FIG. 4A	FIG. 4B
FIG. 4C	FIG. 4D
FIG. 4E	FIG. 4F

FIG. 4

FIG. 4A

H.pylori futC MAFKVVQICGGLGNQMFQYAFAKSLQKHSNTP--VLLDITSFDWSDR
H.mustelae futL MDFKIVQVHGGLGNQMFQYAFAKSLQTHLNIP--VLLDTTWFDYGNR
Bacteroides vulgatus futN M--RLIKVTGGLGNQMFIYAFYLRMKKYY---PKVRIDLSDMMH---
E. coli 0126 wbgL M--SIIRLQGGLGNQLFQFSFGYALSKINGTP--LYFDISHYAEN---

Prevotella melaninogenica FutO YP_003814512.1 M-K-IVKILGGLGNQMFQYALYLSLQES-FPKERVALDLSSF-----
Clostridium bolteae+13 FutP WP_002570768.1 m-v-iikmmggIgnqMFQYALYKAFEQK-HID--VYADLAWYKNKSV
Lachnospiraceae sp. FutQ WP_009251343.1 M-V-IVQLSGGLGNQMFEYALYLSLKAK-GKEVKID-DVTCYEGPGT
Methanosphaerula palustris FutR YP_002467213.1 M-I-IVRLKGGLGNQLSQYALGRKIAHL-HNTE-LKLDTTWFTTISS
Tannerella sp. FutS WP_021929367.1 M-VRIVEIIGGLGNQMFQYAFSLYLKNKSHIWDRLYVDIEAMKT---
Bacteroides caccae FutU WP_005675707.1 M-K-IVKILGGLGNQMFQYALFLSLKER-FPHEQVMIDTSCF-----
Butyrivibrio FutV WP_022772718.1 M-I-IIQLKGGLGNQMFQYALYKSLKKR-GKEVKID-DKTGFVNDKL
Prevotella sp. FutW WP_022481266.1 M--RLVKMIGGLGNQMFIYAFYLQMRKRGIF--SNVRIDLTDMMH---
Parabacteroides johnsonii FutX WP_008155883.1 M--RLIKMIGGLGNQMFIYAFYLKMKHHY---PDTNIDLSDMVH---
Akkermansia muciniphilia FutY YP_001877555 M-----RLFGGLGNQLFQYAFLFALSRQGG---KARLETSSYEHDDK
Salmonella enterica FutZ WP_023214330 M-YSC--LSGGLGNQMFQYAAAYILKQYFQSTTLVLDDSYYYSQPKR
Bacteroides sp. FutZA WP_022161880.1 M--RLIKMTGGLGNQMFIYAFYLRMKKRY---PKVRIDLSDMVH---
Clostridium bolteae FutP WP_002570768.1 M-----FQYALYKAFEQK-HID--VYADLAWYKNKSV

```
KMQL----------ELFPIDLPYASAKEIAIAKMQHLPKLVRDALKCM----------GFDRVSQEIVF 94
ELGL----------HLFPIDLQCASAQQIAAAHMQNLPRLVRGALRRM----------GLGRVSKEIVF 94
-----YKVHYGYEMHRVFNLPH----------TEFCINQPLKKVIEFLF-FKKIY----------ERKQAPN 85
------DDHGGYRLNNL----------QIPEEYLQYYTPKINNIYKFLVRGSRLYPEIFLPLGFCNEFHAY 96
---HGYHLHNGFELENIFSVTAQKASAADIMRIAYYYPNYLLWRIGKRFLPRRKGM----------CLESSSL 99
----KFELYN----------FGIKINVASEKDINRLSDCQADF-VSRIRRKIFGKKKSF----------VSEKNDS 93
RPR----------QLDVFGITYDRASREELTEMTDASMD-ALSRVRRKLTG-RRTK----------AYRERDI 94
DTPRTYRLNN----YNIIGTIASAKEIQLIERGRAQGRGYLLSKISDLLTPMYRRT----------YVRERMH 102
-----YDRHYGLELEKVFNLSLCPISNRLHRNLQ----------KRSFAKHFVKS----------LYEHSEC 90
