

SEQUENCE LISTING

<110> Novo Nordisk A/S

<120> TRANSGLUTAMINASE VARIANTS WITH IMPROVED SPECIFICITY

<130> 7775.504-WO

<160> 5

<170> PatentIn version 3.3

<210> 1

<211> 331

<212> PRT

<213> Streptovercillium ladakanum

<400> 1

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

Pro Asp Pro Tyr Arg Pro Ser Tyr Gly Arg Ala Glu Thr Ile Val Asn
20 25 30

Asn Tyr Ile Arg Lys Trp Gln Gln Val Tyr Ser His Arg Asp Gly Arg
35 40 45

Lys Gln Gln Met Thr Glu Glu Gln Arg Glu Trp Leu Ser Tyr Gly Cys
50 55 60

Val Gly Val Thr Trp Val Asn Ser Gly Gln Tyr Pro Thr Asn Arg Leu
65 70 75 80

Ala Phe Ala Phe Phe Asp Glu Asp Lys Tyr Lys Asn Glu Leu Lys Asn
85 90 95

Gly Arg Pro Arg Ser Gly Glu Thr Arg Ala Glu Phe Glu Gly Arg Val
100 105 110

Ala Lys Asp Ser Phe Asp Glu Ala Lys Gly Phe Gln Arg Ala Arg Asp
115 120 125

Val Ala Ser Val Met Asn Lys Ala Leu Glu Asn Ala His Asp Glu Gly
130 135 140

Ala Tyr Leu Asp Asn Leu Lys Lys Glu Leu Ala Asn Gly Asn Asp Ala
145 150 155 160

Leu Arg Asn Glu Asp Ala Arg Ser Pro Phe Tyr Ser Ala Leu Arg Asn
165 170 175

Thr Pro Ser Phe Lys Asp Arg Asn Gly Gly Asn His Asp Pro Ser Lys
180 185 190

Met Lys Ala Val Ile Tyr Ser Lys His Phe Trp Ser Gly Gln Asp Arg
195 200 205

Ser Gly Ser Ser Asp Lys Arg Lys Tyr Gly Asp Pro Glu Ala Phe Arg
210 215 220

Pro Asp Arg Gly Thr Gly Leu Val Asp Met Ser Arg Asp Arg Asn Ile
225 230 235 240

Pro Arg Ser Pro Thr Ser Pro Gly Glu Ser Phe Val Asn Phe Asp Tyr
245 250 255

Gly Trp Phe Gly Ala Gln Thr Glu Ala Asp Ala Asp Lys Thr Val Trp
260 265 270

Thr His Gly Asn His Tyr His Ala Pro Asn Gly Ser Leu Gly Ala Met
275 280 285

His Val Tyr Glu Ser Lys Phe Arg Asn Trp Ser Asp Gly Tyr Ser Asp
290 295 300

Phe Asp Arg Gly Ala Tyr Val Val Thr Phe Val Pro Lys Ser Trp Asn
305 310 315 320

Thr Ala Pro Asp Lys Val Lys Gln Gly Trp Pro
325 330

<210> 2
<211> 331
<212> PRT
<213> Streptomyces mobaraensis

<400> 2

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

Pro Asp Pro Tyr Arg Pro Ser Tyr Gly Arg Ala Glu Thr Val Val Asn
20 25 30

Asn Tyr Ile Arg Lys Trp Gln Gln Val Tyr Ser His Arg Asp Gly Arg
35 40 45

Lys Gln Gln Met Thr Glu Glu Gln Arg Glu Trp Leu Ser Tyr Gly Cys
50 55 60

Val Gly Val Thr Trp Val Asn Ser Gly Gln Tyr Pro Thr Asn Arg Leu
65 70 75 80

Ala Phe Ala Ser Phe Asp Glu Asp Arg Phe Lys Asn Glu Leu Lys Asn
85 90 95

Gly Arg Pro Arg Ser Gly Glu Thr Arg Ala Glu Phe Glu Gly Arg Val
100 105 110

Ala Lys Glu Ser Phe Asp Glu Glu Lys Gly Phe Gln Arg Ala Arg Glu
115 120 125

Val Ala Ser Val Met Asn Arg Ala Leu Glu Asn Ala His Asp Glu Ser
130 135 140

Ala Tyr Leu Asp Asn Leu Lys Lys Glu Leu Ala Asn Gly Asn Asp Ala
145 150 155 160

Leu Arg Asn Glu Asp Ala Arg Ser Pro Phe Tyr Ser Ala Leu Arg Asn
