

B 7828.ST25.txt  
SEQUENCE LISTING

<110> BASF AG  
 <120> Methionine synthases with reduced product inhibition  
 <130> B 7828/MH  
 <150> EP 06 127 363.7  
 <151> 2006-12-29  
 <160> 32  
 <170> PatentIn version 3.3  
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 Met Gly Thr Gln Leu Gln Gly Phe Asp Leu Asp Val Glu Lys Asp Phe  
 35 40 45  
 Leu Asp Leu Glu Gly Cys Asn Glu Ile Leu Asn Asp Thr Arg Pro Asp  
 50 55 60  
 Val Leu Arg Gln Ile His Arg Ala Tyr Phe Glu Ala Gly Ala Asp Leu  
 65 70 75 80  
 Val Glu Thr Asn Thr Phe Gly Cys Asn Leu Pro Asn Leu Ala Asp Tyr  
 85 90 95  
 Asp Ile Ala Asp Arg Cys Arg Glu Leu Ala Tyr Lys Gly Thr Ala Val  
 100 105 110  
 Ala Arg Glu Val Ala Asp Glu Met Gly Pro Gly Arg Asn Gly Met Arg  
 115 120 125  
 Arg Phe Val Val Gly Ser Leu Gly Pro Gly Thr Lys Leu Pro Ser Leu  
 130 135 140  
 Gly His Ala Pro Tyr Ala Asp Leu Arg Gly His Tyr Lys Glu Ala Ala  
 145 150 155 160  
 Leu Gly Ile Ile Asp Gly Gly Gly Asp Ala Phe Leu Ile Glu Thr Ala  
 165 170 175

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Gln Asp Leu Leu Gln Val Lys Ala Ala Val His Gly Val Gln Asp Ala  
180 185 190

Met Ala Glu Leu Asp Thr Phe Leu Pro Ile Ile Cys His Val Thr Val  
195 200 205

Glu Thr Thr Gly Thr Met Leu Met Gly Ser Glu Ile Gly Ala Ala Leu  
210 215 220

Thr Ala Leu Gln Pro Leu Gly Ile Asp Met Ile Gly Leu Asn Cys Ala  
225 230 235 240

Thr Gly Pro Asp Glu Met Ser Glu His Leu Arg Tyr Leu Ser Lys His  
245 250 255

Ala Asp Ile Pro Val Ser Val Met Pro Asn Ala Gly Leu Pro Val Leu  
260 265 270

Gly Lys Asn Gly Ala Glu Tyr Pro Leu Glu Ala Glu Asp Leu Ala Gln  
275 280 285

Ala Leu Ala Gly Phe Val Ser Glu Tyr Gly Leu Ser Met Val Gly Gly  
290 295 300

Cys Cys Gly Thr Thr Pro Glu His Ile Arg Ala Val Arg Asp Ala Val  
305 310 315 320

Val Gly Val Pro Glu Gln Glu Thr Ser Thr Leu Thr Lys Ile Pro Ala  
325 330 335

Gly Pro Val Glu Gln Ala Ser Arg Glu Val Glu Lys Glu Asp Ser Val  
340 345 350

Ala Ser Leu Tyr Thr Ser Val Pro Leu Ser Gln Glu Thr Gly Ile Ser  
355 360 365

Met Ile Gly Glu Arg Thr Asn Ser Asn Gly Ser Lys Ala Phe Arg Glu  
370 375 380

Ala Met Leu Ser Gly Asp Trp Glu Lys Cys Val Asp Ile Ala Lys Gln  
385 390 395 400

Gln Thr Arg Asp Gly Ala His Met Leu Asp Leu Cys Val Asp Tyr Val  
405 410 415

Gly Arg Asp Gly Thr Ala Asp Met Ala Thr Leu Ala Ala Leu Leu Ala  
420 425 430

Thr Ser Ser Thr Leu Pro Ile Met Ile Asp Ser Thr Glu Pro Glu Val  
435 440 445

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Ile Arg Thr Gly Leu Glu His Leu Gly Gly Arg Ser Ile Val Asn Ser  
450 455 460

Val Asn Phe Glu Asp Gly Asp Gly Pro Glu Ser Arg Tyr Gln Arg Ile  
465 470 475 480

Met Lys Leu Val Lys Gln His Gly Ala Ala Val Val Ala Leu Thr Ile  
485 490 495

Asp Glu Glu Gly Gln Ala Arg Thr Ala Glu His Lys Val Arg Ile Ala  
500 505 510

Lys Arg Leu Ile Asp Asp Ile Thr Gly Ser Tyr Gly Leu Asp Ile Lys  
515 520 525

Asp Ile Val Val Asp Cys Leu Thr Phe Pro Ile Ser Thr Gly Gln Glu  
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Glu Thr Arg Arg Asp Gly Ile Glu Thr Ile Glu Ala Ile Arg Glu Leu  
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Lys Lys Leu Tyr Pro Glu Ile His Thr Thr Leu Gly Leu Ser Asn Ile  
565 570 575

Ser Phe Gly Leu Asn Pro Ala Ala Arg Gln Val Leu Asn Ser Val Phe  
580 585 590

Leu Asn Glu Cys Ile Glu Ala Gly Leu Asp Ser Ala Ile Ala His Ser  
595 600 605

Ser Lys Ile Leu Pro Met Asn Arg Ile Asp Asp Arg Gln Arg Glu Val  
610 615 620

Ala Leu Asp Met Val Tyr Asp Arg Arg Thr Glu Asp Tyr Asp Pro Leu  
625 630 635 640

Gln Glu Phe Met Gln Leu Phe Glu Gly Val Ser Ala Ala Asp Ala Lys  
645 650 655

Asp Ala Arg Ala Glu Gln Leu Ala Ala Met Pro Leu Phe Glu Arg Leu  
660 665 670

Ala Gln Arg Ile Ile Asp Gly Asp Lys Asn Gly Leu Glu Asp Asp Leu  
675 680 685

Glu Ala Gly Met Lys Glu Lys Ser Pro Ile Ala Ile Ile Asn Glu Asp  
690 695 700

Leu Leu Asn Gly Met Lys Thr Val Gly Glu Leu Phe Gly Ser Gly Gln  
705 710 715 720

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Met Gln Leu Pro Phe Val Leu Gln Ser Ala Glu Thr Met Lys Thr Ala  
725 730 735

Val Ala Tyr Leu Glu Pro Phe Met Glu Glu Glu Ala Glu Ala Thr Gly  
740 745 750

Ser Ala Gln Ala Glu Gly Lys Gly Lys Ile Val Val Ala Thr Val Lys  
755 760 765

Gly Asp Val His Asp Ile Gly Lys Asn Leu Val Asp Ile Ile Leu Ser  
770 775 780

Asn Asn Gly Tyr Asp Val Val Asn Leu Gly Ile Lys Gln Pro Leu Ser  
785 790 795 800

Ala Met Leu Glu Ala Ala Glu Glu His Lys Ala Asp Val Ile Gly Met  
805 810 815

Ser Gly Leu Leu Val Lys Ser Thr Val Val Met Lys Glu Asn Leu Glu  
820 825 830

Glu Met Asn Asn Ala Gly Ala Ser Asn Tyr Pro Val Ile Leu Gly Gly  
835 840 845

Ala Ala Leu Thr Arg Thr Tyr Val Glu Asn Asp Leu Asn Glu Val Tyr  
850 855 860

Thr Gly Glu Val Tyr Tyr Ala Arg Asp Ala Phe Glu Gly Leu Arg Leu  
865 870 875 880

Met Asp Glu Val Met Ala Glu Lys Arg Gly Glu Gly Leu Asp Pro Asn  
885 890 895

Ser Pro Glu Ala Ile Glu Gln Ala Lys Lys Lys Ala Glu Arg Lys Ala  
900 905 910

Arg Asn Glu Arg Ser Arg Lys Ile Ala Ala Glu Arg Lys Ala Asn Ala  
915 920 925

Ala Pro Val Ile Val Pro Glu Arg Ser Asp Val Ser Thr Asp Thr Pro  
930 935 940

Thr Ala Ala Pro Pro Phe Trp Gly Thr Arg Ile Val Lys Gly Leu Pro  
945 950 955 960

Leu Ala Glu Phe Leu Gly Asn Leu Asp Glu Arg Ala Leu Phe Met Gly  
965 970 975

Gln Trp Gly Leu Lys Ser Thr Arg Gly Asn Glu Gly Pro Ser Tyr Glu  
980 985 990

Asp Leu Val Glu Thr Glu Gly Arg Pro Arg Leu Arg Tyr Trp Leu Asp  
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995

1000

1005

Arg Leu Lys Ser Glu Gly Ile Leu Asp His Val Ala Leu Val Tyr  
1010 1015 1020

Gly Tyr Phe Pro Ala Val Ala Glu Gly Asp Asp Val Val Ile Leu  
1025 1030 1035

Glu Ser Pro Asp Pro His Ala Ala Glu Arg Met Arg Phe Ser Phe  
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Pro Arg Gln Gln Arg Gly Arg Phe Leu Cys Ile Ala Asp Phe Ile  
1055 1060 1065

Arg Pro Arg Glu Gln Ala Val Lys Asp Gly Gln Val Asp Val Met  
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Pro Phe Gln Leu Val Thr Met Gly Asn Pro Ile Ala Asp Phe Ala  
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Asn Glu Leu Phe Ala Ala Asn Glu Tyr Arg Glu Tyr Leu Glu Val  
1100 1105 1110

His Gly Ile Gly Val Gln Leu Thr Glu Ala Leu Ala Glu Tyr Trp  
1115 1120 1125

His Ser Arg Val Arg Ser Glu Leu Lys Leu Asn Asp Gly Gly Ser  
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Val Ala Asp Phe Asp Pro Glu Asp Lys Thr Lys Phe Phe Asp Leu  
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Asp Tyr Arg Gly Ala Arg Phe Ser Phe Gly Tyr Gly Ser Cys Pro  
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Asp Leu Glu Asp Arg Ala Lys Leu Val Glu Leu Leu Glu Pro Gly  
1175 1180 1185

Arg Ile Gly Val Glu Leu Ser Glu Glu Leu Gln Leu His Pro Glu  
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Gln Ser Thr Asp Ala Phe Val Leu Tyr His Pro Glu Ala Lys Tyr  
1205 1210 1215

Phe Asn Val  
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20 25 30

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35 40 45

Leu Asp Leu Glu Gly Cys Asn Glu Ile Leu Asn Asp Thr Arg Pro Asp  
50 55 60

Val Leu Arg Gln Ile His Arg Ala Tyr Phe Glu Ala Gly Ala Asp Leu  
65 70 75 80

Val Glu Thr Asn Thr Phe Gly Cys Asn Leu Pro Asn Leu Ala Asp Tyr  
85 90 95

Asp Ile Ala Asp Arg Cys Arg Glu Leu Ala Tyr Lys Gly Thr Ala Val  
100 105 110

Ala Arg Glu Val Ala Asp Glu Met Gly Pro Gly Arg Asn Gly Met Arg  
115 120 125

Arg Phe Val Val Gly Ser Leu Gly Pro Gly Thr Lys Leu Pro Ser Leu  
130 135 140

Gly His Ala Pro Tyr Ala Asp Leu Arg Gly His Tyr Lys Glu Ala Ala  
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Leu Gly Ile Ile Asp Gly Gly Gly Asp Ala Phe Leu Ile Glu Thr Ala  
165 170 175

