

SEQUENCE LISTING

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<120> URIDINE DIPHOSPHATE-DEPENDENT GLYCOSYLTRANSFERASE ENZYME

<130> MAN-024PC/107590-5023

<150> US 62/866,148
 <151> 2019-06-25

<160> 9

<170> PatentIn version 3.5

<210> 1
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 <212> PRT
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<400> 1

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

Ala Asn Val Leu Tyr Ser Lys Gly Phe Ser Ile Thr Ile Phe His Thr
 35 40 45

Asn Phe Asn Lys Pro Lys Thr Ser Asn Tyr Pro His Phe Thr Phe Arg
 50 55 60

Phe Ile Leu Asp Asn Asp Pro Gln Asp Glu Arg Ile Ser Asn Leu Pro
 65 70 75 80

Thr His Gly Pro Leu Ala Gly Met Arg Ile Pro Ile Ile Asn Glu His
 85 90 95

Gly Ala Asp Glu Leu Arg Arg Glu Leu Glu Leu Leu Met Leu Ala Ser
 100 105 110

Glu Glu Asp Glu Glu Val Ser Cys Leu Ile Thr Asp Ala Leu Trp Tyr
115 120 125

Phe Ala Gln Ser Val Ala Asp Ser Leu Asn Leu Arg Arg Leu Val Leu
130 135 140

Met Thr Ser Ser Leu Phe Asn Phe His Ala His Val Ser Leu Pro Gln
145 150 155 160

Phe Asp Glu Leu Gly Tyr Leu Asp Pro Asp Asp Lys Thr Arg Leu Glu
165 170 175

Glu Gln Ala Ser Gly Phe Pro Met Leu Lys Val Lys Asp Ile Lys Ser
180 185 190

Ala Tyr Ser Asn Trp Gln Ile Leu Lys Glu Ile Leu Gly Lys Met Ile
195 200 205

Lys Gln Thr Lys Ala Ser Ser Gly Val Ile Trp Asn Ser Phe Lys Glu
210 215 220

Leu Glu Glu Ser Glu Leu Glu Thr Val Ile Arg Glu Ile Pro Ala Pro
225 230 235 240

Ser Phe Leu Ile Pro Leu Pro Lys His Leu Thr Ala Ser Ser Ser Ser
245 250 255

Leu Leu Asp His Asp Arg Thr Val Phe Gln Trp Leu Asp Gln Gln Pro
260 265 270

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

Glu Lys Asp Phe Leu Glu Ile Ala Arg Gly Leu Val Asp Ser Lys Gln
290 295 300

Ser Phe Leu Trp Val Val Arg Pro Gly Phe Val Lys Gly Ser Thr Trp
305 310 315 320

Val Glu Pro Leu Pro Asp Gly Phe Leu Gly Glu Arg Gly Arg Ile Val

325

330

335

Lys Trp Val Pro Gln Gln Glu Val Leu Ala His Gly Ala Ile Gly Ala
 340 345 350

Phe Trp Thr His Ser Gly Trp Asn Ser Thr Leu Glu Ser Val Cys Glu
 355 360 365

Gly Val Pro Met Ile Phe Ser Asp Phe Gly Leu Asp Gln Pro Leu Asn
 370 375 380

Ala Arg Tyr Met Ser Asp Val Leu Lys Val Gly Val Tyr Leu Glu Asn
 385 390 395 400

Gly Trp Glu Arg Gly Glu Ile Ala Asn Ala Ile Arg Arg Val Met Val
 405 410 415

Asp Glu Glu Gly Glu Tyr Ile Arg Gln Asn Ala Arg Val Leu Lys Gln
 420 425 430

Lys Ala Asp Val Ser Leu Met Lys Gly Gly Ser Ser Tyr Glu Ser Leu
 435 440 445

Glu Ser Leu Val Ser Tyr Ile Ser Ser Leu
 450 455

<210> 2

<211> 459

<212> PRT

<213> Stevia rebaudiana

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Met Ala Asn Trp Gln Ile Leu Lys Glu Ile Leu Gly Lys Met Ile Lys
 1 5 10 15

