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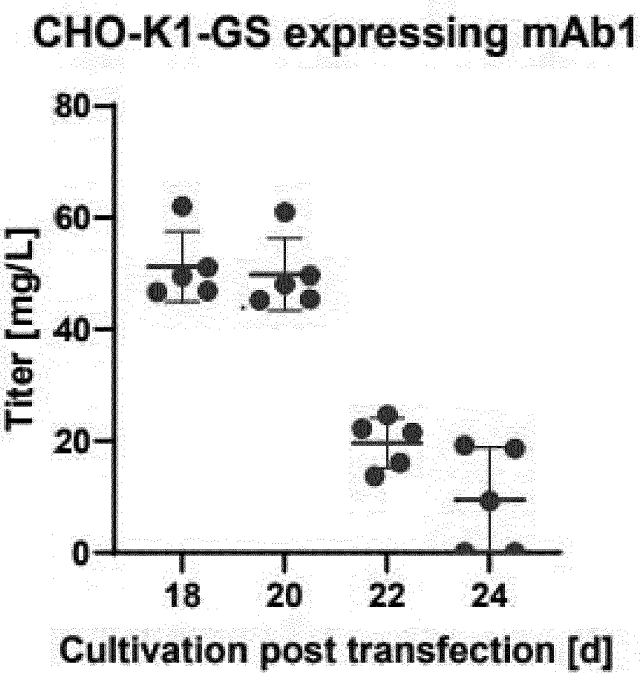


Figure 2

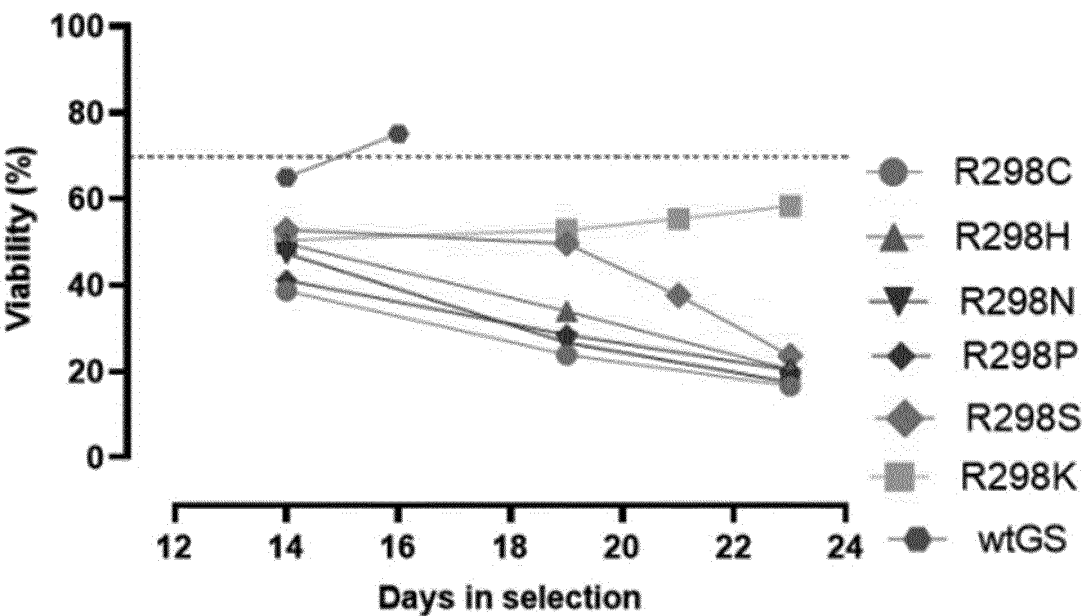


Figure 3

A

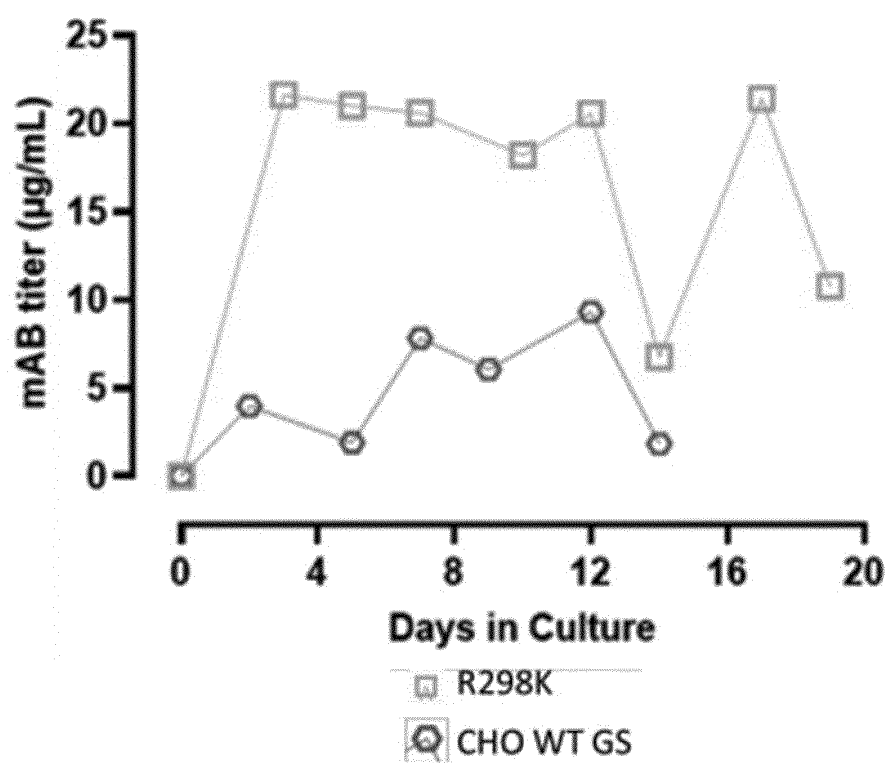


Figure 3 (cont.)

