

eolf-othd-000002 (1)
SEQUENCE LISTING

<110> GENETHON et al.

<120> ACID-ALPHA GLUCOSIDASE VARIANTS AND USES THEREOF

<130> B2299PC00

<160> 53

<170> PatentIn version 3.3

<210> 1

<211> 925

<212> PRT

<213> artificial

<220>

<223> hGAAwt w/o sp

<400> 1

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Ala	Ser	Arg	Pro	Gly	Pro	Arg	Asp	Ala	Gln	Ala	His	Pro	Gly	Arg	Pro
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Arg	Ala	Val	Pro	Thr	Gln	Cys	Asp	Val	Pro	Pro	Asn	Ser	Arg	Phe	Asp
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Cys	Ala	Pro	Asp	Lys	Ala	Ile	Thr	Gln	Glu	Gln	Cys	Glu	Ala	Arg	Gly
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Cys	Cys	Tyr	Ile	Pro	Ala	Lys	Gln	Gly	Leu	Gln	Gly	Ala	Gln	Met	Gly
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Gln	Pro	Trp	Cys	Phe	Phe	Pro	Pro	Ser	Tyr	Pro	Ser	Tyr	Lys	Leu	Glu
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Asn Leu Ser Ser Ser Glu Met Gly Tyr Thr Ala Thr Leu Thr Arg Thr
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Thr Pro Thr Phe Phe Pro Lys Asp Ile Leu Thr Leu Arg Leu Asp Val
130 135 140

Met Met Glu Thr Glu Asn Arg Leu His Phe Thr Ile Lys Asp Pro Ala
145 150 155 160

Asn Arg Arg Tyr Glu Val Pro Leu Glu Thr Pro His Val His Ser Arg
165 170 175

Ala Pro Ser Pro Leu Tyr Ser Val Glu Phe Ser Glu Glu Pro Phe Gly
180 185 190

Val Ile Val Arg Arg Gln Leu Asp Gly Arg Val Leu Leu Asn Thr Thr
195 200 205

Val Ala Pro Leu Phe Phe Ala Asp Gln Phe Leu Gln Leu Ser Thr Ser
210 215 220

Leu Pro Ser Gln Tyr Ile Thr Gly Leu Ala Glu His Leu Ser Pro Leu
225 230 235 240

Met Leu Ser Thr Ser Trp Thr Arg Ile Thr Leu Trp Asn Arg Asp Leu
245 250 255

Ala Pro Thr Pro Gly Ala Asn Leu Tyr Gly Ser His Pro Phe Tyr Leu
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Ala Leu Glu Asp Gly Gly Ser Ala His Gly Val Phe Leu Leu Asn Ser
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Asn Ala Met Asp Val Val Leu Gln Pro Ser Pro Ala Leu Ser Trp Arg
290 295 300

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

Val Gln Glu Leu His Gln Gly Gly Arg Arg Tyr Met Met Ile Val Asp
405 410 415

Pro Ala Ile Ser Ser Ser Gly Pro Ala Gly Ser Tyr Arg Pro Tyr Asp
420 425 430

Glu Gly Leu Arg Arg Gly Val Phe Ile Thr Asn Glu Thr Gly Gln Pro
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Leu Ile Gly Lys Val Trp Pro Gly Ser Thr Ala Phe Pro Asp Phe Thr
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Asn Pro Thr Ala Leu Ala Trp Trp Glu Asp Met Val Ala Glu Phe His
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Asp Gln Val Pro Phe Asp Gly Met Trp Ile Asp Met Asn Glu Pro Ser
485 490 495

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Asn Phe Ile Arg Gly Ser Glu Asp Gly Cys Pro Asn Asn Glu Leu Glu
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Asn Pro Pro Tyr Val Pro Gly Val Val Gly Gly Thr Leu Gln Ala Ala
515 520 525

Thr Ile Cys Ala Ser Ser His Gln Phe Leu Ser Thr His Tyr Asn Leu
530 535 540

His Asn Leu Tyr Gly Leu Thr Glu Ala Ile Ala Ser His Arg Ala Leu
545 550 555 560

Val Lys Ala Arg Gly Thr Arg Pro Phe Val Ile Ser Arg Ser Thr Phe
565 570 575

Ala Gly His Gly Arg Tyr Ala Gly His Trp Thr Gly Asp Val Trp Ser
580 585 590

Ser Trp Glu Gln Leu Ala Ser Ser Val Pro Glu Ile Leu Gln Phe Asn
595 600 605

Leu Leu Gly Val Pro Leu Val Gly Ala Asp Val Cys Gly Phe Leu Gly
610 615 620

Asn Thr Ser Glu Glu Leu Cys Val Arg Trp Thr Gln Leu Gly Ala Phe
625 630 635 640

Tyr Pro Phe Met Arg Asn His Asn Ser Leu Leu Ser Leu Pro Gln Glu
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Pro Tyr Ser Phe Ser Glu Pro Ala Gln Gln Ala Met Arg Lys Ala Leu
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Thr Leu Arg Tyr Ala Leu Leu Pro His Leu Tyr Thr Leu Phe His Gln
675 680 685

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Ala His Val Ala Gly Glu Thr Val Ala Arg Pro Leu Phe Leu Glu Phe
690 695 700

Pro Lys Asp Ser Ser Thr Trp Thr Val Asp His Gln Leu Leu Trp Gly
705 710 715 720

Glu Ala Leu Leu Ile Thr Pro Val Leu Gln Ala Gly Lys Ala Glu Val
725 730 735

Thr Gly Tyr Phe Pro Leu Gly Thr Trp Tyr Asp Leu Gln Thr Val Pro
740 745 750

Val Glu Ala Leu Gly Ser Leu Pro Pro Pro Ala Ala Pro Arg Glu
755 760 765

Pro Ala Ile His Ser Glu Gly Gln Trp Val Thr Leu Pro Ala Pro Leu
770 775 780

Asp Thr Ile Asn Val His Leu Arg Ala Gly Tyr Ile Ile Pro Leu Gln
785 790 795 800

Gly Pro Gly Leu Thr Thr Thr Glu Ser Arg Gln Gln Pro Met Ala Leu
805 810 815

Ala Val Ala Leu Thr Lys Gly Gly Glu Ala Arg Gly Glu Leu Phe Trp
820 825 830

Asp Asp Gly Glu Ser Leu Glu Val Leu Glu Arg Gly Ala Tyr Thr Gln
835 840 845

Val Ile Phe Leu Ala Arg Asn Asn Thr Ile Val Asn Glu Leu Val Arg
850 855 860

Val Thr Ser Glu Gly Ala Gly Leu Gln Leu Gln Lys Val Thr Val Leu
865 870 875 880

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Gly Val Ala Thr Ala Pro Gln Gln Val Leu Ser Asn Gly Val Pro Val
885 890 895

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915 920 925

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Leu Glu Glu Thr His Pro Ala His Gln Gln Gly Ala Ser Arg Pro Gly
50 55 60

Pro Arg Asp Ala Gln Ala His Pro Gly Arg Pro Arg Ala Val Pro Thr
65 70 75 80

Gln Cys Asp Val Pro Pro Asn Ser Arg Phe Asp Cys Ala Pro Asp Lys
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Ala Ile Thr Gln Glu Gln Cys Glu Ala Arg Gly Cys Cys Tyr Ile Pro
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Ala Lys Gln Gly Leu Gln Gly Ala Gln Met Gly Gln Pro Trp Cys Phe
115 120 125

Phe Pro Pro Ser Tyr Pro Ser Tyr Lys Leu Glu Asn Leu Ser Ser Ser
130 135 140

Glu Met Gly Tyr Thr Ala Thr Leu Thr Arg Thr Thr Pro Thr Phe Phe
145 150 155 160

Pro Lys Asp Ile Leu Thr Leu Arg Leu Asp Val Met Met Glu Thr Glu
165 170 175

Asn Arg Leu His Phe Thr Ile Lys Asp Pro Ala Asn Arg Arg Tyr Glu
180 185 190

Val Pro Leu Glu Thr Pro His Val His Ser Arg Ala Pro Ser Pro Leu
195 200 205

Tyr Ser Val Glu Phe Ser Glu Glu Pro Phe Gly Val Ile Val Arg Arg
210 215 220

Gln Leu Asp Gly Arg Val Leu Leu Asn Thr Thr Val Ala Pro Leu Phe
225 230 235 240

Phe Ala Asp Gln Phe Leu Gln Leu Ser Thr Ser Leu Pro Ser Gln Tyr
245 250 255

Ile Thr Gly Leu Ala Glu His Leu Ser Pro Leu Met Leu Ser Thr Ser
260 265 270

Trp Thr Arg Ile Thr Leu Trp Asn Arg Asp Leu Ala Pro Thr Pro Gly
275 280 285

Ala Asn Leu Tyr Gly Ser His Pro Phe Tyr Leu Ala Leu Glu Asp Gly
290 295 300

eolf-othd-000002 (1)

Gly Ser Ala His Gly Val Phe Leu Leu Asn Ser Asn Ala Met Asp Val
305 310 315 320

Val Leu Gln Pro Ser Pro Ala Leu Ser Trp Arg Ser Thr Gly Gly Ile
325 330 335

Leu Asp Val Tyr Ile Phe Leu Gly Pro Glu Pro Lys Ser Val Val Gln
340 345 350

Gln Tyr Leu Asp Val Val Gly Tyr Pro Phe Met Pro Pro Tyr Trp Gly
355 360 365

Leu Gly Phe His Leu Cys Arg Trp Gly Tyr Ser Ser Thr Ala Ile Thr
370 375 380

Arg Gln Val Val Glu Asn Met Thr Arg Ala His Phe Pro Leu Asp Val
385 390 395 400

Gln Trp Asn Asp Leu Asp Tyr Met Asp Ser Arg Arg Asp Phe Thr Phe
405 410 415

Asn Lys Asp Gly Phe Arg Asp Phe Pro Ala Met Val Gln Glu Leu His
420 425 430

Gln Gly Gly Arg Arg Tyr Met Met Ile Val Asp Pro Ala Ile Ser Ser
435 440 445

Ser Gly Pro Ala Gly Ser Tyr Arg Pro Tyr Asp Glu Gly Leu Arg Arg
450 455 460

Gly Val Phe Ile Thr Asn Glu Thr Gly Gln Pro Leu Ile Gly Lys Val
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Trp Pro Gly Ser Thr Ala Phe Pro Asp Phe Thr Asn Pro Thr Ala Leu
485 490 495

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Ala Trp Trp Glu Asp Met Val Ala Glu Phe His Asp Gln Val Pro Phe
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Asp Gly Met Trp Ile Asp Met Asn Glu Pro Ser Asn Phe Ile Arg Gly
515 520 525