Gln Thr Lys Ala Ser Ser Gly Val Ile Trp Asn Ser Phe Lys Glu Leu
 20 25 30

Glu Glu Ser Glu Leu Glu Thr Val Ile Arg Glu Ile Pro Ala Pro Ser
 35 40 45

Phe Leu Ile Pro Leu Pro Lys His Leu Thr Ala Ser Ser Ser Ser Leu
50 55 60

Leu Asp His Asp Arg Thr Val Phe Gln Trp Leu Asp Gln Gln Pro Pro
65 70 75 80

Ser Ser Val Leu Tyr Val Ser Phe Gly Ser Thr Ser Glu Val Asp Glu
85 90 95

Lys Asp Phe Leu Glu Ile Ala Arg Gly Leu Val Asp Ser Lys Gln Ser
100 105 110

Phe Leu Trp Val Val Arg Pro Gly Phe Val Lys Gly Ser Thr Trp Val
115 120 125

Glu Pro Leu Pro Asp Gly Phe Leu Gly Glu Arg Gly Arg Ile Val Lys
130 135 140

Trp Val Pro Gln Gln Glu Val Leu Ala His Gly Ala Ile Gly Ala Phe
145 150 155 160

Trp Thr His Ser Gly Trp Asn Ser Thr Leu Glu Ser Val Cys Glu Gly
165 170 175

Val Pro Met Ile Phe Ser Asp Phe Gly Leu Asp Gln Pro Leu Asn Ala
180 185 190

Arg Tyr Met Ser Asp Val Leu Lys Val Gly Val Tyr Leu Glu Asn Gly
195 200 205

Trp Glu Arg Gly Glu Ile Ala Asn Ala Ile Arg Arg Val Met Val Asp
210 215 220

Glu Glu Gly Glu Tyr Ile Arg Gln Asn Ala Arg Val Leu Lys Gln Lys
225 230 235 240

Ala Asp Val Ser Leu Met Lys Gly Gly Ser Ser Tyr Glu Ser Leu Glu
245 250 255

Ser Leu Val Ser Tyr Ile Ser Ser Leu Glu Asn Lys Thr Glu Thr Thr
260 265 270

Val Arg Arg Arg Arg Arg Ile Ile Leu Phe Pro Val Pro Phe Gln Gly
275 280 285

His Ile Asn Pro Ile Leu Gln Leu Ala Asn Val Leu Tyr Ser Lys Gly
290 295 300

Phe Ser Ile Thr Ile Phe His Thr Asn Phe Asn Lys Pro Lys Thr Ser
305 310 315 320

Asn Tyr Pro His Phe Thr Phe Arg Phe Ile Leu Asp Asn Asp Pro Gln
325 330 335

Asp Glu Arg Ile Ser Asn Leu Pro Thr His Gly Pro Leu Ala Gly Met
340 345 350

Arg Ile Pro Ile Ile Asn Glu His Gly Ala Asp Glu Leu Arg Arg Glu
355 360 365

Leu Glu Leu Leu Met Leu Ala Ser Glu Glu Asp Glu Glu Val Ser Cys
370 375 380

Leu Ile Thr Asp Ala Leu Trp Tyr Phe Ala Gln Ser Val Ala Asp Ser
385 390 395 400

Leu Asn Leu Arg Arg Leu Val Leu Met Thr Ser Ser Leu Phe Asn Phe
405 410 415

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

Pro Asp Asp Lys Thr Arg Leu Glu Glu Gln Ala Ser Gly Phe Pro Met
435 440 445

Leu Lys Val Lys Asp Ile Lys Ser Ala Tyr Ser
450 455

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<212> PRT
<213> Stevia rebaudiana

