Asn Tyr Ile		
[5381]	85	90	95
[5382]	Ser Leu Phe Arg Lys Lys Thr Arg Thr Glu Lys Glu Asn Lys Glu Leu		
[5383]	100	105	110
[5384]	Glu Asn Leu Glu Ile Asn Leu Arg Lys Glu Ile Ala Lys Ala Phe Lys		
[5385]	115	120	125
[5386]	Gly Asn Glu Gly Tyr Lys Ser Leu Phe Lys Lys Asp Ile Ile Glu Thr		
[5387]	130	135	140
[5388]	Ile Leu Pro Glu Phe Leu Asp Asp Lys Asp Glu Ile Ala Leu Val Asn		
[5389]	145	150	155
[5390]	Ser Phe Asn Gly Phe Thr Thr Ala Phe Thr Gly Phe Phe Asp Asn Arg		
[5391]	165	170	175
[5392]	Glu Asn Met Phe Ser Glu Glu Ala Lys Ser Thr Ser Ile Ala Phe Arg		
[5393]	180	185	190
[5394]	Cys Ile Asn Glu Asn Leu Thr Arg Tyr Ile Ser Asn Met Asp Ile Phe		
[5395]	195	200	205
[5396]	Glu Lys Val Asp Ala Ile Phe Asp Lys His Glu Val Gln Glu Ile Lys		
[5397]	210	215	220
[5398]	Glu Lys Ile Leu Asn Ser Asp Tyr Asp Val Glu Asp Phe Phe Glu Gly		
[5399]	225	230	235
[5400]	Glu Phe Phe Asn Phe Val Leu Thr Gln Glu Gly Ile Asp Val Tyr Asn		
[5401]	245	250	255
[5402]	Ala Ile Ile Gly Gly Phe Val Thr Glu Ser Gly Glu Lys Ile Lys Gly		
[5403]	260	265	270
[5404]	Leu Asn Glu Tyr Ile Asn Leu Tyr Asn Gln Lys Thr Lys Gln Lys Leu		
[5405]	275	280	285
[5406]	Pro Lys Phe Lys Pro Leu Tyr Lys Gln Val Leu Ser Asp Arg Glu Ser		
[5407]	290	295	300
[5408]	Leu Ser Phe Tyr Gly Glu Gly Tyr Thr Ser Asp Glu Glu Val Leu Glu		
[5409]	305	310	315
[5410]	Val Phe Arg Asn Thr Leu Asn Lys Asn Ser Glu Ile Phe Ser Ser Ile		
[5411]	325	330	335
[5412]	Lys Lys Leu Glu Lys Leu Phe Lys Asn Phe Asp Glu Tyr Ser Ser Ala		
[5413]	340	345	350
[5414]	Gly Ile Phe Val Lys Asn Gly Pro Ala Ile Ser Thr Ile Ser Lys Asp		
[5415]	355	360	365
[5416]	Ile Phe Gly Glu Trp Asn Val Ile Arg Asp Lys Trp Asn Ala Glu Tyr		
[5417]	370	375	380

[5418]	Asp Asp Ile His Leu Lys Lys Lys Ala Val Val Thr Glu Lys Tyr Glu		
[5419]	385	390	395 400
[5420]	Asp Asp Arg Arg Lys Ser Phe Lys Lys Ile Gly Ser Phe Ser Leu Glu		
[5421]	405	410	415
[5422]	Gln Leu Gln Glu Tyr Ala Asp Ala Asp Leu Ser Val Val Glu Lys Leu		
[5423]	420	425	430
[5424]	Lys Glu Ile Ile Ile Gln Lys Val Asp Glu Ile Tyr Lys Val Tyr Gly		
[5425]	435	440	445
[5426]	Ser Ser Glu Lys Leu Phe Asp Ala Asp Phe Val Leu Glu Lys Ser Leu		
[5427]	450	455	460
[5428]	Lys Lys Asn Asp Ala Val Val Ala Ile Met Lys Asp Leu Leu Asp Ser		
[5429]	465	470	475 480
[5430]	Val Lys Ser Phe Glu Asn Tyr Ile Lys Ala Phe Phe Gly Glu Gly Lys		
[5431]	485	490	495
[5432]	Glu Thr Asn Arg Asp Glu Ser Phe Tyr Gly Asp Phe Val Leu Ala Tyr		
[5433]	500	505	510
[5434]	Asp Ile Leu Leu Lys Val Asp His Ile Tyr Asp Ala Ile Arg Asn Tyr		
[5435]	515	520	525
[5436]	Val Thr Gln Lys Pro Tyr Ser Lys Asp Lys Phe Lys Leu Tyr Phe Gln		
[5437]	530	535	540
[5438]	Asn Pro Gln Phe Met Gly Gly Trp Asp Lys Asp Lys Glu Thr Asp Tyr		
[5439]	545	550	555 560
[5440]	Arg Ala Thr Ile Leu Arg Tyr Gly Ser Lys Tyr Tyr Leu Ala Ile Met		
[5441]	565	570	575
[5442]	Asp Lys Lys Tyr Ala Lys Cys Leu Gln Lys Ile Asp Lys Asp Asp Val		
[5443]	580	585	590
[5444]	Asn Gly Asn Tyr Glu Lys Ile Asn Tyr Lys Leu Leu Pro Gly Pro Asn		
[5445]	595	600	605
[5446]	Lys Met Leu Pro Lys Val Phe Phe Ser Lys Lys Trp Met Ala Tyr Tyr		
[5447]	610	615	620
[5448]	Asn Pro Ser Glu Asp Ile Gln Lys Ile Tyr Lys Asn Gly Thr Phe Lys		
[5449]	625	630	635 640
[5450]	Lys Gly Asp Met Phe Asn Leu Asn Asp Cys His Lys Leu Ile Asp Phe		
[5451]	645	650	655
[5452]	Phe Lys Asp Ser Ile Ser Arg Tyr Pro Lys Trp Ser Asn Ala Tyr Asp		
[5453]	660	665	670
[5454]	Phe Asn Phe Ser Glu Thr Glu Lys Tyr Lys Asp Ile Ala Gly Phe Tyr		
[5455]	675	680	685
[5456]	Arg Glu Val Glu Glu Gln Gly Tyr Lys Val Ser Phe Glu Ser Ala Ser		
[5457]	690	695	700
[5458]	Lys Lys Glu Val Asp Lys Leu Val Glu Glu Gly Lys Leu Tyr Met Phe		
[5459]	705	710	715 720

[5460]	Gln Ile Tyr Asn Lys Asp Phe Ser Asp Lys Ser His Gly Thr Pro Asn		
[5461]		725	730 735
[5462]	Leu His Thr Met Tyr Phe Lys Leu Leu Phe Asp Glu Asn Asn His Gly		
[5463]		740	745 750
[5464]	Gln Ile Arg Leu Ser Gly Gly Ala Glu Leu Phe Met Arg Arg Ala Ser		
[5465]		755	760 765
[5466]	Leu Lys Lys Glu Glu Leu Val Val His Pro Ala Asn Ser Pro Ile Ala		
[5467]		770	775 780
[5468]	Asn Lys Asn Pro Asp Asn Pro Lys Lys Thr Thr Thr Leu Ser Tyr Asp		
[5469]		785	790 795 800
[5470]	Val Tyr Lys Asp Lys Arg Phe Ser Glu Asp Gln Tyr Glu Leu His Ile		
[5471]		805	810 815
[5472]	Pro Ile Ala Ile Asn Lys Cys Pro Lys Asn Ile Phe Lys Ile Asn Thr		
[5473]		820	825 830
[5474]	Glu Val Arg Val Leu Leu Lys His Asp Asp Asn Pro Tyr Val Ile Gly		
[5475]		835	840 845
[5476]	Ile Ala Arg Gly Glu Arg Asn Leu Leu Tyr Ile Val Val Val Asp Gly		
[5477]		850	855 860
[5478]	Lys Gly Asn Ile Val Glu Gln Tyr Ser Leu Asn Glu Ile Ile Asn Asn		
[5479]		865	870 875 880
[5480]	Phe Asn Gly Ile Arg Ile Lys Thr Asp Tyr His Ser Leu Leu Asp Lys		
[5481]		885	890 895
[5482]	Lys Glu Lys Glu Arg Phe Glu Ala Arg Gln Asn Trp Thr Ser Ile Glu		
[5483]		900	905 910
[5484]	Asn Ile Lys Glu Leu Lys Ala Gly Tyr Ile Ser Gln Val Val His Lys		
[5485]		915	920 925
[5486]	Ile Cys Glu Leu Val Glu Lys Tyr Asp Ala Val Ile Ala Leu Glu Asp		
[5487]		930	935 940
[5488]	Leu Asn Ser Gly Phe Lys Asn Ser Arg Val Lys Val Glu Lys Gln Val		
[5489]		945	950 955 960
[5490]	Tyr Gln Lys Phe Glu Lys Met Leu Ile Asp Lys Leu Asn Tyr Met Val		
[5491]		965	970 975
[5492]	Asp Lys Lys Ser Asn Pro Cys Ala Thr Gly Gly Ala Leu Lys Gly Tyr		
[5493]		980	985 990
[5494]	Gln Ile Thr Asn Lys Phe Glu Ser Phe Lys Ser Met Ser Thr Gln Asn		
[5495]		995	1000 1005
[5496]	Gly Phe Ile Phe Tyr Ile Pro Ala Trp Leu Thr Ser Lys Ile Asp		
[5497]		1010	1015 1020
[5498]	Pro Ser Thr Gly Phe Val Asn Leu Leu Lys Thr Lys Tyr Thr Ser		
[5499]		1025	1030 1035
[5500]	Ile Ala Asp Ser Lys Lys Phe Ile Ser Ser Phe Asp Arg Ile Met		
[5501]		1040	1045 1050

[5502]	Tyr Val Pro Glu Glu Asp Leu Phe Glu Phe Ala Leu Asp Tyr Lys
[5503]	1055 1060 1065
[5504]	Asn Phe Ser Arg Thr Asp Ala Asp Tyr Ile Lys Lys Trp Lys Leu
[5505]	1070 1075 1080
[5506]	Tyr Ser Tyr Gly Asn Arg Ile Arg Ile Phe Arg Asn Pro Lys Lys
[5507]	1085 1090 1095
[5508]	Asn Asn Val Phe Asp Trp Glu Glu Val Cys Leu Thr Ser Ala Tyr
[5509]	1100 1105 1110
[5510]	Lys Glu Leu Phe Asn Lys Tyr Gly Ile Asn Tyr Gln Gln Gly Asp
[5511]	1115 1120 1125
[5512]	Ile Arg Ala Leu Leu Cys Glu Gln Ser Asp Lys Ala Phe Tyr Ser
[5513]	1130 1135 1140
[5514]	Ser Phe Met Ala Leu Met Ser Leu Met Leu Gln Met Arg Asn Ser
[5515]	1145 1150 1155
[5516]	Ile Thr Gly Arg Thr Asp Val Asp Phe Leu Ile Ser Pro Val Lys
[5517]	1160 1165 1170
[5518]	Asn Ser Asp Gly Ile Phe Tyr Asp Ser Arg Asn Tyr Glu Ala Gln
[5519]	1175 1180 1185
[5520]	Glu Asn Ala Ile Leu Pro Lys Asn Ala Asp Ala Asn Gly Ala Tyr
[5521]	1190 1195 1200
[5522]	Asn Ile Ala Arg Lys Val Leu Trp Ala Ile Gly Gln Phe Lys Lys
[5523]	1205 1210 1215
[5524]	Ala Glu Asp Glu Lys Leu Asp Lys Val Lys Ile Ala Ile Ser Asn
[5525]	1220 1225 1230
[5526]	Lys Glu Trp Leu Glu Tyr Ala Gln Thr Ser Val Lys His Ser Thr
[5527]	1235 1240 1245
[5528]	Asp Gly Ser Gly Gln Pro Lys His Lys Pro Thr Asn Leu Ser Asp
[5529]	1250 1255 1260
[5530]	Ile Ile Glu Lys Glu Thr Gly Lys Gln Leu Val Ile Gln Glu Ser
[5531]	1265 1270 1275
[5532]	Ile Leu Met Leu Pro Glu Glu Val Glu Glu Val Ile Gly Asn Lys
[5533]	1280 1285 1290
[5534]	Pro Glu Ser Asp Ile Leu Val His Thr Ala Tyr Asp Glu Ser Thr
[5535]	1295 1300 1305
[5536]	Asp Glu Asn Val Met Leu Leu Thr Ser Asp Ala Pro Glu Tyr Lys
[5537]	1310 1315 1320
[5538]	Pro Trp Ala Leu Val Ile Gln Asp Ser Asn Gly Glu Asn Lys Ile
[5539]	1325 1330 1335
[5540]	Lys Met Leu Lys Gly Gly Gly Gly Glu Pro Asp Glu Lys Arg Pro
[5541]	1340 1345 1350
[5542]	Ser Gln Ser Ser Ser Ser Glu Thr Gly Pro Val Ala Val Asp Pro
[5543]	1355 1360 1365

[5544]	Thr	Leu	Arg	Arg	Arg	Ile	Glu	Pro	His	Glu	Phe	Glu	Val	Phe	Phe
[5545]		1370					1375					1380			
[5546]	Asp	Pro	Arg	Glu	Leu	Arg	Lys	Glu	Thr	Cys	Leu	Leu	Tyr	Glu	Ile
[5547]		1385					1390					1395			
[5548]	Asn	Trp	Gly	Gly	Arg	His	Ser	Ile	Trp	Arg	His	Thr	Ser	Gln	Asn
[5549]		1400					1405					1410			
[5550]	Thr	Asn	Lys	His	Val	Glu	Val	Asn	Phe	Ile	Glu	Lys	Phe	Thr	Thr
[5551]		1415					1420					1425			
[5552]	Glu	Arg	Tyr	Phe	Cys	Pro	Asn	Thr	Arg	Cys	Ser	Ile	Thr	Trp	Phe
[5553]		1430					1435					1440			
[5554]	Leu	Ser	Trp	Ser	Pro	Cys	Gly	Glu	Cys	Ser	Arg	Ala	Ile	Thr	Glu
[5555]		1445					1450					1455			
[5556]	Phe	Leu	Ser	Arg	Tyr	Pro	His	Val	Thr	Leu	Phe	Ile	Tyr	Ile	Ala
[5557]		1460					1465					1470			
[5558]	Arg	Leu	Tyr	His	His	Ala	Asp	Pro	Arg	Asn	Arg	Gln	Gly	Leu	Arg
[5559]		1475					1480					1485			
[5560]	Asp	Leu	Ile	Ser	Ser	Gly	Val	Thr	Ile	Gln	Ile	Met	Thr	Glu	Gln
[5561]		1490					1495					1500			
[5562]	Glu	Ser	Gly	Tyr	Cys	Trp	Arg	Asn	Phe	Val	Asn	Tyr	Ser	Pro	Ser
[5563]		1505					1510					1515			
[5564]	Asn	Glu	Ala	His	Trp	Pro	Arg	Tyr	Pro	His	Leu	Trp	Val	Arg	Leu
[5565]		1520					1525					1530			
[5566]	Tyr	Val	Leu	Glu	Leu	Tyr	Cys	Ile	Ile	Leu	Gly	Leu	Pro	Pro	Cys
[5567]		1535					1540					1545			
[5568]	Leu	Asn	Ile	Leu	Arg	Arg	Lys	Gln	Pro	Gln	Leu	Thr	Phe	Phe	Thr
[5569]		1550					1555					1560			
[5570]	Ile	Ala	Leu	Gln	Ser	Cys	His	Tyr	Gln	Arg	Leu	Pro	Pro	His	Ile
[5571]		1565					1570					1575			
[5572]	Leu	Trp	Ala	Thr	Gly	Leu	Lys	Ser	Gly	Gly	Ser	Lys	Arg	Thr	Ala
[5573]		1580					1585					1590			
[5574]	Asp	Gly	Ser	Glu	Phe										
[5575]		1595													
[5576]	<210>	60													
[5577]	<211>	1602													
[5578]	<212>	PRT													
[5579]	<213>	人工的													
[5580]	<220>														
[5581]	<223>	碱基编辑器融合蛋白													
[5582]	<400>	60													
[5583]	Met	Lys	Arg	Thr	Ala	Asp	Gly	Ser	Glu	Phe	Glu	Ser	Pro	Lys	Lys
[5584]	1				5					10				15	
[5585]	Arg	Lys	Val	Ser	Lys	Leu	Glu	Lys	Phe	Thr	Asn	Cys	Tyr	Ser	Leu

[5586]	20	25	30
[5587]	Lys Thr Leu Arg Phe Lys Ala Ile Pro Val Gly Lys Thr Gln Glu Asn		
[5588]	35	40	45
[5589]	Ile Asp Asn Lys Arg Leu Leu Val Glu Asp Glu Lys Arg Ala Glu Asp		
[5590]	50	55	60
[5591]	Tyr Lys Gly Val Lys Lys Leu Leu Asp Arg Tyr Tyr Leu Ser Phe Ile		
[5592]	65	70	75
[5593]	Asn Asp Val Leu His Ser Ile Lys Leu Lys Asn Leu Asn Asn Tyr Ile		
[5594]	85	90	95
[5595]	Ser Leu Phe Arg Lys Lys Thr Arg Thr Glu Lys Glu Asn Lys Glu Leu		
[5596]	100	105	110
[5597]	Glu Asn Leu Glu Ile Asn Leu Arg Lys Glu Ile Ala Lys Ala Phe Lys		
[5598]	115	120	125
[5599]	Gly Asn Glu Gly Tyr Lys Ser Leu Phe Lys Lys Asp Ile Ile Glu Thr		
[5600]	130	135	140
[5601]	Ile Leu Pro Glu Phe Leu Asp Asp Lys Asp Glu Ile Ala Leu Val Asn		
[5602]	145	150	155
[5603]	Ser Phe Asn Gly Phe Thr Thr Ala Phe Thr Gly Phe Phe Asp Asn Arg		
[5604]	165	170	175
[5605]	Glu Asn Met Phe Ser Glu Glu Ala Lys Ser Thr Ser Ile Ala Phe Arg		
[5606]	180	185	190
[5607]	Cys Ile Asn Glu Asn Leu Thr Arg Tyr Ile Ser Asn Met Asp Ile Phe		
[5608]	195	200	205
[5609]	Glu Lys Val Asp Ala Ile Phe Asp Lys His Glu Val Gln Glu Ile Lys		
[5610]	210	215	220
[5611]	Glu Lys Ile Leu Asn Ser Asp Tyr Asp Val Glu Asp Phe Phe Glu Gly		
[5612]	225	230	235
[5613]	Glu Phe Phe Asn Phe Val Leu Thr Gln Glu Gly Ile Asp Val Tyr Asn		
[5614]	245	250	255
[5615]	Ala Ile Ile Gly Gly Phe Val Thr Glu Ser Gly Glu Lys Ile Lys Gly		
[5616]	260	265	270
[5617]	Leu Asn Glu Tyr Ile Asn Leu Tyr Asn Gln Lys Thr Lys Gln Lys Leu		
[5618]	275	280	285
[5619]	Pro Lys Phe Lys Pro Leu Tyr Lys Gln Val Leu Ser Asp Arg Glu Ser		
[5620]	290	295	300
[5621]	Leu Ser Phe Tyr Gly Glu Gly Tyr Thr Ser Asp Glu Glu Val Leu Glu		
[5622]	305	310	315
[5623]	Val Phe Arg Asn Thr Leu Asn Lys Asn Ser Glu Ile Phe Ser Ser Ile		
[5624]	325	330	335
[5625]	Lys Lys Leu Glu Lys Leu Phe Lys Asn Phe Asp Glu Tyr Ser Ser Ala		
[5626]	340	345	350
[5627]	Gly Ile Phe Val Lys Asn Gly Pro Ala Ile Ser Thr Ile Ser Lys Asp		

[5628]	355	360	365
[5629]	Ile Phe Gly Glu Trp Asn Val Ile Arg Asp Lys Trp Asn Ala Glu Tyr		
[5630]	370	375	380
[5631]	Asp Asp Ile His Leu Lys Lys Lys Ala Val Val Thr Glu Lys Tyr Glu		
[5632]	385	390	395
[5633]	Asp Asp Arg Arg Lys Ser Phe Lys Lys Ile Gly Ser Phe Ser Leu Glu		
[5634]	405	410	415
[5635]	Gln Leu Gln Glu Tyr Ala Asp Ala Asp Leu Ser Val Val Glu Lys Leu		
[5636]	420	425	430
[5637]	Lys Glu Ile Ile Ile Gln Lys Val Asp Glu Ile Tyr Lys Val Tyr Gly		
[5638]	435	440	445
[5639]	Ser Ser Glu Lys Leu Phe Asp Ala Asp Phe Val Leu Glu Lys Ser Leu		
[5640]	450	455	460
[5641]	Lys Lys Asn Asp Ala Val Val Ala Ile Met Lys Asp Leu Leu Asp Ser		
[5642]	465	470	475
[5643]	Val Lys Ser Phe Glu Asn Tyr Ile Lys Ala Phe Phe Gly Glu Gly Lys		
[5644]	485	490	495
[5645]	Glu Thr Asn Arg Asp Glu Ser Phe Tyr Gly Asp Phe Val Leu Ala Tyr		
[5646]	500	505	510
[5647]	Asp Ile Leu Leu Lys Val Asp His Ile Tyr Asp Ala Ile Arg Asn Tyr		
[5648]	515	520	525
[5649]	Val Thr Gln Lys Pro Tyr Ser Lys Asp Lys Phe Lys Leu Tyr Phe Gln		
[5650]	530	535	540
[5651]	Asn Pro Gln Phe Met Gly Gly Trp Asp Lys Asp Lys Glu Thr Asp Tyr		
[5652]	545	550	555
[5653]	Arg Ala Thr Ile Leu Arg Tyr Gly Ser Lys Tyr Tyr Leu Ala Ile Met		
[5654]	565	570	575
[5655]	Asp Lys Lys Tyr Ala Lys Cys Leu Gln Lys Ile Asp Lys Asp Asp Val		
[5656]	580	585	590
[5657]	Asn Gly Asn Tyr Glu Lys Ile Asn Tyr Lys Leu Leu Pro Gly Pro Asn		
[5658]	595	600	605
[5659]	Lys Met Leu Pro Lys Val Phe Phe Ser Lys Lys Trp Met Ala Tyr Tyr		
[5660]	610	615	620
[5661]	Asn Pro Ser Glu Asp Ile Gln Lys Ile Tyr Lys Asn Gly Thr Phe Lys		
[5662]	625	630	635
[5663]	Lys Gly Asp Met Phe Asn Leu Asn Asp Cys His Lys Leu Ile Asp Phe		
[5664]	645	650	655
[5665]	Phe Lys Asp Ser Ile Ser Arg Tyr Pro Lys Trp Ser Asn Ala Tyr Asp		
[5666]	660	665	670
[5667]	Phe Asn Phe Ser Glu Thr Glu Lys Tyr Lys Asp Ile Ala Gly Phe Tyr		
[5668]	675	680	685
[5669]	Arg Glu Val Glu Glu Gln Gly Tyr Lys Val Ser Phe Glu Ser Ala Ser		

[5670]	690	695	700
[5671]	Lys Lys Glu Val Asp Lys Leu Val Glu Glu Gly Lys Leu Tyr Met Phe		
[5672]	705	710	715
[5673]	Gln Ile Tyr Asn Lys Asp Phe Ser Asp Lys Ser His Gly Thr Pro Asn		
[5674]		725	730
[5675]	Leu His Thr Met Tyr Phe Lys Leu Leu Phe Asp Glu Asn Asn His Gly		735
[5676]		740	745
[5677]	Gln Ile Arg Leu Ser Gly Gly Ala Glu Leu Phe Met Arg Arg Ala Ser		750
[5678]		755	760
[5679]	Leu Lys Lys Glu Glu Leu Val Val His Pro Ala Asn Ser Pro Ile Ala		765
[5680]	770	775	780
[5681]	Asn Lys Asn Pro Asp Asn Pro Lys Lys Thr Thr Thr Leu Ser Tyr Asp		
[5682]	785	790	795
[5683]	Val Tyr Lys Asp Lys Arg Phe Ser Glu Asp Gln Tyr Glu Leu His Ile		800
[5684]		805	810
[5685]	Pro Ile Ala Ile Asn Lys Cys Pro Lys Asn Ile Phe Lys Ile Asn Thr		815
[5686]		820	825
[5687]	Glu Val Arg Val Leu Leu Lys His Asp Asp Asn Pro Tyr Val Ile Gly		830
[5688]		835	840
[5689]	Ile Ala Arg Gly Glu Arg Asn Leu Leu Tyr Ile Val Val Val Asp Gly		845
[5690]	850	855	860
[5691]	Lys Gly Asn Ile Val Glu Gln Tyr Ser Leu Asn Glu Ile Ile Asn Asn		
[5692]	865	870	875
[5693]	Phe Asn Gly Ile Arg Ile Lys Thr Asp Tyr His Ser Leu Leu Asp Lys		880
[5694]		885	890
[5695]	Lys Glu Lys Glu Arg Phe Glu Ala Arg Gln Asn Trp Thr Ser Ile Glu		895
[5696]		900	905
[5697]	Asn Ile Lys Glu Leu Lys Ala Gly Tyr Ile Ser Gln Val Val His Lys		910
[5698]		915	920
[5699]	Ile Cys Glu Leu Val Glu Lys Tyr Asp Ala Val Ile Ala Leu Glu Asp		925
[5700]	930	935	940
[5701]	Leu Asn Ser Gly Phe Lys Asn Ser Arg Val Lys Val Glu Lys Gln Val		
[5702]	945	950	955
[5703]	Tyr Gln Lys Phe Glu Lys Met Leu Ile Asp Lys Leu Asn Tyr Met Val		960
[5704]		965	970
[5705]	Asp Lys Lys Ser Asn Pro Cys Ala Thr Gly Gly Ala Leu Lys Gly Tyr		975
[5706]		980	985
[5707]	Gln Ile Thr Asn Lys Phe Glu Ser Phe Lys Ser Met Ser Thr Gln Asn		990
[5708]		995	1000
[5709]	Gly Phe Ile Phe Tyr Ile Pro Ala Trp Leu Thr Ser Lys Ile Asp		1005
[5710]	1010	1015	1020
[5711]	Pro Ser Thr Gly Phe Val Asn Leu Leu Lys Thr Lys Tyr Thr Ser		

[5712]	1025	1030	1035
[5713]	Ile Ala Asp Ser Lys Lys Phe	Ile Ser Ser Phe Asp	Arg Ile Met
[5714]	1040	1045	1050
[5715]	Tyr Val Pro Glu Glu Asp Leu	Phe Glu Phe Ala Leu	Asp Tyr Lys
[5716]	1055	1060	1065
[5717]	Asn Phe Ser Arg Thr Asp Ala	Asp Tyr Ile Lys Lys	Trp Lys Leu
[5718]	1070	1075	1080
[5719]	Tyr Ser Tyr Gly Asn Arg Ile	Arg Ile Phe Arg Asn	Pro Lys Lys
[5720]	1085	1090	1095
[5721]	Asn Asn Val Phe Asp Trp Glu	Glu Val Cys Leu Thr	Ser Ala Tyr
[5722]	1100	1105	1110
[5723]	Lys Glu Leu Phe Asn Lys Tyr	Gly Ile Asn Tyr Gln	Gln Gly Asp
[5724]	1115	1120	1125
[5725]	Ile Arg Ala Leu Leu Cys Glu	Gln Ser Asp Lys Ala	Phe Tyr Ser
[5726]	1130	1135	1140
[5727]	Ser Phe Met Ala Leu Met Ser	Leu Met Leu Gln Met	Arg Asn Ser
[5728]	1145	1150	1155
[5729]	Ile Thr Gly Arg Thr Asp Val	Asp Phe Leu Ile Ser	Pro Val Lys
[5730]	1160	1165	1170
[5731]	Asn Ser Asp Gly Ile Phe Tyr	Asp Ser Arg Asn Tyr	Glu Ala Gln
[5732]	1175	1180	1185
[5733]	Glu Asn Ala Ile Leu Pro Lys	Asn Ala Asp Ala Asn	Gly Ala Tyr
[5734]	1190	1195	1200
[5735]	Asn Ile Ala Arg Lys Val Leu	Trp Ala Ile Gly Gln	Phe Lys Lys
[5736]	1205	1210	1215
[5737]	Ala Glu Asp Glu Lys Leu Asp	Lys Val Lys Ile Ala	Ile Ser Asn
[5738]	1220	1225	1230
[5739]	Lys Glu Trp Leu Glu Tyr Ala	Gln Thr Ser Val Lys	His Ser Thr
[5740]	1235	1240	1245
[5741]	Asp Gly Ser Gly Gln Pro Lys	His Lys Pro Thr Asn	Leu Ser Asp
[5742]	1250	1255	1260
[5743]	Ile Ile Glu Lys Glu Thr Gly	Lys Gln Leu Val Ile	Gln Glu Ser
[5744]	1265	1270	1275
[5745]	Ile Leu Met Leu Pro Glu Glu	Val Glu Glu Val Ile	Gly Asn Lys
[5746]	1280	1285	1290
[5747]	Pro Glu Ser Asp Ile Leu Val	His Thr Ala Tyr Asp	Glu Ser Thr
[5748]	1295	1300	1305
[5749]	Asp Glu Asn Val Met Leu Leu	Thr Ser Asp Ala Pro	Glu Tyr Lys
[5750]	1310	1315	1320
[5751]	Pro Trp Ala Leu Val Ile Gln	Asp Ser Asn Gly Glu	Asn Lys Ile
[5752]	1325	1330	1335
[5753]	Lys Met Leu Pro Lys Pro Ser	Ser Glu Ser Gly Glu	Arg Tyr Glu

[5754]	1340	1345	1350
[5755]	Gln Gln Pro Glu Pro Pro Pro Pro Ser Ser Glu Thr Gly Pro Val		
[5756]	1355	1360	1365
[5757]	Ala Val Asp Pro Thr Leu Arg Arg Arg Ile Glu Pro His Glu Phe		
[5758]	1370	1375	1380
[5759]	Glu Val Phe Phe Asp Pro Arg Glu Leu Arg Lys Glu Thr Cys Leu		
[5760]	1385	1390	1395
[5761]	Leu Tyr Glu Ile Asn Trp Gly Gly Arg His Ser Ile Trp Arg His		
[5762]	1400	1405	1410
[5763]	Thr Ser Gln Asn Thr Asn Lys His Val Glu Val Asn Phe Ile Glu		
[5764]	1415	1420	1425
[5765]	Lys Phe Thr Thr Glu Arg Tyr Phe Cys Pro Asn Thr Arg Cys Ser		
[5766]	1430	1435	1440
[5767]	Ile Thr Trp Phe Leu Ser Trp Ser Pro Cys Gly Glu Cys Ser Arg		
[5768]	1445	1450	1455
[5769]	Ala Ile Thr Glu Phe Leu Ser Arg Tyr Pro His Val Thr Leu Phe		
[5770]	1460	1465	1470
[5771]	Ile Tyr Ile Ala Arg Leu Tyr His His Ala Asp Pro Arg Asn Arg		
[5772]	1475	1480	1485
[5773]	Gln Gly Leu Arg Asp Leu Ile Ser Ser Gly Val Thr Ile Gln Ile		
[5774]	1490	1495	1500
[5775]	Met Thr Glu Gln Glu Ser Gly Tyr Cys Trp Arg Asn Phe Val Asn		
[5776]	1505	1510	1515
[5777]	Tyr Ser Pro Ser Asn Glu Ala His Trp Pro Arg Tyr Pro His Leu		
[5778]	1520	1525	1530
[5779]	Trp Val Arg Leu Tyr Val Leu Glu Leu Tyr Cys Ile Ile Leu Gly		
[5780]	1535	1540	1545
[5781]	Leu Pro Pro Cys Leu Asn Ile Leu Arg Arg Lys Gln Pro Gln Leu		
[5782]	1550	1555	1560
[5783]	Thr Phe Phe Thr Ile Ala Leu Gln Ser Cys His Tyr Gln Arg Leu		
[5784]	1565	1570	1575
[5785]	Pro Pro His Ile Leu Trp Ala Thr Gly Leu Lys Ser Gly Gly Ser		
[5786]	1580	1585	1590
[5787]	Lys Arg Thr Ala Asp Gly Ser Glu Phe		
[5788]	1595	1600	
[5789]	<210> 61		
[5790]	<211> 1594		
[5791]	<212> PRT		
[5792]	<213> 人工的		
[5793]	<220>		
[5794]	<223> 碱基编辑器融合蛋白		
[5795]	<400> 61		

[5796]	Met	Lys	Arg	Thr	Ala	Asp	Gly	Ser	Glu	Phe	Glu	Ser	Pro	Lys	Lys	Lys
[5797]	1				5				10					15		
[5798]	Arg	Lys	Val	Ser	Lys	Leu	Glu	Lys	Phe	Thr	Asn	Cys	Tyr	Ser	Leu	Ser
[5799]					20				25					30		
[5800]	Lys	Thr	Leu	Arg	Phe	Lys	Ala	Ile	Pro	Val	Gly	Lys	Thr	Gln	Glu	Asn
[5801]					35				40					45		
[5802]	Ile	Asp	Asn	Lys	Arg	Leu	Leu	Val	Glu	Asp	Glu	Lys	Arg	Ala	Glu	Asp
[5803]					50				55					60		
[5804]	Tyr	Lys	Gly	Val	Lys	Lys	Leu	Leu	Asp	Arg	Tyr	Tyr	Leu	Ser	Phe	Ile
[5805]	65				70				75					80		
[5806]	Asn	Asp	Val	Leu	His	Ser	Ile	Lys	Leu	Lys	Asn	Leu	Asn	Asn	Tyr	Ile
[5807]					85				90					95		
[5808]	Ser	Leu	Phe	Arg	Lys	Lys	Thr	Arg	Thr	Glu	Lys	Glu	Asn	Lys	Glu	Leu
[5809]					100				105					110		
[5810]	Glu	Asn	Leu	Glu	Ile	Asn	Leu	Arg	Lys	Glu	Ile	Ala	Lys	Ala	Phe	Lys
[5811]					115				120					125		
[5812]	Gly	Asn	Glu	Gly	Tyr	Lys	Ser	Leu	Phe	Lys	Lys	Asp	Ile	Ile	Glu	Thr
[5813]					130				135					140		
[5814]	Ile	Leu	Pro	Glu	Phe	Leu	Asp	Asp	Lys	Asp	Glu	Ile	Ala	Leu	Val	Asn
[5815]	145				150				155					160		
[5816]	Ser	Phe	Asn	Gly	Phe	Thr	Thr	Ala	Phe	Thr	Gly	Phe	Phe	Asp	Asn	Arg
[5817]					165				170					175		
[5818]	Glu	Asn	Met	Phe	Ser	Glu	Glu	Ala	Lys	Ser	Thr	Ser	Ile	Ala	Phe	Arg
[5819]					180				185					190		
[5820]	Cys	Ile	Asn	Glu	Asn	Leu	Thr	Arg	Tyr	Ile	Ser	Asn	Met	Asp	Ile	Phe
[5821]					195				200					205		
[5822]	Glu	Lys	Val	Asp	Ala	Ile	Phe	Asp	Lys	His	Glu	Val	Gln	Glu	Ile	Lys
[5823]					210				215					220		
[5824]	Glu	Lys	Ile	Leu	Asn	Ser	Asp	Tyr	Asp	Val	Glu	Asp	Phe	Phe	Glu	Gly
[5825]	225				230				235					240		
[5826]	Glu	Phe	Phe	Asn	Phe	Val	Leu	Thr	Gln	Glu	Gly	Ile	Asp	Val	Tyr	Asn
[5827]					245				250					255		
[5828]	Ala	Ile	Ile	Gly	Gly	Phe	Val	Thr	Glu	Ser	Gly	Glu	Lys	Ile	Lys	Gly
[5829]					260				265					270		
[5830]	Leu	Asn	Glu	Tyr	Ile	Asn	Leu	Tyr	Asn	Gln	Lys	Thr	Lys	Gln	Lys	Leu
[5831]					275				280					285		
[5832]	Pro	Lys	Phe	Lys	Pro	Leu	Tyr	Lys	Gln	Val	Leu	Ser	Asp	Arg	Glu	Ser
[5833]					290				295					300		
[5834]	Leu	Ser	Phe	Tyr	Gly	Glu	Gly	Tyr	Thr	Ser	Asp	Glu	Glu	Val	Leu	Glu
[5835]	305				310				315					320		
[5836]	Val	Phe	Arg	Asn	Thr	Leu	Asn	Lys	Asn	Ser	Glu	Ile	Phe	Ser	Ser	Ile
[5837]					325				330					335		

[5838]	Lys	Lys	Leu	Glu	Lys	Leu	Phe	Lys	Asn	Phe	Asp	Glu	Tyr	Ser	Ser	Ala
[5839]				340					345					350		
[5840]	Gly	Ile	Phe	Val	Lys	Asn	Gly	Pro	Ala	Ile	Ser	Thr	Ile	Ser	Lys	Asp
[5841]				355					360					365		
[5842]	Ile	Phe	Gly	Glu	Trp	Asn	Val	Ile	Arg	Asp	Lys	Trp	Asn	Ala	Glu	Tyr
[5843]				370					375					380		
[5844]	Asp	Asp	Ile	His	Leu	Lys	Lys	Lys	Ala	Val	Val	Thr	Glu	Lys	Tyr	Glu
[5845]				385					390					395		400
[5846]	Asp	Asp	Arg	Arg	Lys	Ser	Phe	Lys	Lys	Ile	Gly	Ser	Phe	Ser	Leu	Glu
[5847]					405					410					415	
[5848]	Gln	Leu	Gln	Glu	Tyr	Ala	Asp	Ala	Asp	Leu	Ser	Val	Val	Glu	Lys	Leu
[5849]					420					425					430	
[5850]	Lys	Glu	Ile	Ile	Ile	Gln	Lys	Val	Asp	Glu	Ile	Tyr	Lys	Val	Tyr	Gly
[5851]					435					440					445	
[5852]	Ser	Ser	Glu	Lys	Leu	Phe	Asp	Ala	Asp	Phe	Val	Leu	Glu	Lys	Ser	Leu
[5853]					450					455				460		
[5854]	Lys	Lys	Asn	Asp	Ala	Val	Val	Ala	Ile	Met	Lys	Asp	Leu	Leu	Asp	Ser
[5855]					465					470				475		480
[5856]	Val	Lys	Ser	Phe	Glu	Asn	Tyr	Ile	Lys	Ala	Phe	Phe	Gly	Glu	Gly	Lys
[5857]					485					490					495	
[5858]	Glu	Thr	Asn	Arg	Asp	Glu	Ser	Phe	Tyr	Gly	Asp	Phe	Val	Leu	Ala	Tyr
[5859]					500					505					510	
[5860]	Asp	Ile	Leu	Leu	Lys	Val	Asp	His	Ile	Tyr	Asp	Ala	Ile	Arg	Asn	Tyr
[5861]					515					520					525	
[5862]	Val	Thr	Gln	Lys	Pro	Tyr	Ser	Lys	Asp	Lys	Phe	Lys	Leu	Tyr	Phe	Gln
[5863]					530					535					540	
[5864]	Asn	Pro	Gln	Phe	Met	Gly	Gly	Trp	Asp	Lys	Asp	Lys	Glu	Thr	Asp	Tyr
[5865]					545							555				560
[5866]	Arg	Ala	Thr	Ile	Leu	Arg	Tyr	Gly	Ser	Lys	Tyr	Tyr	Leu	Ala	Ile	Met
[5867]					565						570					575
[5868]	Asp	Lys	Lys	Tyr	Ala	Lys	Cys	Leu	Gln	Lys	Ile	Asp	Lys	Asp	Asp	Val
[5869]					580					585					590	
[5870]	Asn	Gly	Asn	Tyr	Glu	Lys	Ile	Asn	Tyr	Lys	Leu	Leu	Pro	Gly	Pro	Asn
[5871]					595					600					605	
[5872]	Lys	Met	Leu	Pro	Lys	Val	Phe	Phe	Ser	Lys	Lys	Trp	Met	Ala	Tyr	Tyr
[5873]					610									615		620
[5874]	Asn	Pro	Ser	Glu	Asp	Ile	Gln	Lys	Ile	Tyr	Lys	Asn	Gly	Thr	Phe	Lys
[5875]					625									630		635
[5876]	Lys	Gly	Asp	Met	Phe	Asn	Leu	Asn	Asp	Cys	His	Lys	Leu	Ile	Asp	Phe
[5877]					645									650		655
[5878]	Phe	Lys	Asp	Ser	Ile	Ser	Arg	Tyr	Pro	Lys	Trp	Ser	Asn	Ala	Tyr	Asp
[5879]					660									665		670

[5880]	Phe Asn Phe Ser Glu Thr Glu Lys Tyr Lys Asp Ile Ala Gly Phe Tyr
[5881]	675 680 685
[5882]	Arg Glu Val Glu Glu Gln Gly Tyr Lys Val Ser Phe Glu Ser Ala Ser
[5883]	690 695 700
[5884]	Lys Lys Glu Val Asp Lys Leu Val Glu Glu Gly Lys Leu Tyr Met Phe
[5885]	705 710 715 720
[5886]	Gln Ile Tyr Asn Lys Asp Phe Ser Asp Lys Ser His Gly Thr Pro Asn
[5887]	725 730 735
[5888]	Leu His Thr Met Tyr Phe Lys Leu Leu Phe Asp Glu Asn Asn His Gly
[5889]	740 745 750
[5890]	Gln Ile Arg Leu Ser Gly Gly Ala Glu Leu Phe Met Arg Arg Ala Ser
[5891]	755 760 765
[5892]	Leu Lys Lys Glu Glu Leu Val Val His Pro Ala Asn Ser Pro Ile Ala
[5893]	770 775 780
[5894]	Asn Lys Asn Pro Asp Asn Pro Lys Lys Thr Thr Thr Leu Ser Tyr Asp
[5895]	785 790 795 800
[5896]	Val Tyr Lys Asp Lys Arg Phe Ser Glu Asp Gln Tyr Glu Leu His Ile
[5897]	805 810 815
[5898]	Pro Ile Ala Ile Asn Lys Cys Pro Lys Asn Ile Phe Lys Ile Asn Thr
[5899]	820 825 830
[5900]	Glu Val Arg Val Leu Leu Lys His Asp Asp Asn Pro Tyr Val Ile Gly
[5901]	835 840 845
[5902]	Ile Ala Arg Gly Glu Arg Asn Leu Leu Tyr Ile Val Val Val Asp Gly
[5903]	850 855 860
[5904]	Lys Gly Asn Ile Val Glu Gln Tyr Ser Leu Asn Glu Ile Ile Asn Asn
[5905]	865 870 875 880
[5906]	Phe Asn Gly Ile Arg Ile Lys Thr Asp Tyr His Ser Leu Leu Asp Lys
[5907]	885 890 895
[5908]	Lys Glu Lys Glu Arg Phe Glu Ala Arg Gln Asn Trp Thr Ser Ile Glu
[5909]	900 905 910
[5910]	Asn Ile Lys Glu Leu Lys Ala Gly Tyr Ile Ser Gln Val Val His Lys
[5911]	915 920 925
[5912]	Ile Cys Glu Leu Val Glu Lys Tyr Asp Ala Val Ile Ala Leu Glu Asp
[5913]	930 935 940
[5914]	Leu Asn Ser Gly Phe Lys Asn Ser Arg Val Lys Val Glu Lys Gln Val
[5915]	945 950 955 960
[5916]	Tyr Gln Lys Phe Glu Lys Met Leu Ile Asp Lys Leu Asn Tyr Met Val
[5917]	965 970 975
[5918]	Asp Lys Lys Ser Asn Pro Cys Ala Thr Gly Gly Ala Leu Lys Gly Tyr
[5919]	980 985 990
[5920]	Gln Ile Thr Asn Lys Phe Glu Ser Phe Lys Ser Met Ser Thr Gln Asn
[5921]	995 1000 1005

[5922]	Gly Phe Ile Phe Tyr Ile Pro Ala Trp Leu Thr Ser Lys Ile Asp
[5923]	1010 1015 1020
[5924]	Pro Ser Thr Gly Phe Val Asn Leu Leu Lys Thr Lys Tyr Thr Ser
[5925]	1025 1030 1035
[5926]	Ile Ala Asp Ser Lys Lys Phe Ile Ser Ser Phe Asp Arg Ile Met
[5927]	1040 1045 1050
[5928]	Tyr Val Pro Glu Glu Asp Leu Phe Glu Phe Ala Leu Asp Tyr Lys
[5929]	1055 1060 1065
[5930]	Asn Phe Ser Arg Thr Asp Ala Asp Tyr Ile Lys Lys Trp Lys Leu
[5931]	1070 1075 1080
[5932]	Tyr Ser Tyr Gly Asn Arg Ile Arg Ile Phe Arg Asn Pro Lys Lys
[5933]	1085 1090 1095
[5934]	Asn Asn Val Phe Asp Trp Glu Glu Val Cys Leu Thr Ser Ala Tyr
[5935]	1100 1105 1110
[5936]	Lys Glu Leu Phe Asn Lys Tyr Gly Ile Asn Tyr Gln Gln Gly Asp
[5937]	1115 1120 1125
[5938]	Ile Arg Ala Leu Leu Cys Glu Gln Ser Asp Lys Ala Phe Tyr Ser
[5939]	1130 1135 1140
[5940]	Ser Phe Met Ala Leu Met Ser Leu Met Leu Gln Met Arg Asn Ser
[5941]	1145 1150 1155
[5942]	Ile Thr Gly Arg Thr Asp Val Asp Phe Leu Ile Ser Pro Val Lys
[5943]	1160 1165 1170
[5944]	Asn Ser Asp Gly Ile Phe Tyr Asp Ser Arg Asn Tyr Glu Ala Gln
[5945]	1175 1180 1185
[5946]	Glu Asn Ala Ile Leu Pro Lys Asn Ala Asp Ala Asn Gly Ala Tyr
[5947]	1190 1195 1200
[5948]	Asn Ile Ala Arg Lys Val Leu Trp Ala Ile Gly Gln Phe Lys Lys
[5949]	1205 1210 1215
[5950]	Ala Glu Asp Glu Lys Leu Asp Lys Val Lys Ile Ala Ile Ser Asn
[5951]	1220 1225 1230
[5952]	Lys Glu Trp Leu Glu Tyr Ala Gln Thr Ser Val Lys His Ser Glu
[5953]	1235 1240 1245
[5954]	Gln Gln Glu Asn Pro Gly Ser Gly Thr Asn Leu Ser Asp Ile Ile
[5955]	1250 1255 1260
[5956]	Glu Lys Glu Thr Gly Lys Gln Leu Val Ile Gln Glu Ser Ile Leu
[5957]	1265 1270 1275
[5958]	Met Leu Pro Glu Glu Val Glu Glu Val Ile Gly Asn Lys Pro Glu
[5959]	1280 1285 1290
[5960]	Ser Asp Ile Leu Val His Thr Ala Tyr Asp Glu Ser Thr Asp Glu
[5961]	1295 1300 1305
[5962]	Asn Val Met Leu Leu Thr Ser Asp Ala Pro Glu Tyr Lys Pro Trp
[5963]	1310 1315 1320

[5964]	Ala Leu Val Ile Gln Asp Ser Asn Gly Glu Asn Lys Ile Lys Met
[5965]	1325 1330 1335
[5966]	Leu Val Ala Gly Gly Thr Pro Phe Glu Pro Pro Pro Pro Asn Ser
[5967]	1340 1345 1350
[5968]	Ser Ser Glu Thr Gly Pro Val Ala Val Asp Pro Thr Leu Arg Arg
[5969]	1355 1360 1365
[5970]	Arg Ile Glu Pro His Glu Phe Glu Val Phe Phe Asp Pro Arg Glu
[5971]	1370 1375 1380
[5972]	Leu Arg Lys Glu Thr Cys Leu Leu Tyr Glu Ile Asn Trp Gly Gly
[5973]	1385 1390 1395
[5974]	Arg His Ser Ile Trp Arg His Thr Ser Gln Asn Thr Asn Lys His
[5975]	1400 1405 1410
[5976]	Val Glu Val Asn Phe Ile Glu Lys Phe Thr Thr Glu Arg Tyr Phe
[5977]	1415 1420 1425
[5978]	Cys Pro Asn Thr Arg Cys Ser Ile Thr Trp Phe Leu Ser Trp Ser
[5979]	1430 1435 1440
[5980]	Pro Cys Gly Glu Cys Ser Arg Ala Ile Thr Glu Phe Leu Ser Arg
[5981]	1445 1450 1455
[5982]	Tyr Pro His Val Thr Leu Phe Ile Tyr Ile Ala Arg Leu Tyr His
[5983]	1460 1465 1470
[5984]	His Ala Asp Pro Arg Asn Arg Gln Gly Leu Arg Asp Leu Ile Ser
[5985]	1475 1480 1485
[5986]	Ser Gly Val Thr Ile Gln Ile Met Thr Glu Gln Glu Ser Gly Tyr
[5987]	1490 1495 1500
[5988]	Cys Trp Arg Asn Phe Val Asn Tyr Ser Pro Ser Asn Glu Ala His
[5989]	1505 1510 1515
[5990]	Trp Pro Arg Tyr Pro His Leu Trp Val Arg Leu Tyr Val Leu Glu
[5991]	1520 1525 1530
[5992]	Leu Tyr Cys Ile Ile Leu Gly Leu Pro Pro Cys Leu Asn Ile Leu
[5993]	1535 1540 1545
[5994]	Arg Arg Lys Gln Pro Gln Leu Thr Phe Phe Thr Ile Ala Leu Gln
[5995]	1550 1555 1560
[5996]	Ser Cys His Tyr Gln Arg Leu Pro Pro His Ile Leu Trp Ala Thr
[5997]	1565 1570 1575
[5998]	Gly Leu Lys Ser Gly Gly Ser Lys Arg Thr Ala Asp Gly Ser Glu
[5999]	1580 1585 1590
[6000]	Phe
[6001]	<210> 62
[6002]	<211> 1596
[6003]	<212> PRT
[6004]	<213> 人工的
[6005]	<220>

[6006]	<223> 碱基编辑器融合蛋白															
[6007]	<400> 62															
[6008]	Met	Lys	Arg	Thr	Ala	Asp	Gly	Ser	Glu	Phe	Glu	Ser	Pro	Lys	Lys	Lys
[6009]	1				5					10					15	
[6010]	Arg	Lys	Val	Ser	Lys	Leu	Glu	Lys	Phe	Thr	Asn	Cys	Tyr	Ser	Leu	Ser
[6011]				20				25					30			
[6012]	Lys	Thr	Leu	Arg	Phe	Lys	Ala	Ile	Pro	Val	Gly	Lys	Thr	Gln	Glu	Asn
[6013]			35				40					45				
[6014]	Ile	Asp	Asn	Lys	Arg	Leu	Leu	Val	Glu	Asp	Glu	Lys	Arg	Ala	Glu	Asp
[6015]		50					55				60					
[6016]	Tyr	Lys	Gly	Val	Lys	Lys	Leu	Leu	Asp	Arg	Tyr	Tyr	Leu	Ser	Phe	Ile
[6017]	65				70					75					80	
[6018]	Asn	Asp	Val	Leu	His	Ser	Ile	Lys	Leu	Lys	Asn	Leu	Asn	Asn	Tyr	Ile
[6019]				85				90						95		
[6020]	Ser	Leu	Phe	Arg	Lys	Lys	Thr	Arg	Thr	Glu	Lys	Glu	Asn	Lys	Glu	Leu
[6021]			100					105					110			
[6022]	Glu	Asn	Leu	Glu	Ile	Asn	Leu	Arg	Lys	Glu	Ile	Ala	Lys	Ala	Phe	Lys
[6023]			115				120					125				
[6024]	Gly	Asn	Glu	Gly	Tyr	Lys	Ser	Leu	Phe	Lys	Lys	Asp	Ile	Ile	Glu	Thr
[6025]		130					135					140				
[6026]	Ile	Leu	Pro	Glu	Phe	Leu	Asp	Asp	Lys	Asp	Glu	Ile	Ala	Leu	Val	Asn
[6027]	145				150					155					160	
[6028]	Ser	Phe	Asn	Gly	Phe	Thr	Thr	Ala	Phe	Thr	Gly	Phe	Phe	Asp	Asn	Arg
[6029]				165				170						175		
[6030]	Glu	Asn	Met	Phe	Ser	Glu	Glu	Ala	Lys	Ser	Thr	Ser	Ile	Ala	Phe	Arg
[6031]			180					185					190			
[6032]	Cys	Ile	Asn	Glu	Asn	Leu	Thr	Arg	Tyr	Ile	Ser	Asn	Met	Asp	Ile	Phe
[6033]		195					200					205				
[6034]	Glu	Lys	Val	Asp	Ala	Ile	Phe	Asp	Lys	His	Glu	Val	Gln	Glu	Ile	Lys
[6035]		210					215					220				
[6036]	Glu	Lys	Ile	Leu	Asn	Ser	Asp	Tyr	Asp	Val	Glu	Asp	Phe	Phe	Glu	Gly
[6037]	225				230					235					240	
[6038]	Glu	Phe	Phe	Asn	Phe	Val	Leu	Thr	Gln	Glu	Gly	Ile	Asp	Val	Tyr	Asn
[6039]				245				250					255			
[6040]	Ala	Ile	Ile	Gly	Gly	Phe	Val	Thr	Glu	Ser	Gly	Glu	Lys	Ile	Lys	Gly
[6041]			260					265					270			
[6042]	Leu	Asn	Glu	Tyr	Ile	Asn	Leu	Tyr	Asn	Gln	Lys	Thr	Lys	Gln	Lys	Leu
[6043]			275					280					285			
[6044]	Pro	Lys	Phe	Lys	Pro	Leu	Tyr	Lys	Gln	Val	Leu	Ser	Asp	Arg	Glu	Ser
[6045]		290					295					300				
[6046]	Leu	Ser	Phe	Tyr	Gly	Glu	Gly	Tyr	Thr	Ser	Asp	Glu	Glu	Val	Leu	Glu
[6047]	305				310					315					320	

[6048]	Val Phe Arg Asn Thr Leu Asn Lys Asn Ser Glu Ile Phe Ser Ser Ile		
[6049]		325	330 335
[6050]	Lys Lys Leu Glu Lys Leu Phe Lys Asn Phe Asp Glu Tyr Ser Ser Ala		
[6051]		340	345 350
[6052]	Gly Ile Phe Val Lys Asn Gly Pro Ala Ile Ser Thr Ile Ser Lys Asp		
[6053]		355	360 365
[6054]	Ile Phe Gly Glu Trp Asn Val Ile Arg Asp Lys Trp Asn Ala Glu Tyr		
[6055]		370	375 380
[6056]	Asp Asp Ile His Leu Lys Lys Lys Ala Val Val Thr Glu Lys Tyr Glu		
[6057]		385	390 395 400
[6058]	Asp Asp Arg Arg Lys Ser Phe Lys Lys Ile Gly Ser Phe Ser Leu Glu		
[6059]		405	410 415
[6060]	Gln Leu Gln Glu Tyr Ala Asp Ala Asp Leu Ser Val Val Glu Lys Leu		
[6061]		420	425 430
[6062]	Lys Glu Ile Ile Ile Gln Lys Val Asp Glu Ile Tyr Lys Val Tyr Gly		
[6063]		435	440 445
[6064]	Ser Ser Glu Lys Leu Phe Asp Ala Asp Phe Val Leu Glu Lys Ser Leu		
[6065]		450	455 460
[6066]	Lys Lys Asn Asp Ala Val Val Ala Ile Met Lys Asp Leu Leu Asp Ser		
[6067]		465	470 475 480
[6068]	Val Lys Ser Phe Glu Asn Tyr Ile Lys Ala Phe Phe Gly Glu Gly Lys		
[6069]		485	490 495
[6070]	Glu Thr Asn Arg Asp Glu Ser Phe Tyr Gly Asp Phe Val Leu Ala Tyr		
[6071]		500	505 510
[6072]	Asp Ile Leu Leu Lys Val Asp His Ile Tyr Asp Ala Ile Arg Asn Tyr		
[6073]		515	520 525
[6074]	Val Thr Gln Lys Pro Tyr Ser Lys Asp Lys Phe Lys Leu Tyr Phe Gln		
[6075]		530	535 540
[6076]	Asn Pro Gln Phe Met Gly Gly Trp Asp Lys Asp Lys Glu Thr Asp Tyr		
[6077]		545	550 555 560
[6078]	Arg Ala Thr Ile Leu Arg Tyr Gly Ser Lys Tyr Tyr Leu Ala Ile Met		
[6079]		565	570 575
[6080]	Asp Lys Lys Tyr Ala Lys Cys Leu Gln Lys Ile Asp Lys Asp Asp Val		
[6081]		580	585 590
[6082]	Asn Gly Asn Tyr Glu Lys Ile Asn Tyr Lys Leu Leu Pro Gly Pro Asn		
[6083]		595	600 605
[6084]	Lys Met Leu Pro Lys Val Phe Phe Ser Lys Lys Trp Met Ala Tyr Tyr		
[6085]		610	615 620
[6086]	Asn Pro Ser Glu Asp Ile Gln Lys Ile Tyr Lys Asn Gly Thr Phe Lys		
[6087]		625	630 635 640
[6088]	Lys Gly Asp Met Phe Asn Leu Asn Asp Cys His Lys Leu Ile Asp Phe		
[6089]		645	650 655

[6090]	Phe Lys Asp Ser Ile Ser Arg Tyr Pro Lys Trp Ser Asn Ala Tyr Asp
[6091]	660 665 670
[6092]	Phe Asn Phe Ser Glu Thr Glu Lys Tyr Lys Asp Ile Ala Gly Phe Tyr
[6093]	675 680 685
[6094]	Arg Glu Val Glu Glu Gln Gly Tyr Lys Val Ser Phe Glu Ser Ala Ser
[6095]	690 695 700
[6096]	Lys Lys Glu Val Asp Lys Leu Val Glu Glu Gly Lys Leu Tyr Met Phe
[6097]	705 710 715 720
[6098]	Gln Ile Tyr Asn Lys Asp Phe Ser Asp Lys Ser His Gly Thr Pro Asn
[6099]	725 730 735
[6100]	Leu His Thr Met Tyr Phe Lys Leu Leu Phe Asp Glu Asn Asn His Gly
[6101]	740 745 750
[6102]	Gln Ile Arg Leu Ser Gly Gly Ala Glu Leu Phe Met Arg Arg Ala Ser
[6103]	755 760 765
[6104]	Leu Lys Lys Glu Glu Leu Val Val His Pro Ala Asn Ser Pro Ile Ala
[6105]	770 775 780
[6106]	Asn Lys Asn Pro Asp Asn Pro Lys Lys Thr Thr Thr Leu Ser Tyr Asp
[6107]	785 790 795 800
[6108]	Val Tyr Lys Asp Lys Arg Phe Ser Glu Asp Gln Tyr Glu Leu His Ile
[6109]	805 810 815
[6110]	Pro Ile Ala Ile Asn Lys Cys Pro Lys Asn Ile Phe Lys Ile Asn Thr
[6111]	820 825 830
[6112]	Glu Val Arg Val Leu Leu Lys His Asp Asp Asn Pro Tyr Val Ile Gly
[6113]	835 840 845
[6114]	Ile Ala Arg Gly Glu Arg Asn Leu Leu Tyr Ile Val Val Val Asp Gly
[6115]	850 855 860
[6116]	Lys Gly Asn Ile Val Glu Gln Tyr Ser Leu Asn Glu Ile Ile Asn Asn
[6117]	865 870 875 880
[6118]	Phe Asn Gly Ile Arg Ile Lys Thr Asp Tyr His Ser Leu Leu Asp Lys
[6119]	885 890 895
[6120]	Lys Glu Lys Glu Arg Phe Glu Ala Arg Gln Asn Trp Thr Ser Ile Glu
[6121]	900 905 910
[6122]	Asn Ile Lys Glu Leu Lys Ala Gly Tyr Ile Ser Gln Val Val His Lys
[6123]	915 920 925
[6124]	Ile Cys Glu Leu Val Glu Lys Tyr Asp Ala Val Ile Ala Leu Glu Asp
[6125]	930 935 940
[6126]	Leu Asn Ser Gly Phe Lys Asn Ser Arg Val Lys Val Glu Lys Gln Val
[6127]	945 950 955 960
[6128]	Tyr Gln Lys Phe Glu Lys Met Leu Ile Asp Lys Leu Asn Tyr Met Val
[6129]	965 970 975
[6130]	Asp Lys Lys Ser Asn Pro Cys Ala Thr Gly Gly Ala Leu Lys Gly Tyr
[6131]	980 985 990

[6132]	Gln Ile Thr Asn Lys Phe Glu Ser	Phe Lys Ser Met Ser	Thr Gln Asn
[6133]	995	1000	1005
[6134]	Gly Phe Ile Phe Tyr Ile Pro	Ala Trp Leu Thr Ser	Lys Ile Asp
[6135]	1010	1015	1020
[6136]	Pro Ser Thr Gly Phe Val Asn	Leu Leu Lys Thr Lys	Tyr Thr Ser
[6137]	1025	1030	1035
[6138]	Ile Ala Asp Ser Lys Lys Phe	Ile Ser Ser Phe Asp	Arg Ile Met
[6139]	1040	1045	1050
[6140]	Tyr Val Pro Glu Glu Asp Leu	Phe Glu Phe Ala Leu	Asp Tyr Lys
[6141]	1055	1060	1065
[6142]	Asn Phe Ser Arg Thr Asp Ala	Asp Tyr Ile Lys Lys	Trp Lys Leu
[6143]	1070	1075	1080
[6144]	Tyr Ser Tyr Gly Asn Arg Ile	Arg Ile Phe Arg Asn	Pro Lys Lys
[6145]	1085	1090	1095
[6146]	Asn Asn Val Phe Asp Trp Glu	Glu Val Cys Leu Thr	Ser Ala Tyr
[6147]	1100	1105	1110
[6148]	Lys Glu Leu Phe Asn Lys Tyr	Gly Ile Asn Tyr Gln	Gln Gly Asp
[6149]	1115	1120	1125
[6150]	Ile Arg Ala Leu Leu Cys Glu	Gln Ser Asp Lys Ala	Phe Tyr Ser
[6151]	1130	1135	1140
[6152]	Ser Phe Met Ala Leu Met Ser	Leu Met Leu Gln Met	Arg Asn Ser
[6153]	1145	1150	1155
[6154]	Ile Thr Gly Arg Thr Asp Val	Asp Phe Leu Ile Ser	Pro Val Lys
[6155]	1160	1165	1170
[6156]	Asn Ser Asp Gly Ile Phe Tyr	Asp Ser Arg Asn Tyr	Glu Ala Gln
[6157]	1175	1180	1185
[6158]	Glu Asn Ala Ile Leu Pro Lys	Asn Ala Asp Ala Asn	Gly Ala Tyr
[6159]	1190	1195	1200
[6160]	Asn Ile Ala Arg Lys Val Leu	Trp Ala Ile Gly Gln	Phe Lys Lys
[6161]	1205	1210	1215
[6162]	Ala Glu Asp Glu Lys Leu Asp	Lys Val Lys Ile Ala	Ile Ser Asn
[6163]	1220	1225	1230
[6164]	Lys Glu Trp Leu Glu Tyr Ala	Gln Thr Ser Val Lys	His Ser Glu
[6165]	1235	1240	1245
[6166]	Gln Gln Glu Asn Pro Gly Ser	Gly Thr Asn Leu Ser	Asp Ile Ile
[6167]	1250	1255	1260
[6168]	Glu Lys Glu Thr Gly Lys Gln	Leu Val Ile Gln Glu	Ser Ile Leu
[6169]	1265	1270	1275
[6170]	Met Leu Pro Glu Glu Val Glu	Glu Val Ile Gly Asn	Lys Pro Glu
[6171]	1280	1285	1290
[6172]	Ser Asp Ile Leu Val His Thr	Ala Tyr Asp Glu Ser	Thr Asp Glu
[6173]	1295	1300	1305

[6174]	Asn Val Met Leu Leu Thr Ser Asp Ala Pro Glu Tyr Lys Pro Trp
[6175]	1310 1315 1320
[6176]	Ala Leu Val Ile Gln Asp Ser Asn Gly Glu Asn Lys Ile Lys Met
[6177]	1325 1330 1335
[6178]	Leu Lys Gly Gly Gly Gly Glu Pro Asp Glu Lys Arg Pro Ser Gln
[6179]	1340 1345 1350
[6180]	Ser Ser Ser Ser Glu Thr Gly Pro Val Ala Val Asp Pro Thr Leu
[6181]	1355 1360 1365
[6182]	Arg Arg Arg Ile Glu Pro His Glu Phe Glu Val Phe Phe Asp Pro
[6183]	1370 1375 1380
[6184]	Arg Glu Leu Arg Lys Glu Thr Cys Leu Leu Tyr Glu Ile Asn Trp
[6185]	1385 1390 1395
[6186]	Gly Gly Arg His Ser Ile Trp Arg His Thr Ser Gln Asn Thr Asn
[6187]	1400 1405 1410
[6188]	Lys His Val Glu Val Asn Phe Ile Glu Lys Phe Thr Thr Glu Arg
[6189]	1415 1420 1425
[6190]	Tyr Phe Cys Pro Asn Thr Arg Cys Ser Ile Thr Trp Phe Leu Ser
[6191]	1430 1435 1440
[6192]	Trp Ser Pro Cys Gly Glu Cys Ser Arg Ala Ile Thr Glu Phe Leu
[6193]	1445 1450 1455
[6194]	Ser Arg Tyr Pro His Val Thr Leu Phe Ile Tyr Ile Ala Arg Leu
[6195]	1460 1465 1470
[6196]	Tyr His His Ala Asp Pro Arg Asn Arg Gln Gly Leu Arg Asp Leu
[6197]	1475 1480 1485
[6198]	Ile Ser Ser Gly Val Thr Ile Gln Ile Met Thr Glu Gln Glu Ser
[6199]	1490 1495 1500
[6200]	Gly Tyr Cys Trp Arg Asn Phe Val Asn Tyr Ser Pro Ser Asn Glu
[6201]	1505 1510 1515
[6202]	Ala His Trp Pro Arg Tyr Pro His Leu Trp Val Arg Leu Tyr Val
[6203]	1520 1525 1530
[6204]	Leu Glu Leu Tyr Cys Ile Ile Leu Gly Leu Pro Pro Cys Leu Asn
[6205]	1535 1540 1545
[6206]	Ile Leu Arg Arg Lys Gln Pro Gln Leu Thr Phe Phe Thr Ile Ala
[6207]	1550 1555 1560
[6208]	Leu Gln Ser Cys His Tyr Gln Arg Leu Pro Pro His Ile Leu Trp
[6209]	1565 1570 1575
[6210]	Ala Thr Gly Leu Lys Ser Gly Gly Ser Lys Arg Thr Ala Asp Gly
[6211]	1580 1585 1590
[6212]	Ser Glu Phe
[6213]	1595
[6214]	<210> 63
[6215]	<211> 1600

[6216]	<212>	PRT
[6217]	<213>	人工的
[6218]	<220>	
[6219]	<223>	碱基编辑器融合蛋白
[6220]	<400>	63
[6221]	Met Lys Arg Thr Ala Asp Gly Ser Glu Phe Glu Ser Pro Lys Lys Lys	
[6222]	1 5 10 15	
[6223]	Arg Lys Val Ser Lys Leu Glu Lys Phe Thr Asn Cys Tyr Ser Leu Ser	
[6224]	20 25 30	
[6225]	Lys Thr Leu Arg Phe Lys Ala Ile Pro Val Gly Lys Thr Gln Glu Asn	
[6226]	35 40 45	
[6227]	Ile Asp Asn Lys Arg Leu Leu Val Glu Asp Glu Lys Arg Ala Glu Asp	
[6228]	50 55 60	
[6229]	Tyr Lys Gly Val Lys Lys Leu Leu Asp Arg Tyr Tyr Leu Ser Phe Ile	
[6230]	65 70 75 80	
[6231]	Asn Asp Val Leu His Ser Ile Lys Leu Lys Asn Leu Asn Asn Tyr Ile	
[6232]	85 90 95	
[6233]	Ser Leu Phe Arg Lys Lys Thr Arg Thr Glu Lys Glu Asn Lys Glu Leu	
[6234]	100 105 110	
[6235]	Glu Asn Leu Glu Ile Asn Leu Arg Lys Glu Ile Ala Lys Ala Phe Lys	
[6236]	115 120 125	
[6237]	Gly Asn Glu Gly Tyr Lys Ser Leu Phe Lys Lys Asp Ile Ile Glu Thr	
[6238]	130 135 140	
[6239]	Ile Leu Pro Glu Phe Leu Asp Asp Lys Asp Glu Ile Ala Leu Val Asn	
[6240]	145 150 155 160	
[6241]	Ser Phe Asn Gly Phe Thr Thr Ala Phe Thr Gly Phe Phe Asp Asn Arg	
[6242]	165 170 175	
[6243]	Glu Asn Met Phe Ser Glu Glu Ala Lys Ser Thr Ser Ile Ala Phe Arg	
[6244]	180 185 190	
[6245]	Cys Ile Asn Glu Asn Leu Thr Arg Tyr Ile Ser Asn Met Asp Ile Phe	
[6246]	195 200 205	
[6247]	Glu Lys Val Asp Ala Ile Phe Asp Lys His Glu Val Gln Glu Ile Lys	
[6248]	210 215 220	
[6249]	Glu Lys Ile Leu Asn Ser Asp Tyr Asp Val Glu Asp Phe Phe Glu Gly	
[6250]	225 230 235 240	
[6251]	Glu Phe Phe Asn Phe Val Leu Thr Gln Glu Gly Ile Asp Val Tyr Asn	
[6252]	245 250 255	
[6253]	Ala Ile Ile Gly Gly Phe Val Thr Glu Ser Gly Glu Lys Ile Lys Gly	
[6254]	260 265 270	
[6255]	Leu Asn Glu Tyr Ile Asn Leu Tyr Asn Gln Lys Thr Lys Gln Lys Leu	
[6256]	275 280 285	
[6257]	Pro Lys Phe Lys Pro Leu Tyr Lys Gln Val Leu Ser Asp Arg Glu Ser	

[6258]	290	295	300
[6259]	Leu Ser Phe Tyr Gly Glu Gly Tyr Thr Ser Asp Glu Glu Val Leu Glu		
[6260]	305	310	315
[6261]	Val Phe Arg Asn Thr Leu Asn Lys Asn Ser Glu Ile Phe Ser Ser Ile		
[6262]		325	330
[6263]	Lys Lys Leu Glu Lys Leu Phe Lys Asn Phe Asp Glu Tyr Ser Ser Ala		
[6264]		340	345
[6265]	Gly Ile Phe Val Lys Asn Gly Pro Ala Ile Ser Thr Ile Ser Lys Asp		
[6266]		355	360
[6267]	Ile Phe Gly Glu Trp Asn Val Ile Arg Asp Lys Trp Asn Ala Glu Tyr		
[6268]	370	375	380
[6269]	Asp Asp Ile His Leu Lys Lys Lys Ala Val Val Thr Glu Lys Tyr Glu		
[6270]	385	390	395
[6271]	Asp Asp Arg Arg Lys Ser Phe Lys Lys Ile Gly Ser Phe Ser Leu Glu		
[6272]		405	410
[6273]	Gln Leu Gln Glu Tyr Ala Asp Ala Asp Leu Ser Val Val Glu Lys Leu		
[6274]		420	425
[6275]	Lys Glu Ile Ile Ile Gln Lys Val Asp Glu Ile Tyr Lys Val Tyr Gly		
[6276]		435	440
[6277]	Ser Ser Glu Lys Leu Phe Asp Ala Asp Phe Val Leu Glu Lys Ser Leu		
[6278]	450	455	460
[6279]	Lys Lys Asn Asp Ala Val Val Ala Ile Met Lys Asp Leu Leu Asp Ser		
[6280]	465	470	475
[6281]	Val Lys Ser Phe Glu Asn Tyr Ile Lys Ala Phe Phe Gly Glu Gly Lys		
[6282]		485	490
[6283]	Glu Thr Asn Arg Asp Glu Ser Phe Tyr Gly Asp Phe Val Leu Ala Tyr		
[6284]		500	505
[6285]	Asp Ile Leu Leu Lys Val Asp His Ile Tyr Asp Ala Ile Arg Asn Tyr		
[6286]		515	520
[6287]	Val Thr Gln Lys Pro Tyr Ser Lys Asp Lys Phe Lys Leu Tyr Phe Gln		
[6288]	530	535	540
[6289]	Asn Pro Gln Phe Met Gly Gly Trp Asp Lys Asp Lys Glu Thr Asp Tyr		
[6290]	545	550	555
[6291]	Arg Ala Thr Ile Leu Arg Tyr Gly Ser Lys Tyr Tyr Leu Ala Ile Met		
[6292]		565	570
[6293]	Asp Lys Lys Tyr Ala Lys Cys Leu Gln Lys Ile Asp Lys Asp Asp Val		
[6294]		580	585
[6295]	Asn Gly Asn Tyr Glu Lys Ile Asn Tyr Lys Leu Leu Pro Gly Pro Asn		
[6296]		595	600
[6297]	Lys Met Leu Pro Lys Val Phe Phe Ser Lys Lys Trp Met Ala Tyr Tyr		
[6298]	610	615	620
[6299]	Asn Pro Ser Glu Asp Ile Gln Lys Ile Tyr Lys Asn Gly Thr Phe Lys		

