SEQUENCE LISTING

<110> VaxInnate Corporation

<120> Methods and Compositions for Providing Protective Immunity in the Elderly

<130> VAX-ELDFLU

<150> 61/292,593
<151> 2010-01-06

<160> 7

<170> PatentIn version 3.5

<210> 1
<211> 727
<212> PRT
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Ser Gly Leu Arg Ile Asn Ser Ala Lys Asp Asp Ala Ala Gly Gln Ala
        35                  40                  45

Ile Ala Asn Arg Phe Thr Ala Asn Ile Lys Gly Leu Thr Gln Ala Ser
    50                  55                  60

Arg Asn Ala Asn Asp Gly Ile Ser Ile Ala Gln Thr Thr Glu Gly Ala
65                  70                  75                  80

Leu Asn Glu Ile Asn Asn Asn Leu Gln Arg Val Arg Glu Leu Ala Val
                85                  90                  95

Gln Ser Ala Asn Ser Thr Asn Ser Gln Ser Asp Leu Asp Ser Ile Gln
            100                 105                 110

Ala Glu Ile Thr Gln Arg Leu Asn Glu Ile Asp Arg Val Ser Gly Gln
        115                 120                 125

Thr Gln Phe Asn Gly Val Lys Val Leu Ala Gln Asp Asn Thr Leu Thr
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Ile Gln Val Gly Ala Asn Asp Gly Glu Thr Ile Asp Ile Asp Leu Lys
145                 150                 155                 160

Gln Ile Asn Ser Gln Thr Leu Gly Leu Asp Ser Leu Asn Val Gln Lys
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Ala Tyr Asp Val Lys Asp Thr Ala Val Thr Thr Lys Ala Tyr Ala Asn
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Asn Gly Thr Thr Leu Asp Val Ser Gly Leu Asp Asp Ala Ala Ile Lys
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Ala Ala Thr Gly Gly Thr Asn Gly Thr Ala Ser Val Thr Gly Gly Ala
210 215 220

Val Lys Phe Asp Ala Asp Asn Asn Lys Tyr Phe Val Thr Ile Gly Gly
225 230 235 240

Phe Thr Gly Ala Asp Ala Ala Lys Asn Gly Asp Tyr Glu Val Asn Val
245 250 255

Ala Thr Asp Gly Thr Val Thr Leu Ala Ala Gly Ala Thr Lys Thr Thr
260 265 270

Met Pro Ala Gly Ala Thr Thr Lys Thr Glu Val Gln Glu Leu Lys Asp
275 280 285

Thr Pro Ala Val Val Ser Ala Asp Ala Lys Asn Ala Leu Ile Ala Gly
290 295 300

Gly Val Asp Ala Thr Asp Ala Asn Gly Ala Glu Leu Val Lys Met Ser
305 310 315 320

Tyr Thr Asp Lys Asn Gly Lys Thr Ile Glu Gly Gly Tyr Ala Leu Lys
325 330 335

Ala Gly Asp Lys Tyr Tyr Ala Ala Asp Tyr Asp Glu Ala Thr Gly Ala
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Ile Lys Ala Lys Thr Thr Ser Tyr Thr Ala Ala Asp Gly Thr Thr Lys
355 360 365

Thr Ala Ala Asn Gln Leu Gly Gly Val Asp Gly Lys Thr Glu Val Val
370 375 380

Thr Ile Asp Gly Lys Thr Tyr Asn Ala Ser Lys Ala Ala Gly His Asp
385 390 395 400

Phe Lys Ala Gln Pro Glu Leu Ala Glu Ala Ala Ala Lys Thr Thr Glu
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Asn Pro Leu Gln Lys Ile Asp Ala Ala Leu Ala Gln Val Asp Ala Leu
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Arg Ser Asp Leu Gly Ala Val Gln Asn Arg Phe Asn Ser Ala Ile Thr
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Asn Leu Gly Asn Thr Val Asn Asn Leu Ser Glu Ala Arg Ser Arg Ile

450 455 460

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

Glu Leu Leu Ile Ser Arg Glu Ser Trp Ser Tyr Ile Val Glu Lys Pro
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Asn Pro Glu Asn Gly Thr Cys Tyr Pro Gly His Phe Ala Asp Tyr Glu
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Glu Leu Arg Glu Gln Leu Ser Ser Val Ser Ser Phe Glu Arg Phe Glu
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Ile Phe Pro Lys Glu Ser Ser Trp Pro Asn His Thr Thr Thr Gly Val
580 585 590