<400> 3

Met Ala Glu Asn Lys Thr Glu Thr Thr Val Arg Arg Arg Arg Arg Ile
1 5 10 15

Ile Leu Phe Pro Val Pro Phe Gln Gly His Ile Asn Pro Ile Leu Gln
20 25 30

Leu Ala Asn Val Leu Tyr Ser Lys Gly Phe Ser Ile Thr Ile Phe His
35 40 45

Thr Asn Phe Asn Lys Pro Lys Thr Ser Asn Tyr Pro His Phe Thr Phe
50 55 60

Arg Phe Ile Leu Asp Asn Asp Pro Gln Asp Glu Arg Ile Ser Asn Leu
65 70 75 80

Pro Thr His Gly Pro Leu Ala Gly Met Arg Ile Pro Ile Ile Asn Glu
85 90 95

His Gly Ala Asp Glu Leu Arg Arg Glu Leu Glu Leu Leu Met Leu Ala
100 105 110

Ser Glu Glu Asp Glu Glu Val Ser Cys Leu Ile Thr Asp Ala Leu Trp
115 120 125

Tyr Phe Ala Gln Ser Val Ala Asp Ser Leu Asn Leu Arg Arg Leu Val
130 135 140

Leu Met Thr Ser Ser Leu Phe Asn Phe His Ala His Val Ser Leu Pro
145 150 155 160

Gln Phe Asp Glu Leu Gly Tyr Leu Asp Pro Asp Asp Lys Thr Arg Leu
165 170 175

Glu Glu Gln Ala Ser Gly Phe Pro Met Leu Lys Val Lys Asp Ile Lys
180 185 190

Ser Ala Tyr Ser Asn Trp Gln Ile Ala Lys Glu Ile Leu Gly Lys Met
195 200 205

Ile Lys Gln Thr Lys Ala Ser Ser Gly Val Ile Trp Asn Ser Phe Lys
210 215 220

Glu Leu Glu Glu Ser Glu Leu Glu Thr Val Ile Arg Glu Ile Pro Ala
225 230 235 240

Pro Ser Phe Leu Ile Pro Leu Pro Lys His Leu Thr Ala Ser Ser Ser
245 250 255

Ser Leu Leu Asp His Asp Arg Thr Val Phe Gln Trp Leu Asp Gln Gln
260 265 270

Pro Pro Ser Ser Val Leu Tyr Val Ser Phe Gly Ser Thr Ser Glu Val
275 280 285

Asp Glu Lys Asp Phe Leu Glu Ile Ala Arg Gly Leu Val Asp Ser Lys
290 295 300

Gln Ser Phe Leu Trp Val Val Arg Pro Gly Phe Val Lys Gly Ser Thr
305 310 315 320

Trp Val Glu Pro Leu Pro Asp Gly Phe Leu Gly Glu Arg Gly Arg Ile
325 330 335

Val Lys Trp Val Pro Gln Gln Glu Val Leu Ala His Gly Ala Ile Gly
340 345 350

Ala Phe Trp Thr His Ser Gly Trp Asn Ser Thr Leu Glu Ser Val Cys
355 360 365

Glu Gly Val Pro Met Ile Phe Ser Asp Phe Gly Leu Asp Gln Pro Leu
370 375 380

Asn Ala Arg Tyr Met Ser Asp Val Leu Lys Val Gly Val Tyr Leu Glu
385 390 395 400

Asn Gly Trp Glu Arg Gly Glu Ile Ala Asn Ala Ile Arg Arg Val Met
405 410 415

Val Asp Glu Glu Gly Glu Tyr Ile Arg Gln Asn Ala Arg Val Leu Lys

420

425

430

Gln Lys Ala Asp Val Ser Leu Met Lys Gly Gly Ser Ser Tyr Glu Ser
 435 440 445

Leu Glu Ser Leu Val Ser Tyr Ile Ser Ser Leu
 450 455

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<213> Stevia rebaudiana