B

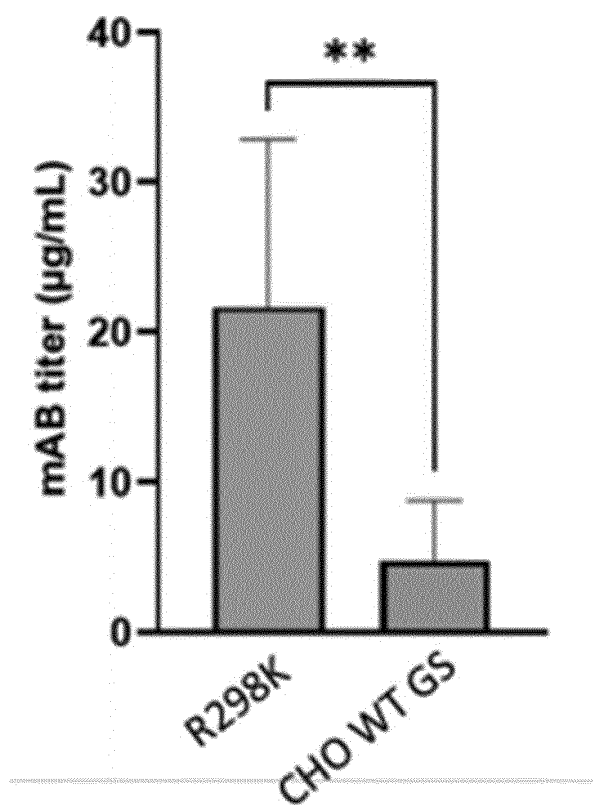


Figure 4

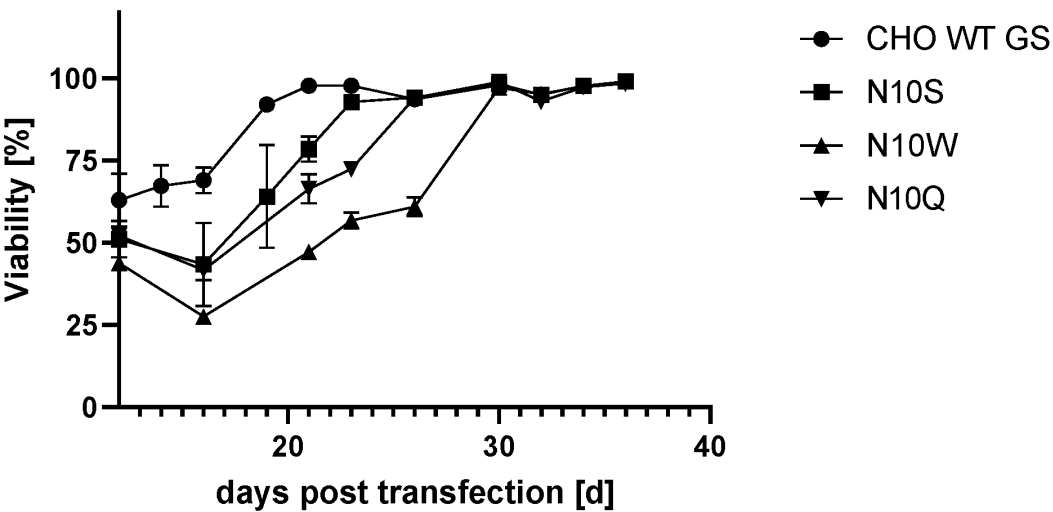


Figure 5

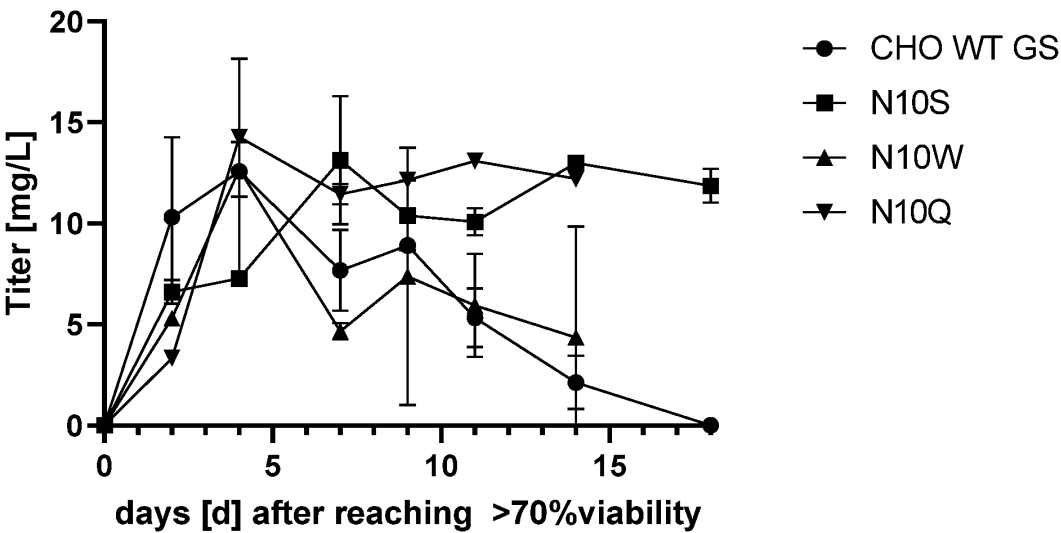


Figure 6

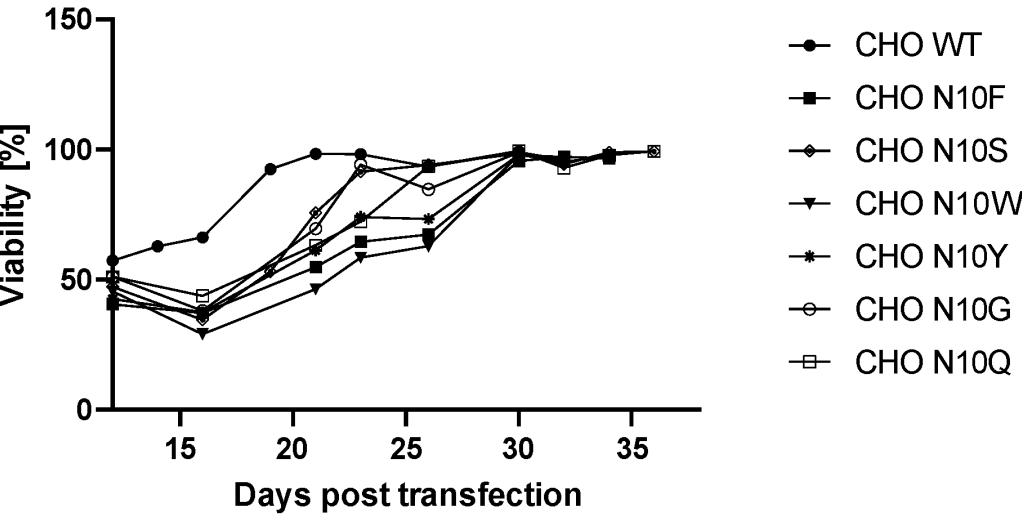


Figure 7

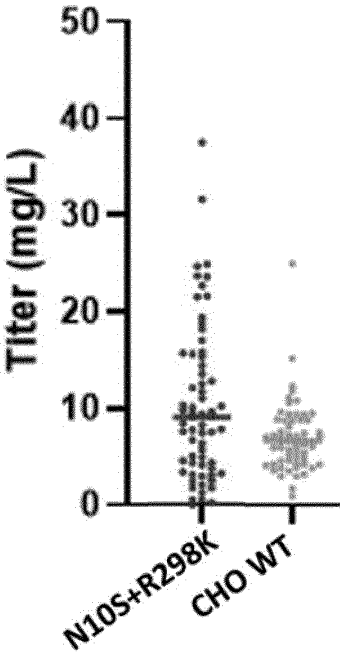


Figure 8

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<210> 1
<211> 373
<212> PRT
<213> Cricetulus griseus

<220>
<223> Wild type Cricetulus griseus glutamine synthetase

<400> 1
Met Ala Thr Ser Ala Ser Ser His Leu Asn Lys Asn Ile Lys Gln Met
1      5      10      15
Tyr Leu Cys Leu Pro Gln Gly Glu Lys Val Gln Ala Met Tyr Ile Trp
20     25     30
Val Asp Gly Thr Gly Glu Gly Leu Arg Cys Lys Thr Arg Thr Leu Asp
35     40     45
Cys Glu Pro Lys Cys Val Glu Glu Leu Pro Glu Trp Asn Phe Asp Gly
50     55     60
Ser Ser Thr Phe Gln Ser Glu Gly Ser Asn Ser Asp Met Tyr Leu Ser
65     70     75     80
Pro Val Ala Met Phe Arg Asp Pro Phe Arg Arg Asp Pro Asn Lys Leu
85     90     95
Val Phe Cys Glu Val Phe Lys Tyr Asn Arg Lys Pro Ala Glu Thr Asn
100    105    110
Leu Arg His Ser Cys Lys Arg Ile Met Asp Met Val Ser Asn Gln His
115    120    125
Pro Trp Phe Gly Met Glu Gln Glu Tyr Thr Leu Met Gly Thr Asp Gly
130    135    140
His Pro Phe Gly Trp Pro Ser Asn Gly Phe Pro Gly Pro Gln Gly Pro
145    150    155    160