---RNYPLHNGFEVDRIFAQKAPVASWRNILKVAYPYPNYRFWKIGKYILPKRKTM----------CVERKNF 99
RIP----------VLSRWGVEYDRATDEEIINLTDSKMD-LFSRIRRKLTG-RKTF----------RIDEESG 94
-----YNVHYGYELHKVFGLPR----------TEFCMNQPLKKVLEFLF-FRTIV----------ERKQH-G 84
-----YKVHNGYEMNRIFDLSQ----------TEFCINRTLKKILEFLF-FKKIY----------ERRQDPS 85
RVC---ELHHFRVSLPIEGGPPPWA----------FRKSRIPACLRSLFAAPKYPH----------FREEKRH 89
DTVRSLELNG----------FNISYDRFSFAD----EKEKIKLLRKFKRNPFPKQISEIDSIALPGKYALSDRA 104
-----YHVHHGYEMHRVFNLPH----------TEFCINQPLKKVIEFLF-FKKIY----------ERKQDPN 85
----KFELYN----------FGIKINVASEKDINRLSDCQADF-VSRIRRKIFGKKKSF----------VSEKNDS 80
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FIG. 4B

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H.pylori futC          EYEPKLLKPSR-LTYFFGYFQDPRYF--DAISPLIKQTFTLPPPPEN
H.mustelae futL        EYMPELFEPSR-IAYFHGYFQDPRYF--EDISPLIKQTFTLPHPTEH
Bacteroides vulgatus futN SLRAFEKKYFWPLLYFKGFYQSERFF--ADIKDEVRESFTF----DK
E. coli 0126 wbgL      GYDFEYIAQKWKSKKYIGYWQSEHFFHKHIL--DLKEFFI------P
Prevotella melaninogenica FutO YP_003814512.1 RFDESVLR-QEGNRYFDGYWQDERYF--AAYREKVLKAFTFPAFKRA
Clostridium bolteae+13 FutP WP_002570768.1 CYENDILR-M-DNVYLSGYWQTEKYF--SNTREKLLEDYSF-ALVNS
Lachnospiraceae sp. FutQ WP_009251343.1 NFDPLVME--KDPALLEGCFQSDKYF--RDCEGRVREAYRFRGIESG
Methanosphaerula palustris FutR YP_002467213.1 TFDKAILT-VPDNVYLDGYWQTEKYF--KDIEEILRREVTLKDEPDS
Tannerella sp. FutS WP_021929367.1 EFDEPVYRGLRPYRYYRGYWQNEGYFV--DIEPMIREAFQFNVNILS
Bacteroides caccae FutU WP_005675707.1 SFDAAVLT-RKGDCYYDGYWQHEEYF--CDMKETIWEAFSFPEPVDG
Butyrivibrio FutV WP_022772718.1 KFNPEILE--KENAYLVGYWQCDKYFDDKDVVREIREAFEKKPQE--
Prevotella sp. FutW WP_022481266.1 RMEPYTCQYVWPLVYFKGFYQSERYF--SEVKDEVRECFTF----NP
Parabacteroides johnsonii FutX WP_008155883.1 TLYPYEKRYFWPLLYFKGFYQSERFF--FDIKDDVRKAFSF----NL
Akkermansia muciniphilia FutY YP_001877555 GFDPGLAAPPRRHTYFKGYFQTEQYFL--HCREQLCREFRLKTPLTP
Salmonella enterica FutZ WP_023214330 FYTFETIKNIDKACLFSFYQDAD---LLNKYKQLILPLFELR---DD
Bacteroides sp. FutZA WP_022161880.1 SLRAFEKKYLWPLLYFKGFYQSERFF--ADIKDEVRKAFTF----DS
Clostridium bolteae FutP WP_002570768.1 CYENDILR-M-DNVYLSGYWQTEKYF--SNTREKLLEDYSF-ALVNS
```

