

EM2975_ST25
SEQUENCE LISTING

<110> Forschungszentrum Jülich GmbH

<120> Lyase und für die Lyase kodierende DNA, die DNA enthaltende Vektoren, sowie Verfahren zur asymmetrischen Synthese von (S) - Phenylacetylcarbinol

<130> PT1.2666

<160> 31

<170> PatentIn version 3.5

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<212> PRT

<213> artificial

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Leu Asp Gln Leu Leu Leu Asn Lys Asp Met Lys Gln Ile Tyr Cys Cys
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Asn Glu Leu Asn Cys Gly Phe Ser Ala Glu Gly Tyr Ala Arg Ser Asn
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Gly Ala Ala Ala Ala Val Val Thr Phe Ser Val Gly Ala Ile Ser Ala
65 70 75 80

Met Asn Ala Leu Gly Gly Ala Tyr Ala Glu Asn Leu Pro Val Ile Leu
85 90 95

Ile Ser Gly Ala Pro Asn Ser Asn Asp Gln Gly Thr Gly His Ile Leu
100 105 110

His His Thr Ile Gly Lys Thr Asp Tyr Ser Tyr Gln Leu Glu Met Ala
115 120 125

Arg Gln Val Thr Cys Ala Ala Glu Ser Ile Thr Asp Ala His Ser Ala
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Pro Ala Lys Ile Asp His Val Ile Arg Thr Ala Leu Arg Glu Arg Lys
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Pro Ala Tyr Leu Asp Ile Ala Cys Asn Ile Ala Ser Glu Pro Cys Val
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Arg Pro Gly Pro Val Ser Ser Leu Leu Ser Glu Pro Glu Ile Asp His
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Thr Ser Leu Lys Ala Ala Val Asp Ala Thr Val Ala Leu Leu Glu Lys
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Ser Ala Ser Pro Val Met Leu Leu Gly Ser Lys Leu Arg Ala Ala Asn
210 215 220

Ala Leu Ala Ala Thr Glu Thr Leu Ala Asp Lys Leu Gln Cys Ala Val
225 230 235 240

Thr Ile Met Ala Ala Ala Lys Gly Phe Phe Pro Glu Asp His Ala Gly
245 250 255

Phe Arg Gly Leu Tyr Trp Gly Glu Val Ser Asn Pro Gly Val Gln Glu
260 265 270

Leu Val Glu Thr Ser Asp Ala Leu Leu Cys Ile Ala Pro Val Phe Asn
275 280 285

Asp Tyr Ser Thr Val Gly Trp Ser Ala Trp Pro Lys Gly Pro Asn Val
290 295 300

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

Gly Phe Thr Leu Arg Ala Phe Leu Gln Ala Leu Ala Glu Lys Ala Pro
325 330 335

Ala Arg Pro Ala Ser Ala Gln Lys Ser Ser Val Pro Thr Cys Ser Leu
340 345 350

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

His Ile Asn Ala Leu Leu Thr Ser Asn Thr Thr Leu Val Ala Glu Thr
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Gly Asp Ser Trp Phe Asn Ala Met Arg Met Thr Leu Pro Arg Gly Ala
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Arg Val Glu Leu Glu Met Gln Trp Gly His Ile Gly Trp Ser Val Pro
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Ser Ala Phe Gly Asn Ala Met Gly Ser Gln Asp Arg Gln His Val Val
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Met Val Gly Asp Gly Ser Phe Gln Leu Thr Ala Gln Glu Val Ala Gln
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Met Val Arg Tyr Glu Leu Pro Val Ile Ile Phe Leu Ile Asn Asn Arg
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Gly Tyr Val Ile Gly Ile Ala Ile His Asp Gly Pro Tyr Asn Tyr Ile
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Lys Asn Trp Asp Tyr Ala Gly Leu Met Glu Val Phe Asn Ala Gly Glu
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Gly His Gly Leu Gly Leu Lys Ala Thr Thr Pro Lys Glu Leu Thr Glu
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Ala Ile Ala Arg Ala Lys Ala Asn Thr Arg Gly Pro Thr Leu Ile Glu
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Gly Leu Lys His His Phe Ala Val Ala Gly Asp Tyr Asn Leu Val Leu
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Leu Asp Gln Leu Leu Leu Asn Lys Asp Met Lys Gln Ile Tyr Cys Cys
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Asn Glu Leu Asn Cys Gly Phe Ser Ala Glu Gly Tyr Ala Arg Ser Asn
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Gly Ala Ala Ala Ala Val Val Thr Phe Ser Val Gly Ala Ile Ser Ala
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Met Asn Ala Leu Gly Gly Ala Tyr Ala Glu Asn Leu Pro Val Ile Leu
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Ile Ser Gly Ala Pro Asn Ser Asn Asp Gln Gly Thr Gly His Ile Leu
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His His Thr Ile Gly Lys Thr Asp Tyr Ser Tyr Gln Leu Glu Met Ala
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Arg Gln Val Thr Cys Ala Ala Glu Ser Ile Thr Asp Ala His Ser Ala
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Pro Ala Lys Ile Asp His Val Ile Arg Thr Ala Leu Arg Glu Arg Lys
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Pro Ala Tyr Leu Asp Ile Ala Cys Asn Ile Ala Ser Glu Pro Cys Val
165 170 175

Arg Pro Gly Pro Val Ser Ser Leu Leu Ser Glu Pro Glu Ile Asp His
180 185 190

Thr Ser Leu Lys Ala Ala Val Asp Ala Thr Val Ala Leu Leu Glu Lys
195 200 205

Ser Ala Ser Pro Val Met Leu Leu Gly Ser Lys Leu Arg Ala Ala Asn
210 215 220

Ala Leu Ala Ala Thr Glu Thr Leu Ala Asp Lys Leu Gln Cys Ala Val
225 230 235 240

Thr Ile Met Ala Ala Ala Lys Gly Phe Phe Pro Glu Asp His Ala Gly
245 250 255

Phe Arg Gly Leu Tyr Trp Gly Glu Val Ser Asn Pro Gly Val Gln Glu
260 265 270

Leu Val Glu Thr Ser Asp Ala Leu Leu Cys Ile Ala Pro Val Phe Asn
275 280 285

Asp Tyr Ser Thr Val Gly Trp Ser Ala Trp Pro Lys Gly Pro Asn Val
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Ile Leu Ala Glu Pro Asp Arg Val Thr Val Asp Gly Arg Ala Tyr Asp
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Gly Phe Thr Leu Arg Ala Phe Leu Gln Ala Leu Ala Glu Lys Ala Pro
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Ala Arg Pro Ala Ser Ala Gln Lys Ser Ser Val Pro Thr Cys Ser Leu
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Thr Ala Thr Ser Asp Glu Ala Gly Leu Thr Asn Asp Glu Ile Val Arg
355 360 365

His Ile Asn Ala Leu Leu Thr Ser Asn Thr Thr Leu Val Ala Glu Thr
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Gly Asp Ser Trp Phe Asn Ala Met Arg Met Thr Leu Pro Arg Gly Ala
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Arg Val Glu Leu Glu Met Gln Trp Gly His Ile Gly Trp Ser Val Pro
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Ser Ala Phe Gly Asn Ala Met Gly Ser Gln Asp Arg Gln His Val Val
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Met Val Gly Asp Gly Ser Phe Gln Leu Thr Ala Gln Glu Val Ala Gln
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Met Val Arg Tyr Glu Leu Pro Val Ile Ile Phe Leu Ile Asn Asn Arg
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Gly Tyr Val Ile Gly Ile Ala Ile His Asp Gly Pro Tyr Asn Tyr Ile
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Lys Asn Trp Asp Tyr Ala Gly Leu Met Glu Val Phe Asn Ala Gly Glu
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Ala Ile Ala Arg Ala Lys Ala Asn Thr Arg Gly Pro Thr Leu Ile Glu
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Leu Asp Gln Leu Leu Leu Asn Lys Asp Met Lys Gln Ile Tyr Cys Cys
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Asn Glu Leu Asn Cys Gly Phe Ser Ala Glu Gly Tyr Ala Arg Ser Asn
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Gly Ala Ala Ala Ala Val Val Thr Phe Ser Val Gly Ala Ile Ser Ala
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Met Asn Ala Leu Gly Gly Ala Tyr Ala Glu Asn Leu Pro Val Ile Leu
85 90 95