[6300]	625	630	635	640
[6301]	Lys Gly Asp Met Phe Asn Leu Asn Asp Cys His Lys Leu Ile Asp Phe			
[6302]		645	650	655
[6303]	Phe Lys Asp Ser Ile Ser Arg Tyr Pro Lys Trp Ser Asn Ala Tyr Asp			
[6304]		660	665	670
[6305]	Phe Asn Phe Ser Glu Thr Glu Lys Tyr Lys Asp Ile Ala Gly Phe Tyr			
[6306]		675	680	685
[6307]	Arg Glu Val Glu Glu Gln Gly Tyr Lys Val Ser Phe Glu Ser Ala Ser			
[6308]		690	695	700
[6309]	Lys Lys Glu Val Asp Lys Leu Val Glu Glu Gly Lys Leu Tyr Met Phe			
[6310]	705	710	715	720
[6311]	Gln Ile Tyr Asn Lys Asp Phe Ser Asp Lys Ser His Gly Thr Pro Asn			
[6312]		725	730	735
[6313]	Leu His Thr Met Tyr Phe Lys Leu Leu Phe Asp Glu Asn Asn His Gly			
[6314]		740	745	750
[6315]	Gln Ile Arg Leu Ser Gly Gly Ala Glu Leu Phe Met Arg Arg Ala Ser			
[6316]		755	760	765
[6317]	Leu Lys Lys Glu Glu Leu Val Val His Pro Ala Asn Ser Pro Ile Ala			
[6318]		770	775	780
[6319]	Asn Lys Asn Pro Asp Asn Pro Lys Lys Thr Thr Thr Leu Ser Tyr Asp			
[6320]	785	790	795	800
[6321]	Val Tyr Lys Asp Lys Arg Phe Ser Glu Asp Gln Tyr Glu Leu His Ile			
[6322]		805	810	815
[6323]	Pro Ile Ala Ile Asn Lys Cys Pro Lys Asn Ile Phe Lys Ile Asn Thr			
[6324]		820	825	830
[6325]	Glu Val Arg Val Leu Leu Lys His Asp Asp Asn Pro Tyr Val Ile Gly			
[6326]		835	840	845
[6327]	Ile Ala Arg Gly Glu Arg Asn Leu Leu Tyr Ile Val Val Val Asp Gly			
[6328]		850	855	860
[6329]	Lys Gly Asn Ile Val Glu Gln Tyr Ser Leu Asn Glu Ile Ile Asn Asn			
[6330]	865	870	875	880
[6331]	Phe Asn Gly Ile Arg Ile Lys Thr Asp Tyr His Ser Leu Leu Asp Lys			
[6332]		885	890	895
[6333]	Lys Glu Lys Glu Arg Phe Glu Ala Arg Gln Asn Trp Thr Ser Ile Glu			
[6334]		900	905	910
[6335]	Asn Ile Lys Glu Leu Lys Ala Gly Tyr Ile Ser Gln Val Val His Lys			
[6336]		915	920	925
[6337]	Ile Cys Glu Leu Val Glu Lys Tyr Asp Ala Val Ile Ala Leu Glu Asp			
[6338]		930	935	940
[6339]	Leu Asn Ser Gly Phe Lys Asn Ser Arg Val Lys Val Glu Lys Gln Val			
[6340]	945	950	955	960
[6341]	Tyr Gln Lys Phe Glu Lys Met Leu Ile Asp Lys Leu Asn Tyr Met Val			

[6342]	965						970						975					
[6343]	Asp	Lys	Lys	Ser	Asn	Pro	Cys	Ala	Thr	Gly	Gly	Ala	Leu	Lys	Gly	Tyr		
[6344]	980						985						990					
[6345]	Gln	Ile	Thr	Asn	Lys	Phe	Glu	Ser	Phe	Lys	Ser	Met	Ser	Thr	Gln	Asn		
[6346]	995						1000						1005					
[6347]	Gly	Phe	Ile	Phe	Tyr	Ile	Pro	Ala	Trp	Leu	Thr	Ser	Lys	Ile	Asp			
[6348]	1010						1015						1020					
[6349]	Pro	Ser	Thr	Gly	Phe	Val	Asn	Leu	Leu	Lys	Thr	Lys	Tyr	Thr	Ser			
[6350]	1025						1030						1035					
[6351]	Ile	Ala	Asp	Ser	Lys	Lys	Phe	Ile	Ser	Ser	Phe	Asp	Arg	Ile	Met			
[6352]	1040						1045						1050					
[6353]	Tyr	Val	Pro	Glu	Glu	Asp	Leu	Phe	Glu	Phe	Ala	Leu	Asp	Tyr	Lys			
[6354]	1055						1060						1065					
[6355]	Asn	Phe	Ser	Arg	Thr	Asp	Ala	Asp	Tyr	Ile	Lys	Lys	Trp	Lys	Leu			
[6356]	1070						1075						1080					
[6357]	Tyr	Ser	Tyr	Gly	Asn	Arg	Ile	Arg	Ile	Phe	Arg	Asn	Pro	Lys	Lys			
[6358]	1085						1090						1095					
[6359]	Asn	Asn	Val	Phe	Asp	Trp	Glu	Glu	Val	Cys	Leu	Thr	Ser	Ala	Tyr			
[6360]	1100						1105						1110					
[6361]	Lys	Glu	Leu	Phe	Asn	Lys	Tyr	Gly	Ile	Asn	Tyr	Gln	Gln	Gly	Asp			
[6362]	1115						1120						1125					
[6363]	Ile	Arg	Ala	Leu	Leu	Cys	Glu	Gln	Ser	Asp	Lys	Ala	Phe	Tyr	Ser			
[6364]	1130						1135						1140					
[6365]	Ser	Phe	Met	Ala	Leu	Met	Ser	Leu	Met	Leu	Gln	Met	Arg	Asn	Ser			
[6366]	1145						1150						1155					
[6367]	Ile	Thr	Gly	Arg	Thr	Asp	Val	Asp	Phe	Leu	Ile	Ser	Pro	Val	Lys			
[6368]	1160						1165						1170					
[6369]	Asn	Ser	Asp	Gly	Ile	Phe	Tyr	Asp	Ser	Arg	Asn	Tyr	Glu	Ala	Gln			
[6370]	1175						1180						1185					
[6371]	Glu	Asn	Ala	Ile	Leu	Pro	Lys	Asn	Ala	Asp	Ala	Asn	Gly	Ala	Tyr			
[6372]	1190						1195						1200					
[6373]	Asn	Ile	Ala	Arg	Lys	Val	Leu	Trp	Ala	Ile	Gly	Gln	Phe	Lys	Lys			
[6374]	1205						1210						1215					
[6375]	Ala	Glu	Asp	Glu	Lys	Leu	Asp	Lys	Val	Lys	Ile	Ala	Ile	Ser	Asn			
[6376]	1220						1225						1230					
[6377]	Lys	Glu	Trp	Leu	Glu	Tyr	Ala	Gln	Thr	Ser	Val	Lys	His	Ser	Glu			
[6378]	1235						1240						1245					
[6379]	Gln	Gln	Glu	Asn	Pro	Gly	Ser	Gly	Thr	Asn	Leu	Ser	Asp	Ile	Ile			
[6380]	1250						1255						1260					
[6381]	Glu	Lys	Glu	Thr	Gly	Lys	Gln	Leu	Val	Ile	Gln	Glu	Ser	Ile	Leu			
[6382]	1265						1270						1275					
[6383]	Met	Leu	Pro	Glu	Glu	Val	Glu	Glu	Val	Ile	Gly	Asn	Lys	Pro	Glu			

[6384]	1280	1285	1290
[6385]	Ser Asp Ile Leu Val His Thr Ala Tyr Asp Glu Ser Thr Asp Glu		
[6386]	1295	1300	1305
[6387]	Asn Val Met Leu Leu Thr Ser Asp Ala Pro Glu Tyr Lys Pro Trp		
[6388]	1310	1315	1320
[6389]	Ala Leu Val Ile Gln Asp Ser Asn Gly Glu Asn Lys Ile Lys Met		
[6390]	1325	1330	1335
[6391]	Leu Pro Lys Pro Ser Ser Glu Ser Gly Glu Arg Tyr Glu Gln Gln		
[6392]	1340	1345	1350
[6393]	Pro Glu Pro Pro Pro Pro Ser Ser Glu Thr Gly Pro Val Ala Val		
[6394]	1355	1360	1365
[6395]	Asp Pro Thr Leu Arg Arg Arg Ile Glu Pro His Glu Phe Glu Val		
[6396]	1370	1375	1380
[6397]	Phe Phe Asp Pro Arg Glu Leu Arg Lys Glu Thr Cys Leu Leu Tyr		
[6398]	1385	1390	1395
[6399]	Glu Ile Asn Trp Gly Gly Arg His Ser Ile Trp Arg His Thr Ser		
[6400]	1400	1405	1410
[6401]	Gln Asn Thr Asn Lys His Val Glu Val Asn Phe Ile Glu Lys Phe		
[6402]	1415	1420	1425
[6403]	Thr Thr Glu Arg Tyr Phe Cys Pro Asn Thr Arg Cys Ser Ile Thr		
[6404]	1430	1435	1440
[6405]	Trp Phe Leu Ser Trp Ser Pro Cys Gly Glu Cys Ser Arg Ala Ile		
[6406]	1445	1450	1455
[6407]	Thr Glu Phe Leu Ser Arg Tyr Pro His Val Thr Leu Phe Ile Tyr		
[6408]	1460	1465	1470
[6409]	Ile Ala Arg Leu Tyr His His Ala Asp Pro Arg Asn Arg Gln Gly		
[6410]	1475	1480	1485
[6411]	Leu Arg Asp Leu Ile Ser Ser Gly Val Thr Ile Gln Ile Met Thr		
[6412]	1490	1495	1500
[6413]	Glu Gln Glu Ser Gly Tyr Cys Trp Arg Asn Phe Val Asn Tyr Ser		
[6414]	1505	1510	1515
[6415]	Pro Ser Asn Glu Ala His Trp Pro Arg Tyr Pro His Leu Trp Val		
[6416]	1520	1525	1530
[6417]	Arg Leu Tyr Val Leu Glu Leu Tyr Cys Ile Ile Leu Gly Leu Pro		
[6418]	1535	1540	1545
[6419]	Pro Cys Leu Asn Ile Leu Arg Arg Lys Gln Pro Gln Leu Thr Phe		
[6420]	1550	1555	1560
[6421]	Phe Thr Ile Ala Leu Gln Ser Cys His Tyr Gln Arg Leu Pro Pro		
[6422]	1565	1570	1575
[6423]	His Ile Leu Trp Ala Thr Gly Leu Lys Ser Gly Gly Ser Lys Arg		
[6424]	1580	1585	1590
[6425]	Thr Ala Asp Gly Ser Glu Phe		

[6426]	1595	1600
[6427]	<210> 64	
[6428]	<211> 1614	
[6429]	<212> PRT	
[6430]	<213> 人工的	
[6431]	<220>	
[6432]	<223> 碱基编辑器融合蛋白	
[6433]	<400> 64	
[6434]	Met Lys Arg Thr Ala Asp Gly Ser Glu Phe Glu Ser Pro Lys Lys Lys	
[6435]	1 5 10 15	
[6436]	Arg Lys Val Ser Ser Glu Thr Gly Pro Val Ala Val Asp Pro Thr Leu	
[6437]	20 25 30	
[6438]	Arg Arg Arg Ile Glu Pro His Glu Phe Glu Val Phe Phe Asp Pro Arg	
[6439]	35 40 45	
[6440]	Glu Leu Arg Lys Glu Thr Cys Leu Leu Tyr Glu Ile Asn Trp Gly Gly	
[6441]	50 55 60	
[6442]	Arg His Ser Ile Trp Arg His Thr Ser Gln Asn Thr Asn Lys His Val	
[6443]	65 70 75 80	
[6444]	Glu Val Asn Phe Ile Glu Lys Phe Thr Thr Glu Arg Tyr Phe Cys Pro	
[6445]	85 90 95	
[6446]	Asn Thr Arg Cys Ser Ile Thr Trp Phe Leu Ser Trp Ser Pro Cys Gly	
[6447]	100 105 110	
[6448]	Glu Cys Ser Arg Ala Ile Thr Glu Phe Leu Ser Arg Tyr Pro His Val	
[6449]	115 120 125	
[6450]	Thr Leu Phe Ile Tyr Ile Ala Arg Leu Tyr His His Ala Asp Pro Arg	
[6451]	130 135 140	
[6452]	Asn Arg Gln Gly Leu Arg Asp Leu Ile Ser Ser Gly Val Thr Ile Gln	
[6453]	145 150 155 160	
[6454]	Ile Met Thr Glu Gln Glu Ser Gly Tyr Cys Trp Arg Asn Phe Val Asn	
[6455]	165 170 175	
[6456]	Tyr Ser Pro Ser Asn Glu Ala His Trp Pro Arg Tyr Pro His Leu Trp	
[6457]	180 185 190	
[6458]	Val Arg Leu Tyr Val Leu Glu Leu Tyr Cys Ile Ile Leu Gly Leu Pro	
[6459]	195 200 205	
[6460]	Pro Cys Leu Asn Ile Leu Arg Arg Lys Gln Pro Gln Leu Thr Phe Phe	
[6461]	210 215 220	
[6462]	Thr Ile Ala Leu Gln Ser Cys His Tyr Gln Arg Leu Pro Pro His Ile	
[6463]	225 230 235 240	
[6464]	Leu Trp Ala Thr Gly Leu Lys Ser Gly Gly Ser Ser Gly Gly Ser Ser	
[6465]	245 250 255	
[6466]	Gly Ser Glu Thr Pro Gly Thr Ser Glu Ser Ala Thr Pro Glu Ser Ser	
[6467]	260 265 270	

[6468]	Gly Gly Ser Ser Gly Gly Ser Ser Lys Leu Glu Lys Phe Thr Asn Cys		
[6469]	275	280	285
[6470]	Tyr Ser Leu Ser Lys Thr Leu Arg Phe Lys Ala Ile Pro Val Gly Lys		
[6471]	290	295	300
[6472]	Thr Gln Glu Asn Ile Asp Asn Lys Arg Leu Leu Val Glu Asp Glu Lys		
[6473]	305	310	315
[6474]	Arg Ala Glu Asp Tyr Lys Gly Val Lys Lys Leu Leu Asp Arg Tyr Tyr		
[6475]	325	330	335
[6476]	Leu Ser Phe Ile Asn Asp Val Leu His Ser Ile Lys Leu Lys Asn Leu		
[6477]	340	345	350
[6478]	Asn Asn Tyr Ile Ser Leu Phe Arg Lys Lys Thr Arg Thr Glu Lys Glu		
[6479]	355	360	365
[6480]	Asn Lys Glu Leu Glu Asn Leu Glu Ile Asn Leu Arg Lys Glu Ile Ala		
[6481]	370	375	380
[6482]	Lys Ala Phe Lys Gly Asn Glu Gly Tyr Lys Ser Leu Phe Lys Lys Asp		
[6483]	385	390	395
[6484]	Ile Ile Glu Thr Ile Leu Pro Glu Phe Leu Asp Asp Lys Asp Glu Ile		
[6485]	405	410	415
[6486]	Ala Leu Val Asn Ser Phe Asn Gly Phe Thr Thr Ala Phe Thr Gly Phe		
[6487]	420	425	430
[6488]	Phe Asp Asn Arg Glu Asn Met Phe Ser Glu Glu Ala Lys Ser Thr Ser		
[6489]	435	440	445
[6490]	Ile Ala Phe Arg Cys Ile Asn Glu Asn Leu Thr Arg Tyr Ile Ser Asn		
[6491]	450	455	460
[6492]	Met Asp Ile Phe Glu Lys Val Asp Ala Ile Phe Asp Lys His Glu Val		
[6493]	465	470	475
[6494]	Gln Glu Ile Lys Glu Lys Ile Leu Asn Ser Asp Tyr Asp Val Glu Asp		
[6495]	485	490	495
[6496]	Phe Phe Glu Gly Glu Phe Phe Asn Phe Val Leu Thr Gln Glu Gly Ile		
[6497]	500	505	510
[6498]	Asp Val Tyr Asn Ala Ile Ile Gly Gly Phe Val Thr Glu Ser Gly Glu		
[6499]	515	520	525
[6500]	Lys Ile Lys Gly Leu Asn Glu Tyr Ile Asn Leu Tyr Asn Gln Lys Thr		
[6501]	530	535	540
[6502]	Lys Gln Lys Leu Pro Lys Phe Lys Pro Leu Tyr Lys Gln Val Leu Ser		
[6503]	545	550	555
[6504]	Asp Arg Glu Ser Leu Ser Phe Tyr Gly Glu Gly Tyr Thr Ser Asp Glu		
[6505]	565	570	575
[6506]	Glu Val Leu Glu Val Phe Arg Asn Thr Leu Asn Lys Asn Ser Glu Ile		
[6507]	580	585	590
[6508]	Phe Ser Ser Ile Lys Lys Leu Glu Lys Leu Phe Lys Asn Phe Asp Glu		
[6509]	595	600	605

[6510]	Tyr Ser Ser Ala Gly Ile Phe Val Lys Asn Gly Pro Ala Ile Ser Thr
[6511]	610 615 620
[6512]	Ile Ser Lys Asp Ile Phe Gly Glu Trp Asn Val Ile Arg Asp Lys Trp
[6513]	625 630 635 640
[6514]	Asn Ala Glu Tyr Asp Asp Ile His Leu Lys Lys Lys Ala Val Val Thr
[6515]	645 650 655
[6516]	Glu Lys Tyr Glu Asp Asp Arg Arg Lys Ser Phe Lys Lys Ile Gly Ser
[6517]	660 665 670
[6518]	Phe Ser Leu Glu Gln Leu Gln Glu Tyr Ala Asp Ala Asp Leu Ser Val
[6519]	675 680 685
[6520]	Val Glu Lys Leu Lys Glu Ile Ile Ile Gln Lys Val Asp Glu Ile Tyr
[6521]	690 695 700
[6522]	Lys Val Tyr Gly Ser Ser Glu Lys Leu Phe Asp Ala Asp Phe Val Leu
[6523]	705 710 715 720
[6524]	Glu Lys Ser Leu Lys Lys Asn Asp Ala Val Val Ala Ile Met Lys Asp
[6525]	725 730 735
[6526]	Leu Leu Asp Ser Val Lys Ser Phe Glu Asn Tyr Ile Lys Ala Phe Phe
[6527]	740 745 750
[6528]	Gly Glu Gly Lys Glu Thr Asn Arg Asp Glu Ser Phe Tyr Gly Asp Phe
[6529]	755 760 765
[6530]	Val Leu Ala Tyr Asp Ile Leu Leu Lys Val Asp His Ile Tyr Asp Ala
[6531]	770 775 780
[6532]	Ile Arg Asn Tyr Val Thr Gln Lys Pro Tyr Ser Lys Asp Lys Phe Lys
[6533]	785 790 795 800
[6534]	Leu Tyr Phe Gln Asn Pro Gln Phe Met Gly Gly Trp Asp Lys Asp Lys
[6535]	805 810 815
[6536]	Glu Thr Asp Tyr Arg Ala Thr Ile Leu Arg Tyr Gly Ser Lys Tyr Tyr
[6537]	820 825 830
[6538]	Leu Ala Ile Met Asp Lys Lys Tyr Ala Lys Cys Leu Gln Lys Ile Asp
[6539]	835 840 845
[6540]	Lys Asp Asp Val Asn Gly Asn Tyr Glu Lys Ile Asn Tyr Lys Leu Leu
[6541]	850 855 860
[6542]	Pro Gly Pro Asn Lys Met Leu Pro Lys Val Phe Phe Ser Lys Lys Trp
[6543]	865 870 875 880
[6544]	Met Ala Tyr Tyr Asn Pro Ser Glu Asp Ile Gln Lys Ile Tyr Lys Asn
[6545]	885 890 895
[6546]	Gly Thr Phe Lys Lys Gly Asp Met Phe Asn Leu Asn Asp Cys His Lys
[6547]	900 905 910
[6548]	Leu Ile Asp Phe Phe Lys Asp Ser Ile Ser Arg Tyr Pro Lys Trp Ser
[6549]	915 920 925
[6550]	Asn Ala Tyr Asp Phe Asn Phe Ser Glu Thr Glu Lys Tyr Lys Asp Ile
[6551]	930 935 940

[6552]	Ala Gly Phe Tyr Arg Glu Val Glu Glu Gln Gly Tyr Lys Val Ser Phe		
[6553]	945	950	955 960
[6554]	Glu Ser Ala Ser Lys Lys Glu Val Asp Lys Leu Val Glu Glu Gly Lys		
[6555]		965	970 975
[6556]	Leu Tyr Met Phe Gln Ile Tyr Asn Lys Asp Phe Ser Asp Lys Ser His		
[6557]		980	985 990
[6558]	Gly Thr Pro Asn Leu His Thr Met Tyr Phe Lys Leu Leu Phe Asp Glu		
[6559]		995	1000 1005
[6560]	Asn Asn His Gly Gln Ile Arg Leu Ser Gly Gly Ala Glu Leu Phe		
[6561]	1010	1015	1020
[6562]	Met Arg Arg Ala Ser Leu Lys Lys Glu Glu Leu Val Val His Pro		
[6563]	1025	1030	1035
[6564]	Ala Asn Ser Pro Ile Ala Asn Lys Asn Pro Asp Asn Pro Lys Lys		
[6565]	1040	1045	1050
[6566]	Thr Thr Thr Leu Ser Tyr Asp Val Tyr Lys Asp Lys Arg Phe Ser		
[6567]	1055	1060	1065
[6568]	Glu Asp Gln Tyr Glu Leu His Ile Pro Ile Ala Ile Asn Lys Cys		
[6569]	1070	1075	1080
[6570]	Pro Lys Asn Ile Phe Lys Ile Asn Thr Glu Val Arg Val Leu Leu		
[6571]	1085	1090	1095
[6572]	Lys His Asp Asp Asn Pro Tyr Val Ile Gly Ile Ala Arg Gly Glu		
[6573]	1100	1105	1110
[6574]	Arg Asn Leu Leu Tyr Ile Val Val Val Asp Gly Lys Gly Asn Ile		
[6575]	1115	1120	1125
[6576]	Val Glu Gln Tyr Ser Leu Asn Glu Ile Ile Asn Asn Phe Asn Gly		
[6577]	1130	1135	1140
[6578]	Ile Arg Ile Lys Thr Asp Tyr His Ser Leu Leu Asp Lys Lys Glu		
[6579]	1145	1150	1155
[6580]	Lys Glu Arg Phe Glu Ala Arg Gln Asn Trp Thr Ser Ile Glu Asn		
[6581]	1160	1165	1170
[6582]	Ile Lys Glu Leu Lys Ala Gly Tyr Ile Ser Gln Val Val His Lys		
[6583]	1175	1180	1185
[6584]	Ile Cys Glu Leu Val Glu Lys Tyr Asp Ala Val Ile Ala Leu Glu		
[6585]	1190	1195	1200
[6586]	Asp Leu Asn Ser Gly Phe Lys Asn Ser Arg Val Lys Val Glu Lys		
[6587]	1205	1210	1215
[6588]	Gln Val Tyr Gln Lys Phe Glu Lys Met Leu Ile Asp Lys Leu Asn		
[6589]	1220	1225	1230
[6590]	Tyr Met Val Asp Lys Lys Ser Asn Pro Cys Ala Thr Gly Gly Ala		
[6591]	1235	1240	1245
[6592]	Leu Lys Gly Tyr Gln Ile Thr Asn Lys Phe Glu Ser Phe Lys Ser		
[6593]	1250	1255	1260

[6594]	Met Ser Thr Gln Asn Gly Phe Ile Phe Tyr Ile Pro Ala Trp Leu
[6595]	1265 1270 1275
[6596]	Thr Ser Lys Ile Asp Pro Ser Thr Gly Phe Val Asn Leu Leu Lys
[6597]	1280 1285 1290
[6598]	Thr Lys Tyr Thr Ser Ile Ala Asp Ser Lys Lys Phe Ile Ser Ser
[6599]	1295 1300 1305
[6600]	Phe Asp Arg Ile Met Tyr Val Pro Glu Glu Asp Leu Phe Glu Phe
[6601]	1310 1315 1320
[6602]	Ala Leu Asp Tyr Lys Asn Phe Ser Arg Thr Asp Ala Asp Tyr Ile
[6603]	1325 1330 1335
[6604]	Lys Lys Trp Lys Leu Tyr Ser Tyr Gly Asn Arg Ile Arg Ile Phe
[6605]	1340 1345 1350
[6606]	Arg Asn Pro Lys Lys Asn Asn Val Phe Asp Trp Glu Glu Val Cys
[6607]	1355 1360 1365
[6608]	Leu Thr Ser Ala Tyr Lys Glu Leu Phe Asn Lys Tyr Gly Ile Asn
[6609]	1370 1375 1380
[6610]	Tyr Gln Gln Gly Asp Ile Arg Ala Leu Leu Cys Glu Gln Ser Asp
[6611]	1385 1390 1395
[6612]	Lys Ala Phe Tyr Ser Ser Phe Met Ala Leu Met Ser Leu Met Leu
[6613]	1400 1405 1410
[6614]	Gln Met Arg Asn Ser Ile Thr Gly Arg Thr Asp Val Asp Phe Leu
[6615]	1415 1420 1425
[6616]	Ile Ser Pro Val Lys Asn Ser Asp Gly Ile Phe Tyr Asp Ser Arg
[6617]	1430 1435 1440
[6618]	Asn Tyr Glu Ala Gln Glu Asn Ala Ile Leu Pro Lys Asn Ala Asp
[6619]	1445 1450 1455
[6620]	Ala Asn Gly Ala Tyr Asn Ile Ala Arg Lys Val Leu Trp Ala Ile
[6621]	1460 1465 1470
[6622]	Gly Gln Phe Lys Lys Ala Glu Asp Glu Lys Leu Asp Lys Val Lys
[6623]	1475 1480 1485
[6624]	Ile Ala Ile Ser Asn Lys Glu Trp Leu Glu Tyr Ala Gln Thr Ser
[6625]	1490 1495 1500
[6626]	Val Lys His Glu Ser Asn Asp Asn Ser Gln Val Pro Pro Ser Leu
[6627]	1505 1510 1515
[6628]	Thr Asn Leu Ser Asp Ile Ile Glu Lys Glu Thr Gly Lys Gln Leu
[6629]	1520 1525 1530
[6630]	Val Ile Gln Glu Ser Ile Leu Met Leu Pro Glu Glu Val Glu Glu
[6631]	1535 1540 1545
[6632]	Val Ile Gly Asn Lys Pro Glu Ser Asp Ile Leu Val His Thr Ala
[6633]	1550 1555 1560
[6634]	Tyr Asp Glu Ser Thr Asp Glu Asn Val Met Leu Leu Thr Ser Asp
[6635]	1565 1570 1575

[6636]	Ala Pro Glu Tyr Lys Pro Trp Ala Leu Val Ile Gln Asp Ser Asn
[6637]	1580 1585 1590
[6638]	Gly Glu Asn Lys Ile Lys Met Leu Ser Gly Gly Ser Lys Arg Thr
[6639]	1595 1600 1605
[6640]	Ala Asp Gly Ser Glu Phe
[6641]	1610
[6642]	<210> 65
[6643]	<211> 1616
[6644]	<212> PRT
[6645]	<213> 人工的
[6646]	<220>
[6647]	<223> 碱基编辑器融合蛋白
[6648]	<400> 65
[6649]	Met Lys Arg Thr Ala Asp Gly Ser Glu Phe Glu Ser Pro Lys Lys Lys
[6650]	1 5 10 15
[6651]	Arg Lys Val Ser Ser Glu Thr Gly Pro Val Ala Val Asp Pro Thr Leu
[6652]	20 25 30
[6653]	Arg Arg Arg Ile Glu Pro His Glu Phe Glu Val Phe Phe Asp Pro Arg
[6654]	35 40 45
[6655]	Glu Leu Arg Lys Glu Thr Cys Leu Leu Tyr Glu Ile Asn Trp Gly Gly
[6656]	50 55 60
[6657]	Arg His Ser Ile Trp Arg His Thr Ser Gln Asn Thr Asn Lys His Val
[6658]	65 70 75 80
[6659]	Glu Val Asn Phe Ile Glu Lys Phe Thr Thr Glu Arg Tyr Phe Cys Pro
[6660]	85 90 95
[6661]	Asn Thr Arg Cys Ser Ile Thr Trp Phe Leu Ser Trp Ser Pro Cys Gly
[6662]	100 105 110
[6663]	Glu Cys Ser Arg Ala Ile Thr Glu Phe Leu Ser Arg Tyr Pro His Val
[6664]	115 120 125
[6665]	Thr Leu Phe Ile Tyr Ile Ala Arg Leu Tyr His His Ala Asp Pro Arg
[6666]	130 135 140
[6667]	Asn Arg Gln Gly Leu Arg Asp Leu Ile Ser Ser Gly Val Thr Ile Gln
[6668]	145 150 155 160
[6669]	Ile Met Thr Glu Gln Glu Ser Gly Tyr Cys Trp Arg Asn Phe Val Asn
[6670]	165 170 175
[6671]	Tyr Ser Pro Ser Asn Glu Ala His Trp Pro Arg Tyr Pro His Leu Trp
[6672]	180 185 190
[6673]	Val Arg Leu Tyr Val Leu Glu Leu Tyr Cys Ile Ile Leu Gly Leu Pro
[6674]	195 200 205
[6675]	Pro Cys Leu Asn Ile Leu Arg Arg Lys Gln Pro Gln Leu Thr Phe Phe
[6676]	210 215 220
[6677]	Thr Ile Ala Leu Gln Ser Cys His Tyr Gln Arg Leu Pro Pro His Ile

[6678]	225	230	235	240
[6679]	Leu Trp Ala Thr Gly Leu Lys Ser Gly Gly Ser Ser Gly Gly Ser Ser			
[6680]		245	250	255
[6681]	Gly Ser Glu Thr Pro Gly Thr Ser Glu Ser Ala Thr Pro Glu Ser Ser			
[6682]		260	265	270
[6683]	Gly Gly Ser Ser Gly Gly Ser Ser Lys Leu Glu Lys Phe Thr Asn Cys			
[6684]		275	280	285
[6685]	Tyr Ser Leu Ser Lys Thr Leu Arg Phe Lys Ala Ile Pro Val Gly Lys			
[6686]		290	295	300
[6687]	Thr Gln Glu Asn Ile Asp Asn Lys Arg Leu Leu Val Glu Asp Glu Lys			
[6688]	305	310	315	320
[6689]	Arg Ala Glu Asp Tyr Lys Gly Val Lys Lys Leu Leu Asp Arg Tyr Tyr			
[6690]		325	330	335
[6691]	Leu Ser Phe Ile Asn Asp Val Leu His Ser Ile Lys Leu Lys Asn Leu			
[6692]		340	345	350
[6693]	Asn Asn Tyr Ile Ser Leu Phe Arg Lys Lys Thr Arg Thr Glu Lys Glu			
[6694]		355	360	365
[6695]	Asn Lys Glu Leu Glu Asn Leu Glu Ile Asn Leu Arg Lys Glu Ile Ala			
[6696]		370	375	380
[6697]	Lys Ala Phe Lys Gly Asn Glu Gly Tyr Lys Ser Leu Phe Lys Lys Asp			
[6698]	385	390	395	400
[6699]	Ile Ile Glu Thr Ile Leu Pro Glu Phe Leu Asp Asp Lys Asp Glu Ile			
[6700]		405	410	415
[6701]	Ala Leu Val Asn Ser Phe Asn Gly Phe Thr Thr Ala Phe Thr Gly Phe			
[6702]		420	425	430
[6703]	Phe Asp Asn Arg Glu Asn Met Phe Ser Glu Glu Ala Lys Ser Thr Ser			
[6704]		435	440	445
[6705]	Ile Ala Phe Arg Cys Ile Asn Glu Asn Leu Thr Arg Tyr Ile Ser Asn			
[6706]		450	455	460
[6707]	Met Asp Ile Phe Glu Lys Val Asp Ala Ile Phe Asp Lys His Glu Val			
[6708]	465	470	475	480
[6709]	Gln Glu Ile Lys Glu Lys Ile Leu Asn Ser Asp Tyr Asp Val Glu Asp			
[6710]		485	490	495
[6711]	Phe Phe Glu Gly Glu Phe Phe Asn Phe Val Leu Thr Gln Glu Gly Ile			
[6712]		500	505	510
[6713]	Asp Val Tyr Asn Ala Ile Ile Gly Gly Phe Val Thr Glu Ser Gly Glu			
[6714]		515	520	525
[6715]	Lys Ile Lys Gly Leu Asn Glu Tyr Ile Asn Leu Tyr Asn Gln Lys Thr			
[6716]		530	535	540
[6717]	Lys Gln Lys Leu Pro Lys Phe Lys Pro Leu Tyr Lys Gln Val Leu Ser			
[6718]	545	550	555	560
[6719]	Asp Arg Glu Ser Leu Ser Phe Tyr Gly Glu Gly Tyr Thr Ser Asp Glu			

[6720]		565		570		575
[6721]	Glu Val Leu Glu Val Phe Arg Asn Thr Leu Asn Lys Asn Ser Glu Ile					
[6722]		580		585		590
[6723]	Phe Ser Ser Ile Lys Lys Leu Glu Lys Leu Phe Lys Asn Phe Asp Glu					
[6724]		595		600		605
[6725]	Tyr Ser Ser Ala Gly Ile Phe Val Lys Asn Gly Pro Ala Ile Ser Thr					
[6726]		610		615		620
[6727]	Ile Ser Lys Asp Ile Phe Gly Glu Trp Asn Val Ile Arg Asp Lys Trp					
[6728]	625		630		635	640
[6729]	Asn Ala Glu Tyr Asp Asp Ile His Leu Lys Lys Lys Ala Val Val Thr					
[6730]		645		650		655
[6731]	Glu Lys Tyr Glu Asp Asp Arg Arg Lys Ser Phe Lys Lys Ile Gly Ser					
[6732]		660		665		670
[6733]	Phe Ser Leu Glu Gln Leu Gln Glu Tyr Ala Asp Ala Asp Leu Ser Val					
[6734]		675		680		685
[6735]	Val Glu Lys Leu Lys Glu Ile Ile Ile Gln Lys Val Asp Glu Ile Tyr					
[6736]		690		695		700
[6737]	Lys Val Tyr Gly Ser Ser Glu Lys Leu Phe Asp Ala Asp Phe Val Leu					
[6738]	705		710		715	720
[6739]	Glu Lys Ser Leu Lys Lys Asn Asp Ala Val Val Ala Ile Met Lys Asp					
[6740]		725		730		735
[6741]	Leu Leu Asp Ser Val Lys Ser Phe Glu Asn Tyr Ile Lys Ala Phe Phe					
[6742]		740		745		750
[6743]	Gly Glu Gly Lys Glu Thr Asn Arg Asp Glu Ser Phe Tyr Gly Asp Phe					
[6744]		755		760		765
[6745]	Val Leu Ala Tyr Asp Ile Leu Leu Lys Val Asp His Ile Tyr Asp Ala					
[6746]		770		775		780
[6747]	Ile Arg Asn Tyr Val Thr Gln Lys Pro Tyr Ser Lys Asp Lys Phe Lys					
[6748]	785		790		795	800
[6749]	Leu Tyr Phe Gln Asn Pro Gln Phe Met Gly Gly Trp Asp Lys Asp Lys					
[6750]		805		810		815
[6751]	Glu Thr Asp Tyr Arg Ala Thr Ile Leu Arg Tyr Gly Ser Lys Tyr Tyr					
[6752]		820		825		830
[6753]	Leu Ala Ile Met Asp Lys Lys Tyr Ala Lys Cys Leu Gln Lys Ile Asp					
[6754]		835		840		845
[6755]	Lys Asp Asp Val Asn Gly Asn Tyr Glu Lys Ile Asn Tyr Lys Leu Leu					
[6756]		850		855		860
[6757]	Pro Gly Pro Asn Lys Met Leu Pro Lys Val Phe Phe Ser Lys Lys Trp					
[6758]	865		870		875	880
[6759]	Met Ala Tyr Tyr Asn Pro Ser Glu Asp Ile Gln Lys Ile Tyr Lys Asn					
[6760]		885		890		895
[6761]	Gly Thr Phe Lys Lys Gly Asp Met Phe Asn Leu Asn Asp Cys His Lys					

[6762]	900	905	910
[6763]	Leu Ile Asp Phe Phe Lys Asp Ser Ile Ser Arg Tyr Pro Lys Trp Ser		
[6764]	915	920	925
[6765]	Asn Ala Tyr Asp Phe Asn Phe Ser Glu Thr Glu Lys Tyr Lys Asp Ile		
[6766]	930	935	940
[6767]	Ala Gly Phe Tyr Arg Glu Val Glu Glu Gln Gly Tyr Lys Val Ser Phe		
[6768]	945	950	955 960
[6769]	Glu Ser Ala Ser Lys Lys Glu Val Asp Lys Leu Val Glu Glu Gly Lys		
[6770]	965	970	975
[6771]	Leu Tyr Met Phe Gln Ile Tyr Asn Lys Asp Phe Ser Asp Lys Ser His		
[6772]	980	985	990
[6773]	Gly Thr Pro Asn Leu His Thr Met Tyr Phe Lys Leu Leu Phe Asp Glu		
[6774]	995	1000	1005
[6775]	Asn Asn His Gly Gln Ile Arg Leu Ser Gly Gly Ala Glu Leu Phe		
[6776]	1010	1015	1020
[6777]	Met Arg Arg Ala Ser Leu Lys Lys Glu Glu Leu Val Val His Pro		
[6778]	1025	1030	1035
[6779]	Ala Asn Ser Pro Ile Ala Asn Lys Asn Pro Asp Asn Pro Lys Lys		
[6780]	1040	1045	1050
[6781]	Thr Thr Thr Leu Ser Tyr Asp Val Tyr Lys Asp Lys Arg Phe Ser		
[6782]	1055	1060	1065
[6783]	Glu Asp Gln Tyr Glu Leu His Ile Pro Ile Ala Ile Asn Lys Cys		
[6784]	1070	1075	1080
[6785]	Pro Lys Asn Ile Phe Lys Ile Asn Thr Glu Val Arg Val Leu Leu		
[6786]	1085	1090	1095
[6787]	Lys His Asp Asp Asn Pro Tyr Val Ile Gly Ile Ala Arg Gly Glu		
[6788]	1100	1105	1110
[6789]	Arg Asn Leu Leu Tyr Ile Val Val Val Asp Gly Lys Gly Asn Ile		
[6790]	1115	1120	1125
[6791]	Val Glu Gln Tyr Ser Leu Asn Glu Ile Ile Asn Asn Phe Asn Gly		
[6792]	1130	1135	1140
[6793]	Ile Arg Ile Lys Thr Asp Tyr His Ser Leu Leu Asp Lys Lys Glu		
[6794]	1145	1150	1155
[6795]	Lys Glu Arg Phe Glu Ala Arg Gln Asn Trp Thr Ser Ile Glu Asn		
[6796]	1160	1165	1170
[6797]	Ile Lys Glu Leu Lys Ala Gly Tyr Ile Ser Gln Val Val His Lys		
[6798]	1175	1180	1185
[6799]	Ile Cys Glu Leu Val Glu Lys Tyr Asp Ala Val Ile Ala Leu Glu		
[6800]	1190	1195	1200
[6801]	Asp Leu Asn Ser Gly Phe Lys Asn Ser Arg Val Lys Val Glu Lys		
[6802]	1205	1210	1215
[6803]	Gln Val Tyr Gln Lys Phe Glu Lys Met Leu Ile Asp Lys Leu Asn		

[6804]	1220	1225	1230
[6805]	Tyr Met Val Asp Lys Lys Ser Asn Pro Cys Ala Thr Gly Gly Ala		
[6806]	1235	1240	1245
[6807]	Leu Lys Gly Tyr Gln Ile Thr Asn Lys Phe Glu Ser Phe Lys Ser		
[6808]	1250	1255	1260
[6809]	Met Ser Thr Gln Asn Gly Phe Ile Phe Tyr Ile Pro Ala Trp Leu		
[6810]	1265	1270	1275
[6811]	Thr Ser Lys Ile Asp Pro Ser Thr Gly Phe Val Asn Leu Leu Lys		
[6812]	1280	1285	1290
[6813]	Thr Lys Tyr Thr Ser Ile Ala Asp Ser Lys Lys Phe Ile Ser Ser		
[6814]	1295	1300	1305
[6815]	Phe Asp Arg Ile Met Tyr Val Pro Glu Glu Asp Leu Phe Glu Phe		
[6816]	1310	1315	1320
[6817]	Ala Leu Asp Tyr Lys Asn Phe Ser Arg Thr Asp Ala Asp Tyr Ile		
[6818]	1325	1330	1335
[6819]	Lys Lys Trp Lys Leu Tyr Ser Tyr Gly Asn Arg Ile Arg Ile Phe		
[6820]	1340	1345	1350
[6821]	Arg Asn Pro Lys Lys Asn Asn Val Phe Asp Trp Glu Glu Val Cys		
[6822]	1355	1360	1365
[6823]	Leu Thr Ser Ala Tyr Lys Glu Leu Phe Asn Lys Tyr Gly Ile Asn		
[6824]	1370	1375	1380
[6825]	Tyr Gln Gln Gly Asp Ile Arg Ala Leu Leu Cys Glu Gln Ser Asp		
[6826]	1385	1390	1395
[6827]	Lys Ala Phe Tyr Ser Ser Phe Met Ala Leu Met Ser Leu Met Leu		
[6828]	1400	1405	1410
[6829]	Gln Met Arg Asn Ser Ile Thr Gly Arg Thr Asp Val Asp Phe Leu		
[6830]	1415	1420	1425
[6831]	Ile Ser Pro Val Lys Asn Ser Asp Gly Ile Phe Tyr Asp Ser Arg		
[6832]	1430	1435	1440
[6833]	Asn Tyr Glu Ala Gln Glu Asn Ala Ile Leu Pro Lys Asn Ala Asp		
[6834]	1445	1450	1455
[6835]	Ala Asn Gly Ala Tyr Asn Ile Ala Arg Lys Val Leu Trp Ala Ile		
[6836]	1460	1465	1470
[6837]	Gly Gln Phe Lys Lys Ala Glu Asp Glu Lys Leu Asp Lys Val Lys		
[6838]	1475	1480	1485
[6839]	Ile Ala Ile Ser Asn Lys Glu Trp Leu Glu Tyr Ala Gln Thr Ser		
[6840]	1490	1495	1500
[6841]	Val Lys His Ile Gln Leu Pro Pro Ser Asp Thr Thr Pro Glu Asn		
[6842]	1505	1510	1515
[6843]	Pro Ile Thr Asn Leu Ser Asp Ile Ile Glu Lys Glu Thr Gly Lys		
[6844]	1520	1525	1530
[6845]	Gln Leu Val Ile Gln Glu Ser Ile Leu Met Leu Pro Glu Glu Val		

[6846]	1535	1540	1545
[6847]	Glu Glu Val Ile Gly Asn Lys Pro Glu Ser Asp Ile Leu Val His		
[6848]	1550	1555	1560
[6849]	Thr Ala Tyr Asp Glu Ser Thr Asp Glu Asn Val Met Leu Leu Thr		
[6850]	1565	1570	1575
[6851]	Ser Asp Ala Pro Glu Tyr Lys Pro Trp Ala Leu Val Ile Gln Asp		
[6852]	1580	1585	1590
[6853]	Ser Asn Gly Glu Asn Lys Ile Lys Met Leu Ser Gly Gly Ser Lys		
[6854]	1595	1600	1605
[6855]	Arg Thr Ala Asp Gly Ser Glu Phe		
[6856]	1610	1615	
[6857]	<210> 66		
[6858]	<211> 1616		
[6859]	<212> PRT		
[6860]	<213> 人工的		
[6861]	<220>		
[6862]	<223> 碱基编辑器融合蛋白		
[6863]	<400> 66		
[6864]	Met Lys Arg Thr Ala Asp Gly Ser Glu Phe Glu Ser Pro Lys Lys Lys		
[6865]	1 5 10 15		
[6866]	Arg Lys Val Ser Ser Glu Thr Gly Pro Val Ala Val Asp Pro Thr Leu		
[6867]	20 25 30		
[6868]	Arg Arg Arg Ile Glu Pro His Glu Phe Glu Val Phe Phe Asp Pro Arg		
[6869]	35 40 45		
[6870]	Glu Leu Arg Lys Glu Thr Cys Leu Leu Tyr Glu Ile Asn Trp Gly Gly		
[6871]	50 55 60		
[6872]	Arg His Ser Ile Trp Arg His Thr Ser Gln Asn Thr Asn Lys His Val		
[6873]	65 70 75 80		
[6874]	Glu Val Asn Phe Ile Glu Lys Phe Thr Thr Glu Arg Tyr Phe Cys Pro		
[6875]	85 90 95		
[6876]	Asn Thr Arg Cys Ser Ile Thr Trp Phe Leu Ser Trp Ser Pro Cys Gly		
[6877]	100 105 110		
[6878]	Glu Cys Ser Arg Ala Ile Thr Glu Phe Leu Ser Arg Tyr Pro His Val		
[6879]	115 120 125		
[6880]	Thr Leu Phe Ile Tyr Ile Ala Arg Leu Tyr His His Ala Asp Pro Arg		
[6881]	130 135 140		
[6882]	Asn Arg Gln Gly Leu Arg Asp Leu Ile Ser Ser Gly Val Thr Ile Gln		
[6883]	145 150 155 160		
[6884]	Ile Met Thr Glu Gln Glu Ser Gly Tyr Cys Trp Arg Asn Phe Val Asn		
[6885]	165 170 175		
[6886]	Tyr Ser Pro Ser Asn Glu Ala His Trp Pro Arg Tyr Pro His Leu Trp		
[6887]	180 185 190		

[6888]	Val Arg Leu Tyr Val Leu Glu Leu Tyr Cys Ile Ile Leu Gly Leu Pro
[6889]	195 200 205
[6890]	Pro Cys Leu Asn Ile Leu Arg Arg Lys Gln Pro Gln Leu Thr Phe Phe
[6891]	210 215 220
[6892]	Thr Ile Ala Leu Gln Ser Cys His Tyr Gln Arg Leu Pro Pro His Ile
[6893]	225 230 235 240
[6894]	Leu Trp Ala Thr Gly Leu Lys Ser Gly Gly Ser Ser Gly Gly Ser Ser
[6895]	245 250 255
[6896]	Gly Ser Glu Thr Pro Gly Thr Ser Glu Ser Ala Thr Pro Glu Ser Ser
[6897]	260 265 270
[6898]	Gly Gly Ser Ser Gly Gly Ser Ser Lys Leu Glu Lys Phe Thr Asn Cys
[6899]	275 280 285
[6900]	Tyr Ser Leu Ser Lys Thr Leu Arg Phe Lys Ala Ile Pro Val Gly Lys
[6901]	290 295 300
[6902]	Thr Gln Glu Asn Ile Asp Asn Lys Arg Leu Leu Val Glu Asp Glu Lys
[6903]	305 310 315 320
[6904]	Arg Ala Glu Asp Tyr Lys Gly Val Lys Lys Leu Leu Asp Arg Tyr Tyr
[6905]	325 330 335
[6906]	Leu Ser Phe Ile Asn Asp Val Leu His Ser Ile Lys Leu Lys Asn Leu
[6907]	340 345 350
[6908]	Asn Asn Tyr Ile Ser Leu Phe Arg Lys Lys Thr Arg Thr Glu Lys Glu
[6909]	355 360 365
[6910]	Asn Lys Glu Leu Glu Asn Leu Glu Ile Asn Leu Arg Lys Glu Ile Ala
[6911]	370 375 380
[6912]	Lys Ala Phe Lys Gly Asn Glu Gly Tyr Lys Ser Leu Phe Lys Lys Asp
[6913]	385 390 395 400
[6914]	Ile Ile Glu Thr Ile Leu Pro Glu Phe Leu Asp Asp Lys Asp Glu Ile
[6915]	405 410 415
[6916]	Ala Leu Val Asn Ser Phe Asn Gly Phe Thr Thr Ala Phe Thr Gly Phe
[6917]	420 425 430
[6918]	Phe Asp Asn Arg Glu Asn Met Phe Ser Glu Glu Ala Lys Ser Thr Ser
[6919]	435 440 445
[6920]	Ile Ala Phe Arg Cys Ile Asn Glu Asn Leu Thr Arg Tyr Ile Ser Asn
[6921]	450 455 460
[6922]	Met Asp Ile Phe Glu Lys Val Asp Ala Ile Phe Asp Lys His Glu Val
[6923]	465 470 475 480
[6924]	Gln Glu Ile Lys Glu Lys Ile Leu Asn Ser Asp Tyr Asp Val Glu Asp
[6925]	485 490 495
[6926]	Phe Phe Glu Gly Glu Phe Phe Asn Phe Val Leu Thr Gln Glu Gly Ile
[6927]	500 505 510
[6928]	Asp Val Tyr Asn Ala Ile Ile Gly Gly Phe Val Thr Glu Ser Gly Glu
[6929]	515 520 525

[6930]	Lys Ile Lys Gly Leu Asn Glu Tyr Ile Asn Leu Tyr Asn Gln Lys Thr
[6931]	530 535 540
[6932]	Lys Gln Lys Leu Pro Lys Phe Lys Pro Leu Tyr Lys Gln Val Leu Ser
[6933]	545 550 555 560
[6934]	Asp Arg Glu Ser Leu Ser Phe Tyr Gly Glu Gly Tyr Thr Ser Asp Glu
[6935]	565 570 575
[6936]	Glu Val Leu Glu Val Phe Arg Asn Thr Leu Asn Lys Asn Ser Glu Ile
[6937]	580 585 590
[6938]	Phe Ser Ser Ile Lys Lys Leu Glu Lys Leu Phe Lys Asn Phe Asp Glu
[6939]	595 600 605
[6940]	Tyr Ser Ser Ala Gly Ile Phe Val Lys Asn Gly Pro Ala Ile Ser Thr
[6941]	610 615 620
[6942]	Ile Ser Lys Asp Ile Phe Gly Glu Trp Asn Val Ile Arg Asp Lys Trp
[6943]	625 630 635 640
[6944]	Asn Ala Glu Tyr Asp Asp Ile His Leu Lys Lys Lys Ala Val Val Thr
[6945]	645 650 655
[6946]	Glu Lys Tyr Glu Asp Asp Arg Arg Lys Ser Phe Lys Lys Ile Gly Ser
[6947]	660 665 670
[6948]	Phe Ser Leu Glu Gln Leu Gln Glu Tyr Ala Asp Ala Asp Leu Ser Val
[6949]	675 680 685
[6950]	Val Glu Lys Leu Lys Glu Ile Ile Ile Gln Lys Val Asp Glu Ile Tyr
[6951]	690 695 700
[6952]	Lys Val Tyr Gly Ser Ser Glu Lys Leu Phe Asp Ala Asp Phe Val Leu
[6953]	705 710 715 720
[6954]	Glu Lys Ser Leu Lys Lys Asn Asp Ala Val Val Ala Ile Met Lys Asp
[6955]	725 730 735
[6956]	Leu Leu Asp Ser Val Lys Ser Phe Glu Asn Tyr Ile Lys Ala Phe Phe
[6957]	740 745 750
[6958]	Gly Glu Gly Lys Glu Thr Asn Arg Asp Glu Ser Phe Tyr Gly Asp Phe
[6959]	755 760 765
[6960]	Val Leu Ala Tyr Asp Ile Leu Leu Lys Val Asp His Ile Tyr Asp Ala
[6961]	770 775 780
[6962]	Ile Arg Asn Tyr Val Thr Gln Lys Pro Tyr Ser Lys Asp Lys Phe Lys
[6963]	785 790 795 800
[6964]	Leu Tyr Phe Gln Asn Pro Gln Phe Met Gly Gly Trp Asp Lys Asp Lys
[6965]	805 810 815
[6966]	Glu Thr Asp Tyr Arg Ala Thr Ile Leu Arg Tyr Gly Ser Lys Tyr Tyr
[6967]	820 825 830
[6968]	Leu Ala Ile Met Asp Lys Lys Tyr Ala Lys Cys Leu Gln Lys Ile Asp
[6969]	835 840 845
[6970]	Lys Asp Asp Val Asn Gly Asn Tyr Glu Lys Ile Asn Tyr Lys Leu Leu
[6971]	850 855 860

[6972]	Pro Gly Pro Asn Lys Met Leu Pro Lys Val Phe Phe Ser Lys Lys Trp		
[6973]	865	870	875 880
[6974]	Met Ala Tyr Tyr Asn Pro Ser Glu Asp Ile Gln Lys Ile Tyr Lys Asn		
[6975]		885 890	895
[6976]	Gly Thr Phe Lys Lys Gly Asp Met Phe Asn Leu Asn Asp Cys His Lys		
[6977]		900 905	910
[6978]	Leu Ile Asp Phe Phe Lys Asp Ser Ile Ser Arg Tyr Pro Lys Trp Ser		
[6979]		915 920	925
[6980]	Asn Ala Tyr Asp Phe Asn Phe Ser Glu Thr Glu Lys Tyr Lys Asp Ile		
[6981]		930 935	940
[6982]	Ala Gly Phe Tyr Arg Glu Val Glu Glu Gln Gly Tyr Lys Val Ser Phe		
[6983]		945 950	955 960
[6984]	Glu Ser Ala Ser Lys Lys Glu Val Asp Lys Leu Val Glu Glu Gly Lys		
[6985]		965 970	975
[6986]	Leu Tyr Met Phe Gln Ile Tyr Asn Lys Asp Phe Ser Asp Lys Ser His		
[6987]		980 985	990
[6988]	Gly Thr Pro Asn Leu His Thr Met Tyr Phe Lys Leu Leu Phe Asp Glu		
[6989]		995 1000	1005
[6990]	Asn Asn His Gly Gln Ile Arg Leu Ser Gly Gly Ala Glu Leu Phe		
[6991]		1010 1015	1020
[6992]	Met Arg Arg Ala Ser Leu Lys Lys Glu Glu Leu Val Val His Pro		
[6993]		1025 1030	1035
[6994]	Ala Asn Ser Pro Ile Ala Asn Lys Asn Pro Asp Asn Pro Lys Lys		
[6995]		1040 1045	1050
[6996]	Thr Thr Thr Leu Ser Tyr Asp Val Tyr Lys Asp Lys Arg Phe Ser		
[6997]		1055 1060	1065
[6998]	Glu Asp Gln Tyr Glu Leu His Ile Pro Ile Ala Ile Asn Lys Cys		
[6999]		1070 1075	1080
[7000]	Pro Lys Asn Ile Phe Lys Ile Asn Thr Glu Val Arg Val Leu Leu		
[7001]		1085 1090	1095
[7002]	Lys His Asp Asp Asn Pro Tyr Val Ile Gly Ile Ala Arg Gly Glu		
[7003]		1100 1105	1110
[7004]	Arg Asn Leu Leu Tyr Ile Val Val Val Asp Gly Lys Gly Asn Ile		
[7005]		1115 1120	1125
[7006]	Val Glu Gln Tyr Ser Leu Asn Glu Ile Ile Asn Asn Phe Asn Gly		
[7007]		1130 1135	1140
[7008]	Ile Arg Ile Lys Thr Asp Tyr His Ser Leu Leu Asp Lys Lys Glu		
[7009]		1145 1150	1155
[7010]	Lys Glu Arg Phe Glu Ala Arg Gln Asn Trp Thr Ser Ile Glu Asn		
[7011]		1160 1165	1170
[7012]	Ile Lys Glu Leu Lys Ala Gly Tyr Ile Ser Gln Val Val His Lys		
[7013]		1175 1180	1185

[7014]	Ile Cys Glu Leu Val Glu Lys Tyr Asp Ala Val Ile Ala Leu Glu
[7015]	1190 1195 1200
[7016]	Asp Leu Asn Ser Gly Phe Lys Asn Ser Arg Val Lys Val Glu Lys
[7017]	1205 1210 1215
[7018]	Gln Val Tyr Gln Lys Phe Glu Lys Met Leu Ile Asp Lys Leu Asn
[7019]	1220 1225 1230
[7020]	Tyr Met Val Asp Lys Lys Ser Asn Pro Cys Ala Thr Gly Gly Ala
[7021]	1235 1240 1245
[7022]	Leu Lys Gly Tyr Gln Ile Thr Asn Lys Phe Glu Ser Phe Lys Ser
[7023]	1250 1255 1260
[7024]	Met Ser Thr Gln Asn Gly Phe Ile Phe Tyr Ile Pro Ala Trp Leu
[7025]	1265 1270 1275
[7026]	Thr Ser Lys Ile Asp Pro Ser Thr Gly Phe Val Asn Leu Leu Lys
[7027]	1280 1285 1290
[7028]	Thr Lys Tyr Thr Ser Ile Ala Asp Ser Lys Lys Phe Ile Ser Ser
[7029]	1295 1300 1305
[7030]	Phe Asp Arg Ile Met Tyr Val Pro Glu Glu Asp Leu Phe Glu Phe
[7031]	1310 1315 1320
[7032]	Ala Leu Asp Tyr Lys Asn Phe Ser Arg Thr Asp Ala Asp Tyr Ile
[7033]	1325 1330 1335
[7034]	Lys Lys Trp Lys Leu Tyr Ser Tyr Gly Asn Arg Ile Arg Ile Phe
[7035]	1340 1345 1350
[7036]	Arg Asn Pro Lys Lys Asn Asn Val Phe Asp Trp Glu Glu Val Cys
[7037]	1355 1360 1365
[7038]	Leu Thr Ser Ala Tyr Lys Glu Leu Phe Asn Lys Tyr Gly Ile Asn
[7039]	1370 1375 1380
[7040]	Tyr Gln Gln Gly Asp Ile Arg Ala Leu Leu Cys Glu Gln Ser Asp
[7041]	1385 1390 1395
[7042]	Lys Ala Phe Tyr Ser Ser Phe Met Ala Leu Met Ser Leu Met Leu
[7043]	1400 1405 1410
[7044]	Gln Met Arg Asn Ser Ile Thr Gly Arg Thr Asp Val Asp Phe Leu
[7045]	1415 1420 1425
[7046]	Ile Ser Pro Val Lys Asn Ser Asp Gly Ile Phe Tyr Asp Ser Arg
[7047]	1430 1435 1440
[7048]	Asn Tyr Glu Ala Gln Glu Asn Ala Ile Leu Pro Lys Asn Ala Asp
[7049]	1445 1450 1455
[7050]	Ala Asn Gly Ala Tyr Asn Ile Ala Arg Lys Val Leu Trp Ala Ile
[7051]	1460 1465 1470
[7052]	Gly Gln Phe Lys Lys Ala Glu Asp Glu Lys Leu Asp Lys Val Lys
[7053]	1475 1480 1485
[7054]	Ile Ala Ile Ser Asn Lys Glu Trp Leu Glu Tyr Ala Gln Thr Ser
[7055]	1490 1495 1500

[7056]	Val	Lys	His	Leu	Gln	Leu	Glu	Pro	Gly	Pro	Thr	Thr	Pro	Glu	Tyr
[7057]	1505						1510						1515		
[7058]	Pro	Ile	Thr	Asn	Leu	Ser	Asp	Ile	Ile	Glu	Lys	Glu	Thr	Gly	Lys
[7059]	1520						1525						1530		
[7060]	Gln	Leu	Val	Ile	Gln	Glu	Ser	Ile	Leu	Met	Leu	Pro	Glu	Glu	Val
[7061]	1535						1540						1545		
[7062]	Glu	Glu	Val	Ile	Gly	Asn	Lys	Pro	Glu	Ser	Asp	Ile	Leu	Val	His
[7063]	1550						1555						1560		
[7064]	Thr	Ala	Tyr	Asp	Glu	Ser	Thr	Asp	Glu	Asn	Val	Met	Leu	Leu	Thr
[7065]	1565						1570						1575		
[7066]	Ser	Asp	Ala	Pro	Glu	Tyr	Lys	Pro	Trp	Ala	Leu	Val	Ile	Gln	Asp
[7067]	1580						1585						1590		
[7068]	Ser	Asn	Gly	Glu	Asn	Lys	Ile	Lys	Met	Leu	Ser	Gly	Gly	Ser	Lys
[7069]	1595						1600						1605		
[7070]	Arg	Thr	Ala	Asp	Gly	Ser	Glu	Phe							
[7071]	1610						1615								
[7072]	<210>	67													
[7073]	<211>	1616													
[7074]	<212>	PRT													
[7075]	<213>	人工的													
[7076]	<220>														
[7077]	<223>	碱基编辑器融合蛋白													
[7078]	<400>	67													
[7079]	Met	Lys	Arg	Thr	Ala	Asp	Gly	Ser	Glu	Phe	Glu	Ser	Pro	Lys	Lys
[7080]	1				5					10				15	
[7081]	Arg	Lys	Val	Ser	Ser	Glu	Thr	Gly	Pro	Val	Ala	Val	Asp	Pro	Thr
[7082]					20					25				30	
[7083]	Arg	Arg	Arg	Ile	Glu	Pro	His	Glu	Phe	Glu	Val	Phe	Phe	Asp	Pro
[7084]					35					40				45	
[7085]	Glu	Leu	Arg	Lys	Glu	Thr	Cys	Leu	Leu	Tyr	Glu	Ile	Asn	Trp	Gly
[7086]	50						55							60	
[7087]	Arg	His	Ser	Ile	Trp	Arg	His	Thr	Ser	Gln	Asn	Thr	Asn	Lys	His
[7088]	65						70					75			80
[7089]	Glu	Val	Asn	Phe	Ile	Glu	Lys	Phe	Thr	Thr	Glu	Arg	Tyr	Phe	Cys
[7090]							85				90				95
[7091]	Asn	Thr	Arg	Cys	Ser	Ile	Thr	Trp	Phe	Leu	Ser	Trp	Ser	Pro	Cys
[7092]					100					105				110	
[7093]	Glu	Cys	Ser	Arg	Ala	Ile	Thr	Glu	Phe	Leu	Ser	Arg	Tyr	Pro	His
[7094]					115					120				125	
[7095]	Thr	Leu	Phe	Ile	Tyr	Ile	Ala	Arg	Leu	Tyr	His	His	Ala	Asp	Pro
[7096]	130									135				140	
[7097]	Asn	Arg	Gln	Gly	Leu	Arg	Asp	Leu	Ile	Ser	Ser	Gly	Val	Thr	Ile

[7098]	145	150	155	160
[7099]	Ile Met Thr Glu Gln Glu Ser Gly Tyr Cys Trp Arg Asn Phe Val Asn			
[7100]		165	170	175
[7101]	Tyr Ser Pro Ser Asn Glu Ala His Trp Pro Arg Tyr Pro His Leu Trp			
[7102]		180	185	190
[7103]	Val Arg Leu Tyr Val Leu Glu Leu Tyr Cys Ile Ile Leu Gly Leu Pro			
[7104]		195	200	205
[7105]	Pro Cys Leu Asn Ile Leu Arg Arg Lys Gln Pro Gln Leu Thr Phe Phe			
[7106]		210	215	220
[7107]	Thr Ile Ala Leu Gln Ser Cys His Tyr Gln Arg Leu Pro Pro His Ile			
[7108]		225	230	235
[7109]	Leu Trp Ala Thr Gly Leu Lys Ser Gly Gly Ser Ser Gly Gly Ser Ser			
[7110]		245	250	255
[7111]	Gly Ser Glu Thr Pro Gly Thr Ser Glu Ser Ala Thr Pro Glu Ser Ser			
[7112]		260	265	270
[7113]	Gly Gly Ser Ser Gly Gly Ser Ser Lys Leu Glu Lys Phe Thr Asn Cys			
[7114]		275	280	285
[7115]	Tyr Ser Leu Ser Lys Thr Leu Arg Phe Lys Ala Ile Pro Val Gly Lys			
[7116]		290	295	300
[7117]	Thr Gln Glu Asn Ile Asp Asn Lys Arg Leu Leu Val Glu Asp Glu Lys			
[7118]		305	310	315
[7119]	Arg Ala Glu Asp Tyr Lys Gly Val Lys Lys Leu Leu Asp Arg Tyr Tyr			
[7120]		325	330	335
[7121]	Leu Ser Phe Ile Asn Asp Val Leu His Ser Ile Lys Leu Lys Asn Leu			
[7122]		340	345	350
[7123]	Asn Asn Tyr Ile Ser Leu Phe Arg Lys Lys Thr Arg Thr Glu Lys Glu			
[7124]		355	360	365
[7125]	Asn Lys Glu Leu Glu Asn Leu Glu Ile Asn Leu Arg Lys Glu Ile Ala			
[7126]		370	375	380
[7127]	Lys Ala Phe Lys Gly Asn Glu Gly Tyr Lys Ser Leu Phe Lys Lys Asp			
[7128]		385	390	395
[7129]	Ile Ile Glu Thr Ile Leu Pro Glu Phe Leu Asp Asp Lys Asp Glu Ile			
[7130]		405	410	415
[7131]	Ala Leu Val Asn Ser Phe Asn Gly Phe Thr Thr Ala Phe Thr Gly Phe			
[7132]		420	425	430
[7133]	Phe Asp Asn Arg Glu Asn Met Phe Ser Glu Glu Ala Lys Ser Thr Ser			
[7134]		435	440	445
[7135]	Ile Ala Phe Arg Cys Ile Asn Glu Asn Leu Thr Arg Tyr Ile Ser Asn			
[7136]		450	455	460
[7137]	Met Asp Ile Phe Glu Lys Val Asp Ala Ile Phe Asp Lys His Glu Val			
[7138]		465	470	475
[7139]	Gln Glu Ile Lys Glu Lys Ile Leu Asn Ser Asp Tyr Asp Val Glu Asp			

[7140]	485							490							495			
[7141]	Phe	Phe	Glu	Gly	Glu	Phe	Phe	Asn	Phe	Val	Leu	Thr	Gln	Glu	Gly	Ile		
[7142]	500							505							510			
[7143]	Asp	Val	Tyr	Asn	Ala	Ile	Ile	Gly	Gly	Phe	Val	Thr	Glu	Ser	Gly	Glu		
[7144]	515							520							525			
[7145]	Lys	Ile	Lys	Gly	Leu	Asn	Glu	Tyr	Ile	Asn	Leu	Tyr	Asn	Gln	Lys	Thr		
[7146]	530							535							540			
[7147]	Lys	Gln	Lys	Leu	Pro	Lys	Phe	Lys	Pro	Leu	Tyr	Lys	Gln	Val	Leu	Ser		
[7148]	545	550							555							560		
[7149]	Asp	Arg	Glu	Ser	Leu	Ser	Phe	Tyr	Gly	Glu	Gly	Tyr	Thr	Ser	Asp	Glu		
[7150]	565							570							575			
[7151]	Glu	Val	Leu	Glu	Val	Phe	Arg	Asn	Thr	Leu	Asn	Lys	Asn	Ser	Glu	Ile		
[7152]	580							585							590			
[7153]	Phe	Ser	Ser	Ile	Lys	Lys	Leu	Glu	Lys	Leu	Phe	Lys	Asn	Phe	Asp	Glu		
[7154]	595							600							605			
[7155]	Tyr	Ser	Ser	Ala	Gly	Ile	Phe	Val	Lys	Asn	Gly	Pro	Ala	Ile	Ser	Thr		
[7156]	610							615							620			
[7157]	Ile	Ser	Lys	Asp	Ile	Phe	Gly	Glu	Trp	Asn	Val	Ile	Arg	Asp	Lys	Trp		
[7158]	625	630							635							640		
[7159]	Asn	Ala	Glu	Tyr	Asp	Asp	Ile	His	Leu	Lys	Lys	Lys	Ala	Val	Val	Thr		
[7160]	645							650							655			
[7161]	Glu	Lys	Tyr	Glu	Asp	Asp	Arg	Arg	Lys	Ser	Phe	Lys	Lys	Ile	Gly	Ser		
[7162]	660							665							670			
[7163]	Phe	Ser	Leu	Glu	Gln	Leu	Gln	Glu	Tyr	Ala	Asp	Ala	Asp	Leu	Ser	Val		
[7164]	675							680							685			
[7165]	Val	Glu	Lys	Leu	Lys	Glu	Ile	Ile	Ile	Gln	Lys	Val	Asp	Glu	Ile	Tyr		
[7166]	690							695							700			
[7167]	Lys	Val	Tyr	Gly	Ser	Ser	Glu	Lys	Leu	Phe	Asp	Ala	Asp	Phe	Val	Leu		
[7168]	705	710							715							720		
[7169]	Glu	Lys	Ser	Leu	Lys	Lys	Asn	Asp	Ala	Val	Val	Ala	Ile	Met	Lys	Asp		
[7170]	725							730							735			
[7171]	Leu	Leu	Asp	Ser	Val	Lys	Ser	Phe	Glu	Asn	Tyr	Ile	Lys	Ala	Phe	Phe		
[7172]	740							745							750			
[7173]	Gly	Glu	Gly	Lys	Glu	Thr	Asn	Arg	Asp	Glu	Ser	Phe	Tyr	Gly	Asp	Phe		
[7174]	755							760							765			
[7175]	Val	Leu	Ala	Tyr	Asp	Ile	Leu	Leu	Lys	Val	Asp	His	Ile	Tyr	Asp	Ala		
[7176]	770							775							780			
[7177]	Ile	Arg	Asn	Tyr	Val	Thr	Gln	Lys	Pro	Tyr	Ser	Lys	Asp	Lys	Phe	Lys		
[7178]	785	790							795							800		
[7179]	Leu	Tyr	Phe	Gln	Asn	Pro	Gln	Phe	Met	Gly	Gly	Trp	Asp	Lys	Asp	Lys		
[7180]	805							810							815			
[7181]	Glu	Thr	Asp	Tyr	Arg	Ala	Thr	Ile	Leu	Arg	Tyr	Gly	Ser	Lys	Tyr	Tyr		

[7182]	820	825	830
[7183]	Leu Ala Ile Met Asp Lys Lys Tyr Ala Lys Cys Leu Gln Lys Ile Asp		
[7184]	835	840	845
[7185]	Lys Asp Asp Val Asn Gly Asn Tyr Glu Lys Ile Asn Tyr Lys Leu Leu		
[7186]	850	855	860
[7187]	Pro Gly Pro Asn Lys Met Leu Pro Lys Val Phe Phe Ser Lys Lys Trp		
[7188]	865	870	875
[7189]	Met Ala Tyr Tyr Asn Pro Ser Glu Asp Ile Gln Lys Ile Tyr Lys Asn		
[7190]	885	890	895
[7191]	Gly Thr Phe Lys Lys Gly Asp Met Phe Asn Leu Asn Asp Cys His Lys		
[7192]	900	905	910
[7193]	Leu Ile Asp Phe Phe Lys Asp Ser Ile Ser Arg Tyr Pro Lys Trp Ser		
[7194]	915	920	925
[7195]	Asn Ala Tyr Asp Phe Asn Phe Ser Glu Thr Glu Lys Tyr Lys Asp Ile		
[7196]	930	935	940
[7197]	Ala Gly Phe Tyr Arg Glu Val Glu Glu Gln Gly Tyr Lys Val Ser Phe		
[7198]	945	950	955
[7199]	Glu Ser Ala Ser Lys Lys Glu Val Asp Lys Leu Val Glu Glu Gly Lys		
[7200]	965	970	975
[7201]	Leu Tyr Met Phe Gln Ile Tyr Asn Lys Asp Phe Ser Asp Lys Ser His		
[7202]	980	985	990
[7203]	Gly Thr Pro Asn Leu His Thr Met Tyr Phe Lys Leu Leu Phe Asp Glu		
[7204]	995	1000	1005
[7205]	Asn Asn His Gly Gln Ile Arg Leu Ser Gly Gly Ala Glu Leu Phe		
[7206]	1010	1015	1020
[7207]	Met Arg Arg Ala Ser Leu Lys Lys Glu Glu Leu Val Val His Pro		
[7208]	1025	1030	1035
[7209]	Ala Asn Ser Pro Ile Ala Asn Lys Asn Pro Asp Asn Pro Lys Lys		
[7210]	1040	1045	1050
[7211]	Thr Thr Thr Leu Ser Tyr Asp Val Tyr Lys Asp Lys Arg Phe Ser		
[7212]	1055	1060	1065
[7213]	Glu Asp Gln Tyr Glu Leu His Ile Pro Ile Ala Ile Asn Lys Cys		
[7214]	1070	1075	1080
[7215]	Pro Lys Asn Ile Phe Lys Ile Asn Thr Glu Val Arg Val Leu Leu		
[7216]	1085	1090	1095
[7217]	Lys His Asp Asp Asn Pro Tyr Val Ile Gly Ile Ala Arg Gly Glu		
[7218]	1100	1105	1110
[7219]	Arg Asn Leu Leu Tyr Ile Val Val Val Asp Gly Lys Gly Asn Ile		
[7220]	1115	1120	1125
[7221]	Val Glu Gln Tyr Ser Leu Asn Glu Ile Ile Asn Asn Phe Asn Gly		
[7222]	1130	1135	1140
[7223]	Ile Arg Ile Lys Thr Asp Tyr His Ser Leu Leu Asp Lys Lys Glu		