Tyr Tyr Cys Gly Val Gly Ala Asp Lys Ala Tyr Gly Arg Asp Ile Val
165    170    175
Glu Ala His Tyr Arg Ala Cys Leu Tyr Ala Gly Val Lys Ile Thr Gly
180    185    190
Thr Asn Ala Glu Val Met Pro Ala Gln Trp Glu Phe Gln Ile Gly Pro
195    200    205
Cys Glu Gly Ile Arg Met Gly Asp His Leu Trp Val Ala Arg Phe Ile
210    215    220
Leu His Arg Val Cys Glu Asp Phe Gly Val Ile Ala Thr Phe Asp Pro
225    230    235    240
Lys Pro Ile Pro Gly Asn Trp Asn Gly Ala Gly Cys His Thr Asn Phe
245    250    255
Ser Thr Lys Ala Met Arg Glu Glu Asn Gly Leu Lys His Ile Glu Glu
260    265    270
Ala Ile Glu Lys Leu Ser Lys Arg His Arg Tyr His Ile Arg Ala Tyr
275    280    285
Asp Pro Lys Gly Gly Leu Asp Asn Ala Arg Arg Leu Thr Gly Phe His
290    295    300
Glu Thr Ser Asn Ile Asn Asp Phe Ser Ala Gly Val Ala Asn Arg Ser
305    310    315    320
Ala Ser Ile Arg Ile Pro Arg Thr Val Gly Gln Glu Lys Lys Gly Tyr
325    330    335
Phe Glu Asp Arg Arg Pro Ser Ala Asn Cys Asp Pro Phe Ala Val Thr
340    345    350
Glu Ala Ile Val Arg Thr Cys Leu Leu Asn Glu Thr Gly Asp Glu Pro
355    360    365
Phe Gln Tyr Lys Asn
370

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Figure 9

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<210> 2
<211> 373
<212> PRT
<213> Homo sapiens