<400> 4

Met Ala Lys Gln Ser Phe Leu Trp Val Val Arg Pro Gly Phe Val Lys
 1 5 10 15

Gly Ser Thr Trp Val Glu Pro Leu Pro Asp Gly Phe Leu Gly Glu Arg
 20 25 30

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

Ala Ile Gly Ala Phe Trp Thr His Ser Gly Trp Asn Ser Thr Leu Glu
 50 55 60

Ser Val Cys Glu Gly Val Pro Met Ile Phe Ser Asp Phe Gly Leu Asp
 65 70 75 80

Gln Pro Leu Asn Ala Arg Tyr Met Ser Asp Val Leu Lys Val Gly Val
 85 90 95

Tyr Leu Glu Asn Gly Trp Glu Arg Gly Glu Ile Ala Asn Ala Ile Arg
 100 105 110

Arg Val Met Val Asp Glu Glu Gly Glu Tyr Ile Arg Gln Asn Ala Arg
 115 120 125

Val Leu Lys Gln Lys Ala Asp Val Ser Leu Met Lys Gly Gly Ser Ser
 130 135 140

Tyr Glu Ser Leu Glu Ser Leu Val Ser Tyr Ile Ser Ser Leu Glu Asn
 145 150 155 160

Lys Thr Glu Thr Thr Val Arg Arg Arg Arg Arg Ile Ile Leu Phe Pro
 165 170 175

Val Pro Phe Gln Gly His Ile Asn Pro Ile Leu Gln Leu Ala Asn Val
 180 185 190

Leu Tyr Ser Lys Gly Phe Ser Ile Thr Ile Phe His Thr Asn Phe Asn
 195 200 205

Lys Pro Lys Thr Ser Asn Tyr Pro His Phe Thr Phe Arg Phe Ile Leu
 210 215 220

Asp Asn Asp Pro Gln Asp Glu Arg Ile Ser Asn Leu Pro Thr His Gly
 225 230 235 240

Pro Leu Ala Gly Met Arg Ile Pro Ile Ile Asn Glu His Gly Ala Asp
 245 250 255

Glu Leu Arg Arg Glu Leu Glu Leu Leu Met Leu Ala Ser Glu Glu Asp
 260 265 270

Glu Glu Val Ser Cys Leu Ile Thr Asp Ala Leu Trp Tyr Phe Ala Gln
 275 280 285

Ser Val Ala Asp Ser Leu Asn Leu Arg Arg Leu Val Leu Met Thr Ser
 290 295 300

Ser Leu Phe Asn Phe His Ala His Val Ser Leu Pro Gln Phe Asp Glu
 305 310 315 320

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

Ser Gly Phe Pro Met Leu Lys Val Lys Asp Ile Lys Ser Ala Tyr Ser
 340 345 350

Asn Trp Gln Ile Ala Lys Glu Ile Leu Gly Lys Met Ile Lys Gln Thr
 355 360 365

Lys Ala Ser Ser Gly Val Ile Trp Asn Ser Phe Lys Glu Leu Glu Glu
370 375 380

Ser Glu Leu Glu Thr Val Ile Arg Glu Ile Pro Ala Pro Ser Phe Leu
385 390 395 400

Ile Pro Leu Pro Lys His Leu Thr Ala Ser Ser Ser Ser Leu Leu Asp
405 410 415

His Asp Arg Thr Val Phe Gln Trp Leu Asp Gln Gln Pro Pro Ser Ser
420 425 430

Val Leu Tyr Val Ser Phe Gly Ser Thr Ser Glu Val Asp Glu Lys Asp
435 440 445

Phe Leu Glu Ile Ala Arg Gly Leu Val Asp Ser
450 455

<210> 5
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<213> Stevia rebaudiana