[7224]	1145	1150	1155
[7225]	Lys Glu Arg Phe Glu Ala Arg Gln Asn Trp Thr Ser Ile Glu Asn		
[7226]	1160	1165	1170
[7227]	Ile Lys Glu Leu Lys Ala Gly Tyr Ile Ser Gln Val Val His Lys		
[7228]	1175	1180	1185
[7229]	Ile Cys Glu Leu Val Glu Lys Tyr Asp Ala Val Ile Ala Leu Glu		
[7230]	1190	1195	1200
[7231]	Asp Leu Asn Ser Gly Phe Lys Asn Ser Arg Val Lys Val Glu Lys		
[7232]	1205	1210	1215
[7233]	Gln Val Tyr Gln Lys Phe Glu Lys Met Leu Ile Asp Lys Leu Asn		
[7234]	1220	1225	1230
[7235]	Tyr Met Val Asp Lys Lys Ser Asn Pro Cys Ala Thr Gly Gly Ala		
[7236]	1235	1240	1245
[7237]	Leu Lys Gly Tyr Gln Ile Thr Asn Lys Phe Glu Ser Phe Lys Ser		
[7238]	1250	1255	1260
[7239]	Met Ser Thr Gln Asn Gly Phe Ile Phe Tyr Ile Pro Ala Trp Leu		
[7240]	1265	1270	1275
[7241]	Thr Ser Lys Ile Asp Pro Ser Thr Gly Phe Val Asn Leu Leu Lys		
[7242]	1280	1285	1290
[7243]	Thr Lys Tyr Thr Ser Ile Ala Asp Ser Lys Lys Phe Ile Ser Ser		
[7244]	1295	1300	1305
[7245]	Phe Asp Arg Ile Met Tyr Val Pro Glu Glu Asp Leu Phe Glu Phe		
[7246]	1310	1315	1320
[7247]	Ala Leu Asp Tyr Lys Asn Phe Ser Arg Thr Asp Ala Asp Tyr Ile		
[7248]	1325	1330	1335
[7249]	Lys Lys Trp Lys Leu Tyr Ser Tyr Gly Asn Arg Ile Arg Ile Phe		
[7250]	1340	1345	1350
[7251]	Arg Asn Pro Lys Lys Asn Asn Val Phe Asp Trp Glu Glu Val Cys		
[7252]	1355	1360	1365
[7253]	Leu Thr Ser Ala Tyr Lys Glu Leu Phe Asn Lys Tyr Gly Ile Asn		
[7254]	1370	1375	1380
[7255]	Tyr Gln Gln Gly Asp Ile Arg Ala Leu Leu Cys Glu Gln Ser Asp		
[7256]	1385	1390	1395
[7257]	Lys Ala Phe Tyr Ser Ser Phe Met Ala Leu Met Ser Leu Met Leu		
[7258]	1400	1405	1410
[7259]	Gln Met Arg Asn Ser Ile Thr Gly Arg Thr Asp Val Asp Phe Leu		
[7260]	1415	1420	1425
[7261]	Ile Ser Pro Val Lys Asn Ser Asp Gly Ile Phe Tyr Asp Ser Arg		
[7262]	1430	1435	1440
[7263]	Asn Tyr Glu Ala Gln Glu Asn Ala Ile Leu Pro Lys Asn Ala Asp		
[7264]	1445	1450	1455
[7265]	Ala Asn Gly Ala Tyr Asn Ile Ala Arg Lys Val Leu Trp Ala Ile		

[7266]	1460	1465	1470
[7267]	Gly Gln Phe Lys Lys Ala Glu Asp Glu Lys Leu Asp Lys Val Lys		
[7268]	1475	1480	1485
[7269]	Ile Ala Ile Ser Asn Lys Glu Trp Leu Glu Tyr Ala Gln Thr Ser		
[7270]	1490	1495	1500
[7271]	Val Lys His Ala Lys Pro Asp Asp Glu Ser Gln Lys Pro Pro Gln		
[7272]	1505	1510	1515
[7273]	Asp Asp Thr Asn Leu Ser Asp Ile Ile Glu Lys Glu Thr Gly Lys		
[7274]	1520	1525	1530
[7275]	Gln Leu Val Ile Gln Glu Ser Ile Leu Met Leu Pro Glu Glu Val		
[7276]	1535	1540	1545
[7277]	Glu Glu Val Ile Gly Asn Lys Pro Glu Ser Asp Ile Leu Val His		
[7278]	1550	1555	1560
[7279]	Thr Ala Tyr Asp Glu Ser Thr Asp Glu Asn Val Met Leu Leu Thr		
[7280]	1565	1570	1575
[7281]	Ser Asp Ala Pro Glu Tyr Lys Pro Trp Ala Leu Val Ile Gln Asp		
[7282]	1580	1585	1590
[7283]	Ser Asn Gly Glu Asn Lys Ile Lys Met Leu Ser Gly Gly Ser Lys		
[7284]	1595	1600	1605
[7285]	Arg Thr Ala Asp Gly Ser Glu Phe		
[7286]	1610	1615	
[7287]	<210> 68		
[7288]	<211> 1610		
[7289]	<212> PRT		
[7290]	<213> 人工的		
[7291]	<220>		
[7292]	<223> 碱基编辑器融合蛋白		
[7293]	<400> 68		
[7294]	Met Lys Arg Thr Ala Asp Gly Ser Glu Phe Glu Ser Pro Lys Lys Lys		
[7295]	1 5 10 15		
[7296]	Arg Lys Val Ser Ser Glu Thr Gly Pro Val Ala Val Asp Pro Thr Leu		
[7297]	20 25 30		
[7298]	Arg Arg Arg Ile Glu Pro His Glu Phe Glu Val Phe Phe Asp Pro Arg		
[7299]	35 40 45		
[7300]	Glu Leu Arg Lys Glu Thr Cys Leu Leu Tyr Glu Ile Asn Trp Gly Gly		
[7301]	50 55 60		
[7302]	Arg His Ser Ile Trp Arg His Thr Ser Gln Asn Thr Asn Lys His Val		
[7303]	65 70 75 80		
[7304]	Glu Val Asn Phe Ile Glu Lys Phe Thr Thr Glu Arg Tyr Phe Cys Pro		
[7305]	85 90 95		
[7306]	Asn Thr Arg Cys Ser Ile Thr Trp Phe Leu Ser Trp Ser Pro Cys Gly		
[7307]	100 105 110		

[7308]	Glu Cys Ser Arg Ala Ile Thr Glu Phe Leu Ser Arg Tyr Pro His Val		
[7309]	115	120	125
[7310]	Thr Leu Phe Ile Tyr Ile Ala Arg Leu Tyr His His Ala Asp Pro Arg		
[7311]	130	135	140
[7312]	Asn Arg Gln Gly Leu Arg Asp Leu Ile Ser Ser Gly Val Thr Ile Gln		
[7313]	145	150	155
[7314]	Ile Met Thr Glu Gln Glu Ser Gly Tyr Cys Trp Arg Asn Phe Val Asn		
[7315]	165	170	175
[7316]	Tyr Ser Pro Ser Asn Glu Ala His Trp Pro Arg Tyr Pro His Leu Trp		
[7317]	180	185	190
[7318]	Val Arg Leu Tyr Val Leu Glu Leu Tyr Cys Ile Ile Leu Gly Leu Pro		
[7319]	195	200	205
[7320]	Pro Cys Leu Asn Ile Leu Arg Arg Lys Gln Pro Gln Leu Thr Phe Phe		
[7321]	210	215	220
[7322]	Thr Ile Ala Leu Gln Ser Cys His Tyr Gln Arg Leu Pro Pro His Ile		
[7323]	225	230	235
[7324]	Leu Trp Ala Thr Gly Leu Lys Ser Thr Ser Gln Ser Asp Gly Ser Ser		
[7325]	245	250	255
[7326]	Val Pro Ala Asp Ile Asp Gln Ser Ser Asp Ser Asp Gln Ser Ser Ser		
[7327]	260	265	270
[7328]	Gln Gly Gln Pro Gly Ser Lys Leu Glu Lys Phe Thr Asn Cys Tyr Ser		
[7329]	275	280	285
[7330]	Leu Ser Lys Thr Leu Arg Phe Lys Ala Ile Pro Val Gly Lys Thr Gln		
[7331]	290	295	300
[7332]	Glu Asn Ile Asp Asn Lys Arg Leu Leu Val Glu Asp Glu Lys Arg Ala		
[7333]	305	310	315
[7334]	Glu Asp Tyr Lys Gly Val Lys Lys Leu Leu Asp Arg Tyr Tyr Leu Ser		
[7335]	325	330	335
[7336]	Phe Ile Asn Asp Val Leu His Ser Ile Lys Leu Lys Asn Leu Asn Asn		
[7337]	340	345	350
[7338]	Tyr Ile Ser Leu Phe Arg Lys Lys Thr Arg Thr Glu Lys Glu Asn Lys		
[7339]	355	360	365
[7340]	Glu Leu Glu Asn Leu Glu Ile Asn Leu Arg Lys Glu Ile Ala Lys Ala		
[7341]	370	375	380
[7342]	Phe Lys Gly Asn Glu Gly Tyr Lys Ser Leu Phe Lys Lys Asp Ile Ile		
[7343]	385	390	395
[7344]	Glu Thr Ile Leu Pro Glu Phe Leu Asp Asp Lys Asp Glu Ile Ala Leu		
[7345]	405	410	415
[7346]	Val Asn Ser Phe Asn Gly Phe Thr Thr Ala Phe Thr Gly Phe Phe Asp		
[7347]	420	425	430
[7348]	Asn Arg Glu Asn Met Phe Ser Glu Glu Ala Lys Ser Thr Ser Ile Ala		
[7349]	435	440	445

[7350]	Phe Arg Cys Ile Asn Glu Asn Leu Thr Arg Tyr Ile Ser Asn Met Asp
[7351]	450 455 460
[7352]	Ile Phe Glu Lys Val Asp Ala Ile Phe Asp Lys His Glu Val Gln Glu
[7353]	465 470 475 480
[7354]	Ile Lys Glu Lys Ile Leu Asn Ser Asp Tyr Asp Val Glu Asp Phe Phe
[7355]	485 490 495
[7356]	Glu Gly Glu Phe Phe Asn Phe Val Leu Thr Gln Glu Gly Ile Asp Val
[7357]	500 505 510
[7358]	Tyr Asn Ala Ile Ile Gly Gly Phe Val Thr Glu Ser Gly Glu Lys Ile
[7359]	515 520 525
[7360]	Lys Gly Leu Asn Glu Tyr Ile Asn Leu Tyr Asn Gln Lys Thr Lys Gln
[7361]	530 535 540
[7362]	Lys Leu Pro Lys Phe Lys Pro Leu Tyr Lys Gln Val Leu Ser Asp Arg
[7363]	545 550 555 560
[7364]	Glu Ser Leu Ser Phe Tyr Gly Glu Gly Tyr Thr Ser Asp Glu Glu Val
[7365]	565 570 575
[7366]	Leu Glu Val Phe Arg Asn Thr Leu Asn Lys Asn Ser Glu Ile Phe Ser
[7367]	580 585 590
[7368]	Ser Ile Lys Lys Leu Glu Lys Leu Phe Lys Asn Phe Asp Glu Tyr Ser
[7369]	595 600 605
[7370]	Ser Ala Gly Ile Phe Val Lys Asn Gly Pro Ala Ile Ser Thr Ile Ser
[7371]	610 615 620
[7372]	Lys Asp Ile Phe Gly Glu Trp Asn Val Ile Arg Asp Lys Trp Asn Ala
[7373]	625 630 635 640
[7374]	Glu Tyr Asp Asp Ile His Leu Lys Lys Lys Ala Val Val Thr Glu Lys
[7375]	645 650 655
[7376]	Tyr Glu Asp Asp Arg Arg Lys Ser Phe Lys Lys Ile Gly Ser Phe Ser
[7377]	660 665 670
[7378]	Leu Glu Gln Leu Gln Glu Tyr Ala Asp Ala Asp Leu Ser Val Val Glu
[7379]	675 680 685
[7380]	Lys Leu Lys Glu Ile Ile Ile Gln Lys Val Asp Glu Ile Tyr Lys Val
[7381]	690 695 700
[7382]	Tyr Gly Ser Ser Glu Lys Leu Phe Asp Ala Asp Phe Val Leu Glu Lys
[7383]	705 710 715 720
[7384]	Ser Leu Lys Lys Asn Asp Ala Val Val Ala Ile Met Lys Asp Leu Leu
[7385]	725 730 735
[7386]	Asp Ser Val Lys Ser Phe Glu Asn Tyr Ile Lys Ala Phe Phe Gly Glu
[7387]	740 745 750
[7388]	Gly Lys Glu Thr Asn Arg Asp Glu Ser Phe Tyr Gly Asp Phe Val Leu
[7389]	755 760 765
[7390]	Ala Tyr Asp Ile Leu Leu Lys Val Asp His Ile Tyr Asp Ala Ile Arg
[7391]	770 775 780

[7392]	Asn Tyr Val Thr Gln Lys Pro Tyr Ser Lys Asp Lys Phe Lys Leu Tyr		
[7393]	785	790	795 800
[7394]	Phe Gln Asn Pro Gln Phe Met Gly Gly Trp Asp Lys Asp Lys Glu Thr		
[7395]	805	810	815
[7396]	Asp Tyr Arg Ala Thr Ile Leu Arg Tyr Gly Ser Lys Tyr Tyr Leu Ala		
[7397]	820	825	830
[7398]	Ile Met Asp Lys Lys Tyr Ala Lys Cys Leu Gln Lys Ile Asp Lys Asp		
[7399]	835	840	845
[7400]	Asp Val Asn Gly Asn Tyr Glu Lys Ile Asn Tyr Lys Leu Leu Pro Gly		
[7401]	850	855	860
[7402]	Pro Asn Lys Met Leu Pro Lys Val Phe Phe Ser Lys Lys Trp Met Ala		
[7403]	865	870	875 880
[7404]	Tyr Tyr Asn Pro Ser Glu Asp Ile Gln Lys Ile Tyr Lys Asn Gly Thr		
[7405]	885	890	895
[7406]	Phe Lys Lys Gly Asp Met Phe Asn Leu Asn Asp Cys His Lys Leu Ile		
[7407]	900	905	910
[7408]	Asp Phe Phe Lys Asp Ser Ile Ser Arg Tyr Pro Lys Trp Ser Asn Ala		
[7409]	915	920	925
[7410]	Tyr Asp Phe Asn Phe Ser Glu Thr Glu Lys Tyr Lys Asp Ile Ala Gly		
[7411]	930	935	940
[7412]	Phe Tyr Arg Glu Val Glu Glu Gln Gly Tyr Lys Val Ser Phe Glu Ser		
[7413]	945	950	955 960
[7414]	Ala Ser Lys Lys Glu Val Asp Lys Leu Val Glu Glu Gly Lys Leu Tyr		
[7415]	965	970	975
[7416]	Met Phe Gln Ile Tyr Asn Lys Asp Phe Ser Asp Lys Ser His Gly Thr		
[7417]	980	985	990
[7418]	Pro Asn Leu His Thr Met Tyr Phe Lys Leu Leu Phe Asp Glu Asn Asn		
[7419]	995	1000	1005
[7420]	His Gly Gln Ile Arg Leu Ser Gly Gly Ala Glu Leu Phe Met Arg		
[7421]	1010	1015	1020
[7422]	Arg Ala Ser Leu Lys Lys Glu Glu Leu Val Val His Pro Ala Asn		
[7423]	1025	1030	1035
[7424]	Ser Pro Ile Ala Asn Lys Asn Pro Asp Asn Pro Lys Lys Thr Thr		
[7425]	1040	1045	1050
[7426]	Thr Leu Ser Tyr Asp Val Tyr Lys Asp Lys Arg Phe Ser Glu Asp		
[7427]	1055	1060	1065
[7428]	Gln Tyr Glu Leu His Ile Pro Ile Ala Ile Asn Lys Cys Pro Lys		
[7429]	1070	1075	1080
[7430]	Asn Ile Phe Lys Ile Asn Thr Glu Val Arg Val Leu Leu Lys His		
[7431]	1085	1090	1095
[7432]	Asp Asp Asn Pro Tyr Val Ile Gly Ile Ala Arg Gly Glu Arg Asn		
[7433]	1100	1105	1110

[7434]	Leu	Leu	Tyr	Ile	Val	Val	Val	Asp	Gly	Lys	Gly	Asn	Ile	Val	Glu
[7435]		1115					1120					1125			
[7436]	Gln	Tyr	Ser	Leu	Asn	Glu	Ile	Ile	Asn	Asn	Phe	Asn	Gly	Ile	Arg
[7437]		1130					1135					1140			
[7438]	Ile	Lys	Thr	Asp	Tyr	His	Ser	Leu	Leu	Asp	Lys	Lys	Glu	Lys	Glu
[7439]		1145					1150					1155			
[7440]	Arg	Phe	Glu	Ala	Arg	Gln	Asn	Trp	Thr	Ser	Ile	Glu	Asn	Ile	Lys
[7441]		1160					1165					1170			
[7442]	Glu	Leu	Lys	Ala	Gly	Tyr	Ile	Ser	Gln	Val	Val	His	Lys	Ile	Cys
[7443]		1175					1180					1185			
[7444]	Glu	Leu	Val	Glu	Lys	Tyr	Asp	Ala	Val	Ile	Ala	Leu	Glu	Asp	Leu
[7445]		1190					1195					1200			
[7446]	Asn	Ser	Gly	Phe	Lys	Asn	Ser	Arg	Val	Lys	Val	Glu	Lys	Gln	Val
[7447]		1205					1210					1215			
[7448]	Tyr	Gln	Lys	Phe	Glu	Lys	Met	Leu	Ile	Asp	Lys	Leu	Asn	Tyr	Met
[7449]		1220					1225					1230			
[7450]	Val	Asp	Lys	Lys	Ser	Asn	Pro	Cys	Ala	Thr	Gly	Gly	Ala	Leu	Lys
[7451]		1235					1240					1245			
[7452]	Gly	Tyr	Gln	Ile	Thr	Asn	Lys	Phe	Glu	Ser	Phe	Lys	Ser	Met	Ser
[7453]		1250					1255					1260			
[7454]	Thr	Gln	Asn	Gly	Phe	Ile	Phe	Tyr	Ile	Pro	Ala	Trp	Leu	Thr	Ser
[7455]		1265					1270					1275			
[7456]	Lys	Ile	Asp	Pro	Ser	Thr	Gly	Phe	Val	Asn	Leu	Leu	Lys	Thr	Lys
[7457]		1280					1285					1290			
[7458]	Tyr	Thr	Ser	Ile	Ala	Asp	Ser	Lys	Lys	Phe	Ile	Ser	Ser	Phe	Asp
[7459]		1295					1300					1305			
[7460]	Arg	Ile	Met	Tyr	Val	Pro	Glu	Glu	Asp	Leu	Phe	Glu	Phe	Ala	Leu
[7461]		1310					1315					1320			
[7462]	Asp	Tyr	Lys	Asn	Phe	Ser	Arg	Thr	Asp	Ala	Asp	Tyr	Ile	Lys	Lys
[7463]		1325					1330					1335			
[7464]	Trp	Lys	Leu	Tyr	Ser	Tyr	Gly	Asn	Arg	Ile	Arg	Ile	Phe	Arg	Asn
[7465]		1340					1345					1350			
[7466]	Pro	Lys	Lys	Asn	Asn	Val	Phe	Asp	Trp	Glu	Glu	Val	Cys	Leu	Thr
[7467]		1355					1360					1365			
[7468]	Ser	Ala	Tyr	Lys	Glu	Leu	Phe	Asn	Lys	Tyr	Gly	Ile	Asn	Tyr	Gln
[7469]		1370					1375					1380			
[7470]	Gln	Gly	Asp	Ile	Arg	Ala	Leu	Leu	Cys	Glu	Gln	Ser	Asp	Lys	Ala
[7471]		1385					1390					1395			
[7472]	Phe	Tyr	Ser	Ser	Phe	Met	Ala	Leu	Met	Ser	Leu	Met	Leu	Gln	Met
[7473]		1400					1405					1410			
[7474]	Arg	Asn	Ser	Ile	Thr	Gly	Arg	Thr	Asp	Val	Asp	Phe	Leu	Ile	Ser
[7475]		1415					1420					1425			

[7476]	Pro Val Lys Asn Ser Asp Gly Ile Phe Tyr Asp Ser Arg Asn Tyr
[7477]	1430 1435 1440
[7478]	Glu Ala Gln Glu Asn Ala Ile Leu Pro Lys Asn Ala Asp Ala Asn
[7479]	1445 1450 1455
[7480]	Gly Ala Tyr Asn Ile Ala Arg Lys Val Leu Trp Ala Ile Gly Gln
[7481]	1460 1465 1470
[7482]	Phe Lys Lys Ala Glu Asp Glu Lys Leu Asp Lys Val Lys Ile Ala
[7483]	1475 1480 1485
[7484]	Ile Ser Asn Lys Glu Trp Leu Glu Tyr Ala Gln Thr Ser Val Lys
[7485]	1490 1495 1500
[7486]	His Ser Gly Gly Ser Gly Gly Ser Gly Gly Ser Thr Asn Leu Ser
[7487]	1505 1510 1515
[7488]	Asp Ile Ile Glu Lys Glu Thr Gly Lys Gln Leu Val Ile Gln Glu
[7489]	1520 1525 1530
[7490]	Ser Ile Leu Met Leu Pro Glu Glu Val Glu Glu Val Ile Gly Asn
[7491]	1535 1540 1545
[7492]	Lys Pro Glu Ser Asp Ile Leu Val His Thr Ala Tyr Asp Glu Ser
[7493]	1550 1555 1560
[7494]	Thr Asp Glu Asn Val Met Leu Leu Thr Ser Asp Ala Pro Glu Tyr
[7495]	1565 1570 1575
[7496]	Lys Pro Trp Ala Leu Val Ile Gln Asp Ser Asn Gly Glu Asn Lys
[7497]	1580 1585 1590
[7498]	Ile Lys Met Leu Ser Gly Gly Ser Lys Arg Thr Ala Asp Gly Ser
[7499]	1595 1600 1605
[7500]	Glu Phe
[7501]	1610
[7502]	<210> 69
[7503]	<211> 1614
[7504]	<212> PRT
[7505]	<213> 人工的
[7506]	<220>
[7507]	<223> 碱基编辑器融合蛋白
[7508]	<400> 69
[7509]	Met Lys Arg Thr Ala Asp Gly Ser Glu Phe Glu Ser Pro Lys Lys Lys
[7510]	1 5 10 15
[7511]	Arg Lys Val Ser Ser Glu Thr Gly Pro Val Ala Val Asp Pro Thr Leu
[7512]	20 25 30
[7513]	Arg Arg Arg Ile Glu Pro His Glu Phe Glu Val Phe Phe Asp Pro Arg
[7514]	35 40 45
[7515]	Glu Leu Arg Lys Glu Thr Cys Leu Leu Tyr Glu Ile Asn Trp Gly Gly
[7516]	50 55 60
[7517]	Arg His Ser Ile Trp Arg His Thr Ser Gln Asn Thr Asn Lys His Val

[7518]	65	70	75	80
[7519]	Glu Val Asn Phe Ile Glu Lys Phe Thr Thr Glu Arg Tyr Phe Cys Pro			
[7520]		85	90	95
[7521]	Asn Thr Arg Cys Ser Ile Thr Trp Phe Leu Ser Trp Ser Pro Cys Gly			
[7522]		100	105	110
[7523]	Glu Cys Ser Arg Ala Ile Thr Glu Phe Leu Ser Arg Tyr Pro His Val			
[7524]		115	120	125
[7525]	Thr Leu Phe Ile Tyr Ile Ala Arg Leu Tyr His His Ala Asp Pro Arg			
[7526]		130	135	140
[7527]	Asn Arg Gln Gly Leu Arg Asp Leu Ile Ser Ser Gly Val Thr Ile Gln			
[7528]	145	150	155	160
[7529]	Ile Met Thr Glu Gln Glu Ser Gly Tyr Cys Trp Arg Asn Phe Val Asn			
[7530]		165	170	175
[7531]	Tyr Ser Pro Ser Asn Glu Ala His Trp Pro Arg Tyr Pro His Leu Trp			
[7532]		180	185	190
[7533]	Val Arg Leu Tyr Val Leu Glu Leu Tyr Cys Ile Ile Leu Gly Leu Pro			
[7534]		195	200	205
[7535]	Pro Cys Leu Asn Ile Leu Arg Arg Lys Gln Pro Gln Leu Thr Phe Phe			
[7536]		210	215	220
[7537]	Thr Ile Ala Leu Gln Ser Cys His Tyr Gln Arg Leu Pro Pro His Ile			
[7538]	225	230	235	240
[7539]	Leu Trp Ala Thr Gly Leu Lys Pro Asp Asn Ser Thr Leu Gln Thr Leu			
[7540]		245	250	255
[7541]	Gln Leu Pro Gln Pro Thr Pro Ser Ser Thr Asp Thr Gln Gln Thr Ser			
[7542]		260	265	270
[7543]	Asp Thr Asp Pro Glu Asp Thr Thr Asp Ser Lys Leu Glu Lys Phe Thr			
[7544]		275	280	285
[7545]	Asn Cys Tyr Ser Leu Ser Lys Thr Leu Arg Phe Lys Ala Ile Pro Val			
[7546]		290	295	300
[7547]	Gly Lys Thr Gln Glu Asn Ile Asp Asn Lys Arg Leu Leu Val Glu Asp			
[7548]	305	310	315	320
[7549]	Glu Lys Arg Ala Glu Asp Tyr Lys Gly Val Lys Lys Leu Leu Asp Arg			
[7550]		325	330	335
[7551]	Tyr Tyr Leu Ser Phe Ile Asn Asp Val Leu His Ser Ile Lys Leu Lys			
[7552]		340	345	350
[7553]	Asn Leu Asn Asn Tyr Ile Ser Leu Phe Arg Lys Lys Thr Arg Thr Glu			
[7554]		355	360	365
[7555]	Lys Glu Asn Lys Glu Leu Glu Asn Leu Glu Ile Asn Leu Arg Lys Glu			
[7556]		370	375	380
[7557]	Ile Ala Lys Ala Phe Lys Gly Asn Glu Gly Tyr Lys Ser Leu Phe Lys			
[7558]	385	390	395	400
[7559]	Lys Asp Ile Ile Glu Thr Ile Leu Pro Glu Phe Leu Asp Asp Lys Asp			

[7560]	405							410							415			
[7561]	Glu	Ile	Ala	Leu	Val	Asn	Ser	Phe	Asn	Gly	Phe	Thr	Thr	Ala	Phe	Thr		
[7562]	420							425							430			
[7563]	Gly	Phe	Phe	Asp	Asn	Arg	Glu	Asn	Met	Phe	Ser	Glu	Glu	Ala	Lys	Ser		
[7564]	435							440							445			
[7565]	Thr	Ser	Ile	Ala	Phe	Arg	Cys	Ile	Asn	Glu	Asn	Leu	Thr	Arg	Tyr	Ile		
[7566]	450							455							460			
[7567]	Ser	Asn	Met	Asp	Ile	Phe	Glu	Lys	Val	Asp	Ala	Ile	Phe	Asp	Lys	His		
[7568]	465	470							475							480		
[7569]	Glu	Val	Gln	Glu	Ile	Lys	Glu	Lys	Ile	Leu	Asn	Ser	Asp	Tyr	Asp	Val		
[7570]	485							490							495			
[7571]	Glu	Asp	Phe	Phe	Glu	Gly	Glu	Phe	Phe	Asn	Phe	Val	Leu	Thr	Gln	Glu		
[7572]	500							505							510			
[7573]	Gly	Ile	Asp	Val	Tyr	Asn	Ala	Ile	Ile	Gly	Gly	Phe	Val	Thr	Glu	Ser		
[7574]	515							520							525			
[7575]	Gly	Glu	Lys	Ile	Lys	Gly	Leu	Asn	Glu	Tyr	Ile	Asn	Leu	Tyr	Asn	Gln		
[7576]	530							535							540			
[7577]	Lys	Thr	Lys	Gln	Lys	Leu	Pro	Lys	Phe	Lys	Pro	Leu	Tyr	Lys	Gln	Val		
[7578]	545	550							555							560		
[7579]	Leu	Ser	Asp	Arg	Glu	Ser	Leu	Ser	Phe	Tyr	Gly	Glu	Gly	Tyr	Thr	Ser		
[7580]	565							570							575			
[7581]	Asp	Glu	Glu	Val	Leu	Glu	Val	Phe	Arg	Asn	Thr	Leu	Asn	Lys	Asn	Ser		
[7582]	580							585							590			
[7583]	Glu	Ile	Phe	Ser	Ser	Ile	Lys	Lys	Leu	Glu	Lys	Leu	Phe	Lys	Asn	Phe		
[7584]	595							600							605			
[7585]	Asp	Glu	Tyr	Ser	Ser	Ala	Gly	Ile	Phe	Val	Lys	Asn	Gly	Pro	Ala	Ile		
[7586]	610							615							620			
[7587]	Ser	Thr	Ile	Ser	Lys	Asp	Ile	Phe	Gly	Glu	Trp	Asn	Val	Ile	Arg	Asp		
[7588]	625	630							635							640		
[7589]	Lys	Trp	Asn	Ala	Glu	Tyr	Asp	Asp	Ile	His	Leu	Lys	Lys	Lys	Ala	Val		
[7590]	645							650							655			
[7591]	Val	Thr	Glu	Lys	Tyr	Glu	Asp	Asp	Arg	Arg	Lys	Ser	Phe	Lys	Lys	Ile		
[7592]	660							665							670			
[7593]	Gly	Ser	Phe	Ser	Leu	Glu	Gln	Leu	Gln	Glu	Tyr	Ala	Asp	Ala	Asp	Leu		
[7594]	675							680							685			
[7595]	Ser	Val	Val	Glu	Lys	Leu	Lys	Glu	Ile	Ile	Ile	Gln	Lys	Val	Asp	Glu		
[7596]	690							695							700			
[7597]	Ile	Tyr	Lys	Val	Tyr	Gly	Ser	Ser	Glu	Lys	Leu	Phe	Asp	Ala	Asp	Phe		
[7598]	705	710							715							720		
[7599]	Val	Leu	Glu	Lys	Ser	Leu	Lys	Lys	Asn	Asp	Ala	Val	Val	Ala	Ile	Met		
[7600]	725							730							735			
[7601]	Lys	Asp	Leu	Leu	Asp	Ser	Val	Lys	Ser	Phe	Glu	Asn	Tyr	Ile	Lys	Ala		

[7602]	740	745	750
[7603]	Phe Phe Gly Glu Gly Lys Glu Thr Asn Arg Asp Glu Ser Phe Tyr Gly		
[7604]	755	760	765
[7605]	Asp Phe Val Leu Ala Tyr Asp Ile Leu Leu Lys Val Asp His Ile Tyr		
[7606]	770	775	780
[7607]	Asp Ala Ile Arg Asn Tyr Val Thr Gln Lys Pro Tyr Ser Lys Asp Lys		
[7608]	785	790	795 800
[7609]	Phe Lys Leu Tyr Phe Gln Asn Pro Gln Phe Met Gly Gly Trp Asp Lys		
[7610]	805	810	815
[7611]	Asp Lys Glu Thr Asp Tyr Arg Ala Thr Ile Leu Arg Tyr Gly Ser Lys		
[7612]	820	825	830
[7613]	Tyr Tyr Leu Ala Ile Met Asp Lys Lys Tyr Ala Lys Cys Leu Gln Lys		
[7614]	835	840	845
[7615]	Ile Asp Lys Asp Asp Val Asn Gly Asn Tyr Glu Lys Ile Asn Tyr Lys		
[7616]	850	855	860
[7617]	Leu Leu Pro Gly Pro Asn Lys Met Leu Pro Lys Val Phe Phe Ser Lys		
[7618]	865	870	875 880
[7619]	Lys Trp Met Ala Tyr Tyr Asn Pro Ser Glu Asp Ile Gln Lys Ile Tyr		
[7620]	885	890	895
[7621]	Lys Asn Gly Thr Phe Lys Lys Gly Asp Met Phe Asn Leu Asn Asp Cys		
[7622]	900	905	910
[7623]	His Lys Leu Ile Asp Phe Phe Lys Asp Ser Ile Ser Arg Tyr Pro Lys		
[7624]	915	920	925
[7625]	Trp Ser Asn Ala Tyr Asp Phe Asn Phe Ser Glu Thr Glu Lys Tyr Lys		
[7626]	930	935	940
[7627]	Asp Ile Ala Gly Phe Tyr Arg Glu Val Glu Glu Gln Gly Tyr Lys Val		
[7628]	945	950	955 960
[7629]	Ser Phe Glu Ser Ala Ser Lys Lys Glu Val Asp Lys Leu Val Glu Glu		
[7630]	965	970	975
[7631]	Gly Lys Leu Tyr Met Phe Gln Ile Tyr Asn Lys Asp Phe Ser Asp Lys		
[7632]	980	985	990
[7633]	Ser His Gly Thr Pro Asn Leu His Thr Met Tyr Phe Lys Leu Leu Phe		
[7634]	995	1000	1005
[7635]	Asp Glu Asn Asn His Gly Gln Ile Arg Leu Ser Gly Gly Ala Glu		
[7636]	1010	1015	1020
[7637]	Leu Phe Met Arg Arg Ala Ser Leu Lys Lys Glu Glu Leu Val Val		
[7638]	1025	1030	1035
[7639]	His Pro Ala Asn Ser Pro Ile Ala Asn Lys Asn Pro Asp Asn Pro		
[7640]	1040	1045	1050
[7641]	Lys Lys Thr Thr Thr Leu Ser Tyr Asp Val Tyr Lys Asp Lys Arg		
[7642]	1055	1060	1065
[7643]	Phe Ser Glu Asp Gln Tyr Glu Leu His Ile Pro Ile Ala Ile Asn		

[7644]	1070	1075	1080
[7645]	Lys Cys Pro Lys Asn Ile Phe	Lys Ile Asn Thr Glu	Val Arg Val
[7646]	1085	1090	1095
[7647]	Leu Leu Lys His Asp Asp Asn	Pro Tyr Val Ile Gly	Ile Ala Arg
[7648]	1100	1105	1110
[7649]	Gly Glu Arg Asn Leu Leu Tyr	Ile Val Val Val Asp	Gly Lys Gly
[7650]	1115	1120	1125
[7651]	Asn Ile Val Glu Gln Tyr Ser	Leu Asn Glu Ile Ile	Asn Asn Phe
[7652]	1130	1135	1140
[7653]	Asn Gly Ile Arg Ile Lys Thr	Asp Tyr His Ser Leu	Leu Asp Lys
[7654]	1145	1150	1155
[7655]	Lys Glu Lys Glu Arg Phe Glu	Ala Arg Gln Asn Trp	Thr Ser Ile
[7656]	1160	1165	1170
[7657]	Glu Asn Ile Lys Glu Leu Lys	Ala Gly Tyr Ile Ser	Gln Val Val
[7658]	1175	1180	1185
[7659]	His Lys Ile Cys Glu Leu Val	Glu Lys Tyr Asp Ala	Val Ile Ala
[7660]	1190	1195	1200
[7661]	Leu Glu Asp Leu Asn Ser Gly	Phe Lys Asn Ser Arg	Val Lys Val
[7662]	1205	1210	1215
[7663]	Glu Lys Gln Val Tyr Gln Lys	Phe Glu Lys Met Leu	Ile Asp Lys
[7664]	1220	1225	1230
[7665]	Leu Asn Tyr Met Val Asp Lys	Lys Ser Asn Pro Cys	Ala Thr Gly
[7666]	1235	1240	1245
[7667]	Gly Ala Leu Lys Gly Tyr Gln	Ile Thr Asn Lys Phe	Glu Ser Phe
[7668]	1250	1255	1260
[7669]	Lys Ser Met Ser Thr Gln Asn	Gly Phe Ile Phe Tyr	Ile Pro Ala
[7670]	1265	1270	1275
[7671]	Trp Leu Thr Ser Lys Ile Asp	Pro Ser Thr Gly Phe	Val Asn Leu
[7672]	1280	1285	1290
[7673]	Leu Lys Thr Lys Tyr Thr Ser	Ile Ala Asp Ser Lys	Lys Phe Ile
[7674]	1295	1300	1305
[7675]	Ser Ser Phe Asp Arg Ile Met	Tyr Val Pro Glu Glu	Asp Leu Phe
[7676]	1310	1315	1320
[7677]	Glu Phe Ala Leu Asp Tyr Lys	Asn Phe Ser Arg Thr	Asp Ala Asp
[7678]	1325	1330	1335
[7679]	Tyr Ile Lys Lys Trp Lys Leu	Tyr Ser Tyr Gly Asn	Arg Ile Arg
[7680]	1340	1345	1350
[7681]	Ile Phe Arg Asn Pro Lys Lys	Asn Asn Val Phe Asp	Trp Glu Glu
[7682]	1355	1360	1365
[7683]	Val Cys Leu Thr Ser Ala Tyr	Lys Glu Leu Phe Asn	Lys Tyr Gly
[7684]	1370	1375	1380
[7685]	Ile Asn Tyr Gln Gln Gly Asp	Ile Arg Ala Leu Leu	Cys Glu Gln

[7686]	1385	1390	1395
[7687]	Ser Asp Lys Ala Phe Tyr Ser Ser Phe Met Ala Leu Met Ser Leu		
[7688]	1400	1405	1410
[7689]	Met Leu Gln Met Arg Asn Ser Ile Thr Gly Arg Thr Asp Val Asp		
[7690]	1415	1420	1425
[7691]	Phe Leu Ile Ser Pro Val Lys Asn Ser Asp Gly Ile Phe Tyr Asp		
[7692]	1430	1435	1440
[7693]	Ser Arg Asn Tyr Glu Ala Gln Glu Asn Ala Ile Leu Pro Lys Asn		
[7694]	1445	1450	1455
[7695]	Ala Asp Ala Asn Gly Ala Tyr Asn Ile Ala Arg Lys Val Leu Trp		
[7696]	1460	1465	1470
[7697]	Ala Ile Gly Gln Phe Lys Lys Ala Glu Asp Glu Lys Leu Asp Lys		
[7698]	1475	1480	1485
[7699]	Val Lys Ile Ala Ile Ser Asn Lys Glu Trp Leu Glu Tyr Ala Gln		
[7700]	1490	1495	1500
[7701]	Thr Ser Val Lys His Ser Gly Gly Ser Gly Gly Ser Gly Gly Ser		
[7702]	1505	1510	1515
[7703]	Thr Asn Leu Ser Asp Ile Ile Glu Lys Glu Thr Gly Lys Gln Leu		
[7704]	1520	1525	1530
[7705]	Val Ile Gln Glu Ser Ile Leu Met Leu Pro Glu Glu Val Glu Glu		
[7706]	1535	1540	1545
[7707]	Val Ile Gly Asn Lys Pro Glu Ser Asp Ile Leu Val His Thr Ala		
[7708]	1550	1555	1560
[7709]	Tyr Asp Glu Ser Thr Asp Glu Asn Val Met Leu Leu Thr Ser Asp		
[7710]	1565	1570	1575
[7711]	Ala Pro Glu Tyr Lys Pro Trp Ala Leu Val Ile Gln Asp Ser Asn		
[7712]	1580	1585	1590
[7713]	Gly Glu Asn Lys Ile Lys Met Leu Ser Gly Gly Ser Lys Arg Thr		
[7714]	1595	1600	1605
[7715]	Ala Asp Gly Ser Glu Phe		
[7716]	1610		
[7717]	<210> 70		
[7718]	<211> 1614		
[7719]	<212> PRT		
[7720]	<213> 人工的		
[7721]	<220>		
[7722]	<223> 碱基编辑器融合蛋白		
[7723]	<400> 70		
[7724]	Met Lys Arg Thr Ala Asp Gly Ser Glu Phe Glu Ser Pro Lys Lys Lys		
[7725]	1 5 10 15		
[7726]	Arg Lys Val Ser Ser Glu Thr Gly Pro Val Ala Val Asp Pro Thr Leu		
[7727]	20 25 30		

[7728]	Arg Arg Arg Ile Glu Pro His Glu Phe Glu Val Phe Phe Asp Pro Arg		
[7729]	35	40	45
[7730]	Glu Leu Arg Lys Glu Thr Cys Leu Leu Tyr Glu Ile Asn Trp Gly Gly		
[7731]	50	55	60
[7732]	Arg His Ser Ile Trp Arg His Thr Ser Gln Asn Thr Asn Lys His Val		
[7733]	65	70	75
[7734]	Glu Val Asn Phe Ile Glu Lys Phe Thr Thr Glu Arg Tyr Phe Cys Pro		
[7735]	85	90	95
[7736]	Asn Thr Arg Cys Ser Ile Thr Trp Phe Leu Ser Trp Ser Pro Cys Gly		
[7737]	100	105	110
[7738]	Glu Cys Ser Arg Ala Ile Thr Glu Phe Leu Ser Arg Tyr Pro His Val		
[7739]	115	120	125
[7740]	Thr Leu Phe Ile Tyr Ile Ala Arg Leu Tyr His His Ala Asp Pro Arg		
[7741]	130	135	140
[7742]	Asn Arg Gln Gly Leu Arg Asp Leu Ile Ser Ser Gly Val Thr Ile Gln		
[7743]	145	150	155
[7744]	Ile Met Thr Glu Gln Glu Ser Gly Tyr Cys Trp Arg Asn Phe Val Asn		
[7745]	165	170	175
[7746]	Tyr Ser Pro Ser Asn Glu Ala His Trp Pro Arg Tyr Pro His Leu Trp		
[7747]	180	185	190
[7748]	Val Arg Leu Tyr Val Leu Glu Leu Tyr Cys Ile Ile Leu Gly Leu Pro		
[7749]	195	200	205
[7750]	Pro Cys Leu Asn Ile Leu Arg Arg Lys Gln Pro Gln Leu Thr Phe Phe		
[7751]	210	215	220
[7752]	Thr Ile Ala Leu Gln Ser Cys His Tyr Gln Arg Leu Pro Pro His Ile		
[7753]	225	230	235
[7754]	Leu Trp Ala Thr Gly Leu Lys Pro Asp Asn Ser Ser Gly Gln Lys Leu		
[7755]	245	250	255
[7756]	Gln Leu Pro Gln Pro Ser Asp Lys Pro Gln Asp Ser Arg Glu Lys Ser		
[7757]	260	265	270
[7758]	Asp Ser Leu Pro Ser Asp Lys Arg Asp Ser Lys Leu Glu Lys Phe Thr		
[7759]	275	280	285
[7760]	Asn Cys Tyr Ser Leu Ser Lys Thr Leu Arg Phe Lys Ala Ile Pro Val		
[7761]	290	295	300
[7762]	Gly Lys Thr Gln Glu Asn Ile Asp Asn Lys Arg Leu Leu Val Glu Asp		
[7763]	305	310	315
[7764]	Glu Lys Arg Ala Glu Asp Tyr Lys Gly Val Lys Lys Leu Leu Asp Arg		
[7765]	325	330	335
[7766]	Tyr Tyr Leu Ser Phe Ile Asn Asp Val Leu His Ser Ile Lys Leu Lys		
[7767]	340	345	350
[7768]	Asn Leu Asn Asn Tyr Ile Ser Leu Phe Arg Lys Lys Thr Arg Thr Glu		
[7769]	355	360	365

[7770]	Lys	Glu	Asn	Lys	Glu	Leu	Glu	Asn	Leu	Glu	Ile	Asn	Leu	Arg	Lys	Glu
[7771]	370							375				380				
[7772]	Ile	Ala	Lys	Ala	Phe	Lys	Gly	Asn	Glu	Gly	Tyr	Lys	Ser	Leu	Phe	Lys
[7773]	385						390					395				400
[7774]	Lys	Asp	Ile	Ile	Glu	Thr	Ile	Leu	Pro	Glu	Phe	Leu	Asp	Asp	Lys	Asp
[7775]					405					410					415	
[7776]	Glu	Ile	Ala	Leu	Val	Asn	Ser	Phe	Asn	Gly	Phe	Thr	Thr	Ala	Phe	Thr
[7777]				420					425					430		
[7778]	Gly	Phe	Phe	Asp	Asn	Arg	Glu	Asn	Met	Phe	Ser	Glu	Glu	Ala	Lys	Ser
[7779]		435						440				445				
[7780]	Thr	Ser	Ile	Ala	Phe	Arg	Cys	Ile	Asn	Glu	Asn	Leu	Thr	Arg	Tyr	Ile
[7781]	450						455					460				
[7782]	Ser	Asn	Met	Asp	Ile	Phe	Glu	Lys	Val	Asp	Ala	Ile	Phe	Asp	Lys	His
[7783]	465					470					475				480	
[7784]	Glu	Val	Gln	Glu	Ile	Lys	Glu	Lys	Ile	Leu	Asn	Ser	Asp	Tyr	Asp	Val
[7785]				485					490					495		
[7786]	Glu	Asp	Phe	Phe	Glu	Gly	Glu	Phe	Phe	Asn	Phe	Val	Leu	Thr	Gln	Glu
[7787]			500					505				510				
[7788]	Gly	Ile	Asp	Val	Tyr	Asn	Ala	Ile	Ile	Gly	Gly	Phe	Val	Thr	Glu	Ser
[7789]		515						520				525				
[7790]	Gly	Glu	Lys	Ile	Lys	Gly	Leu	Asn	Glu	Tyr	Ile	Asn	Leu	Tyr	Asn	Gln
[7791]	530						535					540				
[7792]	Lys	Thr	Lys	Gln	Lys	Leu	Pro	Lys	Phe	Lys	Pro	Leu	Tyr	Lys	Gln	Val
[7793]	545					550					555				560	
[7794]	Leu	Ser	Asp	Arg	Glu	Ser	Leu	Ser	Phe	Tyr	Gly	Glu	Gly	Tyr	Thr	Ser
[7795]				565					570			575				
[7796]	Asp	Glu	Glu	Val	Leu	Glu	Val	Phe	Arg	Asn	Thr	Leu	Asn	Lys	Asn	Ser
[7797]			580						585			590				
[7798]	Glu	Ile	Phe	Ser	Ser	Ile	Lys	Lys	Leu	Glu	Lys	Leu	Phe	Lys	Asn	Phe
[7799]		595						600				605				
[7800]	Asp	Glu	Tyr	Ser	Ser	Ala	Gly	Ile	Phe	Val	Lys	Asn	Gly	Pro	Ala	Ile
[7801]	610						615					620				
[7802]	Ser	Thr	Ile	Ser	Lys	Asp	Ile	Phe	Gly	Glu	Trp	Asn	Val	Ile	Arg	Asp
[7803]	625					630					635				640	
[7804]	Lys	Trp	Asn	Ala	Glu	Tyr	Asp	Asp	Ile	His	Leu	Lys	Lys	Lys	Ala	Val
[7805]				645					650			655				
[7806]	Val	Thr	Glu	Lys	Tyr	Glu	Asp	Asp	Arg	Arg	Lys	Ser	Phe	Lys	Lys	Ile
[7807]			660						665			670				
[7808]	Gly	Ser	Phe	Ser	Leu	Glu	Gln	Leu	Gln	Glu	Tyr	Ala	Asp	Ala	Asp	Leu
[7809]		675						680				685				
[7810]	Ser	Val	Val	Glu	Lys	Leu	Lys	Glu	Ile	Ile	Ile	Gln	Lys	Val	Asp	Glu
[7811]	690							695				700				

[7812]	Ile Tyr Lys Val Tyr Gly Ser Ser Glu Lys Leu Phe Asp Ala Asp Phe		
[7813]	705	710	715 720
[7814]	Val Leu Glu Lys Ser Leu Lys Lys Asn Asp Ala Val Val Ala Ile Met		
[7815]		725 730	735
[7816]	Lys Asp Leu Leu Asp Ser Val Lys Ser Phe Glu Asn Tyr Ile Lys Ala		
[7817]		740 745	750
[7818]	Phe Phe Gly Glu Gly Lys Glu Thr Asn Arg Asp Glu Ser Phe Tyr Gly		
[7819]		755 760	765
[7820]	Asp Phe Val Leu Ala Tyr Asp Ile Leu Leu Lys Val Asp His Ile Tyr		
[7821]	770	775	780
[7822]	Asp Ala Ile Arg Asn Tyr Val Thr Gln Lys Pro Tyr Ser Lys Asp Lys		
[7823]	785	790	795 800
[7824]	Phe Lys Leu Tyr Phe Gln Asn Pro Gln Phe Met Gly Gly Trp Asp Lys		
[7825]		805 810	815
[7826]	Asp Lys Glu Thr Asp Tyr Arg Ala Thr Ile Leu Arg Tyr Gly Ser Lys		
[7827]		820 825	830
[7828]	Tyr Tyr Leu Ala Ile Met Asp Lys Lys Tyr Ala Lys Cys Leu Gln Lys		
[7829]		835 840	845
[7830]	Ile Asp Lys Asp Asp Val Asn Gly Asn Tyr Glu Lys Ile Asn Tyr Lys		
[7831]	850	855	860
[7832]	Leu Leu Pro Gly Pro Asn Lys Met Leu Pro Lys Val Phe Phe Ser Lys		
[7833]	865	870	875 880
[7834]	Lys Trp Met Ala Tyr Tyr Asn Pro Ser Glu Asp Ile Gln Lys Ile Tyr		
[7835]		885 890	895
[7836]	Lys Asn Gly Thr Phe Lys Lys Gly Asp Met Phe Asn Leu Asn Asp Cys		
[7837]		900 905	910
[7838]	His Lys Leu Ile Asp Phe Phe Lys Asp Ser Ile Ser Arg Tyr Pro Lys		
[7839]		915 920	925
[7840]	Trp Ser Asn Ala Tyr Asp Phe Asn Phe Ser Glu Thr Glu Lys Tyr Lys		
[7841]	930	935	940
[7842]	Asp Ile Ala Gly Phe Tyr Arg Glu Val Glu Glu Gln Gly Tyr Lys Val		
[7843]	945	950	955 960
[7844]	Ser Phe Glu Ser Ala Ser Lys Lys Glu Val Asp Lys Leu Val Glu Glu		
[7845]		965 970	975
[7846]	Gly Lys Leu Tyr Met Phe Gln Ile Tyr Asn Lys Asp Phe Ser Asp Lys		
[7847]		980 985	990
[7848]	Ser His Gly Thr Pro Asn Leu His Thr Met Tyr Phe Lys Leu Leu Phe		
[7849]		995 1000	1005
[7850]	Asp Glu Asn Asn His Gly Gln Ile Arg Leu Ser Gly Gly Ala Glu		
[7851]	1010	1015	1020
[7852]	Leu Phe Met Arg Arg Ala Ser Leu Lys Lys Glu Glu Leu Val Val		
[7853]	1025	1030	1035

[7854]	His	Pro	Ala	Asn	Ser	Pro	Ile	Ala	Asn	Lys	Asn	Pro	Asp	Asn	Pro
[7855]		1040						1045					1050		
[7856]	Lys	Lys	Thr	Thr	Thr	Leu	Ser	Tyr	Asp	Val	Tyr	Lys	Asp	Lys	Arg
[7857]		1055						1060					1065		
[7858]	Phe	Ser	Glu	Asp	Gln	Tyr	Glu	Leu	His	Ile	Pro	Ile	Ala	Ile	Asn
[7859]		1070						1075					1080		
[7860]	Lys	Cys	Pro	Lys	Asn	Ile	Phe	Lys	Ile	Asn	Thr	Glu	Val	Arg	Val
[7861]		1085						1090					1095		
[7862]	Leu	Leu	Lys	His	Asp	Asp	Asn	Pro	Tyr	Val	Ile	Gly	Ile	Ala	Arg
[7863]		1100						1105					1110		
[7864]	Gly	Glu	Arg	Asn	Leu	Leu	Tyr	Ile	Val	Val	Val	Asp	Gly	Lys	Gly
[7865]		1115						1120					1125		
[7866]	Asn	Ile	Val	Glu	Gln	Tyr	Ser	Leu	Asn	Glu	Ile	Ile	Asn	Asn	Phe
[7867]		1130						1135					1140		
[7868]	Asn	Gly	Ile	Arg	Ile	Lys	Thr	Asp	Tyr	His	Ser	Leu	Leu	Asp	Lys
[7869]		1145						1150					1155		
[7870]	Lys	Glu	Lys	Glu	Arg	Phe	Glu	Ala	Arg	Gln	Asn	Trp	Thr	Ser	Ile
[7871]		1160						1165					1170		
[7872]	Glu	Asn	Ile	Lys	Glu	Leu	Lys	Ala	Gly	Tyr	Ile	Ser	Gln	Val	Val
[7873]		1175						1180					1185		
[7874]	His	Lys	Ile	Cys	Glu	Leu	Val	Glu	Lys	Tyr	Asp	Ala	Val	Ile	Ala
[7875]		1190						1195					1200		
[7876]	Leu	Glu	Asp	Leu	Asn	Ser	Gly	Phe	Lys	Asn	Ser	Arg	Val	Lys	Val
[7877]		1205						1210					1215		
[7878]	Glu	Lys	Gln	Val	Tyr	Gln	Lys	Phe	Glu	Lys	Met	Leu	Ile	Asp	Lys
[7879]		1220						1225					1230		
[7880]	Leu	Asn	Tyr	Met	Val	Asp	Lys	Lys	Ser	Asn	Pro	Cys	Ala	Thr	Gly
[7881]		1235						1240					1245		
[7882]	Gly	Ala	Leu	Lys	Gly	Tyr	Gln	Ile	Thr	Asn	Lys	Phe	Glu	Ser	Phe
[7883]		1250						1255					1260		
[7884]	Lys	Ser	Met	Ser	Thr	Gln	Asn	Gly	Phe	Ile	Phe	Tyr	Ile	Pro	Ala
[7885]		1265						1270					1275		
[7886]	Trp	Leu	Thr	Ser	Lys	Ile	Asp	Pro	Ser	Thr	Gly	Phe	Val	Asn	Leu
[7887]		1280						1285					1290		
[7888]	Leu	Lys	Thr	Lys	Tyr	Thr	Ser	Ile	Ala	Asp	Ser	Lys	Lys	Phe	Ile
[7889]		1295						1300					1305		
[7890]	Ser	Ser	Phe	Asp	Arg	Ile	Met	Tyr	Val	Pro	Glu	Glu	Asp	Leu	Phe
[7891]		1310						1315					1320		
[7892]	Glu	Phe	Ala	Leu	Asp	Tyr	Lys	Asn	Phe	Ser	Arg	Thr	Asp	Ala	Asp
[7893]		1325						1330					1335		
[7894]	Tyr	Ile	Lys	Lys	Trp	Lys	Leu	Tyr	Ser	Tyr	Gly	Asn	Arg	Ile	Arg
[7895]		1340						1345					1350		

[7896]	Ile Phe Arg Asn Pro Lys Lys Asn Asn Val Phe Asp Trp Glu Glu
[7897]	1355 1360 1365
[7898]	Val Cys Leu Thr Ser Ala Tyr Lys Glu Leu Phe Asn Lys Tyr Gly
[7899]	1370 1375 1380
[7900]	Ile Asn Tyr Gln Gln Gly Asp Ile Arg Ala Leu Leu Cys Glu Gln
[7901]	1385 1390 1395
[7902]	Ser Asp Lys Ala Phe Tyr Ser Ser Phe Met Ala Leu Met Ser Leu
[7903]	1400 1405 1410
[7904]	Met Leu Gln Met Arg Asn Ser Ile Thr Gly Arg Thr Asp Val Asp
[7905]	1415 1420 1425
[7906]	Phe Leu Ile Ser Pro Val Lys Asn Ser Asp Gly Ile Phe Tyr Asp
[7907]	1430 1435 1440
[7908]	Ser Arg Asn Tyr Glu Ala Gln Glu Asn Ala Ile Leu Pro Lys Asn
[7909]	1445 1450 1455
[7910]	Ala Asp Ala Asn Gly Ala Tyr Asn Ile Ala Arg Lys Val Leu Trp
[7911]	1460 1465 1470
[7912]	Ala Ile Gly Gln Phe Lys Lys Ala Glu Asp Glu Lys Leu Asp Lys
[7913]	1475 1480 1485
[7914]	Val Lys Ile Ala Ile Ser Asn Lys Glu Trp Leu Glu Tyr Ala Gln
[7915]	1490 1495 1500
[7916]	Thr Ser Val Lys His Ser Gly Gly Ser Gly Gly Ser Gly Gly Ser
[7917]	1505 1510 1515
[7918]	Thr Asn Leu Ser Asp Ile Ile Glu Lys Glu Thr Gly Lys Gln Leu
[7919]	1520 1525 1530
[7920]	Val Ile Gln Glu Ser Ile Leu Met Leu Pro Glu Glu Val Glu Glu
[7921]	1535 1540 1545
[7922]	Val Ile Gly Asn Lys Pro Glu Ser Asp Ile Leu Val His Thr Ala
[7923]	1550 1555 1560
[7924]	Tyr Asp Glu Ser Thr Asp Glu Asn Val Met Leu Leu Thr Ser Asp
[7925]	1565 1570 1575
[7926]	Ala Pro Glu Tyr Lys Pro Trp Ala Leu Val Ile Gln Asp Ser Asn
[7927]	1580 1585 1590
[7928]	Gly Glu Asn Lys Ile Lys Met Leu Ser Gly Gly Ser Lys Arg Thr
[7929]	1595 1600 1605
[7930]	Ala Asp Gly Ser Glu Phe
[7931]	1610
[7932]	<210> 71
[7933]	<211> 1614
[7934]	<212> PRT
[7935]	<213> 人工的
[7936]	<220>
[7937]	<223> 碱基编辑器融合蛋白

[7938]	<400>	71														
[7939]	Met	Lys	Arg	Thr	Ala	Asp	Gly	Ser	Glu	Phe	Glu	Ser	Pro	Lys	Lys	Lys
[7940]	1				5					10					15	
[7941]	Arg	Lys	Val	Ser	Ser	Glu	Thr	Gly	Pro	Val	Ala	Val	Asp	Pro	Thr	Leu
[7942]				20					25					30		
[7943]	Arg	Arg	Arg	Ile	Glu	Pro	His	Glu	Phe	Glu	Val	Phe	Phe	Asp	Pro	Arg
[7944]			35					40					45			
[7945]	Glu	Leu	Arg	Lys	Glu	Thr	Cys	Leu	Leu	Tyr	Glu	Ile	Asn	Trp	Gly	Gly
[7946]		50					55					60				
[7947]	Arg	His	Ser	Ile	Trp	Arg	His	Thr	Ser	Gln	Asn	Thr	Asn	Lys	His	Val
[7948]	65					70				75						80
[7949]	Glu	Val	Asn	Phe	Ile	Glu	Lys	Phe	Thr	Thr	Glu	Arg	Tyr	Phe	Cys	Pro
[7950]					85					90					95	
[7951]	Asn	Thr	Arg	Cys	Ser	Ile	Thr	Trp	Phe	Leu	Ser	Trp	Ser	Pro	Cys	Gly
[7952]				100					105					110		
[7953]	Glu	Cys	Ser	Arg	Ala	Ile	Thr	Glu	Phe	Leu	Ser	Arg	Tyr	Pro	His	Val
[7954]			115					120					125			
[7955]	Thr	Leu	Phe	Ile	Tyr	Ile	Ala	Arg	Leu	Tyr	His	His	Ala	Asp	Pro	Arg
[7956]		130					135					140				
[7957]	Asn	Arg	Gln	Gly	Leu	Arg	Asp	Leu	Ile	Ser	Ser	Gly	Val	Thr	Ile	Gln
[7958]	145					150				155						160
[7959]	Ile	Met	Thr	Glu	Gln	Glu	Ser	Gly	Tyr	Cys	Trp	Arg	Asn	Phe	Val	Asn
[7960]				165					170						175	
[7961]	Tyr	Ser	Pro	Ser	Asn	Glu	Ala	His	Trp	Pro	Arg	Tyr	Pro	His	Leu	Trp
[7962]				180					185					190		
[7963]	Val	Arg	Leu	Tyr	Val	Leu	Glu	Leu	Tyr	Cys	Ile	Ile	Leu	Gly	Leu	Pro
[7964]			195					200					205			
[7965]	Pro	Cys	Leu	Asn	Ile	Leu	Arg	Arg	Lys	Gln	Pro	Gln	Leu	Thr	Phe	Phe
[7966]		210					215					220				
[7967]	Thr	Ile	Ala	Leu	Gln	Ser	Cys	His	Tyr	Gln	Arg	Leu	Pro	Pro	His	Ile
[7968]	225					230				235						240
[7969]	Leu	Trp	Ala	Thr	Gly	Leu	Lys	Gln	Glu	Pro	Lys	Pro	Gln	Asp	Gln	Ser
[7970]				245					250						255	
[7971]	Ser	Glu	Val	Pro	Pro	Pro	Pro	Gly	Ser	Gln	Lys	Pro	Gly	Thr	Lys	Glu
[7972]				260					265					270		
[7973]	Pro	His	Asp	Ser	Lys	Ser	Ser	Gly	Pro	Ser	Lys	Leu	Glu	Lys	Phe	Thr
[7974]			275					280					285			
[7975]	Asn	Cys	Tyr	Ser	Leu	Ser	Lys	Thr	Leu	Arg	Phe	Lys	Ala	Ile	Pro	Val
[7976]		290					295					300				
[7977]	Gly	Lys	Thr	Gln	Glu	Asn	Ile	Asp	Asn	Lys	Arg	Leu	Leu	Val	Glu	Asp
[7978]	305					310				315						320
[7979]	Glu	Lys	Arg	Ala	Glu	Asp	Tyr	Lys	Gly	Val	Lys	Lys	Leu	Leu	Asp	Arg

[7980]		325		330		335
[7981]	Tyr Tyr Leu Ser Phe Ile Asn Asp Val Leu His Ser Ile Lys Leu Lys					
[7982]		340		345		350
[7983]	Asn Leu Asn Asn Tyr Ile Ser Leu Phe Arg Lys Lys Thr Arg Thr Glu					
[7984]		355		360		365
[7985]	Lys Glu Asn Lys Glu Leu Glu Asn Leu Glu Ile Asn Leu Arg Lys Glu					
[7986]		370		375		380
[7987]	Ile Ala Lys Ala Phe Lys Gly Asn Glu Gly Tyr Lys Ser Leu Phe Lys					
[7988]	385		390		395	400
[7989]	Lys Asp Ile Ile Glu Thr Ile Leu Pro Glu Phe Leu Asp Asp Lys Asp					
[7990]		405		410		415
[7991]	Glu Ile Ala Leu Val Asn Ser Phe Asn Gly Phe Thr Thr Ala Phe Thr					
[7992]		420		425		430
[7993]	Gly Phe Phe Asp Asn Arg Glu Asn Met Phe Ser Glu Glu Ala Lys Ser					
[7994]		435		440		445
[7995]	Thr Ser Ile Ala Phe Arg Cys Ile Asn Glu Asn Leu Thr Arg Tyr Ile					
[7996]		450		455		460
[7997]	Ser Asn Met Asp Ile Phe Glu Lys Val Asp Ala Ile Phe Asp Lys His					
[7998]	465		470		475	480
[7999]	Glu Val Gln Glu Ile Lys Glu Lys Ile Leu Asn Ser Asp Tyr Asp Val					
[8000]		485		490		495
[8001]	Glu Asp Phe Phe Glu Gly Glu Phe Phe Asn Phe Val Leu Thr Gln Glu					
[8002]		500		505		510
[8003]	Gly Ile Asp Val Tyr Asn Ala Ile Ile Gly Gly Phe Val Thr Glu Ser					
[8004]		515		520		525
[8005]	Gly Glu Lys Ile Lys Gly Leu Asn Glu Tyr Ile Asn Leu Tyr Asn Gln					
[8006]		530		535		540
[8007]	Lys Thr Lys Gln Lys Leu Pro Lys Phe Lys Pro Leu Tyr Lys Gln Val					
[8008]	545		550		555	560
[8009]	Leu Ser Asp Arg Glu Ser Leu Ser Phe Tyr Gly Glu Gly Tyr Thr Ser					
[8010]		565		570		575
[8011]	Asp Glu Glu Val Leu Glu Val Phe Arg Asn Thr Leu Asn Lys Asn Ser					
[8012]		580		585		590
[8013]	Glu Ile Phe Ser Ser Ile Lys Lys Leu Glu Lys Leu Phe Lys Asn Phe					
[8014]		595		600		605
[8015]	Asp Glu Tyr Ser Ser Ala Gly Ile Phe Val Lys Asn Gly Pro Ala Ile					
[8016]		610		615		620
[8017]	Ser Thr Ile Ser Lys Asp Ile Phe Gly Glu Trp Asn Val Ile Arg Asp					
[8018]	625		630		635	640
[8019]	Lys Trp Asn Ala Glu Tyr Asp Asp Ile His Leu Lys Lys Lys Ala Val					
[8020]		645		650		655
[8021]	Val Thr Glu Lys Tyr Glu Asp Asp Arg Arg Lys Ser Phe Lys Lys Ile					

[8022]	660					665					670					
[8023]	Gly	Ser	Phe	Ser	Leu	Glu	Gln	Leu	Gln	Glu	Tyr	Ala	Asp	Ala	Asp	Leu
[8024]	675					680					685					
[8025]	Ser	Val	Val	Glu	Lys	Leu	Lys	Glu	Ile	Ile	Ile	Gln	Lys	Val	Asp	Glu
[8026]	690					695					700					
[8027]	Ile	Tyr	Lys	Val	Tyr	Gly	Ser	Ser	Glu	Lys	Leu	Phe	Asp	Ala	Asp	Phe
[8028]	705	710					715					720				
[8029]	Val	Leu	Glu	Lys	Ser	Leu	Lys	Lys	Asn	Asp	Ala	Val	Val	Ala	Ile	Met
[8030]	725					730					735					
[8031]	Lys	Asp	Leu	Leu	Asp	Ser	Val	Lys	Ser	Phe	Glu	Asn	Tyr	Ile	Lys	Ala
[8032]	740					745					750					
[8033]	Phe	Phe	Gly	Glu	Gly	Lys	Glu	Thr	Asn	Arg	Asp	Glu	Ser	Phe	Tyr	Gly
[8034]	755					760					765					
[8035]	Asp	Phe	Val	Leu	Ala	Tyr	Asp	Ile	Leu	Leu	Lys	Val	Asp	His	Ile	Tyr
[8036]	770					775					780					
[8037]	Asp	Ala	Ile	Arg	Asn	Tyr	Val	Thr	Gln	Lys	Pro	Tyr	Ser	Lys	Asp	Lys
[8038]	785	790					795					800				
[8039]	Phe	Lys	Leu	Tyr	Phe	Gln	Asn	Pro	Gln	Phe	Met	Gly	Gly	Trp	Asp	Lys
[8040]	805					810					815					
[8041]	Asp	Lys	Glu	Thr	Asp	Tyr	Arg	Ala	Thr	Ile	Leu	Arg	Tyr	Gly	Ser	Lys
[8042]	820					825					830					
[8043]	Tyr	Tyr	Leu	Ala	Ile	Met	Asp	Lys	Lys	Tyr	Ala	Lys	Cys	Leu	Gln	Lys
[8044]	835					840					845					
[8045]	Ile	Asp	Lys	Asp	Asp	Val	Asn	Gly	Asn	Tyr	Glu	Lys	Ile	Asn	Tyr	Lys
[8046]	850					855					860					
[8047]	Leu	Leu	Pro	Gly	Pro	Asn	Lys	Met	Leu	Pro	Lys	Val	Phe	Phe	Ser	Lys
[8048]	865	870					875					880				
[8049]	Lys	Trp	Met	Ala	Tyr	Tyr	Asn	Pro	Ser	Glu	Asp	Ile	Gln	Lys	Ile	Tyr
[8050]	885					890					895					
[8051]	Lys	Asn	Gly	Thr	Phe	Lys	Lys	Gly	Asp	Met	Phe	Asn	Leu	Asn	Asp	Cys
[8052]	900					905					910					
[8053]	His	Lys	Leu	Ile	Asp	Phe	Phe	Lys	Asp	Ser	Ile	Ser	Arg	Tyr	Pro	Lys
[8054]	915					920					925					
[8055]	Trp	Ser	Asn	Ala	Tyr	Asp	Phe	Asn	Phe	Ser	Glu	Thr	Glu	Lys	Tyr	Lys
[8056]	930					935					940					
[8057]	Asp	Ile	Ala	Gly	Phe	Tyr	Arg	Glu	Val	Glu	Glu	Gln	Gly	Tyr	Lys	Val
[8058]	945	950					955					960				
[8059]	Ser	Phe	Glu	Ser	Ala	Ser	Lys	Lys	Glu	Val	Asp	Lys	Leu	Val	Glu	Glu
[8060]	965					970					975					
[8061]	Gly	Lys	Leu	Tyr	Met	Phe	Gln	Ile	Tyr	Asn	Lys	Asp	Phe	Ser	Asp	Lys
[8062]	980					985					990					
[8063]	Ser	His	Gly	Thr	Pro	Asn	Leu	His	Thr	Met	Tyr	Phe	Lys	Leu	Leu	Ph

[8064]	995	1000	1005
[8065]	Asp Glu Asn Asn His Gly Gln Ile Arg Leu Ser Gly Gly Ala Glu		
[8066]	1010	1015	1020
[8067]	Leu Phe Met Arg Arg Ala Ser Leu Lys Lys Glu Glu Leu Val Val		
[8068]	1025	1030	1035
[8069]	His Pro Ala Asn Ser Pro Ile Ala Asn Lys Asn Pro Asp Asn Pro		
[8070]	1040	1045	1050
[8071]	Lys Lys Thr Thr Thr Leu Ser Tyr Asp Val Tyr Lys Asp Lys Arg		
[8072]	1055	1060	1065
[8073]	Phe Ser Glu Asp Gln Tyr Glu Leu His Ile Pro Ile Ala Ile Asn		
[8074]	1070	1075	1080
[8075]	Lys Cys Pro Lys Asn Ile Phe Lys Ile Asn Thr Glu Val Arg Val		
[8076]	1085	1090	1095
[8077]	Leu Leu Lys His Asp Asp Asn Pro Tyr Val Ile Gly Ile Ala Arg		
[8078]	1100	1105	1110
[8079]	Gly Glu Arg Asn Leu Leu Tyr Ile Val Val Val Asp Gly Lys Gly		
[8080]	1115	1120	1125
[8081]	Asn Ile Val Glu Gln Tyr Ser Leu Asn Glu Ile Ile Asn Asn Phe		
[8082]	1130	1135	1140
[8083]	Asn Gly Ile Arg Ile Lys Thr Asp Tyr His Ser Leu Leu Asp Lys		
[8084]	1145	1150	1155
[8085]	Lys Glu Lys Glu Arg Phe Glu Ala Arg Gln Asn Trp Thr Ser Ile		
[8086]	1160	1165	1170
[8087]	Glu Asn Ile Lys Glu Leu Lys Ala Gly Tyr Ile Ser Gln Val Val		
[8088]	1175	1180	1185
[8089]	His Lys Ile Cys Glu Leu Val Glu Lys Tyr Asp Ala Val Ile Ala		
[8090]	1190	1195	1200
[8091]	Leu Glu Asp Leu Asn Ser Gly Phe Lys Asn Ser Arg Val Lys Val		
[8092]	1205	1210	1215
[8093]	Glu Lys Gln Val Tyr Gln Lys Phe Glu Lys Met Leu Ile Asp Lys		
[8094]	1220	1225	1230
[8095]	Leu Asn Tyr Met Val Asp Lys Lys Ser Asn Pro Cys Ala Thr Gly		
[8096]	1235	1240	1245
[8097]	Gly Ala Leu Lys Gly Tyr Gln Ile Thr Asn Lys Phe Glu Ser Phe		
[8098]	1250	1255	1260
[8099]	Lys Ser Met Ser Thr Gln Asn Gly Phe Ile Phe Tyr Ile Pro Ala		
[8100]	1265	1270	1275
[8101]	Trp Leu Thr Ser Lys Ile Asp Pro Ser Thr Gly Phe Val Asn Leu		
[8102]	1280	1285	1290
[8103]	Leu Lys Thr Lys Tyr Thr Ser Ile Ala Asp Ser Lys Lys Phe Ile		
[8104]	1295	1300	1305
[8105]	Ser Ser Phe Asp Arg Ile Met Tyr Val Pro Glu Glu Asp Leu Phe		