Ser Glu Asp Gly Cys Pro Asn Asn Glu Leu Glu Asn Pro Pro Tyr Val
530 535 540

Pro Gly Val Val Gly Gly Thr Leu Gln Ala Ala Thr Ile Cys Ala Ser
545 550 555 560

Ser His Gln Phe Leu Ser Thr His Tyr Asn Leu His Asn Leu Tyr Gly
565 570 575

Leu Thr Glu Ala Ile Ala Ser His Arg Ala Leu Val Lys Ala Arg Gly
580 585 590

Thr Arg Pro Phe Val Ile Ser Arg Ser Thr Phe Ala Gly His Gly Arg
595 600 605

Tyr Ala Gly His Trp Thr Gly Asp Val Trp Ser Ser Trp Glu Gln Leu
610 615 620

Ala Ser Ser Val Pro Glu Ile Leu Gln Phe Asn Leu Leu Gly Val Pro
625 630 635 640

Leu Val Gly Ala Asp Val Cys Gly Phe Leu Gly Asn Thr Ser Glu Glu
645 650 655

Leu Cys Val Arg Trp Thr Gln Leu Gly Ala Phe Tyr Pro Phe Met Arg
660 665 670

Asn His Asn Ser Leu Leu Ser Leu Pro Gln Glu Pro Tyr Ser Phe Ser
675 680 685

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Glu Pro Ala Gln Gln Ala Met Arg Lys Ala Leu Thr Leu Arg Tyr Ala
690 695 700

Leu Leu Pro His Leu Tyr Thr Leu Phe His Gln Ala His Val Ala Gly
705 710 715 720

Glu Thr Val Ala Arg Pro Leu Phe Leu Glu Phe Pro Lys Asp Ser Ser
725 730 735

Thr Trp Thr Val Asp His Gln Leu Leu Trp Gly Glu Ala Leu Leu Ile
740 745 750

Thr Pro Val Leu Gln Ala Gly Lys Ala Glu Val Thr Gly Tyr Phe Pro
755 760 765

Leu Gly Thr Trp Tyr Asp Leu Gln Thr Val Pro Val Glu Ala Leu Gly
770 775 780

Ser Leu Pro Pro Pro Pro Ala Ala Pro Arg Glu Pro Ala Ile His Ser
785 790 795 800

Glu Gly Gln Trp Val Thr Leu Pro Ala Pro Leu Asp Thr Ile Asn Val
805 810 815

His Leu Arg Ala Gly Tyr Ile Ile Pro Leu Gln Gly Pro Gly Leu Thr
820 825 830

Thr Thr Glu Ser Arg Gln Gln Pro Met Ala Leu Ala Val Ala Leu Thr
835 840 845

Lys Gly Gly Glu Ala Arg Gly Glu Leu Phe Trp Asp Asp Gly Glu Ser
850 855 860

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

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Arg Asn Asn Thr Ile Val Asn Glu Leu Val Arg Val Thr Ser Glu Gly
 885 890 895

Ala Gly Leu Gln Leu Gln Lys Val Thr Val Leu Gly Val Ala Thr Ala
 900 905 910

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

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 <212> PRT
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<220>
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Cys Leu Val Pro Val Ser Leu Ala
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<210> 6
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<213> artificial

<220>
<223> sp6

<400> 6

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Leu Ser Ser Val Cys Val Ala Leu Gly
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<212> DNA

<213> artificial

<220>

<223> chicken beta-globin intron

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tgggtcacac	tgctgcccc	cctggatacc	atcaacgtgc	acctgagggc	cggctacatc	3600
ataccactgc	agggacctgg	cctgaccacc	accgagtcta	gacagcagcc	aatggccctg	3660
gccgtggccc	tgaccaaaagg	cggagaagct	aggggcgagc	tgttctggga	cgatggcgag	3720
agcctggaag	tgctggaaaag	aggcgcttat	acccaagtga	tcttcctggc	ccggaacaac	3780
accatcgtga	acgagctgggt	gcgcgtgacc	tctgaaggcg	ctggactgca	gctgcagaaa	3840

eolf-othd-000002 (1)

gtgaccgtgc tgggagtggc cacagcccct cagcaggtgc tgtctaattgg cgtgcccgtg 3900
 tccaacttca cctacagccc cgacaccaag gtgctggaca tctgcgtgtc actgctgatg 3960
 ggagagcagt ttctggtgtc ctggtgctga ctcgagagat ctaccggtga attcaccgcg 4020
 ggtttaaact gtgccttcta gttgccagcc atctgttggt tgccccctccc ccgtgccttc 4080
 cttgaccctg gaagggtgcca ctcccactgt cctttcctaa taaaatgagg aaattgcatc 4140
 gcattgtctg agtaggtgtc attctattct ggggggtggg gtgggggcta gctctaga 4198

<210> 27
 <211> 917
 <212> PRT
 <213> artificial

<220>
 <223> hGAA-delta-8

<400> 27

Leu Leu Val Pro Arg Glu Leu Ser Gly Ser Ser Pro Val Leu Glu Glu
 1 5 10 15

Thr His Pro Ala His Gln Gln Gly Ala Ser Arg Pro Gly Pro Arg Asp
 20 25 30

Ala Gln Ala His Pro Gly Arg Pro Arg Ala Val Pro Thr Gln Cys Asp
 35 40 45

Val Pro Pro Asn Ser Arg Phe Asp Cys Ala Pro Asp Lys Ala Ile Thr
 50 55 60

Gln Glu Gln Cys Glu Ala Arg Gly Cys Cys Tyr Ile Pro Ala Lys Gln
 65 70 75 80

Gly Leu Gln Gly Ala Gln Met Gly Gln Pro Trp Cys Phe Phe Pro Pro
 85 90 95

eolf-othd-000002 (1)

Ser Tyr Pro Ser Tyr Lys Leu Glu Asn Leu Ser Ser Ser Glu Met Gly
100 105 110

Tyr Thr Ala Thr Leu Thr Arg Thr Thr Pro Thr Phe Phe Pro Lys Asp
115 120 125

Ile Leu Thr Leu Arg Leu Asp Val Met Met Glu Thr Glu Asn Arg Leu
130 135 140

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

Glu Thr Pro His Val His Ser Arg Ala Pro Ser Pro Leu Tyr Ser Val
165 170 175

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

Gly Arg Val Leu Leu Asn Thr Thr Val Ala Pro Leu Phe Phe Ala Asp
195 200 205

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

Leu Ala Glu His Leu Ser Pro Leu Met Leu Ser Thr Ser Trp Thr Arg
225 230 235 240

Ile Thr Leu Trp Asn Arg Asp Leu Ala Pro Thr Pro Gly Ala Asn Leu
245 250 255

Tyr Gly Ser His Pro Phe Tyr Leu Ala Leu Glu Asp Gly Gly Ser Ala
260 265 270

His Gly Val Phe Leu Leu Asn Ser Asn Ala Met Asp Val Val Leu Gln
275 280 285

eolf-othd-000002 (1)

Pro Ser Pro Ala Leu Ser Trp Arg Ser Thr Gly Gly Ile Leu Asp Val
290 295 300

Tyr Ile Phe Leu Gly Pro Glu Pro Lys Ser Val Val Gln Gln Tyr Leu
305 310 315 320

Asp Val Val Gly Tyr Pro Phe Met Pro Pro Tyr Trp Gly Leu Gly Phe
325 330 335

His Leu Cys Arg Trp Gly Tyr Ser Ser Thr Ala Ile Thr Arg Gln Val
340 345 350

Val Glu Asn Met Thr Arg Ala His Phe Pro Leu Asp Val Gln Trp Asn
355 360 365

Asp Leu Asp Tyr Met Asp Ser Arg Arg Asp Phe Thr Phe Asn Lys Asp
370 375 380

Gly Phe Arg Asp Phe Pro Ala Met Val Gln Glu Leu His Gln Gly Gly
385 390 395 400

Arg Arg Tyr Met Met Ile Val Asp Pro Ala Ile Ser Ser Ser Gly Pro
405 410 415

Ala Gly Ser Tyr Arg Pro Tyr Asp Glu Gly Leu Arg Arg Gly Val Phe
420 425 430

Ile Thr Asn Glu Thr Gly Gln Pro Leu Ile Gly Lys Val Trp Pro Gly
435 440 445

Ser Thr Ala Phe Pro Asp Phe Thr Asn Pro Thr Ala Leu Ala Trp Trp
450 455 460

Glu Asp Met Val Ala Glu Phe His Asp Gln Val Pro Phe Asp Gly Met
465 470 475 480

eolf-othd-000002 (1)

Trp Ile Asp Met Asn Glu Pro Ser Asn Phe Ile Arg Gly Ser Glu Asp
485 490 495

Gly Cys Pro Asn Asn Glu Leu Glu Asn Pro Pro Tyr Val Pro Gly Val
500 505 510

Val Gly Gly Thr Leu Gln Ala Ala Thr Ile Cys Ala Ser Ser His Gln
515 520 525

Phe Leu Ser Thr His Tyr Asn Leu His Asn Leu Tyr Gly Leu Thr Glu
530 535 540

Ala Ile Ala Ser His Arg Ala Leu Val Lys Ala Arg Gly Thr Arg Pro
545 550 555 560

Phe Val Ile Ser Arg Ser Thr Phe Ala Gly His Gly Arg Tyr Ala Gly
565 570 575

His Trp Thr Gly Asp Val Trp Ser Ser Trp Glu Gln Leu Ala Ser Ser
580 585 590

Val Pro Glu Ile Leu Gln Phe Asn Leu Leu Gly Val Pro Leu Val Gly
595 600 605

Ala Asp Val Cys Gly Phe Leu Gly Asn Thr Ser Glu Glu Leu Cys Val
610 615 620

Arg Trp Thr Gln Leu Gly Ala Phe Tyr Pro Phe Met Arg Asn His Asn
625 630 635 640

Ser Leu Leu Ser Leu Pro Gln Glu Pro Tyr Ser Phe Ser Glu Pro Ala
645 650 655

Gln Gln Ala Met Arg Lys Ala Leu Thr Leu Arg Tyr Ala Leu Leu Pro
660 665 670

eolf-othd-000002 (1)

His Leu Tyr Thr Leu Phe His Gln Ala His Val Ala Gly Glu Thr Val
675 680 685

Ala Arg Pro Leu Phe Leu Glu Phe Pro Lys Asp Ser Ser Thr Trp Thr
690 695 700

Val Asp His Gln Leu Leu Trp Gly Glu Ala Leu Leu Ile Thr Pro Val
705 710 715 720

Leu Gln Ala Gly Lys Ala Glu Val Thr Gly Tyr Phe Pro Leu Gly Thr
725 730 735

Trp Tyr Asp Leu Gln Thr Val Pro Val Glu Ala Leu Gly Ser Leu Pro
740 745 750

Pro Pro Pro Ala Ala Pro Arg Glu Pro Ala Ile His Ser Glu Gly Gln
755 760 765

Trp Val Thr Leu Pro Ala Pro Leu Asp Thr Ile Asn Val His Leu Arg
770 775 780

Ala Gly Tyr Ile Ile Pro Leu Gln Gly Pro Gly Leu Thr Thr Thr Glu
785 790 795 800

Ser Arg Gln Gln Pro Met Ala Leu Ala Val Ala Leu Thr Lys Gly Gly
805 810 815

Glu Ala Arg Gly Glu Leu Phe Trp Asp Asp Gly Glu Ser Leu Glu Val
820 825 830

Leu Glu Arg Gly Ala Tyr Thr Gln Val Ile Phe Leu Ala Arg Asn Asn
835 840 845

Thr Ile Val Asn Glu Leu Val Arg Val Thr Ser Glu Gly Ala Gly Leu
850 855 860

eolf-othd-000002 (1)