Ile Ser Gly Ala Pro Asn Ser Asn Asp Gln Gly Thr Gly His Ile Leu
100 105 110

His His Thr Ile Gly Lys Thr Asp Tyr Ser Tyr Gln Leu Glu Met Ala
115 120 125

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

Ser Ala Ser Pro Val Met Leu Leu Gly Ser Lys Leu Arg Ala Ala Asn
210 215 220

Ala Leu Ala Ala Thr Glu Thr Leu Ala Asp Lys Leu Gln Cys Ala Val
225 230 235 240

Thr Ile Met Ala Ala Ala Lys Gly Phe Phe Pro Glu Asp His Ala Gly
245 250 255

Phe Arg Gly Leu Tyr Trp Gly Glu Val Ser Asn Pro Gly Val Gln Glu
260 265 270

Leu Val Glu Thr Ser Asp Ala Leu Leu Cys Ile Ala Pro Val Phe Asn
275 280 285

Asp Tyr Ser Thr Val Gly Trp Ser Ala Trp Pro Lys Gly Pro Asn Val
290 295 300

Ile Leu Ala Glu Pro Asp Arg Val Thr Val Asp Gly Arg Ala Tyr Asp
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Gly Phe Thr Leu Arg Ala Phe Leu Gln Ala Leu Ala Glu Lys Ala Pro
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Ala Arg Pro Ala Ser Ala Gln Lys Ser Ser Val Pro Thr Cys Ser Leu
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Thr Ala Thr Ser Asp Glu Ala Gly Leu Thr Asn Asp Glu Ile Val Arg
355 360 365

His Ile Asn Ala Leu Leu Thr Ser Asn Thr Thr Leu Val Ala Glu Thr
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Gly Asp Ser Trp Phe Asn Ala Met Arg Met Thr Leu Pro Arg Gly Ala
385 390 395 400

Arg Val Glu Leu Glu Met Gln Trp Gly His Ile Gly Trp Ser Val Pro
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Ser Ala Phe Gly Asn Ala Met Gly Ser Gln Asp Arg Gln His Val Val
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Met Val Gly Asp Gly Ser Phe Gln Leu Thr Ala Gln Glu Val Ala Gln
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Met Val Arg Tyr Glu Leu Pro Val Ile Ile Phe Leu Ile Asn Asn Arg
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Gly Tyr Val Ile Gly Ile Ala Ile His Asp Gly Pro Tyr Asn Tyr Ile
465 470 475 480

Lys Asn Trp Asp Tyr Ala Gly Leu Met Glu Val Phe Asn Ala Gly Glu
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Gly His Gly Leu Gly Leu Lys Ala Thr Thr Pro Lys Glu Leu Thr Glu
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Ala Ile Ala Arg Ala Lys Ala Asn Thr Arg Gly Pro Thr Leu Ile Glu
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			20					25					30		

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 Asn Glu Leu Asn Cys Gly Phe Ser Ala Glu Gly Tyr Ala Arg Ser Asn
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 Met Asn Ala Leu Gly Gly Ala Tyr Ala Glu Asn Leu Pro Val Ile Leu
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 Ile Ser Gly Ala Pro Asn Ser Asn Asp Gln Gly Thr Gly His Ile Leu
 100 105 110
 His His Thr Ile Gly Lys Thr Asp Tyr Ser Tyr Gln Leu Glu Met Ala
 115 120 125
 Arg Gln Val Thr Cys Ala Ala Glu Ser Ile Thr Asp Ala His Ser Ala
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 Pro Ala Lys Ile Asp His Val Ile Arg Thr Ala Leu Arg Glu Arg Lys
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 Pro Ala Tyr Leu Asp Ile Ala Cys Asn Ile Ala Ser Glu Pro Cys Val
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 Arg Pro Gly Pro Val Ser Ser Leu Leu Ser Glu Pro Glu Ile Asp His
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 Thr Ser Leu Lys Ala Ala Val Asp Ala Thr Val Ala Leu Leu Glu Lys
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 Ser Ala Ser Pro Val Met Leu Leu Gly Ser Lys Leu Arg Ala Ala Asn
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 Ala Leu Ala Ala Thr Glu Thr Leu Ala Asp Lys Leu Gln Cys Ala Val
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 Thr Ile Met Ala Ala Ala Lys Gly Phe Phe Pro Glu Asp His Ala Gly
 245 250 255
 Phe Arg Gly Leu Tyr Trp Gly Glu Val Ser Asn Pro Gly Val Gln Glu
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 Leu Val Glu Thr Ser Asp Ala Leu Leu Cys Ile Ala Pro Val Phe Asn
 275 280 285
 Asp Tyr Ser Thr Val Gly Trp Ser Ala Trp Pro Lys Gly Pro Asn Val
 290 295 300

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Ile Leu Ala Glu Pro Asp Arg Val Thr Val Asp Gly Arg Ala Tyr Asp
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Gly Phe Thr Leu Arg Ala Phe Leu Gln Ala Leu Ala Glu Lys Ala Pro
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Ala Arg Pro Ala Ser Ala Gln Lys Ser Ser Val Pro Thr Cys Ser Leu
340 345 350

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

His Ile Asn Ala Leu Leu Thr Ser Asn Thr Thr Leu Val Ala Glu Thr
370 375 380

Gly Asp Ser Trp Phe Asn Ala Met Arg Met Thr Leu Pro Arg Gly Ala
385 390 395 400

Arg Val Glu Leu Glu Met Gln Trp Gly His Ile Gly Trp Ser Val Pro
405 410 415

Ser Ala Phe Gly Asn Ala Met Gly Ser Gln Asp Arg Gln His Val Val
420 425 430

Met Val Gly Asp Gly Ser Phe Gln Leu Thr Ala Gln Glu Val Ala Gln
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Met Val Arg Tyr Glu Leu Pro Val Ile Ile Phe Leu Ile Asn Asn Arg
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Gly Tyr Val Ile Gly Ile Ala Ile His Asp Gly Pro Tyr Asn Tyr Ile
465 470 475 480

Lys Asn Trp Asp Tyr Ala Gly Leu Met Glu Val Phe Asn Ala Gly Glu
485 490 495

Gly His Gly Leu Gly Leu Lys Ala Thr Thr Pro Lys Glu Leu Thr Glu
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Ala Ile Ala Arg Ala Lys Ala Asn Thr Arg Gly Pro Thr Leu Ile Glu
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ggccccaatg tgattctggc tgagcccgac cgcgtaacgg tcgatggccg cgcctatgac	960
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cgcggtggaac tggaaatgca gtggggccat atcggctggt ccgtgccctc cgccttcggc	1260
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acccgcggcc cgacgctgat cgaatgccag atcgaccgca cggactgcac ggatatgctg	1620
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<210> 9

<211> 560

<212> PRT

<213> artificial

<220>

EM2975_ST25

<223> künstlich hergestellt

<400> 9

Met Thr Tyr Thr Val Gly Met Tyr Leu Ala Glu Arg Leu Val Gln Ile
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Gly Leu Lys His His Phe Ala Val Ala Gly Asp Tyr Asn Leu Val Leu
 20 25 30

Leu Asp Gln Leu Leu Leu Asn Lys Asp Met Lys Gln Ile Tyr Cys Cys
 35 40 45

Asn Glu Leu Asn Cys Gly Phe Ser Ala Glu Gly Tyr Ala Arg Ser Asn
 50 55 60

Gly Ala Ala Ala Ala Val Val Thr Phe Ser Val Gly Ala Ile Ser Ala
 65 70 75 80

Met Asn Ala Leu Gly Gly Ala Tyr Ala Glu Asn Leu Pro Val Ile Leu
 85 90 95

Ile Ser Gly Ala Pro Asn Ser Asn Asp Gln Gly Thr Gly His Ile Leu
 100 105 110

His His Thr Ile Gly Lys Thr Asp Tyr Ser Tyr Gln Leu Glu Met Ala
 115 120 125

Arg Gln Val Thr Cys Ala Ala Glu Ser Ile Thr Asp Ala His Ser Ala
 130 135 140

Pro Ala Lys Ile Asp His Val Ile Arg Thr Ala Leu Arg Glu Arg Lys
 145 150 155 160

Pro Ala Tyr Leu Asp Ile Ala Cys Asn Ile Ala Ser Glu Pro Cys Val
 165 170 175

Arg Pro Gly Pro Val Ser Ser Leu Leu Ser Glu Pro Glu Ile Asp His
 180 185 190

Thr Ser Leu Lys Ala Ala Val Asp Ala Thr Val Ala Leu Leu Glu Lys
 195 200 205

Ser Ala Ser Pro Val Met Leu Leu Gly Ser Lys Leu Arg Ala Ala Asn
 210 215 220

Ala Leu Ala Ala Thr Glu Thr Leu Ala Asp Lys Leu Gln Cys Ala Val
 225 230 235 240

Thr Ile Met Ala Ala Ala Lys Gly Phe Phe Pro Glu Asp His Ala Gly
 245 250 255

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Phe Arg Gly Leu Tyr Trp Gly Glu Val Ser Asn Pro Gly Val Gln Glu
 260 265 270