Gln Asp Leu Leu Gln Val Lys Ala Ala Val His Gly Val Gln Asp Ala  
180 185 190

Met Ala Glu Leu Asp Thr Phe Leu Pro Ile Ile Cys His Val Thr Val  
195 200 205

Glu Thr Thr Gly Thr Met Leu Met Gly Ser Glu Ile Gly Ala Ala Leu  
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Thr Ala Leu Gln Pro Leu Gly Ile Asp Met Ile Gly Leu Asn Cys Ala  
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Thr Gly Pro Asp Glu  
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Xaa Xaa Xaa Xaa Xaa Xaa Xaa Leu Xaa Xaa Xaa
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Xaa

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1 5

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Xaa Xaa Ala Xaa Glu Xaa  
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 <223> X is G or D or A or E  
  
 <220>  
 <221> misc\_feature  
 <222> (7)..(7)  
 <223> X is H or A or N  
  
 <220>  
 <221> misc\_feature  
 <222> (8)..(8)  
 <223> X is Y or E  
  
 <220>  
 <221> misc\_feature  
 <222> (9)..(9)  
 <223> X is K or Q or R  
  
 <220>  
 <221> misc\_feature  
 <222> (10)..(10)  
 <223> X is E or R  
  
 <220>  
 <221> misc\_feature  
 <222> (11)..(11)  
 <223> X is A or N or S or T  
  
 <220>  
 <221> misc\_feature  
 <222> (12)..(12)  
 <223> X is A or T or V  
  
 <220>  
 <221> misc\_feature  
 <222> (13)..(13)  
 <223> X is L or E or K  
  
 <220>  
 <221> misc\_feature  
 <222> (14)..(14)  
 <223> X is G or A or I  
  
 <220>  
 <221> misc\_feature  
 <222> (15)..(15)  
 <223> X is I or L or M  
  
 <220>  
 <221> misc\_feature  
 <222> (16)..(16)  
 <223> X is I or V  
  
 <220>  
 <221> misc\_feature  
 <222> (17)..(17)  
 <223> X is E or A  
  
 <220>  
 <221> misc\_feature  
 <222> (18)..(18)  
 <223> X is G or E  
  
 <220>

<221> misc\_feature  
 <222> (20)..(20)  
 <223> X is G or A or V

<400> 12

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa  
 1 5 10 15

Xaa Xaa Gly Xaa  
 20

<210> 13  
 <211> 7  
 <212> PRT  
 <213> Artificial

<220>  
 <223> methionine synthase sequence motif

<220>  
 <221> misc\_feature  
 <222> (2)..(2)  
 <223> X is A or L or G

<220>  
 <221> misc\_feature  
 <222> (3)..(3)  
 <223> X is F or L or I

<220>  
 <221> misc\_feature  
 <222> (4)..(4)  
 <223> X is L or I

<220>  
 <221> misc\_feature  
 <222> (5)..(5)  
 <223> X is I or V or F

<400> 13

Asp Xaa Xaa Xaa Xaa Glu Thr  
 1 5

<210> 14  
 <211> 14  
 <212> PRT  
 <213> Artificial

<220>  
 <223> methionine synthase sequence motif

<220>  
 <221> misc\_feature  
 <222> (1)..(1)  
 <223> X is Q or F or S

<220>  
 <221> misc\_feature  
 <222> (3)..(3)  
 <223> X is L or T or I

<220>

<221> misc\_feature  
<222> (5)..(5)  
<223> X is Q or N or E

<220>  
<221> misc\_feature  
<222> (6)..(6)  
<223> X is V or T or A or L

<220>  
<221> misc\_feature  
<222> (9)..(9)  
<223> X is A or S

<220>  
<221> misc\_feature  
<222> (11)..(11)  
<223> X is H or L or F

<220>  
<221> misc\_feature  
<222> (12)..(12)  
<223> X is G or A

<220>  
<221> misc\_feature  
<222> (13)..(13)  
<223> X is V or A

<220>  
<221> misc\_feature  
<222> (14)..(14)  
<223> X is Q or R or K

<400> 14

Xaa Asp Xaa Leu Xaa Xaa Lys Ala Xaa Val Xaa Xaa Xaa Xaa  
1 5 10

<210> 15  
<211> 12  
<212> PRT  
<213> Artificial

<220>  
<223> methionine synthase sequence motif

<220>  
<221> misc\_feature  
<222> (1)..(1)  
<223> X is L or V

<220>  
<221> misc\_feature  
<222> (2)..(2)  
<223> X is D or G or S

<220>  
<221> misc\_feature  
<222> (3)..(3)  
<223> X is T or L or V or R

<220>  
<221> misc\_feature  
<222> (4)..(4)  
<223> X is F or D or E

<220>  
 <221> misc\_feature  
 <222> (5)..(5)  
 <223> X is L or V

<220>  
 <221> misc\_feature  
 <222> (6)..(6)  
 <223> X is P or F

<220>  
 <221> misc\_feature  
 <222> (7)..(7)  
 <223> X is I or L

<220>  
 <221> misc\_feature  
 <222> (8)..(8)  
 <223> X is I or M

<220>  
 <221> misc\_feature  
 <222> (9)..(9)  
 <223> X is C or V or I or A

<220>  
 <221> misc\_feature  
 <222> (10)..(10)  
 <223> X is H or S

<220>  
 <221> misc\_feature  
 <222> (11)..(11)  
 <223> X is V or G or M

<400> 15

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Thr  
 1 5 10

<210> 16  
 <211> 13  
 <212> PRT  
 <213> Artificial

<220>  
 <223> methionine synthase sequence motif

<220>  
 <221> misc\_feature  
 <222> (1)..(1)  
 <223> X is V or I or F

<220>  
 <221> misc\_feature  
 <222> (2)..(2)  
 <223> X is E or T or D

<220>  
 <221> misc\_feature  
 <222> (3)..(3)  
 <223> X is T or D or E

<220>  
 <221> misc\_feature  
 <222> (4)..(4)  
 <223> X is T or A or K

```

<220>
<221> misc_feature
<222> (5)..(5)
<223> X is G or S

<220>
<221> misc_feature
<222> (6)..(6)
<223> X is G (except in Thermotoga maritima, Corynebacterium glutamicum
and Streptomyces coelicolor)

<220>
<221> misc_feature
<222> (7)..(7)
<223> X is T or R

<220>
<221> misc_feature
<222> (8)..(8)
<223> X is M or T or S

<220>
<221> misc_feature
<222> (10)..(10)
<223> X is M or L or S or T

<220>
<221> misc_feature
<222> (12)..(12)
<223> X is S or Q or T

<220>
<221> misc_feature
<222> (13)..(13)
<223> X is E or T or D

<400> 16

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Leu Xaa Gly Xaa Xaa
1          5          10

<210> 17
<211> 7
<212> PRT
<213> Artificial

<220>
<223> methionine synthase sequence motif

<220>
<221> misc_feature
<222> (1)..(1)
<223> X is G or E or A

<220>
<221> misc_feature
<222> (2)..(2)
<223> X is A or N

<220>
<221> misc_feature
<222> (3)..(3)
<223> X is A or F

<220>
<221> misc_feature

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<222> (4)..(4)  
<223> X is L or Y or A

<220>  
<221> misc\_feature  
<222> (5)..(5)  
<223> X is T or N or I

<220>  
<221> misc\_feature  
<222> (6)..(6)  
<223> X is A or S or T

<220>  
<221> misc\_feature  
<222> (7)..(7)  
<223> X is L or F

<400> 17

Xaa Xaa Xaa Xaa Xaa Xaa Xaa  
1 5

<210> 18  
<211> 17  
<212> PRT  
<213> Artificial

<220>  
<223> methionine synthase sequence motif

<220>  
<221> misc\_feature  
<222> (1)..(1)  
<223> X is P or H or E

<220>  
<221> misc\_feature  
<222> (2)..(2)  
<223> X is L or A

<220>  
<221> misc\_feature  
<222> (3)..(3)  
<223> X is G or E or D

<220>  
<221> misc\_feature  
<222> (4)..(4)  
<223> X is I or A

<220>  
<221> misc\_feature  
<222> (5)..(5)  
<223> X is D or L

<220>  
<221> misc\_feature  
<222> (6)..(6)  
<223> X is M or T or A

<220>  
<221> misc\_feature  
<222> (7)..(7)  
<223> X is I or F or L

<220>

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<221> misc\_feature  
<222> (9)..(9)  
<223> X is L or I

<220>  
<221> misc\_feature  
<222> (12)..(12)  
<223> X is A or S

<220>  
<221> misc\_feature  
<222> (13)..(13)  
<223> X is T or L

<220>  
<221> misc\_feature  
<222> (16)..(16)  
<223> X is D or A or E

<400> 18

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Gly Xaa Asn Cys Xaa Xaa Gly Pro Xaa  
1 5 10 15

Glu

<210> 19  
<211> 1221  
<212> PRT  
<213> Corynebacterium glutamicum

<220>  
<221> MUTAGEN  
<222> (33)..(33)  
<223> methionine synthase Meth carrying M33A mutation

<400> 19

Met Ser Thr Ser Val Thr Ser Pro Ala His Asn Asn Ala His Ser Ser  
1 5 10 15

Glu Phe Leu Asp Ala Leu Ala Asn His Val Leu Ile Gly Asp Gly Ala  
20 25 30

Ala Gly Thr Gln Leu Gln Gly Phe Asp Leu Asp Val Glu Lys Asp Phe  
35 40 45

Leu Asp Leu Glu Gly Cys Asn Glu Ile Leu Asn Asp Thr Arg Pro Asp  
50 55 60

Val Leu Arg Gln Ile His Arg Ala Tyr Phe Glu Ala Gly Ala Asp Leu  
65 70 75 80

Val Glu Thr Asn Thr Phe Gly Cys Asn Leu Pro Asn Leu Ala Asp Tyr  
85 90 95

Asp Ile Ala Asp Arg Cys Arg Glu Leu Ala Tyr Lys Gly Thr Ala Val  
100 105 110

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Ala Arg Glu Val Ala Asp Glu Met Gly Pro Gly Arg Asn Gly Met Arg  
115 120 125

Arg Phe Val Val Gly Ser Leu Gly Pro Gly Thr Lys Leu Pro Ser Leu  
130 135 140

Gly His Ala Pro Tyr Ala Asp Leu Arg Gly His Tyr Lys Glu Ala Ala  
145 150 155 160

Leu Gly Ile Ile Asp Gly Gly Gly Asp Ala Phe Leu Ile Glu Thr Ala  
165 170 175

Gln Asp Leu Leu Gln Val Lys Ala Ala Val His Gly Val Gln Asp Ala  
180 185 190

Met Ala Glu Leu Asp Thr Phe Leu Pro Ile Ile Cys His Val Thr Val  
195 200 205

Glu Thr Thr Gly Thr Met Leu Met Gly Ser Glu Ile Gly Ala Ala Leu  
210 215 220

Thr Ala Leu Gln Pro Leu Gly Ile Asp Met Ile Gly Leu Asn Cys Ala  
225 230 235 240

Thr Gly Pro Asp Glu Met Ser Glu His Leu Arg Tyr Leu Ser Lys His  
245 250 255

Ala Asp Ile Pro Val Ser Val Met Pro Asn Ala Gly Leu Pro Val Leu  
260 265 270

Gly Lys Asn Gly Ala Glu Tyr Pro Leu Glu Ala Glu Asp Leu Ala Gln  
275 280 285

Ala Leu Ala Gly Phe Val Ser Glu Tyr Gly Leu Ser Met Val Gly Gly  
290 295 300

Cys Cys Gly Thr Thr Pro Glu His Ile Arg Ala Val Arg Asp Ala Val  
305 310 315 320

Val Gly Val Pro Glu Gln Glu Thr Ser Thr Leu Thr Lys Ile Pro Ala  
325 330 335

Gly Pro Val Glu Gln Ala Ser Arg Glu Val Glu Lys Glu Asp Ser Val  
340 345 350

Ala Ser Leu Tyr Thr Ser Val Pro Leu Ser Gln Glu Thr Gly Ile Ser  
355 360 365

Met Ile Gly Glu Arg Thr Asn Ser Asn Gly Ser Lys Ala Phe Arg Glu  
370 375 380



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Ala Met Leu Ser Gly Asp Trp Glu Lys Cys Val Asp Ile Ala Lys Gln  
385 390 395 400

Gln Thr Arg Asp Gly Ala His Met Leu Asp Leu Cys Val Asp Tyr Val  
405 410 415

Gly Arg Asp Gly Thr Ala Asp Met Ala Thr Leu Ala Ala Leu Leu Ala  
420 425 430

Thr Ser Ser Thr Leu Pro Ile Met Ile Asp Ser Thr Glu Pro Glu Val  
435 440 445

Ile Arg Thr Gly Leu Glu His Leu Gly Gly Arg Ser Ile Val Asn Ser  
450 455 460

Val Asn Phe Glu Asp Gly Asp Gly Pro Glu Ser Arg Tyr Gln Arg Ile  
465 470 475 480

Met Lys Leu Val Lys Gln His Gly Ala Ala Val Val Ala Leu Thr Ile  
485 490 495

Asp Glu Glu Gly Gln Ala Arg Thr Ala Glu His Lys Val Arg Ile Ala  
500 505 510

Lys Arg Leu Ile Asp Asp Ile Thr Gly Ser Tyr Gly Leu Asp Ile Lys  
515 520 525

Asp Ile Val Val Asp Cys Leu Thr Phe Pro Ile Ser Thr Gly Gln Glu  
530 535 540

Glu Thr Arg Arg Asp Gly Ile Glu Thr Ile Glu Ala Ile Arg Glu Leu  
545 550 555 560

Lys Lys Leu Tyr Pro Glu Ile His Thr Thr Leu Gly Leu Ser Asn Ile  
565 570 575