<220>
<223> Wild type Homo sapiens glutamine synthetase

<400> 2
Met Thr Thr Ser Ala Ser Ser His Leu Asn Lys Gly Ile Lys Gln Val
1          5          10          15
Tyr Met Ser Leu Pro Gln Gly Glu Lys Val Gln Ala Met Tyr Ile Trp
          20          25          30
Ile Asp Gly Thr Gly Glu Gly Leu Arg Cys Lys Thr Arg Thr Leu Asp
          35          40          45
Ser Glu Pro Lys Cys Val Glu Glu Leu Pro Glu Trp Asn Phe Asp Gly
          50          55          60
Ser Ser Thr Leu Gln Ser Glu Gly Ser Asn Ser Asp Met Tyr Leu Val
65          70          75          80
Pro Ala Ala Met Phe Arg Asp Pro Phe Arg Lys Asp Pro Asn Lys Leu
          85          90          95
Val Leu Cys Glu Val Phe Lys Tyr Asn Arg Arg Pro Ala Glu Thr Asn
          100          105          110
Leu Arg His Thr Cys Lys Arg Ile Met Asp Met Val Ser Asn Gln His
          115          120          125
Pro Trp Phe Gly Met Glu Gln Glu Tyr Thr Leu Met Gly Thr Asp Gly
          130          135          140
His Pro Phe Gly Trp Pro Ser Asn Gly Phe Pro Gly Pro Gln Gly Pro
145          150          155          160
Tyr Tyr Cys Gly Val Gly Ala Asp Arg Ala Tyr Gly Arg Asp Ile Val
          165          170          175
Glu Ala His Tyr Arg Ala Cys Leu Tyr Ala Gly Val Lys Ile Ala Gly
          180          185          190
Thr Asn Ala Glu Val Met Pro Ala Gln Trp Glu Phe Gln Ile Gly Pro
          195          200          205
Cys Glu Gly Ile Ser Met Gly Asp His Leu Trp Val Ala Arg Phe Ile
          210          215          220
Leu His Arg Val Cys Glu Asp Phe Gly Val Ile Ala Thr Phe Asp Pro
          225          230          235          240
Lys Pro Ile Pro Gly Asn Trp Asn Gly Ala Gly Cys His Thr Asn Phe
          245          250          255
Ser Thr Lys Ala Met Arg Glu Glu Asn Gly Leu Lys Tyr Ile Glu Glu
          260          265          270
Ala Ile Glu Lys Leu Ser Lys Arg His Gln Tyr His Ile Arg Ala Tyr
          275          280          285
Asp Pro Lys Gly Gly Leu Asp Asn Ala Arg Arg Leu Thr Gly Phe His
          290          295          300
Glu Thr Ser Asn Ile Asn Asp Phe Ser Ala Gly Val Ala Asn Arg Ser
          305          310          315          320
Ala Ser Ile Arg Ile Pro Arg Thr Val Gly Gln Glu Lys Lys Gly Tyr
          325          330          335
Phe Glu Asp Arg Arg Pro Ser Ala Asn Cys Asp Pro Phe Ser Val Thr
          340          345          350
Glu Ala Leu Ile Arg Thr Cys Leu Leu Asn Glu Thr Gly Asp Glu Pro
          355          360          365
Phe Gln Tyr Lys Asn
          370

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Figure 10

<210> 3
 <211> 373
 <212> PRT
 <213> Mus musculus

<220>
 <223> Wild type Mus musculus glutamine synthetase

<400> 3
 Met Ala Thr Ser Ala Ser Ser His Leu Asn Lys Gly Ile Lys Gln Met
 1 5 10 15
 Tyr Met Ser Leu Pro Gln Gly Glu Lys Val Gln Ala Met Tyr Ile Trp
 20 25 30
 Val Asp Gly Thr Gly Glu Gly Leu Arg Cys Lys Thr Arg Thr Leu Asp
 35 40 45
 Cys Glu Pro Lys Cys Val Glu Glu Leu Pro Glu Trp Asn Phe Asp Gly
 50 55 60
 Ser Ser Thr Phe Gln Ser Glu Gly Ser Asn Ser Asp Met Tyr Leu His
 65 70 75 80
 Pro Val Ala Met Phe Arg Asp Pro Phe Arg Lys Asp Pro Asn Lys Leu
 85 90 95
 Val Leu Cys Glu Val Phe Lys Tyr Asn Arg Lys Pro Ala Glu Thr Asn
 100 105 110
 Leu Arg His Ile Cys Lys Arg Ile Met Asp Met Val Ser Asn Gln His
 115 120 125
 Pro Trp Phe Gly Met Glu Gln Glu Tyr Thr Leu Met Gly Thr Asp Gly
 130 135 140
 His Pro Phe Gly Trp Pro Ser Asn Gly Phe Pro Gly Pro Gln Gly Pro
 145 150 155 160
 Tyr Tyr Cys Gly Val Gly Ala Asp Lys Ala Tyr Gly Arg Asp Ile Val
 165 170 175
 Glu Ala His Tyr Arg Ala Cys Leu Tyr Ala Gly Val Lys Ile Thr Gly
 180 185 190
 Thr Asn Ala Glu Val Met Pro Ala Gln Trp Glu Phe Gln Ile Gly Pro
 195 200 205
 Cys Glu Gly Ile Arg Met Gly Asp His Leu Trp Ile Ala Arg Phe Ile
 210 215 220
 Leu His Arg Val Cys Glu Asp Phe Gly Val Ile Ala Thr Phe Asp Pro
 225 230 235 240
 Lys Pro Ile Pro Gly Asn Trp Asn Gly Ala Gly Cys His Thr Asn Phe
 245 250 255
 Ser Thr Lys Ala Met Arg Glu Glu Asn Gly Leu Lys Cys Ile Glu Glu
 260 265 270
 Ala Ile Asp Lys Leu Ser Lys Arg His Gln Tyr His Ile Arg Ala Tyr
 275 280 285
 Asp Pro Lys Gly Gly Leu Asp Asn Ala Arg Arg Leu Thr Gly Phe His
 290 295 300
 Glu Thr Ser Asn Ile Asn Asp Phe Ser Ala Gly Val Ala Asn Arg Gly
 305 310 315 320
 Ala Ser Ile Arg Ile Pro Arg Thr Val Gly Gln Glu Lys Lys Gly Tyr
 325 330 335
 Phe Glu Asp Arg Arg Pro Ser Ala Asn Cys Asp Pro Tyr Ala Val Thr
 340 345 350
 Glu Ala Ile Val Arg Thr Cys Leu Leu Asn Glu Thr Gly Asp Glu Pro
 355 360 365
 Phe Gln Tyr Lys Asn
 370

Figure 11

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<210> 4
<211> 373
<212> PRT
<213> Rattus norvegicus