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

Val Lys Trp Val Pro Gln Gln Glu Val Leu Ala His Gly Ala Ile Gly
35 40 45

Ala Phe Trp Thr His Gly Gly Trp Asn Ser Thr Leu Glu Ser Val Cys
50 55 60

Glu Gly Val Pro Met Ile Phe Ser Asp Phe Gly Leu Asp Gln Pro Leu
65 70 75 80

Asn Ala Arg Tyr Met Ser Asp Val Leu Lys Val Gly Val Tyr Leu Glu

85

90

95

Asn Gly Trp Glu Arg Gly Glu Ile Ala Asn Ala Ile Arg Arg Leu Met
 100 105 110

Val Asp Glu Glu Gly Glu Tyr Ile Arg Gln Asn Ala Arg Val Leu Lys
 115 120 125

Gln Lys Ala Asp Val Ser Leu Met Lys Gly Gly Ser Ser Tyr Glu Ser
 130 135 140

Leu Glu Ser Leu Val Ser Tyr Ile Ser Ser Leu Gly Ser Gly Gly Ser
 145 150 155 160

Gly Gly Ser Gly Arg Arg Arg Arg Ile Ile Leu Phe Pro Val Pro Phe
 165 170 175

Gln Gly His Ile Asn Pro Met Leu Gln Leu Ala Asn Val Leu Tyr Ser
 180 185 190

Lys Gly Phe Ser Ile Thr Ile Phe His Thr Asn Phe Asn Lys Pro Lys
 195 200 205

Thr Ser Asn Tyr Pro His Phe Thr Phe Arg Phe Ile Leu Asp Asn Asp
 210 215 220

Pro Gln Asp Glu Arg Ile Ser Asn Leu Pro Thr His Gly Pro Leu Ala
 225 230 235 240

Gly Met Arg Ile Pro Ile Ile Asn Glu His Gly Ala Asp Glu Leu Arg
 245 250 255

Arg Glu Leu Glu Leu Leu Met Leu Ala Ser Glu Glu Asp Glu Glu Val
 260 265 270

Ser Cys Leu Ile Thr Asp Ala Leu Trp Tyr Phe Ala Gln Ser Val Ala
 275 280 285

Asp Ser Leu Asn Leu Arg Arg Leu Val Leu Met Thr Ser Ser Leu Phe
 290 295 300

Asn Phe His Ala His Val Ser Leu Pro Gln Phe Asp Glu Leu Gly Tyr
305 310 315 320

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

Pro Met Leu Lys Val Lys Asp Ile Lys Ser Ala Tyr Ser Asn Trp Gln
340 345 350

Ile Ala Lys Glu Ile Leu Gly Lys Met Ile Lys Gln Thr Lys Ala Ser
355 360 365

Ser Gly Val Ile Trp Asn Ser Phe Lys Glu Leu Glu Glu Ser Glu Leu
370 375 380

Glu Thr Val Ile Arg Glu Ile Pro Ala Pro Ser Phe Leu Ile Pro Leu
385 390 395 400

Pro Lys His Leu Thr Ala Ser Ser Ser Ser Leu Leu Asp His Asp Arg
405 410 415

Thr Val Phe Gln Trp Leu Asp Gln Gln Pro Pro Ser Ser Val Leu Tyr
420 425 430

Val Ser Phe Gly Ser Thr Ser Glu Val Asp Glu Lys Asp Phe Leu Glu
435 440 445

Ile Ala Arg Gly Leu Val Asp Ser Gln Ser
450 455

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

Trp Val Glu Pro Leu Pro Asp Gly Phe Leu Gly Glu Arg Gly Arg Ile
20 25 30

Val Lys Trp Val Pro Gln Gln Glu Val Leu Ala His Gly Ala Ile Gly
35 40 45

Ala Phe Trp Thr His Gly Gly Trp Asn Ser Thr Leu Glu Ser Val Cys
50 55 60

Glu Gly Val Pro Met Ile Phe Ser Asp Phe Gly Leu Asp Gln Pro Leu
65 70 75 80

Asn Ala Arg Tyr Met Ser Asp Val Leu Lys Val Gly Val Tyr Leu Glu
85 90 95

Asn Gly Trp Glu Arg Gly Glu Ile Ala Asn Ala Ile Arg Arg Leu Met
100 105 110

Val Asp Glu Glu Gly Glu Tyr Ile Arg Gln Asn Ala Arg Val Leu Lys
115 120 125

Gln Lys Ala Asp Val Ser Leu Met Lys Gly Gly Ser Ser Tyr Glu Ser
130 135 140

Leu Glu Ser Leu Val Ser Tyr Ile Ser Ser Leu Gly Ser Gly Gly Ser
145 150 155 160

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

Ile Asn Pro Met Leu Gln Leu Ala Asn Val Leu Tyr Ser Lys Gly Phe
180 185 190

Ser Ile Thr Ile Phe His Thr Asn Phe Asn Lys Pro Lys Thr Ser Asn
195 200 205

Tyr Pro His Phe Thr Phe Arg Phe Ile Leu Asp Asn Asp Pro Gln Asp
210 215 220

Glu Arg Ile Ser Asn Leu Pro Thr His Gly Pro Leu Ala Gly Met Arg
225 230 235 240

Ile Pro Ile Ile Asn Glu His Gly Ala Asp Glu Leu Arg Arg Glu Leu
245 250 255

Glu Leu Gln Met Leu Ala Ser Glu Glu Asp Glu Glu Val Ser Cys Leu
260 265 270

Ile Thr Asp Ala Leu Trp Tyr Phe Ala Gln Ser Val Ala Asp Ser Leu
275 280 285

Asn Leu Pro Arg Leu Val Leu Met Thr Ser Ser Leu Phe Asn Phe His
290 295 300

Ala His Val Ser Leu Pro Gln Phe Asp Glu Leu Gly Tyr Leu Asp Pro
305 310 315 320

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

Lys Val Lys Asp Ile Lys Ser Ala Tyr Ser Asn Trp Gln Ile Ala Lys
340 345 350

Glu Ile Leu Gly Lys Met Ile Lys Gln Thr Lys Ala Ser Ser Gly Val
355 360 365

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

Ile Arg Glu Ile Pro Ala Pro Ser Phe Leu Ile Pro Leu Pro Lys His
385 390 395 400

Leu Thr Ala Ser Ser Ser Ser Leu Leu Glu His Asp Arg Thr Val Phe
405 410 415

Gln Trp Leu Asp Gln Gln Pro Pro Ser Ser Val Leu Tyr Val Ser Phe
420 425 430

Gly Ser Thr Ser Glu Val Asp Glu Lys Asp Phe Leu Glu Ile Ala Arg
435 440 445

Gly Leu Val Asp Ser Gln Ser
450 455

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<213> Artificial Sequence

<220>
<223> Synthetic Sequence

<400> 7

Gly Ser Gly Gly Ser Gly
1 5

<210> 8
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Sequence

<400> 8

Gly Ser Gly Gly Ser Gly Gly Ser Gly
1 5

<210> 9
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<213> Stevia rebaudiana