Ser Phe Gly Leu Asn Pro Ala Ala Arg Gln Val Leu Asn Ser Val Phe  
580 585 590

Leu Asn Glu Cys Ile Glu Ala Gly Leu Asp Ser Ala Ile Ala His Ser  
595 600 605

Ser Lys Ile Leu Pro Met Asn Arg Ile Asp Asp Arg Gln Arg Glu Val  
610 615 620

Ala Leu Asp Met Val Tyr Asp Arg Arg Thr Glu Asp Tyr Asp Pro Leu  
625 630 635 640

Gln Glu Phe Met Gln Leu Phe Glu Gly Val Ser Ala Ala Asp Ala Lys  
645 650 655

Asp Ala Arg Ala Glu Gln Leu Ala Ala Met Pro Leu Phe Glu Arg Leu  
Seite 25

Ala Gln Arg Ile Ile Asp Gly Asp Lys Asn Gly Leu Glu Asp Asp Leu  
675 680 685

Glu Ala Gly Met Lys Glu Lys Ser Pro Ile Ala Ile Ile Asn Glu Asp  
690 695

Leu Leu Asn Gly Met Lys Thr Val Gly Glu Leu Phe Gly Ser Gly Gln  
705 710 715 720

Met Gln Leu Pro Phe Val Leu Gln Ser Ala Glu Thr Met Lys Thr Ala  
725 730 735

Val Ala Tyr Leu Glu Pro Phe Met Glu Glu Glu Ala Glu Ala Thr Gly  
740 745 750

Ser Ala Gln Ala Glu Gly Lys Gly Lys Ile Val Val Ala Thr Val Lys  
755 760 765

Gly Asp Val His Asp Ile Gly Lys Asn Leu Val Asp Ile Ile Leu Ser  
770 775 780

Asn Asn Gly Tyr Asp Val Val Asn Leu Gly Ile Lys Gln Pro Leu Ser  
785 790 795 800

Ala Met Leu Glu Ala Ala Glu Glu His Lys Ala Asp Val Ile Gly Met  
805 810 815

Ser Gly Leu Leu Val Lys Ser Thr Val Val Met Lys Glu Asn Leu Glu  
820 825 830

Glu Met Asn Asn Ala Gly Ala Ser Asn Tyr Pro Val Ile Leu Gly Gly  
835 840 845

Ala Ala Leu Thr Arg Thr Tyr Val Glu Asn Asp Leu Asn Glu Val Tyr  
850 855 860

Thr Gly Glu Val Tyr Tyr Ala Arg Asp Ala Phe Glu Gly Leu Arg Leu  
865 870 875 880

Met Asp Glu Val Met Ala Glu Lys Arg Gly Glu Gly Leu Asp Pro Asn  
885 890 895

Ser Pro Glu Ala Ile Glu Gln Ala Lys Lys Lys Ala Glu Arg Lys Ala  
900 905 910

Arg Asn Glu Arg Ser Arg Lys Ile Ala Ala Glu Arg Lys Ala Asn Ala  
915 920 925

Ala Pro Val Ile Val Pro Glu Arg Ser Asp Val Ser Thr Asp Thr Pro  
930 935 940

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Thr Ala Ala Pro Pro Phe Trp Gly Thr Arg Ile Val Lys Gly Leu Pro  
 945 950 955 960  
 Leu Ala Glu Phe Leu Gly Asn Leu Asp Glu Arg Ala Leu Phe Met Gly  
 965 970 975  
 Gln Trp Gly Leu Lys Ser Thr Arg Gly Asn Glu Gly Pro Ser Tyr Glu  
 980 985 990  
 Asp Leu Val Glu Thr Glu Gly Arg Pro Arg Leu Arg Tyr Trp Leu Asp  
 995 1000 1005  
 Arg Leu Lys Ser Glu Gly Ile Leu Asp His Val Ala Leu Val Tyr  
 1010 1015 1020  
 Gly Tyr Phe Pro Ala Val Ala Glu Gly Asp Asp Val Val Ile Leu  
 1025 1030 1035  
 Glu Ser Pro Asp Pro His Ala Ala Glu Arg Met Arg Phe Ser Phe  
 1040 1045 1050  
 Pro Arg Gln Gln Arg Gly Arg Phe Leu Cys Ile Ala Asp Phe Ile  
 1055 1060 1065  
 Arg Pro Arg Glu Gln Ala Val Lys Asp Gly Gln Val Asp Val Met  
 1070 1075 1080  
 Pro Phe Gln Leu Val Thr Met Gly Asn Pro Ile Ala Asp Phe Ala  
 1085 1090 1095  
 Asn Glu Leu Phe Ala Ala Asn Glu Tyr Arg Glu Tyr Leu Glu Val  
 1100 1105 1110  
 His Gly Ile Gly Val Gln Leu Thr Glu Ala Leu Ala Glu Tyr Trp  
 1115 1120 1125  
 His Ser Arg Val Arg Ser Glu Leu Lys Leu Asn Asp Gly Gly Ser  
 1130 1135 1140  
 Val Ala Asp Phe Asp Pro Glu Asp Lys Thr Lys Phe Phe Asp Leu  
 1145 1150 1155  
 Asp Tyr Arg Gly Ala Arg Phe Ser Phe Gly Tyr Gly Ser Cys Pro  
 1160 1165 1170  
 Asp Leu Glu Asp Arg Ala Lys Leu Val Glu Leu Leu Glu Pro Gly  
 1175 1180 1185  
 Arg Ile Gly Val Glu Leu Ser Glu Glu Leu Gln Leu His Pro Glu  
 1190 1195 1200

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Gln Ser Thr Asp Ala Phe Val Leu Tyr His Pro Glu Ala Lys Tyr  
1205 1210 1215

Phe Asn Val  
1220

<210> 20  
<211> 1221  
<212> PRT  
<213> Corynebacterium glutamicum

<220>  
<221> MUTAGEN  
<222> (33)..(33)  
<223> methionine synthase Meth carrying M33L mutation  
  
<400> 20

Met Ser Thr Ser Val Thr Ser Pro Ala His Asn Asn Ala His Ser Ser  
1 5 10 15

Glu Phe Leu Asp Ala Leu Ala Asn His Val Leu Ile Gly Asp Gly Ala  
20 25 30

Gly Gly Thr Gln Leu Gln Gly Phe Asp Leu Asp Val Glu Lys Asp Phe  
35 40 45

Leu Asp Leu Glu Gly Cys Asn Glu Ile Leu Asn Asp Thr Arg Pro Asp  
50 55 60

Val Leu Arg Gln Ile His Arg Ala Tyr Phe Glu Ala Gly Ala Asp Leu  
65 70 75 80

Val Glu Thr Asn Thr Phe Gly Cys Asn Leu Pro Asn Leu Ala Asp Tyr  
85 90 95

Asp Ile Ala Asp Arg Cys Arg Glu Leu Ala Tyr Lys Gly Thr Ala Val  
100 105 110

Ala Arg Glu Val Ala Asp Glu Met Gly Pro Gly Arg Asn Gly Met Arg  
115 120 125

Arg Phe Val Val Gly Ser Leu Gly Pro Gly Thr Lys Leu Pro Ser Leu  
130 135 140

Gly His Ala Pro Tyr Ala Asp Leu Arg Gly His Tyr Lys Glu Ala Ala  
145 150 155 160

Leu Gly Ile Ile Asp Gly Gly Gly Asp Ala Phe Leu Ile Glu Thr Ala  
165 170 175

Gln Asp Leu Leu Gln Val Lys Ala Ala Val His Gly Val Gln Asp Ala  
180 185 190

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Met Ala Glu Leu Asp Thr Phe Leu Pro Ile Ile Cys His Val Thr Val  
195 200 205

Glu Thr Thr Gly Thr Met Leu Met Gly Ser Glu Ile Gly Ala Ala Leu  
210 215 220

Thr Ala Leu Gln Pro Leu Gly Ile Asp Met Ile Gly Leu Asn Cys Ala  
225 230 235 240

Thr Gly Pro Asp Glu Met Ser Glu His Leu Arg Tyr Leu Ser Lys His  
245 250 255

Ala Asp Ile Pro Val Ser Val Met Pro Asn Ala Gly Leu Pro Val Leu  
260 265 270

Gly Lys Asn Gly Ala Glu Tyr Pro Leu Glu Ala Glu Asp Leu Ala Gln  
275 280 285

Ala Leu Ala Gly Phe Val Ser Glu Tyr Gly Leu Ser Met Val Gly Gly  
290 295 300

Cys Cys Gly Thr Thr Pro Glu His Ile Arg Ala Val Arg Asp Ala Val  
305 310 315 320

Val Gly Val Pro Glu Gln Glu Thr Ser Thr Leu Thr Lys Ile Pro Ala  
325 330 335

Gly Pro Val Glu Gln Ala Ser Arg Glu Val Glu Lys Glu Asp Ser Val  
340 345 350

Ala Ser Leu Tyr Thr Ser Val Pro Leu Ser Gln Glu Thr Gly Ile Ser  
355 360 365

Met Ile Gly Glu Arg Thr Asn Ser Asn Gly Ser Lys Ala Phe Arg Glu  
370 375 380

Ala Met Leu Ser Gly Asp Trp Glu Lys Cys Val Asp Ile Ala Lys Gln  
385 390 395 400

Gln Thr Arg Asp Gly Ala His Met Leu Asp Leu Cys Val Asp Tyr Val  
405 410 415

Gly Arg Asp Gly Thr Ala Asp Met Ala Thr Leu Ala Ala Leu Leu Ala  
420 425 430

Thr Ser Ser Thr Leu Pro Ile Met Ile Asp Ser Thr Glu Pro Glu Val  
435 440 445

Ile Arg Thr Gly Leu Glu His Leu Gly Gly Arg Ser Ile Val Asn Ser  
450 455 460

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Val Asn Phe Glu Asp Gly Asp Gly Pro Glu Ser Arg Tyr Gln Arg Ile  
465 470 475 480

Met Lys Leu Val Lys Gln His Gly Ala Ala Val Val Ala Leu Thr Ile  
485 490 495

Asp Glu Glu Gly Gln Ala Arg Thr Ala Glu His Lys Val Arg Ile Ala  
500 505 510

Lys Arg Leu Ile Asp Asp Ile Thr Gly Ser Tyr Gly Leu Asp Ile Lys  
515 520 525

Asp Ile Val Val Asp Cys Leu Thr Phe Pro Ile Ser Thr Gly Gln Glu  
530 535 540

Glu Thr Arg Arg Asp Gly Ile Glu Thr Ile Glu Ala Ile Arg Glu Leu  
545 550 555 560

Lys Lys Leu Tyr Pro Glu Ile His Thr Thr Leu Gly Leu Ser Asn Ile  
565 570 575

Ser Phe Gly Leu Asn Pro Ala Ala Arg Gln Val Leu Asn Ser Val Phe  
580 585 590

Leu Asn Glu Cys Ile Glu Ala Gly Leu Asp Ser Ala Ile Ala His Ser  
595 600 605

Ser Lys Ile Leu Pro Met Asn Arg Ile Asp Asp Arg Gln Arg Glu Val  
610 615 620

Ala Leu Asp Met Val Tyr Asp Arg Arg Thr Glu Asp Tyr Asp Pro Leu  
625 630 635 640

Gln Glu Phe Met Gln Leu Phe Glu Gly Val Ser Ala Ala Asp Ala Lys  
645 650 655

Asp Ala Arg Ala Glu Gln Leu Ala Ala Met Pro Leu Phe Glu Arg Leu  
660 665 670

Ala Gln Arg Ile Ile Asp Gly Asp Lys Asn Gly Leu Glu Asp Asp Leu  
675 680 685

Glu Ala Gly Met Lys Glu Lys Ser Pro Ile Ala Ile Ile Asn Glu Asp  
690 695 700

Leu Leu Asn Gly Met Lys Thr Val Gly Glu Leu Phe Gly Ser Gly Gln  
705 710 715 720

Met Gln Leu Pro Phe Val Leu Gln Ser Ala Glu Thr Met Lys Thr Ala  
725 730 735

Val Ala Tyr Leu Glu Pro Phe Met Glu Glu Glu Ala Glu Ala Thr Gly  
Seite 30

Ser Ala Gln Ala Glu Gly Lys Gly Lys Ile Val Val Ala Thr Val Lys  
755 760 765

Gly Asp Val His Asp Ile Gly Lys Asn Leu Val Asp Ile Ile Leu Ser  
770 775 780

Asn Asn Gly Tyr Asp Val Val Asn Leu Gly Ile Lys Gln Pro Leu Ser  
785 790 795 800

Ala Met Leu Glu Ala Ala Glu Glu His Lys Ala Asp Val Ile Gly Met  
805 810 815

Ser Gly Leu Leu Val Lys Ser Thr Val Val Met Lys Glu Asn Leu Glu  
820 825 830

Glu Met Asn Asn Ala Gly Ala Ser Asn Tyr Pro Val Ile Leu Gly Gly  
835 840 845

Ala Ala Leu Thr Arg Thr Tyr Val Glu Asn Asp Leu Asn Glu Val Tyr  
850 855 860

Thr Gly Glu Val Tyr Tyr Ala Arg Asp Ala Phe Glu Gly Leu Arg Leu  
865 870 875 880

Met Asp Glu Val Met Ala Glu Lys Arg Gly Glu Gly Leu Asp Pro Asn  
885 890 895

Ser Pro Glu Ala Ile Glu Gln Ala Lys Lys Lys Ala Glu Arg Lys Ala  
900 905 910

Arg Asn Glu Arg Ser Arg Lys Ile Ala Ala Glu Arg Lys Ala Asn Ala  
915 920 925

Ala Pro Val Ile Val Pro Glu Arg Ser Asp Val Ser Thr Asp Thr Pro  
930 935 940

Thr Ala Ala Pro Pro Phe Trp Gly Thr Arg Ile Val Lys Gly Leu Pro  
945 950 955 960

Leu Ala Glu Phe Leu Gly Asn Leu Asp Glu Arg Ala Leu Phe Met Gly  
965 970 975

Gln Trp Gly Leu Lys Ser Thr Arg Gly Asn Glu Gly Pro Ser Tyr Glu  
980 985 990

Asp Leu Val Glu Thr Glu Gly Arg Pro Arg Leu Arg Tyr Trp Leu Asp  
995 1000 1005

Arg Leu Lys Ser Glu Gly Ile Leu Asp His Val Ala Leu Val Tyr  
1010 1015 1020

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Gly Tyr Phe Pro Ala Val Ala Glu Gly Asp Asp Val Val Ile Leu  
1025 1030 1035

Glu Ser Pro Asp Pro His Ala Ala Glu Arg Met Arg Phe Ser Phe  
1040 1045 1050

Pro Arg Gln Gln Arg Gly Arg Phe Leu Cys Ile Ala Asp Phe Ile  
1055 1060 1065

Arg Pro Arg Glu Gln Ala Val Lys Asp Gly Gln Val Asp Val Met  
1070 1075 1080

Pro Phe Gln Leu Val Thr Met Gly Asn Pro Ile Ala Asp Phe Ala  
1085 1090 1095

Asn Glu Leu Phe Ala Ala Asn Glu Tyr Arg Glu Tyr Leu Glu Val  
1100 1105 1110

His Gly Ile Gly Val Gln Leu Thr Glu Ala Leu Ala Glu Tyr Trp  
1115 1120 1125

His Ser Arg Val Arg Ser Glu Leu Lys Leu Asn Asp Gly Gly Ser  
1130 1135 1140

Val Ala Asp Phe Asp Pro Glu Asp Lys Thr Lys Phe Phe Asp Leu  
1145 1150 1155

Asp Tyr Arg Gly Ala Arg Phe Ser Phe Gly Tyr Gly Ser Cys Pro  
1160 1165 1170

Asp Leu Glu Asp Arg Ala Lys Leu Val Glu Leu Leu Glu Pro Gly  
1175 1180 1185

Arg Ile Gly Val Glu Leu Ser Glu Glu Leu Gln Leu His Pro Glu  
1190 1195 1200

Gln Ser Thr Asp Ala Phe Val Leu Tyr His Pro Glu Ala Lys Tyr  
1205 1210 1215

Phe Asn Val  
1220

<210> 21  
<211> 1221  
<212> PRT  
<213> Corynebacterium glutamicum

<220>  
<221> MUTAGEN  
<222> (86)..(86)  
<223> methionine synthase Meth carrying F86L mutation



&lt;400&gt; 21