Leu Val Glu Thr Ser Asp Ala Leu Leu Cys Ile Ala Pro Val Phe Asn
 275 280 285

Asp Tyr Ser Thr Val Gly Trp Ser Ala Trp Pro Lys Gly Pro Asn Val
 290 295 300

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

Gly Phe Thr Leu Arg Ala Phe Leu Gln Ala Leu Ala Glu Lys Ala Pro
 325 330 335

Ala Arg Pro Ala Ser Ala Gln Lys Ser Ser Val Pro Thr Cys Ser Leu
 340 345 350

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

His Ile Asn Ala Leu Leu Thr Ser Asn Thr Thr Leu Val Ala Glu Thr
 370 375 380

Gly Asp Ser Trp Phe Asn Ala Met Arg Met Thr Leu Pro Arg Gly Ala
 385 390 395 400

Arg Val Glu Leu Glu Met Gln Trp Gly His Ile Gly Trp Ser Val Pro
 405 410 415

Ser Ala Phe Gly Asn Ala Met Gly Ser Gln Asp Arg Gln His Val Val
 420 425 430

Met Val Gly Asp Gly Ser Phe Gln Leu Thr Ala Gln Glu Val Ala Gln
 435 440 445

Met Val Arg Tyr Glu Leu Pro Val Ile Ile Phe Leu Ile Asn Asn Arg
 450 455 460

Gly Tyr Val Ile Gly Ile Ala Ile His Asp Gly Pro Tyr Asn Tyr Ile
 465 470 475 480

Lys Asn Trp Asp Tyr Ala Gly Leu Met Glu Val Phe Asn Ala Gly Glu
 485 490 495

Gly His Gly Leu Gly Leu Lys Ala Thr Thr Pro Lys Glu Leu Thr Glu
 500 505 510

Ala Ile Ala Arg Ala Lys Ala Asn Thr Arg Gly Pro Thr Leu Ile Glu
 515 520 525

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Cys Gln Ile Asp Arg Thr Asp Cys Thr Asp Met Leu Val Gln Leu Gly
530 535 540

Arg Lys Val Ala Ser Thr Asn Ala Arg Lys Thr Thr Leu Ala Leu Glu
545 550 555 560

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<211> 1680
<212> DNA
<213> artificial

<220>
<223> künstlich hergestellt

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gacatgaaac agatctattg ctgcaatgag ttgaactgtg gcttcagcgc ggaaggctac 180
gcccgttcta acggggctgc ggcagcgggt gtcaccttca gcgttggcgc catttccgcc 240
atgaacgccc tcggcggcgc ctatgccgaa aacctgccgg ttatcctgat ttccggcgcg 300
cccaacagca atgatcaggg cacaggtcat atcctgcac acacaatcgg caagacggat 360
tacagctacc agcttgaaat ggcccgtcag gtcacctgtg ccgccgaaag cattaccgac 420
gtcactccg ccccgcccaa gattgaccac gtcattcgca cggcgctgcg cgagcgtaag 480
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tactggggcg aagtctcgaa ccccgcgctg caggaactgg tggagacctc cgacgcactg 840
ctgtgcatcg cccccgtatt caacgactat tcaacagtcg gctggtcggc atggcccaag 900
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tccgcacaga aaagcagcgt cccgacgtgc tcgctcaccg cgacatccga tgaagccggt 1080
ctgacgaatg acgaaatcgt ccgtcatatc aacgccctgc tgacatcaaa cagcagctg 1140
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cgcgtggaac tggaaatgca gtggggccat atcggctggt ccgtgccctc cgccttcggc 1260
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aagaactggg attacgccgg cctgatggaa gtcttcaacg ccggagaagg ccatggactt 1500
ggcctgaaag ccaccacccc gaaggaactg acagaagcca tcgccagggc aaaagccaat 1560

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acccgcggcc cgacgctgat cgaatgccag atcgaccgca cggactgcac ggatatgctg 1620
 gttcaactcg gccgcaaggt tgcctcaacc aacgcgcgca agaccactct ggccctcgag 1680

<210> 11
 <211> 560
 <212> PRT
 <213> artificial

<220>
 <223> künstlich hergestellt

<400> 11

Met Thr Tyr Thr Val Gly Met Tyr Leu Ala Glu Arg Leu Val Gln Ile
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Gly Leu Lys His His Phe Ala Val Ala Gly Asp Tyr Asn Leu Val Leu
 20 25 30

Leu Asp Gln Leu Leu Leu Asn Lys Asp Met Lys Gln Ile Tyr Cys Cys
 35 40 45

Asn Glu Leu Asn Cys Gly Phe Ser Ala Glu Gly Tyr Ala Arg Ser Asn
 50 55 60

Gly Ala Ala Ala Ala Val Val Thr Phe Ser Val Gly Ala Ile Ser Ala
 65 70 75 80

Met Asn Ala Leu Gly Gly Ala Tyr Ala Glu Asn Leu Pro Val Ile Leu
 85 90 95

Ile Ser Gly Ala Pro Asn Ser Asn Asp Gln Gly Thr Gly His Ile Leu
 100 105 110

His His Thr Ile Gly Lys Thr Asp Tyr Ser Tyr Gln Leu Glu Met Ala
 115 120 125

Arg Gln Val Thr Cys Ala Ala Glu Ser Ile Thr Asp Ala His Ser Ala
 130 135 140

Pro Ala Lys Ile Asp His Val Ile Arg Thr Ala Leu Arg Glu Arg Lys
 145 150 155 160

Pro Ala Tyr Leu Asp Ile Ala Cys Asn Ile Ala Ser Glu Pro Cys Val
 165 170 175

Arg Pro Gly Pro Val Ser Ser Leu Leu Ser Glu Pro Glu Ile Asp His
 180 185 190

Thr Ser Leu Lys Ala Ala Val Asp Ala Thr Val Ala Leu Leu Glu Lys
 195 200 205

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Ser Ala Ser Pro Val Met Leu Leu Gly Ser Lys Leu Arg Ala Ala Asn
 210 215 220

Ala Leu Ala Ala Thr Glu Thr Leu Ala Asp Lys Leu Gln Cys Ala Val
 225 230 235 240

Thr Ile Met Ala Ala Ala Lys Gly Phe Phe Pro Glu Asp His Ala Gly
 245 250 255

Phe Arg Gly Leu Tyr Trp Gly Glu Val Ser Asn Pro Gly Val Gln Glu
 260 265 270

Leu Val Glu Thr Ser Asp Ala Leu Leu Cys Ile Ala Pro Val Phe Asn
 275 280 285

Asp Tyr Ser Thr Val Gly Trp Ser Ala Trp Pro Lys Gly Pro Asn Val
 290 295 300

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

Gly Phe Thr Leu Arg Ala Phe Leu Gln Ala Leu Ala Glu Lys Ala Pro
 325 330 335

Ala Arg Pro Ala Ser Ala Gln Lys Ser Ser Val Pro Thr Cys Ser Leu
 340 345 350

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

His Ile Asn Ala Leu Leu Thr Ser Asn Thr Thr Leu Val Ala Glu Thr
 370 375 380

Gly Asp Ser Trp Phe Asn Ala Met Arg Met Thr Leu Pro Arg Gly Ala
 385 390 395 400

Arg Val Glu Leu Glu Met Gln Trp Gly His Ile Gly Trp Ser Val Pro
 405 410 415

Ser Ala Phe Gly Asn Ala Met Gly Ser Gln Asp Arg Gln His Val Val
 420 425 430

Met Val Gly Asp Gly Ser Phe Gln Leu Thr Ala Gln Glu Val Ala Gln
 435 440 445

Met Val Arg Tyr Glu Leu Pro Val Ile Ile Phe Leu Ile Asn Asn Arg
 450 455 460

Gly Tyr Val Ile Gly Ile Ala Ile His Asp Gly Pro Tyr Asn Tyr Ile
 465 470 475 480

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Lys Asn Trp Asp Tyr Ala Gly Leu Met Glu Val Phe Asn Ala Gly Glu
485 490 495