FIG. 4C

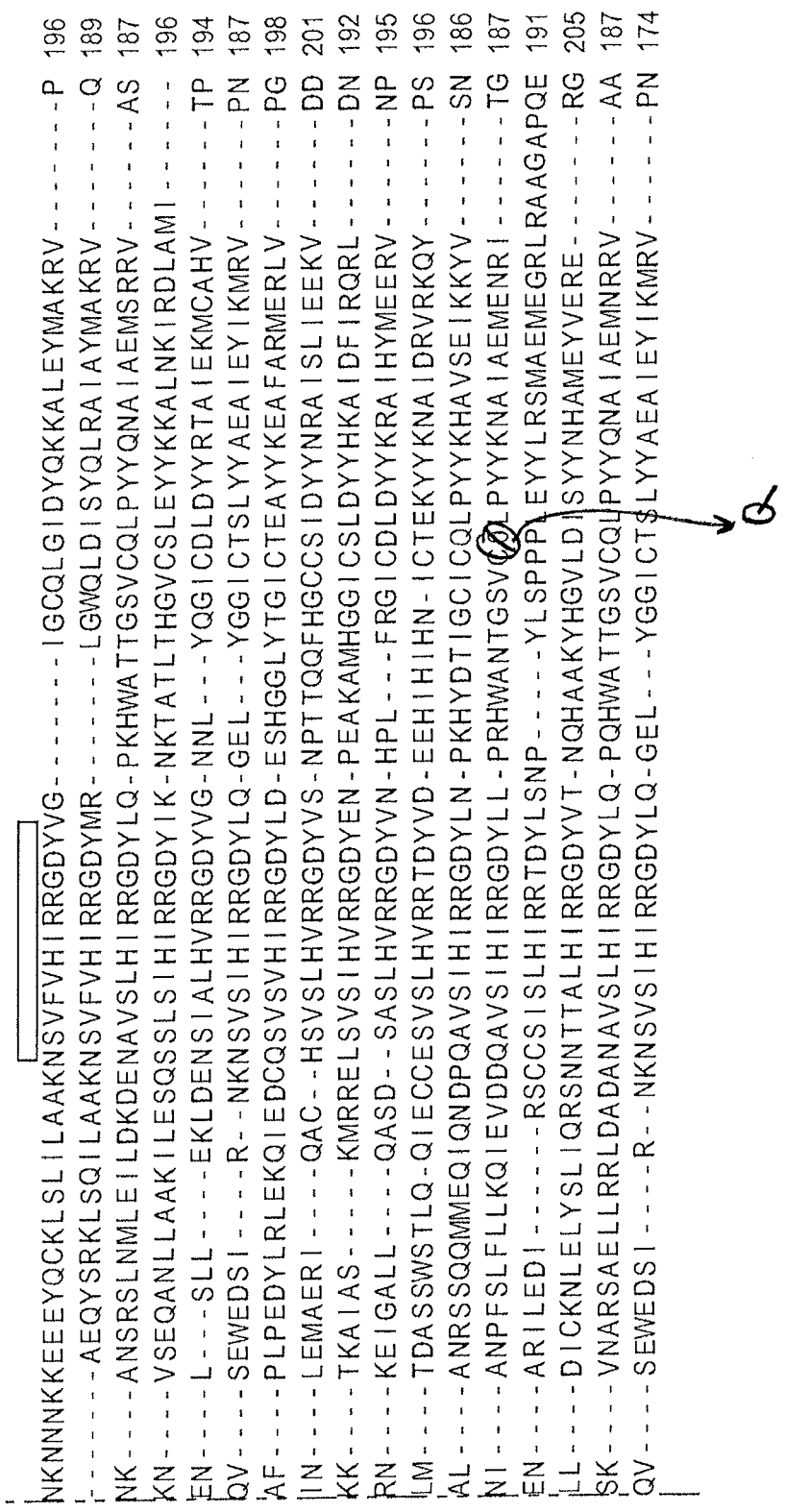

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NK----ANSRSLNMLEILDKDENAVSLHIRRGDYLQ-PKHWATTGSVCQLPYYQNAIAEMSRRV------AS 187
KN----VSEQANLLAAKILESQSSLSIHIRRGDYIK-NKTATLTHGVCSLEYYKKALNKIRDLAMI------ 196
EN----L---SLL----EKLDENSIALHVRRGDYVG-NNL---YQGICDLDYYRTAIEKMCAHV------TP 194
QV----SEWEDSI----R--NKNSVSIHIRRGDYLQ-GEL---YGGICTSLYYAEAIEYIKMRV------PN 187
AF----PLPEDYLRLEKQIEDCQSVSVHIRRGDYLD-ESHGGLYTGICTEAYYKEAFARMERLV------PG 198
IN----LEMAERI----QAC--HSVSLHVRRGDYVS-NPTTQQFHGCCSIDYYNRAISLIEEKV------DD 201
KK----TKAIAS-----KMRRELSVSIHVRRGDYEN-PEAKAMHGGICSLDYYHKAIDFIRQRL------DN 192
RN----KEIGALL----QASD--SASLHVRRGDYVN-HPL---FRGICDLDYYKRAIHYMEERV------NP 195
LM----TDASSWSTLQ-QIECCESVSLHVRRTDYVD-EEHIHIHN-ICTEKYYKNAIDRVRKQY------PS 196
AL----ANRSSQQMMEQIQNDPQAVSIHIRRGDYLN-PKHYDTIGCICQLPYYKHAVSEIKKYV------SN 186
NI----ANPFSLFLLKQIEVDDQAVSIHIRRGDYLL-PRHWANTGSVCQLPYYKNAIAEMENRI------TG 187
EN----ARILEDI-------RSCCSISLHIRRTDYLSNP----YLSPPPLEYYLRSMAEMEGRLRAAGAPQE 191
LL----DICKNLELYSLIQRSNNTTALHIRRGDYVT-NQHAAKYHGVLDISYYNHAMEYVERE------RG 205
SK----VNARSAELLRRLDADANAVSLHIRRGDYLQ-PQHWATTGSVCQLPYYQNAIAEMNRRV------AA 187
QV----SEWEDSI----R--NKNSVSIHIRRGDYLQ-GEL---YGGICTSLYYAEAIEYIKMRV------PN 174