165 170 175

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

Met Lys Ala Val Ile Tyr Ser Lys His Phe Trp Ser Gly Gln Asp Arg
195 200 205

Ser Ser Ser Ala Asp Lys Arg Lys Tyr Gly Asp Pro Asp Ala Phe Arg
210 215 220

Pro Ala Pro Gly Thr Gly Leu Val Asp Met Ser Arg Asp Arg Asn Ile
225 230 235 240

Pro Arg Ser Pro Thr Ser Pro Gly Glu Gly Phe Val Asn Phe Asp Tyr

Arg Lys Gln Gln Met Thr Glu Glu Gln Arg Glu Trp Leu Ser Tyr Gly
100 105 110

Cys Val Gly Val Thr Trp Val Asn Ser Gly Gln Tyr Pro Thr Asn Arg
115 120 125

Leu Ala Phe Ala Phe Phe Asp Glu Asp Lys Tyr Lys Asn Glu Leu Lys
130 135 140

Asn Gly Arg Pro Arg Ser Gly Glu Thr Arg Ala Glu Phe Glu Gly Arg
145 150 155 160

Val Ala Lys Asp Ser Phe Asp Glu Ala Lys Gly Phe Gln Arg Ala Arg
165 170 175

Asp Val Ala Ser Val Met Asn Lys Ala Leu Glu Asn Ala His Asp Glu
180 185 190

Gly Ala Tyr Leu Asp Asn Leu Lys Lys Glu Leu Ala Asn Gly Asn Asp
195 200 205

Ala Leu Arg Asn Glu Asp Ala Arg Ser Pro Phe Tyr Ser Ala Leu Arg
210 215 220

Asn Thr Pro Ser Phe Lys Asp Arg Asn Gly Gly Asn His Asp Pro Ser
225 230 235 240

Lys Met Lys Ala Val Ile Tyr Ser Lys His Phe Trp Ser Gly Gln Asp
245 250 255

Arg Ser Gly Ser Ser Asp Lys Arg Lys Tyr Gly Asp Pro Glu Ala Phe
260 265 270

Arg Pro Asp Arg Gly Thr Gly Leu Val Asp Met Ser Arg Asp Arg Asn
275 280 285

Ile Pro Arg Ser Pro Thr Ser Pro Gly Glu Ser Phe Val Asn Phe Asp
290 295 300

Tyr Gly Trp Phe Gly Ala Gln Thr Glu Ala Asp Ala Asp Lys Thr Val
305 310 315 320

Trp Thr His Gly Asn His Tyr His Ala Pro Asn Gly Ser Leu Gly Ala

325

330

335

Met His Val Tyr Glu Ser Lys Phe Arg Asn Trp Ser Asp Gly Tyr Ser
 340 345 350

Asp Phe Asp Arg Gly Ala Tyr Val Val Thr Phe Val Pro Lys Ser Trp
 355 360 365

Asn Thr Ala Pro Asp Lys Val Thr Gln Gly Trp Pro
 370 375 380

<210> 4
 <211> 333
 <212> PRT
 <213> Artificial

<220>
 <223> GlyPro-mTGase_Y62H_Y75F from S. ladakanum

<400> 4

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

Arg Met Pro Asp Pro Tyr Arg Pro Ser Tyr Gly Arg Ala Glu Thr Ile
 20 25 30

Val Asn Asn Tyr Ile Arg Lys Trp Gln Gln Val Tyr Ser His Arg Asp
 35 40 45

Gly Arg Lys Gln Gln Met Thr Glu Glu Gln Arg Glu Trp Leu Ser His
 50 55 60

Gly Cys Val Gly Val Thr Trp Val Asn Ser Gly Gln Phe Pro Thr Asn
 65 70 75 80

Arg Leu Ala Phe Ala Phe Phe Asp Glu Asp Lys Tyr Lys Asn Glu Leu
 85 90 95

Lys Asn Gly Arg Pro Arg Ser Gly Glu Thr Arg Ala Glu Phe Glu Gly
 100 105 110

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

Arg Asp Val Ala Ser Val Met Asn Lys Ala Leu Glu Asn Ala His Asp
130 135 140

Glu Gly Ala Tyr Leu Asp Asn Leu Lys Lys Glu Leu Ala Asn Gly Asn
145 150 155 160

Asp Ala Leu Arg Asn Glu Asp Ala Arg Ser Pro Phe Tyr Ser Ala Leu
165 170 175