[8106]	1310	1315	1320
[8107]	Glu Phe Ala Leu Asp Tyr Lys Asn Phe Ser Arg Thr Asp Ala Asp		
[8108]	1325	1330	1335
[8109]	Tyr Ile Lys Lys Trp Lys Leu Tyr Ser Tyr Gly Asn Arg Ile Arg		
[8110]	1340	1345	1350
[8111]	Ile Phe Arg Asn Pro Lys Lys Asn Asn Val Phe Asp Trp Glu Glu		
[8112]	1355	1360	1365
[8113]	Val Cys Leu Thr Ser Ala Tyr Lys Glu Leu Phe Asn Lys Tyr Gly		
[8114]	1370	1375	1380
[8115]	Ile Asn Tyr Gln Gln Gly Asp Ile Arg Ala Leu Leu Cys Glu Gln		
[8116]	1385	1390	1395
[8117]	Ser Asp Lys Ala Phe Tyr Ser Ser Phe Met Ala Leu Met Ser Leu		
[8118]	1400	1405	1410
[8119]	Met Leu Gln Met Arg Asn Ser Ile Thr Gly Arg Thr Asp Val Asp		
[8120]	1415	1420	1425
[8121]	Phe Leu Ile Ser Pro Val Lys Asn Ser Asp Gly Ile Phe Tyr Asp		
[8122]	1430	1435	1440
[8123]	Ser Arg Asn Tyr Glu Ala Gln Glu Asn Ala Ile Leu Pro Lys Asn		
[8124]	1445	1450	1455
[8125]	Ala Asp Ala Asn Gly Ala Tyr Asn Ile Ala Arg Lys Val Leu Trp		
[8126]	1460	1465	1470
[8127]	Ala Ile Gly Gln Phe Lys Lys Ala Glu Asp Glu Lys Leu Asp Lys		
[8128]	1475	1480	1485
[8129]	Val Lys Ile Ala Ile Ser Asn Lys Glu Trp Leu Glu Tyr Ala Gln		
[8130]	1490	1495	1500
[8131]	Thr Ser Val Lys His Ser Gly Gly Ser Gly Gly Ser Gly Gly Ser		
[8132]	1505	1510	1515
[8133]	Thr Asn Leu Ser Asp Ile Ile Glu Lys Glu Thr Gly Lys Gln Leu		
[8134]	1520	1525	1530
[8135]	Val Ile Gln Glu Ser Ile Leu Met Leu Pro Glu Glu Val Glu Glu		
[8136]	1535	1540	1545
[8137]	Val Ile Gly Asn Lys Pro Glu Ser Asp Ile Leu Val His Thr Ala		
[8138]	1550	1555	1560
[8139]	Tyr Asp Glu Ser Thr Asp Glu Asn Val Met Leu Leu Thr Ser Asp		
[8140]	1565	1570	1575
[8141]	Ala Pro Glu Tyr Lys Pro Trp Ala Leu Val Ile Gln Asp Ser Asn		
[8142]	1580	1585	1590
[8143]	Gly Glu Asn Lys Ile Lys Met Leu Ser Gly Gly Ser Lys Arg Thr		
[8144]	1595	1600	1605
[8145]	Ala Asp Gly Ser Glu Phe		
[8146]	1610		
[8147]	<210> 72		

[8148]	<211>	1616
[8149]	<212>	PRT
[8150]	<213>	人工的
[8151]	<220>	
[8152]	<223>	碱基编辑器融合蛋白
[8153]	<400>	72
[8154]	Met Lys Arg Thr Ala Asp Gly Ser Glu Phe Glu Ser Pro Lys Lys Lys	
[8155]	1	5 10 15
[8156]	Arg Lys Val Ser Ser Glu Thr Gly Pro Val Ala Val Asp Pro Thr Leu	
[8157]	20	25 30
[8158]	Arg Arg Arg Ile Glu Pro His Glu Phe Glu Val Phe Phe Asp Pro Arg	
[8159]	35	40 45
[8160]	Glu Leu Arg Lys Glu Thr Cys Leu Leu Tyr Glu Ile Asn Trp Gly Gly	
[8161]	50	55 60
[8162]	Arg His Ser Ile Trp Arg His Thr Ser Gln Asn Thr Asn Lys His Val	
[8163]	65	70 75 80
[8164]	Glu Val Asn Phe Ile Glu Lys Phe Thr Thr Glu Arg Tyr Phe Cys Pro	
[8165]	85	90 95
[8166]	Asn Thr Arg Cys Ser Ile Thr Trp Phe Leu Ser Trp Ser Pro Cys Gly	
[8167]	100	105 110
[8168]	Glu Cys Ser Arg Ala Ile Thr Glu Phe Leu Ser Arg Tyr Pro His Val	
[8169]	115	120 125
[8170]	Thr Leu Phe Ile Tyr Ile Ala Arg Leu Tyr His His Ala Asp Pro Arg	
[8171]	130	135 140
[8172]	Asn Arg Gln Gly Leu Arg Asp Leu Ile Ser Ser Gly Val Thr Ile Gln	
[8173]	145	150 155 160
[8174]	Ile Met Thr Glu Gln Glu Ser Gly Tyr Cys Trp Arg Asn Phe Val Asn	
[8175]	165	170 175
[8176]	Tyr Ser Pro Ser Asn Glu Ala His Trp Pro Arg Tyr Pro His Leu Trp	
[8177]	180	185 190
[8178]	Val Arg Leu Tyr Val Leu Glu Leu Tyr Cys Ile Ile Leu Gly Leu Pro	
[8179]	195	200 205
[8180]	Pro Cys Leu Asn Ile Leu Arg Arg Lys Gln Pro Gln Leu Thr Phe Phe	
[8181]	210	215 220
[8182]	Thr Ile Ala Leu Gln Ser Cys His Tyr Gln Arg Leu Pro Pro His Ile	
[8183]	225	230 235 240
[8184]	Leu Trp Ala Thr Gly Leu Lys Glu Lys Ser Lys Asn Asp Arg Ser Lys	
[8185]	245	250 255
[8186]	Pro Gln Pro Ser Asp Asp Arg Asp Arg Gln Pro Pro Ser Gly Glu Asp	
[8187]	260	265 270
[8188]	Tyr Pro Glu Trp Lys Ala Pro Gly Glu Tyr Glu Ser Lys Leu Glu Lys	
[8189]	275	280 285

[8190]	Phe Thr Asn Cys Tyr Ser Leu Ser Lys Thr Leu Arg Phe Lys Ala Ile		
[8191]	290	295	300
[8192]	Pro Val Gly Lys Thr Gln Glu Asn Ile Asp Asn Lys Arg Leu Leu Val		
[8193]	305	310	315 320
[8194]	Glu Asp Glu Lys Arg Ala Glu Asp Tyr Lys Gly Val Lys Lys Leu Leu		
[8195]	325	330	335
[8196]	Asp Arg Tyr Tyr Leu Ser Phe Ile Asn Asp Val Leu His Ser Ile Lys		
[8197]	340	345	350
[8198]	Leu Lys Asn Leu Asn Asn Tyr Ile Ser Leu Phe Arg Lys Lys Thr Arg		
[8199]	355	360	365
[8200]	Thr Glu Lys Glu Asn Lys Glu Leu Glu Asn Leu Glu Ile Asn Leu Arg		
[8201]	370	375	380
[8202]	Lys Glu Ile Ala Lys Ala Phe Lys Gly Asn Glu Gly Tyr Lys Ser Leu		
[8203]	385	390	395 400
[8204]	Phe Lys Lys Asp Ile Ile Glu Thr Ile Leu Pro Glu Phe Leu Asp Asp		
[8205]	405	410	415
[8206]	Lys Asp Glu Ile Ala Leu Val Asn Ser Phe Asn Gly Phe Thr Thr Ala		
[8207]	420	425	430
[8208]	Phe Thr Gly Phe Phe Asp Asn Arg Glu Asn Met Phe Ser Glu Glu Ala		
[8209]	435	440	445
[8210]	Lys Ser Thr Ser Ile Ala Phe Arg Cys Ile Asn Glu Asn Leu Thr Arg		
[8211]	450	455	460
[8212]	Tyr Ile Ser Asn Met Asp Ile Phe Glu Lys Val Asp Ala Ile Phe Asp		
[8213]	465	470	475 480
[8214]	Lys His Glu Val Gln Glu Ile Lys Glu Lys Ile Leu Asn Ser Asp Tyr		
[8215]	485	490	495
[8216]	Asp Val Glu Asp Phe Phe Glu Gly Glu Phe Phe Asn Phe Val Leu Thr		
[8217]	500	505	510
[8218]	Gln Glu Gly Ile Asp Val Tyr Asn Ala Ile Ile Gly Gly Phe Val Thr		
[8219]	515	520	525
[8220]	Glu Ser Gly Glu Lys Ile Lys Gly Leu Asn Glu Tyr Ile Asn Leu Tyr		
[8221]	530	535	540
[8222]	Asn Gln Lys Thr Lys Gln Lys Leu Pro Lys Phe Lys Pro Leu Tyr Lys		
[8223]	545	550	555 560
[8224]	Gln Val Leu Ser Asp Arg Glu Ser Leu Ser Phe Tyr Gly Glu Gly Tyr		
[8225]	565	570	575
[8226]	Thr Ser Asp Glu Glu Val Leu Glu Val Phe Arg Asn Thr Leu Asn Lys		
[8227]	580	585	590
[8228]	Asn Ser Glu Ile Phe Ser Ser Ile Lys Lys Leu Glu Lys Leu Phe Lys		
[8229]	595	600	605
[8230]	Asn Phe Asp Glu Tyr Ser Ser Ala Gly Ile Phe Val Lys Asn Gly Pro		
[8231]	610	615	620

[8232]	Ala	Ile	Ser	Thr	Ile	Ser	Lys	Asp	Ile	Phe	Gly	Glu	Trp	Asn	Val	Ile
[8233]	625						630				635					640
[8234]	Arg	Asp	Lys	Trp	Asn	Ala	Glu	Tyr	Asp	Asp	Ile	His	Leu	Lys	Lys	Lys
[8235]						645					650					655
[8236]	Ala	Val	Val	Thr	Glu	Lys	Tyr	Glu	Asp	Asp	Arg	Arg	Lys	Ser	Phe	Lys
[8237]						660					665					670
[8238]	Lys	Ile	Gly	Ser	Phe	Ser	Leu	Glu	Gln	Leu	Gln	Glu	Tyr	Ala	Asp	Ala
[8239]						675					680					685
[8240]	Asp	Leu	Ser	Val	Val	Glu	Lys	Leu	Lys	Glu	Ile	Ile	Ile	Gln	Lys	Val
[8241]		690								695						700
[8242]	Asp	Glu	Ile	Tyr	Lys	Val	Tyr	Gly	Ser	Ser	Glu	Lys	Leu	Phe	Asp	Ala
[8243]	705										710					715
[8244]	Asp	Phe	Val	Leu	Glu	Lys	Ser	Leu	Lys	Lys	Asn	Asp	Ala	Val	Val	Ala
[8245]											725					730
[8246]	Ile	Met	Lys	Asp	Leu	Leu	Asp	Ser	Val	Lys	Ser	Phe	Glu	Asn	Tyr	Ile
[8247]											740					745
[8248]	Lys	Ala	Phe	Phe	Gly	Glu	Gly	Lys	Glu	Thr	Asn	Arg	Asp	Glu	Ser	Phe
[8249]											755					760
[8250]	Tyr	Gly	Asp	Phe	Val	Leu	Ala	Tyr	Asp	Ile	Leu	Leu	Lys	Val	Asp	His
[8251]											770					775
[8252]	Ile	Tyr	Asp	Ala	Ile	Arg	Asn	Tyr	Val	Thr	Gln	Lys	Pro	Tyr	Ser	Lys
[8253]	785															790
[8254]	Asp	Lys	Phe	Lys	Leu	Tyr	Phe	Gln	Asn	Pro	Gln	Phe	Met	Gly	Gly	Trp
[8255]											805					810
[8256]	Asp	Lys	Asp	Lys	Glu	Thr	Asp	Tyr	Arg	Ala	Thr	Ile	Leu	Arg	Tyr	Gly
[8257]											820					825
[8258]	Ser	Lys	Tyr	Tyr	Leu	Ala	Ile	Met	Asp	Lys	Lys	Tyr	Ala	Lys	Cys	Leu
[8259]											835					840
[8260]	Gln	Lys	Ile	Asp	Lys	Asp	Asp	Val	Asn	Gly	Asn	Tyr	Glu	Lys	Ile	Asn
[8261]											850					855
[8262]	Tyr	Lys	Leu	Leu	Pro	Gly	Pro	Asn	Lys	Met	Leu	Pro	Lys	Val	Phe	Phe
[8263]	865															870
[8264]	Ser	Lys	Lys	Trp	Met	Ala	Tyr	Tyr	Asn	Pro	Ser	Glu	Asp	Ile	Gln	Lys
[8265]											885					890
[8266]	Ile	Tyr	Lys	Asn	Gly	Thr	Phe	Lys	Lys	Gly	Asp	Met	Phe	Asn	Leu	Asn
[8267]											900					905
[8268]	Asp	Cys	His	Lys	Leu	Ile	Asp	Phe	Phe	Lys	Asp	Ser	Ile	Ser	Arg	Tyr
[8269]											915					920
[8270]	Pro	Lys	Trp	Ser	Asn	Ala	Tyr	Asp	Phe	Asn	Phe	Ser	Glu	Thr	Glu	Lys
[8271]											930					935
[8272]	Tyr	Lys	Asp	Ile	Ala	Gly	Phe	Tyr	Arg	Glu	Val	Glu	Glu	Gln	Gly	Tyr
[8273]	945															950
											955					960

[8274]	Lys Val Ser Phe Glu Ser Ala Ser Lys Lys Glu Val Asp Lys Leu Val
[8275]	965 970 975
[8276]	Glu Glu Gly Lys Leu Tyr Met Phe Gln Ile Tyr Asn Lys Asp Phe Ser
[8277]	980 985 990
[8278]	Asp Lys Ser His Gly Thr Pro Asn Leu His Thr Met Tyr Phe Lys Leu
[8279]	995 1000 1005
[8280]	Leu Phe Asp Glu Asn Asn His Gly Gln Ile Arg Leu Ser Gly Gly
[8281]	1010 1015 1020
[8282]	Ala Glu Leu Phe Met Arg Arg Ala Ser Leu Lys Lys Glu Glu Leu
[8283]	1025 1030 1035
[8284]	Val Val His Pro Ala Asn Ser Pro Ile Ala Asn Lys Asn Pro Asp
[8285]	1040 1045 1050
[8286]	Asn Pro Lys Lys Thr Thr Thr Leu Ser Tyr Asp Val Tyr Lys Asp
[8287]	1055 1060 1065
[8288]	Lys Arg Phe Ser Glu Asp Gln Tyr Glu Leu His Ile Pro Ile Ala
[8289]	1070 1075 1080
[8290]	Ile Asn Lys Cys Pro Lys Asn Ile Phe Lys Ile Asn Thr Glu Val
[8291]	1085 1090 1095
[8292]	Arg Val Leu Leu Lys His Asp Asp Asn Pro Tyr Val Ile Gly Ile
[8293]	1100 1105 1110
[8294]	Ala Arg Gly Glu Arg Asn Leu Leu Tyr Ile Val Val Val Asp Gly
[8295]	1115 1120 1125
[8296]	Lys Gly Asn Ile Val Glu Gln Tyr Ser Leu Asn Glu Ile Ile Asn
[8297]	1130 1135 1140
[8298]	Asn Phe Asn Gly Ile Arg Ile Lys Thr Asp Tyr His Ser Leu Leu
[8299]	1145 1150 1155
[8300]	Asp Lys Lys Glu Lys Glu Arg Phe Glu Ala Arg Gln Asn Trp Thr
[8301]	1160 1165 1170
[8302]	Ser Ile Glu Asn Ile Lys Glu Leu Lys Ala Gly Tyr Ile Ser Gln
[8303]	1175 1180 1185
[8304]	Val Val His Lys Ile Cys Glu Leu Val Glu Lys Tyr Asp Ala Val
[8305]	1190 1195 1200
[8306]	Ile Ala Leu Glu Asp Leu Asn Ser Gly Phe Lys Asn Ser Arg Val
[8307]	1205 1210 1215
[8308]	Lys Val Glu Lys Gln Val Tyr Gln Lys Phe Glu Lys Met Leu Ile
[8309]	1220 1225 1230
[8310]	Asp Lys Leu Asn Tyr Met Val Asp Lys Lys Ser Asn Pro Cys Ala
[8311]	1235 1240 1245
[8312]	Thr Gly Gly Ala Leu Lys Gly Tyr Gln Ile Thr Asn Lys Phe Glu
[8313]	1250 1255 1260
[8314]	Ser Phe Lys Ser Met Ser Thr Gln Asn Gly Phe Ile Phe Tyr Ile
[8315]	1265 1270 1275

[8316]	Pro	Ala	Trp	Leu	Thr	Ser	Lys	Ile	Asp	Pro	Ser	Thr	Gly	Phe	Val
[8317]	1280						1285					1290			
[8318]	Asn	Leu	Leu	Lys	Thr	Lys	Tyr	Thr	Ser	Ile	Ala	Asp	Ser	Lys	Lys
[8319]	1295						1300					1305			
[8320]	Phe	Ile	Ser	Ser	Phe	Asp	Arg	Ile	Met	Tyr	Val	Pro	Glu	Glu	Asp
[8321]	1310						1315					1320			
[8322]	Leu	Phe	Glu	Phe	Ala	Leu	Asp	Tyr	Lys	Asn	Phe	Ser	Arg	Thr	Asp
[8323]	1325						1330					1335			
[8324]	Ala	Asp	Tyr	Ile	Lys	Lys	Trp	Lys	Leu	Tyr	Ser	Tyr	Gly	Asn	Arg
[8325]	1340						1345					1350			
[8326]	Ile	Arg	Ile	Phe	Arg	Asn	Pro	Lys	Lys	Asn	Asn	Val	Phe	Asp	Trp
[8327]	1355						1360					1365			
[8328]	Glu	Glu	Val	Cys	Leu	Thr	Ser	Ala	Tyr	Lys	Glu	Leu	Phe	Asn	Lys
[8329]	1370						1375					1380			
[8330]	Tyr	Gly	Ile	Asn	Tyr	Gln	Gln	Gly	Asp	Ile	Arg	Ala	Leu	Leu	Cys
[8331]	1385						1390					1395			
[8332]	Glu	Gln	Ser	Asp	Lys	Ala	Phe	Tyr	Ser	Ser	Phe	Met	Ala	Leu	Met
[8333]	1400						1405					1410			
[8334]	Ser	Leu	Met	Leu	Gln	Met	Arg	Asn	Ser	Ile	Thr	Gly	Arg	Thr	Asp
[8335]	1415						1420					1425			
[8336]	Val	Asp	Phe	Leu	Ile	Ser	Pro	Val	Lys	Asn	Ser	Asp	Gly	Ile	Phe
[8337]	1430						1435					1440			
[8338]	Tyr	Asp	Ser	Arg	Asn	Tyr	Glu	Ala	Gln	Glu	Asn	Ala	Ile	Leu	Pro
[8339]	1445						1450					1455			
[8340]	Lys	Asn	Ala	Asp	Ala	Asn	Gly	Ala	Tyr	Asn	Ile	Ala	Arg	Lys	Val
[8341]	1460						1465					1470			
[8342]	Leu	Trp	Ala	Ile	Gly	Gln	Phe	Lys	Lys	Ala	Glu	Asp	Glu	Lys	Leu
[8343]	1475						1480					1485			
[8344]	Asp	Lys	Val	Lys	Ile	Ala	Ile	Ser	Asn	Lys	Glu	Trp	Leu	Glu	Tyr
[8345]	1490						1495					1500			
[8346]	Ala	Gln	Thr	Ser	Val	Lys	His	Ser	Gly	Gly	Ser	Gly	Gly	Ser	Gly
[8347]	1505						1510					1515			
[8348]	Gly	Ser	Thr	Asn	Leu	Ser	Asp	Ile	Ile	Glu	Lys	Glu	Thr	Gly	Lys
[8349]	1520						1525					1530			
[8350]	Gln	Leu	Val	Ile	Gln	Glu	Ser	Ile	Leu	Met	Leu	Pro	Glu	Glu	Val
[8351]	1535						1540					1545			
[8352]	Glu	Glu	Val	Ile	Gly	Asn	Lys	Pro	Glu	Ser	Asp	Ile	Leu	Val	His
[8353]	1550						1555					1560			
[8354]	Thr	Ala	Tyr	Asp	Glu	Ser	Thr	Asp	Glu	Asn	Val	Met	Leu	Leu	Thr
[8355]	1565						1570					1575			
[8356]	Ser	Asp	Ala	Pro	Glu	Tyr	Lys	Pro	Trp	Ala	Leu	Val	Ile	Gln	Asp
[8357]	1580						1585					1590			

[8358]	Ser Asn Gly Glu Asn Lys Ile Lys Met Leu Ser Gly Gly Ser Lys
[8359]	1595 1600 1605
[8360]	Arg Thr Ala Asp Gly Ser Glu Phe
[8361]	1610 1615
[8362]	<210> 73
[8363]	<211> 19
[8364]	<212> PRT
[8365]	<213> 人工的
[8366]	<220>
[8367]	<223> RNA间隔子
[8368]	<400> 73
[8369]	Asn Asn Asn Asn Asn Asn Asn Asn Asn Asn Asn Asn Asn Asn Asn
[8370]	1 5 10 15
[8371]	Asn Asn Asn
[8372]	<210> 74
[8373]	<211> 22
[8374]	<212> PRT
[8375]	<213> 人工的
[8376]	<220>
[8377]	<223> 靶链
[8378]	<400> 74
[8379]	Ala Ala Ala Asn Asn Asn Asn Asn Asn Asn Asn Asn Asn Asn Asn
[8380]	1 5 10 15
[8381]	Asn Asn Asn Asn Asn Asn
[8382]	20
[8383]	<210> 75
[8384]	<211> 22
[8385]	<212> PRT
[8386]	<213> 人工的
[8387]	<220>
[8388]	<223> 非靶链
[8389]	<400> 75
[8390]	Thr Thr Thr Asn Asn Asn Asn Asn Asn Asn Asn Asn Asn Asn Asn
[8391]	1 5 10 15
[8392]	Asn Asn Asn Asn Asn Asn
[8393]	20
[8394]	<210> 76
[8395]	<211> 621
[8396]	<212> DNA
[8397]	<213> 海七鳃鳗(Petromyzon marinus)
[8398]	<400> 76
[8399]	acagatgcag agtatgtgag aattcacgaa aagctggaca tctatacett caagaagcag 60

[8400]	ttctttaaca ataagaagtc tgtgagccat aggtgctacg tgctgttcga gctgaagaga	120
[8401]	aggggtgaaa gaaggcatg tttttggggg tatgctgtga acaagcccca gtctggaact	180
[8402]	gagagaggca ttcacgccga aattttcagc atcagaaagg tggaggaata cctgagggat	240
[8403]	aaccctggac agtttacaat taattggtat tctagctggt ctccatgcgc tgactgtgcc	300
[8404]	gagaagatcc tggaatggta caaccaggag ctgagaggaa atggccatac cctgaagatt	360
[8405]	tgggcctgca agctgtacta tgaaaagaac gcaagaaatc agatcggact gtggaacctg	420
[8406]	agggataatg gtgtggggct gaacgtgatg gtgtccgagc actatcagtg ctgtagaaag	480
[8407]	attttcattc agtcctcaca taatcagctg aacgagaata gatggctgga aaagactctg	540
[8408]	aagagggctg agaagagaag gtccgaactg tcaattatga tccaggtgaa gatcctgcac	600
[8409]	accactaagt cacctgccgt g	621
[8410]	<210>	77
[8411]	<211>	160
[8412]	<212>	PRT
[8413]	<213>	人工的
[8414]	<220>	
[8415]	<223>	多肽
[8416]	<400>	77
[8417]	Phe Glu Arg Asn Tyr Asp Pro Arg Glu Leu Arg Lys Glu Thr Tyr Leu	
[8418]	1 5 10 15	
[8419]	Leu Tyr Glu Ile Lys Trp Gly Lys Ser Gly Lys Leu Trp Arg His Trp	
[8420]	20 25 30	
[8421]	Cys Gln Asn Asn Arg Thr Gln His Ala Glu Val Tyr Phe Leu Glu Asn	
[8422]	35 40 45	
[8423]	Ile Phe Asn Ala Arg Arg Phe Asn Pro Ser Thr His Cys Ser Ile Thr	
[8424]	50 55 60	
[8425]	Trp Tyr Leu Ser Trp Ser Pro Cys Ala Glu Cys Ser Gln Lys Ile Val	
[8426]	65 70 75 80	
[8427]	Asp Phe Leu Lys Glu His Pro Asn Val Leu Glu Ile Tyr Val Ala Arg	
[8428]	85 90 95	
[8429]	Leu Tyr Tyr His Glu Asp Glu Arg Asn Arg Gln Gly Leu Arg Asp Leu	
[8430]	100 105 110	
[8431]	Val Asn Ser Gly Val Thr Ile Arg Ile Met Asp Leu Pro Asp Tyr Asn	
[8432]	115 120 125	
[8433]	Tyr Cys Trp Lys Thr Phe Val Ser Asp Gln Gly Gly Asp Glu Asp Tyr	
[8434]	130 135 140	
[8435]	Trp Pro Gly His Phe Ala Pro Trp Ile Lys Gln Tyr Ser Leu Lys Leu	
[8436]	145 150 155 160	
[8437]	<210>	78
[8438]	<211>	207
[8439]	<212>	PRT
[8440]	<213>	人工的
[8441]	<220>	

[8442]	<223>	多肽
[8443]	<400>	78
[8444]	Thr Asp Ala Glu Tyr Val Arg Ile His Glu Lys Leu Asp Ile Tyr Thr	
[8445]	1	5 10 15
[8446]	Phe Lys Lys Gln Phe Ser Asn Asn Lys Lys Ser Val Ser His Arg Cys	
[8447]		20 25 30
[8448]	Tyr Val Leu Phe Glu Leu Lys Arg Arg Gly Glu Arg Arg Ala Cys Phe	
[8449]		35 40 45
[8450]	Trp Gly Tyr Ala Val Asn Lys Pro Gln Ser Gly Thr Glu Arg Gly Ile	
[8451]		50 55 60
[8452]	His Ala Glu Ile Phe Ser Ile Arg Lys Val Glu Glu Tyr Leu Arg Asp	
[8453]	65	70 75 80
[8454]	Asn Pro Gly Gln Phe Thr Ile Asn Trp Tyr Ser Ser Trp Ser Pro Cys	
[8455]		85 90 95
[8456]	Ala Asp Cys Ala Glu Lys Ile Leu Glu Trp Tyr Asn Gln Glu Leu Arg	
[8457]		100 105 110
[8458]	Gly Asn Gly His Thr Leu Lys Ile Trp Val Cys Lys Leu Tyr Tyr Glu	
[8459]		115 120 125
[8460]	Lys Asn Ala Arg Asn Gln Ile Gly Leu Trp Asn Leu Arg Asp Asn Gly	
[8461]		130 135 140
[8462]	Val Gly Leu Asn Val Met Val Ser Glu His Tyr Gln Cys Cys Arg Lys	
[8463]	145	150 155 160
[8464]	Ile Phe Ile Gln Ser Ser His Asn Gln Leu Asn Glu Asn Arg Trp Leu	
[8465]		165 170 175
[8466]	Glu Lys Thr Leu Lys Arg Ala Glu Lys Arg Arg Ser Glu Leu Ser Ile	
[8467]		180 185 190
[8468]	Met Phe Gln Val Lys Ile Leu His Thr Thr Lys Ser Pro Ala Val	
[8469]		195 200 205
[8470]	<210>	79
[8471]	<211>	228
[8472]	<212>	PRT
[8473]	<213>	人工的
[8474]	<220>	
[8475]	<223>	多肽
[8476]	<400>	79
[8477]	Ser Ser Lys Thr Gly Pro Val Ala Val Asp Pro Thr Leu Arg Arg Arg	
[8478]	1	5 10 15
[8479]	Ile Glu Pro His Glu Phe Glu Val Phe Phe Asp Pro Arg Glu Leu Arg	
[8480]		20 25 30
[8481]	Lys Glu Thr Cys Leu Leu Tyr Glu Ile Asn Trp Gly Gly Arg His Ser	
[8482]		35 40 45
[8483]	Ile Trp Arg His Thr Ser Gln Asn Thr Asn Lys His Val Glu Val Asn	

[8484]	50	55	60
[8485]	Phe Ile Glu Lys Phe Thr Thr Glu Arg Tyr Phe Cys Pro Asn Thr Arg		
[8486]	65	70	75 80
[8487]	Cys Ser Ile Thr Trp Phe Leu Ser Trp Ser Pro Cys Gly Glu Cys Ser		
[8488]	85	90	95
[8489]	Arg Ala Ile Thr Glu Phe Leu Ser Arg Tyr Pro Asn Val Thr Leu Phe		
[8490]	100	105	110
[8491]	Ile Tyr Ile Ala Arg Leu Tyr His Leu Ala Asn Pro Arg Asn Arg Gln		
[8492]	115	120	125
[8493]	Gly Leu Arg Asp Leu Ile Ser Ser Gly Val Thr Ile Gln Ile Met Thr		
[8494]	130	135	140
[8495]	Glu Gln Glu Ser Gly Tyr Cys Trp His Asn Phe Val Asn Tyr Ser Pro		
[8496]	145	150	155 160
[8497]	Ser Asn Glu Ser His Trp Pro Arg Tyr Pro His Leu Trp Val Arg Leu		
[8498]	165	170	175
[8499]	Tyr Val Leu Glu Leu Tyr Cys Ile Ile Leu Gly Leu Pro Pro Cys Leu		
[8500]	180	185	190
[8501]	Asn Ile Leu Arg Arg Lys Gln Ser Gln Leu Thr Ser Phe Thr Ile Ala		
[8502]	195	200	205
[8503]	Leu Gln Ser Cys His Tyr Gln Arg Leu Pro Pro His Ile Leu Trp Ala		
[8504]	210	215	220
[8505]	Thr Gly Leu Lys		
[8506]	225		
[8507]	<210> 80		
[8508]	<211> 162		
[8509]	<212> PRT		
[8510]	<213> 人工的		
[8511]	<220>		
[8512]	<223> 多肽		
[8513]	<400> 80		
[8514]	Ser Phe Glu Arg Asn Tyr Asp Pro Arg Glu Leu Arg Lys Glu Thr Tyr		
[8515]	1 5 10 15		
[8516]	Leu Leu Tyr Glu Ile Lys Trp Gly Lys Ser Gly Lys Leu Trp Arg His		
[8517]	20 25 30		
[8518]	Trp Cys Gln Asn Asn Arg Thr Gln His Ala Glu Val Tyr Phe Leu Glu		
[8519]	35 40 45		
[8520]	Asn Ile Phe Asn Ala Arg Arg Phe Asn Pro Ser Thr His Cys Ser Ile		
[8521]	50 55 60		
[8522]	Thr Trp Tyr Leu Ser Trp Ser Pro Cys Ala Glu Cys Ser Gln Lys Ile		
[8523]	65 70 75 80		
[8524]	Val Asp Phe Leu Lys Glu His Pro Asn Val Asn Leu Glu Ile Tyr Val		
[8525]	85 90 95		

[8526]	Ala Arg Leu Tyr Tyr Pro Glu Asn Glu Arg Asn Arg Gln Gly Leu Arg
[8527]	100 105 110
[8528]	Asp Leu Val Asn Ser Gly Val Thr Ile Arg Ile Met Asp Leu Pro Asp
[8529]	115 120 125
[8530]	Tyr Asn Tyr Cys Trp Lys Thr Phe Val Ser Asp Gln Gly Gly Asp Glu
[8531]	130 135 140
[8532]	Asp Tyr Trp Pro Gly His Phe Ala Pro Trp Ile Lys Gln Tyr Ser Leu
[8533]	145 150 155 160
[8534]	Lys Leu
[8535]	<210> 81
[8536]	<211> 198
[8537]	<212> PRT
[8538]	<213> 智人
[8539]	<400> 81
[8540]	Met Asp Ser Leu Leu Met Asn Arg Arg Lys Phe Leu Tyr Gln Phe Lys
[8541]	1 5 10 15
[8542]	Asn Val Arg Trp Ala Lys Gly Arg Arg Glu Thr Tyr Leu Cys Tyr Val
[8543]	20 25 30
[8544]	Val Lys Arg Arg Asp Ser Ala Thr Ser Phe Ser Leu Asp Phe Gly Tyr
[8545]	35 40 45
[8546]	Leu Arg Asn Lys Asn Gly Cys His Val Glu Leu Leu Phe Leu Arg Tyr
[8547]	50 55 60
[8548]	Ile Ser Asp Trp Asp Leu Asp Pro Gly Arg Cys Tyr Arg Val Thr Trp
[8549]	65 70 75 80
[8550]	Phe Thr Ser Trp Ser Pro Cys Tyr Asp Cys Ala Arg His Val Ala Asp
[8551]	85 90 95
[8552]	Phe Leu Arg Gly Asn Pro Asn Leu Ser Leu Arg Ile Phe Thr Ala Arg
[8553]	100 105 110
[8554]	Leu Tyr Phe Cys Glu Asp Arg Lys Ala Glu Pro Glu Gly Leu Arg Arg
[8555]	115 120 125
[8556]	Leu His Arg Ala Gly Val Gln Ile Ala Ile Met Thr Phe Lys Asp Tyr
[8557]	130 135 140
[8558]	Phe Tyr Cys Trp Asn Thr Phe Val Glu Asn His Glu Arg Thr Phe Lys
[8559]	145 150 155 160
[8560]	Ala Trp Glu Gly Leu His Glu Asn Ser Val Arg Leu Ser Arg Gln Leu
[8561]	165 170 175
[8562]	Arg Arg Ile Leu Leu Pro Leu Tyr Glu Val Asp Asp Leu Arg Asp Ala
[8563]	180 185 190
[8564]	Phe Arg Thr Leu Gly Leu
[8565]	195
[8566]	<210> 82
[8567]	<211> 197

[8568]	<212>	PRT
[8569]	<213>	人工的
[8570]	<220>	
[8571]	<223>	多肽
[8572]	<400>	82
[8573]	Met Asp Ser Leu Leu Met Asn Arg Arg Glu Phe Leu Tyr Gln Phe Lys	
[8574]	1 5 10 15	
[8575]	Asn Val Arg Trp Ala Lys Gly Arg Arg Glu Thr Tyr Leu Cys Tyr Val	
[8576]	20 25 30	
[8577]	Val Lys Arg Arg Asp Ser Ala Thr Ser Phe Ser Leu Asp Phe Gly Tyr	
[8578]	35 40 45	
[8579]	Leu Arg Asn Lys Asn Gly Cys His Val Glu Leu Leu Phe Leu Arg Tyr	
[8580]	50 55 60	
[8581]	Ile Ser Asp Trp Asp Leu Asp Pro Gly Arg Cys Tyr Arg Val Thr Trp	
[8582]	65 70 75 80	
[8583]	Phe Ile Ser Trp Ser Pro Cys Tyr Asp Cys Ala Arg His Val Ala Asp	
[8584]	85 90 95	
[8585]	Phe Leu Arg Gly Asn Pro Asn Leu Ser Leu Arg Ile Phe Thr Ala Arg	
[8586]	100 105 110	
[8587]	Leu Tyr Phe Cys Glu Asp Arg Lys Ala Glu Pro Glu Gly Leu Arg Arg	
[8588]	115 120 125	
[8589]	Leu His Arg Ala Gly Val Gln Ile Ala Ile Met Thr Phe Lys Asp Tyr	
[8590]	130 135 140	
[8591]	Phe Tyr Cys Trp Asn Thr Phe Val Glu Asn His Gly Arg Thr Phe Lys	
[8592]	145 150 155 160	
[8593]	Ala Trp Glu Gly Leu His Glu Asn Ser Val Arg Leu Ser Arg Gln Leu	
[8594]	165 170 175	
[8595]	Arg Arg Ile Leu Leu Pro Leu Tyr Glu Val Asp Asp Leu Arg Asp Ala	
[8596]	180 185 190	
[8597]	Phe Arg Thr Cys Thr	
[8598]	195	
[8599]	<210>	83
[8600]	<211>	23
[8601]	<212>	DNA
[8602]	<213>	人工的
[8603]	<220>	
[8604]	<223>	间隔子
[8605]	<400>	83
[8606]	tcatctgtgc ccctccctcc ctg	23
[8607]	<210>	84
[8608]	<211>	23
[8609]	<212>	DNA

[8610]	<213>	人工的	
[8611]	<220>		
[8612]	<223>	间隔子	
[8613]	<400>	84	
[8614]		agcctcaccc ctctagccct aca	23
[8615]	<210>	85	
[8616]	<211>	23	
[8617]	<212>	DNA	
[8618]	<213>	人工的	
[8619]	<220>		
[8620]	<223>	间隔子	
[8621]	<400>	85	
[8622]		ttctccctc tgctggatac ctc	23
[8623]	<210>	86	
[8624]	<211>	23	
[8625]	<212>	DNA	
[8626]	<213>	人工的	
[8627]	<220>		
[8628]	<223>	间隔子	
[8629]	<400>	86	
[8630]		cctcactcct gctcggtagaa ttt	23
[8631]	<210>	87	
[8632]	<211>	23	
[8633]	<212>	DNA	
[8634]	<213>	人工的	
[8635]	<220>		
[8636]	<223>	间隔子	
[8637]	<400>	87	
[8638]		gctcagcagg cacctgcctc agc	23
[8639]	<210>	88	
[8640]	<211>	23	
[8641]	<212>	DNA	
[8642]	<213>	人工的	
[8643]	<220>		
[8644]	<223>	间隔子	
[8645]	<400>	88	
[8646]		tctgtcccct ccaccccaca gtg	23
[8647]	<210>	89	
[8648]	<211>	133	
[8649]	<212>	DNA	
[8650]	<213>	智人	
[8651]	<400>	89	

[8652]	gtaagtatca aggttacaag acaggtttaa ggagaccaat agaaactggg cttgtcgaga	60
[8653]	cagagaagac tcttgcttt ctgataggca cctattggtc ttactgacat ccactttgcc	120
[8654]	ttctctcca cag	133
[8655]	<210>	90
[8656]	<211>	189
[8657]	<212>	DNA
[8658]	<213>	大豆 (Glycine max)
[8659]	<400>	90
[8660]	gtaagtttct gcttctacct ttgatataata tataataatt atcattaatt agtagtaata	60
[8661]	taatatttca aatatttttt tcaaaataaa agaattgtagt atatagcaat tgcttttctg	120
[8662]	tagtttataa gtgtgtatat tttaatttat aacttttcta atatatgacc aaaatttggt	180
[8663]	gaagtgcag	189
[8664]	<210>	91
[8665]	<211>	1591
[8666]	<212>	PRT
[8667]	<213>	人工的
[8668]	<220>	
[8669]	<223>	融合蛋白
[8670]	<400>	91
[8671]	Met Lys Arg Thr Ala Asp Gly Ser Glu Phe Glu Ser Pro Lys Lys Lys	
[8672]	1 5 10 15	
[8673]	Arg Lys Val Glu Ala Ser Pro Ala Ser Gly Pro Arg His Leu Met Asp	
[8674]	20 25 30	
[8675]	Pro His Ile Phe Thr Ser Asn Phe Asn Asn Gly Ile Gly Arg His Lys	
[8676]	35 40 45	
[8677]	Thr Tyr Leu Cys Tyr Glu Val Glu Arg Leu Asp Asn Gly Thr Ser Val	
[8678]	50 55 60	
[8679]	Lys Met Asp Gln His Arg Gly Phe Leu His Asn Gln Ala Lys Asn Leu	
[8680]	65 70 75 80	
[8681]	Leu Cys Gly Phe Tyr Gly Arg His Ala Glu Leu Arg Phe Leu Asp Leu	
[8682]	85 90 95	
[8683]	Val Pro Ser Leu Gln Leu Asp Pro Ala Gln Ile Tyr Arg Val Thr Trp	
[8684]	100 105 110	
[8685]	Phe Ile Ser Trp Ser Pro Cys Phe Ser Trp Gly Cys Ala Gly Glu Val	
[8686]	115 120 125	
[8687]	Arg Ala Phe Leu Gln Glu Asn Thr His Val Arg Leu Arg Ile Phe Ala	
[8688]	130 135 140	
[8689]	Ala Arg Ile Tyr Asp Tyr Asp Pro Leu Tyr Lys Glu Ala Leu Gln Met	
[8690]	145 150 155 160	
[8691]	Leu Arg Asp Ala Gly Ala Gln Val Ser Ile Met Thr Tyr Asp Glu Phe	
[8692]	165 170 175	
[8693]	Lys His Cys Trp Asp Thr Phe Val Asp His Gln Gly Cys Pro Phe Gln	

[8694]	180	185	190
[8695]	Pro Trp Asp Gly Leu Asp Glu His Ser Gln Ala Leu Ser Gly Arg Leu		
[8696]	195	200	205
[8697]	Arg Ala Ile Leu Gln Asn Gln Gly Asn Ser Thr Ser Gln Ser Asp Gly		
[8698]	210	215	220
[8699]	Ser Ser Val Pro Ala Asp Ile Asp Gln Ser Ser Asp Ser Asp Gln Ser		
[8700]	225	230	235
[8701]	Ser Ser Gln Gly Gln Pro Gly Ser Lys Leu Glu Lys Phe Thr Asn Cys		
[8702]	245	250	255
[8703]	Tyr Ser Leu Ser Lys Thr Leu Arg Phe Lys Ala Ile Pro Val Gly Lys		
[8704]	260	265	270
[8705]	Thr Gln Glu Asn Ile Asp Asn Lys Arg Leu Leu Val Glu Asp Glu Lys		
[8706]	275	280	285
[8707]	Arg Ala Glu Asp Tyr Lys Gly Val Lys Lys Leu Leu Asp Arg Tyr Tyr		
[8708]	290	295	300
[8709]	Leu Ser Phe Ile Asn Asp Val Leu His Ser Ile Lys Leu Lys Asn Leu		
[8710]	305	310	315
[8711]	Asn Asn Tyr Ile Ser Leu Phe Arg Lys Lys Thr Arg Thr Glu Lys Glu		
[8712]	325	330	335
[8713]	Asn Lys Glu Leu Glu Asn Leu Glu Ile Asn Leu Arg Lys Glu Ile Ala		
[8714]	340	345	350
[8715]	Lys Ala Phe Lys Gly Asn Glu Gly Tyr Lys Ser Leu Phe Lys Lys Asp		
[8716]	355	360	365
[8717]	Ile Ile Glu Thr Ile Leu Pro Glu Phe Leu Asp Asp Lys Asp Glu Ile		
[8718]	370	375	380
[8719]	Ala Leu Val Asn Ser Phe Asn Gly Phe Thr Thr Ala Phe Thr Gly Phe		
[8720]	385	390	395
[8721]	Phe Asp Asn Arg Glu Asn Met Phe Ser Glu Glu Ala Lys Ser Thr Ser		
[8722]	405	410	415
[8723]	Ile Ala Phe Arg Cys Ile Asn Glu Asn Leu Thr Arg Tyr Ile Ser Asn		
[8724]	420	425	430
[8725]	Met Asp Ile Phe Glu Lys Val Asp Ala Ile Phe Asp Lys His Glu Val		
[8726]	435	440	445
[8727]	Gln Glu Ile Lys Glu Lys Ile Leu Asn Ser Asp Tyr Asp Val Glu Asp		
[8728]	450	455	460
[8729]	Phe Phe Glu Gly Glu Phe Phe Asn Phe Val Leu Thr Gln Glu Gly Ile		
[8730]	465	470	475
[8731]	Asp Val Tyr Asn Ala Ile Ile Gly Gly Phe Val Thr Glu Ser Gly Glu		
[8732]	485	490	495
[8733]	Lys Ile Lys Gly Leu Asn Glu Tyr Ile Asn Leu Tyr Asn Gln Lys Thr		
[8734]	500	505	510
[8735]	Lys Gln Lys Leu Pro Lys Phe Lys Pro Leu Tyr Lys Gln Val Leu Ser		

[8736]	515	520	525
[8737]	Asp Arg Glu Ser Leu Ser Phe Tyr Gly Glu Gly Tyr Thr Ser Asp Glu		
[8738]	530	535	540
[8739]	Glu Val Leu Glu Val Phe Arg Asn Thr Leu Asn Lys Asn Ser Glu Ile		
[8740]	545	550	555
[8741]	Phe Ser Ser Ile Lys Lys Leu Glu Lys Leu Phe Lys Asn Phe Asp Glu		
[8742]	565	570	575
[8743]	Tyr Ser Ser Ala Gly Ile Phe Val Lys Asn Gly Pro Ala Ile Ser Thr		
[8744]	580	585	590
[8745]	Ile Ser Lys Asp Ile Phe Gly Glu Trp Asn Val Ile Arg Asp Lys Trp		
[8746]	595	600	605
[8747]	Asn Ala Glu Tyr Asp Asp Ile His Leu Lys Lys Lys Ala Val Val Thr		
[8748]	610	615	620
[8749]	Glu Lys Tyr Glu Asp Asp Arg Arg Lys Ser Phe Lys Lys Ile Gly Ser		
[8750]	625	630	635
[8751]	Phe Ser Leu Glu Gln Leu Gln Glu Tyr Ala Asp Ala Asp Leu Ser Val		
[8752]	645	650	655
[8753]	Val Glu Lys Leu Lys Glu Ile Ile Ile Gln Lys Val Asp Glu Ile Tyr		
[8754]	660	665	670
[8755]	Lys Val Tyr Gly Ser Ser Glu Lys Leu Phe Asp Ala Asp Phe Val Leu		
[8756]	675	680	685
[8757]	Glu Lys Ser Leu Lys Lys Asn Asp Ala Val Val Ala Ile Met Lys Asp		
[8758]	690	695	700
[8759]	Leu Leu Asp Ser Val Lys Ser Phe Glu Asn Tyr Ile Lys Ala Phe Phe		
[8760]	705	710	715
[8761]	Gly Glu Gly Lys Glu Thr Asn Arg Asp Glu Ser Phe Tyr Gly Asp Phe		
[8762]	725	730	735
[8763]	Val Leu Ala Tyr Asp Ile Leu Leu Lys Val Asp His Ile Tyr Asp Ala		
[8764]	740	745	750
[8765]	Ile Arg Asn Tyr Val Thr Gln Lys Pro Tyr Ser Lys Asp Lys Phe Lys		
[8766]	755	760	765
[8767]	Leu Tyr Phe Gln Asn Pro Gln Phe Met Gly Gly Trp Asp Lys Asp Lys		
[8768]	770	775	780
[8769]	Glu Thr Asp Tyr Arg Ala Thr Ile Leu Arg Tyr Gly Ser Lys Tyr Tyr		
[8770]	785	790	795
[8771]	Leu Ala Ile Met Asp Lys Lys Tyr Ala Lys Cys Leu Gln Lys Ile Asp		
[8772]	805	810	815
[8773]	Lys Asp Asp Val Asn Gly Asn Tyr Glu Lys Ile Asn Tyr Lys Leu Leu		
[8774]	820	825	830
[8775]	Pro Gly Pro Asn Lys Met Leu Pro Lys Val Phe Phe Ser Lys Lys Trp		
[8776]	835	840	845
[8777]	Met Ala Tyr Tyr Asn Pro Ser Glu Asp Ile Gln Lys Ile Tyr Lys Asn		

[8778]	850	855	860
[8779]	Gly Thr Phe Lys Lys Gly Asp Met Phe Asn Leu Asn Asp Cys His Lys		
[8780]	865	870	875 880
[8781]	Leu Ile Asp Phe Phe Lys Asp Ser Ile Ser Arg Tyr Pro Lys Trp Ser		
[8782]	885	890	895
[8783]	Asn Ala Tyr Asp Phe Asn Phe Ser Glu Thr Glu Lys Tyr Lys Asp Ile		
[8784]	900	905	910
[8785]	Ala Gly Phe Tyr Arg Glu Val Glu Glu Gln Gly Tyr Lys Val Ser Phe		
[8786]	915	920	925
[8787]	Glu Ser Ala Ser Lys Lys Glu Val Asp Lys Leu Val Glu Glu Gly Lys		
[8788]	930	935	940
[8789]	Leu Tyr Met Phe Gln Ile Tyr Asn Lys Asp Phe Ser Asp Lys Ser His		
[8790]	945	950	955 960
[8791]	Gly Thr Pro Asn Leu His Thr Met Tyr Phe Lys Leu Leu Phe Asp Glu		
[8792]	965	970	975
[8793]	Asn Asn His Gly Gln Ile Arg Leu Ser Gly Gly Ala Glu Leu Phe Met		
[8794]	980	985	990
[8795]	Arg Arg Ala Ser Leu Lys Lys Glu Glu Leu Val Val His Pro Ala Asn		
[8796]	995	1000	1005
[8797]	Ser Pro Ile Ala Asn Lys Asn Pro Asp Asn Pro Lys Lys Thr Thr		
[8798]	1010	1015	1020
[8799]	Thr Leu Ser Tyr Asp Val Tyr Lys Asp Lys Arg Phe Ser Glu Asp		
[8800]	1025	1030	1035
[8801]	Gln Tyr Glu Leu His Ile Pro Ile Ala Ile Asn Lys Cys Pro Lys		
[8802]	1040	1045	1050
[8803]	Asn Ile Phe Lys Ile Asn Thr Glu Val Arg Val Leu Leu Lys His		
[8804]	1055	1060	1065
[8805]	Asp Asp Asn Pro Tyr Val Ile Gly Ile Ala Arg Gly Glu Arg Asn		
[8806]	1070	1075	1080
[8807]	Leu Leu Tyr Ile Val Val Val Asp Gly Lys Gly Asn Ile Val Glu		
[8808]	1085	1090	1095
[8809]	Gln Tyr Ser Leu Asn Glu Ile Ile Asn Asn Phe Asn Gly Ile Arg		
[8810]	1100	1105	1110
[8811]	Ile Lys Thr Asp Tyr His Ser Leu Leu Asp Lys Lys Glu Lys Glu		
[8812]	1115	1120	1125
[8813]	Arg Phe Glu Ala Arg Gln Asn Trp Thr Ser Ile Glu Asn Ile Lys		
[8814]	1130	1135	1140
[8815]	Glu Leu Lys Ala Gly Tyr Ile Ser Gln Val Val His Lys Ile Cys		
[8816]	1145	1150	1155
[8817]	Glu Leu Val Glu Lys Tyr Asp Ala Val Ile Ala Leu Glu Asp Leu		
[8818]	1160	1165	1170
[8819]	Asn Ser Gly Phe Lys Asn Ser Arg Val Lys Val Glu Lys Gln Val		

[8820]	1175	1180	1185
[8821]	Tyr Gln Lys Phe Glu Lys Met	Leu Ile Asp Lys Leu	Asn Tyr Met
[8822]	1190	1195	1200
[8823]	Val Asp Lys Lys Ser Asn Pro	Cys Ala Thr Gly Gly	Ala Leu Lys
[8824]	1205	1210	1215
[8825]	Gly Tyr Gln Ile Thr Asn Lys	Phe Glu Ser Phe Lys	Ser Met Ser
[8826]	1220	1225	1230
[8827]	Thr Gln Asn Gly Phe Ile Phe	Tyr Ile Pro Ala Trp	Leu Thr Ser
[8828]	1235	1240	1245
[8829]	Lys Ile Asp Pro Ser Thr Gly	Phe Val Asn Leu Leu	Lys Thr Lys
[8830]	1250	1255	1260
[8831]	Tyr Thr Ser Ile Ala Asp Ser	Lys Lys Phe Ile Ser	Ser Phe Asp
[8832]	1265	1270	1275
[8833]	Arg Ile Met Tyr Val Pro Glu	Glu Asp Leu Phe Glu	Phe Ala Leu
[8834]	1280	1285	1290
[8835]	Asp Tyr Lys Asn Phe Ser Arg	Thr Asp Ala Asp Tyr	Ile Lys Lys
[8836]	1295	1300	1305
[8837]	Trp Lys Leu Tyr Ser Tyr Gly	Asn Arg Ile Arg Ile	Phe Arg Asn
[8838]	1310	1315	1320
[8839]	Pro Lys Lys Asn Asn Val Phe	Asp Trp Glu Glu Val	Cys Leu Thr
[8840]	1325	1330	1335
[8841]	Ser Ala Tyr Lys Glu Leu Phe	Asn Lys Tyr Gly Ile	Asn Tyr Gln
[8842]	1340	1345	1350
[8843]	Gln Gly Asp Ile Arg Ala Leu	Leu Cys Glu Gln Ser	Asp Lys Ala
[8844]	1355	1360	1365
[8845]	Phe Tyr Ser Ser Phe Met Ala	Leu Met Ser Leu Met	Leu Gln Met
[8846]	1370	1375	1380
[8847]	Arg Asn Ser Ile Thr Gly Arg	Thr Asp Val Asp Phe	Leu Ile Ser
[8848]	1385	1390	1395
[8849]	Pro Val Lys Asn Ser Asp Gly	Ile Phe Tyr Asp Ser	Arg Asn Tyr
[8850]	1400	1405	1410
[8851]	Glu Ala Gln Glu Asn Ala Ile	Leu Pro Lys Asn Ala	Asp Ala Asn
[8852]	1415	1420	1425
[8853]	Gly Ala Tyr Asn Ile Ala Arg	Lys Val Leu Trp Ala	Ile Gly Gln
[8854]	1430	1435	1440
[8855]	Phe Lys Lys Ala Glu Asp Glu	Lys Leu Asp Lys Val	Lys Ile Ala
[8856]	1445	1450	1455
[8857]	Ile Ser Asn Lys Glu Trp Leu	Glu Tyr Ala Gln Thr	Ser Val Lys
[8858]	1460	1465	1470
[8859]	His Ser Gly Gly Ser Gly Gly	Ser Gly Gly Ser Thr	Asn Leu Ser
[8860]	1475	1480	1485
[8861]	Asp Ile Ile Glu Lys Glu Thr	Gly Lys Gln Leu Val	Ile Gln Glu

[8862]	1490	1495	1500
[8863]	Ser Ile Leu Met Leu Pro Glu Glu Val Glu Glu Val Ile Gly Asn		
[8864]	1505	1510	1515
[8865]	Lys Pro Glu Ser Asp Ile Leu Val His Thr Ala Tyr Asp Glu Ser		
[8866]	1520	1525	1530
[8867]	Thr Asp Glu Asn Val Met Leu Leu Thr Ser Asp Ala Pro Glu Tyr		
[8868]	1535	1540	1545
[8869]	Lys Pro Trp Ala Leu Val Ile Gln Asp Ser Asn Gly Glu Asn Lys		
[8870]	1550	1555	1560
[8871]	Ile Lys Met Leu Ser Gly Gly Ser Lys Arg Thr Ala Asp Gly Ser		
[8872]	1565	1570	1575
[8873]	Glu Phe Glu Pro Lys Lys Lys Arg Lys Val Gly Ser Gly		
[8874]	1580	1585	1590
[8875]	<210> 92		
[8876]	<211> 1570		
[8877]	<212> PRT		
[8878]	<213> 人工的		
[8879]	<220>		
[8880]	<223> 融合蛋白		
[8881]	<400> 92		
[8882]	Met Ala Gly Ser Lys Lys Arg Arg Ile Lys Gln Asp Glu Ala Ser Pro		
[8883]	1 5 10 15		
[8884]	Ala Ser Gly Pro Arg His Leu Met Asp Pro His Ile Phe Thr Ser Asn		
[8885]	20 25 30		
[8886]	Phe Asn Asn Gly Ile Gly Arg His Lys Thr Tyr Leu Cys Tyr Glu Val		
[8887]	35 40 45		
[8888]	Glu Arg Leu Asp Asn Gly Thr Ser Val Lys Met Asp Gln His Arg Gly		
[8889]	50 55 60		
[8890]	Phe Leu His Asn Gln Ala Lys Asn Leu Leu Cys Gly Phe Tyr Gly Arg		
[8891]	65 70 75 80		
[8892]	His Ala Glu Leu Arg Phe Leu Asp Leu Val Pro Ser Leu Gln Leu Asp		
[8893]	85 90 95		
[8894]	Pro Ala Gln Ile Tyr Arg Val Thr Trp Phe Ile Ser Trp Ser Pro Cys		
[8895]	100 105 110		
[8896]	Phe Ser Trp Gly Cys Ala Gly Glu Val Arg Ala Phe Leu Gln Glu Asn		
[8897]	115 120 125		
[8898]	Thr His Val Arg Leu Arg Ile Phe Ala Ala Arg Ile Tyr Asp Tyr Asp		
[8899]	130 135 140		
[8900]	Pro Leu Tyr Lys Glu Ala Leu Gln Met Leu Arg Asp Ala Gly Ala Gln		
[8901]	145 150 155 160		
[8902]	Val Ser Ile Met Thr Tyr Asp Glu Phe Lys His Cys Trp Asp Thr Phe		
[8903]	165 170 175		

[8904]	Val Asp His Gln Gly Cys Pro Phe Gln Pro Trp Asp Gly Leu Asp Glu		
[8905]		180	185
[8906]	His Ser Gln Ala Leu Ser Gly Arg Leu Arg Ala Ile Leu Gln Asn Gln		190
[8907]		195	200
[8908]	Gly Asn Ser Thr Ser Gln Ser Asp Gly Ser Ser Val Pro Ala Asp Ile		205
[8909]		210	215
[8910]	Asp Gln Ser Ser Asp Ser Asp Gln Ser Ser Ser Gln Gly Gln Pro Gly		220
[8911]		225	230
[8912]	Ser Lys Leu Glu Lys Phe Thr Asn Cys Tyr Ser Leu Ser Lys Thr Leu		235
[8913]		245	250
[8914]	Arg Phe Lys Ala Ile Pro Val Gly Lys Thr Gln Glu Asn Ile Asp Asn		255
[8915]		260	265
[8916]	Lys Arg Leu Leu Val Glu Asp Glu Lys Arg Ala Glu Asp Tyr Lys Gly		270
[8917]		275	280
[8918]	Val Lys Lys Leu Leu Asp Arg Tyr Tyr Leu Ser Phe Ile Asn Asp Val		285
[8919]		290	295
[8920]	Leu His Ser Ile Lys Leu Lys Asn Leu Asn Asn Tyr Ile Ser Leu Phe		300
[8921]		305	310
[8922]	Arg Lys Lys Thr Arg Thr Glu Lys Glu Asn Lys Glu Leu Glu Asn Leu		315
[8923]		325	330
[8924]	Glu Ile Asn Leu Arg Lys Glu Ile Ala Lys Ala Phe Lys Gly Asn Glu		335
[8925]		340	345
[8926]	Gly Tyr Lys Ser Leu Phe Lys Lys Asp Ile Ile Glu Thr Ile Leu Pro		350
[8927]		355	360
[8928]	Glu Phe Leu Asp Asp Lys Asp Glu Ile Ala Leu Val Asn Ser Phe Asn		365
[8929]		370	375
[8930]	Gly Phe Thr Thr Ala Phe Thr Gly Phe Phe Asp Asn Arg Glu Asn Met		380
[8931]		385	390
[8932]	Phe Ser Glu Glu Ala Lys Ser Thr Ser Ile Ala Phe Arg Cys Ile Asn		395
[8933]		405	410
[8934]	Glu Asn Leu Thr Arg Tyr Ile Ser Asn Met Asp Ile Phe Glu Lys Val		415
[8935]		420	425
[8936]	Asp Ala Ile Phe Asp Lys His Glu Val Gln Glu Ile Lys Glu Lys Ile		430
[8937]		435	440
[8938]	Leu Asn Ser Asp Tyr Asp Val Glu Asp Phe Phe Glu Gly Glu Phe Phe		445
[8939]		450	455
[8940]	Asn Phe Val Leu Thr Gln Glu Gly Ile Asp Val Tyr Asn Ala Ile Ile		460
[8941]		465	470
[8942]	Gly Gly Phe Val Thr Glu Ser Gly Glu Lys Ile Lys Gly Leu Asn Glu		475
[8943]		485	490
[8944]	Tyr Ile Asn Leu Tyr Asn Gln Lys Thr Lys Gln Lys Leu Pro Lys Phe		495
[8945]		500	505
			510

[8946]	Lys	Pro	Leu	Tyr	Lys	Gln	Val	Leu	Ser	Asp	Arg	Glu	Ser	Leu	Ser	Phe
[8947]			515					520					525			
[8948]	Tyr	Gly	Glu	Gly	Tyr	Thr	Ser	Asp	Glu	Glu	Val	Leu	Glu	Val	Phe	Arg
[8949]		530					535					540				
[8950]	Asn	Thr	Leu	Asn	Lys	Asn	Ser	Glu	Ile	Phe	Ser	Ser	Ile	Lys	Lys	Leu
[8951]	545					550				555						560
[8952]	Glu	Lys	Leu	Phe	Lys	Asn	Phe	Asp	Glu	Tyr	Ser	Ser	Ala	Gly	Ile	Phe
[8953]				565					570					575		
[8954]	Val	Lys	Asn	Gly	Pro	Ala	Ile	Ser	Thr	Ile	Ser	Lys	Asp	Ile	Phe	Gly
[8955]			580					585					590			
[8956]	Glu	Trp	Asn	Val	Ile	Arg	Asp	Lys	Trp	Asn	Ala	Glu	Tyr	Asp	Asp	Ile
[8957]		595					600					605				
[8958]	His	Leu	Lys	Lys	Lys	Ala	Val	Val	Thr	Glu	Lys	Tyr	Glu	Asp	Asp	Arg
[8959]	610					615					620					
[8960]	Arg	Lys	Ser	Phe	Lys	Lys	Ile	Gly	Ser	Phe	Ser	Leu	Glu	Gln	Leu	Gln
[8961]	625				630					635					640	
[8962]	Glu	Tyr	Ala	Asp	Ala	Asp	Leu	Ser	Val	Val	Glu	Lys	Leu	Lys	Glu	Ile
[8963]				645					650				655			
[8964]	Ile	Ile	Gln	Lys	Val	Asp	Glu	Ile	Tyr	Lys	Val	Tyr	Gly	Ser	Ser	Glu
[8965]			660					665					670			
[8966]	Lys	Leu	Phe	Asp	Ala	Asp	Phe	Val	Leu	Glu	Lys	Ser	Leu	Lys	Lys	Asn
[8967]		675					680					685				
[8968]	Asp	Ala	Val	Val	Ala	Ile	Met	Lys	Asp	Leu	Leu	Asp	Ser	Val	Lys	Ser
[8969]	690					695					700					
[8970]	Phe	Glu	Asn	Tyr	Ile	Lys	Ala	Phe	Phe	Gly	Glu	Gly	Lys	Glu	Thr	Asn
[8971]	705				710					715					720	
[8972]	Arg	Asp	Glu	Ser	Phe	Tyr	Gly	Asp	Phe	Val	Leu	Ala	Tyr	Asp	Ile	Leu
[8973]				725					730				735			
[8974]	Leu	Lys	Val	Asp	His	Ile	Tyr	Asp	Ala	Ile	Arg	Asn	Tyr	Val	Thr	Gln
[8975]		740						745				750				
[8976]	Lys	Pro	Tyr	Ser	Lys	Asp	Lys	Phe	Lys	Leu	Tyr	Phe	Gln	Asn	Pro	Gln
[8977]		755					760					765				
[8978]	Phe	Met	Gly	Gly	Trp	Asp	Lys	Asp	Lys	Glu	Thr	Asp	Tyr	Arg	Ala	Thr
[8979]		770					775					780				
[8980]	Ile	Leu	Arg	Tyr	Gly	Ser	Lys	Tyr	Tyr	Leu	Ala	Ile	Met	Asp	Lys	Lys
[8981]	785					790				795					800	
[8982]	Tyr	Ala	Lys	Cys	Leu	Gln	Lys	Ile	Asp	Lys	Asp	Asp	Val	Asn	Gly	Asn
[8983]				805					810				815			
[8984]	Tyr	Glu	Lys	Ile	Asn	Tyr	Lys	Leu	Leu	Pro	Gly	Pro	Asn	Lys	Met	Leu
[8985]			820					825				830				
[8986]	Pro	Lys	Val	Phe	Phe	Ser	Lys	Lys	Trp	Met	Ala	Tyr	Tyr	Asn	Pro	Ser
[8987]		835					840					845				

[8988]	Glu Asp Ile Gln Lys Ile Tyr Lys Asn Gly Thr Phe Lys Lys Gly Asp		
[8989]	850	855	860
[8990]	Met Phe Asn Leu Asn Asp Cys His Lys Leu Ile Asp Phe Phe Lys Asp		
[8991]	865	870	875 880
[8992]	Ser Ile Ser Arg Tyr Pro Lys Trp Ser Asn Ala Tyr Asp Phe Asn Phe		
[8993]	885	890	895
[8994]	Ser Glu Thr Glu Lys Tyr Lys Asp Ile Ala Gly Phe Tyr Arg Glu Val		
[8995]	900	905	910
[8996]	Glu Glu Gln Gly Tyr Lys Val Ser Phe Glu Ser Ala Ser Lys Lys Glu		
[8997]	915	920	925
[8998]	Val Asp Lys Leu Val Glu Glu Gly Lys Leu Tyr Met Phe Gln Ile Tyr		
[8999]	930	935	940
[9000]	Asn Lys Asp Phe Ser Asp Lys Ser His Gly Thr Pro Asn Leu His Thr		
[9001]	945	950	955 960
[9002]	Met Tyr Phe Lys Leu Leu Phe Asp Glu Asn Asn His Gly Gln Ile Arg		
[9003]	965	970	975
[9004]	Leu Ser Gly Gly Ala Glu Leu Phe Met Arg Arg Ala Ser Leu Lys Lys		
[9005]	980	985	990
[9006]	Glu Glu Leu Val Val His Pro Ala Asn Ser Pro Ile Ala Asn Lys Asn		
[9007]	995	1000	1005
[9008]	Pro Asp Asn Pro Lys Lys Thr Thr Thr Leu Ser Tyr Asp Val Tyr		
[9009]	1010	1015	1020
[9010]	Lys Asp Lys Arg Phe Ser Glu Asp Gln Tyr Glu Leu His Ile Pro		
[9011]	1025	1030	1035
[9012]	Ile Ala Ile Asn Lys Cys Pro Lys Asn Ile Phe Lys Ile Asn Thr		
[9013]	1040	1045	1050
[9014]	Glu Val Arg Val Leu Leu Lys His Asp Asp Asn Pro Tyr Val Ile		
[9015]	1055	1060	1065
[9016]	Gly Ile Ala Arg Gly Glu Arg Asn Leu Leu Tyr Ile Val Val Val		
[9017]	1070	1075	1080
[9018]	Asp Gly Lys Gly Asn Ile Val Glu Gln Tyr Ser Leu Asn Glu Ile		
[9019]	1085	1090	1095
[9020]	Ile Asn Asn Phe Asn Gly Ile Arg Ile Lys Thr Asp Tyr His Ser		
[9021]	1100	1105	1110
[9022]	Leu Leu Asp Lys Lys Glu Lys Glu Arg Phe Glu Ala Arg Gln Asn		
[9023]	1115	1120	1125
[9024]	Trp Thr Ser Ile Glu Asn Ile Lys Glu Leu Lys Ala Gly Tyr Ile		
[9025]	1130	1135	1140
[9026]	Ser Gln Val Val His Lys Ile Cys Glu Leu Val Glu Lys Tyr Asp		
[9027]	1145	1150	1155
[9028]	Ala Val Ile Ala Leu Glu Asp Leu Asn Ser Gly Phe Lys Asn Ser		
[9029]	1160	1165	1170

[9030]	Arg	Val	Lys	Val	Glu	Lys	Gln	Val	Tyr	Gln	Lys	Phe	Glu	Lys	Met
[9031]		1175					1180					1185			
[9032]	Leu	Ile	Asp	Lys	Leu	Asn	Tyr	Met	Val	Asp	Lys	Lys	Ser	Asn	Pro
[9033]		1190					1195					1200			
[9034]	Cys	Ala	Thr	Gly	Gly	Ala	Leu	Lys	Gly	Tyr	Gln	Ile	Thr	Asn	Lys
[9035]		1205					1210					1215			
[9036]	Phe	Glu	Ser	Phe	Lys	Ser	Met	Ser	Thr	Gln	Asn	Gly	Phe	Ile	Phe
[9037]		1220					1225					1230			
[9038]	Tyr	Ile	Pro	Ala	Trp	Leu	Thr	Ser	Lys	Ile	Asp	Pro	Ser	Thr	Gly
[9039]		1235					1240					1245			
[9040]	Phe	Val	Asn	Leu	Leu	Lys	Thr	Lys	Tyr	Thr	Ser	Ile	Ala	Asp	Ser
[9041]		1250					1255					1260			
[9042]	Lys	Lys	Phe	Ile	Ser	Ser	Phe	Asp	Arg	Ile	Met	Tyr	Val	Pro	Glu
[9043]		1265					1270					1275			
[9044]	Glu	Asp	Leu	Phe	Glu	Phe	Ala	Leu	Asp	Tyr	Lys	Asn	Phe	Ser	Arg
[9045]		1280					1285					1290			
[9046]	Thr	Asp	Ala	Asp	Tyr	Ile	Lys	Lys	Trp	Lys	Leu	Tyr	Ser	Tyr	Gly
[9047]		1295					1300					1305			
[9048]	Asn	Arg	Ile	Arg	Ile	Phe	Arg	Asn	Pro	Lys	Lys	Asn	Asn	Val	Phe
[9049]		1310					1315					1320			
[9050]	Asp	Trp	Glu	Glu	Val	Cys	Leu	Thr	Ser	Ala	Tyr	Lys	Glu	Leu	Phe
[9051]		1325					1330					1335			
[9052]	Asn	Lys	Tyr	Gly	Ile	Asn	Tyr	Gln	Gln	Gly	Asp	Ile	Arg	Ala	Leu
[9053]		1340					1345					1350			
[9054]	Leu	Cys	Glu	Gln	Ser	Asp	Lys	Ala	Phe	Tyr	Ser	Ser	Phe	Met	Ala
[9055]		1355					1360					1365			
[9056]	Leu	Met	Ser	Leu	Met	Leu	Gln	Met	Arg	Asn	Ser	Ile	Thr	Gly	Arg
[9057]		1370					1375					1380			
[9058]	Thr	Asp	Val	Asp	Phe	Leu	Ile	Ser	Pro	Val	Lys	Asn	Ser	Asp	Gly
[9059]		1385					1390					1395			
[9060]	Ile	Phe	Tyr	Asp	Ser	Arg	Asn	Tyr	Glu	Ala	Gln	Glu	Asn	Ala	Ile
[9061]		1400					1405					1410			
[9062]	Leu	Pro	Lys	Asn	Ala	Asp	Ala	Asn	Gly	Ala	Tyr	Asn	Ile	Ala	Arg
[9063]		1415					1420					1425			
[9064]	Lys	Val	Leu	Trp	Ala	Ile	Gly	Gln	Phe	Lys	Lys	Ala	Glu	Asp	Glu
[9065]		1430					1435					1440			
[9066]	Lys	Leu	Asp	Lys	Val	Lys	Ile	Ala	Ile	Ser	Asn	Lys	Glu	Trp	Leu
[9067]		1445					1450					1455			
[9068]	Glu	Tyr	Ala	Gln	Thr	Ser	Val	Lys	His	Ser	Gly	Gly	Ser	Gly	Gly
[9069]		1460					1465					1470			
[9070]	Ser	Gly	Gly	Ser	Thr	Asn	Leu	Ser	Asp	Ile	Ile	Glu	Lys	Glu	Thr
[9071]		1475					1480					1485			