<220>
<223> Wild type Rattus norvegicus glutamine synthetase

<400> 4
Met Ala Thr Ser Ala Ser Ser His Leu Asn Lys Gly Ile Lys Gln Met
1      5      10      15
Tyr Met Asn Leu Pro Gln Gly Glu Lys Ile Gln Leu Met Tyr Ile Trp
20     25     30
Val Asp Gly Thr Gly Glu Gly Leu Arg Cys Lys Thr Arg Thr Leu Asp
35     40     45
Cys Asp Pro Lys Cys Val Glu Glu Leu Pro Glu Trp Asn Phe Asp Gly
50     55     60
Ser Ser Thr Phe Gln Ser Glu Gly Ser Asn Ser Asp Met Tyr Leu His
65     70     75     80
Pro Val Ala Met Phe Arg Asp Pro Phe Arg Arg Asp Pro Asn Lys Leu
85     90     95
Val Phe Cys Glu Val Phe Lys Tyr Asn Arg Lys Pro Ala Glu Thr Asn
100    105    110
Leu Arg His Ser Cys Lys Arg Ile Met Asp Met Val Ser Ser Gln His
115    120    125
Pro Trp Phe Gly Met Glu Gln Glu Tyr Thr Leu Met Gly Thr Asp Gly
130    135    140
His Pro Phe Gly Trp Pro Ser Asn Gly Phe Pro Gly Pro Gln Gly Pro
145    150    155    160
Tyr Tyr Cys Gly Val Gly Ala Asp Lys Ala Tyr Gly Arg Asp Ile Val
165    170    175
Glu Ala His Tyr Arg Ala Cys Leu Tyr Ala Gly Ile Lys Ile Thr Gly
180    185    190
Thr Asn Ala Glu Val Met Pro Ala Gln Trp Glu Phe Gln Ile Gly Pro
195    200    205
Cys Glu Gly Ile Arg Met Gly Asp His Leu Trp Val Ala Arg Phe Ile
210    215    220
Leu His Arg Val Cys Glu Asp Phe Gly Val Ile Ala Thr Phe Asp Pro
225    230    235    240
Lys Pro Ile Pro Gly Asn Trp Asn Gly Ala Gly Cys His Thr Asn Phe
245    250    255
Ser Thr Lys Ala Met Arg Glu Glu Asn Gly Leu Arg Cys Ile Glu Glu
260    265    270
Ala Ile Asp Lys Leu Ser Lys Arg His Gln Tyr His Ile Arg Ala Tyr
275    280    285
Asp Pro Lys Gly Gly Leu Asp Asn Ala Arg Arg Leu Thr Gly Phe His
290    295    300
Glu Thr Ser Asn Ile Asn Asp Phe Ser Ala Gly Val Ala Asn Arg Ser
305    310    315    320
Ala Ser Ile Arg Ile Pro Arg Ile Val Gly Gln Glu Lys Lys Gly Tyr
325    330    335
Phe Glu Asp Arg Arg Pro Ser Ala Asn Cys Asp Pro Tyr Ala Val Thr
340    345    350
Glu Ala Ile Val Arg Thr Cys Leu Leu Asn Glu Thr Gly Asp Glu Pro
355    360    365
Phe Gln Tyr Lys Asn
370

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Figure 12

<210> 5
 <211> 373
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Cricetulus griseus glutamine synthetase R298K

<400> 5
 Met Ala Thr Ser Ala Ser Ser His Leu Asn Lys Asn Ile Lys Gln Met
 1 5 10 15
 Tyr Leu Cys Leu Pro Gln Gly Glu Lys Val Gln Ala Met Tyr Ile Trp
 20 25 30
 Val Asp Gly Thr Gly Glu Gly Leu Arg Cys Lys Thr Arg Thr Leu Asp
 35 40 45
 Cys Glu Pro Lys Cys Val Glu Glu Leu Pro Glu Trp Asn Phe Asp Gly
 50 55 60
 Ser Ser Thr Phe Gln Ser Glu Gly Ser Asn Ser Asp Met Tyr Leu Ser
 65 70 75 80
 Pro Val Ala Met Phe Arg Asp Pro Phe Arg Arg Asp Pro Asn Lys Leu
 85 90 95
 Val Phe Cys Glu Val Phe Lys Tyr Asn Arg Lys Pro Ala Glu Thr Asn
 100 105 110
 Leu Arg His Ser Cys Lys Arg Ile Met Asp Met Val Ser Asn Gln His
 115 120 125
 Pro Trp Phe Gly Met Glu Gln Glu Tyr Thr Leu Met Gly Thr Asp Gly
 130 135 140
 His Pro Phe Gly Trp Pro Ser Asn Gly Phe Pro Gly Pro Gln Gly Pro
 145 150 155 160
 Tyr Tyr Cys Gly Val Gly Ala Asp Lys Ala Tyr Gly Arg Asp Ile Val
 165 170 175
 Glu Ala His Tyr Arg Ala Cys Leu Tyr Ala Gly Val Lys Ile Thr Gly
 180 185 190
 Thr Asn Ala Glu Val Met Pro Ala Gln Trp Glu Phe Gln Ile Gly Pro
 195 200 205
 Cys Glu Gly Ile Arg Met Gly Asp His Leu Trp Val Ala Arg Phe Ile
 210 215 220
 Leu His Arg Val Cys Glu Asp Phe Gly Val Ile Ala Thr Phe Asp Pro
 225 230 235 240
 Lys Pro Ile Pro Gly Asn Trp Asn Gly Ala Gly Cys His Thr Asn Phe
 245 250 255
 Ser Thr Lys Ala Met Arg Glu Glu Asn Gly Leu Lys His Ile Glu Glu
 260 265 270
 Ala Ile Glu Lys Leu Ser Lys Arg His Arg Tyr His Ile Arg Ala Tyr
 275 280 285
 Asp Pro Lys Gly Gly Leu Asp Asn Ala Lys Arg Leu Thr Gly Phe His
 290 295 300
 Glu Thr Ser Asn Ile Asn Asp Phe Ser Ala Gly Val Ala Asn Arg Ser
 305 310 315 320
 Ala Ser Ile Arg Ile Pro Arg Thr Val Gly Gln Glu Lys Lys Gly Tyr
 325 330 335
 Phe Glu Asp Arg Arg Pro Ser Ala Asn Cys Asp Pro Phe Ala Val Thr
 340 345 350
 Glu Ala Ile Val Arg Thr Cys Leu Leu Asn Glu Thr Gly Asp Glu Pro
 355 360 365
 Phe Gln Tyr Lys Asn
 370

Figure 13

<210> 6
 <211> 373
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> *Cricetulus griseus* glutamine synthetase N10S