Gly His Gly Leu Gly Leu Lys Ala Thr Thr Pro Lys Glu Leu Thr Glu
500 505 510

Ala Ile Ala Arg Ala Lys Ala Asn Thr Arg Gly Pro Thr Leu Ile Glu
515 520 525

Cys Gln Ile Asp Arg Thr Asp Cys Thr Asp Met Leu Val Gln Met Gly
530 535 540

Arg Lys Val Ala Ser Thr Asn Ala Arg Lys Thr Thr Leu Ala Leu Glu
545 550 555 560

<210> 12
<211> 1680
<212> DNA
<213> artificial

<220>
<223> künstlich hergestellt

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gacatgaaac agatctattg ctgcaatgag ttgaactgtg gcttcagcgc ggaaggctac 180
gcccgttcta acggggctgc ggcagcgggt gtcaccttca gcgttggcgc catttccgcc 240
atgaacgccc tcggcggcgc ctatgccgaa aacctgccgg ttatcctgat ttccggcgcg 300
cccaacagca atgatcaggg cacaggtcat atcctgcatc acacaatcgg caagacggat 360
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gtcactccg ccccgcccaa gattgaccac gtcattcgca cggcgctgcg cgagcgtaag 480
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gtcagcagcc tgctgtccga gcctgaaatc gaccacacga gcctgaaggc cgcagtggac 600
gccacggttg ccttgctgga aaaatcggcc agccccgtca tgctgctggg cagcaagctg 660
cgggccgcca acgcactggc cgcaaccgaa acgctggcag acaagctgca atgcgcggtg 720
accatcatgg cggccgcgaa aggttttttc cccgaagacc acgcggggtt ccgcggcctg 780
tactggggcg aagtctcgaa ccccgcgctg caggaaactg tggagacctc cgacgcactg 840
ctgtgcatcg cccccgtatt caacgactat tcaacagtcg gctggtcggc atggcccaag 900
ggccccaatg tgattctggc tgagcccgac cgcgtaacgg tcgatggccg cgcctatgac 960
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tccgcacaga aaagcagcgt cccgacgtgc tcgctcaccg cgacatccga tgaagccggt 1080
ctgacgaatg acgaaatcgt ccgtcatatc aacgccctgc tgacatcaaa cagcagcgtg 1140
gtggcgagaaa ccggcgattc atggttcaat gccatgcgca tgaccctgcc gcgcggtgcg 1200

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 aatgccatgg gctcgcagga ccgccagcat gtggtgatgg taggcgatgg ctccttcag 1320
 cttaccgcg aggaagtggc tcagatgggt cgctacgaac tgcccgatcat tatctttctg 1380
 atcaacaacc gtggctatgt cattggcatc gccattcatg acggcccgtc caactatatac 1440
 aagaactggg attacgccgg cctgatggaa gtcttcaacg ccggagaagg ccatggactt 1500
 ggctgaaag ccaccacccc gaaggaactg acagaagcca tcgccagggc aaaagccaat 1560
 acccgcgcc cgacgtgat cgaatgccag atcgaccgca cggactgcac ggatatgctg 1620
 gttcaaattg gccgcaagg tgcctcaacc aacgcgcgca agaccactct ggccctcgag 1680

<210> 13
 <211> 560
 <212> PRT
 <213> artificial

<220>
 <223> künstlich hergestellt

<400> 13

Met Thr Tyr Thr Val Gly Met Tyr Leu Ala Glu Arg Leu Val Gln Ile
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Gly Leu Lys His His Phe Ala Val Ala Gly Asp Tyr Asn Leu Val Leu
20 25 30

Leu Asp Gln Leu Leu Leu Asn Lys Asp Met Lys Gln Ile Tyr Cys Cys
35 40 45

Asn Glu Leu Asn Cys Gly Phe Ser Ala Glu Gly Tyr Ala Arg Ser Asn
50 55 60

Gly Ala Ala Ala Ala Val Val Thr Phe Ser Val Gly Ala Ile Ser Ala
65 70 75 80

Met Asn Ala Leu Gly Gly Ala Tyr Ala Glu Asn Leu Pro Val Ile Leu
85 90 95

Ile Ser Gly Ala Pro Asn Ser Asn Asp Gln Gly Thr Gly His Ile Leu
100 105 110

His His Thr Ile Gly Lys Thr Asp Tyr Ser Tyr Gln Leu Glu Met Ala
115 120 125

Arg Gln Val Thr Cys Ala Ala Glu Ser Ile Thr Asp Ala His Ser Ala
130 135 140

Pro Ala Lys Ile Asp His Val Ile Arg Thr Ala Leu Arg Glu Arg Lys
145 150 155 160

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Pro Ala Tyr Leu Asp Ile Ala Cys Asn Ile Ala Ser Glu Pro Cys Val
 165 170 175

Arg Pro Gly Pro Val Ser Ser Leu Leu Ser Glu Pro Glu Ile Asp His
 180 185 190

Thr Ser Leu Lys Ala Ala Val Asp Ala Thr Val Ala Leu Leu Glu Lys
 195 200 205

Ser Ala Ser Pro Val Met Leu Leu Gly Ser Lys Leu Arg Ala Ala Asn
 210 215 220

Ala Leu Ala Ala Thr Glu Thr Leu Ala Asp Lys Leu Gln Cys Ala Val
 225 230 235 240

Thr Ile Met Ala Ala Ala Lys Gly Phe Phe Pro Glu Asp His Ala Gly
 245 250 255

Phe Arg Gly Leu Tyr Trp Gly Glu Val Ser Asn Pro Gly Val Gln Glu
 260 265 270

Leu Val Glu Thr Ser Asp Ala Leu Leu Cys Ile Ala Pro Val Phe Asn
 275 280 285

Asp Tyr Ser Thr Val Gly Trp Ser Ala Trp Pro Lys Gly Pro Asn Val
 290 295 300

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

Gly Phe Thr Leu Arg Ala Phe Leu Gln Ala Leu Ala Glu Lys Ala Pro
 325 330 335

Ala Arg Pro Ala Ser Ala Gln Lys Ser Ser Val Pro Thr Cys Ser Leu
 340 345 350

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

His Ile Asn Ala Leu Leu Thr Ser Asn Thr Thr Leu Val Ala Glu Thr
 370 375 380

Gly Asp Ser Trp Phe Asn Ala Met Arg Met Thr Leu Pro Arg Gly Ala
 385 390 395 400

Arg Val Glu Leu Glu Met Gln Trp Gly His Ile Gly Trp Ser Val Pro
 405 410 415

Ser Ala Phe Gly Asn Ala Met Gly Ser Gln Asp Arg Gln His Val Val
 420 425 430

EM2975_ST25

Met Val Gly Asp Gly Ser Phe Gln Leu Thr Ala Gln Glu Val Ala Gln
435 440 445

Met Val Arg Tyr Glu Leu Pro Val Ile Ile Phe Leu Ile Asn Asn Arg
450 455 460

Gly Tyr Val Ile Gly Ile Ala Ile His Asp Gly Pro Tyr Asn Tyr Ile
465 470 475 480

Lys Asn Trp Asp Tyr Ala Gly Leu Met Glu Val Phe Asn Ala Gly Glu
485 490 495

Gly His Gly Leu Gly Leu Lys Ala Thr Thr Pro Lys Glu Leu Thr Glu
500 505 510

Ala Ile Ala Arg Ala Lys Ala Asn Thr Arg Gly Pro Thr Leu Ile Glu
515 520 525

Cys Gln Ile Asp Arg Thr Asp Cys Thr Asp Met Leu Val Gln Val Gly
530 535 540

Arg Lys Val Ala Ser Thr Asn Ala Arg Lys Thr Thr Leu Ala Leu Glu
545 550 555 560

<210> 14
<211> 1680
<212> DNA
<213> artificial

<220>
<223> künstlich hergestellt

<400> 14
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gacatgaaac agatctattg ctgcaatgag ttgaactgtg gcttcagcgc ggaaggctac 180
gcccgttcta acggggctgc ggcagcggtt gtcaccttca gcgttggcgc catttccgcc 240
atgaacgccc tcggcggcgc ctatgccgaa aacctgccgg ttatcctgat ttccggcgcg 300
cccaacagca atgatcaggg cacaggatcat atcctgcac acacaatcgg caagacggat 360
tacagctacc agcttgaaat ggcccgtcag gtcacctgtg ccgccgaaag cattaccgac 420
gtcactccg ccccgccaa gattgaccac gtcattcgca cggcgctgcg cgagcgtaag 480
ccggcctatc tggacatcgc gtgcaacatt gcctccgagc cctgcgtgcg gcctggcctt 540
gtcagcagcc tgctgtccga gcctgaaatc gaccacacga gcctgaaggc cgcagtggac 600
gccacggttg ccttgctgga aaaatcggcc agccccgtca tgctgctggg cagcaagctg 660
cgggccgcca acgactggc cgcaaccgaa acgctggcag acaagctgca atgcgcggtg 720
accatcatgg cggccgcgaa aggtttttt cccgaagacc acgcgggttt ccgcggcctg 780
tactggggcg aagtctcgaa ccccggcgtg caggaactgg tggagacctc cgacgcactg 840