```

Met Ser Thr Ser Val Thr Ser Pro Ala His Asn Asn Ala His Ser Ser
1      5      10      15

Glu Phe Leu Asp Ala Leu Ala Asn His Val Leu Ile Gly Asp Gly Ala
      20      25      30

Met Gly Thr Gln Leu Gln Gly Phe Asp Leu Asp Val Glu Lys Asp Phe
      35      40      45

Leu Asp Leu Glu Gly Cys Asn Glu Ile Leu Asn Asp Thr Arg Pro Asp
      50      55      60

Val Leu Arg Gln Ile His Arg Ala Tyr Phe Glu Ala Gly Ala Asp Leu
65      70      75      80

Val Glu Thr Asn Thr Leu Gly Cys Asn Leu Pro Asn Leu Ala Asp Tyr
      85      90      95

Asp Ile Ala Asp Arg Cys Arg Glu Leu Ala Tyr Lys Gly Thr Ala Val
      100      105      110

Ala Arg Glu Val Ala Asp Glu Met Gly Pro Gly Arg Asn Gly Met Arg
      115      120      125

Arg Phe Val Val Gly Ser Leu Gly Pro Gly Thr Lys Leu Pro Ser Leu
      130      135      140

Gly His Ala Pro Tyr Ala Asp Leu Arg Gly His Tyr Lys Glu Ala Ala
145      150      155      160

Leu Gly Ile Ile Asp Gly Gly Gly Asp Ala Phe Leu Ile Glu Thr Ala
      165      170      175

Gln Asp Leu Leu Gln Val Lys Ala Ala Val His Gly Val Gln Asp Ala
      180      185      190

Met Ala Glu Leu Asp Thr Phe Leu Pro Ile Ile Cys His Val Thr Val
      195      200      205

Glu Thr Thr Gly Thr Met Leu Met Gly Ser Glu Ile Gly Ala Ala Leu
      210      215      220

Thr Ala Leu Gln Pro Leu Gly Ile Asp Met Ile Gly Leu Asn Cys Ala
225      230      235      240

Thr Gly Pro Asp Glu Met Ser Glu His Leu Arg Tyr Leu Ser Lys His
      245      250      255

Ala Asp Ile Pro Val Ser Val Met Pro Asn Ala Gly Leu Pro Val Leu
      260      265      270

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B 7828.ST25.txt

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

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Glu Thr Arg Arg Asp Gly Ile Glu Thr Ile Glu Ala Ile Arg Glu Leu  
545 550 555 560

Lys Lys Leu Tyr Pro Glu Ile His Thr Thr Leu Gly Leu Ser Asn Ile  
565 570 575

Ser Phe Gly Leu Asn Pro Ala Ala Arg Gln Val Leu Asn Ser Val Phe  
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Leu Asn Glu Cys Ile Glu Ala Gly Leu Asp Ser Ala Ile Ala His Ser  
595 600 605

Ser Lys Ile Leu Pro Met Asn Arg Ile Asp Asp Arg Gln Arg Glu Val  
610 615 620

Ala Leu Asp Met Val Tyr Asp Arg Arg Thr Glu Asp Tyr Asp Pro Leu  
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Gln Glu Phe Met Gln Leu Phe Glu Gly Val Ser Ala Ala Asp Ala Lys  
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Asp Ala Arg Ala Glu Gln Leu Ala Ala Met Pro Leu Phe Glu Arg Leu  
660 665 670

Ala Gln Arg Ile Ile Asp Gly Asp Lys Asn Gly Leu Glu Asp Asp Leu  
675 680 685

Glu Ala Gly Met Lys Glu Lys Ser Pro Ile Ala Ile Ile Asn Glu Asp  
690 695 700

Leu Leu Asn Gly Met Lys Thr Val Gly Glu Leu Phe Gly Ser Gly Gln  
705 710 715 720