Arg Asn Thr Pro Ser Phe Lys Asp Arg Asn Gly Gly Asn His Asp Pro
180 185 190

Ser Lys Met Lys Ala Val Ile Tyr Ser Lys His Phe Trp Ser Gly Gln
195 200 205

Asp Arg Ser Gly Ser Ser Asp Lys Arg Lys Tyr Gly Asp Pro Glu Ala
210 215 220

Phe Arg Pro Asp Arg Gly Thr Gly Leu Val Asp Met Ser Arg Asp Arg
225 230 235 240

Asn Ile Pro Arg Ser Pro Thr Ser Pro Gly Glu Ser Phe Val Asn Phe
245 250 255

Asp Tyr Gly Trp Phe Gly Ala Gln Thr Glu Ala Asp Ala Asp Lys Thr
260 265 270

Val Trp Thr His Gly Asn His Tyr His Ala Pro Asn Gly Ser Leu Gly
275 280 285

Ala Met His Val Tyr Glu Ser Lys Phe Arg Asn Trp Ser Asp Gly Tyr
290 295 300

Ser Asp Phe Asp Arg Gly Ala Tyr Val Val Thr Phe Val Pro Lys Ser
305 310 315 320

Trp Asn Thr Ala Pro Asp Lys Val Thr Gln Gly Trp Pro
325 330

<210> 5
<211> 388
<212> PRT
<213> artificial

<220>

<223> propeptide-(3C)-MTGase from *S. ladakanum*

<400> 5

Gly Ser Gly Ser Gly Ser Gly Thr Gly Glu Glu Lys Arg Ser Tyr Ala
1 5 10 15

Glu Thr His Arg Leu Thr Ala Asp Asp Val Asp Asp Ile Asn Ala Leu
20 25 30

Asn Glu Ser Ala Pro Ala Ala Ser Ser Ala Gly Pro Ser Phe Arg Ala
35 40 45

Pro Leu Glu Val Leu Phe Gln Gly Pro Asp Ser Asp Glu Arg Val Thr
50 55 60

Pro Pro Ala Glu Pro Leu Asp Arg Met Pro Asp Pro Tyr Arg Pro Ser
65 70 75 80

Tyr Gly Arg Ala Glu Thr Ile Val Asn Asn Tyr Ile Arg Lys Trp Gln
85 90 95

Gln Val Tyr Ser His Arg Asp Gly Arg Lys Gln Gln Met Thr Glu Glu
100 105 110

Gln Arg Glu Trp Leu Ser His Gly Cys Val Gly Val Thr Trp Val Asn
115 120 125

Ser Gly Gln Phe Pro Thr Asn Arg Leu Ala Phe Ala Phe Phe Asp Glu
130 135 140

Asp Lys Tyr Lys Asn Glu Leu Lys Asn Gly Arg Pro Arg Ser Gly Glu
145 150 155 160

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

Ala Lys Gly Phe Gln Arg Ala Arg Asp Val Ala Ser Val Met Asn Lys
180 185 190

Ala Leu Glu Asn Ala His Asp Glu Gly Ala Tyr Leu Asp Asn Leu Lys
195 200 205

Lys Glu Leu Ala Asn Gly Asn Asp Ala Leu Arg Asn Glu Asp Ala Arg
210 215 220

Ser Pro Phe Tyr Ser Ala Leu Arg Asn Thr Pro Ser Phe Lys Asp Arg
225 230 235 240

Asn Gly Gly Asn His Asp Pro Ser Lys Met Lys Ala Val Ile Tyr Ser
245 250 255

Lys His Phe Trp Ser Gly Gln Asp Arg Ser Gly Ser Ser Asp Lys Arg
260 265 270

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

Val Asp Met Ser Arg Asp Arg Asn Ile Pro Arg Ser Pro Thr Ser Pro
290 295 300

Gly Glu Ser Phe Val Asn Phe Asp Tyr Gly Trp Phe Gly Ala Gln Thr
305 310 315 320

Glu Ala Asp Ala Asp Lys Thr Val Trp Thr His Gly Asn His Tyr His
325 330 335

Ala Pro Asn Gly Ser Leu Gly Ala Met His Val Tyr Glu Ser Lys Phe
340 345 350

Arg Asn Trp Ser Asp Gly Tyr Ser Asp Phe Asp Arg Gly Ala Tyr Val
355 360 365

Val Thr Phe Val Pro Lys Ser Trp Asn Thr Ala Pro Asp Lys Val Thr
370 375 380

Gln Gly Trp Pro
385