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 ggccccaatg tgattctggc tgagcccgac cgcgtaacgg tcgatggccg cgcctatgac 960
 ggctttaccc tgcgcgcctt cctgcaggct ctggcggaag aagccccgc gcgcccggcc 1020
 tccgcacaga aaagcagcgt cccgacgtgc tcgctcaccg cgacatccga tgaagccggt 1080
 ctgacgaatg acgaaatcgt ccgtcatatc aacgccttgc tgacatcaaa cacgacgtg 1140
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 cttaccgcgc aggaagtggc tcagatgggt cgctacgaac tgcccgtcat tatctttctg 1380
 atcaacaacc gtggctatgt cattggcatc gccattcatg acggcccgtc caactatatc 1440
 aagaactggg attacgccgg cctgatggaa gtcttcaacg ccggagaagg ccatggactt 1500
 ggcttgaag ccaccacccc gaaggaactg acagaagcca tcgccagggc aaaagccaat 1560
 acccgcgccc cgacgtgat cgaatgccag atcgaccgca cggactgcac ggatatgctg 1620
 gttcaagtcg gccgcaaggt tgcctcaacc aacgcgcgca agaccactct ggccctcgag 1680

<210> 15
 <211> 560
 <212> PRT
 <213> artificial

<220>
 <223> künstlich hergestellt

<400> 15

Met Thr Tyr Thr Val Gly Met Tyr Leu Ala Glu Arg Leu Val Gln Ile
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Gly Leu Lys His His Phe Ala Val Ala Gly Asp Tyr Asn Leu Val Leu
 20 25 30

Leu Asp Gln Leu Leu Leu Asn Lys Asp Met Lys Gln Ile Tyr Cys Cys
 35 40 45

Asn Glu Leu Asn Cys Gly Phe Ser Ala Glu Gly Tyr Ala Arg Ser Asn
 50 55 60

Gly Ala Ala Ala Ala Val Val Thr Phe Ser Val Gly Ala Ile Ser Ala
 65 70 75 80

Met Asn Ala Leu Gly Gly Ala Tyr Ala Glu Asn Leu Pro Val Ile Leu
 85 90 95

Ile Ser Gly Ala Pro Asn Ser Asn Asp Gln Gly Thr Gly His Ile Leu
 100 105 110

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His His Thr Ile Gly Lys Thr Asp Tyr Ser Tyr Gln Leu Glu Met Ala
 115 120 125

Arg Gln Val Thr Cys Ala Ala Glu Ser Ile Thr Asp Ala His Ser Ala
 130 135 140

Pro Ala Lys Ile Asp His Val Ile Arg Thr Ala Leu Arg Glu Arg Lys
 145 150 155 160

Pro Ala Tyr Leu Asp Ile Ala Cys Asn Ile Ala Ser Glu Pro Cys Val
 165 170 175

Arg Pro Gly Pro Val Ser Ser Leu Leu Ser Glu Pro Glu Ile Asp His
 180 185 190

Thr Ser Leu Lys Ala Ala Val Asp Ala Thr Val Ala Leu Leu Glu Lys
 195 200 205

Ser Ala Ser Pro Val Met Leu Leu Gly Ser Lys Leu Arg Ala Ala Asn
 210 215 220

Ala Leu Ala Ala Thr Glu Thr Leu Ala Asp Lys Leu Gln Cys Ala Val
 225 230 235 240

Thr Ile Met Ala Ala Ala Lys Gly Phe Phe Pro Glu Asp His Ala Gly
 245 250 255

Phe Arg Gly Leu Tyr Trp Gly Glu Val Ser Asn Pro Gly Val Gln Glu
 260 265 270

Leu Val Glu Thr Ser Asp Ala Leu Leu Cys Ile Ala Pro Val Phe Asn
 275 280 285

Asp Tyr Ser Thr Val Gly Trp Ser Ala Trp Pro Lys Gly Pro Asn Val
 290 295 300

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

Gly Phe Thr Leu Arg Ala Phe Leu Gln Ala Leu Ala Glu Lys Ala Pro
 325 330 335

Ala Arg Pro Ala Ser Ala Gln Lys Ser Ser Val Pro Thr Cys Ser Leu
 340 345 350

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

His Ile Asn Ala Leu Leu Thr Ser Asn Thr Thr Leu Val Ala Glu Thr
 370 375 380

EM2975_ST25

Gly Asp Ser Trp Phe Asn Ala Met Arg Met Thr Leu Pro Arg Gly Ala
385 390 395 400

Arg Val Glu Leu Glu Met Gln Trp Gly His Ile Gly Trp Ser Val Pro
405 410 415

Ser Ala Phe Gly Asn Ala Met Gly Ser Gln Asp Arg Gln His Val Val
420 425 430

Met Val Gly Asp Gly Ser Phe Gln Leu Thr Ala Gln Glu Val Ala Gln
435 440 445

Met Val Arg Tyr Glu Leu Pro Val Ile Ile Phe Leu Ile Asn Asn Arg
450 455 460

Gly Tyr Val Ile Gly Ile Ala Ile His Asp Gly Pro Tyr Asn Tyr Ile
465 470 475 480

Lys Asn Trp Asp Tyr Ala Gly Leu Met Glu Val Phe Asn Ala Gly Glu
485 490 495

Gly His Gly Leu Gly Leu Lys Ala Thr Thr Pro Lys Glu Leu Thr Glu
500 505 510

Ala Ile Ala Arg Ala Lys Ala Asn Thr Arg Gly Pro Thr Leu Ile Glu
515 520 525

Cys Gln Ile Asp Arg Thr Asp Cys Thr Asp Met Leu Val Gln Ala Gly
530 535 540

Arg Lys Val Ala Ser Thr Asn Ala Arg Lys Thr Thr Leu Ala Leu Glu
545 550 555 560

<210> 16
<211> 1680
<212> DNA
<213> artificial

<220>
<223> künstlich hergestellt

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gacatgaaac agatctattg ctgcaatgag ttgaactgtg gcttcagcgc ggaaggctac 180
gcccgttcta acggggctgc ggcagcggtt gtcaccttca gcgttggcgc catttccgcc 240
atgaacgccc tcggcggcgc ctatgccgaa aacctgccgg ttatcctgat ttccggcgcg 300
cccaacagca atgatcaggg cacaggtcat atcctgcac acacaatcgg caagacggat 360
tacagctacc agcttgaaat ggcccgtcag gtcacctgtg ccgccgaaag cattaccgac 420
gtcactccg ccccgccaa gattgaccac gtcattcgca cggcgctgcg cgagcgtaag 480

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 gtcagcagcc tgctgtccga gcctgaaatc gaccacacga gcctgaaggc cgcagtggac 600
 gccacgggtg ccttgctgga aaaatcggcc agccccgtca tgctgctggg cagcaagctg 660
 cgggccgcca acgcactggc cgcaaccgaa acgctggcag acaagctgca atgcgcggtg 720
 accatcatgg cggccgcgaa aggctttttc cccgaagacc acgcggggtt ccgcggcctg 780
 tactggggcg aagtctcgaa ccccggcgtg caggaactgg tggagacctc cgacgcactg 840
 ctgtgcatcg cccccgtatt caacgactat tcaacagtcg gctggtcggc atggcccaag 900
 ggccccaatg tgattctggc tgagcccgac cgcgtaacgg tcgatggccg cgcctatgac 960
 ggctttaccc tgcgcgcctt cctgcaggct ctggcgga aaagccccgc gcgcccggcc 1020
 tccgcacaga aaagcagcgt cccgacgtgc tcgctcaccg cgacatccga tgaagccggt 1080
 ctgacgaatg acgaaatcgt ccgtcatatc aacgccctgc tgacatcaaa cacgacgctg 1140
 gtggcagaaa ccggcgattc atggttcaat gccatgcgca tgaccctgcc gcgcggtgcg 1200
 cgcggtggaac tggaaatgca gtggggccat atcggtggt ccgtgccctc cgccttcggc 1260
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 aagaactggg attacgccgg cctgatggaa gtcttcaacg ccggagaagg ccatggactt 1500
 ggcttgaaag ccaccacccc gaaggaactg acagaagcca tcgccagggc aaaagccaat 1560
 acccgcgccc cgacgtgat cgaatgccag atcgaccgca cggactgcac ggatatgctg 1620
 gttcaagccg gccgcaaggc tgcctcaacc aacgcgcgca agaccactct ggccctcgag 1680