Gln Leu Gln Lys Val Thr Val Leu Gly Val Ala Thr Ala Pro Gln Gln
865 870 875 880

Val Leu Ser Asn Gly Val Pro Val Ser Asn Phe Thr Tyr Ser Pro Asp
885 890 895

Thr Lys Val Leu Asp Ile Cys Val Ser Leu Leu Met Gly Glu Gln Phe
900 905 910

Leu Val Ser Trp Cys
915

<210> 28

<211> 883

<212> PRT

<213> artificial

<220>

<223> hGAA-delta-42

<400> 28

Ala His Pro Gly Arg Pro Arg Ala Val Pro Thr Gln Cys Asp Val Pro
1 5 10 15

Pro Asn Ser Arg Phe Asp Cys Ala Pro Asp Lys Ala Ile Thr Gln Glu
20 25 30

Gln Cys Glu Ala Arg Gly Cys Cys Tyr Ile Pro Ala Lys Gln Gly Leu
35 40 45

Gln Gly Ala Gln Met Gly Gln Pro Trp Cys Phe Phe Pro Pro Ser Tyr
50 55 60

Pro Ser Tyr Lys Leu Glu Asn Leu Ser Ser Ser Glu Met Gly Tyr Thr
65 70 75 80

Ala Thr Leu Thr Arg Thr Thr Pro Thr Phe Phe Pro Lys Asp Ile Leu
85 90 95

eolf-othd-000002 (1)

Thr Leu Arg Leu Asp Val Met Met Glu Thr Glu Asn Arg Leu His Phe
100 105 110

Thr Ile Lys Asp Pro Ala Asn Arg Arg Tyr Glu Val Pro Leu Glu Thr
115 120 125

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

Ser Glu Glu Pro Phe Gly Val Ile Val Arg Arg Gln Leu Asp Gly Arg
145 150 155 160

Val Leu Leu Asn Thr Thr Val Ala Pro Leu Phe Phe Ala Asp Gln Phe
165 170 175

Leu Gln Leu Ser Thr Ser Leu Pro Ser Gln Tyr Ile Thr Gly Leu Ala
180 185 190

Glu His Leu Ser Pro Leu Met Leu Ser Thr Ser Trp Thr Arg Ile Thr
195 200 205

Leu Trp Asn Arg Asp Leu Ala Pro Thr Pro Gly Ala Asn Leu Tyr Gly
210 215 220

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

Val Phe Leu Leu Asn Ser Asn Ala Met Asp Val Val Leu Gln Pro Ser
245 250 255

Pro Ala Leu Ser Trp Arg Ser Thr Gly Gly Ile Leu Asp Val Tyr Ile
260 265 270

Phe Leu Gly Pro Glu Pro Lys Ser Val Val Gln Gln Tyr Leu Asp Val
275 280 285

eolf-othd-000002 (1)

Val Gly Tyr Pro Phe Met Pro Pro Tyr Trp Gly Leu Gly Phe His Leu
290 295 300

Cys Arg Trp Gly Tyr Ser Ser Thr Ala Ile Thr Arg Gln Val Val Glu
305 310 315 320

Asn Met Thr Arg Ala His Phe Pro Leu Asp Val Gln Trp Asn Asp Leu
325 330 335

Asp Tyr Met Asp Ser Arg Arg Asp Phe Thr Phe Asn Lys Asp Gly Phe
340 345 350

Arg Asp Phe Pro Ala Met Val Gln Glu Leu His Gln Gly Gly Arg Arg
355 360 365

Tyr Met Met Ile Val Asp Pro Ala Ile Ser Ser Ser Gly Pro Ala Gly
370 375 380

Ser Tyr Arg Pro Tyr Asp Glu Gly Leu Arg Arg Gly Val Phe Ile Thr
385 390 395 400

Asn Glu Thr Gly Gln Pro Leu Ile Gly Lys Val Trp Pro Gly Ser Thr
405 410 415

Ala Phe Pro Asp Phe Thr Asn Pro Thr Ala Leu Ala Trp Trp Glu Asp
420 425 430

Met Val Ala Glu Phe His Asp Gln Val Pro Phe Asp Gly Met Trp Ile
435 440 445

Asp Met Asn Glu Pro Ser Asn Phe Ile Arg Gly Ser Glu Asp Gly Cys
450 455 460

Pro Asn Asn Glu Leu Glu Asn Pro Pro Tyr Val Pro Gly Val Val Gly
465 470 475 480

eolf-othd-000002 (1)

Gly Thr Leu Gln Ala Ala Thr Ile Cys Ala Ser Ser His Gln Phe Leu
485 490 495

Ser Thr His Tyr Asn Leu His Asn Leu Tyr Gly Leu Thr Glu Ala Ile
500 505 510

Ala Ser His Arg Ala Leu Val Lys Ala Arg Gly Thr Arg Pro Phe Val
515 520 525

Ile Ser Arg Ser Thr Phe Ala Gly His Gly Arg Tyr Ala Gly His Trp
530 535 540

Thr Gly Asp Val Trp Ser Ser Trp Glu Gln Leu Ala Ser Ser Val Pro
545 550 555 560

Glu Ile Leu Gln Phe Asn Leu Leu Gly Val Pro Leu Val Gly Ala Asp
565 570 575

Val Cys Gly Phe Leu Gly Asn Thr Ser Glu Glu Leu Cys Val Arg Trp
580 585 590

Thr Gln Leu Gly Ala Phe Tyr Pro Phe Met Arg Asn His Asn Ser Leu
595 600 605

Leu Ser Leu Pro Gln Glu Pro Tyr Ser Phe Ser Glu Pro Ala Gln Gln
610 615 620

Ala Met Arg Lys Ala Leu Thr Leu Arg Tyr Ala Leu Leu Pro His Leu
625 630 635 640

Tyr Thr Leu Phe His Gln Ala His Val Ala Gly Glu Thr Val Ala Arg
645 650 655

Pro Leu Phe Leu Glu Phe Pro Lys Asp Ser Ser Thr Trp Thr Val Asp
660 665 670

eolf-othd-000002 (1)

His Gln Leu Leu Trp Gly Glu Ala Leu Leu Ile Thr Pro Val Leu Gln
675 680 685

Ala Gly Lys Ala Glu Val Thr Gly Tyr Phe Pro Leu Gly Thr Trp Tyr
690 695 700

Asp Leu Gln Thr Val Pro Val Glu Ala Leu Gly Ser Leu Pro Pro Pro
705 710 715 720

Pro Ala Ala Pro Arg Glu Pro Ala Ile His Ser Glu Gly Gln Trp Val
725 730 735

Thr Leu Pro Ala Pro Leu Asp Thr Ile Asn Val His Leu Arg Ala Gly
740 745 750

Tyr Ile Ile Pro Leu Gln Gly Pro Gly Leu Thr Thr Thr Glu Ser Arg
755 760 765

Gln Gln Pro Met Ala Leu Ala Val Ala Leu Thr Lys Gly Gly Glu Ala
770 775 780

Arg Gly Glu Leu Phe Trp Asp Asp Gly Glu Ser Leu Glu Val Leu Glu
785 790 795 800

Arg Gly Ala Tyr Thr Gln Val Ile Phe Leu Ala Arg Asn Asn Thr Ile
805 810 815

Val Asn Glu Leu Val Arg Val Thr Ser Glu Gly Ala Gly Leu Gln Leu
820 825 830

Gln Lys Val Thr Val Leu Gly Val Ala Thr Ala Pro Gln Gln Val Leu
835 840 845

Ser Asn Gly Val Pro Val Ser Asn Phe Thr Tyr Ser Pro Asp Thr Lys
850 855 860

eolf-othd-000002 (1)

Val Leu Asp Ile Cys Val Ser Leu Leu Met Gly Glu Gln Phe Leu Val
865 870 875 880

Ser Trp Cys

<210> 29
<211> 952
<212> PRT
<213> homo sapiens

<400> 29

Met Gly Val Arg His Pro Pro Cys Ser His Arg Leu Leu Ala Val Cys
1 5 10 15

Ala Leu Val Ser Leu Ala Thr Ala Ala Leu Leu Gly His Ile Leu Leu
20 25 30

His Asp Phe Leu Leu Val Pro Arg Glu Leu Ser Gly Ser Ser Pro Val
35 40 45

Leu Glu Glu Thr His Pro Ala His Gln Gln Gly Ala Ser Arg Pro Gly
50 55 60

Pro Arg Asp Ala Gln Ala His Pro Gly Arg Pro Arg Ala Val Pro Thr
65 70 75 80

Gln Cys Asp Val Pro Pro Asn Ser Arg Phe Asp Cys Ala Pro Asp Lys
85 90 95

Ala Ile Thr Gln Glu Gln Cys Glu Ala Arg Gly Cys Cys Tyr Ile Pro
100 105 110

Ala Lys Gln Gly Leu Gln Gly Ala Gln Met Gly Gln Pro Trp Cys Phe
115 120 125

eolf-othd-000002 (1)

Phe Pro Pro Ser Tyr Pro Ser Tyr Lys Leu Glu Asn Leu Ser Ser Ser
130 135 140

Glu Met Gly Tyr Thr Ala Thr Leu Thr Arg Thr Thr Pro Thr Phe Phe
145 150 155 160

Pro Lys Asp Ile Leu Thr Leu Arg Leu Asp Val Met Met Glu Thr Glu
165 170 175

Asn Arg Leu His Phe Thr Ile Lys Asp Pro Ala Asn Arg Arg Tyr Glu
180 185 190

Val Pro Leu Glu Thr Pro His Val His Ser Arg Ala Pro Ser Pro Leu
195 200 205

Tyr Ser Val Glu Phe Ser Glu Glu Pro Phe Gly Val Ile Val Arg Arg
210 215 220

Gln Leu Asp Gly Arg Val Leu Leu Asn Thr Thr Val Ala Pro Leu Phe
225 230 235 240

Phe Ala Asp Gln Phe Leu Gln Leu Ser Thr Ser Leu Pro Ser Gln Tyr
245 250 255

Ile Thr Gly Leu Ala Glu His Leu Ser Pro Leu Met Leu Ser Thr Ser
260 265 270

Trp Thr Arg Ile Thr Leu Trp Asn Arg Asp Leu Ala Pro Thr Pro Gly
275 280 285

Ala Asn Leu Tyr Gly Ser His Pro Phe Tyr Leu Ala Leu Glu Asp Gly
290 295 300

Gly Ser Ala His Gly Val Phe Leu Leu Asn Ser Asn Ala Met Asp Val
305 310 315 320

eolf-othd-000002 (1)