[9072]	Gly Lys Gln Leu Val Ile Gln Glu Ser Ile Leu Met Leu Pro Glu	
[9073]	1490	1495 1500
[9074]	Glu Val Glu Glu Val Ile Gly Asn Lys Pro Glu Ser Asp Ile Leu	
[9075]	1505	1510 1515
[9076]	Val His Thr Ala Tyr Asp Glu Ser Thr Asp Glu Asn Val Met Leu	
[9077]	1520	1525 1530
[9078]	Leu Thr Ser Asp Ala Pro Glu Tyr Lys Pro Trp Ala Leu Val Ile	
[9079]	1535	1540 1545
[9080]	Gln Asp Ser Asn Gly Glu Asn Lys Ile Lys Met Leu Gly Ser Lys	
[9081]	1550	1555 1560
[9082]	Lys Arg Arg Ile Lys Gln Asp	
[9083]	1565	1570
[9084]	<210> 93	
[9085]	<211> 4906	
[9086]	<212> DNA	
[9087]	<213> 人工的	
[9088]	<220>	
[9089]	<223> 多核苷酸	
[9090]	<400> 93	
[9091]	atgaaacgga cagccgacgg aagcgagttc gagtcaccaa agaagaagcg gaaagtcgag	60
[9092]	gcctcccccg catcaggacc tagacacctg atggatcccc atattttcac atctaacttc	120
[9093]	aacaacggaa tcggcagaca caagacctac ctgtgctatg aggtggaaag gctggataac	180
[9094]	ggaacctctg tgaagatgga ccagcacagg taagtatcaa ggttacaaga caggtttaag	240
[9095]	gagaccaata gaaactgggc ttgtcgagac agagaagact cttgcgtttc tgataggcac	300
[9096]	ctattggtct tactgacatc cactttgcct ttctctccac aggggcttcc tgcataacca	360
[9097]	ggccaagaat ctgctgtgcg gtttctacgg gagacatgca gaactgaggt ttctggatct	420
[9098]	ggtgccatcc ctgcagctgg accccgctca gatctacaga gtgacttggt tcatctcttg	480
[9099]	gagcccttgc ttttcatggg gatgtgctgg cgaggtgagg gccttccttc aggaaaacac	540
[9100]	acacgtgaga ctgaggatit ttgtctgccag aatctacgat tatgaccac tgtacaagga	600
[9101]	agctctgcag atgctgaggg atgcaggcgc tcaggtgagc attatgacct atgacgaatt	660
[9102]	caagcactgc tgggatactt ttgtggacca tcagggttgt ccttttcagc catgggatgg	720
[9103]	gctggacgag cattctcagg cactgagcgg tagactgagg gctatcctgc agaaccaggg	780
[9104]	gaattctact tctcaatctg atggatcttc tgttccagct gatattgac aatcttctga	840
[9105]	ttctgatcaa tcttcttctc aaggacaacc aggatccaag ctggagaagt ttacaaactg	900
[9106]	ttacagcctc tccaaaaccc tcaggtttaa agcgatcccg gtgggcaaga cccaggagaa	960
[9107]	catcgacaac aagaggctcc tgggtggaaga cgagaagcgc gccgaagact acaagggcgt	1020
[9108]	gaagaagctg ctcgataggt actacctcag ctttattaac gacgtgctgc acagcatcaa	1080
[9109]	actcaagaat ctcaacaact acatctccct ctcccgcaaa aagaccgca ccgagaagga	1140
[9110]	gaacaaggag ctggagaacc tggagatcaa cctccgcaag gaaatcgcca aagcgttcaa	1200
[9111]	gggcaatgaa ggttacaaga gcctcttcaa gaaagacatc atcgaaacta tcctccaga	1260
[9112]	gtttctcgat gacaaggacg agatcgcgct ggtgaactcc tttaacgggt tcacaaccgc	1320
[9113]	gtttaccggc ttctttgata acagggaaaa tatgtttctcc gaggaggcca agtccaccag	1380

[9114]	catcgcccttc aggtgtatca acgagaacct caccgcgtac atttccaata tggacatttt	1440
[9115]	cgagaaggtg gatgcgatct tcgataagca cgaggtgcag gagatcaaag agaagattct	1500
[9116]	caattccgat tatgacgtcg aggatttctt cgaaggggag ttctttaatt ttgtgctcac	1560
[9117]	acaagagggc attgacgtgt acaacgcgat tatcgggggc ttcgtcacag agtccgggga	1620
[9118]	gaagattaag gggctgaatg agtacatcaa tctgtacaat cagaagacca agcagaaact	1680
[9119]	gccgaaattc aagccgctct acaagcaagt cctgtccgat agggaaagcc tctccttcta	1740
[9120]	cggcgagggc tataccagcg acgaggaggt gctggaagtc ttccgcaaca cactgaataa	1800
[9121]	gaatagcgag attttctcct ccatcaagaa gctcgagaag ctctttaaga actttgacga	1860
[9122]	gtacagctcc gccgggattt tcgtgaagaa cgggccggcg atcagcacca tctccaagga	1920
[9123]	catctttggc gagtggaacg tcatcaggga caagtggaac gccgagtacg acgacatcca	1980
[9124]	cctgaagaag aaggcgggtg tgaccgagaa gtatgaggac gatcgagga agtccttcaa	2040
[9125]	aaaaatcggc tccttcagcc tcgaacagct ccaggagtat gccgatgcgg atctgtccgt	2100
[9126]	cgtcgagaag ctgaaggaaa tcatcattca gaaggtcgac gagatctata aagtgtacgg	2160
[9127]	gtccagcgag aagctgttcg acgccgactt tgtgtctgag aagtccctca aaaagaatga	2220
[9128]	cgccgtggtg gccattatga aagacctgct cgactccgtg aagtccttcg aaaattacat	2280
[9129]	taaagcgttc tttggggagg ggaaggaaac taacagggat gagtcttct atggcgactt	2340
[9130]	tgtcctcgcg tacgacatcc tgctgaaggt cgaccacatt tacgacgca tccgcaacta	2400
[9131]	cgtgacacag aagccgtact ccaaagacaa gttcaagctg tacttccaga acccgcaatt	2460
[9132]	tatggggggc tgggacaagg ataaagagac agactaccgc gcgacaattc tccgctatgg	2520
[9133]	ctccaaatac tatctggcca tcatggacaa gaagtacgag aagtgcctgc agaagatcga	2580
[9134]	caaagacgac gtcaatggca actatgaaaa gatcaactac aagctgctgc cgggcccga	2640
[9135]	caagatgctc ccgaaggtgt tcttcagcaa gaagtggatg gcctactaca atccaagcga	2700
[9136]	ggatattcag aaaatctata aaaacgggac cttcaagaag ggggacatgt ttaacctcaa	2760
[9137]	cgactgccac aagctcattg atttcttcaa ggatagcatt tcccgctacc cgaaatggctc	2820
[9138]	caatgcgtac gattttaact tctccgagac agaaaagtac aaagacatcg cgggctttta	2880
[9139]	cagggaggtg gaggagcaag ggtataaagt ttcttttgaa tccgcgagca agaagggaagt	2940
[9140]	cgacaagctc gtcgaggagg gcaagctcta catgttccaa atttataaca aggacttttc	3000
[9141]	cgacaagagc catgggaccc caaacctcca caccatgtac ttcaaactgc tctttgacga	3060
[9142]	gaacaaccac gggcaaatca ggctgagcgg cggcgccgaa ttattcatgc gcagggcctc	3120
[9143]	cctcaagaag gaggagctgg tcgtccatcc agccaattcc ccgatcgca acaagaacct	3180
[9144]	ggacaatccg aaaaagacca ccacctgtc ctacgacgtc tacaaggaca aacgcttcag	3240
[9145]	cgaagaccag tacgaattac acatcccaat tgcgattaat aagtgcccaa agaatatctt	3300
[9146]	caaaattaat acagaggtca ggggtgtgct caaacacgac gacaatccgt atgtcatcgg	3360
[9147]	cattgccagg ggcgagcgca atctgtctta tatcgtggtc gtggatggga agggcaatat	3420
[9148]	tgtggagcag tactccctga acgagattat caacaacttc aatgggatta ggattaagac	3480
[9149]	cgactatcac agcctgctcg acaagaaaga aaaagagagg tttagggccc gccaaaactg	3540
[9150]	gacctccatt gagaatatca aagaattaaa ggccggctat atttccaag tcgtccacaa	3600
[9151]	gatctgcgag ctgggtggaga aatatgacgc cgtgattgag ctggaagact taaattctgg	3660
[9152]	gttcaagaac tcccgctga aggtggaaaa acaggtgtat cagaaattcg agaaaatgct	3720
[9153]	gatcgacaaa ctcaattata tggtggataa gaagtccaac ccgtgtgcca cagggggcgc	3780
[9154]	gctgaagggc tatcagatca ccaacaagtt cgagagcttc aagagcatga gcaccagaa	3840
[9155]	cgggtttatt ttctacatcc cggcgtggct cacctccaag attgaccgga gcaccggctt	3900

[9156]	cgtgaacctc ctgaagacaa agtataacctc cattgccgac agcaagaagt ttatctcctc	3960
[9157]	cttcgaccgc attatgtatg tgccggagga ggacctcttc gagttcgccc tcgactacaa	4020
[9158]	aaacttcagc cgcacagatg cggattacat caagaagtgg aagctgtact cctacgggaa	4080
[9159]	caggatccgc atcttcagga atccaaaaaa aaataacgtc ttgactggg aggaagtgtg	4140
[9160]	cctgacatcc gcctacaagg aactgttcaa taaatacggc atcaattacc agcagggcga	4200
[9161]	cattcgcgcc ctctctgtg agcagtcgga caaagcgitt tactccagct tcatggccct	4260
[9162]	catgtccctg atgtccaaa tgaggaatag catcacaggc cgcaccgacg tcgacttctt	4320
[9163]	catcagcccg gtgaagaact cgcacgggat cttttacgac tcccgcaact atgaggcgca	4380
[9164]	agagaatgcg atcctcccga agaacgccga tgcgaacggg gcctataata tcgccaggaa	4440
[9165]	agtgtctctg gccatcgggc agttcaaaaa ggccggaggat gagaagctcg acaaggtgaa	4500
[9166]	aattgccatt tccaacaagg agtggctgga gtacgcgcag acctccgtga agcactcagg	4560
[9167]	cggaagtggg ggaagtggcg gtagtaccac cctcagcgac attatcgaga aggaaaccgg	4620
[9168]	caagcaactc gtgatccagg agagcatact gatgtctccc gaggaggtcg aggaggtgat	4680
[9169]	tggcaataag cccgagtcg atatactggg tcatactgcg tatgacgaaa gcacagacga	4740
[9170]	gaacgtcatg ctacttacca gcgacgcccc ggagtacaag ccctgggccc tagtcatcca	4800
[9171]	agacagcaac ggtgagaaca agatcaagat gctttctggc ggctcaaaaa gaaccgccga	4860
[9172]	cggcagcgaa ttcgagccca agaagaagag gaaagtcgga agcgga	4906
[9173]	<210> 94	
[9174]	<211> 5091	
[9175]	<212> DNA	
[9176]	<213> 人工的	
[9177]	<220>	
[9178]	<223> 多核苷酸	
[9179]	<400> 94	
[9180]	atggcgggat ctaagaagag aagaattaaa caagatgagg catctcctgc gtctggtcca	60
[9181]	aggcacttga tggatccaca tatttttact tcaaaactca acaatggcat tgggagacac	120
[9182]	aagacctact tgtgctatga ggttgaaaga ttggacaatg gaacttctgt aaagatggac	180
[9183]	caacatagag gatttttcca caaccaagcc aaaaatcttc tgtgtggcct ctatggctgt	240
[9184]	catgetgagc ttaggtaagt ttctgtctt acctttgata tatatataat aattatcatt	300
[9185]	aattagtagt aatataatat ttcaaattatt tttttcaaaa taaaagaatg tagtatatag	360
[9186]	caattgcttt tctgtagttt ataagtgtgt atattttaat ttataacttt tctaataat	420
[9187]	gaccaaatt tggtgaagtg caggttctc gacctgtcc caagtcttca gctggatcct	480
[9188]	gcccagatct acagggtagc gtggtttatc tcttgagtc cctgtttttc atggggatgt	540
[9189]	gctggtgaag tgagagcatt tcttcaagaa aatactcatg ttcgcttgag gatttttgc	600
[9190]	gctcgaatat atgattatga ccctctctac aaggaagctt tacaatggt acgtgatgca	660
[9191]	ggggcacaag tttcaataat gacatatgat gaattcaaac attgctggga cacatttgtt	720
[9192]	gatcatcaag gttgccccct tcagccttg gatggtttg atgagcactc tcaagcactg	780
[9193]	agtgaagac tacgggcat actacaaaat caaggaaatt ccacctctca gagtgatggg	840
[9194]	agcagcgtgc cggctgatat tgatcaatca tcagattctg atcagtcgtc cagccaggga	900
[9195]	cagccaggct ccaagctgga gaagtttaca aactgttaca gcctctcaa aaccctcagg	960
[9196]	tttaaagcga tcccggtggg caagaccag gagaacatcg acaacaagag gtcctggtg	1020
[9197]	gaagacgaga agcgcgccga agactacaag ggcgtgaaga agctgctcga taggtactac	1080

[9198]	ctcagcttta ttaacgacgt gctgcacagc atcaaactca agaattctca caactacatc	1140
[9199]	tccctcttcc gcaaaaagac ccgcaccgag aaggagaaca aggagctgga gaacctggag	1200
[9200]	atcaacctcc gcaaggaaat cgccaaagcg ttcaaggga atgaaggga caagagcctc	1260
[9201]	ttcaagaaag acatcatcga aactatcctc ccagagtttc tcgatgacaa ggacgagatc	1320
[9202]	gcgctggtga actcctttaa cgggttcaca accgcgttta ccggttctt tgataacagg	1380
[9203]	gaaaatatgt tctccgagga ggccaagtcc accagcatcg ctttcagggtg tatcaacgag	1440
[9204]	aacctcaccg gctacatttc caatatggac attttcgaga aggtggatgc gatcttcgat	1500
[9205]	aagcacgagg tgcaggagat caaagagaag attctcaatt ccgattatga cgtcgaggat	1560
[9206]	ttcttcgaag gggagtctt taattttgtg ctacacaaag agggcattga cgtgtacaac	1620
[9207]	gcgattatcg ggggttctg cacagagtcc ggggagaaga ttaaggggtg gaatgagtac	1680
[9208]	atcaatctgt acaatcagaa gaccaagcag aaactgccga aattcaagcc gctctacaag	1740
[9209]	caagtccgtg ccgataggga aagcctctcc ttctacggcg agggctatac cagcgacgag	1800
[9210]	gagtgctgga agtcttccg caacacactg aataagaata gcgagatttt ctctccatc	1860
[9211]	aagaagctcg agaagctctt taagaacttt gacgagtaca gctccgccgg gattttcgtg	1920
[9212]	aagaacgggc cggcgatcag caccatctcc aaggacatct ttggcgagtg gaacgtcatc	1980
[9213]	agggacaagt ggaacgccga gtacgacgac atccacctga agaagaaggc ggtggtgacc	2040
[9214]	gagaagtatg aggacgatcg caggaaagtc ttcaaaaaa tcggctcctt cagcctcgaa	2100
[9215]	cagctccagg agtatgccga tgcggatctg tccgtcgtcg agaagctgaa ggaaatcatc	2160
[9216]	attcagaagg tcgacgagat ctataaagtg tacgggtcca gcgagaagct gttcgacgcc	2220
[9217]	gactttgtgc tcgagaagtc cttcaaaaag aatgacgccg tgggtggccat tatgaaagac	2280
[9218]	ctgctcgact ccgtgaagtc cttcgaaaat tacattaaag cgttcttttg ggaggggaag	2340
[9219]	gaaactaaca gggatgagtc cttctatggc gactttgtcc tcgcgtacga catcctgctg	2400
[9220]	aaggtcgacc acatttacga cgcgatccgc aactacgtga cacagaagcc gtactccaaa	2460
[9221]	gacaagttca agctgtactt ccagaaccgc caatttatgg ggggctggga caaggataaa	2520
[9222]	gagacagact accgcgcgac aattctccgc tatgggtcca aatactatct ggccatcatg	2580
[9223]	gacaagaagt acgcaagtg cctgcagaag atcgacaaag acgacgtcaa tggcaactat	2640
[9224]	gaaaagatca actacaagct gctgccgggc ccgaacaaga tgctcccga ggtgttcttc	2700
[9225]	agcaagaagt ggatggccta ctacaatcca agcgaggata ttcagaaaat ctataaaaac	2760
[9226]	gggaccttca agaaggggga catgtttaac ctcaacgact gccacaagct cattgatttc	2820
[9227]	ttcaaggata gcatttcccg ctaccgaaa tgggtccaatg cgtacgattt taacttctcc	2880
[9228]	gagacagaaa agtacaaga catcgcgggc ttttacaggg aggtggagga gcaagggtat	2940
[9229]	aaagtctctt ttgaatccgc gagcaagaag gaagtcgaca agctcgtcga ggagggcaag	3000
[9230]	ctctacatgt tccaaattta taacaaggac ttttccgaca agagccatgg gaccccaaac	3060
[9231]	ctccacacca tgtacttcaa actgctcttt gacgagaaca accacgggca aatcaggctg	3120
[9232]	agcggcggcg ccgaattatt catgcgagg gcctccctca agaaggaaga gctggtcgtc	3180
[9233]	catccagcca attccccgat cgcgaacaag aaccgggaca atccgaaaa gaccaccacc	3240
[9234]	ctgtcctacg acgtctacaa ggacaaacgc ttcagcgaag accagtacga attacacatc	3300
[9235]	ccaattgcga ttaataagtg cccaaagaat atcttcaaaa ttaatacaga ggtcagggtg	3360
[9236]	ctgtcctaac acgacgacaa tccgtatgtc atcggcattg ccaggggcga gcgcaatctg	3420
[9237]	ctctatatcg tggctgtgga tgggaagggc aatattgtgg agcagtactc cctgaacgag	3480
[9238]	attatcaaca attcaatgg gattaggatt aagaccgact atcacagcct gctcgacaag	3540
[9239]	aaagaaaaag agaggtttga ggcccgcga aactggacct ccattgagaa tatcaaagaa	3600

[9240]	ttaaaggccg gctatatattc ccaagtcgtc cacaagatct gcgagctggt ggagaaatat	3660
[9241]	gacgccgtga ttgcgctcga agacttaaat tctgggttca agaactcccg cgtgaagggtg	3720
[9242]	gaaaaacagg tgtatcagaa attcgagaaa atgctgatcg acaaactcaa ttatatgggtg	3780
[9243]	gataagaagt ccaaccctg tgccacaggg ggcgcgctga agggctatca gatcaccaac	3840
[9244]	aagttcgaga gcttcaagag catgagcacc cagaacgggt ttatttttcta catcccggcg	3900
[9245]	tggtcacct ccaagattga cccgagcacc ggcttcgtga acctcctgaa gacaaagtat	3960
[9246]	acctccattg ccgacagcaa gaagtttata tctctcttcg accgcattat gtatgtgccg	4020
[9247]	gaggaggacc tcttcgagtt cgccctcgac taaaaaaact tcagccgcac agatgcggat	4080
[9248]	tacatcaaga agtggaaagt gtactcctac gggaacagga tccgcattct caggaatcca	4140
[9249]	aaaaaaaata acgtctttga ctgggaggaa gtgtgcctga catccgccta caaggaactg	4200
[9250]	ttcaataaat acggcatcaa ttaccagcag ggcgacattc gcgccctcct ctgtgagcag	4260
[9251]	tccgacaaag cgttttactc cagcttcatg gccctcatgt ccctgatgct ccaaatgagg	4320
[9252]	aatagcatca cagggcgac cgacgtcgac ttctcatca gcccggtgaa gaactccgac	4380
[9253]	gggatctttt acgactcccg caactatgag gcgcaagaga atgcgacct cccgaagaac	4440
[9254]	gccgatgcga acggggccta taatatcgcc aggaaagtgc tctgggccat cgggcagttc	4500
[9255]	aaaaaggcgg aggatgagaa gctcgacaag gtgaaaattg ccatttccaa caaggagtgg	4560
[9256]	ctggagtacg cgcagacctc cgtgaagcac tccggtggtt ctggtgggag tgggggctcg	4620
[9257]	acaaatctct ctgacatcat tgagaaagaa actggaaaac aattggtgat tcaggaatca	4680
[9258]	atattgatgc ttctgaaga ggtaagtttc tgcttctacc ttgatatat atataataat	4740
[9259]	tatcattaat tagtagtaat ataatatattc aaatatTTTT ttcaaaataa aagaatgtag	4800
[9260]	tatatagcaa ttgcttttct gtagtttata agtgtgtata ttttaattta taacttttct	4860
[9261]	aatatatgac caaaatttgt tgaagtgcag gttgaagagg tcattggaaa caaacctgag	4920
[9262]	agtgacatac ttgttcatac cgcctatgat gagagcactg atgaaaatgt gatgctgctc	4980
[9263]	acatctgatg ctcccagta caagccatgg gcattagtaa ttcaagattc aaatggagaa	5040
[9264]	aacaagatca agatgttggg atctaagaag agaagaatta aacaagattg a	5091
[9265]	<210> 95	
[9266]	<211> 1595	
[9267]	<212> PRT	
[9268]	<213> 人工的	
[9269]	<220>	
[9270]	<223> 融合蛋白	
[9271]	<400> 95	
[9272]	Met Lys Arg Thr Ala Asp Gly Ser Glu Phe Glu Ser Pro Lys Lys Lys	
[9273]	1 5 10 15	
[9274]	Arg Lys Val Glu Ala Ser Pro Ala Ser Gly Pro Arg His Leu Met Asp	
[9275]	20 25 30	
[9276]	Pro His Ile Phe Thr Ser Asn Phe Asn Asn Gly Ile Gly Arg His Lys	
[9277]	35 40 45	
[9278]	Thr Tyr Leu Cys Tyr Glu Val Glu Arg Leu Asp Asn Gly Thr Ser Val	
[9279]	50 55 60	
[9280]	Lys Met Asp Gln His Arg Gly Phe Leu His Asn Gln Ala Lys Asn Leu	
[9281]	65 70 75 80	

[9282]	Leu Cys Gly Phe Tyr Gly Arg His Ala Glu Leu Arg Phe Leu Asp Leu		
[9283]		85	90 95
[9284]	Val Pro Ser Leu Gln Leu Asp Pro Ala Gln Ile Tyr Arg Val Thr Trp		
[9285]		100	105 110
[9286]	Phe Ile Ser Trp Ser Pro Cys Phe Ser Trp Gly Cys Ala Gly Glu Val		
[9287]		115	120 125
[9288]	Arg Ala Phe Leu Gln Glu Asn Thr His Val Arg Leu Arg Ile Phe Ala		
[9289]		130	135 140
[9290]	Ala Arg Ile Tyr Asp Tyr Asp Pro Leu Tyr Lys Glu Ala Leu Gln Met		
[9291]		145	150 155 160
[9292]	Leu Arg Asp Ala Gly Ala Gln Val Ser Ile Met Thr Tyr Asp Glu Phe		
[9293]		165	170 175
[9294]	Lys His Cys Trp Asp Thr Phe Val Asp His Gln Gly Cys Pro Phe Gln		
[9295]		180	185 190
[9296]	Pro Trp Asp Gly Leu Asp Glu His Ser Gln Ala Leu Ser Gly Arg Leu		
[9297]		195	200 205
[9298]	Arg Ala Ile Leu Gln Asn Gln Gly Asn Gln Glu Pro Lys Pro Gln Asp		
[9299]		210	215 220
[9300]	Gln Ser Ser Glu Val Pro Pro Pro Pro Gly Ser Gln Lys Pro Gly Thr		
[9301]		225	230 235 240
[9302]	Lys Glu Pro His Asp Ser Lys Ser Ser Gly Pro Ser Lys Leu Glu Lys		
[9303]		245	250 255
[9304]	Phe Thr Asn Cys Tyr Ser Leu Ser Lys Thr Leu Arg Phe Lys Ala Ile		
[9305]		260	265 270
[9306]	Pro Val Gly Lys Thr Gln Glu Asn Ile Asp Asn Lys Arg Leu Leu Val		
[9307]		275	280 285
[9308]	Glu Asp Glu Lys Arg Ala Glu Asp Tyr Lys Gly Val Lys Lys Leu Leu		
[9309]		290	295 300
[9310]	Asp Arg Tyr Tyr Leu Ser Phe Ile Asn Asp Val Leu His Ser Ile Lys		
[9311]		305	310 315 320
[9312]	Leu Lys Asn Leu Asn Asn Tyr Ile Ser Leu Phe Arg Lys Lys Thr Arg		
[9313]		325	330 335
[9314]	Thr Glu Lys Glu Asn Lys Glu Leu Glu Asn Leu Glu Ile Asn Leu Arg		
[9315]		340	345 350
[9316]	Lys Glu Ile Ala Lys Ala Phe Lys Gly Asn Glu Gly Tyr Lys Ser Leu		
[9317]		355	360 365
[9318]	Phe Lys Lys Asp Ile Ile Glu Thr Ile Leu Pro Glu Phe Leu Asp Asp		
[9319]		370	375 380
[9320]	Lys Asp Glu Ile Ala Leu Val Asn Ser Phe Asn Gly Phe Thr Thr Ala		
[9321]		385	390 395 400
[9322]	Phe Thr Gly Phe Phe Asp Asn Arg Glu Asn Met Phe Ser Glu Glu Ala		
[9323]		405	410 415

[9324]	Lys Ser Thr Ser Ile Ala Phe Arg Cys Ile Asn Glu Asn Leu Thr Arg		
[9325]		420	425
[9326]	Tyr Ile Ser Asn Met Asp Ile Phe Glu Lys Val Asp Ala Ile Phe Asp		430
[9327]		435	440
[9328]	Lys His Glu Val Gln Glu Ile Lys Glu Lys Ile Leu Asn Ser Asp Tyr		445
[9329]		450	455
[9330]	Asp Val Glu Asp Phe Phe Glu Gly Glu Phe Phe Asn Phe Val Leu Thr		460
[9331]		465	470
[9332]	Gln Glu Gly Ile Asp Val Tyr Asn Ala Ile Ile Gly Gly Phe Val Thr		475
[9333]		485	490
[9334]	Glu Ser Gly Glu Lys Ile Lys Gly Leu Asn Glu Tyr Ile Asn Leu Tyr		495
[9335]		500	505
[9336]	Asn Gln Lys Thr Lys Gln Lys Leu Pro Lys Phe Lys Pro Leu Tyr Lys		510
[9337]		515	520
[9338]	Gln Val Leu Ser Asp Arg Glu Ser Leu Ser Phe Tyr Gly Glu Gly Tyr		525
[9339]		530	535
[9340]	Thr Ser Asp Glu Glu Val Leu Glu Val Phe Arg Asn Thr Leu Asn Lys		540
[9341]		545	550
[9342]	Asn Ser Glu Ile Phe Ser Ser Ile Lys Lys Leu Glu Lys Leu Phe Lys		555
[9343]		565	570
[9344]	Asn Phe Asp Glu Tyr Ser Ser Ala Gly Ile Phe Val Lys Asn Gly Pro		575
[9345]		580	585
[9346]	Ala Ile Ser Thr Ile Ser Lys Asp Ile Phe Gly Glu Trp Asn Val Ile		590
[9347]		595	600
[9348]	Arg Asp Lys Trp Asn Ala Glu Tyr Asp Asp Ile His Leu Lys Lys Lys		605
[9349]		610	615
[9350]	Ala Val Val Thr Glu Lys Tyr Glu Asp Asp Arg Arg Lys Ser Phe Lys		620
[9351]		625	630
[9352]	Lys Ile Gly Ser Phe Ser Leu Glu Gln Leu Gln Glu Tyr Ala Asp Ala		635
[9353]		645	650
[9354]	Asp Leu Ser Val Val Glu Lys Leu Lys Glu Ile Ile Ile Gln Lys Val		655
[9355]		660	665
[9356]	Asp Glu Ile Tyr Lys Val Tyr Gly Ser Ser Glu Lys Leu Phe Asp Ala		670
[9357]		675	680
[9358]	Asp Phe Val Leu Glu Lys Ser Leu Lys Lys Asn Asp Ala Val Val Ala		685
[9359]		690	695
[9360]	Ile Met Lys Asp Leu Leu Asp Ser Val Lys Ser Phe Glu Asn Tyr Ile		700
[9361]		705	710
[9362]	Lys Ala Phe Phe Gly Glu Gly Lys Glu Thr Asn Arg Asp Glu Ser Phe		715
[9363]		725	730
[9364]	Tyr Gly Asp Phe Val Leu Ala Tyr Asp Ile Leu Leu Lys Val Asp His		735
[9365]		740	745
			750

[9366]	Ile Tyr Asp Ala Ile Arg Asn Tyr Val Thr Gln Lys Pro Tyr Ser Lys		
[9367]	755	760	765
[9368]	Asp Lys Phe Lys Leu Tyr Phe Gln Asn Pro Gln Phe Met Gly Gly Trp		
[9369]	770	775	780
[9370]	Asp Lys Asp Lys Glu Thr Asp Tyr Arg Ala Thr Ile Leu Arg Tyr Gly		
[9371]	785	790	795
[9372]	Ser Lys Tyr Tyr Leu Ala Ile Met Asp Lys Lys Tyr Ala Lys Cys Leu		
[9373]	805	810	815
[9374]	Gln Lys Ile Asp Lys Asp Asp Val Asn Gly Asn Tyr Glu Lys Ile Asn		
[9375]	820	825	830
[9376]	Tyr Lys Leu Leu Pro Gly Pro Asn Lys Met Leu Pro Lys Val Phe Phe		
[9377]	835	840	845
[9378]	Ser Lys Lys Trp Met Ala Tyr Tyr Asn Pro Ser Glu Asp Ile Gln Lys		
[9379]	850	855	860
[9380]	Ile Tyr Lys Asn Gly Thr Phe Lys Lys Gly Asp Met Phe Asn Leu Asn		
[9381]	865	870	875
[9382]	Asp Cys His Lys Leu Ile Asp Phe Phe Lys Asp Ser Ile Ser Arg Tyr		
[9383]	885	890	895
[9384]	Pro Lys Trp Ser Asn Ala Tyr Asp Phe Asn Phe Ser Glu Thr Glu Lys		
[9385]	900	905	910
[9386]	Tyr Lys Asp Ile Ala Gly Phe Tyr Arg Glu Val Glu Glu Gln Gly Tyr		
[9387]	915	920	925
[9388]	Lys Val Ser Phe Glu Ser Ala Ser Lys Lys Glu Val Asp Lys Leu Val		
[9389]	930	935	940
[9390]	Glu Glu Gly Lys Leu Tyr Met Phe Gln Ile Tyr Asn Lys Asp Phe Ser		
[9391]	945	950	955
[9392]	Asp Lys Ser His Gly Thr Pro Asn Leu His Thr Met Tyr Phe Lys Leu		
[9393]	965	970	975
[9394]	Leu Phe Asp Glu Asn Asn His Gly Gln Ile Arg Leu Ser Gly Gly Ala		
[9395]	980	985	990
[9396]	Glu Leu Phe Met Arg Arg Ala Ser Leu Lys Lys Glu Glu Leu Val Val		
[9397]	995	1000	1005
[9398]	His Pro Ala Asn Ser Pro Ile Ala Asn Lys Asn Pro Asp Asn Pro		
[9399]	1010	1015	1020
[9400]	Lys Lys Thr Thr Thr Leu Ser Tyr Asp Val Tyr Lys Asp Lys Arg		
[9401]	1025	1030	1035
[9402]	Phe Ser Glu Asp Gln Tyr Glu Leu His Ile Pro Ile Ala Ile Asn		
[9403]	1040	1045	1050
[9404]	Lys Cys Pro Lys Asn Ile Phe Lys Ile Asn Thr Glu Val Arg Val		
[9405]	1055	1060	1065
[9406]	Leu Leu Lys His Asp Asp Asn Pro Tyr Val Ile Gly Ile Ala Arg		
[9407]	1070	1075	1080

[9408]	Gly	Glu	Arg	Asn	Leu	Leu	Tyr	Ile	Val	Val	Val	Asp	Gly	Lys	Gly
[9409]		1085					1090					1095			
[9410]	Asn	Ile	Val	Glu	Gln	Tyr	Ser	Leu	Asn	Glu	Ile	Ile	Asn	Asn	Phe
[9411]		1100					1105					1110			
[9412]	Asn	Gly	Ile	Arg	Ile	Lys	Thr	Asp	Tyr	His	Ser	Leu	Leu	Asp	Lys
[9413]		1115					1120					1125			
[9414]	Lys	Glu	Lys	Glu	Arg	Phe	Glu	Ala	Arg	Gln	Asn	Trp	Thr	Ser	Ile
[9415]		1130					1135					1140			
[9416]	Glu	Asn	Ile	Lys	Glu	Leu	Lys	Ala	Gly	Tyr	Ile	Ser	Gln	Val	Val
[9417]		1145					1150					1155			
[9418]	His	Lys	Ile	Cys	Glu	Leu	Val	Glu	Lys	Tyr	Asp	Ala	Val	Ile	Ala
[9419]		1160					1165					1170			
[9420]	Leu	Glu	Asp	Leu	Asn	Ser	Gly	Phe	Lys	Asn	Ser	Arg	Val	Lys	Val
[9421]		1175					1180					1185			
[9422]	Glu	Lys	Gln	Val	Tyr	Gln	Lys	Phe	Glu	Lys	Met	Leu	Ile	Asp	Lys
[9423]		1190					1195					1200			
[9424]	Leu	Asn	Tyr	Met	Val	Asp	Lys	Lys	Ser	Asn	Pro	Cys	Ala	Thr	Gly
[9425]		1205					1210					1215			
[9426]	Gly	Ala	Leu	Lys	Gly	Tyr	Gln	Ile	Thr	Asn	Lys	Phe	Glu	Ser	Phe
[9427]		1220					1225					1230			
[9428]	Lys	Ser	Met	Ser	Thr	Gln	Asn	Gly	Phe	Ile	Phe	Tyr	Ile	Pro	Ala
[9429]		1235					1240					1245			
[9430]	Trp	Leu	Thr	Ser	Lys	Ile	Asp	Pro	Ser	Thr	Gly	Phe	Val	Asn	Leu
[9431]		1250					1255					1260			
[9432]	Leu	Lys	Thr	Lys	Tyr	Thr	Ser	Ile	Ala	Asp	Ser	Lys	Lys	Phe	Ile
[9433]		1265					1270					1275			
[9434]	Ser	Ser	Phe	Asp	Arg	Ile	Met	Tyr	Val	Pro	Glu	Glu	Asp	Leu	Phe
[9435]		1280					1285					1290			
[9436]	Glu	Phe	Ala	Leu	Asp	Tyr	Lys	Asn	Phe	Ser	Arg	Thr	Asp	Ala	Asp
[9437]		1295					1300					1305			
[9438]	Tyr	Ile	Lys	Lys	Trp	Lys	Leu	Tyr	Ser	Tyr	Gly	Asn	Arg	Ile	Arg
[9439]		1310					1315					1320			
[9440]	Ile	Phe	Arg	Asn	Pro	Lys	Lys	Asn	Asn	Val	Phe	Asp	Trp	Glu	Glu
[9441]		1325					1330					1335			
[9442]	Val	Cys	Leu	Thr	Ser	Ala	Tyr	Lys	Glu	Leu	Phe	Asn	Lys	Tyr	Gly
[9443]		1340					1345					1350			
[9444]	Ile	Asn	Tyr	Gln	Gln	Gly	Asp	Ile	Arg	Ala	Leu	Leu	Cys	Glu	Gln
[9445]		1355					1360					1365			
[9446]	Ser	Asp	Lys	Ala	Phe	Tyr	Ser	Ser	Phe	Met	Ala	Leu	Met	Ser	Leu
[9447]		1370					1375					1380			
[9448]	Met	Leu	Gln	Met	Arg	Asn	Ser	Ile	Thr	Gly	Arg	Thr	Asp	Val	Asp
[9449]		1385					1390					1395			

[9450]	Phe Leu Ile Ser Pro Val Lys Asn Ser Asp Gly Ile Phe Tyr Asp
[9451]	1400 1405 1410
[9452]	Ser Arg Asn Tyr Glu Ala Gln Glu Asn Ala Ile Leu Pro Lys Asn
[9453]	1415 1420 1425
[9454]	Ala Asp Ala Asn Gly Ala Tyr Asn Ile Ala Arg Lys Val Leu Trp
[9455]	1430 1435 1440
[9456]	Ala Ile Gly Gln Phe Lys Lys Ala Glu Asp Glu Lys Leu Asp Lys
[9457]	1445 1450 1455
[9458]	Val Lys Ile Ala Ile Ser Asn Lys Glu Trp Leu Glu Tyr Ala Gln
[9459]	1460 1465 1470
[9460]	Thr Ser Val Lys His Ser Gly Gly Ser Gly Gly Ser Gly Gly Ser
[9461]	1475 1480 1485
[9462]	Thr Asn Leu Ser Asp Ile Ile Glu Lys Glu Thr Gly Lys Gln Leu
[9463]	1490 1495 1500
[9464]	Val Ile Gln Glu Ser Ile Leu Met Leu Pro Glu Glu Val Glu Glu
[9465]	1505 1510 1515
[9466]	Val Ile Gly Asn Lys Pro Glu Ser Asp Ile Leu Val His Thr Ala
[9467]	1520 1525 1530
[9468]	Tyr Asp Glu Ser Thr Asp Glu Asn Val Met Leu Leu Thr Ser Asp
[9469]	1535 1540 1545
[9470]	Ala Pro Glu Tyr Lys Pro Trp Ala Leu Val Ile Gln Asp Ser Asn
[9471]	1550 1555 1560
[9472]	Gly Glu Asn Lys Ile Lys Met Leu Ser Gly Gly Ser Lys Arg Thr
[9473]	1565 1570 1575
[9474]	Ala Asp Gly Ser Glu Phe Glu Pro Lys Lys Lys Arg Lys Val Gly
[9475]	1580 1585 1590
[9476]	Ser Gly
[9477]	1595
[9478]	<210> 96
[9479]	<211> 4918
[9480]	<212> DNA
[9481]	<213> 人工的
[9482]	<220>
[9483]	<223> 多核苷酸
[9484]	<400> 96
[9485]	atgaaacgga cagccgacgg aagcgagttc gagtcaccaa agaagaagcg gaaagtcgag 60
[9486]	gcctcccccg catcaggacc tagacacctg atggatcccc atattttcac atctaacttc 120
[9487]	aacaacggaa tcggcagaca caagacctac ctgtgctatg aggtggaaag gctggataac 180
[9488]	ggaacctctg tgaagatgga ccagcacagg taagtatcaa ggttacaaga caggtttaag 240
[9489]	gagaccaata gaaactgggc ttgtcgagac agagaagact cttgcgtttc tgataggcac 300
[9490]	ctattgggtct tactgacatc cactttgcct ttctctccac aggggcttcc tgcataacca 360
[9491]	ggccaagaat ctgctgtgcg gtttctacgg gagacatgca gaactgaggt ttctggatct 420

[9492]	ggtgccatcc ctgcagctgg accccgctca gatctacaga gtgacttggt tcatctcttg	480
[9493]	gagcccttgc ttttcatggg gatgtgctgg cgaggtgagg gccttccttc agggaaacac	540
[9494]	acacgtgaga ctgaggattt ttgctgccag aatctacgat tatgaccac tgtacaagga	600
[9495]	agctctgcag atgctgaggg atgcaggcgc tcaggtgagc attatgacct atgacgaatt	660
[9496]	caagcactgc tgggatactt ttgtggacca tcagggttgt ccttttcagc catgggatgg	720
[9497]	gctggacgag cattctcagg cactgagcgg tagactgagg gctatcctgc agaaccaggg	780
[9498]	gaatcaagaa ccaaagccac aagatcaatc ttctgaagtt ccaccaccac caggatctca	840
[9499]	aaagccagga actaaggaac cacatgattc taagtcttct ggaccatcca agctggagaa	900
[9500]	gtttacaaac tgttacagcc tctccaaaac cctcaggttt aaagcgatcc cgggtgggcaa	960
[9501]	gaccaggag aacatcgaca acaaggagct cctggtggaa gacgagaagc gcgccgaaga	1020
[9502]	ctacaagggc gtgaagaagc tgctcgatag gtactacctc agctttatta acgacgtgct	1080
[9503]	gcacagcatc aaactcaaga atctcaacaa ctacatctcc ctcttcgcga aaaagaccgc	1140
[9504]	caccgagaag gagaacaagg agctggagaa cctggagatc aacctccgca aggaaatcgc	1200
[9505]	caaagcgttc aagggaatg aagggtacaa gagcctcttc aagaaagaca tcatcgaaac	1260
[9506]	tatctccca gagtttctcg atgacaagga cgagatcgcg ctggtgaact cctttaacgg	1320
[9507]	gttcacaacc gcgtttaccg gcttctttga taacaggga aatatgttct ccgaggaggc	1380
[9508]	caagtccacc agcatcgctt tcaggtgtat caacgagaac ctcaccgct acatttccaa	1440
[9509]	tatggacatt ttcgagaagg tggatgcgat cttcgataag cacgaggtgc aggagatcaa	1500
[9510]	agagaagatt ctcaattccg attatgacgt cgaggatttc ttcgaagggg agttctttaa	1560
[9511]	ttttgtgctc acacaaggagg gcattgacgt gtacaacgcg attatcgggg gcttcgtcac	1620
[9512]	agagtccggg gagaagatta aggggtgtaa tgagtacatc aatctgtaca atcagaagac	1680
[9513]	caagcagaaa ctgccgaaat tcaagccgct ctacaagcaa gtcctgtccg atagggaag	1740
[9514]	cctctccttc tacggcgagg gctataccag cgacgaggag gtgctggaag tcttccgcaa	1800
[9515]	cacactgaat aagaatagcg agattttctc ctccatcaag aagctcgaga agctctttaa	1860
[9516]	gaactttgac gagtacagct ccgccgggat ttctgtgaag aacgggccgg cgatcagcac	1920
[9517]	catctccaag gacatctttg gcgagtggaa cgtcatcagg gacaagtgga acgccgagta	1980
[9518]	cgacgacatc cacctgaaga agaaggcggg ggtgaccgag aagtatgagg acgatcgag	2040
[9519]	gaagtccttc aaaaaaatcg gctccttcag cctcgaacag ctccaggagt atgccgatgc	2100
[9520]	ggatctgtcc gtcgtcgaga agctgaagga aatcatcatt cagaaggtcg acgagatcta	2160
[9521]	taaagtgtac ggggtccagcg agaagctgtt cgacgccgac tttgtgctcg agaagtcct	2220
[9522]	caaaaagaat gacgccgtgg tggccattat gaaagacctg ctcgactccg tgaagtcctt	2280
[9523]	cgaaaattac attaaagcgt tctttgggga ggggaaggaa actaacaggg atgagtcctt	2340
[9524]	ctatggcgac tttgtcctcg cgtacgacat cctgctgaag gtcgaccaca ttacgacgc	2400
[9525]	gatccgcaac tacgtgacac agaagccgta ctccaaagac aagttcaagc tgtacttcca	2460
[9526]	gaaccgcaa tttatggggg gctgggacaa ggataaagag acagactacc gcgcgacaat	2520
[9527]	tctccgctat ggctccaaat actatctggc catcatggac aagaagtacg cgaagtgcct	2580
[9528]	gcagaagatc gacaaagacg acgtcaatgg caactatgaa aagatcaact acaagctgct	2640
[9529]	gccgggcccg aacaagatgc tcccgaaggt gttcttcagc aagaagtgga tggcctacta	2700
[9530]	caatccaagc gaggatattc agaaaatcta taaaaacggg accttcaaga agggggacat	2760
[9531]	gtttaacctc aacgactgcc acaagctcat tgatttcttc aaggatagca tttcccgcta	2820
[9532]	cccgaatgg tccaatgcgt acgattttaa cttctccgag acagaaaagt acaaagacat	2880
[9533]	cgcgggcttt tacagggagg tggaggagca aggggtataaa gtttcttttg aatccgcgag	2940

[9534]	caagaaggaa gtcgacaagc tcgtcgagga gggcaagctc tacatgttcc aaatttataa	3000
[9535]	caaggacttt tccgacaaga gccatgggac cccaaacctc cacaccatgt acttcaaact	3060
[9536]	gctctttgac gagaacaacc acgggcaa at caggctgagc ggcggcgcgc aattattcat	3120
[9537]	gcgcagggcc tccctcaaga aggaggagct ggtcgtccat ccagccaatt ccccgatcgc	3180
[9538]	gaacaagaac ccgacaatc cgaaaaagac caccacctg tcctacgacg tctacaagga	3240
[9539]	caaacgcttc agcgaagacc agtacgaatt acacatccca attgcgatta ataagtgtccc	3300
[9540]	aaagaatatc ttcaaaatta atacagaggt cagggtgctg ctcaaacacg acgacaatcc	3360
[9541]	gtatgtcatc ggcattgcc a gggcgagcgc caatctgctc tatatcgtgg tcgtggatgg	3420
[9542]	gaagggcaat attgtggagc agtactccct gaacgagatt atcaacaact tcaatgggat	3480
[9543]	taggattaag accgactatc acagcctgct cgacaagaaa gaaaaagaga ggtttgaggc	3540
[9544]	ccgccaaaac tggacctcca ttgagaatat caaagaatta aaggccggct atatttccca	3600
[9545]	agtcgtccac aagatctgcg agctggtgga gaaatatgac gccgtgattg cgctcgaaga	3660
[9546]	cttaaatctt gggttcaaga actcccgct gaaggtggaa aaacaggtgt atcagaaatt	3720
[9547]	cgagaaaatg ctgatcgaca aactcaatta tatggtggat aagaagtcca acccgtgtgc	3780
[9548]	cacagggggc gcgctgaagg gctatcagat caccaacaag ttcgagagct tcaagagcat	3840
[9549]	gagcaccag aacgggttta ttttctacat cccggcgtgg ctcacctcca agattgacct	3900
[9550]	gagcaccggc ttcgtgaacc tcctgaagac aaagtatacc tccattgccg acagcaagaa	3960
[9551]	gtttatctcc tccttcgacc gcattatgta tgtgccggag gaggacctct tcgagttcgc	4020
[9552]	cctcgactac aaaaacttca gccgcacaga tgcggattac atcaagaagt ggaagctgta	4080
[9553]	ctctacggg aacaggatcc gcattctcag gaatccaaaa aaaaataacg tctttgactg	4140
[9554]	ggaggaagtg tgcctgacat ccgcctacaa ggaactgttc aataaatacg gcattcaatta	4200
[9555]	ccagcagggc gacattcgcg cctcctctg tgagcagtc gacaaagcgt tttactccag	4260
[9556]	cttcatggcc ctcatgtccc tgatgtcca aatgaggaat agcatcacag ggcgccacca	4320
[9557]	cgtcgacttc ctcatcagcc cggatgaaga ctccgacggg atcttttacg actcccgcaa	4380
[9558]	ctatgaggcg caagagaatg cgatcctccc gaagaacgcc gatgcgaacg gggcctataa	4440
[9559]	tatgccagg aaagtgtctt gggccatcgg gcagttcaaa aaggcggagg atgagaagct	4500
[9560]	cgacaaggatg aaaattgcca tttccaacaa ggagtggctg gaggacgcgc agacctccgt	4560
[9561]	gaagcactca ggcggaagtg gtggaagtgg cggtagtacc aacctcagcg acattatcga	4620
[9562]	gaaggaaacc ggcaagcaac tcgtgatcca ggagagcata ctgatgtcc ccgaggaggt	4680
[9563]	cgaggaggtg attggcaata agcccagtc cgatatactg gttcactact cgatatgacga	4740
[9564]	aagcacagac gagaacgtca tgctacttac cagcgacgcc ccggagtaca agccctgggc	4800
[9565]	cctagtcac caagacagca acggtgagaa caagatcaag atgctttctg gcggctcaaa	4860
[9566]	aagaaccgcc gacggcagcg aattcgagcc caagaagaag aggaaagtgc gaagcgga	4918
[9567]	<210> 97	
[9568]	<211> 1595	
[9569]	<212> PRT	
[9570]	<213> 人工的	
[9571]	<220>	
[9572]	<223> 融合蛋白	
[9573]	<400> 97	
[9574]	Met Lys Arg Thr Ala Asp Gly Ser Glu Phe Glu Ser Pro Lys Lys Lys	
[9575]	1 5 10 15	

[9576]	Arg Lys Val Glu Ala Ser Pro Ala Ser Gly Pro Arg His Leu Met Asp		
[9577]	20	25	30
[9578]	Pro His Ile Phe Thr Ser Asn Phe Asn Asn Gly Ile Gly Arg His Lys		
[9579]	35	40	45
[9580]	Thr Tyr Leu Cys Tyr Glu Val Glu Arg Leu Asp Asn Gly Thr Ser Val		
[9581]	50	55	60
[9582]	Lys Met Asp Gln His Arg Gly Phe Leu His Asn Gln Ala Lys Asn Leu		
[9583]	65	70	75
[9584]	Leu Cys Gly Phe Tyr Gly Arg His Ala Glu Leu Arg Phe Leu Asp Leu		
[9585]	85	90	95
[9586]	Val Pro Ser Leu Gln Leu Asp Pro Ala Gln Ile Tyr Arg Val Thr Trp		
[9587]	100	105	110
[9588]	Phe Ile Ser Trp Ser Pro Cys Phe Ser Trp Gly Cys Ala Gly Glu Val		
[9589]	115	120	125
[9590]	Arg Ala Phe Leu Gln Glu Asn Thr His Val Arg Leu Arg Ile Phe Ala		
[9591]	130	135	140
[9592]	Ala Arg Ile Tyr Asp Tyr Asp Pro Leu Tyr Lys Glu Ala Leu Gln Met		
[9593]	145	150	155
[9594]	Leu Arg Asp Ala Gly Ala Gln Val Ser Ile Met Thr Tyr Asp Glu Phe		
[9595]	165	170	175
[9596]	Lys His Cys Trp Asp Thr Phe Val Asp His Gln Gly Cys Pro Phe Gln		
[9597]	180	185	190
[9598]	Pro Trp Asp Gly Leu Asp Glu His Ser Gln Ala Leu Ser Gly Arg Leu		
[9599]	195	200	205
[9600]	Arg Ala Ile Leu Gln Asn Gln Gly Asn Pro Asp Asn Ser Thr Leu Gln		
[9601]	210	215	220
[9602]	Thr Leu Gln Leu Pro Gln Pro Thr Pro Ser Ser Thr Asp Thr Gln Gln		
[9603]	225	230	235
[9604]	Thr Ser Asp Thr Asp Pro Glu Asp Thr Thr Asp Ser Lys Leu Glu Lys		
[9605]	245	250	255
[9606]	Phe Thr Asn Cys Tyr Ser Leu Ser Lys Thr Leu Arg Phe Lys Ala Ile		
[9607]	260	265	270
[9608]	Pro Val Gly Lys Thr Gln Glu Asn Ile Asp Asn Lys Arg Leu Leu Val		
[9609]	275	280	285
[9610]	Glu Asp Glu Lys Arg Ala Glu Asp Tyr Lys Gly Val Lys Lys Leu Leu		
[9611]	290	295	300
[9612]	Asp Arg Tyr Tyr Leu Ser Phe Ile Asn Asp Val Leu His Ser Ile Lys		
[9613]	305	310	315
[9614]	Leu Lys Asn Leu Asn Asn Tyr Ile Ser Leu Phe Arg Lys Lys Thr Arg		
[9615]	325	330	335
[9616]	Thr Glu Lys Glu Asn Lys Glu Leu Glu Asn Leu Glu Ile Asn Leu Arg		
[9617]	340	345	350

[9618]	Lys	Glu	Ile	Ala	Lys	Ala	Phe	Lys	Gly	Asn	Glu	Gly	Tyr	Lys	Ser	Leu
[9619]				355				360					365			
[9620]	Phe	Lys	Lys	Asp	Ile	Ile	Glu	Thr	Ile	Leu	Pro	Glu	Phe	Leu	Asp	Asp
[9621]			370				375					380				
[9622]	Lys	Asp	Glu	Ile	Ala	Leu	Val	Asn	Ser	Phe	Asn	Gly	Phe	Thr	Thr	Ala
[9623]	385				390					395						400
[9624]	Phe	Thr	Gly	Phe	Phe	Asp	Asn	Arg	Glu	Asn	Met	Phe	Ser	Glu	Glu	Ala
[9625]				405				410						415		
[9626]	Lys	Ser	Thr	Ser	Ile	Ala	Phe	Arg	Cys	Ile	Asn	Glu	Asn	Leu	Thr	Arg
[9627]				420				425						430		
[9628]	Tyr	Ile	Ser	Asn	Met	Asp	Ile	Phe	Glu	Lys	Val	Asp	Ala	Ile	Phe	Asp
[9629]			435				440						445			
[9630]	Lys	His	Glu	Val	Gln	Glu	Ile	Lys	Glu	Lys	Ile	Leu	Asn	Ser	Asp	Tyr
[9631]		450				455						460				
[9632]	Asp	Val	Glu	Asp	Phe	Phe	Glu	Gly	Glu	Phe	Phe	Asn	Phe	Val	Leu	Thr
[9633]	465				470					475					480	
[9634]	Gln	Glu	Gly	Ile	Asp	Val	Tyr	Asn	Ala	Ile	Ile	Gly	Gly	Phe	Val	Thr
[9635]				485				490						495		
[9636]	Glu	Ser	Gly	Glu	Lys	Ile	Lys	Gly	Leu	Asn	Glu	Tyr	Ile	Asn	Leu	Tyr
[9637]			500					505						510		
[9638]	Asn	Gln	Lys	Thr	Lys	Gln	Lys	Leu	Pro	Lys	Phe	Lys	Pro	Leu	Tyr	Lys
[9639]		515				520						525				
[9640]	Gln	Val	Leu	Ser	Asp	Arg	Glu	Ser	Leu	Ser	Phe	Tyr	Gly	Glu	Gly	Tyr
[9641]		530				535						540				
[9642]	Thr	Ser	Asp	Glu	Glu	Val	Leu	Glu	Val	Phe	Arg	Asn	Thr	Leu	Asn	Lys
[9643]	545				550					555					560	
[9644]	Asn	Ser	Glu	Ile	Phe	Ser	Ser	Ile	Lys	Lys	Leu	Glu	Lys	Leu	Phe	Lys
[9645]				565				570						575		
[9646]	Asn	Phe	Asp	Glu	Tyr	Ser	Ser	Ala	Gly	Ile	Phe	Val	Lys	Asn	Gly	Pro
[9647]			580					585						590		
[9648]	Ala	Ile	Ser	Thr	Ile	Ser	Lys	Asp	Ile	Phe	Gly	Glu	Trp	Asn	Val	Ile
[9649]			595				600							605		
[9650]	Arg	Asp	Lys	Trp	Asn	Ala	Glu	Tyr	Asp	Asp	Ile	His	Leu	Lys	Lys	Lys
[9651]		610				615						620				
[9652]	Ala	Val	Val	Thr	Glu	Lys	Tyr	Glu	Asp	Asp	Arg	Arg	Lys	Ser	Phe	Lys
[9653]	625				630					635						640
[9654]	Lys	Ile	Gly	Ser	Phe	Ser	Leu	Glu	Gln	Leu	Gln	Glu	Tyr	Ala	Asp	Ala
[9655]				645				650						655		
[9656]	Asp	Leu	Ser	Val	Val	Glu	Lys	Leu	Lys	Glu	Ile	Ile	Ile	Gln	Lys	Val
[9657]			660					665						670		
[9658]	Asp	Glu	Ile	Tyr	Lys	Val	Tyr	Gly	Ser	Ser	Glu	Lys	Leu	Phe	Asp	Ala
[9659]		675				680							685			

[9660]	Asp Phe Val Leu Glu Lys Ser Leu Lys Lys Asn Asp Ala Val Val Ala
[9661]	690 695 700
[9662]	Ile Met Lys Asp Leu Leu Asp Ser Val Lys Ser Phe Glu Asn Tyr Ile
[9663]	705 710 715 720
[9664]	Lys Ala Phe Phe Gly Glu Gly Lys Glu Thr Asn Arg Asp Glu Ser Phe
[9665]	725 730 735
[9666]	Tyr Gly Asp Phe Val Leu Ala Tyr Asp Ile Leu Leu Lys Val Asp His
[9667]	740 745 750
[9668]	Ile Tyr Asp Ala Ile Arg Asn Tyr Val Thr Gln Lys Pro Tyr Ser Lys
[9669]	755 760 765
[9670]	Asp Lys Phe Lys Leu Tyr Phe Gln Asn Pro Gln Phe Met Gly Gly Trp
[9671]	770 775 780
[9672]	Asp Lys Asp Lys Glu Thr Asp Tyr Arg Ala Thr Ile Leu Arg Tyr Gly
[9673]	785 790 795 800
[9674]	Ser Lys Tyr Tyr Leu Ala Ile Met Asp Lys Lys Tyr Ala Lys Cys Leu
[9675]	805 810 815
[9676]	Gln Lys Ile Asp Lys Asp Asp Val Asn Gly Asn Tyr Glu Lys Ile Asn
[9677]	820 825 830
[9678]	Tyr Lys Leu Leu Pro Gly Pro Asn Lys Met Leu Pro Lys Val Phe Phe
[9679]	835 840 845
[9680]	Ser Lys Lys Trp Met Ala Tyr Tyr Asn Pro Ser Glu Asp Ile Gln Lys
[9681]	850 855 860
[9682]	Ile Tyr Lys Asn Gly Thr Phe Lys Lys Gly Asp Met Phe Asn Leu Asn
[9683]	865 870 875 880
[9684]	Asp Cys His Lys Leu Ile Asp Phe Phe Lys Asp Ser Ile Ser Arg Tyr
[9685]	885 890 895
[9686]	Pro Lys Trp Ser Asn Ala Tyr Asp Phe Asn Phe Ser Glu Thr Glu Lys
[9687]	900 905 910
[9688]	Tyr Lys Asp Ile Ala Gly Phe Tyr Arg Glu Val Glu Glu Gln Gly Tyr
[9689]	915 920 925
[9690]	Lys Val Ser Phe Glu Ser Ala Ser Lys Lys Glu Val Asp Lys Leu Val
[9691]	930 935 940
[9692]	Glu Glu Gly Lys Leu Tyr Met Phe Gln Ile Tyr Asn Lys Asp Phe Ser
[9693]	945 950 955 960
[9694]	Asp Lys Ser His Gly Thr Pro Asn Leu His Thr Met Tyr Phe Lys Leu
[9695]	965 970 975
[9696]	Leu Phe Asp Glu Asn Asn His Gly Gln Ile Arg Leu Ser Gly Gly Ala
[9697]	980 985 990
[9698]	Glu Leu Phe Met Arg Arg Ala Ser Leu Lys Lys Glu Glu Leu Val Val
[9699]	995 1000 1005
[9700]	His Pro Ala Asn Ser Pro Ile Ala Asn Lys Asn Pro Asp Asn Pro
[9701]	1010 1015 1020

[9702]	Lys	Lys	Thr	Thr	Thr	Leu	Ser	Tyr	Asp	Val	Tyr	Lys	Asp	Lys	Arg
[9703]		1025					1030					1035			
[9704]	Phe	Ser	Glu	Asp	Gln	Tyr	Glu	Leu	His	Ile	Pro	Ile	Ala	Ile	Asn
[9705]		1040					1045					1050			
[9706]	Lys	Cys	Pro	Lys	Asn	Ile	Phe	Lys	Ile	Asn	Thr	Glu	Val	Arg	Val
[9707]		1055					1060					1065			
[9708]	Leu	Leu	Lys	His	Asp	Asp	Asn	Pro	Tyr	Val	Ile	Gly	Ile	Ala	Arg
[9709]		1070					1075					1080			
[9710]	Gly	Glu	Arg	Asn	Leu	Leu	Tyr	Ile	Val	Val	Val	Asp	Gly	Lys	Gly
[9711]		1085					1090					1095			
[9712]	Asn	Ile	Val	Glu	Gln	Tyr	Ser	Leu	Asn	Glu	Ile	Ile	Asn	Asn	Phe
[9713]		1100					1105					1110			
[9714]	Asn	Gly	Ile	Arg	Ile	Lys	Thr	Asp	Tyr	His	Ser	Leu	Leu	Asp	Lys
[9715]		1115					1120					1125			
[9716]	Lys	Glu	Lys	Glu	Arg	Phe	Glu	Ala	Arg	Gln	Asn	Trp	Thr	Ser	Ile
[9717]		1130					1135					1140			
[9718]	Glu	Asn	Ile	Lys	Glu	Leu	Lys	Ala	Gly	Tyr	Ile	Ser	Gln	Val	Val
[9719]		1145					1150					1155			
[9720]	His	Lys	Ile	Cys	Glu	Leu	Val	Glu	Lys	Tyr	Asp	Ala	Val	Ile	Ala
[9721]		1160					1165					1170			
[9722]	Leu	Glu	Asp	Leu	Asn	Ser	Gly	Phe	Lys	Asn	Ser	Arg	Val	Lys	Val
[9723]		1175					1180					1185			
[9724]	Glu	Lys	Gln	Val	Tyr	Gln	Lys	Phe	Glu	Lys	Met	Leu	Ile	Asp	Lys
[9725]		1190					1195					1200			
[9726]	Leu	Asn	Tyr	Met	Val	Asp	Lys	Lys	Ser	Asn	Pro	Cys	Ala	Thr	Gly
[9727]		1205					1210					1215			
[9728]	Gly	Ala	Leu	Lys	Gly	Tyr	Gln	Ile	Thr	Asn	Lys	Phe	Glu	Ser	Phe
[9729]		1220					1225					1230			
[9730]	Lys	Ser	Met	Ser	Thr	Gln	Asn	Gly	Phe	Ile	Phe	Tyr	Ile	Pro	Ala
[9731]		1235					1240					1245			
[9732]	Trp	Leu	Thr	Ser	Lys	Ile	Asp	Pro	Ser	Thr	Gly	Phe	Val	Asn	Leu
[9733]		1250					1255					1260			
[9734]	Leu	Lys	Thr	Lys	Tyr	Thr	Ser	Ile	Ala	Asp	Ser	Lys	Lys	Phe	Ile
[9735]		1265					1270					1275			
[9736]	Ser	Ser	Phe	Asp	Arg	Ile	Met	Tyr	Val	Pro	Glu	Glu	Asp	Leu	Phe
[9737]		1280					1285					1290			
[9738]	Glu	Phe	Ala	Leu	Asp	Tyr	Lys	Asn	Phe	Ser	Arg	Thr	Asp	Ala	Asp
[9739]		1295					1300					1305			
[9740]	Tyr	Ile	Lys	Lys	Trp	Lys	Leu	Tyr	Ser	Tyr	Gly	Asn	Arg	Ile	Arg
[9741]		1310					1315					1320			
[9742]	Ile	Phe	Arg	Asn	Pro	Lys	Lys	Asn	Asn	Val	Phe	Asp	Trp	Glu	Glu
[9743]		1325					1330					1335			

[9744]	Val Cys Leu Thr Ser Ala Tyr Lys Glu Leu Phe Asn Lys Tyr Gly
[9745]	1340 1345 1350
[9746]	Ile Asn Tyr Gln Gln Gly Asp Ile Arg Ala Leu Leu Cys Glu Gln
[9747]	1355 1360 1365
[9748]	Ser Asp Lys Ala Phe Tyr Ser Ser Phe Met Ala Leu Met Ser Leu
[9749]	1370 1375 1380
[9750]	Met Leu Gln Met Arg Asn Ser Ile Thr Gly Arg Thr Asp Val Asp
[9751]	1385 1390 1395
[9752]	Phe Leu Ile Ser Pro Val Lys Asn Ser Asp Gly Ile Phe Tyr Asp
[9753]	1400 1405 1410
[9754]	Ser Arg Asn Tyr Glu Ala Gln Glu Asn Ala Ile Leu Pro Lys Asn
[9755]	1415 1420 1425
[9756]	Ala Asp Ala Asn Gly Ala Tyr Asn Ile Ala Arg Lys Val Leu Trp
[9757]	1430 1435 1440
[9758]	Ala Ile Gly Gln Phe Lys Lys Ala Glu Asp Glu Lys Leu Asp Lys
[9759]	1445 1450 1455
[9760]	Val Lys Ile Ala Ile Ser Asn Lys Glu Trp Leu Glu Tyr Ala Gln
[9761]	1460 1465 1470
[9762]	Thr Ser Val Lys His Ser Gly Gly Ser Gly Gly Ser Gly Gly Ser
[9763]	1475 1480 1485
[9764]	Thr Asn Leu Ser Asp Ile Ile Glu Lys Glu Thr Gly Lys Gln Leu
[9765]	1490 1495 1500
[9766]	Val Ile Gln Glu Ser Ile Leu Met Leu Pro Glu Glu Val Glu Glu
[9767]	1505 1510 1515
[9768]	Val Ile Gly Asn Lys Pro Glu Ser Asp Ile Leu Val His Thr Ala
[9769]	1520 1525 1530
[9770]	Tyr Asp Glu Ser Thr Asp Glu Asn Val Met Leu Leu Thr Ser Asp
[9771]	1535 1540 1545
[9772]	Ala Pro Glu Tyr Lys Pro Trp Ala Leu Val Ile Gln Asp Ser Asn
[9773]	1550 1555 1560
[9774]	Gly Glu Asn Lys Ile Lys Met Leu Ser Gly Gly Ser Lys Arg Thr
[9775]	1565 1570 1575
[9776]	Ala Asp Gly Ser Glu Phe Glu Pro Lys Lys Lys Arg Lys Val Gly
[9777]	1580 1585 1590
[9778]	Ser Gly
[9779]	1595
[9780]	<210> 98
[9781]	<211> 4918
[9782]	<212> DNA
[9783]	<213> 人工的
[9784]	<220>
[9785]	<223> 多核苷酸

[9786]	<400> 98	
[9787]	atgaaacgga cagccgacgg aagcgagttc gagtcaccaa agaagaagcg gaaagtcgag	60
[9788]	gcctcccccg catcaggacc tagacacctg atggatcccc atattttcac atctaacttc	120
[9789]	aacaacggaa tcggcagaca caagacctac ctgtgctatg aggtggaaag gctggataac	180
[9790]	ggaacctctg tgaagatgga ccagcacagg taagtatcaa ggttacaaga caggtttaag	240
[9791]	gagaccaata gaaactgggc ttgtcgagac agagaagact cttgcgtttc tgataggcac	300
[9792]	ctattgggtct tactgacatc cactttgcct ttctctccac aggggcttcc tgcataacca	360
[9793]	ggccaagaat ctgctgtgcg gtttctacgg gagacatgca gaactgaggt ttctggatct	420
[9794]	ggtgccatcc ctgcagctgg accccgctca gatctacaga gtgacttgggt tcatctcttg	480
[9795]	gagcccttgc ttttcatggg gatgtgctgg cgaggtaggg gccttccttc agggaaacac	540
[9796]	acacgtgaga ctgaggatit ttgctgccag aatctacgat tatgaccac tgtacaagga	600
[9797]	agctctgcag atgctgaggg atgcaggcgc tcaggtaggc attatgacct atgacgaatt	660
[9798]	caagcactgc tgggatactt ttgtggacca tcagggttgt ctttttcagc catgggatgg	720
[9799]	gctggacgag cattctcagg cactgagcgg tagactgagg gctatcctgc agaaccaggg	780
[9800]	gaatccagat aactctactc ttcaaactct tcaacttcca caaccaactc catcttctac	840
[9801]	tgataactcaa caaactctg atactgatcc agaagatact actgattcca agctggagaa	900
[9802]	gtttacaaac tgttacagcc tctccaaaac cctcaggttt aaagcgatcc cgggtgggcaa	960
[9803]	gaccaggag aacatcgaca acaaggagct cctggtggaa gacgagaagc gcgccgaaga	1020
[9804]	ctacaagggc gtgaagaagc tgctcgatag gtactacctc agctttatta acgacgtgct	1080
[9805]	gcacagcatc aaactcaaga atctcaacaa ctacatctcc ctcttccgca aaaagacccg	1140
[9806]	caccgagaag gagaacaagg agctggagaa cctggagatc aacctccgca aggaaatcgc	1200
[9807]	caaagcgttc aagggaatg aagggtacaa gagcctcttc aagaaagaca tcatcgaaac	1260
[9808]	tatcttccca gagtttctcg atgacaagga cgagatcgcg ctggtgaact cttttaacgg	1320
[9809]	gttcacaacc gcgtttaccg gcttctttga taacagggaa aatatgttct ccgaggaggc	1380
[9810]	caagtccacc agcatcgctt tcagggtgat caacgagaac ctcaccgct acatttccaa	1440
[9811]	tatggacatt ttcgagaagg tggatgcgat cttcgataag cacgaggtgc aggagatcaa	1500
[9812]	agagaagatt ctcaattccg attatgacgt cgaggatttc ttcgaagggg agttctttaa	1560
[9813]	ttttgtgctc acacaagagg gcattgacgt gtacaacgcg attatcgggg gcttcgtcac	1620
[9814]	agagtccggg gagaagatta aggggtgtaa tgagtacatc aatctgtaca atcagaagac	1680
[9815]	caagcagaaa ctgccgaaat tcaagccgct ctacaagcaa gtctgtccg atagggaag	1740
[9816]	cctctccttc tacggcgagg gctataccag cgacgaggag gtgctggaag tcttccgcaa	1800
[9817]	cacactgaat aagaatagcg agattttctc ctccatcaag aagctcgaga agctctttaa	1860
[9818]	gaactttgac gagtacagct ccgccgggat ttctgtgaag aacgggccgg cgatcagcac	1920
[9819]	catctccaag gacatctttg gcgagtggaa cgtcatcagg gacaagtga acgccagta	1980
[9820]	cgacgacatc cacctgaaga agaaggcggg ggtgaccgag aagtatgagg acgatcgag	2040
[9821]	gaagtccttc aaaaaaatcg gctccttcag cctcgaacag ctccaggagt atgccgatgc	2100
[9822]	ggatctgtcc gtcgtcgaga agctgaagga aatcatcatt cagaaggtag acgagatcta	2160
[9823]	taaagtgtac ggggtccagcg agaagctgtt cgacgccgac tttgtgctcg agaagtcct	2220
[9824]	caaaaagaat gacgccgtgg tggccattat gaaagacctg ctgactccg tgaagtcctt	2280
[9825]	cgaaaattac attaaagcgt tctttgggga ggggaaggaa actaacaggg atgagtcctt	2340
[9826]	ctatggcgac tttgtcctcg cgtacgacat cctgctgaag gtcgaccaca ttacgacgc	2400
[9827]	gatccgcaac tacgtgacac agaagccgta ctccaaagac aagttcaagc tgtacttcca	2460