Met Gln Leu Pro Phe Val Leu Gln Ser Ala Glu Thr Met Lys Thr Ala  
725 730 735

Val Ala Tyr Leu Glu Pro Phe Met Glu Glu Glu Ala Glu Ala Thr Gly  
740 745 750

Ser Ala Gln Ala Glu Gly Lys Gly Lys Ile Val Val Ala Thr Val Lys  
755 760 765

Gly Asp Val His Asp Ile Gly Lys Asn Leu Val Asp Ile Ile Leu Ser  
770 775 780

Asn Asn Gly Tyr Asp Val Val Asn Leu Gly Ile Lys Gln Pro Leu Ser  
785 790 795 800

Ala Met Leu Glu Ala Ala Glu Glu His Lys Ala Asp Val Ile Gly Met  
805 810 815

Ser Gly Leu Leu Val Lys Ser Thr Val Val Met Lys Glu Asn Leu Glu

Glu Met Asn Asn Ala Gly Ala Ser Asn Tyr Pro Val Ile Leu Gly Gly  
835 840 845

Ala Ala Leu Thr Arg Thr Tyr Val Glu Asn Asp Leu Asn Glu Val Tyr  
850 855 860

Thr Gly Glu Val Tyr Tyr Ala Arg Asp Ala Phe Glu Gly Leu Arg Leu  
865 870 875 880

Met Asp Glu Val Met Ala Glu Lys Arg Gly Glu Gly Leu Asp Pro Asn  
885 890 895

Ser Pro Glu Ala Ile Glu Gln Ala Lys Lys Lys Ala Glu Arg Lys Ala  
900 905 910

Arg Asn Glu Arg Ser Arg Lys Ile Ala Ala Glu Arg Lys Ala Asn Ala  
915 920 925

Ala Pro Val Ile Val Pro Glu Arg Ser Asp Val Ser Thr Asp Thr Pro  
930 935 940

Thr Ala Ala Pro Pro Phe Trp Gly Thr Arg Ile Val Lys Gly Leu Pro  
945 950 955 960

Leu Ala Glu Phe Leu Gly Asn Leu Asp Glu Arg Ala Leu Phe Met Gly  
965 970 975

Gln Trp Gly Leu Lys Ser Thr Arg Gly Asn Glu Gly Pro Ser Tyr Glu  
980 985 990

Asp Leu Val Glu Thr Glu Gly Arg Pro Arg Leu Arg Tyr Trp Leu Asp  
995 1000 1005

Arg Leu Lys Ser Glu Gly Ile Leu Asp His Val Ala Leu Val Tyr  
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Gly Tyr Phe Pro Ala Val Ala Glu Gly Asp Asp Val Val Ile Leu  
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Glu Ser Pro Asp Pro His Ala Ala Glu Arg Met Arg Phe Ser Phe  
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Pro Arg Gln Gln Arg Gly Arg Phe Leu Cys Ile Ala Asp Phe Ile  
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Arg Pro Arg Glu Gln Ala Val Lys Asp Gly Gln Val Asp Val Met  
1070 1075 1080

Pro Phe Gln Leu Val Thr Met Gly Asn Pro Ile Ala Asp Phe Ala  
1085 1090 1095

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Asn Glu Leu Phe Ala Ala Asn Glu Tyr Arg Glu Tyr Leu Glu Val  
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His Gly Ile Gly Val Gln Leu Thr Glu Ala Leu Ala Glu Tyr Trp  
1115 1120 1125

His Ser Arg Val Arg Ser Glu Leu Lys Leu Asn Asp Gly Gly Ser  
1130 1135 1140

Val Ala Asp Phe Asp Pro Glu Asp Lys Thr Lys Phe Phe Asp Leu  
1145 1150 1155

Asp Tyr Arg Gly Ala Arg Phe Ser Phe Gly Tyr Gly Ser Cys Pro  
1160 1165 1170

Asp Leu Glu Asp Arg Ala Lys Leu Val Glu Leu Leu Glu Pro Gly  
1175 1180 1185

Arg Ile Gly Val Glu Leu Ser Glu Glu Leu Gln Leu His Pro Glu  
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Phe Asn Val  
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Leu Asp Leu Glu Gly Cys Asn Glu Ile Leu Asn Asp Thr Arg Pro Asp  
50 55 60

Val Leu Arg Gln Ile His Arg Ala Tyr Phe Glu Ala Gly Ala Asp Leu  
65 70 75 80

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Val Glu Thr Asn Thr Phe Gly Cys Asn Leu Pro Asn Leu Ala Asp Tyr  
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Asp Ile Ala Asp Arg Cys Arg Glu Leu Ala Tyr Lys Gly Thr Ala Val  
100 105 110

Ala Arg Glu Val Ala Asp Glu Met Gly Pro Gly Arg Asn Gly Met Arg  
115 120 125

Arg Phe Val Val Gly Asn Leu Gly Pro Gly Thr Lys Leu Pro Ser Leu  
130 135 140

Gly His Ala Pro Tyr Ala Asp Leu Arg Gly His Tyr Lys Glu Ala Ala  
145 150 155 160

Leu Gly Ile Ile Asp Gly Gly Gly Asp Ala Phe Leu Ile Glu Thr Ala  
165 170 175

Gln Asp Leu Leu Gln Val Lys Ala Ala Val His Gly Val Gln Asp Ala  
180 185 190

Met Ala Glu Leu Asp Thr Phe Leu Pro Ile Ile Cys His Val Thr Val  
195 200 205

Glu Thr Thr Gly Thr Met Leu Met Gly Ser Glu Ile Gly Ala Ala Leu  
210 215 220

Thr Ala Leu Gln Pro Leu Gly Ile Asp Met Ile Gly Leu Asn Cys Ala  
225 230 235 240

Thr Gly Pro Asp Glu Met Ser Glu His Leu Arg Tyr Leu Ser Lys His  
245 250 255

Ala Asp Ile Pro Val Ser Val Met Pro Asn Ala Gly Leu Pro Val Leu  
260 265 270

Gly Lys Asn Gly Ala Glu Tyr Pro Leu Glu Ala Glu Asp Leu Ala Gln  
275 280 285

Ala Leu Ala Gly Phe Val Ser Glu Tyr Gly Leu Ser Met Val Gly Gly  
290 295 300

Cys Cys Gly Thr Thr Pro Glu His Ile Arg Ala Val Arg Asp Ala Val  
305 310 315 320

Val Gly Val Pro Glu Gln Glu Thr Ser Thr Leu Thr Lys Ile Pro Ala  
325 330 335

Gly Pro Val Glu Gln Ala Ser Arg Glu Val Glu Lys Glu Asp Ser Val  
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Ala Ser Leu Tyr Thr Ser Val Pro Leu Ser Gln Glu Thr Gly Ile Ser  
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Ala Met Leu Ser Gly Asp Trp Glu Lys Cys Val Asp Ile Ala Lys Gln  
385 390 395 400

Gln Thr Arg Asp Gly Ala His Met Leu Asp Leu Cys Val Asp Tyr Val  
405 410 415

Gly Arg Asp Gly Thr Ala Asp Met Ala Thr Leu Ala Ala Leu Leu Ala  
420 425 430

Thr Ser Ser Thr Leu Pro Ile Met Ile Asp Ser Thr Glu Pro Glu Val  
435 440 445

Ile Arg Thr Gly Leu Glu His Leu Gly Gly Arg Ser Ile Val Asn Ser  
450 455 460

Val Asn Phe Glu Asp Gly Asp Gly Pro Glu Ser Arg Tyr Gln Arg Ile  
465 470 475 480

Met Lys Leu Val Lys Gln His Gly Ala Ala Val Val Ala Leu Thr Ile  
485 490 495

Asp Glu Glu Gly Gln Ala Arg Thr Ala Glu His Lys Val Arg Ile Ala  
500 505 510

Lys Arg Leu Ile Asp Asp Ile Thr Gly Ser Tyr Gly Leu Asp Ile Lys  
515 520 525

Asp Ile Val Val Asp Cys Leu Thr Phe Pro Ile Ser Thr Gly Gln Glu  
530 535 540

Glu Thr Arg Arg Asp Gly Ile Glu Thr Ile Glu Ala Ile Arg Glu Leu  
545 550 555 560

Lys Lys Leu Tyr Pro Glu Ile His Thr Thr Leu Gly Leu Ser Asn Ile  
565 570 575

Ser Phe Gly Leu Asn Pro Ala Ala Arg Gln Val Leu Asn Ser Val Phe  
580 585 590

Leu Asn Glu Cys Ile Glu Ala Gly Leu Asp Ser Ala Ile Ala His Ser  
595 600 605

Ser Lys Ile Leu Pro Met Asn Arg Ile Asp Asp Arg Gln Arg Glu Val  
610 615 620

B 7828.ST25.txt

Ala Leu Asp Met Val Tyr Asp Arg Arg Thr Glu Asp Tyr Asp Pro Leu  
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Gln Glu Phe Met Gln Leu Phe Glu Gly Val Ser Ala Ala Asp Ala Lys  
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Asp Ala Arg Ala Glu Gln Leu Ala Ala Met Pro Leu Phe Glu Arg Leu  
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Ala Gln Arg Ile Ile Asp Gly Asp Lys Asn Gly Leu Glu Asp Asp Leu  
675 680 685

Glu Ala Gly Met Lys Glu Lys Ser Pro Ile Ala Ile Ile Asn Glu Asp  
690 695 700

Leu Leu Asn Gly Met Lys Thr Val Gly Glu Leu Phe Gly Ser Gly Gln  
705 710 715 720

Met Gln Leu Pro Phe Val Leu Gln Ser Ala Glu Thr Met Lys Thr Ala  
725 730 735

Val Ala Tyr Leu Glu Pro Phe Met Glu Glu Glu Ala Glu Ala Thr Gly  
740 745 750

Ser Ala Gln Ala Glu Gly Lys Gly Lys Ile Val Val Ala Thr Val Lys  
755 760 765

Gly Asp Val His Asp Ile Gly Lys Asn Leu Val Asp Ile Ile Leu Ser  
770 775 780

Asn Asn Gly Tyr Asp Val Val Asn Leu Gly Ile Lys Gln Pro Leu Ser  
785 790 795 800

Ala Met Leu Glu Ala Ala Glu Glu His Lys Ala Asp Val Ile Gly Met  
805 810 815

Ser Gly Leu Leu Val Lys Ser Thr Val Val Met Lys Glu Asn Leu Glu  
820 825 830

Glu Met Asn Asn Ala Gly Ala Ser Asn Tyr Pro Val Ile Leu Gly Gly  
835 840 845

Ala Ala Leu Thr Arg Thr Tyr Val Glu Asn Asp Leu Asn Glu Val Tyr  
850 855 860

Thr Gly Glu Val Tyr Tyr Ala Arg Asp Ala Phe Glu Gly Leu Arg Leu  
865 870 875 880

Met Asp Glu Val Met Ala Glu Lys Arg Gly Glu Gly Leu Asp Pro Asn  
885 890 895

Ser Pro Glu Ala Ile Glu Gln Ala Lys Lys Lys Ala Glu Arg Lys Ala



Arg Asn Glu Arg Ser Arg Lys Ile Ala Ala Glu Arg Lys Ala Asn Ala  
915 920 925

Ala Pro Val Ile Val Pro Glu Arg Ser Asp Val Ser Thr Asp Thr Pro  
930 935 940

Thr Ala Ala Pro Pro Phe Trp Gly Thr Arg Ile Val Lys Gly Leu Pro  
945 950 955 960