<210> 17
 <211> 560
 <212> PRT
 <213> artificial

<220>
 <223> künstlich hergestellt

<400> 17

Met Thr Tyr Thr Val Gly Met Tyr Leu Ala Glu Arg Leu Val Gln Ile
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Gly Leu Lys His His Phe Ala Val Ala Gly Asp Tyr Asn Leu Val Leu
 20 25 30

Leu Asp Gln Leu Leu Leu Asn Lys Asp Met Lys Gln Ile Tyr Cys Cys
 35 40 45

Asn Glu Leu Asn Cys Gly Phe Ser Ala Glu Gly Tyr Ala Arg Ser Asn
 50 55 60

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Gly Ala Ala Ala Ala Val Val Thr Phe Ser Val Gly Ala Ile Ser Ala
65 70 75 80

Met Asn Ala Leu Gly Gly Ala Tyr Ala Glu Asn Leu Pro Val Ile Leu
85 90 95

Ile Ser Gly Ala Pro Asn Ser Asn Asp Gln Gly Thr Gly His Ile Leu
100 105 110

His His Thr Ile Gly Lys Thr Asp Tyr Ser Tyr Gln Leu Glu Met Ala
115 120 125

Arg Gln Val Thr Cys Ala Ala Glu Ser Ile Thr Asp Ala His Ser Ala
130 135 140

Pro Ala Lys Ile Asp His Val Ile Arg Thr Ala Leu Arg Glu Arg Lys
145 150 155 160

Pro Ala Tyr Leu Asp Ile Ala Cys Asn Ile Ala Ser Glu Pro Cys Val
165 170 175

Arg Pro Gly Pro Val Ser Ser Leu Leu Ser Glu Pro Glu Ile Asp His
180 185 190

Thr Ser Leu Lys Ala Ala Val Asp Ala Thr Val Ala Leu Leu Glu Lys
195 200 205

Ser Ala Ser Pro Val Met Leu Leu Gly Ser Lys Leu Arg Ala Ala Asn
210 215 220

Ala Leu Ala Ala Thr Glu Thr Leu Ala Asp Lys Leu Gln Cys Ala Val
225 230 235 240

Thr Ile Met Ala Ala Ala Lys Gly Phe Phe Pro Glu Asp His Ala Gly
245 250 255

Phe Arg Gly Leu Tyr Trp Gly Glu Val Ser Asn Pro Gly Val Gln Glu
260 265 270

Leu Val Glu Thr Ser Asp Ala Leu Leu Cys Ile Ala Pro Val Phe Asn
275 280 285

Asp Tyr Ser Thr Val Gly Trp Ser Ala Trp Pro Lys Gly Pro Asn Val
290 295 300

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

Gly Phe Thr Leu Arg Ala Phe Leu Gln Ala Leu Ala Glu Lys Ala Pro
325 330 335

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Ala Arg Pro Ala Ser Ala Gln Lys Ser Ser Val Pro Thr Cys Ser Leu
 340 345 350

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

His Ile Asn Ala Leu Leu Thr Ser Asn Thr Thr Leu Val Ala Glu Thr
 370 375 380

Gly Asp Ser Trp Phe Asn Ala Met Arg Met Thr Leu Pro Arg Gly Ala
 385 390 395 400

Arg Val Glu Leu Glu Met Gln Trp Gly His Ile Gly Trp Ser Val Pro
 405 410 415

Ser Ala Phe Gly Asn Ala Met Gly Ser Gln Asp Arg Gln His Val Val
 420 425 430

Met Val Gly Asp Gly Ser Phe Gln Leu Thr Ala Gln Glu Val Ala Gln
 435 440 445

Met Val Arg Tyr Glu Leu Pro Val Ile Ile Phe Leu Ile Asn Asn Arg
 450 455 460

Gly Tyr Val Ile Gly Ile Ala Ile His Asp Gly Pro Tyr Asn Tyr Ile
 465 470 475 480

Lys Asn Trp Asp Tyr Ala Gly Leu Met Glu Val Phe Asn Ala Gly Glu
 485 490 495

Gly His Gly Leu Gly Leu Lys Ala Thr Thr Pro Lys Glu Leu Thr Glu
 500 505 510

Ala Ile Ala Arg Ala Lys Ala Asn Thr Arg Gly Pro Thr Leu Ile Glu
 515 520 525

Cys Gln Ile Asp Arg Thr Asp Cys Thr Asp Met Leu Val Gln Tyr Gly
 530 535 540

Arg Lys Val Ala Ser Thr Asn Ala Arg Lys Thr Thr Leu Ala Leu Glu
 545 550 555 560

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 <211> 1680
 <212> DNA
 <213> artificial

<220>
 <223> künstlich hergetellt

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 cacttcgccg tggcggggcga ctacaatctc gttcttctgg atcagttgct cctcaacaag 120

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 atgaacgccc tcggcggcgc ctatgccgaa aacctgccgg ttatcctgat ttccggcgcg 300
 cccaacagca atgatacagg cacaggtcat atcctgcata acacaatcgg caagacggat 360
 tacagctacc agcttgaaat ggcccgctag gtcacctgtg ccgccgaaag cattaccgac 420
 gctcactccg ccccggccaa gattgaccac gtcattcgca cggcgctgcg cgagcgtaag 480
 ccggcctatc tggacatcgc gtgcaacatt gcctccgagc cctgcgtgcg gcctggccct 540
 gtcagcagcc tgctgtccga gcctgaaatc gaccacacga gcctgaaggc cgcatgtggac 600
 gccacggttg ccttgctgga aaaatcggcc agccccgtca tgctgctggg cagcaagctg 660
 cgggcccggca acgcactggc cgcaaccgaa acgctggcag acaagctgca atgcgcggtg 720
 accatcatgg cggccgcgaa aggccttttc cccgaagacc acgcggggtt ccgcggcctg 780
 tactggggcg aagtctcgaa ccccggcgtg caggaactgg tggagacctc cgacgcactg 840
 ctgtgcatcg cccccgtatt caacgactat tcaacagtcg gctggtcggc atggcccaag 900
 ggccccaatg tgattctggc tgagcccgac cgcgtaacgg tcgatggccg cgcctatgac 960
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 tccgcacaga aaagcagcgt cccgacgtgc tcgctcaccg cgacatccga tgaagccggt 1080
 ctgacgaatg acgaaatcgt ccgtcatatc aacgccctgc tgacatcaaa cacgacgctg 1140
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 cgcgtggaac tggaaatgca gtggggccat atcggttgtt ccgtgccctc cgccttcggc 1260
 aatgccatgg gctcgcagga ccgccagcat gtgggtgatg taggcgatgg ctccttccag 1320
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 atcaacaacc gtggctatgt cattggcatc gccattcatg acggcccgtg caactatatc 1440
 aagaactggg attacgccgg cctgatggaa gtcttcaacg ccggagaagg ccatggactt 1500
 ggcttgaag ccaccacccc gaaggaactg acagaagcca tcgccagggc aaaagccaat 1560
 acccgcggcc cgacgtgat cgaatgccag atcgaccgca cggactgcac ggatatgctg 1620
 gttcaatacg gccgcaagg tgcctcaacc aacgcgcgca agaccactct ggccctcgag 1680

<210> 19
 <211> 560
 <212> PRT
 <213> artificial

<220>
 <223> künstlich hergestellt

<400> 19

Met Thr Tyr Thr Val Gly Met Tyr Leu Ala Glu Arg Leu Val Gln Ile
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EM2975_ST25