[9828]	gaacccgcaa tttatggggg gctgggacaa ggataaagag acagactacc gcgcgacaat	2520
[9829]	tctccgctat ggctccaaat actatctggc catcatggac aagaagtacg cgaagtgcct	2580
[9830]	gcagaagatc gacaaagacg acgtcaatgg caactatgaa aagatcaact acaagctgct	2640
[9831]	gccgggcccc aacaagatgc tcccgaaggt gttcttcagc aagaagtgga tggcctacta	2700
[9832]	caatccaagc gaggatattc agaaaaatcta taaaaacggg accttcaaga agggggacat	2760
[9833]	gtttaacctc aacgactgcc acaagctcat tgattttctc aaggatagca tttcccgcta	2820
[9834]	cccgaatgg tccaatgcgt acgattttaa ctctctccgag acagaaaagt acaaagacat	2880
[9835]	cgcgggcttt tacagggagg tggaggagca aggggtataaa gtttcttttg aatccgcgag	2940
[9836]	caagaaggaa gtcgacaagc tcgtcgagga gggcaagctc tacatgttcc aaatttataa	3000
[9837]	caaggacttt tccgacaaga gccatgggac cccaaacctc cacaccatgt acttcaaact	3060
[9838]	gctctttgac gagaacaacc acgggcaaat caggctgagc ggcggcgcgc aattattcat	3120
[9839]	gcgcagggcc tcctcaaga aggaggagct ggtcgtccat ccagccaatt ccccgatcgc	3180
[9840]	gaacaagaac ccgacaatc cgaaaaagac caccacctg tcctacgacg tctacaagga	3240
[9841]	caaacgcttc agcgaagacc agtacgaatt acacatccca attgcgatta ataagtgcc	3300
[9842]	aaagaatatc ttcaaaatta atacagaggt cagggtgctg ctcaaacacg acgacaatcc	3360
[9843]	gtatgtcatc ggcattgcc a gggcgagcgc caatctgctc tatatcgtgg tcgtggatgg	3420
[9844]	gaagggaat attgtggagc agtactccct gaacgagatt atcaacaact tcaatgggat	3480
[9845]	taggattaag accgactatc acagcctgct cgacaagaaa gaaaaagaga ggtttgaggc	3540
[9846]	ccgccaaaac tggacctcca ttgagaatat caaagaatta aaggccggct atatttccca	3600
[9847]	agtcgtccac aagatctgcg agctggtgga gaaatatgac gccgtgattg cgctcgaaga	3660
[9848]	cttaaatctt gggttcaaga actcccgct gaaggtggaa aaacagggtg atcagaaatt	3720
[9849]	cgagaaaatg ctgatcgaca aactcaatta tatggtggat aagaagtcca acccggtgtgc	3780
[9850]	cacagggggc gcgctgaagg gctatcagat caccaacaag ttcgagagct tcaagagcat	3840
[9851]	gagcaccag aacgggttta tttctacat cccggcgtgg ctacacctca agattgacct	3900
[9852]	gagcaccggc ttcgtgaacc tcctgaagac aaagtatacc tccattgccg acagcaagaa	3960
[9853]	gtttatctcc tccttcgacc gcattatgta tgtgccggag gaggacctct tcgagttcgc	4020
[9854]	cctcgactac aaaaacttca gccgcacaga tgcggattac atcaagaagt ggaagctgta	4080
[9855]	ctctacggg aacaggatcc gcatcttcag gaatccaaaa aaaaataacg tctttgactg	4140
[9856]	ggaggaagtg tgctgacat ccgcctacaa ggaactgttc aataaatacg gcatcaatta	4200
[9857]	ccagcagggc gacattcgcg cctcctctg tgagcagtc gacaaagcgt tttactccag	4260
[9858]	cttcatggcc ctcatgtccc tgatgtcca aatgaggaat agcatcacag ggcgaccga	4320
[9859]	cgtcgacttc ctcatcagcc cggatgaagaa ctccgacggg atcttttacg actcccgcaa	4380
[9860]	ctatgaggcg caagagaatg cgatctccc gaagaacgcc gatgcgaacg gggcctataa	4440
[9861]	tatcgccagg aaagtgtctt gggccatcgg gcagttcaaa aaggcggagg atgagaagct	4500
[9862]	cgacaagggtg aaaattgcc a tttccaacaa ggagtggctg gagtacgcgc agacctccgt	4560
[9863]	gaagcactca ggcggaagtg gtggaagtgg cggtagtacc aacctcagcg acattatcga	4620
[9864]	gaaggaaacc ggcaagcaac tcgtgatcca ggagagcata ctgatgtccc ccgaggaggt	4680
[9865]	cgaggaggtg attggcaata agcccagtc cgatatactg gttcatactg cgtatgacga	4740
[9866]	aagcacagac gagaacgtca tgctacttac cagcgacgcc ccggagtaca agccctgggc	4800
[9867]	cctagtcatc caagacagca acggtgagaa caagatcaag atgctttctg gcggctcaaa	4860
[9868]	aagaaccgcc gacggcagcg aattcgagcc caagaagaag aggaaagtcg gaagcgga	4918
[9869]	<210> 99	

[9870]	<211>	1577
[9871]	<212>	PRT
[9872]	<213>	人工的
[9873]	<220>	
[9874]	<223>	融合蛋白
[9875]	<400>	99
[9876]	Met Lys Arg Thr Ala Asp Gly Ser Glu Phe Glu Ser Pro Lys Lys Lys	
[9877]	1	5 10 15
[9878]	Arg Lys Val Thr Asn Leu Ser Asp Ile Ile Glu Lys Glu Thr Gly Lys	
[9879]		20 25 30
[9880]	Gln Leu Val Ile Gln Glu Ser Ile Leu Met Leu Pro Glu Glu Val Glu	
[9881]		35 40 45
[9882]	Glu Val Ile Gly Asn Lys Pro Glu Ser Asp Ile Leu Val His Thr Ala	
[9883]		50 55 60
[9884]	Tyr Asp Glu Ser Thr Asp Glu Asn Val Met Leu Leu Thr Ser Asp Ala	
[9885]	65	70 75 80
[9886]	Pro Glu Tyr Lys Pro Trp Ala Leu Val Ile Gln Asp Ser Asn Gly Glu	
[9887]		85 90 95
[9888]	Asn Lys Ile Lys Met Leu Ser Gly Gly Ser Gly Gly Ser Gly Gly Ser	
[9889]		100 105 110
[9890]	Ser Lys Leu Glu Lys Phe Thr Asn Cys Tyr Ser Leu Ser Lys Thr Leu	
[9891]		115 120 125
[9892]	Arg Phe Lys Ala Ile Pro Val Gly Lys Thr Gln Glu Asn Ile Asp Asn	
[9893]		130 135 140
[9894]	Lys Arg Leu Leu Val Glu Asp Glu Lys Arg Ala Glu Asp Tyr Lys Gly	
[9895]	145	150 155 160
[9896]	Val Lys Lys Leu Leu Asp Arg Tyr Tyr Leu Ser Phe Ile Asn Asp Val	
[9897]		165 170 175
[9898]	Leu His Ser Ile Lys Leu Lys Asn Leu Asn Asn Tyr Ile Ser Leu Phe	
[9899]		180 185 190
[9900]	Arg Lys Lys Thr Arg Thr Glu Lys Glu Asn Lys Glu Leu Glu Asn Leu	
[9901]		195 200 205
[9902]	Glu Ile Asn Leu Arg Lys Glu Ile Ala Lys Ala Phe Lys Gly Asn Glu	
[9903]		210 215 220
[9904]	Gly Tyr Lys Ser Leu Phe Lys Lys Asp Ile Ile Glu Thr Ile Leu Pro	
[9905]	225	230 235 240
[9906]	Glu Phe Leu Asp Asp Lys Asp Glu Ile Ala Leu Val Asn Ser Phe Asn	
[9907]		245 250 255
[9908]	Gly Phe Thr Thr Ala Phe Thr Gly Phe Phe Asp Asn Arg Glu Asn Met	
[9909]		260 265 270
[9910]	Phe Ser Glu Glu Ala Lys Ser Thr Ser Ile Ala Phe Arg Cys Ile Asn	
[9911]		275 280 285

[9912]	Glu Asn Leu Thr Arg Tyr Ile Ser Asn Met Asp Ile Phe Glu Lys Val		
[9913]	290	295	300
[9914]	Asp Ala Ile Phe Asp Lys His Glu Val Gln Glu Ile Lys Glu Lys Ile		
[9915]	305	310	315 320
[9916]	Leu Asn Ser Asp Tyr Asp Val Glu Asp Phe Phe Glu Gly Glu Phe Phe		
[9917]	325	330	335
[9918]	Asn Phe Val Leu Thr Gln Glu Gly Ile Asp Val Tyr Asn Ala Ile Ile		
[9919]	340	345	350
[9920]	Gly Gly Phe Val Thr Glu Ser Gly Glu Lys Ile Lys Gly Leu Asn Glu		
[9921]	355	360	365
[9922]	Tyr Ile Asn Leu Tyr Asn Gln Lys Thr Lys Gln Lys Leu Pro Lys Phe		
[9923]	370	375	380
[9924]	Lys Pro Leu Tyr Lys Gln Val Leu Ser Asp Arg Glu Ser Leu Ser Phe		
[9925]	385	390	395 400
[9926]	Tyr Gly Glu Gly Tyr Thr Ser Asp Glu Glu Val Leu Glu Val Phe Arg		
[9927]	405	410	415
[9928]	Asn Thr Leu Asn Lys Asn Ser Glu Ile Phe Ser Ser Ile Lys Lys Leu		
[9929]	420	425	430
[9930]	Glu Lys Leu Phe Lys Asn Phe Asp Glu Tyr Ser Ser Ala Gly Ile Phe		
[9931]	435	440	445
[9932]	Val Lys Asn Gly Pro Ala Ile Ser Thr Ile Ser Lys Asp Ile Phe Gly		
[9933]	450	455	460
[9934]	Glu Trp Asn Val Ile Arg Asp Lys Trp Asn Ala Glu Tyr Asp Asp Ile		
[9935]	465	470	475 480
[9936]	His Leu Lys Lys Lys Ala Val Val Thr Glu Lys Tyr Glu Asp Asp Arg		
[9937]	485	490	495
[9938]	Arg Lys Ser Phe Lys Lys Ile Gly Ser Phe Ser Leu Glu Gln Leu Gln		
[9939]	500	505	510
[9940]	Glu Tyr Ala Asp Ala Asp Leu Ser Val Val Glu Lys Leu Lys Glu Ile		
[9941]	515	520	525
[9942]	Ile Ile Gln Lys Val Asp Glu Ile Tyr Lys Val Tyr Gly Ser Ser Glu		
[9943]	530	535	540
[9944]	Lys Leu Phe Asp Ala Asp Phe Val Leu Glu Lys Ser Leu Lys Lys Asn		
[9945]	545	550	555 560
[9946]	Asp Ala Val Val Ala Ile Met Lys Asp Leu Leu Asp Ser Val Lys Ser		
[9947]	565	570	575
[9948]	Phe Glu Asn Tyr Ile Lys Ala Phe Phe Gly Glu Gly Lys Glu Thr Asn		
[9949]	580	585	590
[9950]	Arg Asp Glu Ser Phe Tyr Gly Asp Phe Val Leu Ala Tyr Asp Ile Leu		
[9951]	595	600	605
[9952]	Leu Lys Val Asp His Ile Tyr Asp Ala Ile Arg Asn Tyr Val Thr Gln		
[9953]	610	615	620

[9954]	Lys Pro Tyr Ser Lys Asp Lys Phe Lys Leu Tyr Phe Gln Asn Pro Gln
[9955]	625 630 635 640
[9956]	Phe Met Gly Gly Trp Asp Lys Asp Lys Glu Thr Asp Tyr Arg Ala Thr
[9957]	645 650 655
[9958]	Ile Leu Arg Tyr Gly Ser Lys Tyr Tyr Leu Ala Ile Met Asp Lys Lys
[9959]	660 665 670
[9960]	Tyr Ala Lys Cys Leu Gln Lys Ile Asp Lys Asp Asp Val Asn Gly Asn
[9961]	675 680 685
[9962]	Tyr Glu Lys Ile Asn Tyr Lys Leu Leu Pro Gly Pro Asn Lys Met Leu
[9963]	690 695 700
[9964]	Pro Lys Val Phe Phe Ser Lys Lys Trp Met Ala Tyr Tyr Asn Pro Ser
[9965]	705 710 715 720
[9966]	Glu Asp Ile Gln Lys Ile Tyr Lys Asn Gly Thr Phe Lys Lys Gly Asp
[9967]	725 730 735
[9968]	Met Phe Asn Leu Asn Asp Cys His Lys Leu Ile Asp Phe Phe Lys Asp
[9969]	740 745 750
[9970]	Ser Ile Ser Arg Tyr Pro Lys Trp Ser Asn Ala Tyr Asp Phe Asn Phe
[9971]	755 760 765
[9972]	Ser Glu Thr Glu Lys Tyr Lys Asp Ile Ala Gly Phe Tyr Arg Glu Val
[9973]	770 775 780
[9974]	Glu Glu Gln Gly Tyr Lys Val Ser Phe Glu Ser Ala Ser Lys Lys Glu
[9975]	785 790 795 800
[9976]	Val Asp Lys Leu Val Glu Glu Gly Lys Leu Tyr Met Phe Gln Ile Tyr
[9977]	805 810 815
[9978]	Asn Lys Asp Phe Ser Asp Lys Ser His Gly Thr Pro Asn Leu His Thr
[9979]	820 825 830
[9980]	Met Tyr Phe Lys Leu Leu Phe Asp Glu Asn Asn His Gly Gln Ile Arg
[9981]	835 840 845
[9982]	Leu Ser Gly Gly Ala Glu Leu Phe Met Arg Arg Ala Ser Leu Lys Lys
[9983]	850 855 860
[9984]	Glu Glu Leu Val Val His Pro Ala Asn Ser Pro Ile Ala Asn Lys Asn
[9985]	865 870 875 880
[9986]	Pro Asp Asn Pro Lys Lys Thr Thr Thr Leu Ser Tyr Asp Val Tyr Lys
[9987]	885 890 895
[9988]	Asp Lys Arg Phe Ser Glu Asp Gln Tyr Glu Leu His Ile Pro Ile Ala
[9989]	900 905 910
[9990]	Ile Asn Lys Cys Pro Lys Asn Ile Phe Lys Ile Asn Thr Glu Val Arg
[9991]	915 920 925
[9992]	Val Leu Leu Lys His Asp Asp Asn Pro Tyr Val Ile Gly Ile Ala Arg
[9993]	930 935 940
[9994]	Gly Glu Arg Asn Leu Leu Tyr Ile Val Val Val Asp Gly Lys Gly Asn
[9995]	945 950 955 960

[9996]	Ile Val Glu Gln Tyr Ser Leu Asn Glu Ile Ile Asn Asn Phe Asn Gly		
[9997]		965	970 975
[9998]	Ile Arg Ile Lys Thr Asp Tyr His Ser Leu Leu Asp Lys Lys Glu Lys		
[9999]		980	985 990
[10000]	Glu Arg Phe Glu Ala Arg Gln Asn Trp Thr Ser Ile Glu Asn Ile Lys		
[10001]		995	1000 1005
[10002]	Glu Leu Lys Ala Gly Tyr Ile Ser Gln Val Val His Lys Ile Cys		
[10003]		1010	1015 1020
[10004]	Glu Leu Val Glu Lys Tyr Asp Ala Val Ile Ala Leu Glu Asp Leu		
[10005]		1025	1030 1035
[10006]	Asn Ser Gly Phe Lys Asn Ser Arg Val Lys Val Glu Lys Gln Val		
[10007]		1040	1045 1050
[10008]	Tyr Gln Lys Phe Glu Lys Met Leu Ile Asp Lys Leu Asn Tyr Met		
[10009]		1055	1060 1065
[10010]	Val Asp Lys Lys Ser Asn Pro Cys Ala Thr Gly Gly Ala Leu Lys		
[10011]		1070	1075 1080
[10012]	Gly Tyr Gln Ile Thr Asn Lys Phe Glu Ser Phe Lys Ser Met Ser		
[10013]		1085	1090 1095
[10014]	Thr Gln Asn Gly Phe Ile Phe Tyr Ile Pro Ala Trp Leu Thr Ser		
[10015]		1100	1105 1110
[10016]	Lys Ile Asp Pro Ser Thr Gly Phe Val Asn Leu Leu Lys Thr Lys		
[10017]		1115	1120 1125
[10018]	Tyr Thr Ser Ile Ala Asp Ser Lys Lys Phe Ile Ser Ser Phe Asp		
[10019]		1130	1135 1140
[10020]	Arg Ile Met Tyr Val Pro Glu Glu Asp Leu Phe Glu Phe Ala Leu		
[10021]		1145	1150 1155
[10022]	Asp Tyr Lys Asn Phe Ser Arg Thr Asp Ala Asp Tyr Ile Lys Lys		
[10023]		1160	1165 1170
[10024]	Trp Lys Leu Tyr Ser Tyr Gly Asn Arg Ile Arg Ile Phe Arg Asn		
[10025]		1175	1180 1185
[10026]	Pro Lys Lys Asn Asn Val Phe Asp Trp Glu Glu Val Cys Leu Thr		
[10027]		1190	1195 1200
[10028]	Ser Ala Tyr Lys Glu Leu Phe Asn Lys Tyr Gly Ile Asn Tyr Gln		
[10029]		1205	1210 1215
[10030]	Gln Gly Asp Ile Arg Ala Leu Leu Cys Glu Gln Ser Asp Lys Ala		
[10031]		1220	1225 1230
[10032]	Phe Tyr Ser Ser Phe Met Ala Leu Met Ser Leu Met Leu Gln Met		
[10033]		1235	1240 1245
[10034]	Arg Asn Ser Ile Thr Gly Arg Thr Asp Val Asp Phe Leu Ile Ser		
[10035]		1250	1255 1260
[10036]	Pro Val Lys Asn Ser Asp Gly Ile Phe Tyr Asp Ser Arg Asn Tyr		
[10037]		1265	1270 1275

[10038]	Glu	Ala	Gln	Glu	Asn	Ala	Ile	Leu	Pro	Lys	Asn	Ala	Asp	Ala	Asn
[10039]	1280						1285					1290			
[10040]	Gly	Ala	Tyr	Asn	Ile	Ala	Arg	Lys	Val	Leu	Trp	Ala	Ile	Gly	Gln
[10041]	1295						1300					1305			
[10042]	Phe	Lys	Lys	Ala	Glu	Asp	Glu	Lys	Leu	Asp	Lys	Val	Lys	Ile	Ala
[10043]	1310						1315					1320			
[10044]	Ile	Ser	Asn	Lys	Glu	Trp	Leu	Glu	Tyr	Ala	Gln	Thr	Ser	Val	Lys
[10045]	1325						1330					1335			
[10046]	His	Ser	Glu	Ser	Pro	Ser	Lys	Gln	Gln	Pro	Glu	Pro	Lys	Ser	Ser
[10047]	1340						1345					1350			
[10048]	Lys	Gly	Glu	Ala	Ser	Pro	Ala	Ser	Gly	Pro	Arg	His	Leu	Met	Asp
[10049]	1355						1360					1365			
[10050]	Pro	His	Ile	Phe	Thr	Ser	Asn	Phe	Asn	Asn	Gly	Ile	Gly	Arg	His
[10051]	1370						1375					1380			
[10052]	Lys	Thr	Tyr	Leu	Cys	Tyr	Glu	Val	Glu	Arg	Leu	Asp	Asn	Gly	Thr
[10053]	1385						1390					1395			
[10054]	Ser	Val	Lys	Met	Asp	Gln	His	Arg	Gly	Phe	Leu	His	Asn	Gln	Ala
[10055]	1400						1405					1410			
[10056]	Lys	Asn	Leu	Leu	Cys	Gly	Phe	Tyr	Gly	Arg	His	Ala	Glu	Leu	Arg
[10057]	1415						1420					1425			
[10058]	Phe	Leu	Asp	Leu	Val	Pro	Ser	Leu	Gln	Leu	Asp	Pro	Ala	Gln	Ile
[10059]	1430						1435					1440			
[10060]	Tyr	Arg	Val	Thr	Trp	Phe	Ile	Ser	Trp	Ser	Pro	Cys	Phe	Ser	Trp
[10061]	1445						1450					1455			
[10062]	Gly	Cys	Ala	Gly	Glu	Val	Arg	Ala	Phe	Leu	Gln	Glu	Asn	Thr	His
[10063]	1460						1465					1470			
[10064]	Val	Arg	Leu	Arg	Ile	Phe	Ala	Ala	Arg	Ile	Tyr	Asp	Tyr	Asp	Pro
[10065]	1475						1480					1485			
[10066]	Leu	Tyr	Lys	Glu	Ala	Leu	Gln	Met	Leu	Arg	Asp	Ala	Gly	Ala	Gln
[10067]	1490						1495					1500			
[10068]	Val	Ser	Ile	Met	Thr	Tyr	Asp	Glu	Phe	Lys	His	Cys	Trp	Asp	Thr
[10069]	1505						1510					1515			
[10070]	Phe	Val	Asp	His	Gln	Gly	Cys	Pro	Phe	Gln	Pro	Trp	Asp	Gly	Leu
[10071]	1520						1525					1530			
[10072]	Asp	Glu	His	Ser	Gln	Ala	Leu	Ser	Gly	Arg	Leu	Arg	Ala	Ile	Leu
[10073]	1535						1540					1545			
[10074]	Gln	Asn	Gln	Gly	Asn	Ser	Gly	Gly	Ser	Lys	Arg	Thr	Ala	Asp	Gly
[10075]	1550						1555					1560			
[10076]	Ser	Glu	Phe	Glu	Pro	Lys	Lys	Lys	Arg	Lys	Val	Gly	Ser	Gly	
[10077]	1565						1570					1575			
[10078]	<210>	100													
[10079]	<211>	4864													

[10080]	<212>	DNA	
[10081]	<213>	人工的	
[10082]	<220>		
[10083]	<223>	多核苷酸	
[10084]	<400>	100	
[10085]	atgaaacgga cagccgacgg aagcgagttc gagtcaccaa agaagaagcg gaaagtcacc	60	
[10086]	aacctcagcg acattatcga gaaggaaacc ggcaagcaac tcgtgatcca ggagagcata	120	
[10087]	ctgatgctcc ccgaggaggt cgaggaggtg attggcaata agcccgagtc cgatatactg	180	
[10088]	gttcatactg cgtatgacga aagcacagac gagaacgtca tgctacttac cagcgacgcc	240	
[10089]	ccggagtaca agccctgggc cctagtcac ccaagacagca acggtgagaa caagatcaag	300	
[10090]	atgcttagtg gcgggtccgg tgggtccggt ggtagtcca agctggagaa gtttacaaac	360	
[10091]	tgttacagcc tctccaaac cctcaggttt aaagcgatcc cgggtggcaa gaccagagg	420	
[10092]	aacatcgaca acaagaggct cctggtggaa gacgagaagc gcgccgaaga ctacaagggc	480	
[10093]	gtgaagaagc tgctcgatag gtactacctc agctttatta acgacgtgct gcacagcatc	540	
[10094]	aaactcaaga atctcaacaa ctacatctcc ctcttcgcga aaaagacccg caccgagaag	600	
[10095]	gagaacaagg agctggagaa cctggagatc aacctccgca aggaaatcgc caaagcgttc	660	
[10096]	aagggaatg aagggtacaa gaggctcttc aagaaagaca tcatcgaaac tatectccca	720	
[10097]	gagtttctcg atgacaagga cgagatcgcg ctggtgaact cctttaacgg gttcacaacc	780	
[10098]	gcgtttaccg gcttctttga taacagggaa aatatgttct ccgaggaggc caagtccacc	840	
[10099]	agcatcgctt tcagtggtat caacgagaac ctacccgct acatttccaa tatggacatt	900	
[10100]	ttcgagaagg tggatcgat cttcgataag cacgaggtgc aggagatcaa agagaagatt	960	
[10101]	ctcaattccg attatgacgt cgaggatttc ttcgaagggg agttctttaa ttttgtgctc	1020	
[10102]	acacaagagg gcattgacgt gtacaacgcg attatcgagg gcttcgtcac agagtccggg	1080	
[10103]	gagaagatta aggggctgaa tgagtacatc aatctgtaca atcagaagac caagcagaaa	1140	
[10104]	ctgccgaaat tcaagccgct ctacaagcaa gtctgtccg atagggaag cctctccttc	1200	
[10105]	tacggcgagg gctataccag cgacgaggag gtgctggaag tcttcgcaa cacactgaat	1260	
[10106]	aagaatagcg agattttctc ctccatcaag aagctcgaga agctctttaa gaactttgac	1320	
[10107]	gagtacagct ccgccgggat tttctggaag aacgggcccg cgatcagcac catctccaag	1380	
[10108]	gacatctttg gcgagtggaa cgtcatcagg gacaagtgga acgccgagta cgacgacatc	1440	
[10109]	cacctgaaga agaaggcggg ggtgaccgag aagtatgagg acgatcgag gaagtccttc	1500	
[10110]	aaaaaaatcg gctccttcag cctcgaacag ctccaggagt atgccgatgc ggatctgtcc	1560	
[10111]	gtcgtcgaga agctgaagga aatcatcatt cagaaggtcg acgagatcta taaagtgtac	1620	
[10112]	gggtccagcg agaagctgtt cgacgccgac tttgtgctcg agaagtcctt caaaaagaat	1680	
[10113]	gacgccgtgg tggccattat gaaagacctg ctcgactccg tgaagtcctt cgaaaattac	1740	
[10114]	attaaagcgt tctttgggga ggggaaggaa actaacaggg atgagtcctt ctatggcgac	1800	
[10115]	tttgcctcgc cgtacgacat cctgctgaag gtcgaccaca tttacgacgc gatccgcaac	1860	
[10116]	tacgtgacac agaagccgta ctccaaagac aagttcaagc tgtacttcca gaaccgcaa	1920	
[10117]	tttatggggg gctgggacaa ggataaagag acagactacc gcgcgacaat tctccgtat	1980	
[10118]	ggctccaaat actatctggc catcatggac aagaagtacg cgaagtgcct gcagaagatc	2040	
[10119]	gacaaagacg acgtcaatgg caactatgaa aagatcaact acaagctgct gccgggccc	2100	
[10120]	aacaagatgc tcccgaaggt gttcttcagc aagaagtgga tggcctacta caatccaagc	2160	
[10121]	gaggatatctc agaaaatcta taaaaacggg accttcaaga agggggacat gtttaacctc	2220	

[10122]	aacgactgcc acaagctcat tgatttcttc aaggatagca tttcccgccta cccgaaatgg	2280
[10123]	tccaatgcgt acgattttta cttctccgag acagaaaagt acaaagacat cgcgggcttt	2340
[10124]	tacagggagg tggaggagca agggatataa gtttcttttg aatccgcgag caagaaggaa	2400
[10125]	gtcgacaagc tcgtcgagga gggcaagctc tacatgttcc aaattttata caaggacttt	2460
[10126]	tccgacaaga gccatgggac cccaaacctc cacaccatgt acttcaaact gctctttgac	2520
[10127]	gagaacaacc acgggcacaa caggctgagc ggccggcgccg aattattcat gcgcagggcc	2580
[10128]	tcctcaaga aggaggagct ggtcgtccat ccagccaatt ccccgatcgc gaacaagaac	2640
[10129]	ccggacaatc cgaaaaagac caccacctg tcctacgacg tctacaagga caaacgcttc	2700
[10130]	agcgaagacc agtacgaatt acacatccca attgcgatta ataagtgcc aaagaatatc	2760
[10131]	ttcaaaatta atacagaggt cagggtgctg ctcaaacacg acgacaatcc gtatgtcatc	2820
[10132]	ggcattgcc a ggggcgagcg caatctgctc tatatcgtgg tcgtggatgg gaagggaat	2880
[10133]	attgtggagc agtactccct gaacgagatt atcaacaact tcaatgggat taggattaag	2940
[10134]	accgactatc acagcctgct cgacaagaaa gaaaaagaga ggtttgaggc ccgcaaaaac	3000
[10135]	tggacctcca ttgagaatat caaagaatta aaggccggct atatttccca agtcgtccac	3060
[10136]	aagatctgcg agctggtgga gaaatatgac gccgtgattg cgctcgaaga cttaaattct	3120
[10137]	gggttcaaga actcccgcgt gaaggtggaa aaacaggtgt atcagaaatt cgagaaaatg	3180
[10138]	ctgatcgaca aactcaatta tatggtggat aagaagtcca acccgtgtgc cacagggggc	3240
[10139]	gcgctgaagg gctatcagat caccaacaag ttcgagagct tcaagagcat gagcaccag	3300
[10140]	aacgggttta ttttctacat cccggcgtgg ctcacctcca agattgacct gagcaccggc	3360
[10141]	ttcgtgaacc tcctgaagac aaagtatacc tccattgccg acagcaagaa gtttatctcc	3420
[10142]	tccttcgacc gcattatgta tgtgccggag gaggacctct tcgagttcgc cctcgactac	3480
[10143]	aaaaacttca gccgcacaga tgcggattac atcaagaagt ggaagctgta ctctacggg	3540
[10144]	aacaggatcc gcattctcag gaatccaaaa aaaaataacg tctttgactg ggaggaagtg	3600
[10145]	tgcctgacat ccgctacaa ggaactgttc aataaatacg gcatcaatta ccagcagggc	3660
[10146]	gacattcgcg cctcctctg tgagcagtc gacaaagcgt tttactccag cttcatggcc	3720
[10147]	ctcatgtccc tgatgtcca aatgaggaat agcatcacag ggcgcaccga cgtcgacttc	3780
[10148]	ctcatcagcc cggatgaaga ctccgacggg atcttttacg actcccgcaa ctatgaggcg	3840
[10149]	caagagaatg cgatcctccc gaagaacgcc gatgcgaacg gggcctataa tatcgccagg	3900
[10150]	aaagtgtctt gggccatcgg gcagttcaaa aaggcggagg atgagaagct cgacaaggtg	3960
[10151]	aaaattgcca tttccaacaa ggagtggctg gagtacgcgc agacctccgt gaagcactct	4020
[10152]	gaatctccat ctaagcaaca accagaacca aagtcttcta agggagaggc ctccccgcga	4080
[10153]	tcaggacct a gacacctgat ggatcccat attttcacat ctaactcaa caacggaatc	4140
[10154]	ggcagacaca agacctacct gtgctatgag gtggaaaggc tggataacgg aacctctgtg	4200
[10155]	aagatggacc agcacaggta agtatcaagg ttacaagaca ggtttaagga gaccaataga	4260
[10156]	aactgggctt gtcgagacag agaagactct tgcgtttctg ataggcacct attggtctta	4320
[10157]	ctgacatcca ctttgcttt ctctccacag gggcttcctg cataaccagg ccaagaatct	4380
[10158]	gctgtgcggt ttctacggga gacatgcaga actgaggttt ctggatctgg tgccatccct	4440
[10159]	gcagctggac cccgtcaga tctacagagt gacttggttc atctcttgga gcccttgctt	4500
[10160]	ttcatgggga tgtgctggcg aggtgagggc ctctcttcag gaaaacacac acgtgagact	4560
[10161]	gaggatTTTT gtcgccagaa tctacgatta tgaccactg tacaaggag ctctgcagat	4620
[10162]	gctgagggat gcaggcgctc aggtgagcat tatgacctat gacgaattca agcactgctg	4680
[10163]	ggatactttt gtggaccatc agggttgtcc ttttcagcca tgggatgggc tggacgagca	4740

[10164]	ttctcaggca ctgagcggta gactgagggc tctcctgcag aaccagggga attctggcgg	4800
[10165]	ctcaaaaaga accgccgacg gcagcgaatt cgagcccaag aagaagagga aagtcggaag	4860
[10166]	cgga	4864
[10167]	<210> 101	
[10168]	<211> 1558	
[10169]	<212> PRT	
[10170]	<213> 人工的	
[10171]	<220>	
[10172]	<223> 多肽	
[10173]	<400> 101	
[10174]	Ser Lys Leu Glu Lys Phe Thr Asn Cys Tyr Ser Leu Ser Lys Thr Leu	
[10175]	1 5 10 15	
[10176]	Arg Phe Lys Ala Ile Pro Val Gly Lys Thr Gln Glu Asn Ile Asp Asn	
[10177]	20 25 30	
[10178]	Lys Arg Leu Leu Val Glu Asp Glu Lys Arg Ala Glu Asp Tyr Lys Gly	
[10179]	35 40 45	
[10180]	Val Lys Lys Leu Leu Asp Arg Tyr Tyr Leu Ser Phe Ile Asn Asp Val	
[10181]	50 55 60	
[10182]	Leu His Ser Ile Lys Leu Lys Asn Leu Asn Asn Tyr Ile Ser Leu Phe	
[10183]	65 70 75 80	
[10184]	Arg Lys Lys Thr Arg Thr Glu Lys Glu Asn Lys Glu Leu Glu Asn Leu	
[10185]	85 90 95	
[10186]	Glu Ile Asn Leu Arg Lys Glu Ile Ala Lys Ala Phe Lys Gly Asn Glu	
[10187]	100 105 110	
[10188]	Gly Tyr Lys Ser Leu Phe Lys Lys Asp Ile Ile Glu Thr Ile Leu Pro	
[10189]	115 120 125	
[10190]	Glu Phe Leu Asp Asp Lys Asp Glu Ile Ala Leu Val Asn Ser Phe Asn	
[10191]	130 135 140	
[10192]	Gly Phe Thr Thr Ala Phe Thr Gly Phe Phe Asp Asn Arg Glu Asn Met	
[10193]	145 150 155 160	
[10194]	Phe Ser Glu Glu Ala Lys Ser Thr Ser Ile Ala Phe Arg Cys Ile Asn	
[10195]	165 170 175	
[10196]	Glu Asn Leu Thr Arg Tyr Ile Ser Asn Met Asp Ile Phe Glu Lys Val	
[10197]	180 185 190	
[10198]	Asp Ala Ile Phe Asp Lys His Glu Val Gln Glu Ile Lys Glu Lys Ile	
[10199]	195 200 205	
[10200]	Leu Asn Ser Asp Tyr Asp Val Glu Asp Phe Phe Glu Gly Glu Phe Phe	
[10201]	210 215 220	
[10202]	Asn Phe Val Leu Thr Gln Glu Gly Ile Asp Val Tyr Asn Ala Ile Ile	
[10203]	225 230 235 240	
[10204]	Gly Gly Phe Val Thr Glu Ser Gly Glu Lys Ile Lys Gly Leu Asn Glu	
[10205]	245 250 255	

[10206]	Tyr	Ile	Asn	Leu	Tyr	Asn	Gln	Lys	Thr	Lys	Gln	Lys	Leu	Pro	Lys	Phe
[10207]				260					265					270		
[10208]	Lys	Pro	Leu	Tyr	Lys	Gln	Val	Leu	Ser	Asp	Arg	Glu	Ser	Leu	Ser	Phe
[10209]				275				280						285		
[10210]	Tyr	Gly	Glu	Gly	Tyr	Thr	Ser	Asp	Glu	Glu	Val	Leu	Glu	Val	Phe	Arg
[10211]		290						295					300			
[10212]	Asn	Thr	Leu	Asn	Lys	Asn	Ser	Glu	Ile	Phe	Ser	Ser	Ile	Lys	Lys	Leu
[10213]	305					310					315					320
[10214]	Glu	Lys	Leu	Phe	Lys	Asn	Phe	Asp	Glu	Tyr	Ser	Ser	Ala	Gly	Ile	Phe
[10215]					325					330					335	
[10216]	Val	Lys	Asn	Gly	Pro	Ala	Ile	Ser	Thr	Ile	Ser	Lys	Asp	Ile	Phe	Gly
[10217]				340					345						350	
[10218]	Glu	Trp	Asn	Val	Ile	Arg	Asp	Lys	Trp	Asn	Ala	Glu	Tyr	Asp	Asp	Ile
[10219]			355					360						365		
[10220]	His	Leu	Lys	Lys	Lys	Ala	Val	Val	Thr	Glu	Lys	Tyr	Glu	Asp	Asp	Arg
[10221]		370						375					380			
[10222]	Arg	Lys	Ser	Phe	Lys	Lys	Ile	Gly	Ser	Phe	Ser	Leu	Glu	Gln	Leu	Gln
[10223]	385					390					395					400
[10224]	Glu	Tyr	Ala	Asp	Ala	Asp	Leu	Ser	Val	Val	Glu	Lys	Leu	Lys	Glu	Ile
[10225]				405						410					415	
[10226]	Ile	Ile	Gln	Lys	Val	Asp	Glu	Ile	Tyr	Lys	Val	Tyr	Gly	Ser	Ser	Glu
[10227]				420					425					430		
[10228]	Lys	Leu	Phe	Asp	Ala	Asp	Phe	Val	Leu	Glu	Lys	Ser	Leu	Lys	Lys	Asn
[10229]			435					440						445		
[10230]	Asp	Ala	Val	Val	Ala	Ile	Met	Lys	Asp	Leu	Leu	Asp	Ser	Val	Lys	Ser
[10231]		450						455					460			
[10232]	Phe	Glu	Asn	Tyr	Ile	Lys	Ala	Phe	Phe	Gly	Glu	Gly	Lys	Glu	Thr	Asn
[10233]	465					470					475					480
[10234]	Arg	Asp	Glu	Ser	Phe	Tyr	Gly	Asp	Phe	Val	Leu	Ala	Tyr	Asp	Ile	Leu
[10235]				485						490					495	
[10236]	Leu	Lys	Val	Asp	His	Ile	Tyr	Asp	Ala	Ile	Arg	Asn	Tyr	Val	Thr	Gln
[10237]				500					505					510		
[10238]	Lys	Pro	Tyr	Ser	Lys	Asp	Lys	Phe	Lys	Leu	Tyr	Phe	Gln	Asn	Pro	Gln
[10239]			515						520				525			
[10240]	Phe	Met	Gly	Gly	Trp	Asp	Lys	Asp	Lys	Glu	Thr	Asp	Tyr	Arg	Ala	Thr
[10241]		530						535					540			
[10242]	Ile	Leu	Arg	Tyr	Gly	Ser	Lys	Tyr	Tyr	Leu	Ala	Ile	Met	Asp	Lys	Lys
[10243]	545					550					555					560
[10244]	Tyr	Ala	Lys	Cys	Leu	Gln	Lys	Ile	Asp	Lys	Asp	Asp	Val	Asn	Gly	Asn
[10245]				565						570					575	
[10246]	Tyr	Glu	Lys	Ile	Asn	Tyr	Lys	Leu	Leu	Pro	Gly	Pro	Asn	Lys	Met	Leu
[10247]				580						585					590	

[10248]	Pro	Lys	Val	Phe	Phe	Ser	Lys	Lys	Trp	Met	Ala	Tyr	Tyr	Asn	Pro	Ser
[10249]																
[10250]	Glu	Asp	Ile	Gln	Lys	Ile	Tyr	Lys	Asn	Gly	Thr	Phe	Lys	Lys	Gly	Asp
[10251]																
[10252]	Met	Phe	Asn	Leu	Asn	Asp	Cys	His	Lys	Leu	Ile	Asp	Phe	Phe	Lys	Asp
[10253]																
[10254]	Ser	Ile	Ser	Arg	Tyr	Pro	Lys	Trp	Ser	Asn	Ala	Tyr	Asp	Phe	Asn	Phe
[10255]																
[10256]	Ser	Glu	Thr	Glu	Lys	Tyr	Lys	Asp	Ile	Ala	Gly	Phe	Tyr	Arg	Glu	Val
[10257]																
[10258]	Glu	Glu	Gln	Gly	Tyr	Lys	Val	Ser	Phe	Glu	Ser	Ala	Ser	Lys	Lys	Glu
[10259]																
[10260]	Val	Asp	Lys	Leu	Val	Glu	Glu	Gly	Lys	Leu	Tyr	Met	Phe	Gln	Ile	Tyr
[10261]																
[10262]	Asn	Lys	Asp	Phe	Ser	Asp	Lys	Ser	His	Gly	Thr	Pro	Asn	Leu	His	Thr
[10263]																
[10264]	Met	Tyr	Phe	Lys	Leu	Leu	Phe	Asp	Glu	Asn	Asn	His	Gly	Gln	Ile	Arg
[10265]																
[10266]	Leu	Ser	Gly	Gly	Ala	Glu	Leu	Phe	Met	Arg	Arg	Ala	Ser	Leu	Lys	Lys
[10267]																
[10268]	Glu	Glu	Leu	Val	Val	His	Pro	Ala	Asn	Ser	Pro	Ile	Ala	Asn	Lys	Asn
[10269]																
[10270]	Pro	Asp	Asn	Pro	Lys	Lys	Thr	Thr	Thr	Leu	Ser	Tyr	Asp	Val	Tyr	Lys
[10271]																
[10272]	Asp	Lys	Arg	Phe	Ser	Glu	Asp	Gln	Tyr	Glu	Leu	His	Ile	Pro	Ile	Ala
[10273]																
[10274]	Ile	Asn	Lys	Cys	Pro	Lys	Asn	Ile	Phe	Lys	Ile	Asn	Thr	Glu	Val	Arg
[10275]																
[10276]	Val	Leu	Leu	Lys	His	Asp	Asp	Asn	Pro	Tyr	Val	Ile	Gly	Ile	Ala	Arg
[10277]																
[10278]	Gly	Glu	Arg	Asn	Leu	Leu	Tyr	Ile	Val	Val	Val	Asp	Gly	Lys	Gly	Asn
[10279]																
[10280]	Ile	Val	Glu	Gln	Tyr	Ser	Leu	Asn	Glu	Ile	Ile	Asn	Asn	Phe	Asn	Gly
[10281]																
[10282]	Ile	Arg	Ile	Lys	Thr	Asp	Tyr	His	Ser	Leu	Leu	Asp	Lys	Lys	Glu	Lys
[10283]																
[10284]	Glu	Arg	Phe	Glu	Ala	Arg	Gln	Asn	Trp	Thr	Ser	Ile	Glu	Asn	Ile	Lys
[10285]																
[10286]	Glu	Leu	Lys	Ala	Gly	Tyr	Ile	Ser	Gln	Val	Val	His	Lys	Ile	Cys	Glu
[10287]																
[10288]	Leu	Val	Glu	Lys	Tyr	Asp	Ala	Val	Ile	Ala	Leu	Glu	Asp	Leu	Asn	Ser
[10289]																

[10290]	Gly Phe Lys Asn Ser Arg Val Lys Val Glu Lys Gln Val Tyr Gln Lys
[10291]	930 935 940
[10292]	Phe Glu Lys Met Leu Ile Asp Lys Leu Asn Tyr Met Val Asp Lys Lys
[10293]	945 950 955 960
[10294]	Ser Asn Pro Cys Ala Thr Gly Gly Ala Leu Lys Gly Tyr Gln Ile Thr
[10295]	965 970 975
[10296]	Asn Lys Phe Glu Ser Phe Lys Ser Met Ser Thr Gln Asn Gly Phe Ile
[10297]	980 985 990
[10298]	Phe Tyr Ile Pro Ala Trp Leu Thr Ser Lys Ile Asp Pro Ser Thr Gly
[10299]	995 1000 1005
[10300]	Phe Val Asn Leu Leu Lys Thr Lys Tyr Thr Ser Ile Ala Asp Ser
[10301]	1010 1015 1020
[10302]	Lys Lys Phe Ile Ser Ser Phe Asp Arg Ile Met Tyr Val Pro Glu
[10303]	1025 1030 1035
[10304]	Glu Asp Leu Phe Glu Phe Ala Leu Asp Tyr Lys Asn Phe Ser Arg
[10305]	1040 1045 1050
[10306]	Thr Asp Ala Asp Tyr Ile Lys Lys Trp Lys Leu Tyr Ser Tyr Gly
[10307]	1055 1060 1065
[10308]	Asn Arg Ile Arg Ile Phe Arg Asn Pro Lys Lys Asn Asn Val Phe
[10309]	1070 1075 1080
[10310]	Asp Trp Glu Glu Val Cys Leu Thr Ser Ala Tyr Lys Glu Leu Phe
[10311]	1085 1090 1095
[10312]	Asn Lys Tyr Gly Ile Asn Tyr Gln Gln Gly Asp Ile Arg Ala Leu
[10313]	1100 1105 1110
[10314]	Leu Cys Glu Gln Ser Asp Lys Ala Phe Tyr Ser Ser Phe Met Ala
[10315]	1115 1120 1125
[10316]	Leu Met Ser Leu Met Leu Gln Met Arg Asn Ser Ile Thr Gly Arg
[10317]	1130 1135 1140
[10318]	Thr Asp Val Asp Phe Leu Ile Ser Pro Val Lys Asn Ser Asp Gly
[10319]	1145 1150 1155
[10320]	Ile Phe Tyr Asp Ser Arg Asn Tyr Glu Ala Gln Glu Asn Ala Ile
[10321]	1160 1165 1170
[10322]	Leu Pro Lys Asn Ala Asp Ala Asn Gly Ala Tyr Asn Ile Ala Arg
[10323]	1175 1180 1185
[10324]	Lys Val Leu Trp Ala Ile Gly Gln Phe Lys Lys Ala Glu Asp Glu
[10325]	1190 1195 1200
[10326]	Lys Leu Asp Lys Val Lys Ile Ala Ile Ser Asn Lys Glu Trp Leu
[10327]	1205 1210 1215
[10328]	Glu Tyr Ala Gln Thr Ser Val Lys His Ser Gly Gly Ser Gly Gly
[10329]	1220 1225 1230
[10330]	Ser Gly Gly Ser Thr Asn Leu Ser Asp Ile Ile Glu Lys Glu Thr
[10331]	1235 1240 1245

[10332]	Gly	Lys	Gln	Leu	Val	Ile	Gln	Glu	Ser	Ile	Leu	Met	Leu	Pro	Glu
[10333]		1250					1255					1260			
[10334]	Glu	Val	Glu	Glu	Val	Ile	Gly	Asn	Lys	Pro	Glu	Ser	Asp	Ile	Leu
[10335]		1265					1270					1275			
[10336]	Val	His	Thr	Ala	Tyr	Asp	Glu	Ser	Thr	Asp	Glu	Asn	Val	Met	Leu
[10337]		1280					1285					1290			
[10338]	Leu	Thr	Ser	Asp	Ala	Pro	Glu	Tyr	Lys	Pro	Trp	Ala	Leu	Val	Ile
[10339]		1295					1300					1305			
[10340]	Gln	Asp	Ser	Asn	Gly	Glu	Asn	Lys	Ile	Lys	Met	Leu	Ser	Gly	Gly
[10341]		1310					1315					1320			
[10342]	Ser	Gly	Gly	Ser	Gly	Gly	Ser	Ser	Ser	Glu	Thr	Gly	Pro	Val	Ala
[10343]		1325					1330					1335			
[10344]	Val	Asp	Pro	Thr	Leu	Arg	Arg	Arg	Ile	Glu	Pro	His	Glu	Phe	Glu
[10345]		1340					1345					1350			
[10346]	Val	Phe	Phe	Asp	Pro	Arg	Glu	Leu	Arg	Lys	Glu	Thr	Cys	Leu	Leu
[10347]		1355					1360					1365			
[10348]	Tyr	Glu	Ile	Asn	Trp	Gly	Gly	Arg	His	Ser	Ile	Trp	Arg	His	Thr
[10349]		1370					1375					1380			
[10350]	Ser	Gln	Asn	Thr	Asn	Lys	His	Val	Glu	Val	Asn	Phe	Ile	Glu	Lys
[10351]		1385					1390					1395			
[10352]	Phe	Thr	Thr	Glu	Arg	Tyr	Phe	Cys	Pro	Asn	Thr	Arg	Cys	Ser	Ile
[10353]		1400					1405					1410			
[10354]	Thr	Trp	Phe	Leu	Ser	Trp	Ser	Pro	Cys	Gly	Glu	Cys	Ser	Arg	Ala
[10355]		1415					1420					1425			
[10356]	Ile	Thr	Glu	Phe	Leu	Ser	Arg	Tyr	Pro	His	Val	Thr	Leu	Phe	Ile
[10357]		1430					1435					1440			
[10358]	Tyr	Ile	Ala	Arg	Leu	Tyr	His	His	Ala	Asp	Pro	Arg	Asn	Arg	Gln
[10359]		1445					1450					1455			
[10360]	Gly	Leu	Arg	Asp	Leu	Ile	Ser	Ser	Gly	Val	Thr	Ile	Gln	Ile	Met
[10361]		1460					1465					1470			
[10362]	Thr	Glu	Gln	Glu	Ser	Gly	Tyr	Cys	Trp	Arg	Asn	Phe	Val	Asn	Tyr
[10363]		1475					1480					1485			
[10364]	Ser	Pro	Ser	Asn	Glu	Ala	His	Trp	Pro	Arg	Tyr	Pro	His	Leu	Trp
[10365]		1490					1495					1500			
[10366]	Val	Arg	Leu	Tyr	Val	Leu	Glu	Leu	Tyr	Cys	Ile	Ile	Leu	Gly	Leu
[10367]		1505					1510					1515			
[10368]	Pro	Pro	Cys	Leu	Asn	Ile	Leu	Arg	Arg	Lys	Gln	Pro	Gln	Leu	Thr
[10369]		1520					1525					1530			
[10370]	Phe	Phe	Thr	Ile	Ala	Leu	Gln	Ser	Cys	His	Tyr	Gln	Arg	Leu	Pro
[10371]		1535					1540					1545			
[10372]	Pro	His	Ile	Leu	Trp	Ala	Thr	Gly	Leu	Lys					
[10373]		1550					1555								

[10416]	275	280	285
[10417]	Asn Ile Asp Asn Lys Arg Leu Leu Val Glu Asp Glu Lys Arg Ala Glu		
[10418]	290	295	300
[10419]	Asp Tyr Lys Gly Val Lys Lys Leu Leu Asp Arg Tyr Tyr Leu Ser Phe		
[10420]	305	310	315
[10421]	Ile Asn Asp Val Leu His Ser Ile Lys Leu Lys Asn Leu Asn Asn Tyr		
[10422]	325	330	335
[10423]	Ile Ser Leu Phe Arg Lys Lys Thr Arg Thr Glu Lys Glu Asn Lys Glu		
[10424]	340	345	350
[10425]	Leu Glu Asn Leu Glu Ile Asn Leu Arg Lys Glu Ile Ala Lys Ala Phe		
[10426]	355	360	365
[10427]	Lys Gly Asn Glu Gly Tyr Lys Ser Leu Phe Lys Lys Asp Ile Ile Glu		
[10428]	370	375	380
[10429]	Thr Ile Leu Pro Glu Phe Leu Asp Asp Lys Asp Glu Ile Ala Leu Val		
[10430]	385	390	395
[10431]	Asn Ser Phe Asn Gly Phe Thr Thr Ala Phe Thr Gly Phe Phe Asp Asn		
[10432]	405	410	415
[10433]	Arg Glu Asn Met Phe Ser Glu Glu Ala Lys Ser Thr Ser Ile Ala Phe		
[10434]	420	425	430
[10435]	Arg Cys Ile Asn Glu Asn Leu Thr Arg Tyr Ile Ser Asn Met Asp Ile		
[10436]	435	440	445
[10437]	Phe Glu Lys Val Asp Ala Ile Phe Asp Lys His Glu Val Gln Glu Ile		
[10438]	450	455	460
[10439]	Lys Glu Lys Ile Leu Asn Ser Asp Tyr Asp Val Glu Asp Phe Phe Glu		
[10440]	465	470	475
[10441]	Gly Glu Phe Phe Asn Phe Val Leu Thr Gln Glu Gly Ile Asp Val Tyr		
[10442]	485	490	495
[10443]	Asn Ala Ile Ile Gly Gly Phe Val Thr Glu Ser Gly Glu Lys Ile Lys		
[10444]	500	505	510
[10445]	Gly Leu Asn Glu Tyr Ile Asn Leu Tyr Asn Gln Lys Thr Lys Gln Lys		
[10446]	515	520	525
[10447]	Leu Pro Lys Phe Lys Pro Leu Tyr Lys Gln Val Leu Ser Asp Arg Glu		
[10448]	530	535	540
[10449]	Ser Leu Ser Phe Tyr Gly Glu Gly Tyr Thr Ser Asp Glu Glu Val Leu		
[10450]	545	550	555
[10451]	Glu Val Phe Arg Asn Thr Leu Asn Lys Asn Ser Glu Ile Phe Ser Ser		
[10452]	565	570	575
[10453]	Ile Lys Lys Leu Glu Lys Leu Phe Lys Asn Phe Asp Glu Tyr Ser Ser		
[10454]	580	585	590
[10455]	Ala Gly Ile Phe Val Lys Asn Gly Pro Ala Ile Ser Thr Ile Ser Lys		
[10456]	595	600	605
[10457]	Asp Ile Phe Gly Glu Trp Asn Val Ile Arg Asp Lys Trp Asn Ala Glu		

[10458]	610	615	620
[10459]	Tyr Asp Asp Ile His Leu Lys Lys Lys Ala Val Val Thr Glu Lys Tyr		
[10460]	625	630	635
[10461]	Glu Asp Asp Arg Arg Lys Ser Phe Lys Lys Ile Gly Ser Phe Ser Leu		
[10462]	645	650	655
[10463]	Glu Gln Leu Gln Glu Tyr Ala Asp Ala Asp Leu Ser Val Val Glu Lys		
[10464]	660	665	670
[10465]	Leu Lys Glu Ile Ile Ile Gln Lys Val Asp Glu Ile Tyr Lys Val Tyr		
[10466]	675	680	685
[10467]	Gly Ser Ser Glu Lys Leu Phe Asp Ala Asp Phe Val Leu Glu Lys Ser		
[10468]	690	695	700
[10469]	Leu Lys Lys Asn Asp Ala Val Val Ala Ile Met Lys Asp Leu Leu Asp		
[10470]	705	710	715
[10471]	Ser Val Lys Ser Phe Glu Asn Tyr Ile Lys Ala Phe Phe Gly Glu Gly		
[10472]	725	730	735
[10473]	Lys Glu Thr Asn Arg Asp Glu Ser Phe Tyr Gly Asp Phe Val Leu Ala		
[10474]	740	745	750
[10475]	Tyr Asp Ile Leu Leu Lys Val Asp His Ile Tyr Asp Ala Ile Arg Asn		
[10476]	755	760	765
[10477]	Tyr Val Thr Gln Lys Pro Tyr Ser Lys Asp Lys Phe Lys Leu Tyr Phe		
[10478]	770	775	780
[10479]	Gln Asn Pro Gln Phe Met Gly Gly Trp Asp Lys Asp Lys Glu Thr Asp		
[10480]	785	790	795
[10481]	Tyr Arg Ala Thr Ile Leu Arg Tyr Gly Ser Lys Tyr Tyr Leu Ala Ile		
[10482]	805	810	815
[10483]	Met Asp Lys Lys Tyr Ala Lys Cys Leu Gln Lys Ile Asp Lys Asp Asp		
[10484]	820	825	830
[10485]	Val Asn Gly Asn Tyr Glu Lys Ile Asn Tyr Lys Leu Leu Pro Gly Pro		
[10486]	835	840	845
[10487]	Asn Lys Met Leu Pro Lys Val Phe Phe Ser Lys Lys Trp Met Ala Tyr		
[10488]	850	855	860
[10489]	Tyr Asn Pro Ser Glu Asp Ile Gln Lys Ile Tyr Lys Asn Gly Thr Phe		
[10490]	865	870	875
[10491]	Lys Lys Gly Asp Met Phe Asn Leu Asn Asp Cys His Lys Leu Ile Asp		
[10492]	885	890	895
[10493]	Phe Phe Lys Asp Ser Ile Ser Arg Tyr Pro Lys Trp Ser Asn Ala Tyr		
[10494]	900	905	910
[10495]	Asp Phe Asn Phe Ser Glu Thr Glu Lys Tyr Lys Asp Ile Ala Gly Phe		
[10496]	915	920	925
[10497]	Tyr Arg Glu Val Glu Glu Gln Gly Tyr Lys Val Ser Phe Glu Ser Ala		
[10498]	930	935	940
[10499]	Ser Lys Lys Glu Val Asp Lys Leu Val Glu Glu Gly Lys Leu Tyr Met		

[10500]	945	950	955	960
[10501]	Phe Gln Ile Tyr Asn Lys Asp Phe Ser Asp Lys Ser His Gly Thr Pro			
[10502]		965	970	975
[10503]	Asn Leu His Thr Met Tyr Phe Lys Leu Leu Phe Asp Glu Asn Asn His			
[10504]		980	985	990
[10505]	Gly Gln Ile Arg Leu Ser Gly Gly Ala Glu Leu Phe Met Arg Arg Ala			
[10506]		995	1000	1005
[10507]	Ser Leu Lys Lys Glu Glu Leu Val Val His Pro Ala Asn Ser Pro			
[10508]		1010	1015	1020
[10509]	Ile Ala Asn Lys Asn Pro Asp Asn Pro Lys Lys Thr Thr Thr Leu			
[10510]		1025	1030	1035
[10511]	Ser Tyr Asp Val Tyr Lys Asp Lys Arg Phe Ser Glu Asp Gln Tyr			
[10512]		1040	1045	1050
[10513]	Glu Leu His Ile Pro Ile Ala Ile Asn Lys Cys Pro Lys Asn Ile			
[10514]		1055	1060	1065
[10515]	Phe Lys Ile Asn Thr Glu Val Arg Val Leu Leu Lys His Asp Asp			
[10516]		1070	1075	1080
[10517]	Asn Pro Tyr Val Ile Gly Ile Ala Arg Gly Glu Arg Asn Leu Leu			
[10518]		1085	1090	1095
[10519]	Tyr Ile Val Val Val Asp Gly Lys Gly Asn Ile Val Glu Gln Tyr			
[10520]		1100	1105	1110
[10521]	Ser Leu Asn Glu Ile Ile Asn Asn Phe Asn Gly Ile Arg Ile Lys			
[10522]		1115	1120	1125
[10523]	Thr Asp Tyr His Ser Leu Leu Asp Lys Lys Glu Lys Glu Arg Phe			
[10524]		1130	1135	1140
[10525]	Glu Ala Arg Gln Asn Trp Thr Ser Ile Glu Asn Ile Lys Glu Leu			
[10526]		1145	1150	1155
[10527]	Lys Ala Gly Tyr Ile Ser Gln Val Val His Lys Ile Cys Glu Leu			
[10528]		1160	1165	1170
[10529]	Val Glu Lys Tyr Asp Ala Val Ile Ala Leu Glu Asp Leu Asn Ser			
[10530]		1175	1180	1185
[10531]	Gly Phe Lys Asn Ser Arg Val Lys Val Glu Lys Gln Val Tyr Gln			
[10532]		1190	1195	1200
[10533]	Lys Phe Glu Lys Met Leu Ile Asp Lys Leu Asn Tyr Met Val Asp			
[10534]		1205	1210	1215
[10535]	Lys Lys Ser Asn Pro Cys Ala Thr Gly Gly Ala Leu Lys Gly Tyr			
[10536]		1220	1225	1230
[10537]	Gln Ile Thr Asn Lys Phe Glu Ser Phe Lys Ser Met Ser Thr Gln			
[10538]		1235	1240	1245
[10539]	Asn Gly Phe Ile Phe Tyr Ile Pro Ala Trp Leu Thr Ser Lys Ile			
[10540]		1250	1255	1260
[10541]	Asp Pro Ser Thr Gly Phe Val Asn Leu Leu Lys Thr Lys Tyr Thr			

[10542]	1265	1270	1275
[10543]	Ser Ile Ala Asp Ser Lys Lys Phe Ile Ser Ser Phe Asp Arg Ile		
[10544]	1280	1285	1290
[10545]	Met Tyr Val Pro Glu Glu Asp Leu Phe Glu Phe Ala Leu Asp Tyr		
[10546]	1295	1300	1305
[10547]	Lys Asn Phe Ser Arg Thr Asp Ala Asp Tyr Ile Lys Lys Trp Lys		
[10548]	1310	1315	1320
[10549]	Leu Tyr Ser Tyr Gly Asn Arg Ile Arg Ile Phe Arg Asn Pro Lys		
[10550]	1325	1330	1335
[10551]	Lys Asn Asn Val Phe Asp Trp Glu Glu Val Cys Leu Thr Ser Ala		
[10552]	1340	1345	1350
[10553]	Tyr Lys Glu Leu Phe Asn Lys Tyr Gly Ile Asn Tyr Gln Gln Gly		
[10554]	1355	1360	1365
[10555]	Asp Ile Arg Ala Leu Leu Cys Glu Gln Ser Asp Lys Ala Phe Tyr		
[10556]	1370	1375	1380
[10557]	Ser Ser Phe Met Ala Leu Met Ser Leu Met Leu Gln Met Arg Asn		
[10558]	1385	1390	1395
[10559]	Ser Ile Thr Gly Arg Thr Asp Val Asp Phe Leu Ile Ser Pro Val		
[10560]	1400	1405	1410
[10561]	Lys Asn Ser Asp Gly Ile Phe Tyr Asp Ser Arg Asn Tyr Glu Ala		
[10562]	1415	1420	1425
[10563]	Gln Glu Asn Ala Ile Leu Pro Lys Asn Ala Asp Ala Asn Gly Ala		
[10564]	1430	1435	1440
[10565]	Tyr Asn Ile Ala Arg Lys Val Leu Trp Ala Ile Gly Gln Phe Lys		
[10566]	1445	1450	1455
[10567]	Lys Ala Glu Asp Glu Lys Leu Asp Lys Val Lys Ile Ala Ile Ser		
[10568]	1460	1465	1470
[10569]	Asn Lys Glu Trp Leu Glu Tyr Ala Gln Thr Ser Val Lys His Ser		
[10570]	1475	1480	1485
[10571]	Gly Gly Ser Gly Gly Ser Gly Gly Ser Thr Asn Leu Ser Asp Ile		
[10572]	1490	1495	1500
[10573]	Ile Glu Lys Glu Thr Gly Lys Gln Leu Val Ile Gln Glu Ser Ile		
[10574]	1505	1510	1515
[10575]	Leu Met Leu Pro Glu Glu Val Glu Glu Val Ile Gly Asn Lys Pro		
[10576]	1520	1525	1530
[10577]	Glu Ser Asp Ile Leu Val His Thr Ala Tyr Asp Glu Ser Thr Asp		
[10578]	1535	1540	1545
[10579]	Glu Asn Val Met Leu Leu Thr Ser Asp Ala Pro Glu Tyr Lys Pro		
[10580]	1550	1555	1560
[10581]	Trp Ala Leu Val Ile Gln Asp Ser Asn Gly Glu Asn Lys Ile Lys		
[10582]	1565	1570	1575
[10583]	Met Leu		

[10584]	1580																
[10585]	<210>	103															
[10586]	<211>	1573															
[10587]	<212>	PRT															
[10588]	<213>	人工的															
[10589]	<220>																
[10590]	<223>	多肽															
[10591]	<400>	103															
[10592]	Met	Ser	Ser	Glu	Thr	Gly	Pro	Val	Ala	Val	Asp	Pro	Thr	Leu	Arg	Arg	
[10593]	1				5					10					15		
[10594]	Arg	Ile	Glu	Pro	His	Glu	Phe	Glu	Val	Phe	Phe	Asp	Pro	Arg	Glu	Leu	
[10595]				20					25					30			
[10596]	Arg	Lys	Glu	Thr	Cys	Leu	Leu	Tyr	Glu	Ile	Asn	Trp	Gly	Gly	Arg	His	
[10597]			35					40					45				
[10598]	Ser	Ile	Trp	Arg	His	Thr	Ser	Gln	Asn	Thr	Asn	Lys	His	Val	Glu	Val	
[10599]		50					55					60					
[10600]	Asn	Phe	Ile	Glu	Lys	Phe	Thr	Thr	Glu	Arg	Tyr	Phe	Cys	Pro	Asn	Thr	
[10601]	65					70					75				80		
[10602]	Arg	Cys	Ser	Ile	Thr	Trp	Phe	Leu	Ser	Trp	Ser	Pro	Cys	Gly	Glu	Cys	
[10603]					85					90					95		
[10604]	Ser	Arg	Ala	Ile	Thr	Glu	Phe	Leu	Ser	Arg	Tyr	Pro	His	Val	Thr	Leu	
[10605]			100						105					110			
[10606]	Phe	Ile	Tyr	Ile	Ala	Arg	Leu	Tyr	His	His	Ala	Asp	Pro	Arg	Asn	Arg	
[10607]			115						120					125			
[10608]	Gln	Gly	Leu	Arg	Asp	Leu	Ile	Ser	Ser	Gly	Val	Thr	Ile	Gln	Ile	Met	
[10609]		130					135					140					
[10610]	Thr	Glu	Gln	Glu	Ser	Gly	Tyr	Cys	Trp	Arg	Asn	Phe	Val	Asn	Tyr	Ser	
[10611]	145					150					155				160		
[10612]	Pro	Ser	Asn	Glu	Ala	His	Trp	Pro	Arg	Tyr	Pro	His	Leu	Trp	Val	Arg	
[10613]				165						170					175		
[10614]	Leu	Tyr	Val	Leu	Glu	Leu	Tyr	Cys	Ile	Ile	Leu	Gly	Leu	Pro	Pro	Cys	
[10615]				180					185					190			
[10616]	Leu	Asn	Ile	Leu	Arg	Arg	Lys	Gln	Pro	Gln	Leu	Thr	Phe	Phe	Thr	Ile	
[10617]			195					200					205				
[10618]	Ala	Leu	Gln	Ser	Cys	His	Tyr	Gln	Arg	Leu	Pro	Pro	His	Ile	Leu	Trp	
[10619]		210						215					220				
[10620]	Ala	Thr	Gly	Leu	Lys	Ser	Gly	Ser	Glu	Thr	Pro	Gly	Thr	Ser	Glu	Ser	
[10621]	225					230					235				240		
[10622]	Ala	Thr	Pro	Glu	Ser	Met	Ser	Lys	Leu	Glu	Lys	Phe	Thr	Asn	Cys	Tyr	
[10623]				245						250					255		
[10624]	Ser	Leu	Ser	Lys	Thr	Leu	Arg	Phe	Lys	Ala	Ile	Pro	Val	Gly	Lys	Thr	
[10625]				260					265					270			

[10626]	Gln Glu Asn Ile Asp Asn Lys Arg Leu Leu Val Glu Asp Glu Lys Arg
[10627]	275 280 285
[10628]	Ala Glu Asp Tyr Lys Gly Val Lys Lys Leu Leu Asp Arg Tyr Tyr Leu
[10629]	290 295 300
[10630]	Ser Phe Ile Asn Asp Val Leu His Ser Ile Lys Leu Lys Asn Leu Asn
[10631]	305 310 315 320
[10632]	Asn Tyr Ile Ser Leu Phe Arg Lys Lys Thr Arg Thr Glu Lys Glu Asn
[10633]	325 330 335
[10634]	Lys Glu Leu Glu Asn Leu Glu Ile Asn Leu Arg Lys Glu Ile Ala Lys
[10635]	340 345 350
[10636]	Ala Phe Lys Gly Asn Glu Gly Tyr Lys Ser Leu Phe Lys Lys Asp Ile
[10637]	355 360 365
[10638]	Ile Glu Thr Ile Leu Pro Glu Phe Leu Asp Asp Lys Asp Glu Ile Ala
[10639]	370 375 380
[10640]	Leu Val Asn Ser Phe Asn Gly Phe Thr Thr Ala Phe Thr Gly Phe Phe
[10641]	385 390 395 400
[10642]	Asp Asn Arg Glu Asn Met Phe Ser Glu Glu Ala Lys Ser Thr Ser Ile
[10643]	405 410 415
[10644]	Ala Phe Arg Cys Ile Asn Glu Asn Leu Thr Arg Tyr Ile Ser Asn Met
[10645]	420 425 430
[10646]	Asp Ile Phe Glu Lys Val Asp Ala Ile Phe Asp Lys His Glu Val Gln
[10647]	435 440 445
[10648]	Glu Ile Lys Glu Lys Ile Leu Asn Ser Asp Tyr Asp Val Glu Asp Phe
[10649]	450 455 460
[10650]	Phe Glu Gly Glu Phe Phe Asn Phe Val Leu Thr Gln Glu Gly Ile Asp
[10651]	465 470 475 480
[10652]	Val Tyr Asn Ala Ile Ile Gly Gly Phe Val Thr Glu Ser Gly Glu Lys
[10653]	485 490 495
[10654]	Ile Lys Gly Leu Asn Glu Tyr Ile Asn Leu Tyr Asn Gln Lys Thr Lys
[10655]	500 505 510
[10656]	Gln Lys Leu Pro Lys Phe Lys Pro Leu Tyr Lys Gln Val Leu Ser Asp
[10657]	515 520 525
[10658]	Arg Glu Ser Leu Ser Phe Tyr Gly Glu Gly Tyr Thr Ser Asp Glu Glu
[10659]	530 535 540
[10660]	Val Leu Glu Val Phe Arg Asn Thr Leu Asn Lys Asn Ser Glu Ile Phe
[10661]	545 550 555 560
[10662]	Ser Ser Ile Lys Lys Leu Glu Lys Leu Phe Lys Asn Phe Asp Glu Tyr
[10663]	565 570 575
[10664]	Ser Ser Ala Gly Ile Phe Val Lys Asn Gly Pro Ala Ile Ser Thr Ile
[10665]	580 585 590
[10666]	Ser Lys Asp Ile Phe Gly Glu Trp Asn Val Ile Arg Asp Lys Trp Asn
[10667]	595 600 605

[10668]	Ala	Glu	Tyr	Asp	Asp	Ile	His	Leu	Lys	Lys	Lys	Ala	Val	Val	Thr	Glu
[10669]	610							615				620				
[10670]	Lys	Tyr	Glu	Asp	Asp	Arg	Arg	Lys	Ser	Phe	Lys	Lys	Ile	Gly	Ser	Phe
[10671]	625					630					635					640
[10672]	Ser	Leu	Glu	Gln	Leu	Gln	Glu	Tyr	Ala	Asp	Ala	Asp	Leu	Ser	Val	Val
[10673]					645					650					655	
[10674]	Glu	Lys	Leu	Lys	Glu	Ile	Ile	Ile	Gln	Lys	Val	Asp	Glu	Ile	Tyr	Lys
[10675]					660					665					670	
[10676]	Val	Tyr	Gly	Ser	Ser	Glu	Lys	Leu	Phe	Asp	Ala	Asp	Phe	Val	Leu	Glu
[10677]					675					680					685	
[10678]	Lys	Ser	Leu	Lys	Lys	Asn	Asp	Ala	Val	Val	Ala	Ile	Met	Lys	Asp	Leu
[10679]	690							695							700	
[10680]	Leu	Asp	Ser	Val	Lys	Ser	Phe	Glu	Asn	Tyr	Ile	Lys	Ala	Phe	Phe	Gly
[10681]	705							710								720
[10682]	Glu	Gly	Lys	Glu	Thr	Asn	Arg	Asp	Glu	Ser	Phe	Tyr	Gly	Asp	Phe	Val
[10683]					725						730					735
[10684]	Leu	Ala	Tyr	Asp	Ile	Leu	Leu	Lys	Val	Asp	His	Ile	Tyr	Asp	Ala	Ile
[10685]					740						745					750
[10686]	Arg	Asn	Tyr	Val	Thr	Gln	Lys	Pro	Tyr	Ser	Lys	Asp	Lys	Phe	Lys	Leu
[10687]					755						760					765
[10688]	Tyr	Phe	Gln	Asn	Pro	Gln	Phe	Met	Gly	Gly	Trp	Asp	Lys	Asp	Lys	Glu
[10689]	770										775					780
[10690]	Thr	Asp	Tyr	Arg	Ala	Thr	Ile	Leu	Arg	Tyr	Gly	Ser	Lys	Tyr	Tyr	Leu
[10691]	785							790								800
[10692]	Ala	Ile	Met	Asp	Lys	Lys	Tyr	Ala	Lys	Cys	Leu	Gln	Lys	Ile	Asp	Lys
[10693]					805						810					815
[10694]	Asp	Asp	Val	Asn	Gly	Asn	Tyr	Glu	Lys	Ile	Asn	Tyr	Lys	Leu	Leu	Pro
[10695]					820						825					830
[10696]	Gly	Pro	Asn	Lys	Met	Leu	Pro	Lys	Val	Phe	Phe	Ser	Lys	Lys	Trp	Met
[10697]					835						840					845
[10698]	Ala	Tyr	Tyr	Asn	Pro	Ser	Glu	Asp	Ile	Gln	Lys	Ile	Tyr	Lys	Asn	Gly
[10699]	850										855					860
[10700]	Thr	Phe	Lys	Lys	Gly	Asp	Met	Phe	Asn	Leu	Asn	Asp	Cys	His	Lys	Leu
[10701]	865										870					880
[10702]	Ile	Asp	Phe	Phe	Lys	Asp	Ser	Ile	Ser	Arg	Tyr	Pro	Lys	Trp	Ser	Asn
[10703]					885						890					895
[10704]	Ala	Tyr	Asp	Phe	Asn	Phe	Ser	Glu	Thr	Glu	Lys	Tyr	Lys	Asp	Ile	Ala
[10705]					900						905					910
[10706]	Gly	Phe	Tyr	Arg	Glu	Val	Glu	Glu	Gln	Gly	Tyr	Lys	Val	Ser	Phe	Glu
[10707]					915						920					925
[10708]	Ser	Ala	Ser	Lys	Lys	Glu	Val	Asp	Lys	Leu	Val	Glu	Glu	Gly	Lys	Leu
[10709]	930										935					940