Leu Ala Glu Phe Leu Gly Asn Leu Asp Glu Arg Ala Leu Phe Met Gly  
965 970 975

Gln Trp Gly Leu Lys Ser Thr Arg Gly Asn Glu Gly Pro Ser Tyr Glu  
980 985 990

Asp Leu Val Glu Thr Glu Gly Arg Pro Arg Leu Arg Tyr Trp Leu Asp  
995 1000 1005

Arg Leu Lys Ser Glu Gly Ile Leu Asp His Val Ala Leu Val Tyr  
1010 1015 1020

Gly Tyr Phe Pro Ala Val Ala Glu Gly Asp Asp Val Val Ile Leu  
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Glu Ser Pro Asp Pro His Ala Ala Glu Arg Met Arg Phe Ser Phe  
1040 1045 1050

Pro Arg Gln Gln Arg Gly Arg Phe Leu Cys Ile Ala Asp Phe Ile  
1055 1060 1065

Arg Pro Arg Glu Gln Ala Val Lys Asp Gly Gln Val Asp Val Met  
1070 1075 1080

Pro Phe Gln Leu Val Thr Met Gly Asn Pro Ile Ala Asp Phe Ala  
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Asn Glu Leu Phe Ala Ala Asn Glu Tyr Arg Glu Tyr Leu Glu Val  
1100 1105 1110

His Gly Ile Gly Val Gln Leu Thr Glu Ala Leu Ala Glu Tyr Trp  
1115 1120 1125

His Ser Arg Val Arg Ser Glu Leu Lys Leu Asn Asp Gly Gly Ser  
1130 1135 1140

Val Ala Asp Phe Asp Pro Glu Asp Lys Thr Lys Phe Phe Asp Leu  
1145 1150 1155

Asp Tyr Arg Gly Ala Arg Phe Ser Phe Gly Tyr Gly Ser Cys Pro  
1160 1165 1170

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Asp Leu Glu Asp Arg Ala Lys Leu Val Glu Leu Leu Glu Pro Gly  
1175 1180 1185

Arg Ile Gly Val Glu Leu Ser Glu Glu Leu Gln Leu His Pro Glu  
1190 1195 1200

Gln Ser Thr Asp Ala Phe Val Leu Tyr His Pro Glu Ala Lys Tyr  
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Phe Asn Val  
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B 7828.ST25.txt

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ctggactctg cgattgcgca cagctccaag	attttgccga tgaaccgcat tgatgatcgc	1860
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gaacagctgg ccgctatgcc tttgtttgag	cgtttggcac agcgcatcat cgacggcgat	2040
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atcaacgagg accttctcaa cggcatgaag	accgtgggtg agctgttttg ttccggacag	2160
atgcagctgc cattcgtgct gcaatcggca	gaaaccatga aaactgcggt ggcctatttg	2220
gaaccgttca tggaagagga agcagaagct	accggatctg cgcaggcaga gggcaagggc	2280

B 7828.ST25.txt

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aaaatcgtcg tggccaccgt caagggtgac gtgcacgata tcggcaagaa cttggtggac 2340
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gccatgttgg aagcagcgga agaacacaaa gcagacgtca tcggcatgtc gggacttctt 2460
gtgaagtcca ccgtggtgat gaaggaaaac cttgaggaga tgaacaacgc cggcgcatcc 2520
aattaccag tcattttggg tggcgctgcg ctgacgcgta cctacgtgga aaacgatctc 2580
aacgaggtgt acaccggtga ggtgtactac gcccgtgatg ctttcgaggg cctgcgctgt 2640
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attgagcagg cgaagaagaa ggcggaacgt aaggctcgta atgagcgttc ccgcaagatt 2760
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<210> 29  
 <211> 1170  
 <212> PRT  
 <213> Streptomyces coelicolor

<220>  
 <221> misc\_feature  
 <223> methionine synthase meth

<400> 29

Met Ala Ser Ser Pro Ser Thr Pro Pro Ala Asp Thr Arg Thr Arg Val  
 1 5 10 15

Ser Ala Leu Arg Glu Ala Leu Ala Thr Arg Val Val Val Ala Asp Gly  
 20 25 30

B 7828.ST25.txt

Ala Met Gly Thr Met Leu Gln Ala Gln Asn Pro Thr Leu Asp Asp Phe  
35 40 45

Gln Gln Leu Glu Gly Cys Asn Glu Val Leu Asn Leu Thr Arg Pro Asp  
50 55 60

Ile Val Arg Ser Val His Glu Glu Tyr Phe Ala Ala Gly Val Asp Cys  
65 70 75 80

Val Glu Thr Asn Thr Phe Gly Ala Asn His Ser Ala Leu Gly Glu Tyr  
85 90 95

Asp Ile Pro Glu Arg Val His Glu Leu Ser Glu Ala Gly Ala Arg Val  
100 105 110

Ala Arg Glu Val Ala Asp Glu Phe Gly Ala Arg Asp Gly Arg Gln Arg  
115 120 125

Trp Val Leu Gly Ser Met Gly Pro Gly Thr Lys Leu Pro Thr Leu Gly  
130 135 140

His Ala Pro Tyr Thr Val Leu Arg Asp Ala Tyr Gln Arg Asn Ala Glu  
145 150 155 160

Gly Leu Val Ala Gly Gly Ala Asp Ala Leu Leu Val Glu Thr Thr Gln  
165 170 175

Asp Leu Leu Gln Thr Lys Ala Ser Val Leu Gly Ala Arg Arg Ala Leu  
180 185 190

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

Thr Thr Gly Thr Met Leu Leu Gly Ser Glu Ile Gly Ala Ala Leu Thr  
210 215 220

Ala Leu Glu Pro Leu Gly Ile Asp Met Ile Gly Leu Asn Cys Ala Thr  
225 230 235 240

Gly Pro Ala Glu Met Ser Glu His Leu Arg Tyr Leu Ala Arg His Ser  
245 250 255

Arg Ile Pro Leu Thr Cys Met Pro Asn Ala Gly Leu Pro Val Leu Gly  
260 265 270

Lys Asp Gly Ala His Tyr Pro Leu Thr Ala Pro Glu Leu Ala Asp Ala  
275 280 285

His Glu Thr Phe Val Arg Glu Tyr Gly Leu Ser Leu Val Gly Gly Cys  
290 295 300

B 7828.ST25.txt

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

Lys Ile Leu<sub>595</sub> Pro Ile Ala Arg Phe<sub>600</sub> Asp Glu Glu Gln Val<sub>605</sub> Thr Thr Ala  
 Leu Asp<sub>610</sub> Leu Ile Tyr Asp Arg<sub>615</sub> Arg Arg Glu Gly Tyr<sub>620</sub> Asp Pro Leu Gln  
 Lys<sub>625</sub> Leu Met Gln Leu Phe<sub>630</sub> Glu Gly Ala Thr Ala<sub>635</sub> Lys Ser Leu Lys Ala<sub>640</sub>  
 Ser Lys Ala Glu Glu<sub>645</sub> Leu Ala Ala Leu Pro<sub>650</sub> Leu Glu Glu Arg Leu<sub>655</sub> Lys  
 Arg Arg Ile Ile<sub>660</sub> Asp Gly Glu Lys Asn<sub>665</sub> Gly Leu Glu Gln Asp<sub>670</sub> Leu Asp  
 Glu Ala Leu<sub>675</sub> Arg Glu Arg Pro Ala<sub>680</sub> Leu Glu Ile Val Asn<sub>685</sub> Asp Thr Leu  
 Leu Asp<sub>690</sub> Gly Met Lys Val Val<sub>695</sub> Gly Glu Leu Phe Gly<sub>700</sub> Ser Gly Gln Met  
 Gln Leu Pro Phe Val Leu<sub>710</sub> Gln Ser Ala Glu Val<sub>715</sub> Met Lys Thr Ala Val<sub>720</sub>  
 Ala His Leu Glu Pro<sub>725</sub> His Met Glu Lys Thr<sub>730</sub> Asp Asp Asp Gly Lys<sub>735</sub> Gly  
 Thr Ile Val Leu<sub>740</sub> Ala Thr Val Arg Gly<sub>745</sub> Asp Val His Asp Ile<sub>750</sub> Gly Lys  
 Asn Leu Val<sub>755</sub> Asp Ile Ile Leu Ser<sub>760</sub> Asn Asn Gly Tyr Asn<sub>765</sub> Val Val Asn  
 Leu Gly<sub>770</sub> Ile Lys Gln Pro Val<sub>775</sub> Ser Ala Ile Leu Glu<sub>780</sub> Ala Ala Asp Glu  
 His Arg Ala Asp Val Ile<sub>790</sub> Gly Met Ser Gly Leu<sub>795</sub> Leu Val Lys Ser Thr<sub>800</sub>  
 Val Ile Met Lys Glu<sub>805</sub> Asn Leu Glu Glu Leu<sub>810</sub> Asn Gln Arg Lys Leu<sub>815</sub> Ala  
 Ala Asp Tyr Pro<sub>820</sub> Val Ile Leu Gly Gly<sub>825</sub> Ala Ala Leu Thr Arg<sub>830</sub> Ala Tyr  
 Val Glu Gln<sub>835</sub> Asp Leu His Glu Ile<sub>840</sub> Tyr Asp Gly Glu Val<sub>845</sub> Arg Tyr Ala  
 Arg Asp<sub>850</sub> Ala Phe Glu Gly Leu<sub>855</sub> Arg Leu Met Asp Ala<sub>860</sub> Leu Ile Gly Ile

B 7828.ST25.txt

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



B 7828.ST25.txt

Ile Ala Ala Leu Leu Glu Pro Glu Arg Ile Gly Val His Leu Ser  
1130 1135 1140

Glu Glu Phe Gln Leu His Pro Glu Gln Ser Thr Asp Ala Ile Val  
1145 1150 1155

Ile His His Pro Glu Ala Lys Tyr Phe Asn Ala Arg  
1160 1165 1170

<210> 30  
<211> 1226  
<212> PRT  
<213> Escherichia coli

<220>  
<221> misc\_feature  
<223> cobalamin-dependent methionine synthase Meth

<400> 30

Ser Ser Lys Val Glu Gln Leu Arg Ala Gln Leu Asn Glu Arg Ile Leu  
1 5 10 15

Val Leu Asp Gly Gly Met Gly Thr Met Ile Gln Ser Tyr Arg Leu Asn  
20 25 30

Glu Ala Asp Phe Arg Gly Glu Arg Phe Ala Asp Trp Pro Cys Asp Leu  
35 40 45

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

Ala Ile His Asn Ala Tyr Phe Glu Ala Gly Ala Asp Ile Ile Glu Thr  
65 70 75 80

Asn Thr Phe Asn Ser Thr Thr Ile Ala Met Ala Asp Tyr Gln Met Glu  
85 90 95

Ser Leu Ser Ala Glu Ile Asn Phe Ala Ala Ala Lys Leu Ala Arg Ala  
100 105 110

Cys Ala Asp Glu Trp Thr Ala Arg Thr Pro Glu Lys Pro Arg Tyr Val  
115 120 125

Ala Gly Val Leu Gly Pro Thr Asn Arg Thr Ala Ser Ile Ser Pro Asp  
130 135 140

Val Asn Asp Pro Ala Phe Arg Asn Ile Thr Phe Asp Gly Leu Val Ala  
145 150 155 160