FIG. 4D

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                    H.pylori futC   NMELFVFCEDLEFT-QNLDLGYP---FMDMTTRDKLEEAYWDMLLMQ
                H.mustelae futL     NLELFLFCEDLEFV-QNLDLGYP---FVDMTTRDGA--AHWDMMLMQ
          Bacteroides vulgatus futN PS-YYIFSDDIAWVKENL----PLQNAVYIDWNTDE-DSWQDMMLMS
                E. coli 0126 wbgL   -RDVFIFSDDIFWCKENIETLLSKKYNIYYSEDLSQEE---DLWLMS
Prevotella melaninogenica FutO YP_003814512.1 SL-FCIFSNDITWCQQHLQPYLKAP-VVYVTWNTGV-ESYRDMQLMS
  Clostridium bolteae+13 FutP WP_002570768.1 AK-FFVFSDDVEWVKQQED----FKGFVIVDRNEYS-SALSDMYLMS
      Lachnospiraceae sp. FutQ WP_009251343.1 AR-FFLFSNDPEWTREHFE----SKNCVLVEGSTED-TGYMDLYLMS
Methanosphaerula palustris FutR YP_002467213.1 PS-FFIFSDDLPWAKENLD--IPGEKT-FVAHNGPE-KEYCDLWLMS
          Tannerella sp. FutS WP_021929367.1 NICFYLFSDDINWVEENLQL----ENRCII DWNQGE-DSWQDMYLMS
    Bacteroides caccae FutU WP_005675707.1 QL-YCVFSNDMAWCESHLRALLPGKEVVYVDWNKGA-ESYVDMRLMS
          Butyrivibrio FutV WP_022772718.1 AV-FFIFTDDKEWCRDHFK----GPNFIVVELEEGDGTDIAEMRLMS
        Prevotella sp. FutW WP_022481266.1 PH-FYVFSEDLDWVKANL----PLENAQYIDWNKGA-DSWQDMMLMS
Parabacteroides johnsonii FutX WP_008155883.1 PS-YYVFSDDISWVKENI----PLKKAVYVTWNKGE-DSWQDMMLMS
  Akkermansia muciniphilia FutY YP_001877555 SLRYFIFSDDIEWARQNLRPALP--HVHVDINDG-GTGYFDLELMR