Val Leu Gln Pro Ser Pro Ala Leu Ser Trp Arg Ser Thr Gly Gly Ile
325 330 335

Leu Asp Val Tyr Ile Phe Leu Gly Pro Glu Pro Lys Ser Val Val Gln
340 345 350

Gln Tyr Leu Asp Val Val Gly Tyr Pro Phe Met Pro Pro Tyr Trp Gly
355 360 365

Leu Gly Phe His Leu Cys Arg Trp Gly Tyr Ser Ser Thr Ala Ile Thr
370 375 380

Arg Gln Val Val Glu Asn Met Thr Arg Ala His Phe Pro Leu Asp Val
385 390 395 400

Gln Trp Asn Asp Leu Asp Tyr Met Asp Ser Arg Arg Asp Phe Thr Phe
405 410 415

Asn Lys Asp Gly Phe Arg Asp Phe Pro Ala Met Val Gln Glu Leu His
420 425 430

Gln Gly Gly Arg Arg Tyr Met Met Ile Val Asp Pro Ala Ile Ser Ser
435 440 445

Ser Gly Pro Ala Gly Ser Tyr Arg Pro Tyr Asp Glu Gly Leu Arg Arg
450 455 460

Gly Val Phe Ile Thr Asn Glu Thr Gly Gln Pro Leu Ile Gly Lys Val
465 470 475 480

Trp Pro Gly Ser Thr Ala Phe Pro Asp Phe Thr Asn Pro Thr Ala Leu
485 490 495

Ala Trp Trp Glu Asp Met Val Ala Glu Phe His Asp Gln Val Pro Phe
500 505 510

eolf-othd-000002 (1)

Asp Gly Met Trp Ile Asp Met Asn Glu Pro Ser Asn Phe Ile Arg Gly
515 520 525

Ser Glu Asp Gly Cys Pro Asn Asn Glu Leu Glu Asn Pro Pro Tyr Val
530 535 540

Pro Gly Val Val Gly Gly Thr Leu Gln Ala Ala Thr Ile Cys Ala Ser
545 550 555 560

Ser His Gln Phe Leu Ser Thr His Tyr Asn Leu His Asn Leu Tyr Gly
565 570 575

Leu Thr Glu Ala Ile Ala Ser His Arg Ala Leu Val Lys Ala Arg Gly
580 585 590

Thr Arg Pro Phe Val Ile Ser Arg Ser Thr Phe Ala Gly His Gly Arg
595 600 605

Tyr Ala Gly His Trp Thr Gly Asp Val Trp Ser Ser Trp Glu Gln Leu
610 615 620

Ala Ser Ser Val Pro Glu Ile Leu Gln Phe Asn Leu Leu Gly Val Pro
625 630 635 640

Leu Val Gly Ala Asp Val Cys Gly Phe Leu Gly Asn Thr Ser Glu Glu
645 650 655

Leu Cys Val Arg Trp Thr Gln Leu Gly Ala Phe Tyr Pro Phe Met Arg
660 665 670

Asn His Asn Ser Leu Leu Ser Leu Pro Gln Glu Pro Tyr Ser Phe Ser
675 680 685

Glu Pro Ala Gln Gln Ala Met Arg Lys Ala Leu Thr Leu Arg Tyr Ala
690 695 700

eolf-othd-000002 (1)

Leu Leu Pro His Leu Tyr Thr Leu Phe His Gln Ala His Val Ala Gly
705 710 715 720

Glu Thr Val Ala Arg Pro Leu Phe Leu Glu Phe Pro Lys Asp Ser Ser
725 730 735

Thr Trp Thr Val Asp His Gln Leu Leu Trp Gly Glu Ala Leu Leu Ile
740 745 750

Thr Pro Val Leu Gln Ala Gly Lys Ala Glu Val Thr Gly Tyr Phe Pro
755 760 765

Leu Gly Thr Trp Tyr Asp Leu Gln Thr Val Pro Ile Glu Ala Leu Gly
770 775 780

Ser Leu Pro Pro Pro Pro Ala Ala Pro Arg Glu Pro Ala Ile His Ser
785 790 795 800

Glu Gly Gln Trp Val Thr Leu Pro Ala Pro Leu Asp Thr Ile Asn Val
805 810 815

His Leu Arg Ala Gly Tyr Ile Ile Pro Leu Gln Gly Pro Gly Leu Thr
820 825 830

Thr Thr Glu Ser Arg Gln Gln Pro Met Ala Leu Ala Val Ala Leu Thr
835 840 845

Lys Gly Gly Glu Ala Arg Gly Glu Leu Phe Trp Asp Asp Gly Glu Ser
850 855 860

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

Arg Asn Asn Thr Ile Val Asn Glu Leu Val Arg Val Thr Ser Glu Gly
885 890 895

eolf-othd-000002 (1)

Ala Gly Leu Gln Leu Gln Lys Val Thr Val Leu Gly Val Ala Thr Ala
900 905 910

Pro Gln Gln Val Leu Ser Asn Gly Val Pro Val Ser Asn Phe Thr Tyr
915 920 925

Ser Pro Asp Thr Lys Val Leu Asp Ile Cys Val Ser Leu Leu Met Gly
930 935 940

Glu Gln Phe Leu Val Ser Trp Cys
945 950

<210> 30
<211> 952
<212> PRT
<213> homo sapiens

<400> 30

Met Gly Val Arg His Pro Pro Cys Ser His Arg Leu Leu Ala Val Cys
1 5 10 15

Ala Leu Val Ser Leu Ala Thr Ala Ala Leu Leu Gly His Ile Leu Leu
20 25 30

His Asp Phe Leu Leu Val Pro Arg Glu Leu Ser Gly Ser Ser Pro Val
35 40 45

Leu Glu Glu Thr His Pro Ala His Gln Gln Gly Ala Ser Arg Pro Gly
50 55 60

Pro Arg Asp Ala Gln Ala His Pro Gly Arg Pro Arg Ala Val Pro Thr
65 70 75 80

Gln Cys Asp Val Pro Pro Asn Ser Arg Phe Asp Cys Ala Pro Asp Lys
85 90 95

eolf-othd-000002 (1)

Ala Ile Thr Gln Glu Gln Cys Glu Ala Arg Gly Cys Cys Tyr Ile Pro
100 105 110

Ala Lys Gln Gly Leu Gln Gly Ala Gln Met Gly Gln Pro Trp Cys Phe
115 120 125

Phe Pro Pro Ser Tyr Pro Ser Tyr Lys Leu Glu Asn Leu Ser Ser Ser
130 135 140

Glu Met Gly Tyr Thr Ala Thr Leu Thr Arg Thr Thr Pro Thr Phe Phe
145 150 155 160

Pro Lys Asp Ile Leu Thr Leu Arg Leu Asp Val Met Met Glu Thr Glu
165 170 175

Asn Arg Leu His Phe Thr Ile Lys Asp Pro Ala Asn Arg Arg Tyr Glu
180 185 190

Val Pro Leu Glu Thr Pro Arg Val His Ser Arg Ala Pro Ser Pro Leu
195 200 205

Tyr Ser Val Glu Phe Ser Glu Glu Pro Phe Gly Val Ile Val His Arg
210 215 220

Gln Leu Asp Gly Arg Val Leu Leu Asn Thr Thr Val Ala Pro Leu Phe
225 230 235 240

Phe Ala Asp Gln Phe Leu Gln Leu Ser Thr Ser Leu Pro Ser Gln Tyr
245 250 255

Ile Thr Gly Leu Ala Glu His Leu Ser Pro Leu Met Leu Ser Thr Ser
260 265 270

Trp Thr Arg Ile Thr Leu Trp Asn Arg Asp Leu Ala Pro Thr Pro Gly
275 280 285

eolf-othd-000002 (1)

Ala Asn Leu Tyr Gly Ser His Pro Phe Tyr Leu Ala Leu Glu Asp Gly
290 295 300

Gly Ser Ala His Gly Val Phe Leu Leu Asn Ser Asn Ala Met Asp Val
305 310 315 320

Val Leu Gln Pro Ser Pro Ala Leu Ser Trp Arg Ser Thr Gly Gly Ile
325 330 335

Leu Asp Val Tyr Ile Phe Leu Gly Pro Glu Pro Lys Ser Val Val Gln
340 345 350

Gln Tyr Leu Asp Val Val Gly Tyr Pro Phe Met Pro Pro Tyr Trp Gly
355 360 365

Leu Gly Phe His Leu Cys Arg Trp Gly Tyr Ser Ser Thr Ala Ile Thr
370 375 380

Arg Gln Val Val Glu Asn Met Thr Arg Ala His Phe Pro Leu Asp Val
385 390 395 400

Gln Trp Asn Asp Leu Asp Tyr Met Asp Ser Arg Arg Asp Phe Thr Phe
405 410 415

Asn Lys Asp Gly Phe Arg Asp Phe Pro Ala Met Val Gln Glu Leu His
420 425 430

Gln Gly Gly Arg Arg Tyr Met Met Ile Val Asp Pro Ala Ile Ser Ser
435 440 445

Ser Gly Pro Ala Gly Ser Tyr Arg Pro Tyr Asp Glu Gly Leu Arg Arg
450 455 460

Gly Val Phe Ile Thr Asn Glu Thr Gly Gln Pro Leu Ile Gly Lys Val
465 470 475 480

eolf-othd-000002 (1)

Trp Pro Gly Ser Thr Ala Phe Pro Asp Phe Thr Asn Pro Thr Ala Leu
485 490 495

Ala Trp Trp Glu Asp Met Val Ala Glu Phe His Asp Gln Val Pro Phe
500 505 510

Asp Gly Met Trp Ile Asp Met Asn Glu Pro Ser Asn Phe Ile Arg Gly
515 520 525

Ser Glu Asp Gly Cys Pro Asn Asn Glu Leu Glu Asn Pro Pro Tyr Val
530 535 540

Pro Gly Val Val Gly Gly Thr Leu Gln Ala Ala Thr Ile Cys Ala Ser
545 550 555 560

Ser His Gln Phe Leu Ser Thr His Tyr Asn Leu His Asn Leu Tyr Gly
565 570 575

Leu Thr Glu Ala Ile Ala Ser His Arg Ala Leu Val Lys Ala Arg Gly
580 585 590

Thr Arg Pro Phe Val Ile Ser Arg Ser Thr Phe Ala Gly His Gly Arg
595 600 605

Tyr Ala Gly His Trp Thr Gly Asp Val Trp Ser Ser Trp Glu Gln Leu
610 615 620

Ala Ser Ser Val Pro Glu Ile Leu Gln Phe Asn Leu Leu Gly Val Pro
625 630 635 640

Leu Val Gly Ala Asp Val Cys Gly Phe Leu Gly Asn Thr Ser Glu Glu
645 650 655

Leu Cys Val Arg Trp Thr Gln Leu Gly Ala Phe Tyr Pro Phe Met Arg
660 665 670

eolf-othd-000002 (1)

