

616-4 PCT Sequence listing.txt
SEQUENCE LISTING

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Deutsches Krebsforschungszentrum

<120> AMATOXIN-ARMED TARGET-BINDING MOIETIES FOR THE TREATMENT OF
CANCER

<130> 616-4 PCT

<140>

<141> 2010-04-08

<150> US 61/167,690

<151> 2009-04-08

<160> 28

<170> PatentIn version 3.3

<210> 1

<211> 514

<212> PRT

<213> Artificial

<220>

<223> chimeric antibody huHEA125, heavy chain, membrane-bound form

<400> 1

Glu Val Lys Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
1 5 10 15

Ser Leu Lys Leu Ser Cys Ala Ala Ser Gly Phe Asp Phe Ser Arg Phe
20 25 30

Trp Met Thr Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Glu Ile Asn Leu Asp Ser Ser Thr Ile Asn Tyr Thr Pro Ser Leu
50 55 60

Lys Asp Lys Phe Ile Ile Ser Arg Asp Asn Ala Lys Asn Thr Leu Phe
65 70 75 80

Leu Gln Met Ser Lys Val Arg Ser Glu Asp Thr Ala Leu Tyr Tyr Cys
85 90 95

Ser Arg Gly Ile Ser Met Asp Tyr Trp Gly Gln Gly Thr Ser Val Thr
100 105 110

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

Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu Val
130 135 140

Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly Ala
145 150 155 160

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Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser Gly
165 170 175

Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu Gly
180 185 190

Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr Lys
195 200 205

Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr Cys
210 215 220

Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe Leu
225 230 235 240

Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro Glu
245 250 255

Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val Lys
260 265 270

Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr Lys
275 280 285

Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val Leu
290 295 300

Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys
305 310 315 320

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

Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser
340 345 350

Arg Asp Glu Leu Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys
355 360 365

Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln
370 375 380

Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp Gly
385 390 395 400

Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp Gln
405 410 415

Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His Asn
420 425 430

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His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Leu Gln Leu Asp
435 440 445

Glu Thr Cys Ala Glu Ala Gln Asp Gly Glu Leu Asp Gly Leu Trp Thr
450 455 460

Thr Ile Thr Ile Phe Ile Ser Leu Phe Leu Leu Ser Val Cys Tyr Ser
465 470 475 480

Ala Ala Val Thr Leu Phe Lys Val Lys Trp Ile Phe Ser Ser Val Val
485 490 495

Glu Leu Lys Gln Thr Leu Val Pro Glu Tyr Lys Asn Met Ile Gly Gln
500 505 510

Ala Pro

<210> 2
<211> 445
<212> PRT
<213> Artificial

<220>
<223> chimeric antibody huHEA125, heavy chain, secreted form
<400> 2

Glu Val Lys Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
1 5 10 15

Ser Leu Lys Leu Ser Cys Ala Ala Ser Gly Phe Asp Phe Ser Arg Phe
20 25 30

Trp Met Thr Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Glu Ile Asn Leu Asp Ser Ser Thr Ile Asn Tyr Thr Pro Ser Leu
50 55 60

Lys Asp Lys Phe Ile Ile Ser Arg Asp Asn Ala Lys Asn Thr Leu Phe
65 70 75 80

Leu Gln Met Ser Lys Val Arg Ser Glu Asp Thr Ala Leu Tyr Tyr Cys
85 90 95

Ser Arg Gly Ile Ser Met Asp Tyr Trp Gly Gln Gly Thr Ser Val Thr
100 105 110

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

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Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu Val
130 135 140

Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly Ala
145 150 155 160

Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser Gly
165 170 175

Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu Gly
180 185 190

Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr Lys
195 200 205

Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr Cys
210 215 220

Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe Leu
225 230 235 240

Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro Glu
245 250 255

Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val Lys
260 265 270

Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr Lys
275 280 285

Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val Leu
290 295 300

Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys
305 310 315 320

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

Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser
340 345 350

Arg Asp Glu Leu Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys
355 360 365

Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln
370 375 380

Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp Gly
385 390 395 400

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Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp Gln
405 410 415

Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His Asn
420 425 430

His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
435 440 445

<210> 3
<211> 115
<212> PRT
<213> Artificial

<220>
<223> chimeric antibody huHEA125, heavy chain, VH domain

<400> 3

Glu Val Lys Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
1 5 10 15

Ser Leu Lys Leu Ser Cys Ala Ala Ser Gly Phe Asp Phe Ser Arg Phe
20 25 30

Trp Met Thr Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45

Gly Glu Ile Asn Leu Asp Ser Ser Thr Ile Asn Tyr Thr Pro Ser Leu
50 55 60

Lys Asp Lys Phe Ile Ile Ser Arg Asp Asn Ala Lys Asn Thr Leu Phe
65 70 75 80

Leu Gln Met Ser Lys Val Arg Ser Glu Asp Thr Ala Leu Tyr Tyr Cys
85 90 95

Ser Arg Gly Ile Ser Met Asp Tyr Trp Gly Gln Gly Thr Ser Val Thr
100 105 110

Val Ser Ser
115

<210> 4
<211> 75
<212> DNA
<213> Artificial

<220>
<223> chimeric antibody huHEA125, heavy chain, FR1 segment

<400> 4

gaagtgaagc ttctcgagtc tggaggtggc ctggtgcagc ctggaggatc cctgaaactc 60

tcctgtgcag cctca 75

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<210> 5
 <211> 24
 <212> DNA
 <213> Artificial

 <220>
 <223> chimeric antibody huHEA125, heavy chain, CDR1 segment

 <400> 5
 ggattcgatt ttagtagatt ctgg 24

 <210> 6
 <211> 51
 <212> DNA
 <213> Artificial

 <220>
 <223> chimeric antibody huHEA125, heavy chain, FR2 segment

 <400> 6
 atgacttggg tccggcaggc tccagggaaa gggctagaat ggattggaga a 51

 <210> 7
 <211> 24
 <212> DNA
 <213> Artificial

 <220>
 <223> chimeric antibody huHEA125, heavy chain, CDR2 segment

 <400> 7
 attaattctag atagcagtac gata 24

 <210> 8
 <211> 114
 <212> DNA
 <213> Artificial

 <220>
 <223> chimeric antibody huHEA125, heavy chain, FR3 segment

 <400> 8
 aactatacgc catctctaaa ggataaattc atcatctcca gggacaacgc caaaaatacg 60
 ctgttctctgc aaatgagcaa agtgagatct gaggacacag ccctttatta ctgt 114

 <210> 9
 <211> 24
 <212> DNA
 <213> Artificial

 <220>
 <223> chimeric antibody huHEA125, heavy chain, CDR3 segment

 <400> 9
 tcaagaggta tttctatgga ctac 24

 <210> 10
 <211> 33
 <212> DNA
 <213> Artificial

 <220>

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<223> chimeric antibody huHEA125, heavy chain, FR4 segment