[10710]	Tyr Met Phe Gln Ile Tyr Asn Lys Asp Phe Ser Asp Lys Ser His Gly		
[10711]	945	950	955 960
[10712]	Thr Pro Asn Leu His Thr Met Tyr Phe Lys Leu Leu Phe Asp Glu Asn		
[10713]		965 970	975
[10714]	Asn His Gly Gln Ile Arg Leu Ser Gly Gly Ala Glu Leu Phe Met Arg		
[10715]		980 985	990
[10716]	Arg Ala Ser Leu Lys Lys Glu Glu Leu Val Val His Pro Ala Asn Ser		
[10717]		995 1000	1005
[10718]	Pro Ile Ala Asn Lys Asn Pro Asp Asn Pro Lys Lys Thr Thr Thr		
[10719]	1010	1015	1020
[10720]	Leu Ser Tyr Asp Val Tyr Lys Asp Lys Arg Phe Ser Glu Asp Gln		
[10721]	1025	1030	1035
[10722]	Tyr Glu Leu His Ile Pro Ile Ala Ile Asn Lys Cys Pro Lys Asn		
[10723]	1040	1045	1050
[10724]	Ile Phe Lys Ile Asn Thr Glu Val Arg Val Leu Leu Lys His Asp		
[10725]	1055	1060	1065
[10726]	Asp Asn Pro Tyr Val Ile Gly Ile Ala Arg Gly Glu Arg Asn Leu		
[10727]	1070	1075	1080
[10728]	Leu Tyr Ile Val Val Val Asp Gly Lys Gly Asn Ile Val Glu Gln		
[10729]	1085	1090	1095
[10730]	Tyr Ser Leu Asn Glu Ile Ile Asn Asn Phe Asn Gly Ile Arg Ile		
[10731]	1100	1105	1110
[10732]	Lys Thr Asp Tyr His Ser Leu Leu Asp Lys Lys Glu Lys Glu Arg		
[10733]	1115	1120	1125
[10734]	Phe Glu Ala Arg Gln Asn Trp Thr Ser Ile Glu Asn Ile Lys Glu		
[10735]	1130	1135	1140
[10736]	Leu Lys Ala Gly Tyr Ile Ser Gln Val Val His Lys Ile Cys Glu		
[10737]	1145	1150	1155
[10738]	Leu Val Glu Lys Tyr Asp Ala Val Ile Ala Leu Glu Asp Leu Asn		
[10739]	1160	1165	1170
[10740]	Ser Gly Phe Lys Asn Ser Arg Val Lys Val Glu Lys Gln Val Tyr		
[10741]	1175	1180	1185
[10742]	Gln Lys Phe Glu Lys Met Leu Ile Asp Lys Leu Asn Tyr Met Val		
[10743]	1190	1195	1200
[10744]	Asp Lys Lys Ser Asn Pro Cys Ala Thr Gly Gly Ala Leu Lys Gly		
[10745]	1205	1210	1215
[10746]	Tyr Gln Ile Thr Asn Lys Phe Glu Ser Phe Lys Ser Met Ser Thr		
[10747]	1220	1225	1230
[10748]	Gln Asn Gly Phe Ile Phe Tyr Ile Pro Ala Trp Leu Thr Ser Lys		
[10749]	1235	1240	1245
[10750]	Ile Asp Pro Ser Thr Gly Phe Val Asn Leu Leu Lys Thr Lys Tyr		
[10751]	1250	1255	1260

[10752]	Thr Ser Ile Ala Asp Ser Lys Lys Phe Ile Ser Ser Phe Asp Arg
[10753]	1265 1270 1275
[10754]	Ile Met Tyr Val Pro Glu Glu Asp Leu Phe Glu Phe Ala Leu Asp
[10755]	1280 1285 1290
[10756]	Tyr Lys Asn Phe Ser Arg Thr Asp Ala Asp Tyr Ile Lys Lys Trp
[10757]	1295 1300 1305
[10758]	Lys Leu Tyr Ser Tyr Gly Asn Arg Ile Arg Ile Phe Arg Asn Pro
[10759]	1310 1315 1320
[10760]	Lys Lys Asn Asn Val Phe Asp Trp Glu Glu Val Cys Leu Thr Ser
[10761]	1325 1330 1335
[10762]	Ala Tyr Lys Glu Leu Phe Asn Lys Tyr Gly Ile Asn Tyr Gln Gln
[10763]	1340 1345 1350
[10764]	Gly Asp Ile Arg Ala Leu Leu Cys Glu Gln Ser Asp Lys Ala Phe
[10765]	1355 1360 1365
[10766]	Tyr Ser Ser Phe Met Ala Leu Met Ser Leu Met Leu Gln Met Arg
[10767]	1370 1375 1380
[10768]	Asn Ser Ile Thr Gly Arg Thr Asp Val Asp Phe Leu Ile Ser Pro
[10769]	1385 1390 1395
[10770]	Val Lys Asn Ser Asp Gly Ile Phe Tyr Asp Ser Arg Asn Tyr Glu
[10771]	1400 1405 1410
[10772]	Ala Gln Glu Asn Ala Ile Leu Pro Lys Asn Ala Asp Ala Asn Gly
[10773]	1415 1420 1425
[10774]	Ala Tyr Asn Ile Ala Arg Lys Val Leu Trp Ala Ile Gly Gln Phe
[10775]	1430 1435 1440
[10776]	Lys Lys Ala Glu Asp Glu Lys Leu Asp Lys Val Lys Ile Ala Ile
[10777]	1445 1450 1455
[10778]	Ser Asn Lys Glu Trp Leu Glu Tyr Ala Gln Thr Ser Val Lys His
[10779]	1460 1465 1470
[10780]	Gly Ser Pro Lys Lys Lys Arg Lys Val Ser Gly Gly Ser Thr Asn
[10781]	1475 1480 1485
[10782]	Leu Ser Asp Ile Ile Glu Lys Glu Thr Gly Lys Gln Leu Val Ile
[10783]	1490 1495 1500
[10784]	Gln Glu Ser Ile Leu Met Leu Pro Glu Glu Val Glu Glu Val Ile
[10785]	1505 1510 1515
[10786]	Gly Asn Lys Pro Glu Ser Asp Ile Leu Val His Thr Ala Tyr Asp
[10787]	1520 1525 1530
[10788]	Glu Ser Thr Asp Glu Asn Val Met Leu Leu Thr Ser Asp Ala Pro
[10789]	1535 1540 1545
[10790]	Glu Tyr Lys Pro Trp Ala Leu Val Ile Gln Asp Ser Asn Gly Glu
[10791]	1550 1555 1560
[10792]	Asn Lys Ile Lys Met Leu Thr Lys Tyr Asp
[10793]	1565 1570

[10794]	<210>	104
[10795]	<211>	1593
[10796]	<212>	PRT
[10797]	<213>	人工的
[10798]	<220>	
[10799]	<223>	融合蛋白
[10800]	<400>	104
[10801]	Met Lys Arg Thr Ala Asp Gly Ser Glu Phe Glu Ser Pro Lys Lys Lys	
[10802]	1 5 10 15	
[10803]	Arg Lys Val Glu Ala Ser Pro Ala Ser Gly Pro Arg His Leu Met Asp	
[10804]	20 25 30	
[10805]	Pro His Ile Phe Thr Ser Asn Phe Asn Asn Gly Ile Gly Arg His Lys	
[10806]	35 40 45	
[10807]	Thr Tyr Leu Cys Tyr Glu Val Glu Arg Leu Asp Asn Gly Thr Ser Val	
[10808]	50 55 60	
[10809]	Lys Met Asp Gln His Arg Gly Phe Leu His Asn Gln Ala Lys Asn Leu	
[10810]	65 70 75 80	
[10811]	Leu Cys Gly Phe Tyr Gly Arg His Ala Glu Leu Arg Phe Leu Asp Leu	
[10812]	85 90 95	
[10813]	Val Pro Ser Leu Gln Leu Asp Pro Ala Gln Ile Tyr Arg Val Thr Trp	
[10814]	100 105 110	
[10815]	Phe Ile Ser Trp Ser Pro Cys Phe Ser Trp Gly Cys Ala Gly Glu Val	
[10816]	115 120 125	
[10817]	Arg Ala Phe Leu Gln Glu Asn Thr His Val Arg Leu Arg Ile Phe Ala	
[10818]	130 135 140	
[10819]	Ala Arg Ile Tyr Asp Tyr Asp Pro Leu Tyr Lys Glu Ala Leu Gln Met	
[10820]	145 150 155 160	
[10821]	Leu Arg Asp Ala Gly Ala Gln Val Ser Ile Met Thr Tyr Asp Glu Phe	
[10822]	165 170 175	
[10823]	Lys His Cys Trp Asp Thr Phe Val Asp His Gln Gly Cys Pro Phe Gln	
[10824]	180 185 190	
[10825]	Pro Trp Asp Gly Leu Asp Glu His Ser Gln Ala Leu Ser Gly Arg Leu	
[10826]	195 200 205	
[10827]	Arg Ala Ile Leu Gln Asn Gln Gly Asn Ser Gly Gly Ser Ser Gly Gly	
[10828]	210 215 220	
[10829]	Ser Ser Gly Ser Glu Thr Pro Gly Thr Ser Glu Ser Ala Thr Pro Glu	
[10830]	225 230 235 240	
[10831]	Ser Ser Gly Gly Ser Ser Gly Gly Ser Ser Lys Leu Glu Lys Phe Thr	
[10832]	245 250 255	
[10833]	Asn Cys Tyr Ser Leu Ser Lys Thr Leu Arg Phe Lys Ala Ile Pro Val	
[10834]	260 265 270	
[10835]	Gly Lys Thr Gln Glu Asn Ile Asp Asn Lys Arg Leu Leu Val Glu Asp	

[10836]	275	280	285
[10837]	Glu Lys Arg Ala Glu Asp Tyr Lys Gly Val Lys Lys Leu Leu Asp Arg		
[10838]	290	295	300
[10839]	Tyr Tyr Leu Ser Phe Ile Asn Asp Val Leu His Ser Ile Lys Leu Lys		
[10840]	305	310	315
[10841]	Asn Leu Asn Asn Tyr Ile Ser Leu Phe Arg Lys Lys Thr Arg Thr Glu		
[10842]	325	330	335
[10843]	Lys Glu Asn Lys Glu Leu Glu Asn Leu Glu Ile Asn Leu Arg Lys Glu		
[10844]	340	345	350
[10845]	Ile Ala Lys Ala Phe Lys Gly Asn Glu Gly Tyr Lys Ser Leu Phe Lys		
[10846]	355	360	365
[10847]	Lys Asp Ile Ile Glu Thr Ile Leu Pro Glu Phe Leu Asp Asp Lys Asp		
[10848]	370	375	380
[10849]	Glu Ile Ala Leu Val Asn Ser Phe Asn Gly Phe Thr Thr Ala Phe Thr		
[10850]	385	390	395
[10851]	Gly Phe Phe Asp Asn Arg Glu Asn Met Phe Ser Glu Glu Ala Lys Ser		
[10852]	405	410	415
[10853]	Thr Ser Ile Ala Phe Arg Cys Ile Asn Glu Asn Leu Thr Arg Tyr Ile		
[10854]	420	425	430
[10855]	Ser Asn Met Asp Ile Phe Glu Lys Val Asp Ala Ile Phe Asp Lys His		
[10856]	435	440	445
[10857]	Glu Val Gln Glu Ile Lys Glu Lys Ile Leu Asn Ser Asp Tyr Asp Val		
[10858]	450	455	460
[10859]	Glu Asp Phe Phe Glu Gly Glu Phe Phe Asn Phe Val Leu Thr Gln Glu		
[10860]	465	470	475
[10861]	Gly Ile Asp Val Tyr Asn Ala Ile Ile Gly Gly Phe Val Thr Glu Ser		
[10862]	485	490	495
[10863]	Gly Glu Lys Ile Lys Gly Leu Asn Glu Tyr Ile Asn Leu Tyr Asn Gln		
[10864]	500	505	510
[10865]	Lys Thr Lys Gln Lys Leu Pro Lys Phe Lys Pro Leu Tyr Lys Gln Val		
[10866]	515	520	525
[10867]	Leu Ser Asp Arg Glu Ser Leu Ser Phe Tyr Gly Glu Gly Tyr Thr Ser		
[10868]	530	535	540
[10869]	Asp Glu Glu Val Leu Glu Val Phe Arg Asn Thr Leu Asn Lys Asn Ser		
[10870]	545	550	555
[10871]	Glu Ile Phe Ser Ser Ile Lys Lys Leu Glu Lys Leu Phe Lys Asn Phe		
[10872]	565	570	575
[10873]	Asp Glu Tyr Ser Ser Ala Gly Ile Phe Val Lys Asn Gly Pro Ala Ile		
[10874]	580	585	590
[10875]	Ser Thr Ile Ser Lys Asp Ile Phe Gly Glu Trp Asn Val Ile Arg Asp		
[10876]	595	600	605
[10877]	Lys Trp Asn Ala Glu Tyr Asp Asp Ile His Leu Lys Lys Lys Ala Val		

[10878]	610	615	620
[10879]	Val Thr Glu Lys Tyr Glu Asp Asp Arg Arg Lys Ser Phe Lys Lys Ile		
[10880]	625	630	635
[10881]	Gly Ser Phe Ser Leu Glu Gln Leu Gln Glu Tyr Ala Asp Ala Asp Leu		
[10882]	645	650	655
[10883]	Ser Val Val Glu Lys Leu Lys Glu Ile Ile Ile Gln Lys Val Asp Glu		
[10884]	660	665	670
[10885]	Ile Tyr Lys Val Tyr Gly Ser Ser Glu Lys Leu Phe Asp Ala Asp Phe		
[10886]	675	680	685
[10887]	Val Leu Glu Lys Ser Leu Lys Lys Asn Asp Ala Val Val Ala Ile Met		
[10888]	690	695	700
[10889]	Lys Asp Leu Leu Asp Ser Val Lys Ser Phe Glu Asn Tyr Ile Lys Ala		
[10890]	705	710	715
[10891]	Phe Phe Gly Glu Gly Lys Glu Thr Asn Arg Asp Glu Ser Phe Tyr Gly		
[10892]	725	730	735
[10893]	Asp Phe Val Leu Ala Tyr Asp Ile Leu Leu Lys Val Asp His Ile Tyr		
[10894]	740	745	750
[10895]	Asp Ala Ile Arg Asn Tyr Val Thr Gln Lys Pro Tyr Ser Lys Asp Lys		
[10896]	755	760	765
[10897]	Phe Lys Leu Tyr Phe Gln Asn Pro Gln Phe Met Gly Gly Trp Asp Lys		
[10898]	770	775	780
[10899]	Asp Lys Glu Thr Asp Tyr Arg Ala Thr Ile Leu Arg Tyr Gly Ser Lys		
[10900]	785	790	795
[10901]	Tyr Tyr Leu Ala Ile Met Asp Lys Lys Tyr Ala Lys Cys Leu Gln Lys		
[10902]	805	810	815
[10903]	Ile Asp Lys Asp Asp Val Asn Gly Asn Tyr Glu Lys Ile Asn Tyr Lys		
[10904]	820	825	830
[10905]	Leu Leu Pro Gly Pro Asn Lys Met Leu Pro Lys Val Phe Phe Ser Lys		
[10906]	835	840	845
[10907]	Lys Trp Met Ala Tyr Tyr Asn Pro Ser Glu Asp Ile Gln Lys Ile Tyr		
[10908]	850	855	860
[10909]	Lys Asn Gly Thr Phe Lys Lys Gly Asp Met Phe Asn Leu Asn Asp Cys		
[10910]	865	870	875
[10911]	His Lys Leu Ile Asp Phe Phe Lys Asp Ser Ile Ser Arg Tyr Pro Lys		
[10912]	885	890	895
[10913]	Trp Ser Asn Ala Tyr Asp Phe Asn Phe Ser Glu Thr Glu Lys Tyr Lys		
[10914]	900	905	910
[10915]	Asp Ile Ala Gly Phe Tyr Arg Glu Val Glu Glu Gln Gly Tyr Lys Val		
[10916]	915	920	925
[10917]	Ser Phe Glu Ser Ala Ser Lys Lys Glu Val Asp Lys Leu Val Glu Glu		
[10918]	930	935	940
[10919]	Gly Lys Leu Tyr Met Phe Gln Ile Tyr Asn Lys Asp Phe Ser Asp Lys		

[10920]	945	950	955	960
[10921]	Ser His Gly Thr Pro Asn Leu His Thr Met Tyr Phe Lys Leu Leu Phe			
[10922]		965	970	975
[10923]	Asp Glu Asn Asn His Gly Gln Ile Arg Leu Ser Gly Gly Ala Glu Leu			
[10924]		980	985	990
[10925]	Phe Met Arg Arg Ala Ser Leu Lys Lys Glu Glu Leu Val Val His Pro			
[10926]		995	1000	1005
[10927]	Ala Asn Ser Pro Ile Ala Asn Lys Asn Pro Asp Asn Pro Lys Lys			
[10928]		1010	1015	1020
[10929]	Thr Thr Thr Leu Ser Tyr Asp Val Tyr Lys Asp Lys Arg Phe Ser			
[10930]		1025	1030	1035
[10931]	Glu Asp Gln Tyr Glu Leu His Ile Pro Ile Ala Ile Asn Lys Cys			
[10932]		1040	1045	1050
[10933]	Pro Lys Asn Ile Phe Lys Ile Asn Thr Glu Val Arg Val Leu Leu			
[10934]		1055	1060	1065
[10935]	Lys His Asp Asp Asn Pro Tyr Val Ile Gly Ile Ala Arg Gly Glu			
[10936]		1070	1075	1080
[10937]	Arg Asn Leu Leu Tyr Ile Val Val Val Asp Gly Lys Gly Asn Ile			
[10938]		1085	1090	1095
[10939]	Val Glu Gln Tyr Ser Leu Asn Glu Ile Ile Asn Asn Phe Asn Gly			
[10940]		1100	1105	1110
[10941]	Ile Arg Ile Lys Thr Asp Tyr His Ser Leu Leu Asp Lys Lys Glu			
[10942]		1115	1120	1125
[10943]	Lys Glu Arg Phe Glu Ala Arg Gln Asn Trp Thr Ser Ile Glu Asn			
[10944]		1130	1135	1140
[10945]	Ile Lys Glu Leu Lys Ala Gly Tyr Ile Ser Gln Val Val His Lys			
[10946]		1145	1150	1155
[10947]	Ile Cys Glu Leu Val Glu Lys Tyr Asp Ala Val Ile Ala Leu Glu			
[10948]		1160	1165	1170
[10949]	Asp Leu Asn Ser Gly Phe Lys Asn Ser Arg Val Lys Val Glu Lys			
[10950]		1175	1180	1185
[10951]	Gln Val Tyr Gln Lys Phe Glu Lys Met Leu Ile Asp Lys Leu Asn			
[10952]		1190	1195	1200
[10953]	Tyr Met Val Asp Lys Lys Ser Asn Pro Cys Ala Thr Gly Gly Ala			
[10954]		1205	1210	1215
[10955]	Leu Lys Gly Tyr Gln Ile Thr Asn Lys Phe Glu Ser Phe Lys Ser			
[10956]		1220	1225	1230
[10957]	Met Ser Thr Gln Asn Gly Phe Ile Phe Tyr Ile Pro Ala Trp Leu			
[10958]		1235	1240	1245
[10959]	Thr Ser Lys Ile Asp Pro Ser Thr Gly Phe Val Asn Leu Leu Lys			
[10960]		1250	1255	1260
[10961]	Thr Lys Tyr Thr Ser Ile Ala Asp Ser Lys Lys Phe Ile Ser Ser			

[10962]	1265	1270	1275
[10963]	Phe Asp Arg Ile Met Tyr Val	Pro Glu Glu Asp Leu	Phe Glu Phe
[10964]	1280	1285	1290
[10965]	Ala Leu Asp Tyr Lys Asn Phe	Ser Arg Thr Asp Ala	Asp Tyr Ile
[10966]	1295	1300	1305
[10967]	Lys Lys Trp Lys Leu Tyr Ser	Tyr Gly Asn Arg Ile	Arg Ile Phe
[10968]	1310	1315	1320
[10969]	Arg Asn Pro Lys Lys Asn Asn	Val Phe Asp Trp Glu	Glu Val Cys
[10970]	1325	1330	1335
[10971]	Leu Thr Ser Ala Tyr Lys Glu	Leu Phe Asn Lys Tyr	Gly Ile Asn
[10972]	1340	1345	1350
[10973]	Tyr Gln Gln Gly Asp Ile Arg	Ala Leu Leu Cys Glu	Gln Ser Asp
[10974]	1355	1360	1365
[10975]	Lys Ala Phe Tyr Ser Ser Phe	Met Ala Leu Met Ser	Leu Met Leu
[10976]	1370	1375	1380
[10977]	Gln Met Arg Asn Ser Ile Thr	Gly Arg Thr Asp Val	Asp Phe Leu
[10978]	1385	1390	1395
[10979]	Ile Ser Pro Val Lys Asn Ser	Asp Gly Ile Phe Tyr	Asp Ser Arg
[10980]	1400	1405	1410
[10981]	Asn Tyr Glu Ala Gln Glu Asn	Ala Ile Leu Pro Lys	Asn Ala Asp
[10982]	1415	1420	1425
[10983]	Ala Asn Gly Ala Tyr Asn Ile	Ala Arg Lys Val Leu	Trp Ala Ile
[10984]	1430	1435	1440
[10985]	Gly Gln Phe Lys Lys Ala Glu	Asp Glu Lys Leu Asp	Lys Val Lys
[10986]	1445	1450	1455
[10987]	Ile Ala Ile Ser Asn Lys Glu	Trp Leu Glu Tyr Ala	Gln Thr Ser
[10988]	1460	1465	1470
[10989]	Val Lys His Ser Gly Gly Ser	Gly Gly Ser Gly Gly	Ser Thr Asn
[10990]	1475	1480	1485
[10991]	Leu Ser Asp Ile Ile Glu Lys	Glu Thr Gly Lys Gln	Leu Val Ile
[10992]	1490	1495	1500
[10993]	Gln Glu Ser Ile Leu Met Leu	Pro Glu Glu Val Glu	Glu Val Ile
[10994]	1505	1510	1515
[10995]	Gly Asn Lys Pro Glu Ser Asp	Ile Leu Val His Thr	Ala Tyr Asp
[10996]	1520	1525	1530
[10997]	Glu Ser Thr Asp Glu Asn Val	Met Leu Leu Thr Ser	Asp Ala Pro
[10998]	1535	1540	1545
[10999]	Glu Tyr Lys Pro Trp Ala Leu	Val Ile Gln Asp Ser	Asn Gly Glu
[11000]	1550	1555	1560
[11001]	Asn Lys Ile Lys Met Leu Ser	Gly Gly Ser Lys Arg	Thr Ala Asp
[11002]	1565	1570	1575
[11003]	Gly Ser Glu Phe Glu Pro Lys	Lys Lys Arg Lys Val	Gly Ser Gly

[11004]	1580	1585	1590	
[11005]	<210>	105		
[11006]	<211>	4912		
[11007]	<212>	DNA		
[11008]	<213>	人工的		
[11009]	<220>			
[11010]	<223>	多核苷酸		
[11011]	<400>	105		
[11012]	atgaaacgga cagccgacgg aagcgagttc gagtacacaa agaagaagcg gaaagtcgag	60		
[11013]	gcctcccccg catcaggacc tagacacctg atggatcccc atattttcac atctaacttc		120	
[11014]	aacaacggaa tcggcagaca caagacctac ctgtgctatg aggtggaaag gctggataac		180	
[11015]	ggaacctctg tgaagatgga ccagcacagg taagtatcaa ggttacaaga caggtttaag		240	
[11016]	gagaccaata gaaactgggc ttgtcgagac agagaagact cttgcgtttc tgataggcac		300	
[11017]	ctattggtct tactgacatc cactttgcct ttctctccac aggggcttcc tgcataacca		360	
[11018]	ggccaagaat ctgctgtgcg gttttacagg gagacatgca gaactgaggt ttctggatct		420	
[11019]	ggtgccatcc ctgcagctgg acccgctca gatctacaga gtgacttggt tcattctcttg		480	
[11020]	gagcccttgc ttttcatggg gatgtgctgg cgaggtgagg gccttccttc aggaaaacac		540	
[11021]	acacgtgaga ctgaggattt ttgctgccag aatctacgat tatgaccac tgtacaagga		600	
[11022]	agctctgcag atgctgaggg atgcaggcgc tcaggtgagc attatgacct atgacgaatt		660	
[11023]	caagcactgc tgggatactt ttgtggacca tcagggttgt ctttttcagc catgggatgg		720	
[11024]	gctggacgag cattctcagg cactgagcgg tagactgagg gctatcctgc agaaccaggg		780	
[11025]	gaatagtggc ggtagctcag gtggtagttc aggtagcgag accccgggta catccgagtc		840	
[11026]	agcaacacct gagtcaagcg gcggtagttc aggtggctcc tccaagctgg agaagtttac		900	
[11027]	aaactgttac agcctctcca aaaccctcag gtttaaagcg atcccgtgg gcaagaccca		960	
[11028]	ggagaacatc gacaacaaga ggctcctggt ggaagacgag aagcgcgccg aagactacaa		1020	
[11029]	ggcgctgaag aagctgctcg ataggtacta cctcagcttt attaacgacg tgctgcacag		1080	
[11030]	catcaaactc aagaatctca acaactacat ctccctcttc cgcaaaaaga cccgcaccga		1140	
[11031]	gaaggagaac aaggagctgg agaacctgga gatcaacctc cgcaaggaaa tcgccaaagc		1200	
[11032]	gttcaagggc aatgaagggt acaagagcct cttcaagaaa gacatcatcg aaactatcct		1260	
[11033]	cccagagttt ctcgatgaca aggacgagat cgcgctggtg aactccttta acgggttcac		1320	
[11034]	aaccgcgttt accggcttct ttgataacag ggaaaatatg ttctccgagg aggccaagtc		1380	
[11035]	caccagcatc gccttcaggt gtatcaacga gaacctcacc cgctacattt ccaatatgga		1440	
[11036]	cattttcgag aaggtggatg cgatcttcga taagcacgag gtgcaggaga tcaaagagaa		1500	
[11037]	gattctcaat tccgattatg acgtcgagga ttctctcgaa ggggagttct ttaattttgt		1560	
[11038]	gctcacacaa gagggcattg acgtgtacaa cgcgattatc gggggcttcg tcacagagtc		1620	
[11039]	cggggagaag attaaggggc tgaatgagta catcaatctg tacaatcaga agaccaagca		1680	
[11040]	gaaactgccg aaattcaagc cgctctacaa gcaagtcctg tccgataggg aaagcctctc		1740	
[11041]	cttctacggc gagggctata ccagcgacga ggaggtgctg gaagtcttcc gcaacacact		1800	
[11042]	gaataagaat agcgagattt tctctccat caagaagctc gagaagctct ttaagaactt		1860	
[11043]	tgacgagtac agctccgccg ggattttcgt gaagaacggg ccggcgatca gcaccatctc		1920	
[11044]	caaggacatc tttggcgagt ggaacgtcat cagggacaag tggaacgccg agtacgacga		1980	
[11045]	catccacctg aagaagaagg cgggtgtgac cgagaagtat gaggacgac gcaggaagtc		2040	

[11046]	cttcaaaaaa atcggctcct tcagcctcga acagctccag gagtatgccg atgcggatct	2100
[11047]	gtccgtcgtc gagaagctga aggaaatcat cattcagaag gtcgacgaga tctataaagt	2160
[11048]	gtacgggtcc agcgagaagc tgttcgacgc cgactttgtg ctcgagaagt cctcaaaaa	2220
[11049]	gaatgacgcc gtggtggcca ttatgaaaga cctgctcgac tccgtgaagt ctttcgaaaa	2280
[11050]	ttacattaaa gcgttctttg gggaggggaa ggaaactaac agggatgagt ctttctatgg	2340
[11051]	cgactttgtc ctgcgtacg acatcctgct gaaggctgac cacatttacg acgcgatccg	2400
[11052]	caactacgtg acacagaagc cgtactccaa agacaagttc aagctgtact tccagaaccc	2460
[11053]	gcaatttatg gggggtggg acaaggataa agagacagac taccgcgcga caattctccg	2520
[11054]	ctatggctcc aaatactatc tggccatcat ggacaagaag tacgcgaagt gcctgcagaa	2580
[11055]	gatcgacaaa gacgacgtca atggcaacta tgaaaagatc aactacaagc tgctgccggg	2640
[11056]	cccgaacaag atgtcccgga aggtgttctt cagcaagaag tggatggcct actacaatcc	2700
[11057]	aagcgaggat attcagaaaa tctataaaaa cgggaccttc aagaaggggg acatgtttaa	2760
[11058]	cctcaacgac tgccacaagc tcattgattt cttcaaggat agcatttccc gctacccgaa	2820
[11059]	atgggtccat gcgtacgatt ttaacttctc cgagacagaa aagtacaaag acatcgcggg	2880
[11060]	cttttacagg gaggtggagg agcaagggtg taaagtittt tttgaatccg cgagcaagaa	2940
[11061]	ggaagtcgac aagctcgtcg aggagggcaa gctctacatg ttccaaattt ataacaagga	3000
[11062]	cttttccgac aagagccatg ggaccccaaa cctccacacc atgtacttca aactgctctt	3060
[11063]	tgacgagaac aaccacgggc aaatcaggct gagcggcggc gccgaattat tcatgcgcag	3120
[11064]	ggcctccctc aagaaggagg agctggctgt ccatccagcc aattccccga tcgcaacaa	3180
[11065]	gaacccgac aatccgaaaa agaccaccac cctgtctac gacgtctaca aggacaaacg	3240
[11066]	cttcagcgaa gaccagtacg aattacacat cccaattgag attaataagt gcccaaagaa	3300
[11067]	tatcttcaaa attaatacag aggtcagggt gctgctcaaa cacgacgaca atccgtatgt	3360
[11068]	catcggcatt gccagggcg agcgcaatct gctctatata gtggctgtgg atgggaaggg	3420
[11069]	caatattgtg gagcagtact ccctgaacga gattatcaac aacttcaatg ggattaggat	3480
[11070]	taagaccgac tatcacagcc tgctcgacaa gaaagaaaaa gagaggtttg aggcccgcca	3540
[11071]	aaactggacc tcatttgaga atatacaaga attaaaggcc ggctatatat cccaagtcgt	3600
[11072]	ccacaagatc tgcgagctgg tggagaaata tgacgccgtg attgcgctcg aagacttaaa	3660
[11073]	ttctgggttc aagaactccc gcgtgaaggt ggaanaacag gtgtatcaga aattcgagaa	3720
[11074]	aatgctgate gacaaactca attatatggt ggataagaag tccaaccgt gtgccacagg	3780
[11075]	ggcgcgctg aagggtatc agatcaccaa caagttcgag agcttcaaga gcatgagcac	3840
[11076]	ccagaacggg tttattttct acatcccggc gtggctcacc tccaagattg acccgagcac	3900
[11077]	cggttcgtg aacctcctga agacaaagta tacctccatt gccgacagca agaagtttat	3960
[11078]	ctcctccttc gaccgcatta tgtatgtgcc ggaggaggac ctcttcgagt tcgccctcga	4020
[11079]	ctacaaaaac ttcagccgca cagatgcgga ttacatcaag aagtggaagc tgtactccta	4080
[11080]	cggaacagg atccgcattc tcaggaatcc aaaaaaaaaa aacgtctttg actgggagga	4140
[11081]	agtgtgcctg acatccgcct acaaggaaact gttcaataaa tacggcatca attaccagca	4200
[11082]	ggcgacatt cgcgccctcc tctgtgagca gtccgacaaa gcgttttact ccagcttcat	4260
[11083]	ggccctcatg tcctgatgc tccaaatgag gaatagcatc acagggcgca ccgacgtcga	4320
[11084]	cttctcatc agcccggtga agaactccga cgggatcttt tacgactccc gcaactatga	4380
[11085]	ggcgcaagag aatgcgatcc tcccgaagaa cgccgatgcg aacggggcct ataatatgc	4440
[11086]	caggaaagtg ctctgggcca tcgggcagtt caaaaaggcg gaggatgaga agctcgacaa	4500
[11087]	ggtgaaaatt gccatttcca acaaggagtg gctggagtac gcgcagacct ccgtgaagca	4560

[11088]	ctcaggcgga agtgggtggaa gtggcggtag taccaacctc agcgacatta tcgagaagga	4620
[11089]	aaccggcaag caactcgtga tccaggagag catactgatg ctccccgagg aggtcgagga	4680
[11090]	ggtgattggc aataagcccg agtccgatat actggttcat actgcgtatg acgaaagcac	4740
[11091]	agacgagaac gtcattgtac ttaccagcga cgcggcgagg tacaagccct gggccctagt	4800
[11092]	catccaagac agcaacgggtg agaacaagat caagatgctt tctggcggtc caaaaagaac	4860
[11093]	cgccgacggc agcgaattcg agcccaagaa gaagaggaaa gtcggaagcg ga	4912
[11094]	<210> 106	
[11095]	<211> 4954	
[11096]	<212> DNA	
[11097]	<213> 人工的	
[11098]	<220>	
[11099]	<223> 多核苷酸	
[11100]	<400> 106	
[11101]	atgaaacgga cagccgacgg aagcgagttc gagtcaccaa agaagaagcg gaaagtcacc	60
[11102]	aacctcagcg acattatcga gaaggaaacc ggcaagcaac tcgtgatcca ggagagcata	120
[11103]	ctgatgtcc cagaggagt cgaggaggtg attggcaata agcccgagtc cgatatactg	180
[11104]	gttcatactg cgtatgacga aagcacagac gagaacgtca tgctacttac cagcgacgcc	240
[11105]	ccggagtaca agccctgggc cctagtcac caagacagca acggtgagaa caagatcaag	300
[11106]	atgcttagtg gcgggtccgg tgggtccggt ggtagctcca agctggagaa gtttacaac	360
[11107]	tgttacagcc tctccaaac cctcaggttt aaagcgatcc cgggtgggcaa gaccaggag	420
[11108]	aacatcgaca acaagaggct cctggtggaa gacgagaagc gcgccgaaga ctacaagggc	480
[11109]	gtgaagaagc tgctcgatag gtactacctc agctttatta acgacgtgct gcacagcatc	540
[11110]	aaactcaaga atctcaaaa ctacatctcc ctcttcgca aaaagaccg caccgagaag	600
[11111]	gagaacaagg agctggagaa cctggagatc aacctccgca aggaaatcgc caaagcgttc	660
[11112]	aagggaatg aagggtacaa gagcctcttc aagaaagaca tcatcgaaac tatctctcca	720
[11113]	gagtttctcg atgacaagga cgagatcgcg ctggtgaact cttttaacgg gttcacaacc	780
[11114]	gcgtttaccg gcttctttga taacaggga aatatgttct ccgaggagc caagtccacc	840
[11115]	agcatcgct tcaggtgtat caacgagaac ctcaccgct acatttcaa tatggacatt	900
[11116]	ttcgagaagg tggatcgat cttcgataag cacgaggtgc aggagatcaa agagaagatt	960
[11117]	ctcaattccg attatgacgt cgaggatttc ttcgaagggg agttcttta ttttgtgtc	1020
[11118]	acacaagagg gcattgacgt gtacaacgag attatcgagg gcttcgtcac agagtccggg	1080
[11119]	gagaagatta aggggctgaa tgagtacatc aatctgtaca atcagaagac caagcagaaa	1140
[11120]	ctgccgaaat tcaagccgct ctacaagcaa gtctgtccg atagggaag cctctccttc	1200
[11121]	tacggcgagg gctataccag cgacgaggag gtgctggaag tcttcgcaa cacactgaat	1260
[11122]	aagaatagcg agattttctc ctccatcaag aagctcgaga agctcttta gaactttgac	1320
[11123]	gagtacagct ccgcccggat tttctgaa aacgggcccg cgatcagcac catctccaag	1380
[11124]	gacatctttg gcgagtggaa cgtcatcagg gacaagtga acgccgagta cgacgacatc	1440
[11125]	cacctgaaga agaaggcggg ggtgaccgag aagtatgagg acgatcgag gaagtccttc	1500
[11126]	aaaaaaatcg gctccttcag cctcgaacag ctccaggagt atgccgatgc ggatctgtcc	1560
[11127]	gtcgtcgaga agctgaagga aatcatcatt cagaaggtcg acgagatcta taaagtgtac	1620
[11128]	gggtccagcg agaagctgtt cgacgccgac tttgtgctcg agaagtcctt caaaaagaat	1680
[11129]	gacgccgtgg tggccattat gaaagacctg ctcgactccg tgaagtcctt cgaaaattac	1740

[11130]	attaaagcgt tctttgggga ggggaaggaa actaacaggg atgagtcctt ctatggcgac	1800
[11131]	tttgtcctcg cgtacgacat cctgctgaag gtcgaccaca tttagcgacg gatccgcaac	1860
[11132]	tacgtgacac agaagccgta ctccaaagac aagttcaagc tgtacttcca gaacccgcaa	1920
[11133]	tttatggggg gctgggacaa ggataaagag acagactacc gcgcgacaat tctccgctat	1980
[11134]	ggctccaaat actatctggc catcatggac aagaagtacg cgaagtgcct gcagaagatc	2040
[11135]	gacaaagacg acgtcaatgg caactatgaa aagatcaact acaagctgct gccgggccccg	2100
[11136]	aacaagatgc tcccgaaggt gttcttcage aagaagtga tggcctaact caatccaagc	2160
[11137]	gaggatatct agaaaatcta taaaaacggg accttcaaga agggggacat gtttaacctc	2220
[11138]	aacgactgcc acaagctcat tgatttcttc aaggatagca tttcccgtc cccgaaatgg	2280
[11139]	tccaatgcgt acgattttta cttctccgag acagaaaagt acaaagacat cgcgggcttt	2340
[11140]	tacagggagg tggaggagca agggataaaa gtttcttttg aatccgcgag caagaaggaa	2400
[11141]	gtcgacaagc tcgtcgagga gggcaagctc tacatgttcc aaatttataa caaggacttt	2460
[11142]	tcgcacaaga gccatgggac cccaaacctc cacaccatgt acttcaaact gctctttgac	2520
[11143]	gagaacaacc acgggcaaat caggctgagc ggccggcgccg aattattcat gcgcagggcc	2580
[11144]	tcctcaaga aggaggagct ggtcgtccat ccagccaatt ccccgatcg caacaagaac	2640
[11145]	ccggacaatc cgaaaaagac caccacctg tctacgacg tctacaagga caaacgcttc	2700
[11146]	agcgaagacc agtacgaatt acacatccca attgcgatta ataagtccc aaagaatata	2760
[11147]	ttcaaaatta atacagaggt cagggtgctg ctcaaacacg acgacaatcc gtatgtcatc	2820
[11148]	ggcattgcc a gggcgagcg caatctgctc tatatcgtg tcgtggatgg gaagggcaat	2880
[11149]	attgtggagc agtactccct gaacgagatt atcaacaact tcaatgggat taggattaag	2940
[11150]	accgactatc acagcctgct cgacaagaaa gaaaaagaga ggtttgaggc ccgccaaaac	3000
[11151]	tggacctcca ttgagaatat caaagaatta aaggccggt atatttccca agtcgtccac	3060
[11152]	aagatctgcg agctggtgga gaaatatgac gccgtgattg cgctcgaaga cttaaattct	3120
[11153]	gggttcaaga actcccgcgt gaagggtgaa aaacaggtgt atcagaaatt cgagaaaatg	3180
[11154]	ctgatcgaca aactcaatta tatggtggat aagaagtcca acccgtgtgc cacagggggc	3240
[11155]	gcgtgaagg gctatcagat caccaacaag ttcgagagct tcaagagcat gagcaccag	3300
[11156]	aacgggttta tttctacat cccggcgtgg ctacactcca agattgaccc gagcaccggc	3360
[11157]	ttcgtgaacc tctgaagac aaagtatacc tccattgccg acagcaagaa gtttatctcc	3420
[11158]	tccttcgacc gcattatgta tgtgccggag gaggacctc tegagttcgc cctcgactac	3480
[11159]	aaaaacttca gccgcacaga tgcggattac atcaagaagt ggaagctgta ctctacggg	3540
[11160]	aacaggatcc gcattctcag gaatccaaaa aaaaataacg tctttgactg ggaggaagtg	3600
[11161]	tgcttgacat ccgcctacaa ggaactgttc aataaatacg gcatcaatta ccagcagggc	3660
[11162]	gacattcgcg cctcctctg tgagcagtc gacaaagcgt ttactccag cttcatggcc	3720
[11163]	ctcatgtccc tgatgtcca aatgaggaat agcatcacag ggccgaccga cgtcgacttc	3780
[11164]	ctcatcagcc cggtaagaa ctccgacggg atcttttacg actcccgcaa ctatgaggcg	3840
[11165]	caagagaatg cgatcctccc gaagaacgcc gatgcgaacg gggcctataa tatcgccagg	3900
[11166]	aaagtgtctt gggccatcgg gcagttcaaa aaggcggagg atgagaagct cgacaagggtg	3960
[11167]	aaaattgcc tttccaacaa ggagtggctg gactacgcgc agacctccgt gaagcacgga	4020
[11168]	ccacttcag ctccaccacc acaaccacca ccaccacaac caaactcaag tgaaacgggc	4080
[11169]	ccggtcgcgg tggacccac gctccgacgg cgtatcgagc cccacgagtt cgagggtttt	4140
[11170]	ttcgacccgc gcgagcttcg taaggaaacc tgcttgcttt acgagatcaa ctggggagga	4200
[11171]	cggcactcca tctggcggca cacctcgag aacaccaaca agcacgtcga ggtcaacttt	4260

[11172]	atcgagaaat tcacaaccga gcgctacttc tgccccaaca cacggtgttc aatcacatgg	4320
[11173]	ttcctgagct ggtcgccttg cggagagtgc tcacgcgcca tcacggagtt cctgtctcgc	4380
[11174]	tacccgcacg tcaccctctt tatctatata gcacgcctct accaccacgc cgatccgcgt	4440
[11175]	aatcgccagg taagtatcaa ggttacaaga caggtttaag gagaccaata gaaactgggc	4500
[11176]	ttgtcgagac agagaagact cttgcgtttc tgataggcac ctattggtct tactgacatc	4560
[11177]	cactttgcct ttctctccac aggggttgcg cgacctaate tcatccggcg taaccattca	4620
[11178]	gatcatgacc gaacaagaat ctggttactg ctggaggaat ttcgtaaact actccccgtc	4680
[11179]	gaacgaggcc cactggcccc gctatcccca cctttgggtg cgcctttacg tgctggagct	4740
[11180]	gtactgcacg atactcggtc ttctccttg cctgaacatc cttcggcgaa agcagccgca	4800
[11181]	gttgactttc ttcaccattg cacttcaaag ctgccactac cagcgcctcc ctccacatat	4860
[11182]	tctctggcg accggcttga agtctggcgg ctcaaaaaga accgccgacg gcagcgaatt	4920
[11183]	cgagcccaag aagaagagga aagtcggaag cgga	4954
[11184]	<210> 107	
[11185]	<211> 4954	
[11186]	<212> DNA	
[11187]	<213> 人工的	
[11188]	<220>	
[11189]	<223> 多核苷酸	
[11190]	<400> 107	
[11191]	atgaaacgga cagccgacgg aagcgagttc gagtaccaa agaagaagcg gaaagtcacc	60
[11192]	aacctcagcg acattatcga gaaggaaacc ggcaagcaac tcgtgatcca ggagagcata	120
[11193]	ctgatgctcc ccgaggaggt cgaggaggtg atttgcaata agcccgagtc cgatatactg	180
[11194]	gttcatactg cgtatgacga aagcacagac gagaacgtca tgctacttac cagcgacgcc	240
[11195]	ccggagtaca agccctgggc cctagtcacg caagacagca acggtgagaa caagatcaag	300
[11196]	atgcttagtg gcgggtccgg tgggtccggt ggtagtcca agctggagaa gtttacaac	360
[11197]	tgttacagcc tctccaaaac cctcagttt aaagcgatcc cgggtggcaa gaccaggag	420
[11198]	aacatcgaca acaagaggct cctggtggaa gacgagaagc gcgccgaaga ctacaagggc	480
[11199]	gtgaagaagc tgctcgatag gtactacctc agctttatta acgacgtgct gcacagcatc	540
[11200]	aaactcaaga atctcaaca ctacatctcc ctcttcgca aaaagacccg caccgagaag	600
[11201]	gagaacaagg agctggagaa cctggagatc aacctccgca aggaaatcgc caaagcgttc	660
[11202]	aagggaatg aagggtacaa gagcctcttc aagaaagaca tcatcgaaac tatectcca	720
[11203]	gagtttctcg atgacaagga cgagatcgcg ctggtgaact ctttaacgg gttcacaacc	780
[11204]	gcgtttaccg gcttctttga taacagggaa aatatgttct ccgaggaggc caagtccacc	840
[11205]	agcatcgct tcaggtgtat caacgagaac ctacccgct acatttccaa tatggacatt	900
[11206]	ttcgagaagg tggatgcgat cttcgataag cacgaggtgc aggagatcaa agagaagatt	960
[11207]	ctcaattccg attatgacgt cgaggatttc ttcgaagggg agttctttaa ttttgtgtctc	1020
[11208]	acacaagagg gcattgacgt gtacaacgcg attatcgggg gcttcgtcac agagtccggg	1080
[11209]	gagaagatta aggggctgaa tgagtacatc aatctgtaca atcagaagac caagcagaaa	1140
[11210]	ctgccgaaat tcaagccgct ctacaagcaa gtctgtccg atagggaag cctctccttc	1200
[11211]	tacggcgagg gctataccag cgacaggagg gtgctggaag tcttcgcaa cacactgaat	1260
[11212]	aagaatagcg agattttctc ctccatcaag aagctcgaga agctctttaa gaactttgac	1320
[11213]	gagtacagct ccgccgggat tttcgtgaag aacgggccgg cgatcagcac catctccaag	1380

[11214]	gacatctttg gcgagtggaa cgtcatcagg gacaagtgga acgccgagta cgacgacatc	1440
[11215]	cacctgaaga agaagcggtt ggtgaccgag aagtatgagg acgatcgag gaagtccttc	1500
[11216]	aaaaaaatcg gctccttcag cctcgaacag ctccaggagt atgccgatgc ggatctgtcc	1560
[11217]	gtcgtcgaga agctgaagga aatcatcatt cagaaggteg acgagatcta taaagtgtac	1620
[11218]	gggtccagcg agaagctgtt cgacgccgac tttgtgctcg agaagtcctt caaaaagaat	1680
[11219]	gacgccgtgg tggccattat gaaagacctg ctcgactccg tgaagtcctt cgaaaattac	1740
[11220]	attaaagcgt tctttgggga ggggaaggaa actaacaggg atgagtcctt ctatggcgac	1800
[11221]	tttgtctcg cgtacgacat cctgtgaag gtcgaccaca tttagcgacg gatccgcaac	1860
[11222]	tacgtgacac agaagccgta ctccaaagac aagttcaagc tgtacttcca gaacccgcaa	1920
[11223]	tttatggggg gctgggacaa ggataaagag acagactacc gcgcgacaat tctccgctat	1980
[11224]	ggctccaaat actatctggc catcatggac aagaagtacg cgaagtgcct gcagaagatc	2040
[11225]	gacaaagacg acgtcaatgg caactatgaa aagatcaact acaagctgct gccgggccccg	2100
[11226]	aacaagatgc tcccgaaggt gttcttcagc aagaagtgga tggcctacta caatccaagc	2160
[11227]	gaggatatct agaaaatcta taaaaacggg accttcaaga agggggacat gtttaacctc	2220
[11228]	aacgactgcc acaagctcat tgatttcttc aaggatagca tttcccgtta cccgaaatgg	2280
[11229]	tccaatgcgt acgattttta cttctccgag acagaaaagt acaaagacat cgcgggcttt	2340
[11230]	tacagggagg tggaggagca aggtataaa gtttcttttg aatccgcgag caagaaggaa	2400
[11231]	gtcgacaagc tegtcgagga gggcaagctc tacatgttcc aaattttata caaggacttt	2460
[11232]	tccgacaaga gccatgggac cccaaacctc cacaccatgt acttcaaact gctctttgac	2520
[11233]	gagaacaacc acgggcaaat caggctgagc ggcggcgccg aattattcat gcgcagggcc	2580
[11234]	tcctcaaga aggaggagct ggtcgtccat ccagccaatt ccccgatcgc gaacaagaac	2640
[11235]	ccggacaatc cgaaaaagac caccacctg tcctacgacg tctacaagga caaacgcttc	2700
[11236]	agcgaagacc agtacgaatt acacatccca attgcgatta ataagtgcc aaagaatatc	2760
[11237]	ttcaaaatta atacagaggt cagggtgctg ctcaaacacg acgacaatcc gtatgtcatc	2820
[11238]	ggcattgcca gggcgagcg caatctgctc tatatcgtgg tcgtggatgg gaagggcaat	2880
[11239]	attgtggagc agtactccct gaacgagatt atcaacaact tcaatgggat taggattaag	2940
[11240]	accgactatc acagcctgct cgacaagaaa gaaaaagaga ggtttgaggc ccgccaaaac	3000
[11241]	tggacctcca ttgagaatat caaagaatta aaggccggct atatttcca agtcgtccac	3060
[11242]	aagatctgcg agctggtgga gaaatatgac gccgtgattg cgctcgaaga cttaaattct	3120
[11243]	gggttcaaga actcccgcgt gaagtgga aaacaggtgt atcagaaatt cgagaaaatg	3180
[11244]	ctgatcgaca aactcaatta tatggtggat aagaagtcca acccggtgac cacagggggc	3240
[11245]	gcgctgaagg gctatcagat caccaacaag ttcgagagct tcaagagcat gagcaccag	3300
[11246]	aacgggttta ttttctacat cccggcgtgg ctacacctca agattgacct gagcaccggc	3360
[11247]	ttcgtgaacc tcctgaagac aaagtatacc tcattgccg acagcaagaa gtttatctcc	3420
[11248]	tccttcgacc gcattatgta tgtgccggag gaggacctct tcgagttcgc cctcgactac	3480
[11249]	aaaaacttca gccgcacaga tgcggtattac atcaagaagt ggaagctgta ctctacggg	3540
[11250]	aacaggatcc gcattcttcag gaatccaaaa aaaaataaac tctttgactg ggaggaagtg	3600
[11251]	tgcttgacat ccgcctacaa ggaactgttc aataaatacg gcatcaatta ccagcagggc	3660
[11252]	gacattcgcg cctcctctg tgagcagtc gacaaagcgt ttactccag ctcatggcc	3720
[11253]	ctcatgtccc tgatgtcca aatgaggaat agcatcacag ggcgaccga cgtcgacttc	3780
[11254]	ctcatcagcc cgtgaagaa ctccgacggg atcttttacg actcccgcaa ctatgaggcg	3840
[11255]	caagagaatg cgatcctccc gaagaacgcc gatgcgaacg gggcctataa tatcgccagg	3900

[11256]	aaagtgtctt gggccatcgg gcagttcaaa aaggcggagg atgagaagct cgacaaggtg	3960
[11257]	aaaattgcc a tttccaacaa ggagtggttg gtagtcgcgc agacctccgt gaagcacgat	4020
[11258]	tctccagaaa ttccaggaga accaccacca ccaattccac cagaatcaag tgaaacgggc	4080
[11259]	ccggtcgcgg tggaccccac gctccgacgg cgtatcgagc cccacgagtt cgaggtgttt	4140
[11260]	ttcgacccgc gcgagcttcg taaggaaacc tgcttgcttt acgagatcaa ctggggagga	4200
[11261]	cggcactcca tctggcggca cacctcgcag aacaccaaca agcacgtcga ggtcaacttt	4260
[11262]	atcgagaaat tcacaaccga gcgtacttc tgccccaaca cacggtgttc aatcacatgg	4320
[11263]	ttcctgagct ggtcgccttg cggagagtgc tcacgcgcca tcacggagtt cctgtctcgc	4380
[11264]	taccgcacg tcacctctt tatctatata gcacgcctt accaccacgc cgatccgcgt	4440
[11265]	aatcgccagg taagtatcaa ggttacaaga caggtttaag gagaccaata gaaactgggc	4500
[11266]	ttgtcgagac agagaagact cttgcgttgc tgataggcac ctattggtct tactgacatc	4560
[11267]	cactttgcct ttctctccac aggggttgcg cgacctaatc tcacccggcg taaccattca	4620
[11268]	gatcatgacc gaacaagaat ctggttactg ctggaggaat ttcgtaaaact actccccgtc	4680
[11269]	gaacgaggcc cactggcccc gctatcccca cctttgggtg cgcctttacg tgctggagct	4740
[11270]	gtactgcatc atactcggtc ttctccttg cctgaacatc cttcggcgaa agcagccgca	4800
[11271]	gttgactttc ttaccattg cacttcaaag ctgccactac cagcgctcc ctccacatat	4860
[11272]	tctctgggcg accggcttga agtctggcgg ctcaaaaaga accgccgacg gcagcgaatt	4920
[11273]	cgagcccaag aagaagagga aagtcggaag cgga	4954

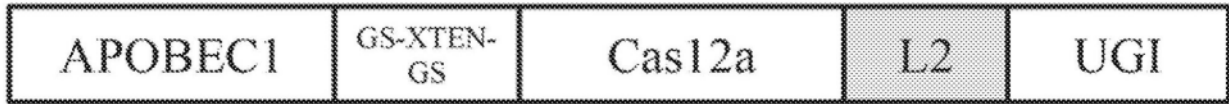
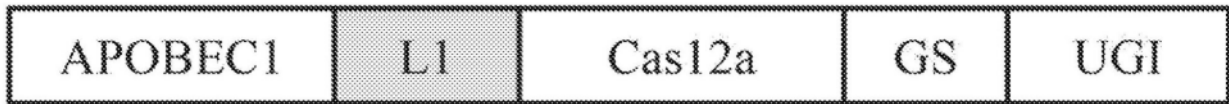
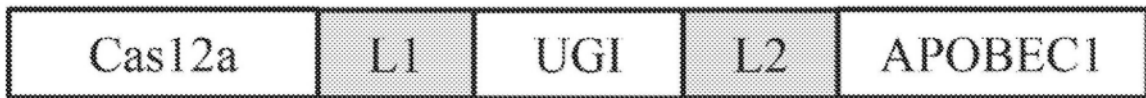
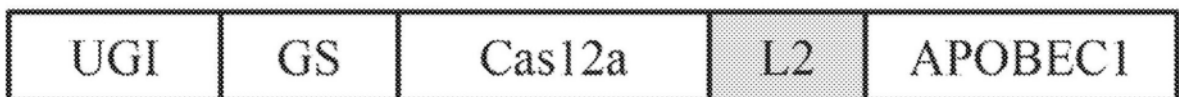
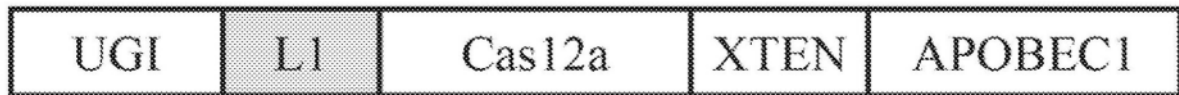
A.**B.****C.**