Asn His Asn Ser Leu Leu Ser Leu Pro Gln Glu Pro Tyr Ser Phe Ser
675 680 685

Glu Pro Ala Gln Gln Ala Met Arg Lys Ala Leu Thr Leu Arg Tyr Ala
690 695 700

Leu Leu Pro His Leu Tyr Thr Leu Phe His Gln Ala His Val Ala Gly
705 710 715 720

Glu Thr Val Ala Arg Pro Leu Phe Leu Glu Phe Pro Lys Asp Ser Ser
725 730 735

Thr Trp Thr Val Asp His Gln Leu Leu Trp Gly Glu Ala Leu Leu Ile
740 745 750

Thr Pro Val Leu Gln Ala Gly Lys Ala Glu Val Thr Gly Tyr Phe Pro
755 760 765

Leu Gly Thr Trp Tyr Asp Leu Gln Thr Val Pro Ile Glu Ala Leu Gly
770 775 780

Ser Leu Pro Pro Pro Pro Ala Ala Pro Arg Glu Pro Ala Ile His Ser
785 790 795 800

Glu Gly Gln Trp Val Thr Leu Pro Ala Pro Leu Asp Thr Ile Asn Val
805 810 815

His Leu Arg Ala Gly Tyr Ile Ile Pro Leu Gln Gly Pro Gly Leu Thr
820 825 830

Thr Thr Glu Ser Arg Gln Gln Pro Met Ala Leu Ala Val Ala Leu Thr
835 840 845

Lys Gly Gly Glu Ala Arg Gly Glu Leu Phe Trp Asp Asp Gly Glu Ser
850 855 860

eolf-othd-000002 (1)

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

Arg Asn Asn Thr Ile Val Asn Glu Leu Val Arg Val Thr Ser Glu Gly
885 890 895

Ala Gly Leu Gln Leu Gln Lys Val Thr Val Leu Gly Val Ala Thr Ala
900 905 910

Pro Gln Gln Val Leu Ser Asn Gly Val Pro Val Ser Asn Phe Thr Tyr
915 920 925

Ser Pro Asp Thr Lys Val Leu Asp Ile Cys Val Ser Leu Leu Met Gly
930 935 940

Glu Gln Phe Leu Val Ser Trp Cys
945 950

<210> 31
<211> 957
<212> PRT
<213> homo sapiens

<400> 31

Met Gly Val Arg His Pro Pro Cys Ser His Arg Leu Leu Ala Val Cys
1 5 10 15

Ala Leu Val Ser Leu Ala Thr Ala Ala Leu Leu Gly His Ile Leu Leu
20 25 30

His Asp Phe Leu Leu Val Pro Arg Glu Leu Ser Gly Ser Ser Pro Val
35 40 45

Leu Glu Glu Thr His Pro Ala His Gln Gln Gly Ala Ser Arg Pro Gly
50 55 60

Pro Arg Asp Ala Gln Ala His Pro Gly Arg Pro Arg Ala Val Pro Thr

eolf-othd-000002 (1)

65		70		75		80
Gln	Cys	Asp	Val	Pro	Pro	Asn
			85			90
						95
Ala	Ile	Thr	Gln	Glu	Gln	Cys
			100			105
						110
Ala	Lys	Gln	Gly	Leu	Gln	Gly
			115			120
						125
Phe	Pro	Pro	Ser	Tyr	Pro	Ser
						130
						135
						140
Glu	Met	Gly	Tyr	Thr	Ala	Thr
						145
						150
						155
						160
Pro	Lys	Asp	Ile	Leu	Thr	Leu
						165
						170
						175
Asn	Arg	Leu	His	Phe	Thr	Ile
						180
						185
						190
Val	Pro	Leu	Glu	Thr	Pro	His
						195
						200
						205
Tyr	Ser	Val	Glu	Phe	Ser	Glu
						210
						215
						220
Gln	Leu	Asp	Gly	Arg	Val	Leu
						225
						230
						235
						240
Phe	Ala	Asp	Gln	Phe	Leu	Gln
						245
						250
						255
Ile	Thr	Gly	Leu	Ala	Glu	His

260

265

270

Trp Thr Arg Ile Thr Leu Trp Asn Arg Asp Leu Ala Pro Thr Pro Gly
 275 280 285

Ala Asn Leu Tyr Gly Ser His Pro Phe Tyr Leu Ala Leu Glu Asp Gly
 290 295 300

Gly Ser Ala His Gly Val Phe Leu Leu Asn Ser Asn Ala Met Asp Val
 305 310 315 320

Val Leu Gln Pro Ser Pro Ala Leu Ser Trp Arg Ser Thr Gly Gly Ile
 325 330 335

Leu Asp Val Tyr Ile Phe Leu Gly Pro Glu Pro Lys Ser Val Val Gln
 340 345 350

Gln Tyr Leu Asp Val Val Gly Tyr Pro Phe Met Pro Pro Tyr Trp Gly
 355 360 365

Leu Gly Phe His Leu Cys Arg Trp Gly Tyr Ser Ser Thr Ala Ile Thr
 370 375 380

Arg Gln Val Val Glu Asn Met Thr Arg Ala His Phe Pro Leu Asp Val
 385 390 395 400

Gln Trp Asn Asp Leu Asp Tyr Met Asp Ser Arg Arg Asp Phe Thr Phe
 405 410 415

Asn Lys Asp Gly Phe Arg Asp Phe Pro Ala Met Val Gln Glu Leu His
 420 425 430

Gln Gly Gly Arg Arg Tyr Met Met Ile Val Asp Pro Ala Ile Ser Ser
 435 440 445

Ser Gly Pro Ala Gly Ser Tyr Arg Pro Tyr Asp Glu Gly Leu Arg Arg

eolf-othd-000002 (1)

450

455

460

Gly Val Phe Ile Thr Asn Glu Thr Gly Gln Pro Leu Ile Gly Lys Val
465 470 475 480

Trp Pro Gly Ser Thr Ala Phe Pro Asp Phe Thr Asn Pro Thr Ala Leu
485 490 495

Ala Trp Trp Glu Asp Met Val Ala Glu Phe His Asp Gln Val Pro Phe
500 505 510

Asp Gly Met Trp Ile Asp Met Asn Glu Pro Ser Asn Phe Ile Arg Gly
515 520 525

Ser Glu Asp Gly Cys Pro Asn Asn Glu Leu Glu Asn Pro Pro Tyr Val
530 535 540

Pro Gly Val Val Gly Gly Thr Leu Gln Ala Ala Thr Ile Cys Ala Ser
545 550 555 560

Ser His Gln Phe Leu Ser Thr His Tyr Asn Leu His Asn Leu Tyr Gly
565 570 575

Leu Thr Glu Ala Ile Ala Ser His Arg Ala Leu Val Lys Ala Arg Gly
580 585 590

Thr Arg Pro Phe Val Ile Ser Arg Ser Thr Phe Ala Gly His Gly Arg
595 600 605

Tyr Ala Gly His Trp Thr Gly Asp Val Trp Ser Ser Trp Glu Gln Leu
610 615 620

Ala Ser Ser Val Pro Glu Ile Leu Gln Phe Asn Leu Leu Gly Val Pro
625 630 635 640

Leu Val Gly Ala Asp Val Cys Gly Phe Leu Gly Asn Thr Ser Glu Glu

eolf-othd-000002 (1)

645

650

655

Leu Cys Val Arg Trp Thr Gln Leu Gly Ala Phe Tyr Pro Phe Met Arg
 660 665 670

Asn His Asn Ser Leu Leu Ser Leu Pro Gln Glu Pro Tyr Ser Phe Ser
 675 680 685

Glu Pro Ala Gln Gln Ala Met Arg Lys Ala Leu Thr Leu Arg Tyr Ala
 690 695 700

Leu Leu Pro His Leu Tyr Thr Leu Phe His Gln Ala His Val Ala Gly
 705 710 715 720

Glu Thr Val Ala Arg Pro Leu Phe Leu Glu Phe Pro Lys Asp Ser Ser
 725 730 735

Thr Trp Thr Val Asp His Gln Leu Leu Trp Gly Glu Ala Leu Leu Ile
 740 745 750

Thr Pro Val Leu Gln Ala Gly Lys Ala Glu Val Thr Gly Tyr Phe Pro
 755 760 765

Leu Gly Thr Trp Tyr Asp Leu Gln Thr Val Pro Ile Glu Ala Leu Gly
 770 775 780

Ser Leu Pro Pro Pro Pro Ala Ala Pro Arg Glu Pro Ala Ile His Ser
 785 790 795 800

Glu Gly Gln Trp Val Thr Leu Pro Ala Pro Leu Asp Thr Ile Asn Val
 805 810 815

His Leu Arg Ala Gly Tyr Ile Ile Pro Leu Gln Gly Pro Gly Leu Thr
 820 825 830

Thr Thr Glu Ser Arg Gln Gln Pro Met Ala Leu Ala Val Ala Leu Thr

eolf-othd-000002 (1)

835

840

845

Lys Gly Gly Glu Ala Arg Gly Glu Leu Phe Trp Asp Asp Gly Glu Ser
850 855 860

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

Arg Asn Asn Thr Ile Val Asn Glu Leu Val Arg Val Thr Ser Glu Gly
885 890 895

Ala Gly Leu Gln Leu Gln Lys Val Thr Val Leu Gly Val Ala Thr Ala
900 905 910

Pro Gln Gln Val Leu Ser Asn Gly Val Pro Val Ser Asn Phe Thr Tyr
915 920 925

Ser Pro Asp Thr Lys Ala Arg Gly Pro Arg Val Leu Asp Ile Cys Val
930 935 940

Ser Leu Leu Met Gly Glu Gln Phe Leu Val Ser Trp Cys
945 950 955

<210> 32
<211> 952
<212> PRT
<213> homo sapiens

<400> 32

Met Gly Val Arg His Pro Pro Cys Ser His Arg Leu Leu Ala Val Cys
1 5 10 15

Ala Leu Val Ser Leu Ala Thr Ala Ala Leu Leu Gly His Ile Leu Leu
20 25 30

His Asp Phe Leu Leu Val Pro Arg Glu Leu Ser Gly Ser Ser Pro Val
35 40 45

eolf-othd-000002 (1)

Leu Glu Glu Thr His Pro Ala His Gln Gln Gly Ala Ser Arg Pro Gly
50 55 60

Pro Arg Asp Ala Gln Ala His Pro Gly Arg Pro Arg Ala Val Pro Thr
65 70 75 80

Gln Cys Asp Val Pro Pro Asn Ser Arg Phe Asp Cys Ala Pro Asp Lys
85 90 95

Ala Ile Thr Gln Glu Gln Cys Glu Ala Arg Gly Cys Cys Tyr Ile Pro
100 105 110

Ala Lys Gln Gly Leu Gln Gly Ala Gln Met Gly Gln Pro Trp Cys Phe
115 120 125

Phe Pro Pro Ser Tyr Pro Ser Tyr Lys Leu Glu Asn Leu Ser Ser Ser
130 135 140

Glu Met Gly Tyr Thr Ala Thr Leu Thr Arg Thr Thr Pro Thr Phe Phe
145 150 155 160

Pro Lys Asp Ile Leu Thr Leu Arg Leu Asp Val Met Met Glu Thr Glu
165 170 175

Asn Arg Leu His Phe Thr Ile Lys Asp Pro Ala Asn Arg Arg Tyr Glu
180 185 190

Val Pro Leu Glu Thr Pro Arg Val His Ser Arg Ala Pro Ser Pro Leu
195 200 205

Tyr Ser Val Glu Phe Ser Glu Glu Pro Phe Gly Val Ile Val His Arg
210 215 220

Gln Leu Asp Gly Arg Val Leu Leu Asn Thr Thr Val Ala Pro Leu Phe
225 230 235 240

eolf-othd-000002 (1)