<400> 10

tggggtcagg gaacctcagt caccgtctcc tca

33

<210> 11

<211> 214

<212> PRT

<213> Artificial

<220>

<223> chimeric antibody huHEA125, light chain

<400> 11

Asp Ile Leu Leu Thr Gln Ser Pro Ala Ile Leu Ser Val Ser Pro Gly
1 5 10 15

Glu Arg Val Ser Phe Ser Cys Arg Ala Ser Gln Ser Ile Gly Ile Ser
20 25 30

Leu His Trp Tyr Gln Gln Arg Pro Ser Asp Ser Pro Arg Leu Leu Ile
35 40 45

Lys Tyr Ala Ser Glu Ser Ile Ser Gly Ile Pro Ser Arg Phe Ser Gly
50 55 60

Ser Gly Ser Gly Thr Asp Phe Thr Leu Ser Ile Asn Ser Val Glu Ser
65 70 75 80

Glu Asp Ile Ala Asp Tyr Tyr Cys Gln Gln Ser Asn Ile Trp Pro Thr
85 90 95

Thr Phe Gly Ala Gly Thr Lys Leu Glu Leu Lys Arg Thr Val Ala Ala
100 105 110

Pro Ser Val Phe Ile Phe Pro Pro Ser Asp Glu Gln Leu Lys Ser Gly
115 120 125

Thr Ala Ser Val Val Cys Leu Leu Asn Asn Phe Tyr Pro Arg Glu Ala
130 135 140

Lys Val Gln Trp Lys Val Asp Asn Ala Leu Gln Ser Gly Asn Ser Gln
145 150 155 160

Glu Ser Val Thr Glu Gln Asp Ser Lys Asp Ser Thr Tyr Ser Leu Ser
165 170 175

Ser Thr Leu Thr Leu Ser Lys Ala Asp Tyr Glu Lys His Lys Val Tyr
180 185 190

Ala Cys Glu Val Thr His Gln Gly Leu Ser Ser Pro Val Thr Lys Ser
195 200 205

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Phe Asn Arg Gly Glu Cys
210

<210> 12
<211> 107
<212> PRT
<213> Artificial

<220>
<223> chimeric antibody huHEA125, light chain, VL domain

<400> 12

Asp Ile Leu Leu Thr Gln Ser Pro Ala Ile Leu Ser Val Ser Pro Gly
1 5 10 15

Glu Arg Val Ser Phe Ser Cys Arg Ala Ser Gln Ser Ile Gly Ile Ser
20 25 30

Leu His Trp Tyr Gln Gln Arg Pro Ser Asp Ser Pro Arg Leu Leu Ile
35 40 45

Lys Tyr Ala Ser Glu Ser Ile Ser Gly Ile Pro Ser Arg Phe Ser Gly
50 55 60

Ser Gly Ser Gly Thr Asp Phe Thr Leu Ser Ile Asn Ser Val Glu Ser
65 70 75 80

Glu Asp Ile Ala Asp Tyr Tyr Cys Gln Gln Ser Asn Ile Trp Pro Thr
85 90 95

Thr Phe Gly Ala Gly Thr Lys Leu Glu Leu Lys
100 105

<210> 13
<211> 78
<212> DNA
<213> Artificial

<220>
<223> chimeric antibody huHEA125, light chain, FR1 segment

<400> 13
gacatcttgc tgactcagtc tccagccatc ctgtctgtga gtccaggaga aagagtcagt 60
ttctcctgca gggccagt 78

<210> 14
<211> 18
<212> DNA
<213> Artificial

<220>
<223> chimeric antibody huHEA125, light chain, CDR1 segment

<400> 14
cagagcattg gcataagt 18

616-4 PCT Sequence listing.txt

<210> 15
 <211> 51
 <212> DNA
 <213> Artificial

 <220>
 <223> chimeric antibody huHEA125, light chain, FR2 segment

 <400> 15
 ttacactggt atcagcaaag accaagtgat tctccaaggc ttctcataaa g 51

 <210> 16
 <211> 9
 <212> DNA
 <213> Artificial

 <220>
 <223> chimeric antibody huHEA125, light chain, CDR2 segment

 <400> 16
 tatgcttct 9

 <210> 17
 <211> 108
 <212> DNA
 <213> Artificial

 <220>
 <223> chimeric antibody huHEA125, light chain, FR3 segment

 <400> 17
 gagtcaatct ctgggatccc ttccagggtt agtggcagtg gatcagggac agattttact 60
 cttagcatca acagtgtgga gtctgaagat attgcagatt attactgt 108

 <210> 18
 <211> 27
 <212> DNA
 <213> Artificial

 <220>
 <223> chimeric antibody huHEA125, light chain, CDR3 segment

 <400> 18
 caacaaagta atatctggcc aaccacg 27

 <210> 19
 <211> 30
 <212> DNA
 <213> Artificial

 <220>
 <223> chimeric antibody huHEA125, light chain, FR4 segment

 <400> 19
 ttcggtgctg ggaccaagct ggagctgaaa 30

 <210> 20
 <211> 8
 <212> PRT
 <213> Artificial

 <220>

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<223> chimeric antibody huHEA125, heavy chain, CDR1 domain