<400> 6
 Met Ala Thr Ser Ala Ser Ser His Leu Ser Lys Asn Ile Lys Gln Met
 1 5 10 15
 Tyr Leu Cys Leu Pro Gln Gly Glu Lys Val Gln Ala Met Tyr Ile Trp
 20 25 30
 Val Asp Gly Thr Gly Glu Gly Leu Arg Cys Lys Thr Arg Thr Leu Asp
 35 40 45
 Cys Glu Pro Lys Cys Val Glu Leu Pro Glu Trp Asn Phe Asp Gly
 50 55 60
 Ser Ser Thr Phe Gln Ser Glu Gly Ser Asn Ser Asp Met Tyr Leu Ser
 65 70 75 80
 Pro Val Ala Met Phe Arg Asp Pro Phe Arg Arg Asp Pro Asn Lys Leu
 85 90 95
 Val Phe Cys Glu Val Phe Lys Tyr Asn Arg Lys Pro Ala Glu Thr Asn
 100 105 110
 Leu Arg His Ser Cys Lys Arg Ile Met Asp Met Val Ser Asn Gln His
 115 120 125
 Pro Trp Phe Gly Met Glu Gln Glu Tyr Thr Leu Met Gly Thr Asp Gly
 130 135 140
 His Pro Phe Gly Trp Pro Ser Asn Gly Phe Pro Gly Pro Gln Gly Pro
 145 150 155 160
 Tyr Tyr Cys Gly Val Gly Ala Asp Lys Ala Tyr Gly Arg Asp Ile Val
 165 170 175
 Glu Ala His Tyr Arg Ala Cys Leu Tyr Ala Gly Val Lys Ile Thr Gly
 180 185 190
 Thr Asn Ala Glu Val Met Pro Ala Gln Trp Glu Phe Gln Ile Gly Pro
 195 200 205
 Cys Glu Gly Ile Arg Met Gly Asp His Leu Trp Val Ala Arg Phe Ile
 210 215 220
 Leu His Arg Val Cys Glu Asp Phe Gly Val Ile Ala Thr Phe Asp Pro
 225 230 235 240
 Lys Pro Ile Pro Gly Asn Trp Asn Gly Ala Gly Cys His Thr Asn Phe
 245 250 255
 Ser Thr Lys Ala Met Arg Glu Glu Asn Gly Leu Lys His Ile Glu Glu
 260 265 270
 Ala Ile Glu Lys Leu Ser Lys Arg His Arg Tyr His Ile Arg Ala Tyr
 275 280 285
 Asp Pro Lys Gly Gly Leu Asp Asn Ala Arg Arg Leu Thr Gly Phe His
 290 295 300
 Glu Thr Ser Asn Ile Asn Asp Phe Ser Ala Gly Val Ala Asn Arg Ser
 305 310 315 320
 Ala Ser Ile Arg Ile Pro Arg Thr Val Gly Gln Glu Lys Lys Gly Tyr
 325 330 335
 Phe Glu Asp Arg Arg Pro Ser Ala Asn Cys Asp Pro Phe Ala Val Thr
 340 345 350
 Glu Ala Ile Val Arg Thr Cys Leu Leu Asn Glu Thr Gly Asp Glu Pro
 355 360 365
 Phe Gln Tyr Lys Asn
 370

Figure 14

```

<210> 7
<211> 373
<212> PRT
<213> Artificial Sequence

<220>
<223> Cricetulus griseus glutamine synthetase N10T

<400> 7
Met Ala Thr Ser Ala Ser Ser His Leu Thr Lys Asn Ile Lys Gln Met
1      5      10
Tyr Leu Cys Leu Pro Gln Gly Glu Lys Val Gln Ala Met Tyr Ile Trp
20     25     30
Val Asp Gly Thr Gly Glu Gly Leu Arg Cys Lys Thr Arg Thr Leu Asp
35     40     45
Cys Glu Pro Lys Cys Val Glu Leu Pro Glu Trp Asn Phe Asp Gly
50     55     60
Ser Ser Thr Phe Gln Ser Glu Gly Ser Asn Ser Asp Met Tyr Leu Ser
65     70     75     80
Pro Val Ala Met Phe Arg Asp Pro Phe Arg Arg Asp Pro Asn Lys Leu
85     90     95
Val Phe Cys Glu Val Phe Lys Tyr Asn Arg Lys Pro Ala Glu Thr Asn
100    105    110
Leu Arg His Ser Cys Lys Arg Ile Met Asp Met Val Ser Asn Gln His
115    120    125
Pro Trp Phe Gly Met Glu Gln Glu Tyr Thr Leu Met Gly Thr Asp Gly
130    135    140
His Pro Phe Gly Trp Pro Ser Asn Gly Phe Pro Gly Pro Gln Gly Pro
145    150    155    160
Tyr Tyr Cys Gly Val Gly Ala Asp Lys Ala Tyr Gly Arg Asp Ile Val
165    170    175
Glu Ala His Tyr Arg Ala Cys Leu Tyr Ala Gly Val Lys Ile Thr Gly
180    185    190
Thr Asn Ala Glu Val Met Pro Ala Gln Trp Glu Phe Gln Ile Gly Pro
195    200    205
Cys Glu Gly Ile Arg Met Gly Asp His Leu Trp Val Ala Arg Phe Ile
210    215    220
Leu His Arg Val Cys Glu Asp Phe Gly Val Ile Ala Thr Phe Asp Pro
225    230    235    240
Lys Pro Ile Pro Gly Asn Trp Asn Gly Ala Gly Cys His Thr Asn Phe
245    250    255
Ser Thr Lys Ala Met Arg Glu Glu Asn Gly Leu Lys His Ile Glu Glu
260    265    270
Ala Ile Glu Lys Leu Ser Lys Arg His Arg Tyr His Ile Arg Ala Tyr
275    280    285
Asp Pro Lys Gly Gly Leu Asp Asn Ala Arg Arg Leu Thr Gly Phe His
290    295    300
Glu Thr Ser Asn Ile Asn Asp Phe Ser Ala Gly Val Ala Asn Arg Ser
305    310    315    320
Ala Ser Ile Arg Ile Pro Arg Thr Val Gly Gln Glu Lys Lys Gly Tyr
325    330    335
Phe Glu Asp Arg Arg Pro Ser Ala Asn Cys Asp Pro Phe Ala Val Thr
340    345    350
Glu Ala Ile Val Arg Thr Cys Leu Leu Asn Glu Thr Gly Asp Glu Pro
355    360    365
Phe Gln Tyr Lys Asn
370