Phe Ala Asp Gln Phe Leu Gln Leu Ser Thr Ser Leu Pro Ser Gln Tyr
245 250 255

Ile Thr Gly Leu Ala Glu His Leu Ser Pro Leu Met Leu Ser Thr Ser
260 265 270

Trp Thr Arg Ile Thr Leu Trp Asn Arg Asp Leu Ala Pro Thr Pro Gly
275 280 285

Ala Asn Leu Tyr Gly Ser His Pro Phe Tyr Leu Ala Leu Glu Asp Gly
290 295 300

Gly Ser Ala His Gly Val Phe Leu Leu Asn Ser Asn Ala Met Asp Val
305 310 315 320

Val Leu Gln Pro Ser Pro Ala Leu Ser Trp Arg Ser Thr Gly Gly Ile
325 330 335

Leu Asp Val Tyr Ile Phe Leu Gly Pro Glu Pro Lys Ser Val Val Gln
340 345 350

Gln Tyr Leu Asp Val Val Gly Tyr Pro Phe Met Pro Pro Tyr Trp Gly
355 360 365

Leu Gly Phe His Leu Cys Arg Trp Gly Tyr Ser Ser Thr Ala Ile Thr
370 375 380

Arg Gln Val Val Glu Asn Met Thr Arg Ala His Phe Pro Leu Asp Val
385 390 395 400

Gln Trp Asn Asp Leu Asp Tyr Met Asp Ser Arg Arg Asp Phe Thr Phe
405 410 415

Asn Lys Asp Gly Phe Arg Asp Phe Pro Ala Met Val Gln Glu Leu His
420 425 430

eolf-othd-000002 (1)

Gln Gly Gly Arg Arg Tyr Met Met Ile Val Asp Pro Ala Ile Ser Ser
435 440 445

Ser Gly Pro Ala Gly Ser Tyr Arg Leu Tyr Asp Glu Gly Leu Arg Arg
450 455 460

Gly Val Phe Ile Thr Asn Glu Thr Gly Gln Pro Leu Ile Gly Lys Val
465 470 475 480

Trp Pro Gly Ser Thr Ala Phe Pro Asp Phe Thr Asn Pro Thr Ala Leu
485 490 495

Ala Trp Trp Glu Asp Met Val Ala Glu Phe His Asp Gln Val Pro Phe
500 505 510

Asp Gly Met Trp Ile Asp Met Asn Glu Pro Ser Asn Phe Ile Arg Gly
515 520 525

Ser Glu Asp Gly Cys Pro Asn Asn Glu Leu Glu Asn Pro Pro Tyr Val
530 535 540

Pro Gly Val Val Gly Gly Thr Leu Gln Ala Ala Thr Ile Cys Ala Ser
545 550 555 560

Ser His Gln Phe Leu Ser Thr His Tyr Asn Leu His Asn Leu Tyr Gly
565 570 575

Leu Thr Glu Ala Ile Ala Ser His Arg Ala Leu Val Lys Ala Arg Gly
580 585 590

Thr Arg Pro Phe Val Ile Ser Arg Ser Thr Phe Ala Gly His Gly Arg
595 600 605

Tyr Ala Gly His Trp Thr Gly Asp Val Trp Ser Ser Trp Glu Gln Leu
610 615 620

eolf-othd-000002 (1)

Ala Ser Ser Val Pro Glu Ile Leu Gln Phe Asn Leu Leu Gly Val Pro
625 630 635 640

Leu Val Gly Ala Asp Val Cys Gly Phe Leu Gly Asn Thr Ser Glu Glu
645 650 655

Leu Cys Val Arg Trp Thr Gln Leu Gly Ala Phe Tyr Pro Phe Met Arg
660 665 670

Asn His Asn Ser Leu Leu Ser Leu Pro Gln Glu Pro Tyr Ser Phe Ser
675 680 685

Glu Pro Ala Gln Gln Ala Met Arg Lys Ala Leu Thr Leu Arg Tyr Ala
690 695 700

Leu Leu Pro His Leu Tyr Thr Leu Phe His Gln Ala His Val Ala Gly
705 710 715 720

Glu Thr Val Ala Arg Pro Leu Phe Leu Glu Phe Pro Lys Asp Ser Ser
725 730 735

Thr Trp Thr Val Asp His Gln Leu Leu Trp Gly Glu Ala Leu Leu Ile
740 745 750

Thr Pro Val Leu Gln Ala Gly Lys Ala Glu Val Thr Gly Tyr Phe Pro
755 760 765

Leu Gly Thr Trp Tyr Asp Leu Gln Thr Val Pro Ile Glu Ala Leu Gly
770 775 780

Ser Leu Pro Pro Pro Pro Ala Ala Pro Arg Glu Pro Ala Ile His Ser
785 790 795 800

Glu Gly Gln Trp Val Thr Leu Pro Ala Pro Leu Asp Thr Ile Asn Val
805 810 815

eolf-othd-000002 (1)

His Leu Arg Ala Gly Tyr Ile Ile Pro Leu Gln Gly Pro Gly Leu Thr
820 825 830

Thr Thr Glu Ser Arg Gln Gln Pro Met Ala Leu Ala Val Ala Leu Thr
835 840 845

Lys Gly Gly Glu Ala Arg Gly Glu Leu Phe Trp Asp Asp Gly Glu Ser
850 855 860

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

Arg Asn Asn Thr Ile Val Asn Glu Leu Val Arg Val Thr Ser Glu Gly
885 890 895

Ala Gly Leu Gln Leu Gln Lys Val Thr Val Leu Gly Val Ala Thr Ala
900 905 910

Pro Gln Gln Val Leu Ser Asn Gly Val Pro Val Ser Asn Phe Thr Tyr
915 920 925

Ser Pro Asp Thr Lys Val Leu Asp Ile Cys Val Ser Leu Leu Met Gly
930 935 940

Glu Gln Phe Leu Val Ser Trp Cys
945 950

<210> 33
<211> 925
<212> PRT
<213> artificial

<220>
<223> variant hGAAwt w/o sp

<400> 33

eolf-othd-000002 (1)

Gly His Ile Leu Leu His Asp Phe Leu Leu Val Pro Arg Glu Leu Ser
1 5 10 15

Gly Ser Ser Pro Val Leu Glu Glu Thr His Pro Ala His Gln Gln Gly
20 25 30

Ala Ser Arg Pro Gly Pro Arg Asp Ala Gln Ala His Pro Gly Arg Pro
35 40 45

Arg Ala Val Pro Thr Gln Cys Asp Val Pro Pro Asn Ser Arg Phe Asp
50 55 60

Cys Ala Pro Asp Lys Ala Ile Thr Gln Glu Gln Cys Glu Ala Arg Gly
65 70 75 80

Cys Cys Tyr Ile Pro Ala Lys Gln Gly Leu Gln Gly Ala Gln Met Gly
85 90 95

Gln Pro Trp Cys Phe Phe Pro Pro Ser Tyr Pro Ser Tyr Lys Leu Glu
100 105 110

Asn Leu Ser Ser Ser Glu Met Gly Tyr Thr Ala Thr Leu Thr Arg Thr
115 120 125

Thr Pro Thr Phe Phe Pro Lys Asp Ile Leu Thr Leu Arg Leu Asp Val
130 135 140

Met Met Glu Thr Glu Asn Arg Leu His Phe Thr Ile Lys Asp Pro Ala
145 150 155 160

Asn Arg Arg Tyr Glu Val Pro Leu Glu Thr Pro Arg Val His Ser Arg
165 170 175

Ala Pro Ser Pro Leu Tyr Ser Val Glu Phe Ser Glu Glu Pro Phe Gly
180 185 190

eolf-othd-000002 (1)

Val Ile Val His Arg Gln Leu Asp Gly Arg Val Leu Leu Asn Thr Thr
195 200 205

Val Ala Pro Leu Phe Phe Ala Asp Gln Phe Leu Gln Leu Ser Thr Ser
210 215 220

Leu Pro Ser Gln Tyr Ile Thr Gly Leu Ala Glu His Leu Ser Pro Leu
225 230 235 240

Met Leu Ser Thr Ser Trp Thr Arg Ile Thr Leu Trp Asn Arg Asp Leu
245 250 255

Ala Pro Thr Pro Gly Ala Asn Leu Tyr Gly Ser His Pro Phe Tyr Leu
260 265 270

Ala Leu Glu Asp Gly Gly Ser Ala His Gly Val Phe Leu Leu Asn Ser
275 280 285

Asn Ala Met Asp Val Val Leu Gln Pro Ser Pro Ala Leu Ser Trp Arg
290 295 300

Ser Thr Gly Gly Ile Leu Asp Val Tyr Ile Phe Leu Gly Pro Glu Pro
305 310 315 320

Lys Ser Val Val Gln Gln Tyr Leu Asp Val Val Gly Tyr Pro Phe Met
325 330 335

Pro Pro Tyr Trp Gly Leu Gly Phe His Leu Cys Arg Trp Gly Tyr Ser
340 345 350

Ser Thr Ala Ile Thr Arg Gln Val Val Glu Asn Met Thr Arg Ala His
355 360 365

Phe Pro Leu Asp Val Gln Trp Asn Asp Leu Asp Tyr Met Asp Ser Arg
370 375 380

eolf-othd-000002 (1)

Arg Asp Phe Thr Phe Asn Lys Asp Gly Phe Arg Asp Phe Pro Ala Met
385 390 395 400

Val Gln Glu Leu His Gln Gly Gly Arg Arg Tyr Met Met Ile Val Asp
405 410 415

Pro Ala Ile Ser Ser Ser Gly Pro Ala Gly Ser Tyr Arg Pro Tyr Asp
420 425 430

Glu Gly Leu Arg Arg Gly Val Phe Ile Thr Asn Glu Thr Gly Gln Pro
435 440 445

Leu Ile Gly Lys Val Trp Pro Gly Ser Thr Ala Phe Pro Asp Phe Thr
450 455 460

Asn Pro Thr Ala Leu Ala Trp Trp Glu Asp Met Val Ala Glu Phe His
465 470 475 480

Asp Gln Val Pro Phe Asp Gly Met Trp Ile Asp Met Asn Glu Pro Ser
485 490 495

Asn Phe Ile Arg Gly Ser Glu Asp Gly Cys Pro Asn Asn Glu Leu Glu
500 505 510

Asn Pro Pro Tyr Val Pro Gly Val Val Gly Gly Thr Leu Gln Ala Ala
515 520 525

Thr Ile Cys Ala Ser Ser His Gln Phe Leu Ser Thr His Tyr Asn Leu
530 535 540

His Asn Leu Tyr Gly Leu Thr Glu Ala Ile Ala Ser His Arg Ala Leu
545 550 555 560

Val Lys Ala Arg Gly Thr Arg Pro Phe Val Ile Ser Arg Ser Thr Phe
565 570 575

eolf-othd-000002 (1)