Gly Leu Lys His His Phe Ala Val Ala Gly Asp Tyr Asn Leu Val Leu
 20 25 30

Leu Asp Gln Leu Leu Leu Asn Lys Asp Met Lys Gln Ile Tyr Cys Cys
 35 40 45

Asn Glu Leu Asn Cys Gly Phe Ser Ala Glu Gly Tyr Ala Arg Ser Asn
 50 55 60

Gly Ala Ala Ala Ala Val Val Thr Phe Ser Val Gly Ala Ile Ser Ala
 65 70 75 80

Met Asn Ala Leu Gly Gly Ala Tyr Ala Glu Asn Leu Pro Val Ile Leu
 85 90 95

Ile Ser Gly Ala Pro Asn Ser Asn Asp Gln Gly Thr Gly His Ile Leu
 100 105 110

His His Thr Ile Gly Lys Thr Asp Tyr Ser Tyr Gln Leu Glu Met Ala
 115 120 125

Arg Gln Val Thr Cys Ala Ala Glu Ser Ile Thr Asp Ala His Ser Ala
 130 135 140

Pro Ala Lys Ile Asp His Val Ile Arg Thr Ala Leu Arg Glu Arg Lys
 145 150 155 160

Pro Ala Tyr Leu Asp Ile Ala Cys Asn Ile Ala Ser Glu Pro Cys Val
 165 170 175

Arg Pro Gly Pro Val Ser Ser Leu Leu Ser Glu Pro Glu Ile Asp His
 180 185 190

Thr Ser Leu Lys Ala Ala Val Asp Ala Thr Val Ala Leu Leu Glu Lys
 195 200 205

Ser Ala Ser Pro Val Met Leu Leu Gly Ser Lys Leu Arg Ala Ala Asn
 210 215 220

Ala Leu Ala Ala Thr Glu Thr Leu Ala Asp Lys Leu Gln Cys Ala Val
 225 230 235 240

Thr Ile Met Ala Ala Ala Lys Gly Phe Phe Pro Glu Asp His Ala Gly
 245 250 255

Phe Arg Gly Leu Tyr Trp Gly Glu Val Ser Asn Pro Gly Val Gln Glu
 260 265 270

Leu Val Glu Thr Ser Asp Ala Leu Leu Cys Ile Ala Pro Val Phe Asn
 275 280 285

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

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<210> 20
<211> 1680
<212> DNA
<213> artificial

<220>
<223> künstlich hergestellt

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gacatgaaac agatctattg ctgcaatgag ttgaactgtg gcttcagcgc ggaaggctac 180
gcccgttcta acggggctgc ggcagcgggt gtcaccttca gcgttggcgc catttccgcc 240
atgaacgccc tcggcggcgc ctatgccgaa aacctgccgg ttatcctgat ttccggcgcg 300
cccaacagca atgatcaggg cacaggtcat atcctgcatc acacaatcgg caagacggat 360
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gtcagcagcc tgctgtccga gcctgaaatc gaccacacga gcctgaaggc cgcagtggac 600
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cgggccgcca acgactggc cgcaaccgaa acgctggcag acaagctgca atgcgcgggtg 720
accatcatgg cggccgcgaa aggctttttc cccgaagacc acgcggggtt ccgcggcctg 780
tactggggcg aagtctcgaa ccccggcgtg caggaaactgg tggagacctc cgacgcactg 840
ctgtgcatcg ccccggtatt caacgactat tcaacagtcg gctggtcggc atggcccaag 900
ggccccaatg tgattctggc tgagcccgac cgcgtaacgg tcgatggccg cgcctatgac 960
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tccgcacaga aaagcagcgt cccgacgtgc tcgctcaccg cgacatccga tgaagccggt 1080
ctgacgaatg acgaaatcgt ccgtcatatc aacgccctgc tgacatcaa cacgacgctg 1140
gtggcagaaa ccggcgattc atggttcaat gccatgcgca tgaccctgcc gcgcgggtgcg 1200
cgcgtggaac tggaatgca gtggggccat atcggctggt ccgtgccctc cgccttcggc 1260
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cttaccgcgc aggaagtggc tcagatgggt cgctacgaac tgcccgtcat tatctttctg 1380
atcaacaacc gtggctatgt cattggcatc gccattcatg acggcccgtg caactatata 1440
aagaactggg attacgccg cctgatggaa gtcttcaacg ccggagaagg ccatggactt 1500
ggcctgaaag ccaccacccc gaaggaactg acagaagcca tcgccagggc aaaagccaat 1560
acccgcggcc cgacgctgat cgaatgccag atcgaccgca cggactgcac ggatatgctg 1620
gttcaaacag gccgcaagggt tgcctcaacc aacgcgcgca agaccactct ggccctcgag 1680

<210> 21
<211> 560

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<212> PRT
<213> artificial

<220>
<223> künstlich hergestellt

<400> 21

Met Thr Tyr Thr Val Gly Met Tyr Leu Ala Glu Arg Leu Val Gln Ile
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Gly Leu Lys His His Phe Ala Val Ala Gly Asp Tyr Asn Leu Val Leu
20 25 30

Leu Asp Gln Leu Leu Leu Asn Lys Asp Met Lys Gln Ile Tyr Cys Cys
35 40 45

Asn Glu Leu Asn Cys Gly Phe Ser Ala Glu Gly Tyr Ala Arg Ser Asn
50 55 60

Gly Ala Ala Ala Ala Val Val Thr Phe Ser Val Gly Ala Ile Ser Ala
65 70 75 80

Met Asn Ala Leu Gly Gly Ala Tyr Ala Glu Asn Leu Pro Val Ile Leu
85 90 95

Ile Ser Gly Ala Pro Asn Ser Asn Asp Gln Gly Thr Gly His Ile Leu
100 105 110

His His Thr Ile Gly Lys Thr Asp Tyr Ser Tyr Gln Leu Glu Met Ala
115 120 125

Arg Gln Val Thr Cys Ala Ala Glu Ser Ile Thr Asp Ala His Ser Ala
130 135 140

Pro Ala Lys Ile Asp His Val Ile Arg Thr Ala Leu Arg Glu Arg Lys
145 150 155 160

Pro Ala Tyr Leu Asp Ile Ala Cys Asn Ile Ala Ser Glu Pro Cys Val
165 170 175

Arg Pro Gly Pro Val Ser Ser Leu Leu Ser Glu Pro Glu Ile Asp His
180 185 190

Thr Ser Leu Lys Ala Ala Val Asp Ala Thr Val Ala Leu Leu Glu Lys
195 200 205

Ser Ala Ser Pro Val Met Leu Leu Gly Ser Lys Leu Arg Ala Ala Asn
210 215 220

Ala Leu Ala Ala Thr Glu Thr Leu Ala Asp Lys Leu Gln Cys Ala Val
225 230 235 240

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

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Ala Ile Ala Arg Ala Lys Ala Asn Thr Arg Gly Pro Thr Leu Ile Glu
515 520 525

Cys Gln Ile Asp Arg Thr Asp Cys Thr Asp Met Leu Val Gln Gly Gly
530 535 540

Arg Lys Val Ala Ser Thr Asn Ala Arg Lys Thr Thr Leu Ala Leu Glu
545 550 555 560

<210> 22
<211> 1680
<212> DNA
<213> artificial

<220>
<223> künstlich hergestellt

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gacatgaaac agatctattg ctgcaatgag ttgaactgtg gcttcagcgc ggaaggctac 180
gcccgttcta acggggctgc ggcagcgggt gtcaccttca gcgttggcgc catttccgcc 240
atgaacgccc tcggcggcgc ctatgccgaa aacctgccgg ttatcctgat ttccggcgcg 300
cccaacagca atgatcaggg cacaggtcat atcctgcac acacaatcgg caagacggat 360
tacagctacc agcttgaaat ggcccgtcag gtcacctgtg ccgccgaaag cattaccgac 420
gctcactccg ccccggccaa gattgaccac gtcattcgca cggcgctgcg cgagcgtaag 480
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gtcagcagcc tgctgtccga gcctgaaatc gaccacacga gcctgaaggc cgcagtggac 600
gccacggttg ccttgctgga aaaatcggcc agccccgtca tgctgctggg cagcaagctg 660
cgggccgcca acgcactggc cgcaaccgaa acgctggcag acaagctgca atgcgcgggtg 720
accatcatgg cggccgcgaa aggcctttttc cccgaagacc acgcggggtt ccgcggcctg 780
tactggggcg aagtctcgaa ccccggcgtg caggaactgg tggagacctc cgacgcactg 840
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cgcggtggaac tggaaatgca gtggggccat atcggctggt ccgtgccctc cgccttcggc 1260
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cttaccgcgc aggaagtggc tcagatgggt cgctacgaac tgcccgtcat tatctttctg 1380
atcaacaacc gtggctatgt cattggcatc gccattcatg acggcccgtg caactatatc 1440

EM2975_ST25

aagaactggg attacgccgg cctgatggaa gtcttcaacg ccggagaagg ccatggactt 1500
 ggcctgaaag ccaccacccc gaaggaactg acagaagcca tcgccagggc aaaagccaat 1560
 acccgcggcc cgacgctgat cgaatgccag atcgaccgca cggactgcac ggatatgctg 1620
 gttcaaggag gccgcaaggt tgcctcaacc aacgcgcgca agaccactct ggccctcgag 1680