```

Figure 15

```

<210> 8
<211> 373
<212> PRT
<213> Artificial Sequence

<220>
<223> Cricetulus griseus glutamine synthetase N10Q

<400> 8
Met Ala Thr Ser Ala Ser Ser His Leu Gln Lys Asn Ile Lys Gln Met
1      5      10      15
Tyr Leu Cys Leu Pro Gln Gly Glu Lys Val Gln Ala Met Tyr Ile Trp
20     25     30
Val Asp Gly Thr Gly Glu Gly Leu Arg Cys Lys Thr Arg Thr Leu Asp
35     40     45
Cys Glu Pro Lys Cys Val Glu Glu Leu Pro Glu Trp Asn Phe Asp Gly
50     55     60
Ser Ser Thr Phe Gln Ser Glu Gly Ser Asn Ser Asp Met Tyr Leu Ser
65     70     75     80
Pro Val Ala Met Phe Arg Asp Pro Phe Arg Arg Asp Pro Asn Lys Leu
85     90     95
Val Phe Cys Glu Val Phe Lys Tyr Asn Arg Lys Pro Ala Glu Thr Asn
100    105    110
Leu Arg His Ser Cys Lys Arg Ile Met Asp Met Val Ser Asn Gln His
115    120    125
Pro Trp Phe Gly Met Glu Gln Glu Tyr Thr Leu Met Gly Thr Asp Gly
130    135    140
His Pro Phe Gly Trp Pro Ser Asn Gly Phe Pro Gly Pro Gln Gly Pro
145    150    155    160
Tyr Tyr Cys Gly Val Gly Ala Asp Lys Ala Tyr Gly Arg Asp Ile Val
165    170    175
Glu Ala His Tyr Arg Ala Cys Leu Tyr Ala Gly Val Lys Ile Thr Gly
180    185    190
Thr Asn Ala Glu Val Met Pro Ala Gln Trp Glu Phe Gln Ile Gly Pro
195    200    205
Cys Glu Gly Ile Arg Met Gly Asp His Leu Trp Val Ala Arg Phe Ile
210    215    220
Leu His Arg Val Cys Glu Asp Phe Gly Val Ile Ala Thr Phe Asp Pro
225    230    235    240
Lys Pro Ile Pro Gly Asn Trp Asn Gly Ala Gly Cys His Thr Asn Phe
245    250    255
Ser Thr Lys Ala Met Arg Glu Glu Asn Gly Leu Lys His Ile Glu Glu
260    265    270
Ala Ile Glu Lys Leu Ser Lys Arg His Arg Tyr His Ile Arg Ala Tyr
275    280    285
Asp Pro Lys Gly Gly Leu Asp Asn Ala Arg Arg Leu Thr Gly Phe His
290    295    300
Glu Thr Ser Asn Ile Asn Asp Phe Ser Ala Gly Val Ala Asn Arg Ser
305    310    315    320
Ala Ser Ile Arg Ile Pro Arg Thr Val Gly Gln Glu Lys Lys Gly Tyr
325    330    335
Phe Glu Asp Arg Arg Pro Ser Ala Asn Cys Asp Pro Phe Ala Val Thr
340    345    350
Glu Ala Ile Val Arg Thr Cys Leu Leu Asn Glu Thr Gly Asp Glu Pro
355    360    365
Phe Gln Tyr Lys Asn
370

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Figure 16

```

<210> 9
<211> 373
<212> PRT
<213> Artificial Sequence

<220>
<223> Cricetulus griseus glutamine synthetase R298K and N10S

<400> 9
Met Ala Thr Ser Ala Ser Ser His Leu Ser Lys Asn Ile Lys Gln Met
1      5      10      15
Tyr Leu Cys Leu Pro Gln Gly Glu Lys Val Gln Ala Met Tyr Ile Trp
20      25      30
Val Asp Gly Thr Gly Glu Gly Leu Arg Cys Lys Thr Arg Thr Leu Asp
35      40      45
Cys Glu Pro Lys Cys Val Glu Glu Leu Pro Glu Trp Asn Phe Asp Gly
50      55      60
Ser Ser Thr Phe Gln Ser Glu Gly Ser Asn Ser Asp Met Tyr Leu Ser
65      70      75      80
Pro Val Ala Met Phe Arg Asp Pro Phe Arg Arg Asp Pro Asn Lys Leu
85      90      95
Val Phe Cys Glu Val Phe Lys Tyr Asn Arg Lys Pro Ala Glu Thr Asn
100     105     110
Leu Arg His Ser Cys Lys Arg Ile Met Asp Met Val Ser Asn Gln His
115     120     125
Pro Trp Phe Gly Met Glu Gln Glu Tyr Thr Leu Met Gly Thr Asp Gly
130     135     140
His Pro Phe Gly Trp Pro Ser Asn Gly Phe Pro Gly Pro Gln Gly Pro
145     150     155     160
Tyr Tyr Cys Gly Val Gly Ala Asp Lys Ala Tyr Gly Arg Asp Ile Val
165     170     175
Glu Ala His Tyr Arg Ala Cys Leu Tyr Ala Gly Val Lys Ile Thr Gly
180     185     190
Thr Asn Ala Glu Val Met Pro Ala Gln Trp Glu Phe Gln Ile Gly Pro
195     200     205
Cys Glu Gly Ile Arg Met Gly Asp His Leu Trp Val Ala Arg Phe Ile
210     215     220
Leu His Arg Val Cys Glu Asp Phe Gly Val Ile Ala Thr Phe Asp Pro
225     230     235     240
Lys Pro Ile Pro Gly Asn Trp Asn Gly Ala Gly Cys His Thr Asn Phe
245     250     255
Ser Thr Lys Ala Met Arg Glu Glu Asn Gly Leu Lys His Ile Glu Glu
260     265     270
Ala Ile Glu Lys Leu Ser Lys Arg His Arg Tyr His Ile Arg Ala Tyr
275     280     285
Asp Pro Lys Gly Gly Leu Asp Asn Ala Lys Arg Leu Thr Gly Phe His
290     295     300
Glu Thr Ser Asn Ile Asn Asp Phe Ser Ala Gly Val Ala Asn Arg Ser
305     310     315     320
Ala Ser Ile Arg Ile Pro Arg Thr Val Gly Gln Glu Lys Lys Gly Tyr
325     330     335
Phe Glu Asp Arg Arg Pro Ser Ala Asn Cys Asp Pro Phe Ala Val Thr
340     345     350
Glu Ala Ile Val Arg Thr Cys Leu Leu Asn Glu Thr Gly Asp Glu Pro
355     360     365
Phe Gln Tyr Lys Asn
370

```

Figure 17