Ala Tyr Arg Glu Ser Thr Lys Ala Leu Val Glu Gly Gly Ala Asp Leu  
165 170 175

Ile Leu Ile Glu Thr Val Phe Asp Thr Leu Asn Ala Lys Ala Ala Val  
180 185 190

Phe Ala Val Lys Thr Glu Phe Glu Ala Leu Gly Val Glu Leu Pro Ile  
195 200 205

Met Ile Ser Gly Thr Ile Thr Asp Ala Ser Gly Arg Thr Leu Ser Gly  
210 215 220

Gln Thr Thr Glu Ala Phe Tyr Asn Ser Leu Arg His Ala Glu Ala Leu  
225 230 235 240

Thr Phe Gly Leu Asn Cys Ala Leu Gly Pro Asp Glu Leu Arg Gln Tyr  
245 250 255

Val Gln Glu Leu Ser Arg Ile Ala Glu Cys Tyr Val Thr Ala His Pro  
260 265 270

Asn Ala Gly Leu Pro Asn Ala Phe Gly Glu Tyr Asp Leu Asp Ala Asp  
275 280 285

Thr Met Ala Lys Gln Ile Arg Glu Trp Ala Gln Ala Gly Phe Leu Asn  
290 295 300

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

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

Val Ala Cys Arg Leu Ser Gly Leu Glu Pro Leu Asn Ile Gly Glu Asp  
340 345 350

Ser Leu Phe Val Asn Val Gly Glu Arg Thr Asn Val Thr Gly Ser Ala  
355 360 365

Lys Phe Lys Arg Leu Ile Lys Glu Glu Lys Tyr Ser Glu Ala Leu Asp  
370 375 380

Val Ala Arg Gln Gln Val Glu Asn Gly Ala Gln Ile Ile Asp Ile Asn  
385 390 395 400

Met Asp Glu Gly Met Leu Asp Ala Glu Ala Ala Met Val Arg Phe Leu  
405 410 415

Asn Leu Ile Ala Gly Glu Pro Asp Ile Ala Arg Val Pro Ile Met Ile  
420 425 430

Asp Ser Ser Lys Trp Asp Val Ile Glu Lys Gly Leu Lys Cys Ile Gln  
435 440 445

Gly Lys Gly Ile Val Asn Ser Ile Ser Met Lys Glu Gly Val Asp Ala  
Seite 58

450

455

Phe Ile His His Ala Lys Leu Leu Arg Arg Tyr Gly Ala Ala Val Val  
465 470 475 480

Val Met Ala Phe Asp Glu Gln Gly Gln Ala Asp Thr Arg Ala Arg Lys  
485 490 495

Ile Glu Ile Cys Arg Arg Ala Tyr Lys Ile Leu Thr Glu Glu Val Gly  
500 505 510

Phe Pro Pro Glu Asp Ile Ile Phe Asp Pro Asn Ile Phe Ala Val Ala  
515 520 525

Thr Gly Ile Glu Glu His Asn Asn Tyr Ala Gln Asp Phe Ile Gly Ala  
530 535 540

Cys Glu Asp Ile Lys Arg Glu Leu Pro His Ala Leu Ile Ser Gly Gly  
545 550 555 560

Val Ser Asn Val Ser Phe Ser Phe Arg Gly Asn Asp Pro Val Arg Glu  
565 570 575

Ala Ile His Ala Val Phe Leu Tyr Tyr Ala Ile Arg Asn Gly Met Asp  
580 585 590

Met Gly Ile Val Asn Ala Gly Gln Leu Ala Ile Tyr Asp Asp Leu Pro  
595 600 605

Ala Glu Leu Arg Asp Ala Val Glu Asp Val Ile Leu Asn Arg Arg Asp  
610 615 620

Asp Gly Thr Glu Arg Leu Leu Glu Leu Ala Glu Lys Tyr Arg Gly Ser  
625 630 635 640

Lys Thr Asp Asp Thr Ala Asn Ala Gln Gln Ala Glu Trp Arg Ser Trp  
645 650 655

Glu Val Asn Lys Arg Leu Glu Tyr Ser Leu Val Lys Gly Ile Thr Glu  
660 665 670

Phe Ile Glu Gln Asp Thr Glu Glu Ala Arg Gln Gln Ala Thr Arg Pro  
675 680 685

Ile Glu Val Ile Glu Gly Pro Leu Met Asp Gly Met Asn Val Val Gly  
690 695 700

Asp Leu Phe Gly Glu Gly Lys Met Phe Leu Pro Gln Val Val Lys Ser  
705 710 715 720

Ala Arg Val Met Lys Gln Ala Val Ala Tyr Leu Glu Pro Phe Ile Glu  
725 730 735

B 7828.ST25.txt

Ala Ser Lys Glu Gln Gly Lys Thr Asn Gly Lys Met Val Ile Ala Thr  
740 745 750

Val Lys Gly Asp Val His Asp Ile Gly Lys Asn Ile Val Gly Val Val  
755 760 765

Leu Gln Cys Asn Asn Tyr Glu Ile Val Asp Leu Gly Val Met Val Pro  
770 775 780

Ala Glu Lys Ile Leu Arg Thr Ala Lys Glu Val Asn Ala Asp Leu Ile  
785 790 795 800

Gly Leu Ser Gly Leu Ile Thr Pro Ser Leu Asp Glu Met Val Asn Val  
805 810 815

Ala Lys Glu Met Glu Arg Gln Gly Phe Thr Ile Pro Leu Leu Ile Gly  
820 825 830

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

Tyr Ser Gly Pro Thr Val Tyr Val Gln Asn Ala Ser Arg Thr Val Gly  
850 855 860

Val Val Ala Ala Leu Leu Ser Asp Thr Gln Arg Asp Asp Phe Val Ala  
865 870 875 880

Arg Thr Arg Lys Glu Tyr Glu Thr Val Arg Ile Gln His Gly Arg Lys  
885 890 895

Lys Pro Arg Thr Pro Pro Val Thr Leu Glu Ala Ala Arg Asp Asn Asp  
900 905 910

Phe Ala Phe Asp Trp Gln Ala Tyr Thr Pro Pro Val Ala His Arg Leu  
915 920 925

Gly Val Gln Glu Val Glu Ala Ser Ile Glu Thr Leu Arg Asn Tyr Ile  
930 935 940

Asp Trp Thr Pro Phe Phe Met Thr Trp Ser Leu Ala Gly Lys Tyr Pro  
945 950 955 960

Arg Ile Leu Glu Asp Glu Val Val Gly Val Glu Ala Gln Arg Leu Phe  
965 970 975

Lys Asp Ala Asn Asp Met Leu Asp Lys Leu Ser Ala Glu Lys Thr Leu  
980 985 990

Asn Pro Arg Gly Val Val Gly Leu Phe Pro Ala Asn Arg Val Gly Asp  
995 1000 1005

B 7828.ST25.txt

Asp Ile Glu Ile Tyr Arg Asp Glu Thr Arg Thr His Val Ile Asn  
1010 1015 1020

Val Ser His His Leu Arg Gln Gln Thr Glu Lys Thr Gly Phe Ala  
1025 1030 1035

Asn Tyr Cys Leu Ala Asp Phe Val Ala Pro Lys Leu Ser Gly Lys  
1040 1045 1050

Ala Asp Tyr Ile Gly Ala Phe Ala Val Thr Gly Gly Leu Glu Glu  
1055 1060 1065

Asp Ala Leu Ala Asp Ala Phe Glu Ala Gln His Asp Asp Tyr Asn  
1070 1075 1080

Lys Ile Met Val Lys Ala Leu Ala Asp Arg Leu Ala Glu Ala Phe  
1085 1090 1095

Ala Glu Tyr Leu His Glu Arg Val Arg Lys Val Tyr Trp Gly Tyr  
1100 1105 1110

Ala Pro Asn Glu Asn Leu Ser Asn Glu Glu Leu Ile Arg Glu Asn  
1115 1120 1125

Tyr Gln Gly Ile Arg Pro Ala Pro Gly Tyr Pro Ala Cys Pro Glu  
1130 1135 1140

His Thr Glu Lys Ala Thr Ile Trp Glu Leu Leu Glu Val Glu Lys  
1145 1150 1155

His Thr Gly Met Lys Leu Thr Glu Ser Phe Ala Met Trp Pro Gly  
1160 1165 1170

Ala Ser Val Ser Gly Trp Tyr Phe Ser His Pro Asp Ser Lys Tyr  
1175 1180 1185

Tyr Ala Val Ala Gln Ile Gln Arg Asp Gln Val Glu Asp Tyr Ala  
1190 1195 1200

Arg Arg Lys Gly Met Ser Val Thr Glu Val Glu Arg Trp Leu Ala  
1205 1210 1215

Pro Asn Leu Gly Tyr Asp Ala Asp  
1220 1225

<210> 31  
<211> 768  
<212> PRT  
<213> Thermotoga maritima

<400> 31

Met Arg Asn Arg Arg Glu Val Ser Lys Leu Leu Ser Glu Arg Val Leu  
Seite 61

1                      5                      15

Leu Leu Asp Gly Ala Tyr Gly Thr Glu Phe Met Lys Tyr Gly Tyr Asp  
20                      25                      30

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

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

Thr Phe Gly Ala Thr Arg Met Lys Leu Arg Lys His Gly Leu Glu Asp  
65                      70                      75                      80

Lys Leu Asp Pro Ile Val Arg Asn Ala Val Arg Ile Ala Arg Arg Ala  
85                      90                      95

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

Pro Tyr Pro Leu Gly Ser Thr Leu Phe Glu Glu Phe Tyr Glu Asn Phe  
115                      120                      125

Arg Glu Thr Val Glu Ile Met Val Glu Glu Gly Val Asp Gly Ile Ile  
130                      135                      140

Phe Glu Thr Phe Ser Asp Ile Leu Glu Leu Lys Ala Ala Val Leu Ala  
145                      150                      155                      160

Ala Arg Glu Val Ser Arg Asp Val Phe Leu Ile Ala His Met Thr Phe  
165                      170                      175

Asp Glu Lys Gly Arg Ser Leu Thr Gly Thr Asp Pro Ala Asn Phe Ala  
180                      185                      190

Ile Thr Phe Asp Glu Leu Asp Ile Asp Ala Leu Gly Ile Asn Cys Ser  
195                      200                      205

Leu Gly Pro Glu Glu Ile Leu Pro Ile Phe Gln Glu Leu Ser Gln Tyr  
210                      215                      220

Thr Asp Lys Phe Leu Val Val Glu Pro Asn Ala Gly Lys Pro Ile Val  
225                      230                      235                      240

Glu Asn Gly Lys Thr Val Tyr Pro Leu Lys Pro His Asp Phe Ala Val  
245                      250                      255

His Ile Asp Ser Tyr Tyr Glu Leu Gly Val Asn Ile Phe Gly Gly Cys  
260                      265                      270

Cys Gly Thr Thr Pro Glu His Val Lys Leu Phe Arg Lys Val Leu Gly  
275                      280                      285

B 7828.ST25.txt

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

B 7828.ST25.txt

Pro Arg Ala Glu Val Lys Glu Glu Lys Leu Val Glu Ile Ile Leu Ser  
565 570 575

Gly Asn Arg Ser Glu Leu Glu Lys Leu Val Glu Asp Phe Leu Lys Glu  
580 585 590

Lys Asp Pro Leu Ser Val Ile Glu Glu His Leu Arg Pro Ala Met Glu  
595 600 605

Arg Ile Gly Glu Leu Tyr Asp Lys Gly Lys Ile Phe Leu Pro Gln Leu  
610 615 620

Ile Leu Ala Ala Gln Thr Val Lys Pro Val Phe Asp Lys Leu Thr Ser  
625 630 635 640