      Salmonella enterica FutZ WP_023214330 KQNFIIFSDDVRWAQKAFLE----NDNCYVINNSDYDFSAIDMYLMS
          Bacteroides sp. FutZA WP_022161880.1 PS-YYVFSDDIAWVKENI----PLQNAVYIDWNKGE-ESWQDMMLMS
    Clostridium bolteae FutP WP_002570768.1 AK-FFVFSDDVEWVKQQED----FKGFVIVDRNEYS-SALSDMYLMS
```


FIG. 4E

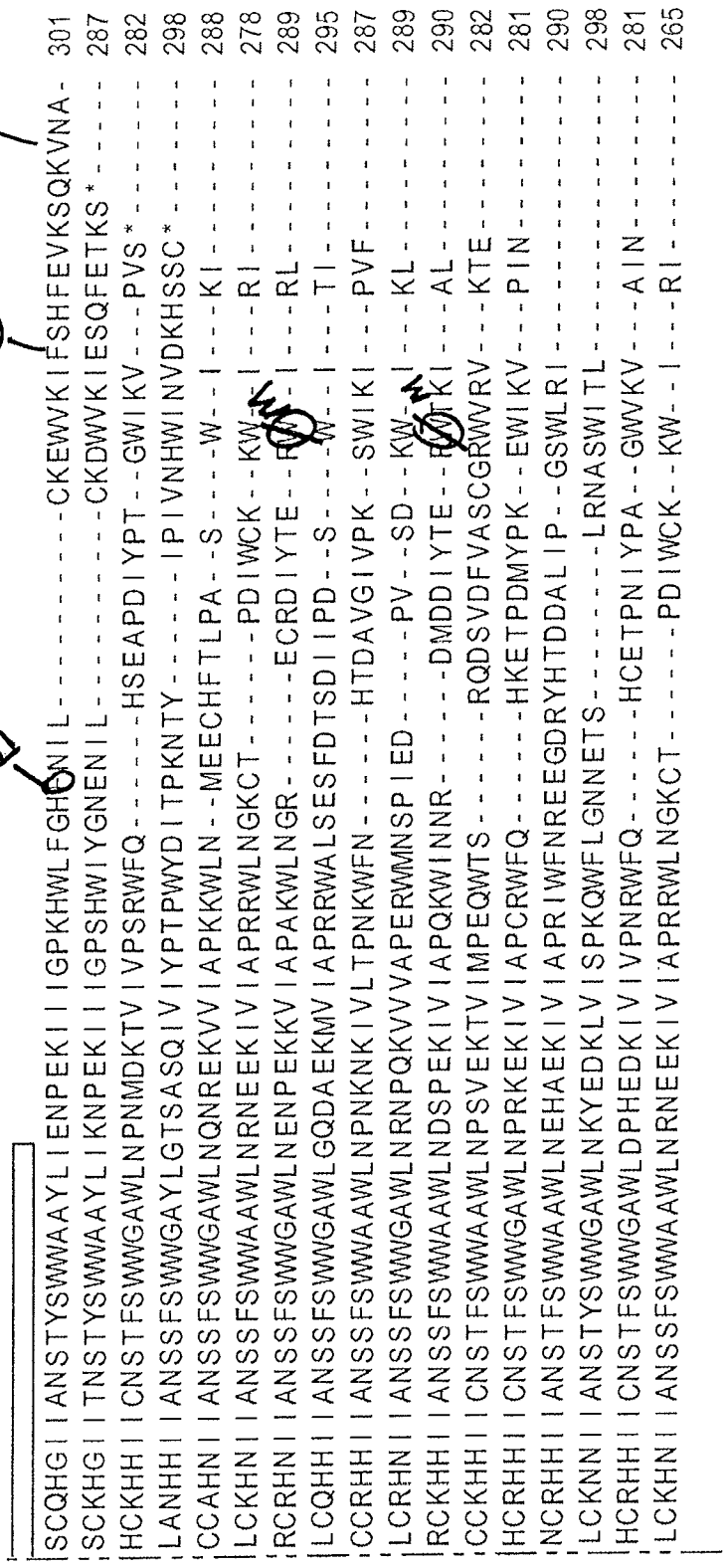

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HCKHHIICNSTFSWWGAWLNPNMDKTVIVPSRWFQ------HSEAPDIYPT--GWIKV---PVS*------ 282
LANHHIIANSSFSWWGAYLGTSASQIVIYPTPWYDITPKNTY------IPIVNHWINVDKHSSC*------ 298
CCAHNIIANSSFSWWGAWLNQNREKVVIAPKKWLN--MEECHFTLPA--S----W--I---KI---------- 288
LCKHNIIANSSFSWWAAWLNRNEEKIVIAPRRWLNGKCT------PDIWCK--KW--I---RI---------- 278
RCRHNIIANSSFSWWGAWLNENPEKKVIAPAKWLNGR------ECRDIYTE--RW--I---RL---------- 289
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CCRHHIIANSSFSWWAAWLNPNKNKIVLTPNKWFN------HTDAVGIVPK--SWIKI---PVF-------- 287
LCRHNIIANSSFSWWGAWLNRNPQKVVVAPERWMNSPIED------PV--SD--KW--I---KL---------- 289
RCKHHIIANSSFSWWAAWLNDSPEKIVIAPQKWINNR------DMDDIYTE--RW--I---AL---------- 290
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LCKNNIIANSTYSWWGAWLNKYEDKLVISPKQWFLGNNETS------LRNASWITL---------- 298
HCRHHIICNSTFSWWGAWLDPHEDKIVIVPNRWFQ------HCETPNIYPA--GWVKV---AIN-------- 281
LCKHNIIANSSFSWWAAWLNRNEEKIVIAPRRWLNGKCT------PDIWCK--KW--I---RI---------- 265

FIG. 4F