Ala Gly His Gly Arg Tyr Ala Gly His Trp Thr Gly Asp Val Trp Ser
580 585 590

Ser Trp Glu Gln Leu Ala Ser Ser Val Pro Glu Ile Leu Gln Phe Asn
595 600 605

Leu Leu Gly Val Pro Leu Val Gly Ala Asp Val Cys Gly Phe Leu Gly
610 615 620

Asn Thr Ser Glu Glu Leu Cys Val Arg Trp Thr Gln Leu Gly Ala Phe
625 630 635 640

Tyr Pro Phe Met Arg Asn His Asn Ser Leu Leu Ser Leu Pro Gln Glu
645 650 655

Pro Tyr Ser Phe Ser Glu Pro Ala Gln Gln Ala Met Arg Lys Ala Leu
660 665 670

Thr Leu Arg Tyr Ala Leu Leu Pro His Leu Tyr Thr Leu Phe His Gln
675 680 685

Ala His Val Ala Gly Glu Thr Val Ala Arg Pro Leu Phe Leu Glu Phe
690 695 700

Pro Lys Asp Ser Ser Thr Trp Thr Val Asp His Gln Leu Leu Trp Gly
705 710 715 720

Glu Ala Leu Leu Ile Thr Pro Val Leu Gln Ala Gly Lys Ala Glu Val
725 730 735

Thr Gly Tyr Phe Pro Leu Gly Thr Trp Tyr Asp Leu Gln Thr Val Pro
740 745 750

Ile Glu Ala Leu Gly Ser Leu Pro Pro Pro Pro Ala Ala Pro Arg Glu
755 760 765

eolf-othd-000002 (1)

Pro Ala Ile His Ser Glu Gly Gln Trp Val Thr Leu Pro Ala Pro Leu
770 775 780

Asp Thr Ile Asn Val His Leu Arg Ala Gly Tyr Ile Ile Pro Leu Gln
785 790 795 800

Gly Pro Gly Leu Thr Thr Thr Glu Ser Arg Gln Gln Pro Met Ala Leu
805 810 815

Ala Val Ala Leu Thr Lys Gly Gly Glu Ala Arg Gly Glu Leu Phe Trp
820 825 830

Asp Asp Gly Glu Ser Leu Glu Val Leu Glu Arg Gly Ala Tyr Thr Gln
835 840 845

Val Ile Phe Leu Ala Arg Asn Asn Thr Ile Val Asn Glu Leu Val Arg
850 855 860

Val Thr Ser Glu Gly Ala Gly Leu Gln Leu Gln Lys Val Thr Val Leu
865 870 875 880

Gly Val Ala Thr Ala Pro Gln Gln Val Leu Ser Asn Gly Val Pro Val
885 890 895

Ser Asn Phe Thr Tyr Ser Pro Asp Thr Lys Val Leu Asp Ile Cys Val
900 905 910

Ser Leu Leu Met Gly Glu Gln Phe Leu Val Ser Trp Cys
915 920 925

<210> 34
<211> 896
<212> PRT
<213> artificial

<220>
<223> hGAA-delta-29

eolf-othd-000002 (1)

<400> 34

Gln Gln Gly Ala Ser Arg Pro Gly Pro Arg Asp Ala Gln Ala His Pro
1 5 10 15

Gly Arg Pro Arg Ala Val Pro Thr Gln Cys Asp Val Pro Pro Asn Ser
20 25 30

Arg Phe Asp Cys Ala Pro Asp Lys Ala Ile Thr Gln Glu Gln Cys Glu
35 40 45

Ala Arg Gly Cys Cys Tyr Ile Pro Ala Lys Gln Gly Leu Gln Gly Ala
50 55 60

Gln Met Gly Gln Pro Trp Cys Phe Phe Pro Pro Ser Tyr Pro Ser Tyr
65 70 75 80

Lys Leu Glu Asn Leu Ser Ser Ser Glu Met Gly Tyr Thr Ala Thr Leu
85 90 95

Thr Arg Thr Thr Pro Thr Phe Phe Pro Lys Asp Ile Leu Thr Leu Arg
100 105 110

Leu Asp Val Met Met Glu Thr Glu Asn Arg Leu His Phe Thr Ile Lys
115 120 125

Asp Pro Ala Asn Arg Arg Tyr Glu Val Pro Leu Glu Thr Pro His Val
130 135 140

His Ser Arg Ala Pro Ser Pro Leu Tyr Ser Val Glu Phe Ser Glu Glu
145 150 155 160

Pro Phe Gly Val Ile Val Arg Arg Gln Leu Asp Gly Arg Val Leu Leu
165 170 175

Asn Thr Thr Val Ala Pro Leu Phe Phe Ala Asp Gln Phe Leu Gln Leu
180 185 190

eolf-othd-000002 (1)

Ser Thr Ser Leu Pro Ser Gln Tyr Ile Thr Gly Leu Ala Glu His Leu
195 200 205

Ser Pro Leu Met Leu Ser Thr Ser Trp Thr Arg Ile Thr Leu Trp Asn
210 215 220

Arg Asp Leu Ala Pro Thr Pro Gly Ala Asn Leu Tyr Gly Ser His Pro
225 230 235 240

Phe Tyr Leu Ala Leu Glu Asp Gly Gly Ser Ala His Gly Val Phe Leu
245 250 255

Leu Asn Ser Asn Ala Met Asp Val Val Leu Gln Pro Ser Pro Ala Leu
260 265 270

Ser Trp Arg Ser Thr Gly Gly Ile Leu Asp Val Tyr Ile Phe Leu Gly
275 280 285

Pro Glu Pro Lys Ser Val Val Gln Gln Tyr Leu Asp Val Val Gly Tyr
290 295 300

Pro Phe Met Pro Pro Tyr Trp Gly Leu Gly Phe His Leu Cys Arg Trp
305 310 315 320

Gly Tyr Ser Ser Thr Ala Ile Thr Arg Gln Val Val Glu Asn Met Thr
325 330 335

Arg Ala His Phe Pro Leu Asp Val Gln Trp Asn Asp Leu Asp Tyr Met
340 345 350

Asp Ser Arg Arg Asp Phe Thr Phe Asn Lys Asp Gly Phe Arg Asp Phe
355 360 365

Pro Ala Met Val Gln Glu Leu His Gln Gly Gly Arg Arg Tyr Met Met
370 375 380

eolf-othd-000002 (1)

Ile Val Asp Pro Ala Ile Ser Ser Ser Gly Pro Ala Gly Ser Tyr Arg
385 390 395 400

Pro Tyr Asp Glu Gly Leu Arg Arg Gly Val Phe Ile Thr Asn Glu Thr
405 410 415

Gly Gln Pro Leu Ile Gly Lys Val Trp Pro Gly Ser Thr Ala Phe Pro
420 425 430

Asp Phe Thr Asn Pro Thr Ala Leu Ala Trp Trp Glu Asp Met Val Ala
435 440 445

Glu Phe His Asp Gln Val Pro Phe Asp Gly Met Trp Ile Asp Met Asn
450 455 460

Glu Pro Ser Asn Phe Ile Arg Gly Ser Glu Asp Gly Cys Pro Asn Asn
465 470 475 480

Glu Leu Glu Asn Pro Pro Tyr Val Pro Gly Val Val Gly Gly Thr Leu
485 490 495

Gln Ala Ala Thr Ile Cys Ala Ser Ser His Gln Phe Leu Ser Thr His
500 505 510

Tyr Asn Leu His Asn Leu Tyr Gly Leu Thr Glu Ala Ile Ala Ser His
515 520 525

Arg Ala Leu Val Lys Ala Arg Gly Thr Arg Pro Phe Val Ile Ser Arg
530 535 540

Ser Thr Phe Ala Gly His Gly Arg Tyr Ala Gly His Trp Thr Gly Asp
545 550 555 560

Val Trp Ser Ser Trp Glu Gln Leu Ala Ser Ser Val Pro Glu Ile Leu
565 570 575

eolf-othd-000002 (1)

Gln Phe Asn Leu Leu Gly Val Pro Leu Val Gly Ala Asp Val Cys Gly
580 585 590

Phe Leu Gly Asn Thr Ser Glu Glu Leu Cys Val Arg Trp Thr Gln Leu
595 600 605

Gly Ala Phe Tyr Pro Phe Met Arg Asn His Asn Ser Leu Leu Ser Leu
610 615 620

Pro Gln Glu Pro Tyr Ser Phe Ser Glu Pro Ala Gln Gln Ala Met Arg
625 630 635 640

Lys Ala Leu Thr Leu Arg Tyr Ala Leu Leu Pro His Leu Tyr Thr Leu
645 650 655

Phe His Gln Ala His Val Ala Gly Glu Thr Val Ala Arg Pro Leu Phe
660 665 670

Leu Glu Phe Pro Lys Asp Ser Ser Thr Trp Thr Val Asp His Gln Leu
675 680 685

Leu Trp Gly Glu Ala Leu Leu Ile Thr Pro Val Leu Gln Ala Gly Lys
690 695 700

Ala Glu Val Thr Gly Tyr Phe Pro Leu Gly Thr Trp Tyr Asp Leu Gln
705 710 715 720

Thr Val Pro Val Glu Ala Leu Gly Ser Leu Pro Pro Pro Pro Ala Ala
725 730 735

Pro Arg Glu Pro Ala Ile His Ser Glu Gly Gln Trp Val Thr Leu Pro
740 745 750

Ala Pro Leu Asp Thr Ile Asn Val His Leu Arg Ala Gly Tyr Ile Ile
755 760 765

eolf-othd-000002 (1)

Pro Leu Gln Gly Pro Gly Leu Thr Thr Thr Glu Ser Arg Gln Gln Pro
770 775 780

Met Ala Leu Ala Val Ala Leu Thr Lys Gly Gly Glu Ala Arg Gly Glu
785 790 795 800

Leu Phe Trp Asp Asp Gly Glu Ser Leu Glu Val Leu Glu Arg Gly Ala
805 810 815

Tyr Thr Gln Val Ile Phe Leu Ala Arg Asn Asn Thr Ile Val Asn Glu
820 825 830

Leu Val Arg Val Thr Ser Glu Gly Ala Gly Leu Gln Leu Gln Lys Val
835 840 845

Thr Val Leu Gly Val Ala Thr Ala Pro Gln Gln Val Leu Ser Asn Gly
850 855 860

Val Pro Val Ser Asn Phe Thr Tyr Ser Pro Asp Thr Lys Val Leu Asp
865 870 875 880

Ile Cys Val Ser Leu Leu Met Gly Glu Gln Phe Leu Val Ser Trp Cys
885 890 895

<210> 35
<211> 882
<212> PRT
<213> artificial

<220>
<223> hGAA-delta-43

<400> 35

His Pro Gly Arg Pro Arg Ala Val Pro Thr Gln Cys Asp Val Pro Pro
1 5 10 15

eolf-othd-000002 (1)