图1

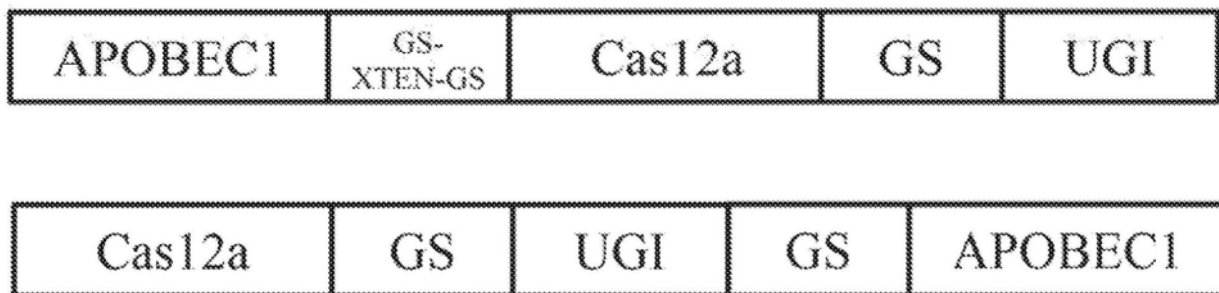


图2

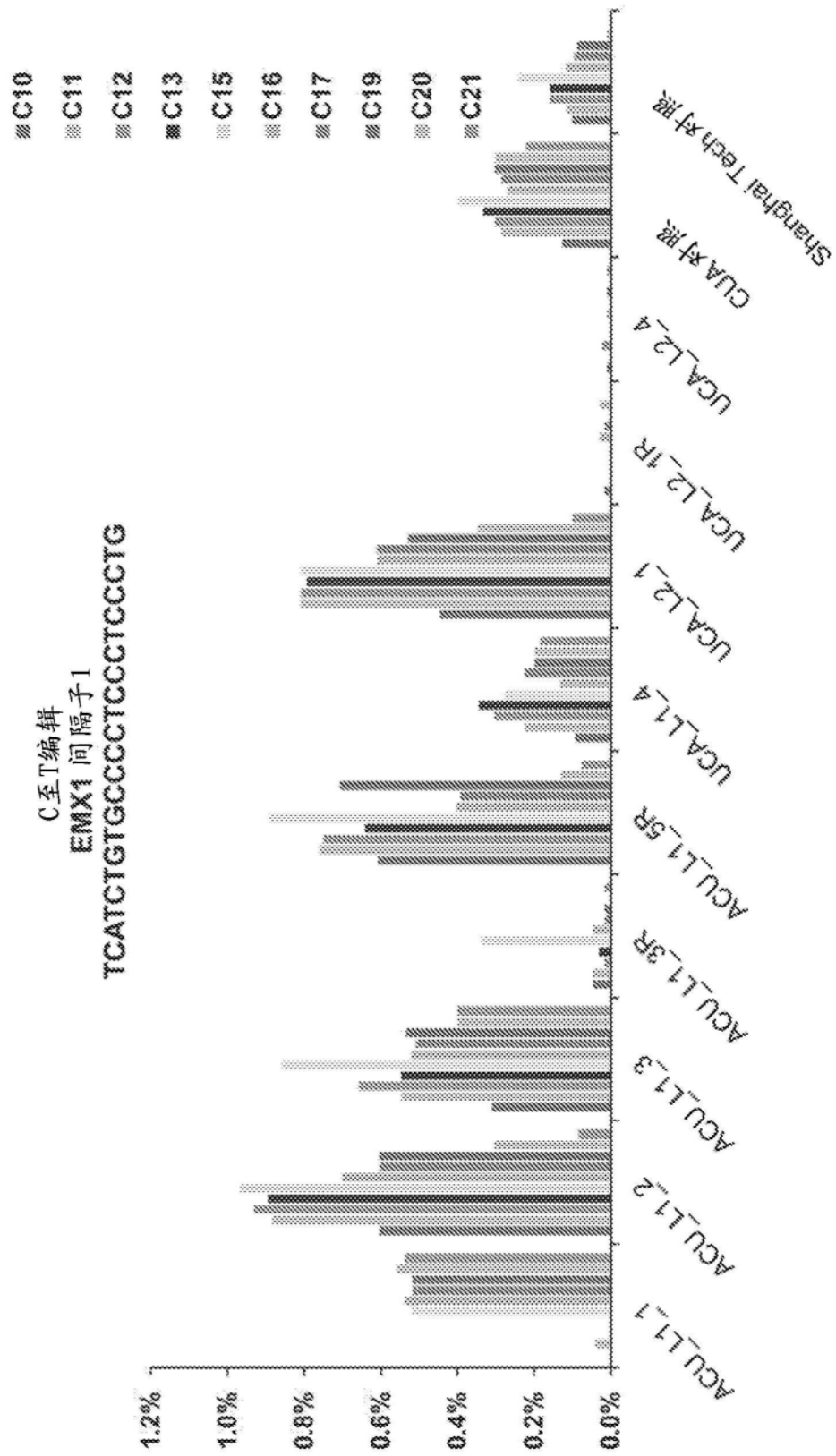


图3

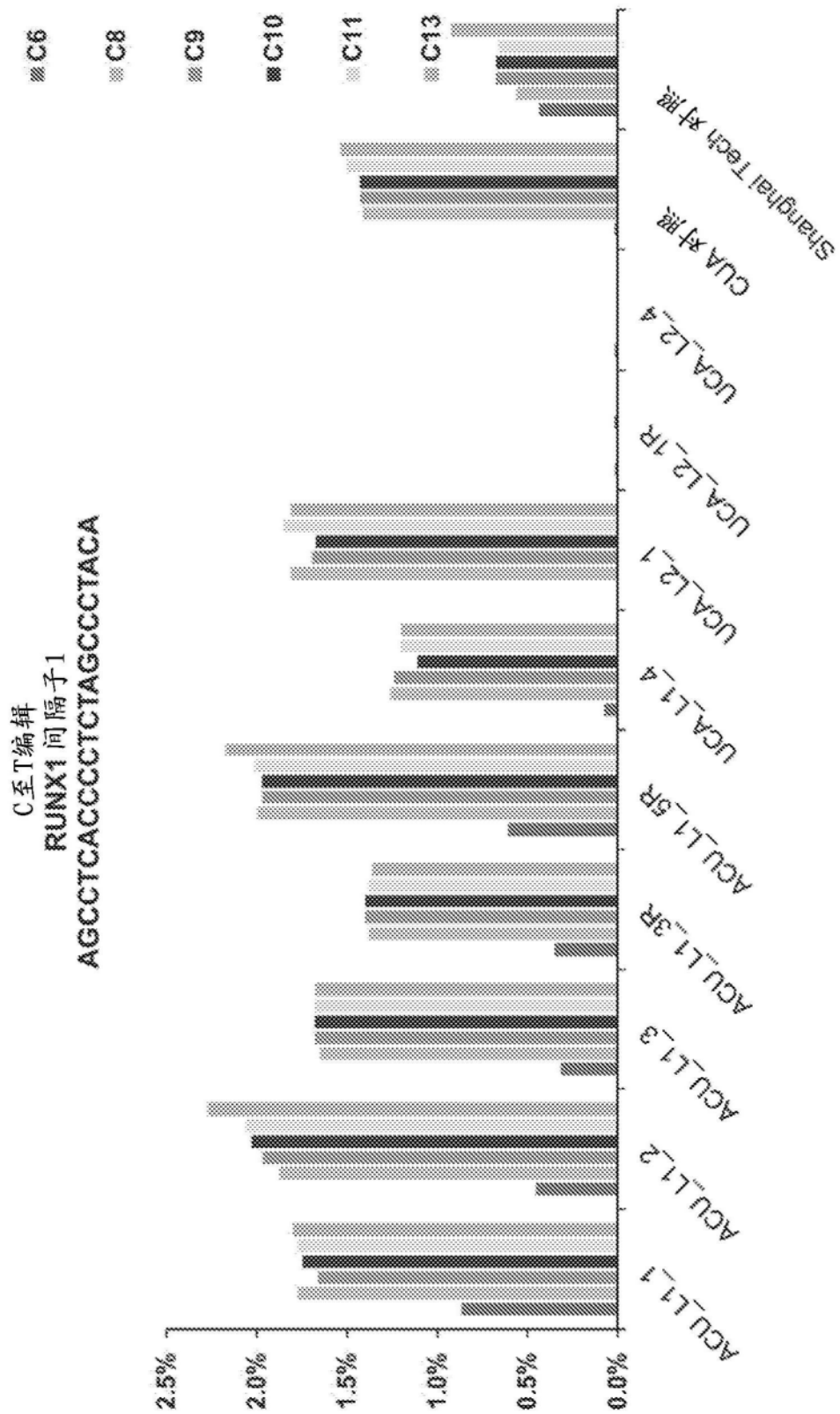


图4

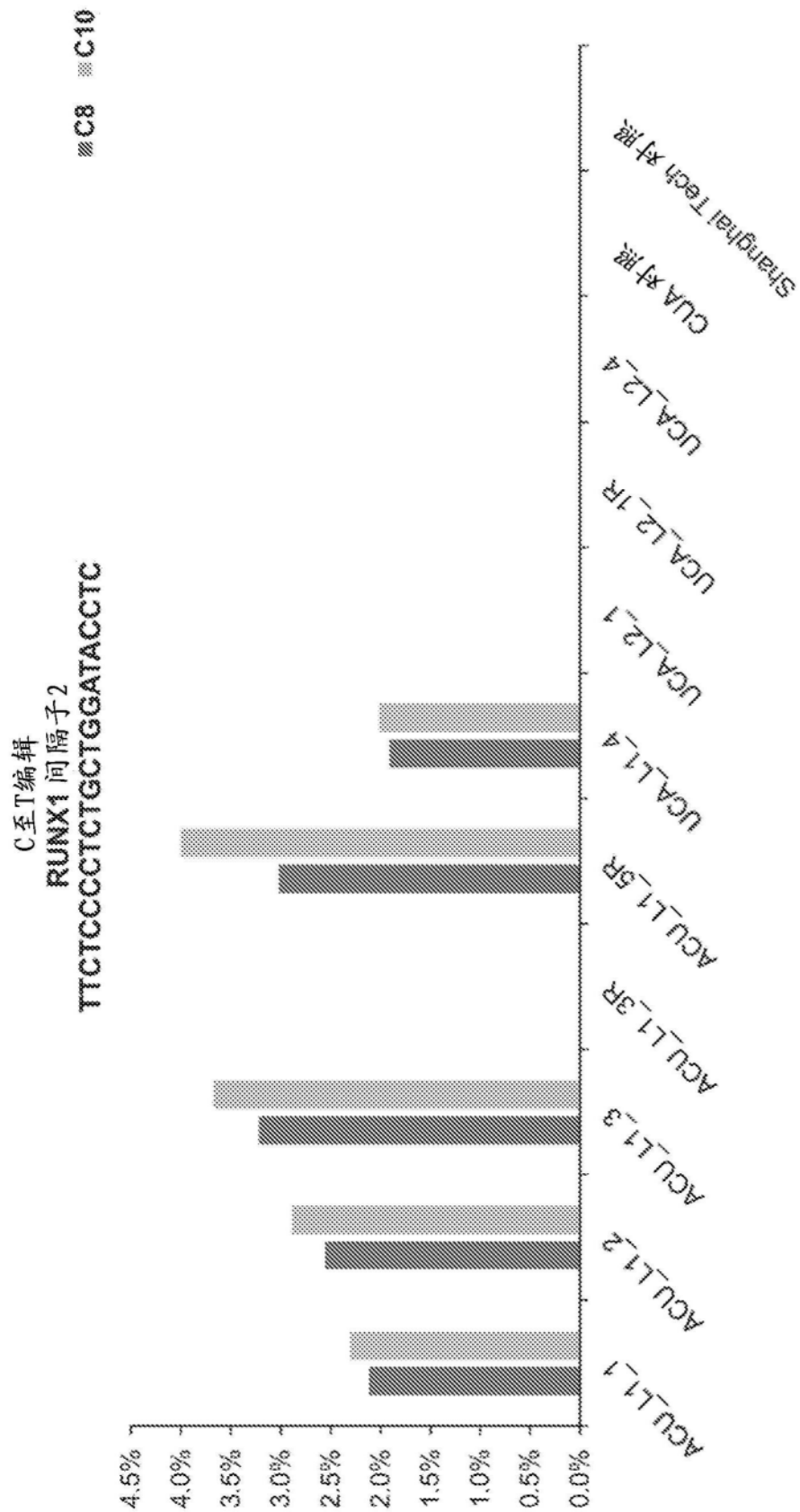


图5

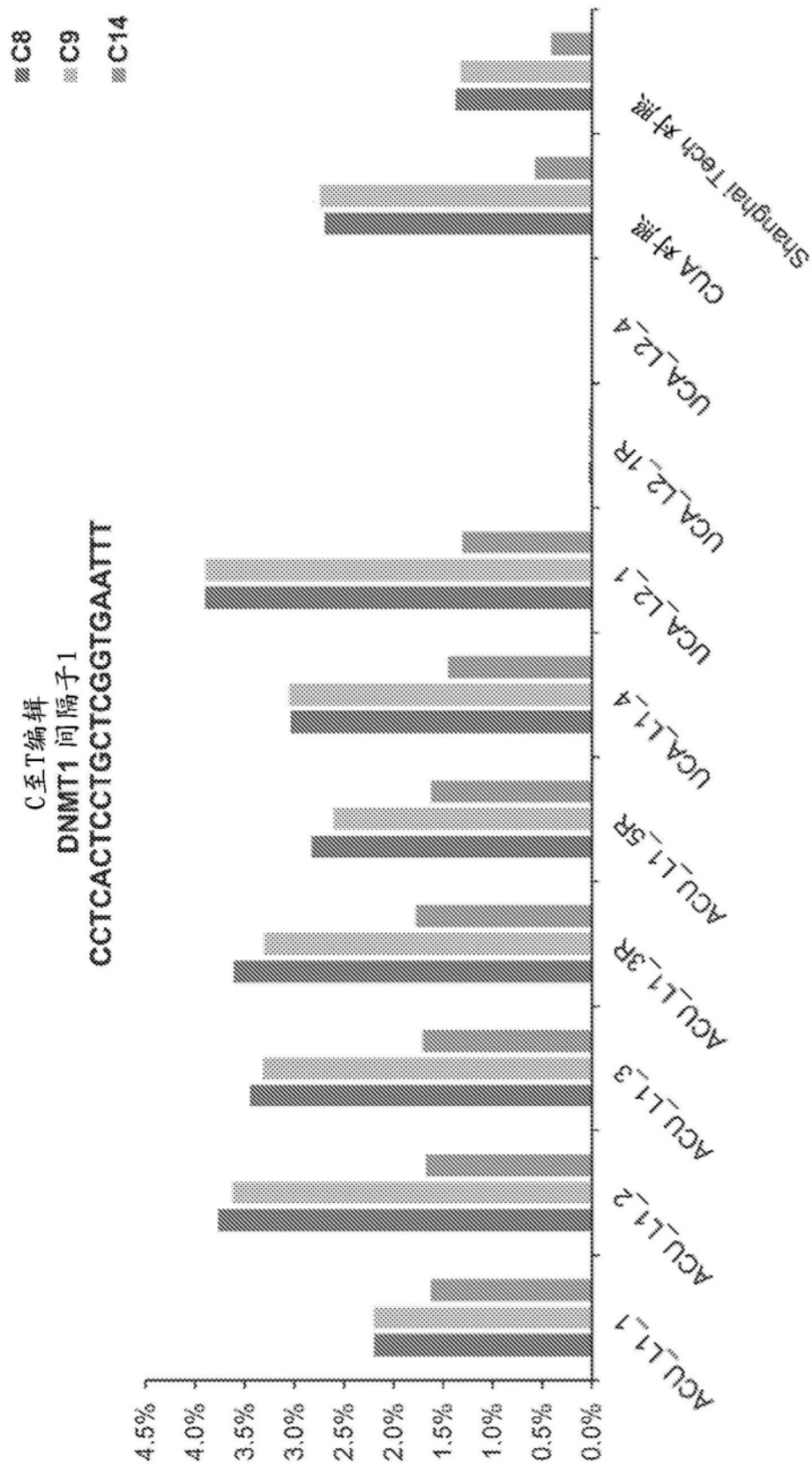


图6

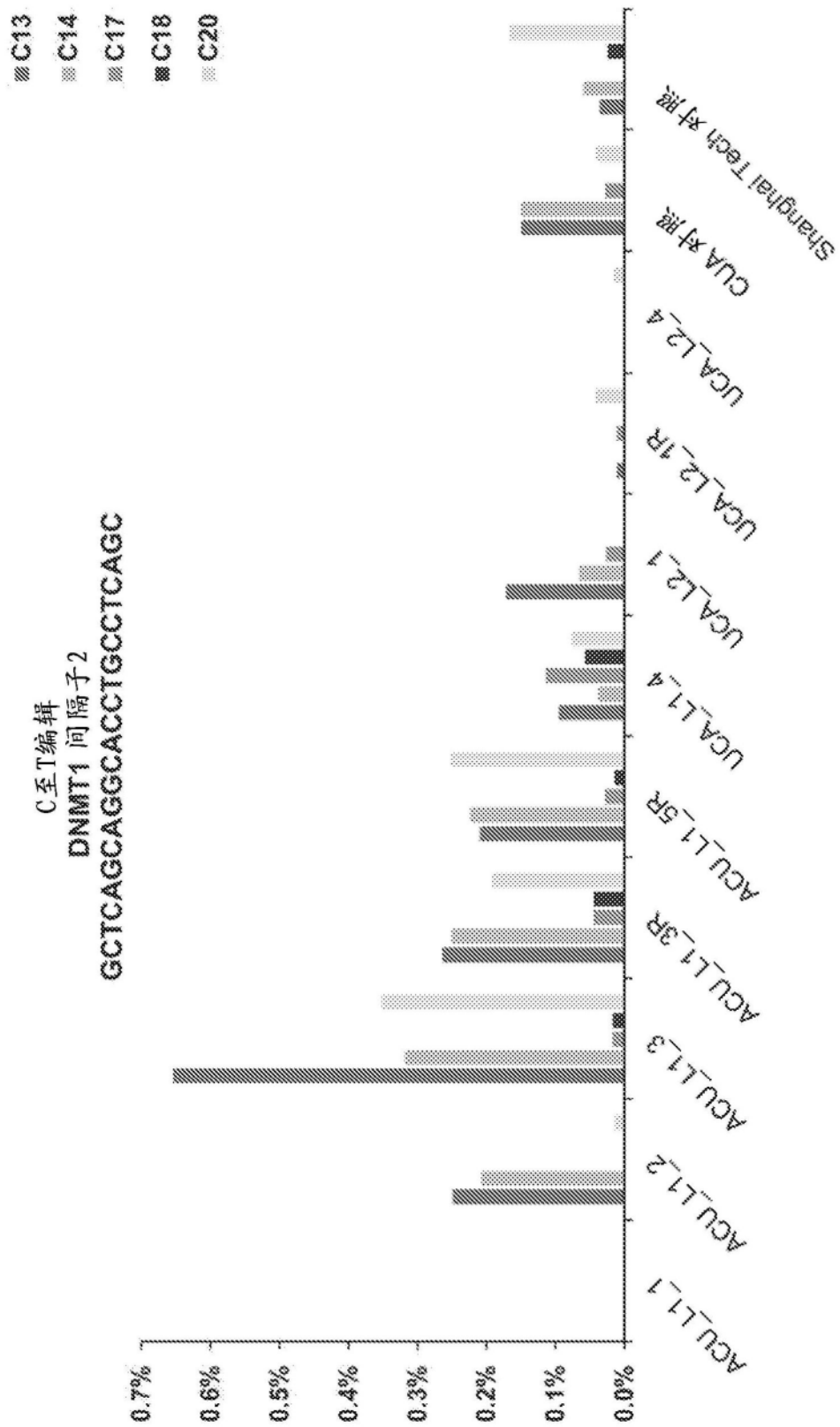


图7

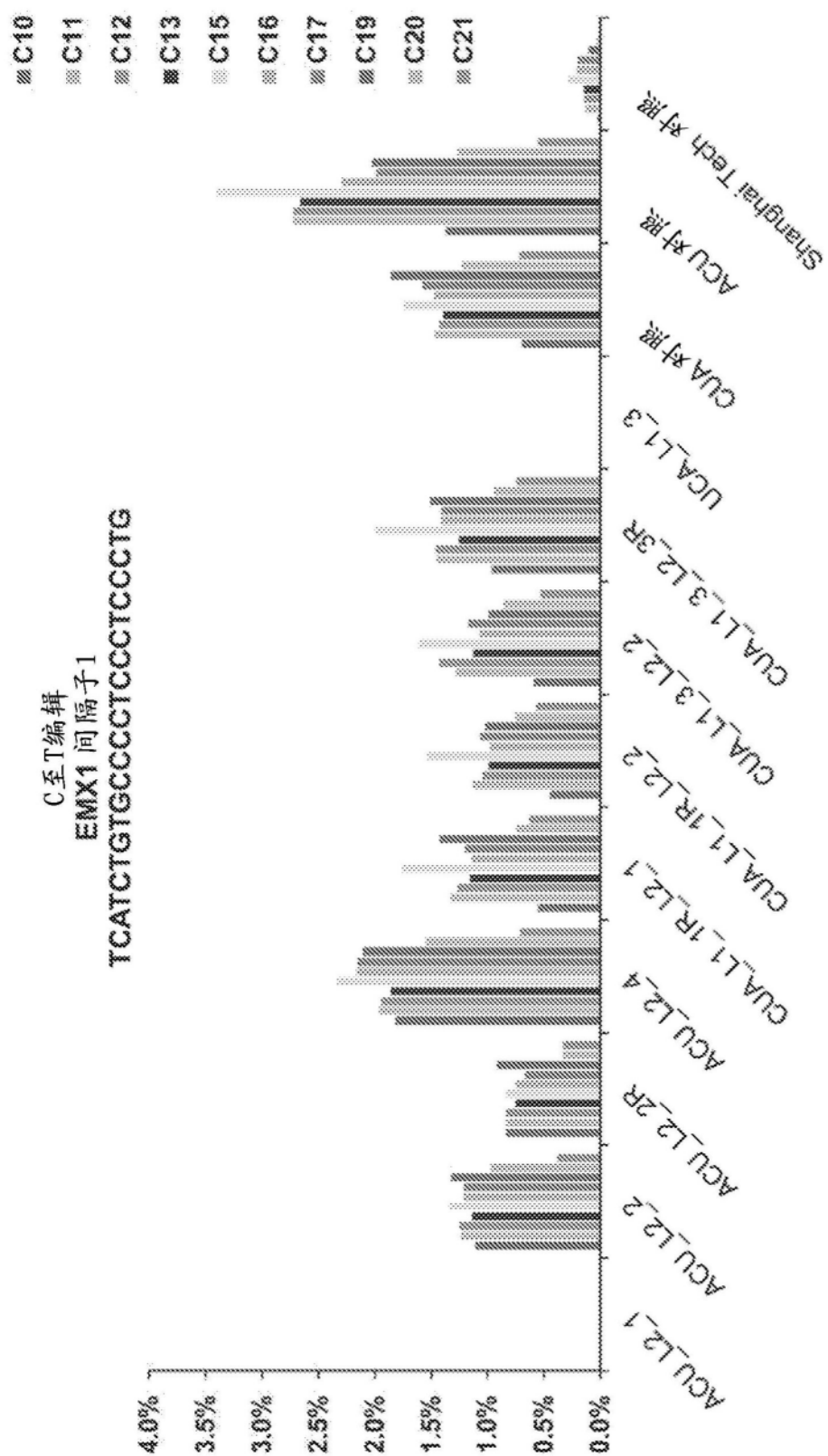


图8

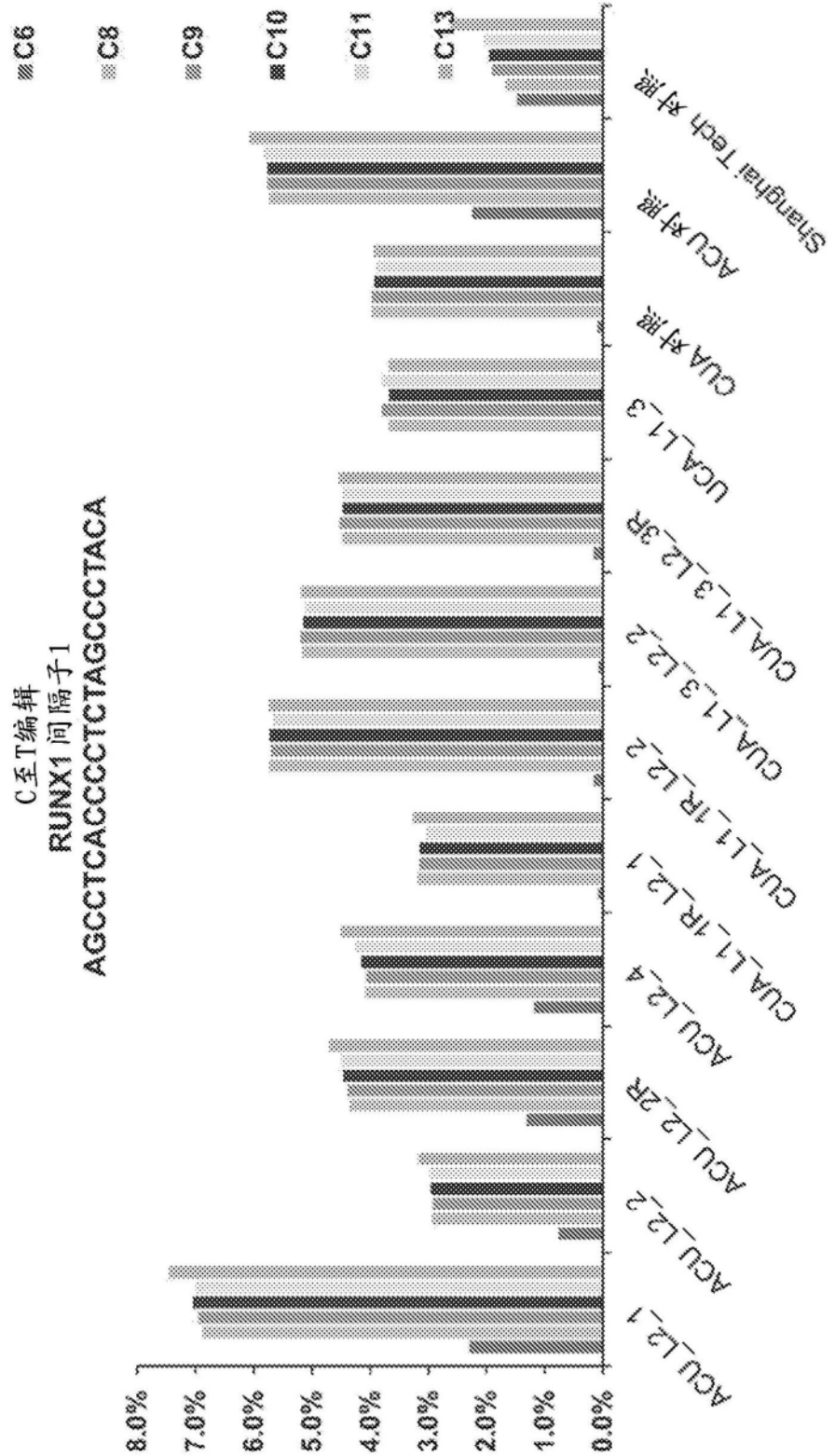


图9

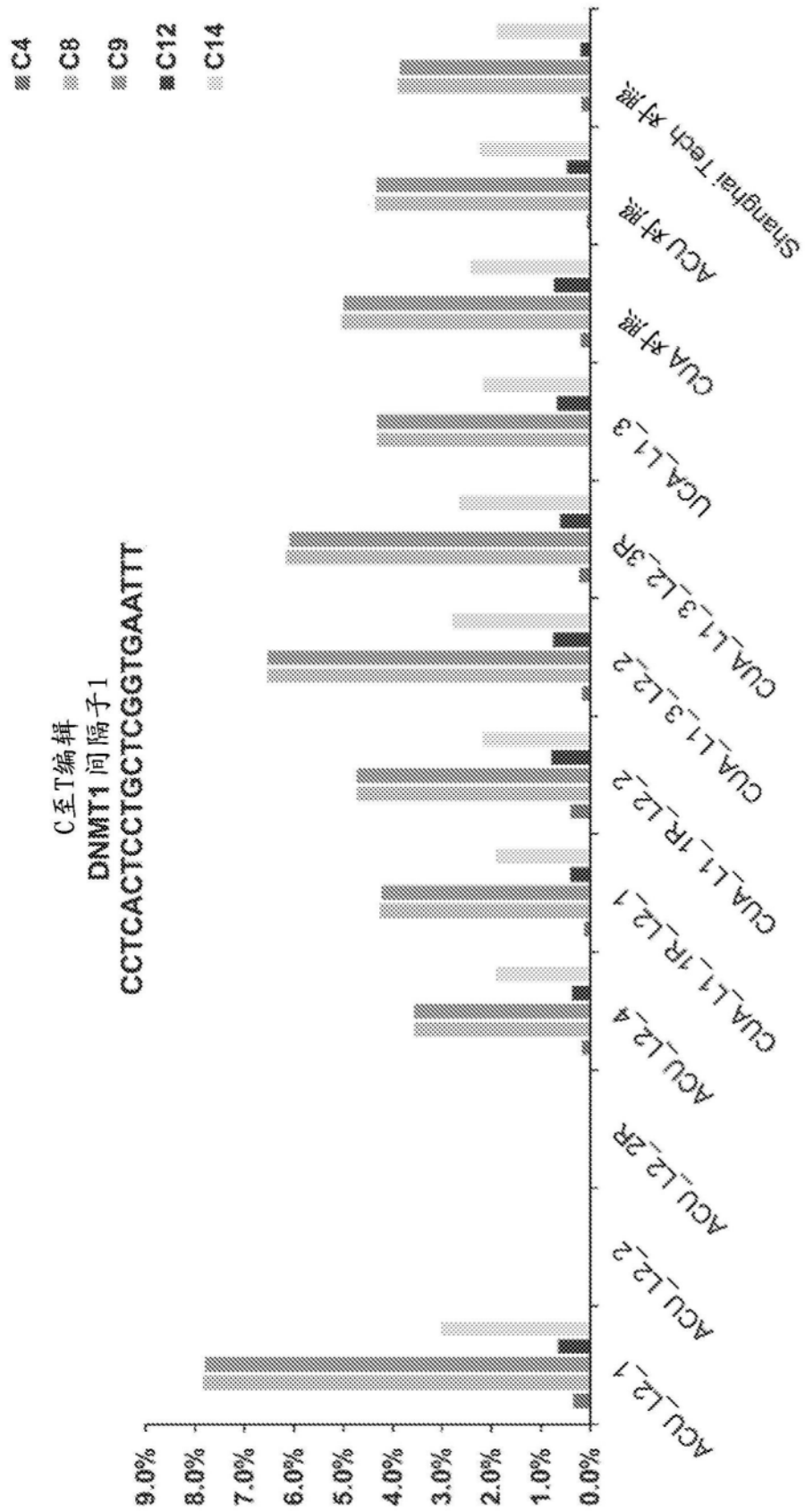


图10

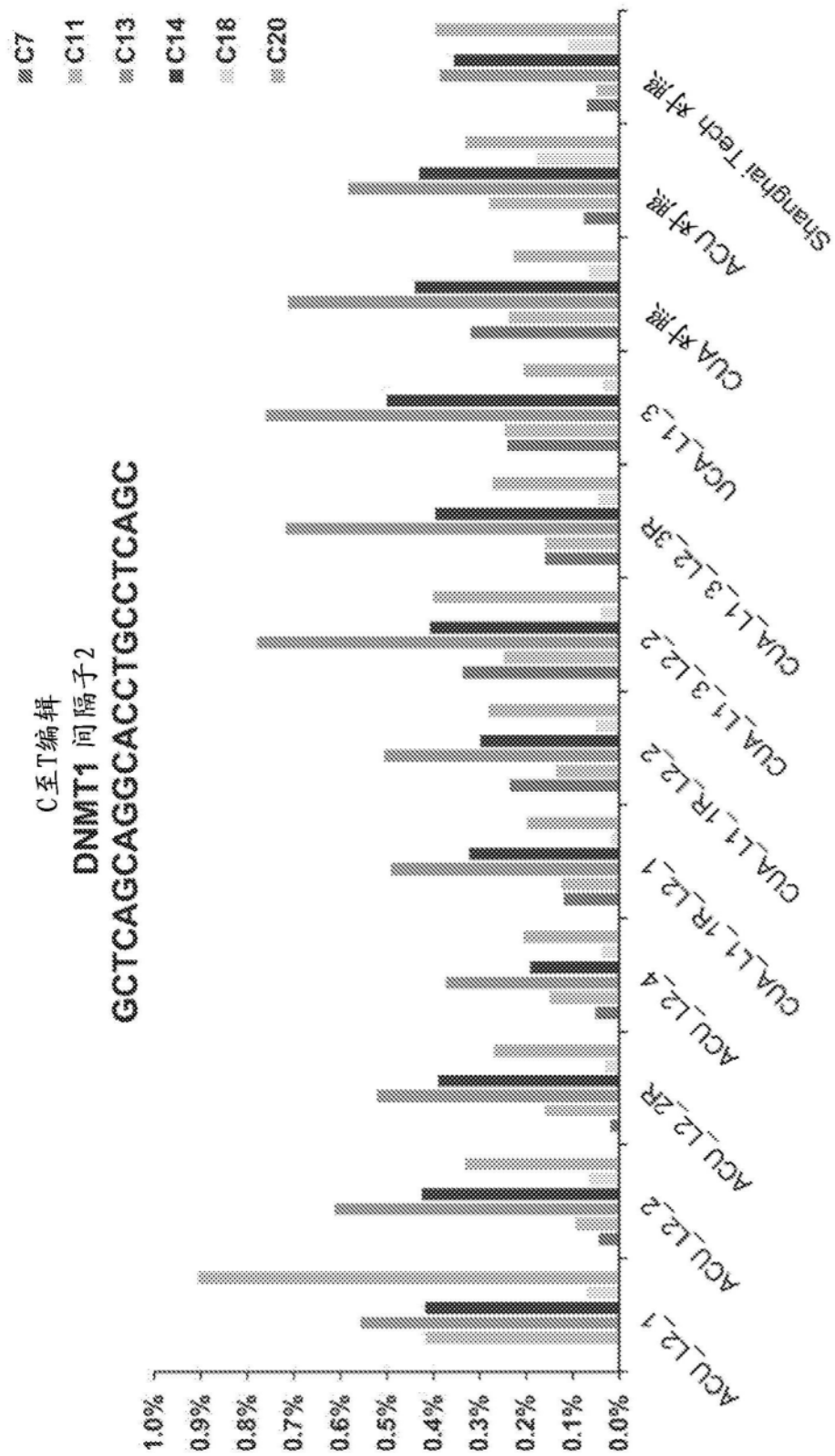


图11

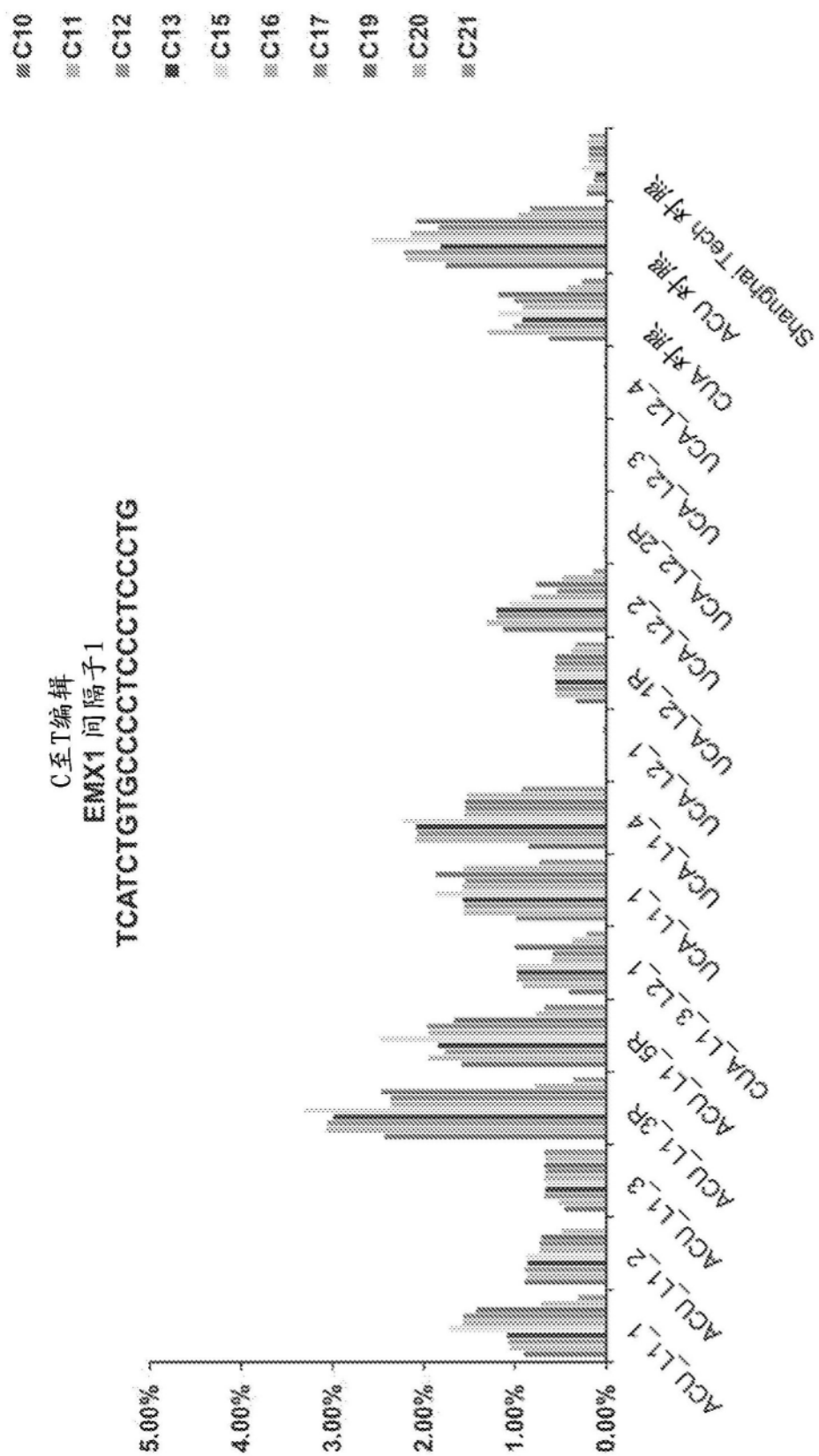


图12

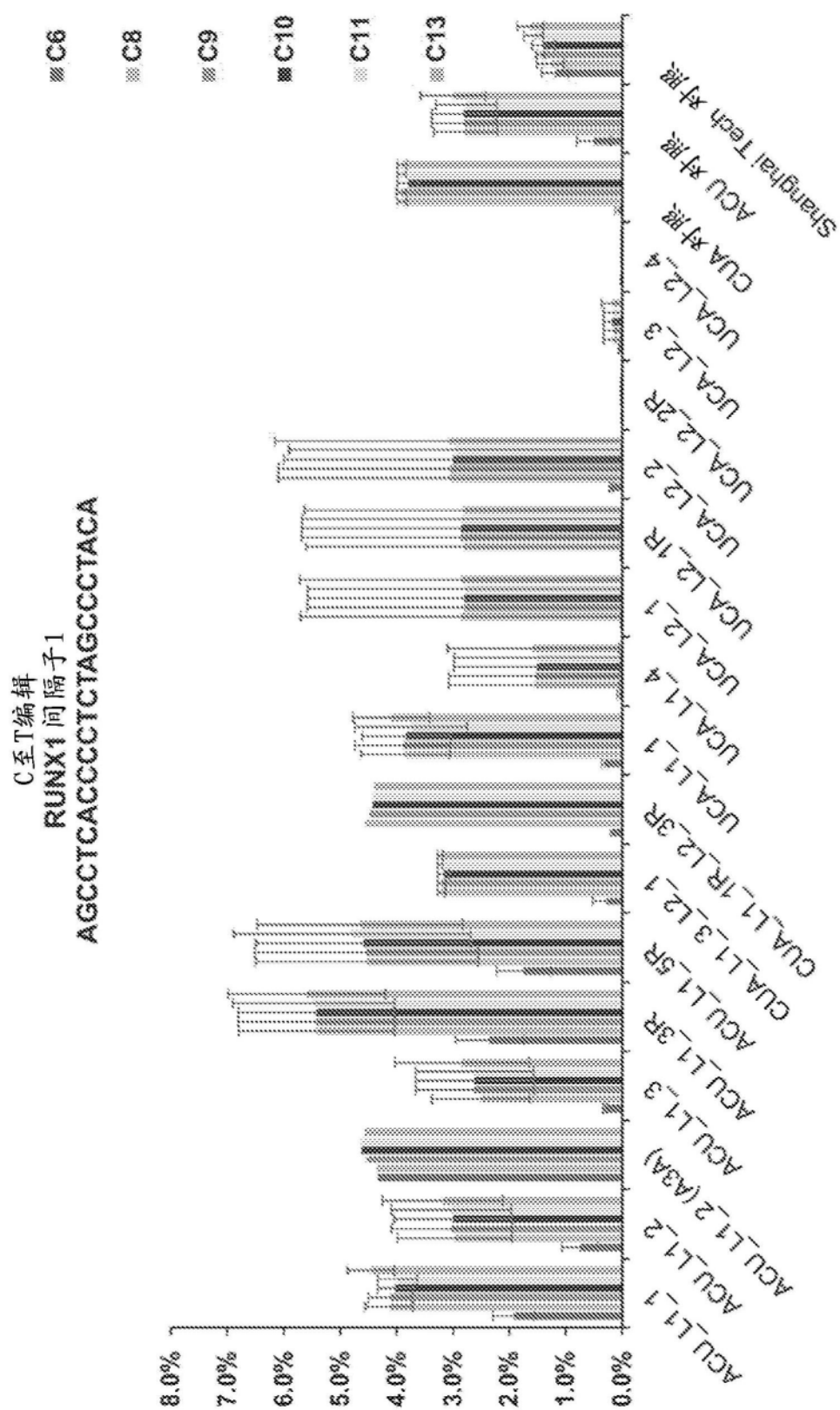


图13

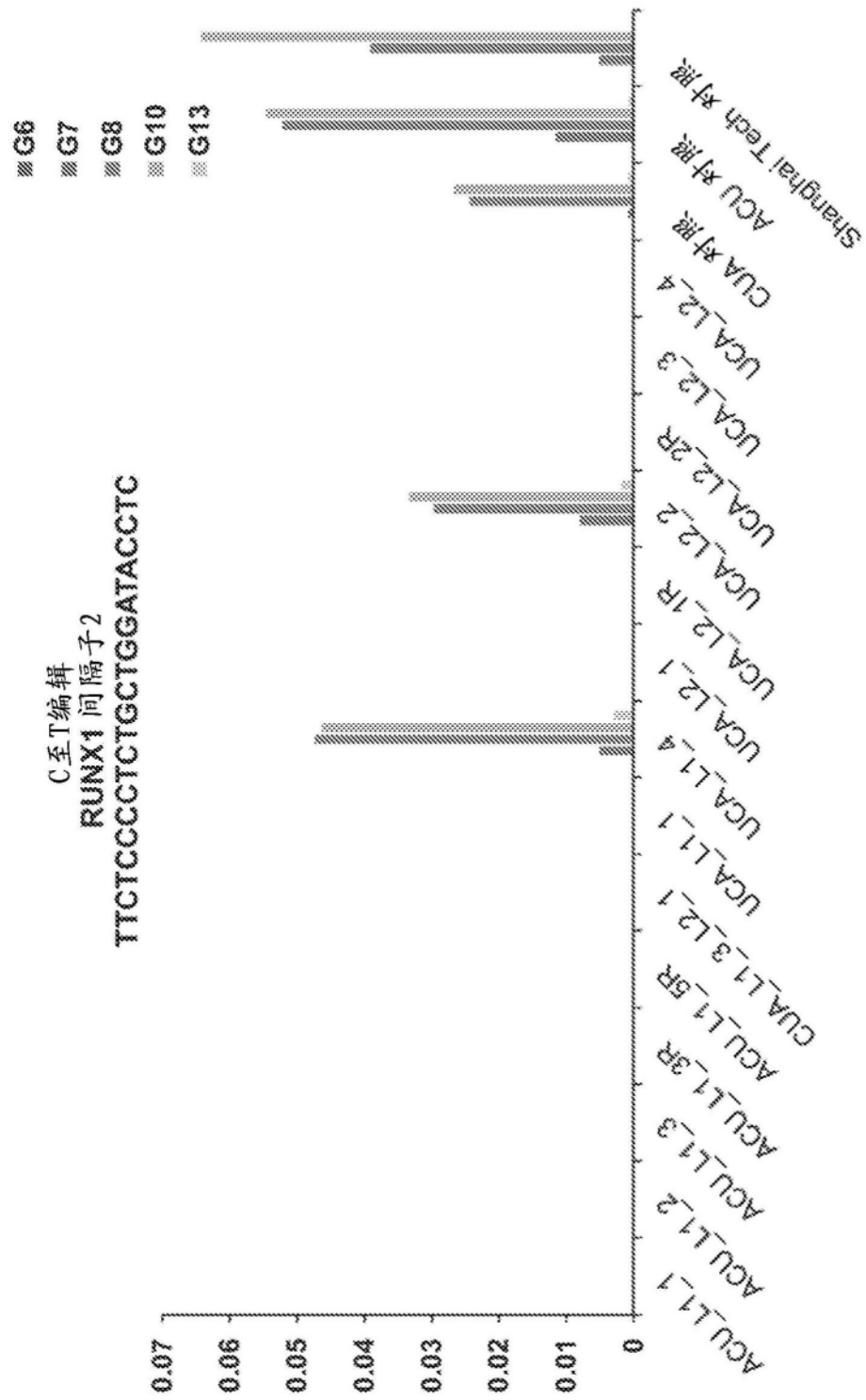


图14

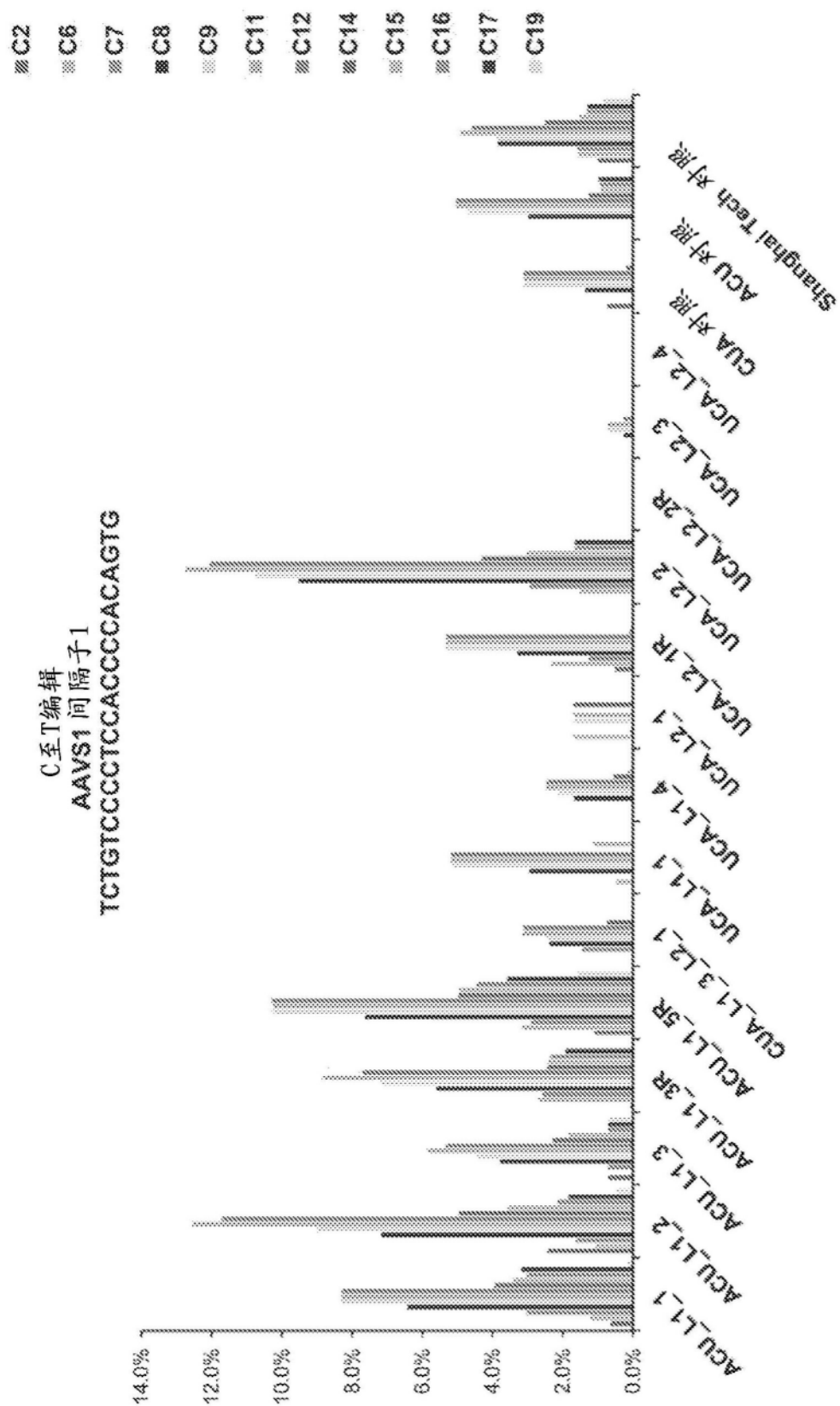


图15

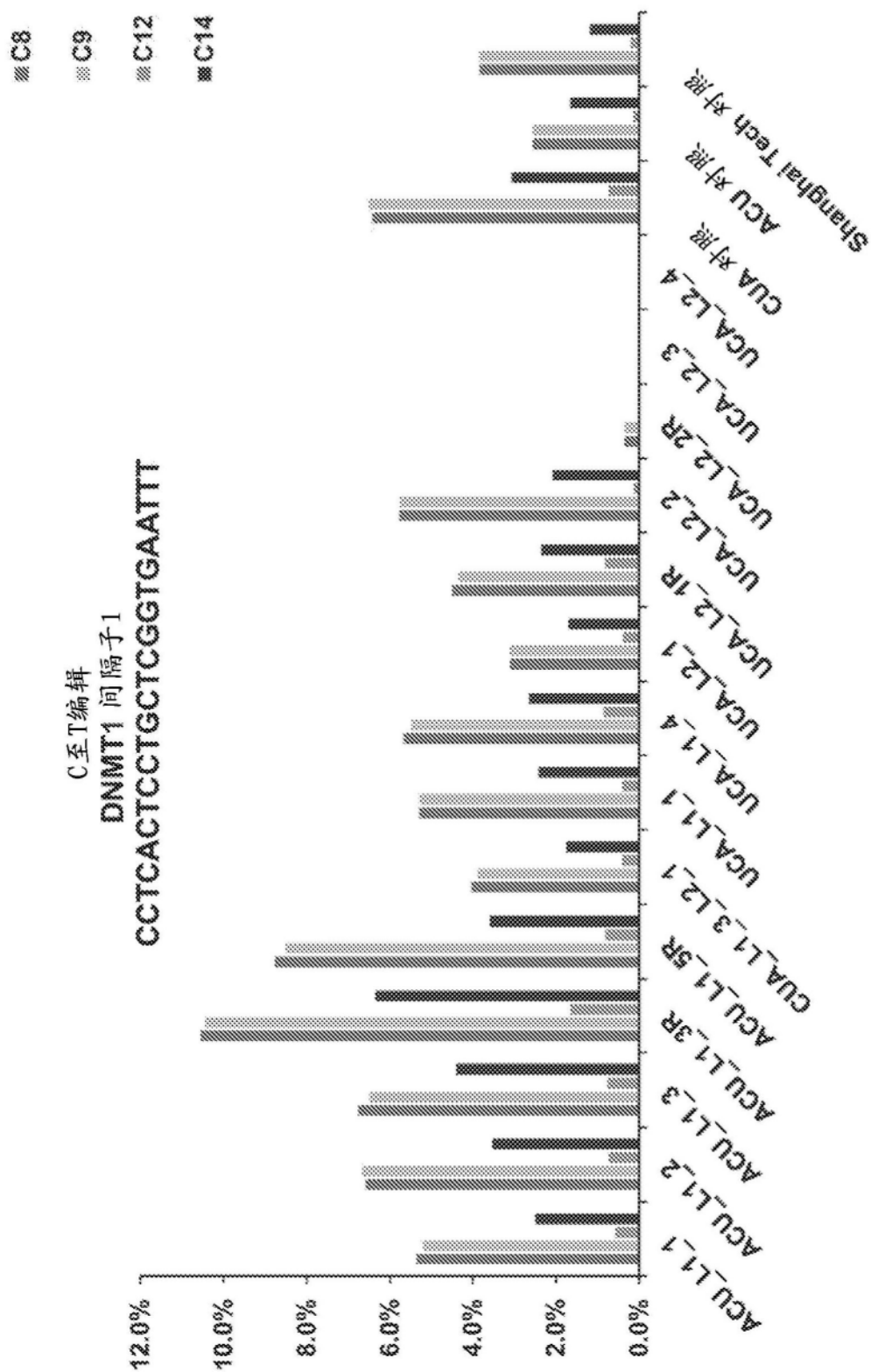


图16

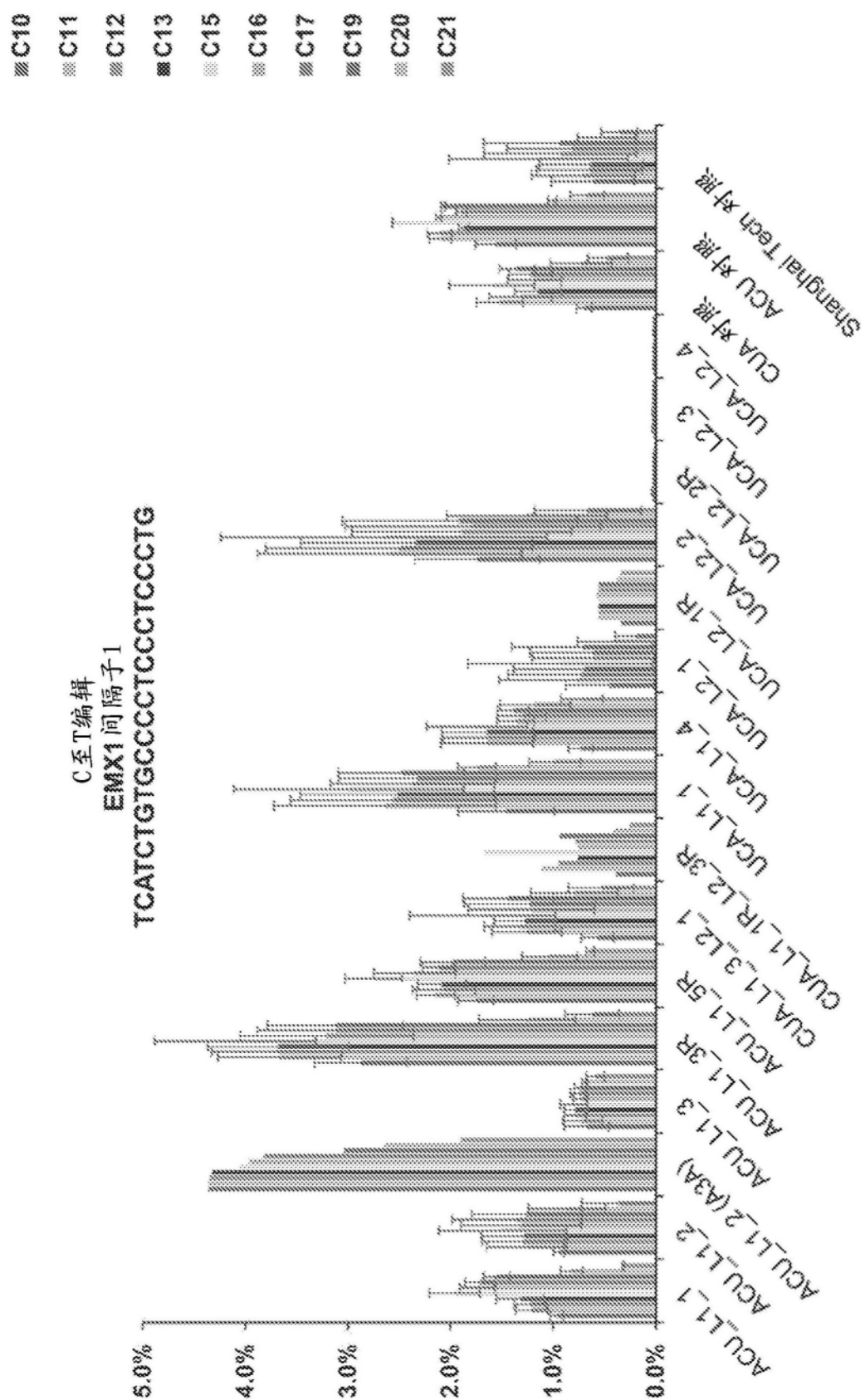


图17

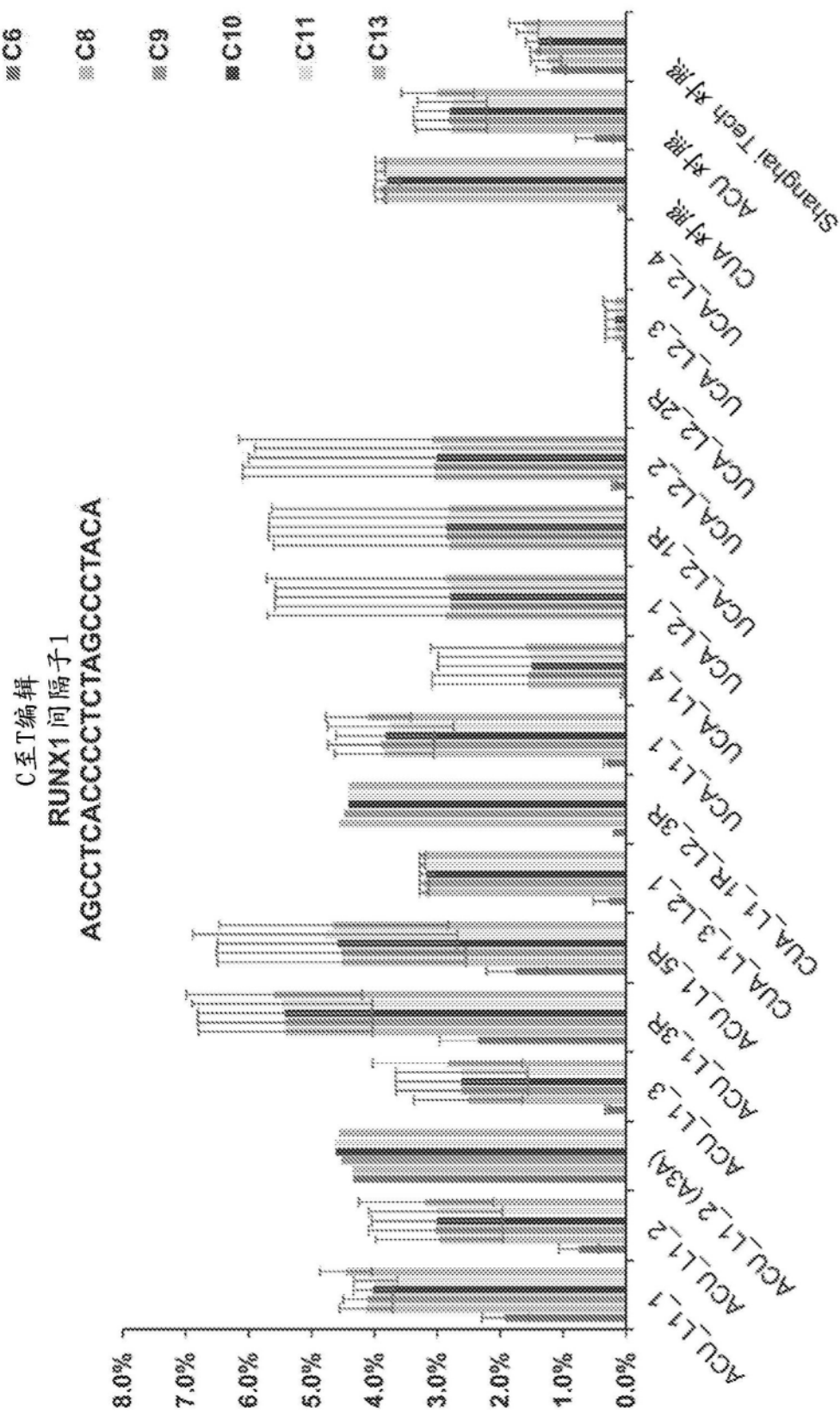


图18

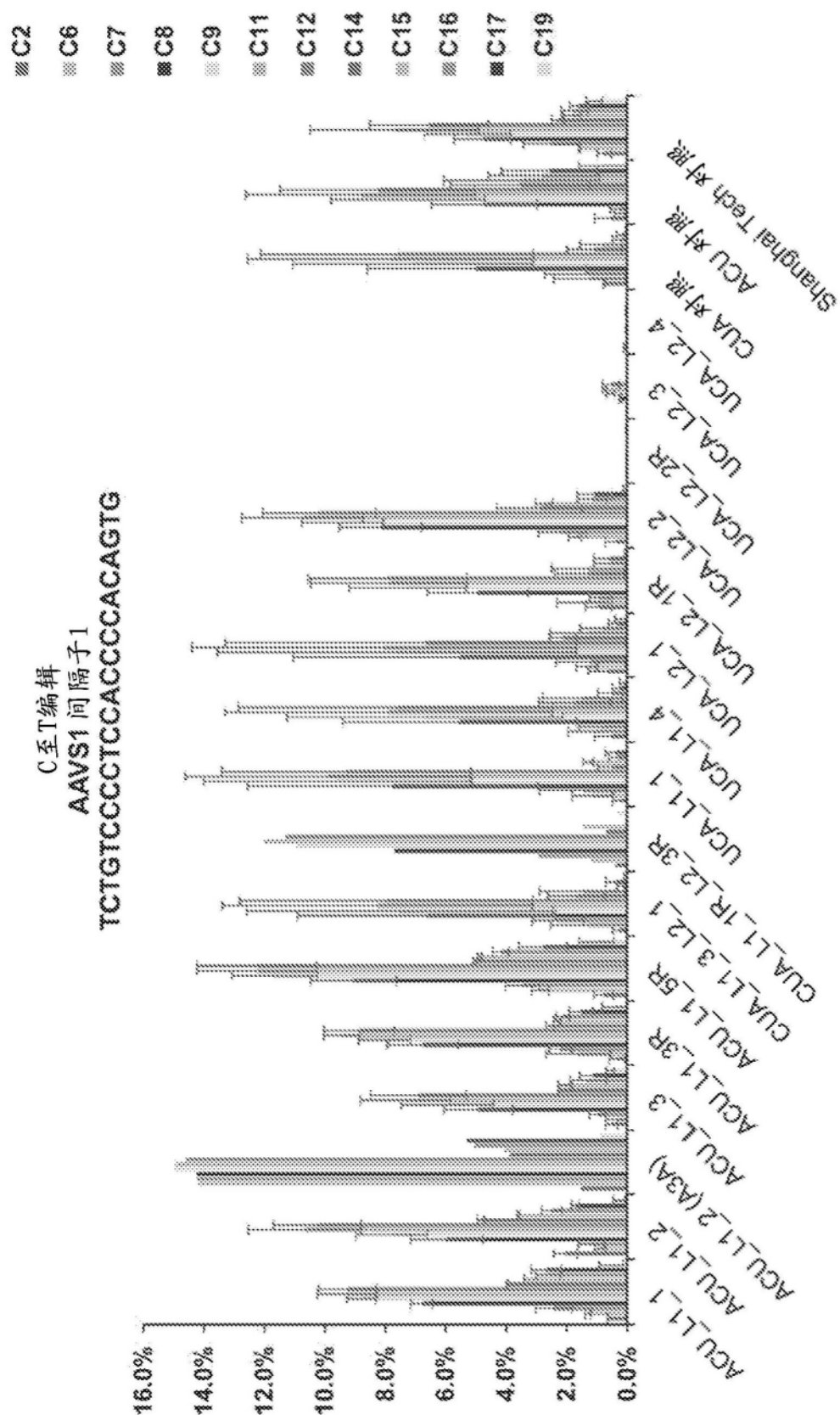


图19

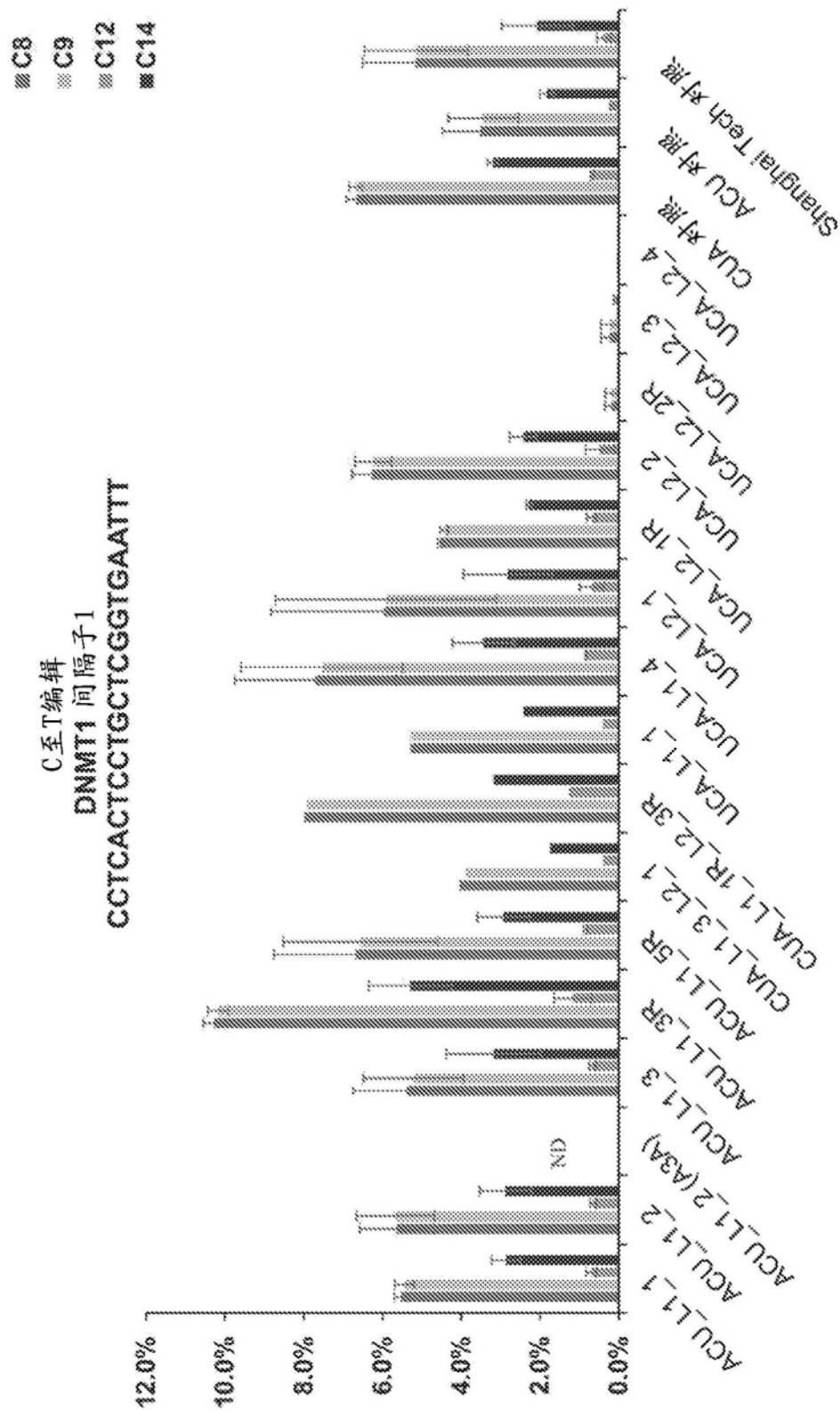


图20

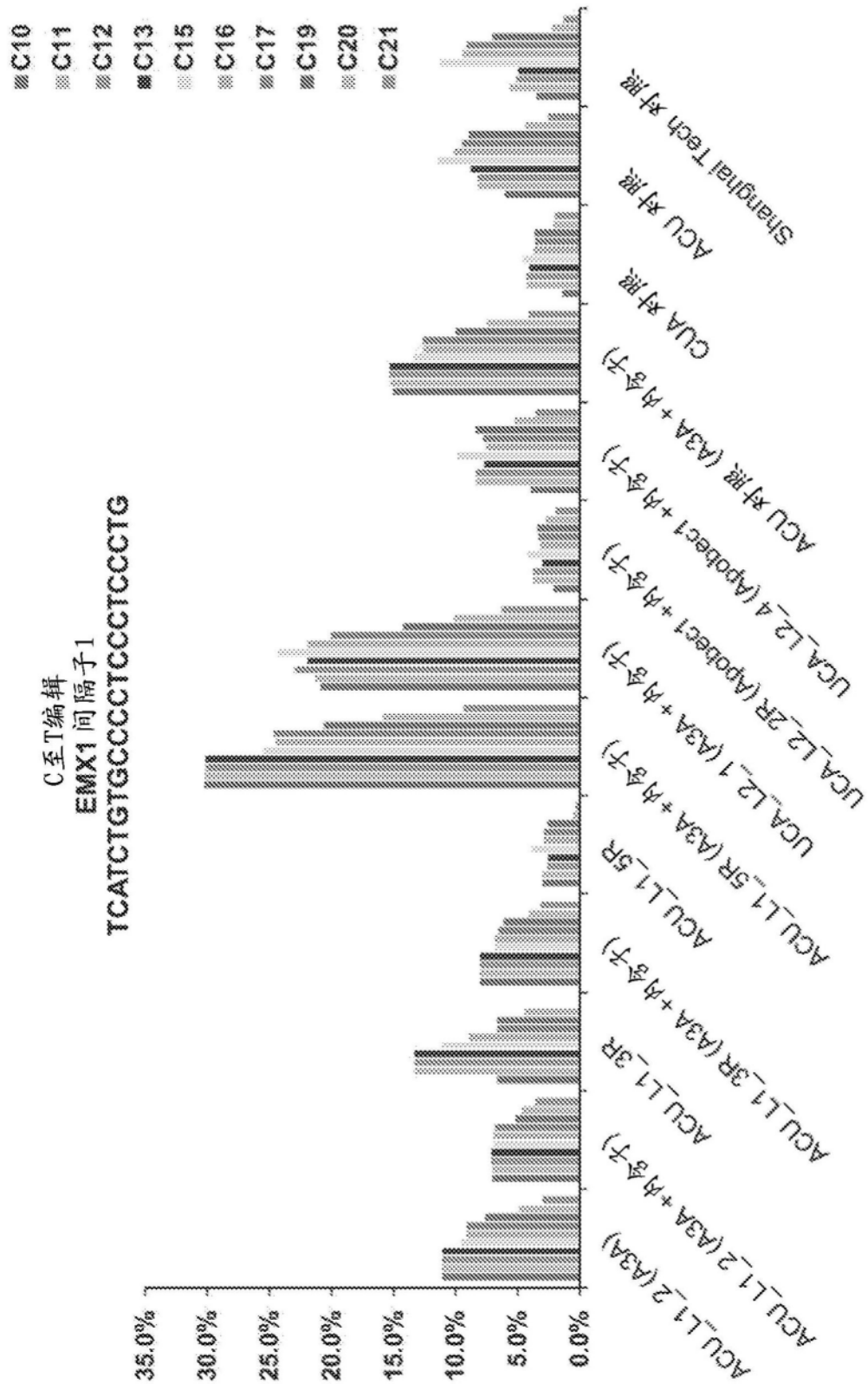


图21

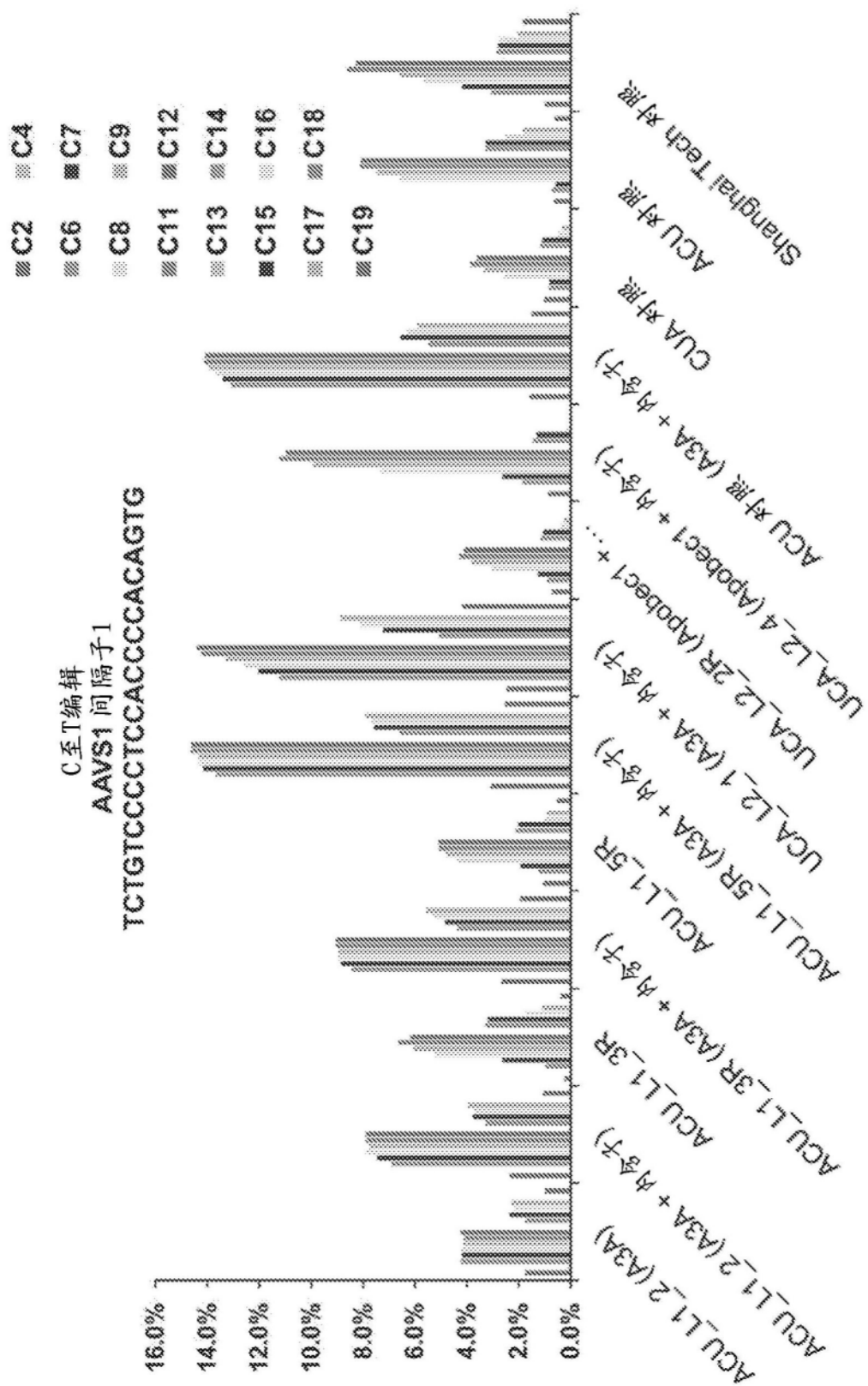


图22

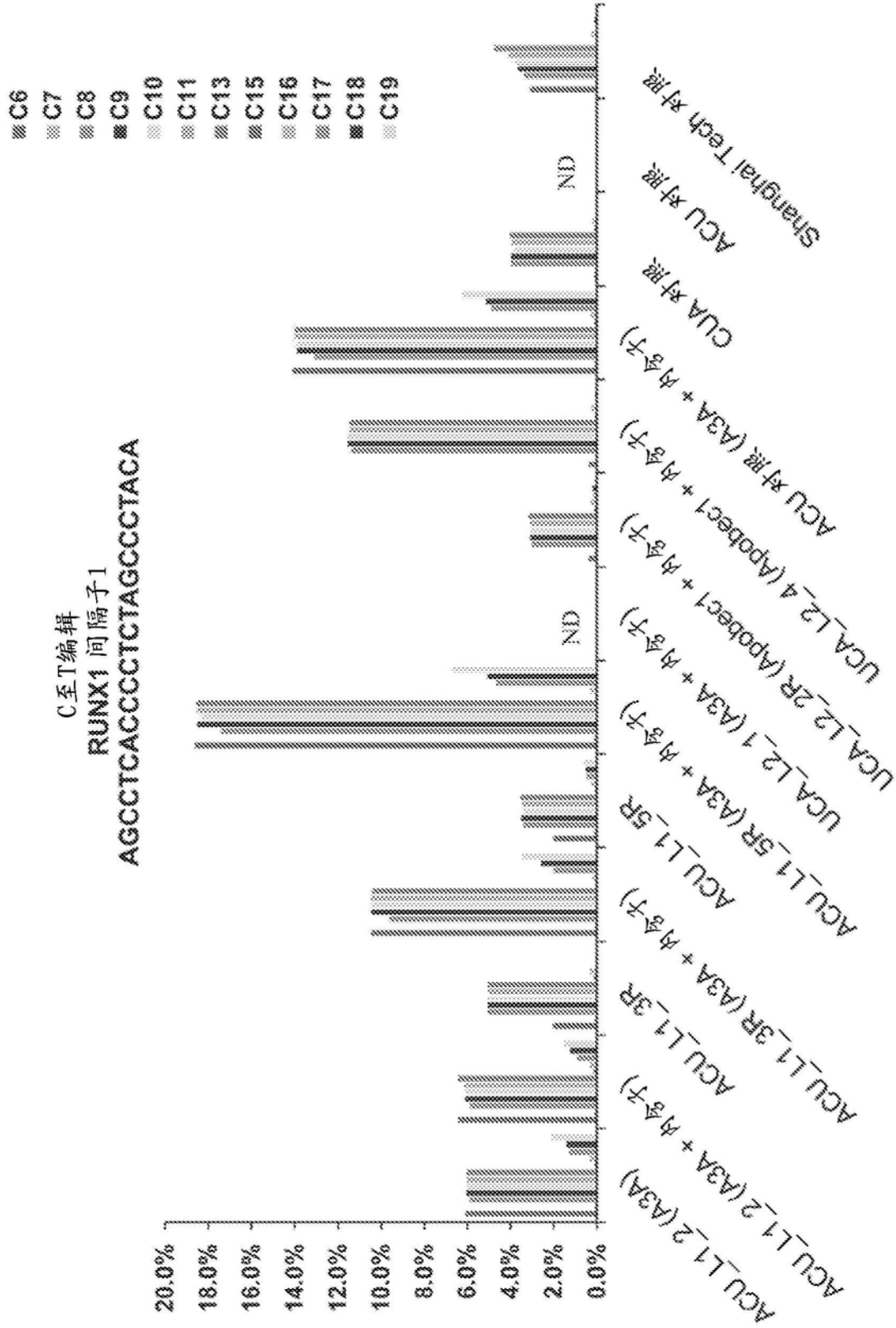


图23

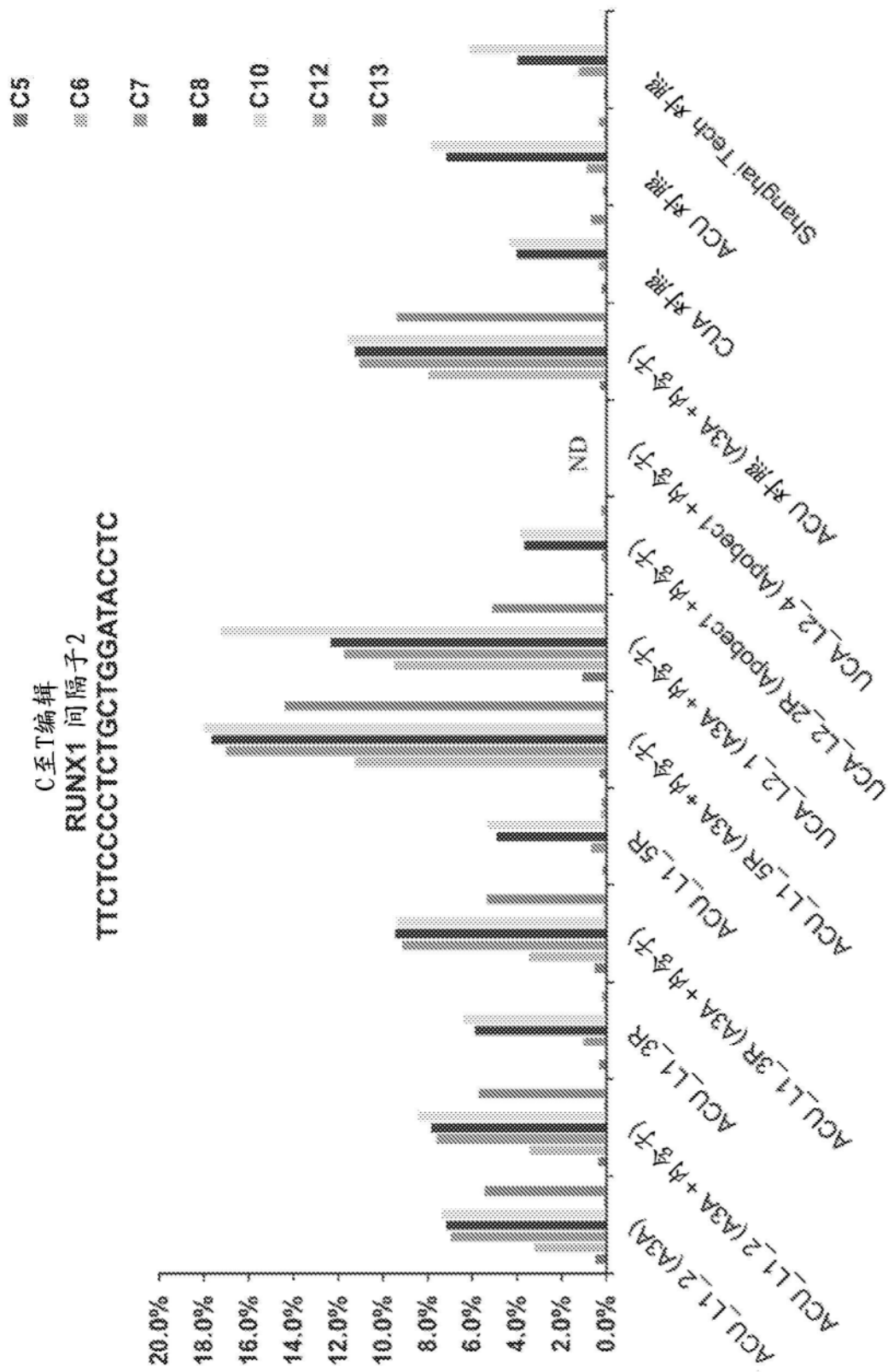


图24

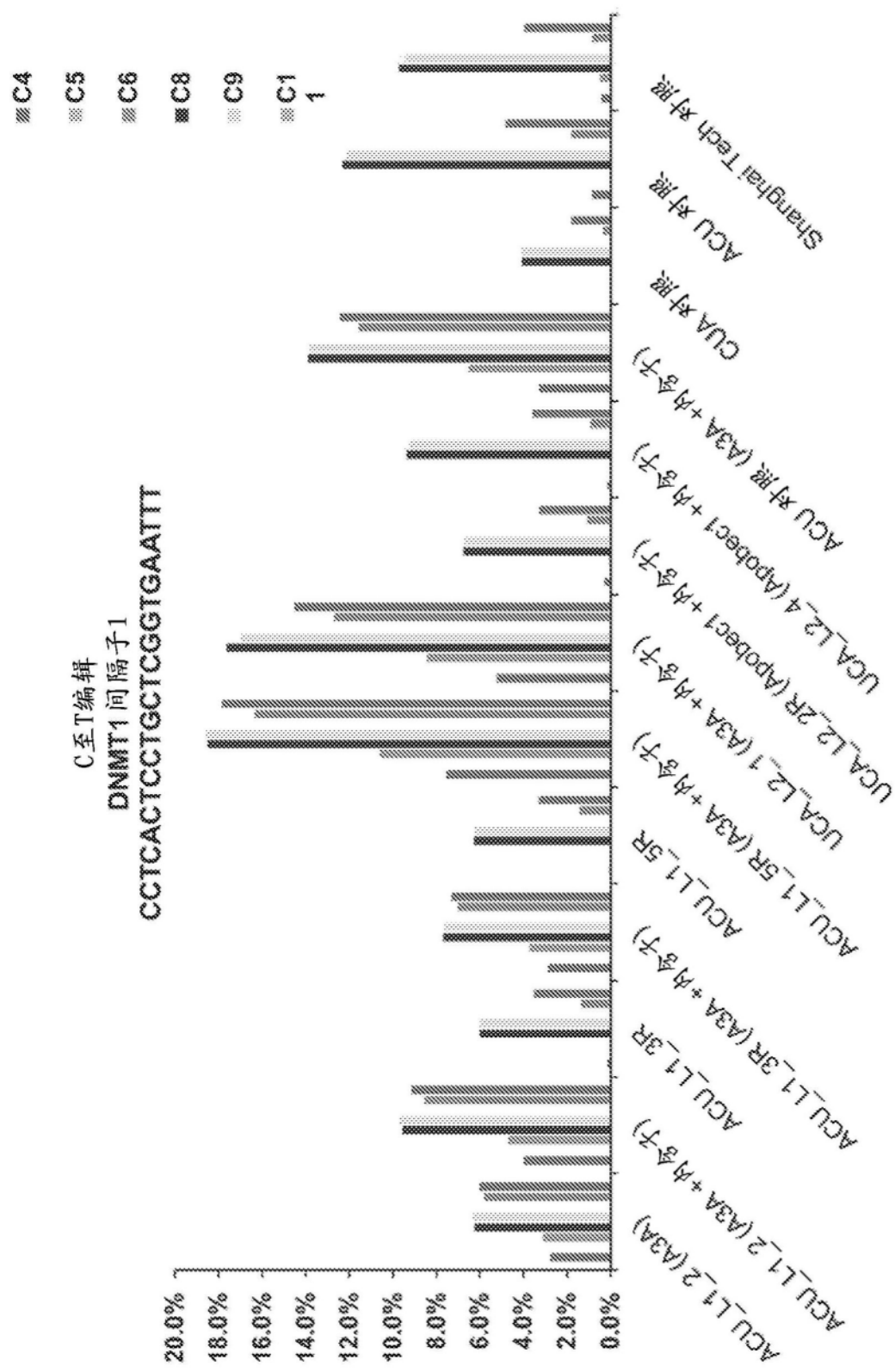


图25

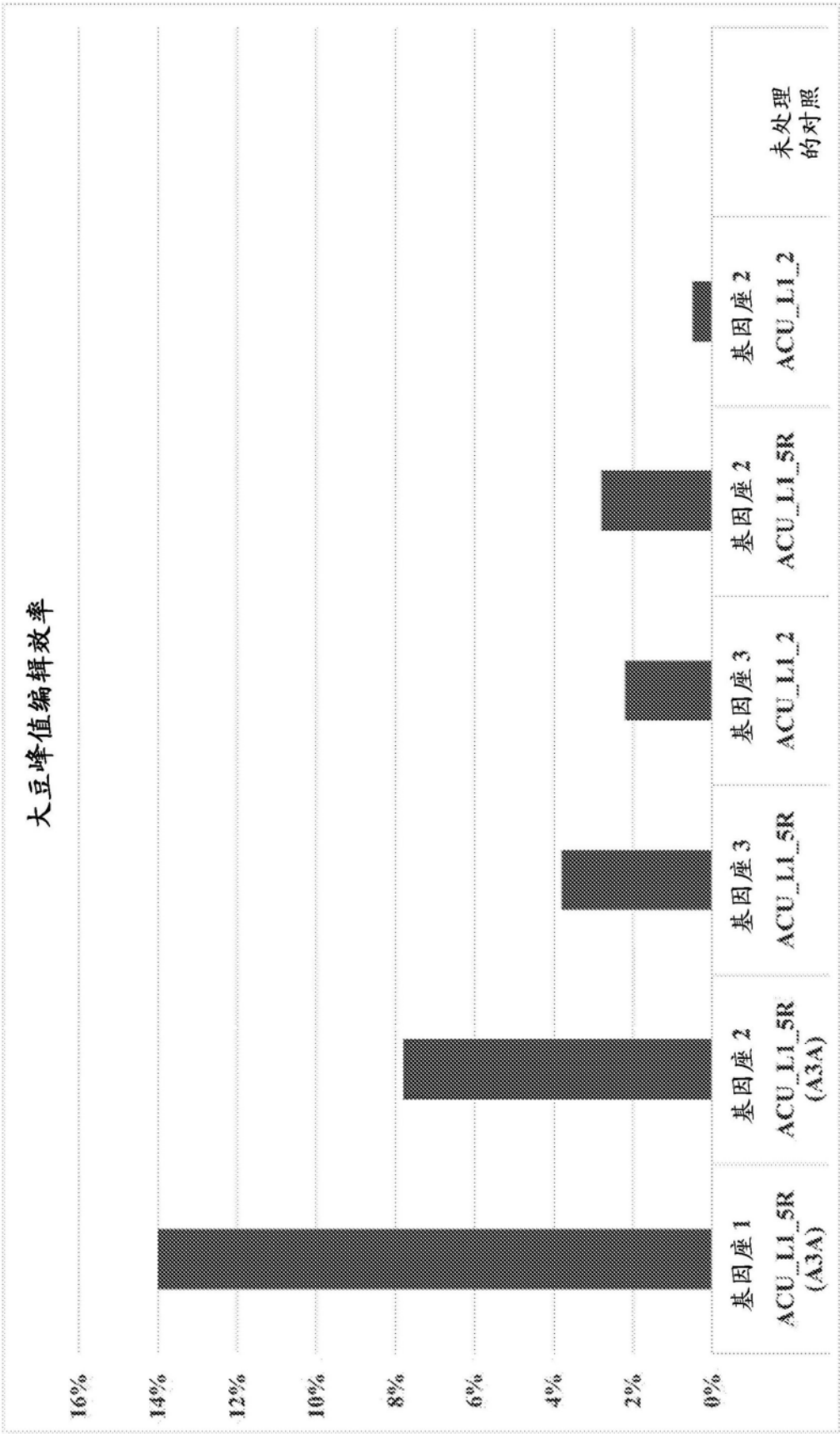


图26