<210> 23
 <211> 560
 <212> PRT
 <213> artificial

<220>
 <223> künstlich hergestellt

<400> 23

Met Thr Tyr Thr Val Gly Met Tyr Leu Ala Glu Arg Leu Val Gln Ile
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Gly Leu Lys His His Phe Ala Val Ala Gly Asp Tyr Asn Leu Val Leu
 20 25 30

Leu Asp Gln Leu Leu Leu Asn Lys Asp Met Lys Gln Ile Tyr Cys Cys
 35 40 45

Asn Glu Leu Asn Cys Gly Phe Ser Ala Glu Gly Tyr Ala Arg Ser Asn
 50 55 60

Gly Ala Ala Ala Ala Val Val Thr Phe Ser Val Gly Ala Ile Ser Ala
 65 70 75 80

Met Asn Ala Leu Gly Gly Ala Tyr Ala Glu Asn Leu Pro Val Ile Leu
 85 90 95

Ile Ser Gly Ala Pro Asn Ser Asn Asp Gln Gly Thr Gly His Ile Leu
 100 105 110

His His Thr Ile Gly Lys Thr Asp Tyr Ser Tyr Gln Leu Glu Met Ala
 115 120 125

Arg Gln Val Thr Cys Ala Ala Glu Ser Ile Thr Asp Ala His Ser Ala
 130 135 140

Pro Ala Lys Ile Asp His Val Ile Arg Thr Ala Leu Arg Glu Arg Lys
 145 150 155 160

Pro Ala Tyr Leu Asp Ile Ala Cys Asn Ile Ala Ser Glu Pro Cys Val
 165 170 175

Arg Pro Gly Pro Val Ser Ser Leu Leu Ser Glu Pro Glu Ile Asp His
 180 185 190

EM2975_ST25

Thr Ser Leu Lys Ala Ala Val Asp Ala Thr Val Ala Leu Leu Glu Lys
195 200 205

Ser Ala Ser Pro Val Met Leu Leu Gly Ser Lys Leu Arg Ala Ala Asn
210 215 220

Ala Leu Ala Ala Thr Glu Thr Leu Ala Asp Lys Leu Gln Cys Ala Val
225 230 235 240

Thr Ile Met Ala Ala Ala Lys Gly Phe Phe Pro Glu Asp His Ala Gly
245 250 255

Phe Arg Gly Leu Tyr Trp Gly Glu Val Ser Asn Pro Gly Val Gln Glu
260 265 270

Leu Val Glu Thr Ser Asp Ala Leu Leu Cys Ile Ala Pro Val Phe Asn
275 280 285

Asp Tyr Ser Thr Val Gly Trp Ser Ala Trp Pro Lys Gly Pro Asn Val
290 295 300

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

Gly Phe Thr Leu Arg Ala Phe Leu Gln Ala Leu Ala Glu Lys Ala Pro
325 330 335

Ala Arg Pro Ala Ser Ala Gln Lys Ser Ser Val Pro Thr Cys Ser Leu
340 345 350

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

His Ile Asn Ala Leu Leu Thr Ser Asn Thr Thr Leu Val Ala Glu Thr
370 375 380

Gly Asp Ser Trp Phe Asn Ala Met Arg Met Thr Leu Pro Arg Gly Ala
385 390 395 400

Arg Val Glu Leu Glu Met Gln Trp Gly His Ile Gly Trp Ser Val Pro
405 410 415

Ser Ala Phe Gly Asn Ala Met Gly Ser Gln Asp Arg Gln His Val Val
420 425 430

Met Val Gly Asp Gly Ser Phe Gln Leu Thr Ala Gln Glu Val Ala Gln
435 440 445

Met Val Arg Tyr Glu Leu Pro Val Ile Ile Phe Leu Ile Asn Asn Arg
450 455 460

EM2975_ST25
Gly Tyr Val Ile Gly Ile Ala Ile His Asp Gly Pro Tyr Asn Tyr Ile
465 470 475 480
Lys Asn Trp Asp Tyr Ala Gly Leu Met Glu Val Phe Asn Ala Gly Glu
485 490 495
Gly His Gly Leu Gly Leu Lys Ala Thr Thr Pro Lys Glu Leu Thr Glu
500 505 510
Ala Ile Ala Arg Ala Lys Ala Asn Thr Arg Gly Pro Thr Leu Ile Glu
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Gly Ala Ala Ala Ala Val Val Thr Phe Ser Val Gly Ala Ile Ser Ala
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Met Asn Ala Leu Gly Gly Ala Tyr Ala Glu Asn Leu Pro Val Ile Leu
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Ile Ser Gly Ala Pro Asn Ser Asn Asp Gln Gly Thr Gly His Ile Leu
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His His Thr Ile Gly Lys Thr Asp Tyr Ser Tyr Gln Leu Glu Met Ala
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Arg Gln Val Thr Cys Ala Ala Glu Ser Ile Thr Asp Ala His Ser Ala
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Arg Pro Gly Pro Val Ser Ser Leu Leu Ser Glu Pro Glu Ile Asp His
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Thr Ser Leu Lys Ala Ala Val Asp Ala Thr Val Ala Leu Leu Glu Lys
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Ser Ala Ser Pro Val Met Leu Leu Gly Ser Lys Leu Arg Ala Ala Asn
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Asn Glu Leu Asn Cys Gly Phe Ser Ala Glu Gly Tyr Ala Arg Ser Asn
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Gly Ala Ala Ala Ala Val Val Thr Phe Ser Val Gly Ala Ile Ser Ala
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Met Asn Ala Leu Gly Gly Ala Tyr Ala Glu Asn Leu Pro Val Ile Leu
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Ile Ser Gly Ala Pro Asn Ser Asn Asp Gln Gly Thr Gly His Ile Leu
 100 105 110

His His Thr Ile Gly Lys Thr Asp Tyr Ser Tyr Gln Leu Glu Met Ala
 115 120 125

Arg Gln Val Thr Cys Ala Ala Glu Ser Ile Thr Asp Ala His Ser Ala
 130 135 140

Pro Ala Lys Ile Asp His Val Ile Arg Thr Ala Leu Arg Glu Arg Lys
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Pro Ala Tyr Leu Asp Ile Ala Cys Asn Ile Ala Ser Glu Pro Cys Val
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Arg Pro Gly Pro Val Ser Ser Leu Leu Ser Glu Pro Glu Ile Asp His
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Thr Ser Leu Lys Ala Ala Val Asp Ala Thr Val Ala Leu Leu Glu Lys
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Ala Leu Ala Ala Thr Glu Thr Leu Ala Asp Lys Leu Gln Cys Ala Val
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Thr Ile Met Ala Ala Ala Lys Gly Phe Phe Pro Glu Asp His Ala Gly
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Phe Arg Gly Leu Tyr Trp Gly Glu Val Ser Asn Pro Gly Val Gln Glu
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Leu Val Glu Thr Ser Asp Ala Leu Leu Cys Ile Ala Pro Val Phe Asn
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Asp Tyr Ser Thr Val Gly Trp Ser Ala Trp Pro Lys Gly Pro Asn Val
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Ile Leu Ala Glu Pro Asp Arg Val Thr Val Asp Gly Arg Ala Tyr Asp
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Gly Phe Thr Leu Arg Ala Phe Leu Gln Ala Leu Ala Glu Lys Ala Pro
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Ala Arg Pro Ala Ser Ala Gln Lys Ser Ser Val Pro Thr Cys Ser Leu
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Thr Ala Thr Ser Asp Glu Ala Gly Leu Thr Asn Asp Glu Ile Val Arg
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His Ile Asn Ala Leu Leu Thr Ser Asn Thr Thr Leu Val Ala Glu Thr
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Gly Asp Ser Trp Phe Asn Ala Met Arg Met Thr Leu Pro Arg Gly Ala
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Arg Val Glu Leu Glu Met Gln Trp Gly His Ile Gly Trp Ser Val Pro
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Ser Ala Phe Gly Asn Ala Met Gly Ser Gln Asp Arg Gln His Val Val
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Met Val Gly Asp Gly Ser Phe Gln Leu Thr Ala Gln Glu Val Ala Gln
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Met Val Arg Tyr Glu Leu Pro Val Ile Ile Phe Leu Ile Asn Asn Arg
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Gly Tyr Val Ile Gly Ile Ala Ile His Asp Gly Pro Tyr Asn Tyr Ile
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Lys Asn Trp Asp Tyr Ala Gly Leu Met Glu Val Phe Asn Ala Gly Glu
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Ala Ile Ala Arg Ala Lys Ala Asn Thr Arg Gly Pro Thr Leu Ile Glu
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