Met Leu Pro Ser Asp Ser Gln Gly Glu Thr Phe Val Ile Ala Thr Val  
645 650 655

Lys Gly Asp Val His Asp Ile Gly Lys Asn Ile Val Ala Ser Val Ile  
660 665 670

Arg Ser Ser Gly Tyr Arg Val Val Asp Leu Gly Lys Asp Val Asp Thr  
675 680 685

Ser Glu Ile Val Glu Ala Val Glu Lys Glu Arg Pro Val Ala Leu Gly  
690 695 700

Leu Ser Ala Met Met Thr Thr Thr Val Gly Arg Ile Lys Glu Val Val  
705 710 715 720

Glu Lys Leu Lys Glu Lys Asn Leu Lys Ile Pro Val Ile Val Gly Gly  
725 730 735

Ala Ser Leu Asn Glu Lys Leu Ala Lys Glu Leu Gly Ala Asp Tyr Tyr  
740 745 750

Ala Lys Asn Ala Ser Glu Ala Val Lys Ile Leu Lys Ser Leu Gly Arg  
755 760 765

<210> 32

<211> 1068

<212> PRT

<213> Artificial

<220>

<223> consensus sequence

<220>

<221> misc\_feature

<223> consensus sequence of meth (from Corynebacterium glutamicum,  
Streptomyces coelicolor, Escherichia coli and Thermotoga  
maritima)

<400> 32



B 7828.ST25.txt

Ser Ser Thr Pro Ala Ser Lys Val Ser Glu Leu Arg Asp Ala Leu Ala  
1 5 10 15

Glu Arg Val Leu Val Leu Asp Gly Ala Met Gly Thr Met Leu Gln Ala  
20 25 30

Tyr Leu Asp Leu Asp Asp Phe Asp Leu Glu Gly Cys Asn Glu Ile Leu  
35 40 45

Asn Leu Thr Arg Pro Asp Val Val Arg Ala Ile His Arg Ala Tyr Phe  
50 55 60

Glu Ala Gly Ala Asp Ile Ile Glu Thr Asn Thr Phe Gly Ala Thr Ile  
65 70 75 80

Ala Leu Ala Asp Tyr Asp Ile Glu Asp Arg Leu Glu Ile Ala Phe Ala  
85 90 95

Ala Ala Arg Val Ala Arg Glu Val Ala Asp Glu Phe Gly Ala Arg Gly  
100 105 110

Lys Arg Phe Val Leu Gly Ser Leu Gly Pro Thr Thr Lys Leu Pro Ser  
115 120 125

Leu Gly His Ala Pro Phe Asp Asp Leu Arg Glu Ala Tyr Arg Glu Ser  
130 135 140

Ala Glu Gly Leu Val Glu Gly Gly Ala Asp Ala Ile Leu Ile Glu Thr  
145 150 155 160

Gln Asp Leu Leu Gln Leu Lys Ala Ala Val Leu Ala Val Arg Ala Leu  
165 170 175

Asp Glu Leu Gly Leu Asp Leu Pro Ile Ile Ile Ser Val Thr Val Glu  
180 185 190

Thr Thr Gly Thr Met Leu Ser Gly Ser Glu Ile Gly Ala Phe Leu Thr  
195 200 205

Ala Leu Asp Pro Leu Gly Ile Asp Met Ile Gly Leu Asn Cys Ala Thr  
210 215 220

Gly Pro Asp Glu Met Ser Glu His Leu Arg Tyr Leu Ser Arg His Ala  
225 230 235 240

Asp Ile Pro Leu Thr Val Met Pro Asn Ala Gly Leu Pro Val Leu Gly  
245 250 255

Lys Gly Ala Glu Tyr Pro Leu Asp Ala Asp Asp Leu Ala Ala Ile Asp  
260 265 270

Ser Phe Val Glu Tyr Gly Leu Ser Ile Val Gly Gly Cys Cys Gly Thr  
 275 280 285  
 Thr Pro Glu His Ile Arg Ala Val Arg Lys Ala Val Gly Leu Ala Pro  
 290 295 300  
 Ala Arg Asp Lys Pro Glu Ile Ala Ser Leu Tyr Ser Pro Val Pro Leu  
 305 310 315 320  
 Gln Asp Thr Phe Val Met Ile Gly Glu Arg Thr Asn Ala Asn Gly Ser  
 325 330 335  
 Lys Lys Phe Arg Glu Ala Met Leu Asp Gly Lys Trp Glu Asp Cys Val  
 340 345 350  
 Asp Ile Ala Lys Gln Gln Val Arg Asp Gly Ala His Met Leu Asp Leu  
 355 360 365  
 Asn Val Asp Tyr Val Gly Arg Asp Gly Val Ala Asp Met Glu Lys Leu  
 370 375 380  
 Ala Asn Leu Leu Ala Thr Ala Ser Thr Leu Pro Ile Met Ile Asp Ser  
 385 390 395 400  
 Thr Glu Val Asp Val Ile Arg Lys Gly Leu Glu Leu Gly Gly Arg Ser  
 405 410 415  
 Ile Val Asn Ser Val Asn Val Glu Asp Gly Asp Gly Pro Glu Ser Arg  
 420 425 430  
 Phe Arg Ile Ile Lys Leu Leu Lys Lys His Gly Ala Ala Leu Ile Val  
 435 440 445  
 Leu Thr Ile Asp Glu Gly Gln Ala Arg Thr Ala Glu Lys Lys Val Glu  
 450 455 460  
 Ile Ala Glu Arg Leu Ile Lys Ile Leu Thr Gly Trp Gly Ile Asp Asp  
 465 470 475 480  
 Ile Ile Val Asp Pro Leu Thr Phe Pro Ile Ala Thr Gly Gln Glu Glu  
 485 490 495  
 Ser Arg Lys Asp Gly Ile Glu Thr Ile Glu Ala Ile Arg Glu Ile Lys  
 500 505 510  
 Arg Lys His Pro Asp Ile Asn Thr Thr Leu Gly Leu Ser Asn Ile Ser  
 515 520 525  
 Phe Gly Leu Asn Pro Ala Ala Arg Leu Leu Asn Ser Val Phe Leu Glu  
 530 535 540  
 Cys Ile Lys Ala Gly Leu Asp Ser Ala Ile Val Asn Ala Ser Lys Ile  
 Seite 66

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555

545					550					555					560
Leu	Pro	Met	Arg	Leu 565	Asp	Ala	Glu	Gln	Arg 570	Asp	Ala	Leu	Asp	Leu 575	Ile
Tyr	Asp	Arg	Arg 580	Glu	Gly	Tyr	Asp	Pro 585	Leu	Gln	Glu	Leu	Met 590	Gln	Leu
Phe	Glu	Gly 595	Ala	Ser	Ala	Asp	Lys 600	Ala	Lys	Ala	Glu	Glu 605	Leu	Arg	Ala
Leu	Pro 610	Leu	Glu	Glu	Arg	Leu 615	Arg	Ile	Ile	Asp	Gly 620	Asp	Lys	Asn	Gly
Leu 625	Glu	Gln	Asp	Leu	Glu 630	Glu	Ala	Leu	Lys	Glu 635	Lys	Ser	Pro	Ile	Glu 640
Ile	Ile	Asn	Glu	Leu 645	Leu	Asp	Gly	Met	Lys 650	Val	Val	Gly	Glu	Leu 655	Phe
Gly	Ser	Gly	Gln 660	Met	Gln	Leu	Pro	Gln 665	Val	Leu	Gln	Ser	Ala 670	Glu	Val
Met	Lys	Thr 675	Ala	Val	Ala	Tyr	Leu 680	Glu	Pro	Phe	Met	Glu 685	Ala	Ser	Ala
Glu	Ala 690	Gly	Lys	Gly	Thr	Ile 695	Val	Ile	Ala	Thr	Val 700	Lys	Gly	Asp	Val
His 705	Asp	Ile	Gly	Lys	Asn 710	Ile	Val	Asp	Ile	Ile 715	Leu	Ser	Asn	Asn	Gly 720
Tyr	Asp	Val	Val	Asn 725	Leu	Gly	Ile	Lys	Val 730	Pro	Leu	Ser	Ala	Ile 735	Leu
Glu	Ala	Ala	Glu 740	Glu	His	Arg	Ala	Asp 745	Val	Ile	Gly	Leu	Ser 750	Gly	Leu
Leu	Val	Lys 755	Ser	Thr	Val	Ile	Met 760	Lys	Glu	Val	Leu	Glu 765	Glu	Leu	Asn
Asn	Ala 770	Ala	Tyr	Pro	Val	Ile 775	Leu	Gly	Gly	Ala	Ala 780	Leu	Thr	Arg	Ala
Tyr 785	Val	Glu	Asn	Asp	Leu 790	Glu	Ile	Tyr	Ser	Gly 795	Glu	Val	Tyr	Tyr	Ala 800
Arg	Asn	Ala	Ser	Glu 805	Gly	Leu	Arg	Leu	Met 810	Asp	Ala	Leu	Ile	Ala 815	Asp
Lys	Arg	Gly	Asp 820	Ser	Pro	Glu	Ala	Lys 825	Lys	Glu	Arg	Lys	Arg 830	Arg	Ala

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Ala Thr Leu Glu Ala Pro Asp Arg Ser Asp Val Ala Thr Asp Asn Pro  
835 840 845

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

Leu Asp Glu Ala Leu Phe Gly Gln Trp Gly Leu Lys Arg Glu Gly Pro  
865 870 875 880

Ser Tyr Glu Asp Leu Val Glu Ser Glu Gly Arg Pro Arg Leu Arg Leu  
885 890 895

Asp Arg Leu Ser Asp Leu Leu Ala Leu Val Tyr Gly Tyr Phe Pro Ala  
900 905 910

Val Ala Gly Asp Asp Ile Ile Ile Leu Asp Asp Asp Glu Arg Met Arg  
915 920 925

Phe Ser Phe Pro Arg Gln Arg Gly Arg Leu Cys Leu Ala Asp Phe Ile  
930 935 940

Arg Pro Lys Glu Gly Asp Val Ile Gly Phe Gln Leu Val Thr Met Gly  
945 950 955 960

Ile Ala Asp Ala Leu Phe Ala Ala Asn Asp Tyr Arg Asp Tyr Leu Glu  
965 970 975

Val His Gly Leu Ala Val Gln Leu Ala Glu Ala Leu Ala Glu Tyr Trp  
980 985 990

His Ala Arg Val Arg Ser Glu Leu Ala Asp Pro Asp Glu Asp Leu Phe  
995 1000 1005

Leu Tyr Arg Gly Ala Arg Phe Ser Gly Tyr Gly Ala Cys Pro Asp  
1010 1015 1020

Leu Glu Asp Arg Ala Lys Ile Glu Leu Leu Glu Pro Glu Arg Ile  
1025 1030 1035

Gly Val Leu Ser Glu Glu Phe Gln Leu His Pro Glu Gln Ser Thr  
1040 1045 1050

Asp Ala Phe Val Ile His His Pro Glu Ala Lys Tyr Phe Asn Val  
1055 1060 1065