<400> 9

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

Trp Val Glu Pro Leu Pro Asp Gly Phe Leu Gly Glu Arg Gly Arg Ile
20 25 30

Val Lys Trp Val Pro Gln Gln Glu Val Leu Ala His Gly Ala Ile Gly
35 40 45

Ala Phe Trp Thr His Gly Gly Trp Asn Ser Thr Leu Glu Ser Val Cys
50 55 60

Glu Gly Val Pro Met Ile Phe Gln Asp Phe Gly Leu Asp Gln Pro Leu

65					70						75				80
Asn	Ala	Arg	Tyr	Met	Ser	Asp	Val	Leu	Lys	Val	Gly	Val	Tyr	Leu	Glu
				85					90					95	
Asn	Gly	Trp	Glu	Arg	Gly	Glu	Ile	Ala	Asn	Ala	Ile	Arg	Arg	Leu	Met
			100					105					110		
Val	Asp	Glu	Glu	Gly	Glu	Tyr	Ile	Arg	Gln	Asn	Ala	Arg	Val	Leu	Lys
		115					120					125			
Gln	Lys	Ala	Asp	Val	Ser	Leu	Met	Lys	Gly	Gly	Ser	Ser	Tyr	Glu	Ser
	130					135					140				
Leu	Glu	Ser	Leu	Val	Ser	Tyr	Ile	Ser	Ser	Leu	Gly	Ser	Gly	Gly	Ser
145					150					155					160
Gly	Arg	Arg	Arg	Arg	Ile	Ile	Leu	Phe	Pro	Val	Pro	Phe	Gln	Gly	His
				165					170					175	
Ile	Asn	Pro	Met	Leu	Gln	Leu	Ala	Asn	Val	Leu	Tyr	Ser	Lys	Gly	Phe
			180					185					190		
Ser	Ile	Thr	Ile	Phe	His	Thr	Asn	Phe	Asn	Lys	Pro	Lys	Thr	Ser	Asn
		195					200					205			
Tyr	Pro	His	Phe	Thr	Phe	Arg	Phe	Ile	Leu	Asp	Asn	Asp	Pro	Gln	Asp
	210					215					220				
His	Gly	Pro	Leu	Ala	Gly	Met	Arg	Ile	Pro	Ile	Ile	Asn	Glu	His	Gly
225					230				235					240	
Ala	Asp	Glu	Leu	Arg	Arg	Glu	Leu	Glu	Leu	Gln	Met	Leu	Ala	Ser	Glu
				245					250					255	
Glu	Asp	Glu	Glu	Val	Ser	Cys	Leu	Ile	Thr	Asp	Ala	Leu	Trp	Tyr	Phe
			260					265					270		
Ala	Gln	Ser	Val	Ala	Asp	Ser	Leu	Asn	Leu	Pro	Arg	Leu	Val	Leu	Met
		275					280					285			

Thr Ser Ser Leu Phe Asn Phe His Cys His Val Ser Leu Pro Gln Phe
290 295 300

Asp Glu Leu Gly Tyr Leu Asp Pro Asp Asp Lys Thr Arg Leu Glu Glu
305 310 315 320

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

Phe Ser Asn Trp Gln Ile Ala Lys Glu Ile Leu Gly Lys Met Ile Lys
340 345 350

Gln Thr Lys Ala Ser Ser Gly Val Ile Trp Asn Ser Phe Lys Glu Leu
355 360 365

Glu Glu Ser Glu Leu Glu Thr Val Ile Arg Glu Ile Pro Ala Pro Ser
370 375 380

Phe Leu Ile Pro Leu Pro Lys His Leu Thr Ala Ser Ser Ser Ser Leu
385 390 395 400

Leu Glu His Asp Arg Thr Val Phe Gln Trp Leu Asp Gln Gln Pro Pro
405 410 415

Ser Ser Val Ile Tyr Val Ser Phe Gly Ser Thr Ser Glu Val Asp Glu
420 425 430

Lys Asp Phe Leu Glu Ile Ala Arg Gly Leu Val Asp Ser Gln Ser
435 440 445