```

<210> 10
<211> 373
<212> PRT
<213> Artificial Sequence

<220>
<223> Cricetulus griseus glutamine synthetase R298K and N10T

<400> 10
Met Ala Thr Ser Ala Ser Ser His Leu Thr Lys Asn Ile Lys Gln Met
1          5          10          15
Tyr Leu Cys Leu Pro Gln Gly Glu Lys Val Gln Ala Met Tyr Ile Trp
20          25          30
Val Asp Gly Thr Gly Glu Gly Leu Arg Cys Lys Thr Arg Thr Leu Asp
35          40          45
Cys Glu Pro Lys Cys Val Glu Glu Leu Pro Glu Trp Asn Phe Asp Gly
50          55          60
Ser Ser Thr Phe Gln Ser Glu Gly Ser Asn Ser Asp Met Tyr Leu Ser
65          70          75          80
Pro Val Ala Met Phe Arg Asp Pro Phe Arg Arg Asp Pro Asn Lys Leu
85          90          95
Val Phe Cys Glu Val Phe Lys Tyr Asn Arg Lys Pro Ala Glu Thr Asn
100         105         110
Leu Arg His Ser Cys Lys Arg Ile Met Asp Met Val Ser Asn Gln His
115         120         125
Pro Trp Phe Gly Met Glu Gln Glu Tyr Thr Leu Met Gly Thr Asp Gly
130         135         140
His Pro Phe Gly Trp Pro Ser Asn Gly Phe Pro Gly Pro Gln Gly Pro
145         150         155         160
Tyr Tyr Cys Gly Val Gly Ala Asp Lys Ala Tyr Gly Arg Asp Ile Val
165         170         175
Glu Ala His Tyr Arg Ala Cys Leu Tyr Ala Gly Val Lys Ile Thr Gly
180         185         190
Thr Asn Ala Glu Val Met Pro Ala Gln Trp Glu Phe Gln Ile Gly Pro
195         200         205
Cys Glu Gly Ile Arg Met Gly Asp His Leu Trp Val Ala Arg Phe Ile
210         215         220
Leu His Arg Val Cys Glu Asp Phe Gly Val Ile Ala Thr Phe Asp Pro
225         230         235         240
Lys Pro Ile Pro Gly Asn Trp Asn Gly Ala Gly Cys His Thr Asn Phe
245         250         255
Ser Thr Lys Ala Met Arg Glu Glu Asn Gly Leu Lys His Ile Glu Glu
260         265         270
Ala Ile Glu Lys Leu Ser Lys Arg His Arg Tyr His Ile Arg Ala Tyr
275         280         285
Asp Pro Lys Gly Gly Leu Asp Asn Ala Lys Arg Leu Thr Gly Phe His
290         295         300
Glu Thr Ser Asn Ile Asn Asp Phe Ser Ala Gly Val Ala Asn Arg Ser
305         310         315         320
Ala Ser Ile Arg Ile Pro Arg Thr Val Gly Gln Glu Lys Lys Gly Tyr
325         330         335
Phe Glu Asp Arg Arg Pro Ser Ala Asn Cys Asp Pro Phe Ala Val Thr
340         345         350
Glu Ala Ile Val Arg Thr Cys Leu Leu Asn Glu Thr Gly Asp Glu Pro
355         360         365
Phe Gln Tyr Lys Asn
370

```

Figure 18

<210> 11
 <211> 373
 <212> PRT
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<220>
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 35 40 45
 Cys Glu Pro Lys Cys Val Glu Glu Leu Pro Glu Trp Asn Phe Asp Gly
 50 55 60
 Ser Ser Thr Phe Gln Ser Glu Gly Ser Asn Ser Asp Met Tyr Leu Ser
 65 70 75 80
 Pro Val Ala Met Phe Arg Asp Pro Phe Arg Asp Pro Asn Lys Leu
 85 90 95
 Val Phe Cys Glu Val Phe Lys Tyr Asn Arg Lys Pro Ala Glu Thr Asn
 100 105 110
 Leu Arg His Ser Cys Lys Arg Ile Met Asp Met Val Ser Asn Gln His
 115 120 125
 Pro Trp Phe Gly Met Glu Gln Glu Tyr Thr Leu Met Gly Thr Asp Gly
 130 135 140
 His Pro Phe Gly Trp Pro Ser Asn Gly Phe Pro Gly Pro Gln Gly Pro
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 Tyr Tyr Cys Gly Val Gly Ala Asp Lys Ala Tyr Gly Arg Asp Ile Val
 165 170 175
 Glu Ala His Tyr Arg Ala Cys Leu Tyr Ala Gly Val Lys Ile Thr Gly
 180 185 190
 Thr Asn Ala Glu Val Met Pro Ala Gln Trp Glu Phe Gln Ile Gly Pro
 195 200 205
 Cys Glu Gly Ile Arg Met Gly Asp His Leu Trp Val Ala Arg Phe Ile
 210 215 220
 Leu His Arg Val Cys Glu Asp Phe Gly Val Ile Ala Thr Phe Asp Pro
 225 230 235 240
 Lys Pro Ile Pro Gly Asn Trp Asn Gly Ala Gly Cys His Thr Asn Phe
 245 250 255
 Ser Thr Lys Ala Met Arg Glu Glu Asn Gly Leu Lys His Ile Glu Glu
 260 265 270
 Ala Ile Glu Lys Leu Ser Lys Arg His Arg Tyr His Ile Arg Ala Tyr
 275 280 285
 Asp Pro Lys Gly Gly Leu Asp Asn Ala Lys Arg Leu Thr Gly Phe His
 290 295 300
 Glu Thr Ser Asn Ile Asn Asp Phe Ser Ala Gly Val Ala Asn Arg Ser
 305 310 315 320
 Ala Ser Ile Arg Ile Pro Arg Thr Val Gly Gln Glu Lys Lys Gly Tyr
 325 330 335
 Phe Glu Asp Arg Arg Pro Ser Ala Asn Cys Asp Pro Phe Ala Val Thr
 340 345 350
 Glu Ala Ile Val Arg Thr Cys Leu Leu Asn Glu Thr Gly Asp Glu Pro
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 Phe Gln Tyr Lys Asn
 370