Asn Ser Arg Phe Asp Cys Ala Pro Asp Lys Ala Ile Thr Gln Glu Gln
20 25 30

Cys Glu Ala Arg Gly Cys Cys Tyr Ile Pro Ala Lys Gln Gly Leu Gln
35 40 45

Gly Ala Gln Met Gly Gln Pro Trp Cys Phe Phe Pro Pro Ser Tyr Pro
50 55 60

Ser Tyr Lys Leu Glu Asn Leu Ser Ser Ser Glu Met Gly Tyr Thr Ala
65 70 75 80

Thr Leu Thr Arg Thr Thr Pro Thr Phe Phe Pro Lys Asp Ile Leu Thr
85 90 95

Leu Arg Leu Asp Val Met Met Glu Thr Glu Asn Arg Leu His Phe Thr
100 105 110

Ile Lys Asp Pro Ala Asn Arg Arg Tyr Glu Val Pro Leu Glu Thr Pro
115 120 125

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

Glu Glu Pro Phe Gly Val Ile Val Arg Arg Gln Leu Asp Gly Arg Val
145 150 155 160

Leu Leu Asn Thr Thr Val Ala Pro Leu Phe Phe Ala Asp Gln Phe Leu
165 170 175

Gln Leu Ser Thr Ser Leu Pro Ser Gln Tyr Ile Thr Gly Leu Ala Glu
180 185 190

His Leu Ser Pro Leu Met Leu Ser Thr Ser Trp Thr Arg Ile Thr Leu
195 200 205

eolf-othd-000002 (1)

Trp Asn Arg Asp Leu Ala Pro Thr Pro Gly Ala Asn Leu Tyr Gly Ser
210 215 220

His Pro Phe Tyr Leu Ala Leu Glu Asp Gly Gly Ser Ala His Gly Val
225 230 235 240

Phe Leu Leu Asn Ser Asn Ala Met Asp Val Val Leu Gln Pro Ser Pro
245 250 255

Ala Leu Ser Trp Arg Ser Thr Gly Gly Ile Leu Asp Val Tyr Ile Phe
260 265 270

Leu Gly Pro Glu Pro Lys Ser Val Val Gln Gln Tyr Leu Asp Val Val
275 280 285

Gly Tyr Pro Phe Met Pro Pro Tyr Trp Gly Leu Gly Phe His Leu Cys
290 295 300

Arg Trp Gly Tyr Ser Ser Thr Ala Ile Thr Arg Gln Val Val Glu Asn
305 310 315 320

Met Thr Arg Ala His Phe Pro Leu Asp Val Gln Trp Asn Asp Leu Asp
325 330 335

Tyr Met Asp Ser Arg Arg Asp Phe Thr Phe Asn Lys Asp Gly Phe Arg
340 345 350

Asp Phe Pro Ala Met Val Gln Glu Leu His Gln Gly Gly Arg Arg Tyr
355 360 365

Met Met Ile Val Asp Pro Ala Ile Ser Ser Ser Gly Pro Ala Gly Ser
370 375 380

Tyr Arg Pro Tyr Asp Glu Gly Leu Arg Arg Gly Val Phe Ile Thr Asn
385 390 395 400

eolf-othd-000002 (1)

Glu Thr Gly Gln Pro Leu Ile Gly Lys Val Trp Pro Gly Ser Thr Ala
405 410 415

Phe Pro Asp Phe Thr Asn Pro Thr Ala Leu Ala Trp Trp Glu Asp Met
420 425 430

Val Ala Glu Phe His Asp Gln Val Pro Phe Asp Gly Met Trp Ile Asp
435 440 445

Met Asn Glu Pro Ser Asn Phe Ile Arg Gly Ser Glu Asp Gly Cys Pro
450 455 460

Asn Asn Glu Leu Glu Asn Pro Pro Tyr Val Pro Gly Val Val Gly Gly
465 470 475 480

Thr Leu Gln Ala Ala Thr Ile Cys Ala Ser Ser His Gln Phe Leu Ser
485 490 495

Thr His Tyr Asn Leu His Asn Leu Tyr Gly Leu Thr Glu Ala Ile Ala
500 505 510

Ser His Arg Ala Leu Val Lys Ala Arg Gly Thr Arg Pro Phe Val Ile
515 520 525

Ser Arg Ser Thr Phe Ala Gly His Gly Arg Tyr Ala Gly His Trp Thr
530 535 540

Gly Asp Val Trp Ser Ser Trp Glu Gln Leu Ala Ser Ser Val Pro Glu
545 550 555 560

Ile Leu Gln Phe Asn Leu Leu Gly Val Pro Leu Val Gly Ala Asp Val
565 570 575

Cys Gly Phe Leu Gly Asn Thr Ser Glu Glu Leu Cys Val Arg Trp Thr
580 585 590

eolf-othd-000002 (1)

Gln Leu Gly Ala Phe Tyr Pro Phe Met Arg Asn His Asn Ser Leu Leu
595 600 605

Ser Leu Pro Gln Glu Pro Tyr Ser Phe Ser Glu Pro Ala Gln Gln Ala
610 615 620

Met Arg Lys Ala Leu Thr Leu Arg Tyr Ala Leu Leu Pro His Leu Tyr
625 630 635 640

Thr Leu Phe His Gln Ala His Val Ala Gly Glu Thr Val Ala Arg Pro
645 650 655

Leu Phe Leu Glu Phe Pro Lys Asp Ser Ser Thr Trp Thr Val Asp His
660 665 670

Gln Leu Leu Trp Gly Glu Ala Leu Leu Ile Thr Pro Val Leu Gln Ala
675 680 685

Gly Lys Ala Glu Val Thr Gly Tyr Phe Pro Leu Gly Thr Trp Tyr Asp
690 695 700

Leu Gln Thr Val Pro Val Glu Ala Leu Gly Ser Leu Pro Pro Pro Pro
705 710 715 720

Ala Ala Pro Arg Glu Pro Ala Ile His Ser Glu Gly Gln Trp Val Thr
725 730 735

Leu Pro Ala Pro Leu Asp Thr Ile Asn Val His Leu Arg Ala Gly Tyr
740 745 750

Ile Ile Pro Leu Gln Gly Pro Gly Leu Thr Thr Thr Glu Ser Arg Gln
755 760 765

Gln Pro Met Ala Leu Ala Val Ala Leu Thr Lys Gly Gly Glu Ala Arg
770 775 780

eolf-othd-000002 (1)

Gly Glu Leu Phe Trp Asp Asp Gly Glu Ser Leu Glu Val Leu Glu Arg
785 790 795 800

Gly Ala Tyr Thr Gln Val Ile Phe Leu Ala Arg Asn Asn Thr Ile Val
805 810 815

Asn Glu Leu Val Arg Val Thr Ser Glu Gly Ala Gly Leu Gln Leu Gln
820 825 830

Lys Val Thr Val Leu Gly Val Ala Thr Ala Pro Gln Gln Val Leu Ser
835 840 845

Asn Gly Val Pro Val Ser Asn Phe Thr Tyr Ser Pro Asp Thr Lys Val
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Gly Cys Cys Tyr Ile Pro Ala Lys Gln Gly Leu Gln Gly Ala Gln Met
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Gly Gln Pro Trp Cys Phe Phe Pro Pro Ser Tyr Pro Ser Tyr Lys Leu
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Glu Asn Leu Ser Ser Ser Glu Met Gly Tyr Thr Ala Thr Leu Thr Arg
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Thr Thr Pro Thr Phe Phe Pro Lys Asp Ile Leu Thr Leu Arg Leu Asp
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Val Met Met Glu Thr Glu Asn Arg Leu His Phe Thr Ile Lys Asp Pro
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Ala Asn Arg Arg Tyr Glu Val Pro Leu Glu Thr Pro His Val His Ser
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Arg Ala Pro Ser Pro Leu Tyr Ser Val Glu Phe Ser Glu Glu Pro Phe
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Gly Val Ile Val Arg Arg Gln Leu Asp Gly Arg Val Leu Leu Asn Thr
145 150 155 160

Thr Val Ala Pro Leu Phe Phe Ala Asp Gln Phe Leu Gln Leu Ser Thr
165 170 175

Ser Leu Pro Ser Gln Tyr Ile Thr Gly Leu Ala Glu His Leu Ser Pro
180 185 190

Leu Met Leu Ser Thr Ser Trp Thr Arg Ile Thr Leu Trp Asn Arg Asp
195 200 205

Leu Ala Pro Thr Pro Gly Ala Asn Leu Tyr Gly Ser His Pro Phe Tyr
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Leu Ala Leu Glu Asp Gly Gly Ser Ala His Gly Val Phe Leu Leu Asn
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Ser Asn Ala Met Asp Val Val Leu Gln Pro Ser Pro Ala Leu Ser Trp
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Arg Ser Thr Gly Gly Ile Leu Asp Val Tyr Ile Phe Leu Gly Pro Glu
260 265 270

Pro Lys Ser Val Val Gln Gln Tyr Leu Asp Val Val Gly Tyr Pro Phe
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Met Pro Pro Tyr Trp Gly Leu Gly Phe His Leu Cys Arg Trp Gly Tyr
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Ser Ser Thr Ala Ile Thr Arg Gln Val Val Glu Asn Met Thr Arg Ala
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His Phe Pro Leu Asp Val Gln Trp Asn Asp Leu Asp Tyr Met Asp Ser
325 330 335

Arg Arg Asp Phe Thr Phe Asn Lys Asp Gly Phe Arg Asp Phe Pro Ala
340 345 350

Met Val Gln Glu Leu His Gln Gly Gly Arg Arg Tyr Met Met Ile Val
355 360 365

Asp Pro Ala Ile Ser Ser Ser Gly Pro Ala Gly Ser Tyr Arg Pro Tyr
370 375 380

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

Val Thr Gly Tyr Phe Pro Leu Gly Thr Trp Tyr Asp Leu Gln Thr Val
690 695 700

Pro Val Glu Ala Leu Gly Ser Leu Pro Pro Pro Pro Ala Ala Pro Arg
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Glu Pro Ala Ile His Ser Glu Gly Gln Trp Val Thr Leu Pro Ala Pro
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Leu Asp Thr Ile Asn Val His Leu Arg Ala Gly Tyr Ile Ile Pro Leu
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Gln Gly Pro Gly Leu Thr Thr Thr Glu Ser Arg Gln Gln Pro Met Ala
755 760 765

Leu Ala Val Ala Leu Thr Lys Gly Gly Glu Ala Arg Gly Glu Leu Phe
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Trp Asp Asp Gly Glu Ser Leu Glu Val Leu Glu Arg Gly Ala Tyr Thr
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Gln Val Ile Phe Leu Ala Arg Asn Asn Thr Ile Val Asn Glu Leu Val
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Arg Val Thr Ser Glu Gly Ala Gly Leu Gln Leu Gln Lys Val Thr Val
820 825 830

Leu Gly Val Ala Thr Ala Pro Gln Gln Val Leu Ser Asn Gly Val Pro
835 840 845

Val Ser Asn Phe Thr Tyr Ser Pro Asp Thr Lys Val Leu Asp Ile Cys
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<223> hGAACO2-delta-43

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<213> artificial

<220>

<223> hGAACO1-delta-47

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