<400> 20

Gly Phe Asp Phe Ser Arg Phe Trp
1 5

<210> 21

<211> 8

<212> PRT

<213> Artificial

<220>

<223> chimeric antibody huHEA125, heavy chain, CDR2 domain

<400> 21

Ile Asn Leu Asp Ser Ser Thr Ile
1 5

<210> 22

<211> 8

<212> PRT

<213> Artificial

<220>

<223> chimeric antibody huHEA125, heavy chain, CDR3 domain

<400> 22

Ser Arg Gly Ile Ser Met Asp Tyr
1 5

<210> 23

<211> 6

<212> PRT

<213> Artificial

<220>

<223> chimeric antibody huHEA125, light chain, CDR1 domain

<400> 23

Gln Ser Ile Gly Ile Ser
1 5

<210> 24

<211> 3

<212> PRT

<213> Artificial

<220>

<223> chimeric antibody huHEA125, light chain, CDR2 domain

<400> 24

Tyr Ala Ser
1

<210> 25

<211> 9

<212> PRT

<213> Artificial

616-4 PCT Sequence listing.txt

<220>

<223> chimeric antibody huHEA125, light chain, CDR3 domain

<400> 25

Gln Gln Ser Asn Ile Trp Pro Thr Thr
1 5

<210> 26

<211> 399

<212> PRT

<213> Artificial

<220>

<223> chimeric antibody huHEA125, heavy chain, constant domain,
membrane-bound form

<400> 26

Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys
1 5 10 15

Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr
20 25 30

Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser
35 40 45

Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser
50 55 60

Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr
65 70 75 80

Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys
85 90 95

Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys
100 105 110

Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro
115 120 125

Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys
130 135 140

Val Val Val Asp Val Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp
145 150 155 160

Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu
165 170 175

Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu
180 185 190

616-4 PCT Sequence listing.txt

His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn
195 200 205

Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly
210 215 220

Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu
225 230 235 240

Leu Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr
245 250 255

Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn
260 265 270

Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe
275 280 285

Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn
290 295 300

Val Phe Ser Cys Ser Val Met His Glu Ala Leu His Asn His Tyr Thr
305 310 315 320

Gln Lys Ser Leu Ser Leu Ser Pro Gly Leu Gln Leu Asp Glu Thr Cys
325 330 335

Ala Glu Ala Gln Asp Gly Glu Leu Asp Gly Leu Trp Thr Thr Ile Thr
340 345 350

Ile Phe Ile Ser Leu Phe Leu Leu Ser Val Cys Tyr Ser Ala Ala Val
355 360 365

Thr Leu Phe Lys Val Lys Trp Ile Phe Ser Ser Val Val Glu Leu Lys
370 375 380

Gln Thr Leu Val Pro Glu Tyr Lys Asn Met Ile Gly Gln Ala Pro
385 390 395

<210> 27
<211> 330
<212> PRT
<213> Artificial

<220>
<223> chimeric antibody huHEA125, heavy chain, constant domain,
secreted form

<400> 27

Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys
1 5 10 15

616-4 PCT Sequence listing.txt

Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr
20 25 30

Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser
35 40 45

Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser
50 55 60

Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr
65 70 75 80

Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys
85 90 95

Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys
100 105 110

Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro
115 120 125

Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys
130 135 140

Val Val Val Asp Val Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp
145 150 155 160

Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu
165 170 175

Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu
180 185 190

His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn
195 200 205

Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly
210 215 220

Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu
225 230 235 240

Leu Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr
245 250 255

Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn
260 265 270

Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe
275 280 285

616-4 PCT Sequence listing.txt

Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn
290 295 300

Val Phe Ser Cys Ser Val Met His Glu Ala Leu His Asn His Tyr Thr
305 310 315 320

Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
325 330

<210> 28
<211> 107
<212> PRT
<213> Artificial

<220>
<223> chimeric antibody huHEA125, light chain, constant domain
<400> 28

Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro Ser Asp Glu
1 5 10 15

Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu Asn Asn Phe
20 25 30

Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn Ala Leu Gln
35 40 45

Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser Lys Asp Ser
50 55 60

Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala Asp Tyr Glu
65 70 75 80

Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly Leu Ser Ser
85 90 95

Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
100 105

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