Ser Ala Ser Cys Ser His Asn Gly Glu Ser Ser Phe Tyr Lys Asn Leu
595 600 605

Leu Trp Leu Thr Gly Lys Asn Gly Leu Tyr Pro Asn Leu Ser Lys Ser
610 615 620

Ala Asn Asn Lys Glu Lys Glu Val Leu Val Leu Trp Gly Val His His
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Pro Pro Asn Ile Gly Asp Gln Arg Ala Leu Tyr His Lys Glu Asn Ala
645 650 655

Tyr Val Ser Val Val Ser Ser His Tyr Ser Arg Lys Phe Thr Pro Glu
660 665 670

Ile Ala Lys Arg Pro Lys Val Arg Asp Gln Glu Gly Arg Ile Asn Tyr
675 680 685

Tyr Trp Thr Leu Leu Glu Pro Gly Asp Thr Ile Ile Phe Glu Ala Asn
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Ser Ser Gly Leu Arg Ile Asn Ser Ala Lys Asp Asp Ala Ala Gly Gln
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50 55 60

Ser Arg Asn Ala Asn Asp Gly Ile Ser Ile Ala Gln Thr Thr Glu Gly
65 70 75 80

Ala Leu Asn Glu Ile Asn Asn Asn Leu Gln Arg Val Arg Glu Leu Ala
85 90 95

Val Gln Ser Ala Asn Ser Thr Asn Ser Gln Ser Asp Leu Asp Ser Ile
100 105 110

Gln Ala Glu Ile Thr Gln Arg Leu Asn Glu Ile Asp Arg Val Ser Gly
115 120 125

Gln Thr Gln Phe Asn Gly Val Lys Val Leu Ala Gln Asp Asn Thr Leu
130 135 140

Thr Ile Gln Val Gly Ala Asn Asp Gly Glu Thr Ile Asp Ile Asp Leu
145 150 155 160

Lys Gln Ile Asn Ser Gln Thr Leu Gly Leu Asp Ser Leu Asn Val Gln
165 170 175

Lys Ala Tyr Asp Val Lys Asp Thr Ala Val Thr Thr Lys Ala Tyr Ala

180 185 190

Asn Asn Gly Thr Thr Leu Asp Val Ser Gly Leu Asp Asp Ala Ala Ile
195 200 205

Lys Ala Ala Thr Gly Gly Thr Asn Gly Thr Ala Ser Val Thr Gly Gly
210 215 220

Ala Val Lys Phe Asp Ala Asp Asn Asn Lys Tyr Phe Val Thr Ile Gly
225 230 235 240

Gly Phe Thr Gly Ala Asp Ala Ala Lys Asn Gly Asp Tyr Glu Val Asn
245 250 255

Val Ala Thr Asp Gly Thr Val Thr Leu Ala Ala Gly Ala Thr Lys Thr
260 265 270

Thr Met Pro Ala Gly Ala Thr Thr Lys Thr Glu Val Gln Glu Leu Lys
275 280 285

Asp Thr Pro Ala Val Val Ser Ala Asp Ala Lys Asn Ala Leu Ile Ala
290 295 300

Gly Gly Val Asp Ala Thr Asp Ala Asn Gly Ala Glu Leu Val Lys Met
305 310 315 320

Ser Tyr Thr Asp Lys Asn Gly Lys Thr Ile Glu Gly Gly Tyr Ala Leu
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340 345 350

Ala Ile Lys Ala Lys Thr Thr Ser Tyr Thr Ala Ala Asp Gly Thr Thr
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Lys Thr Ala Ala Asn Gln Leu Gly Gly Val Asp Gly Lys Thr Glu Val
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Asp Phe Lys Ala Gln Pro Glu Leu Ala Glu Ala Ala Ala Lys Thr Thr
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Glu Asn Pro Leu Gln Lys Ile Asp Ala Ala Leu Ala Gln Val Asp Ala
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Leu Arg Ser Asp Leu Gly Ala Val Gln Asn Arg Phe Asn Ser Ala Ile
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Thr Asn Leu Gly Asn Thr Val Asn Asn Leu Ser Glu Ala Arg Ser Arg

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Ile Glu Asp Ser Asp Tyr Ala Thr Glu Val Ser Asn Met Ser Arg Ala
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Gln Ile Leu Gln Gln Ala Gly Thr Ser Val Leu Ala Gln Ala Asn Gln
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Val Pro Gln Asn Val Leu Ser Leu Leu Ala Ser Gly Val Ala Pro Leu
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His Leu Gly Lys Cys Asn Ile Ala Gly Trp Ile Leu Gly Asn Pro Glu
515 520 525

Cys Glu Ser Leu Ser Thr Ala Ser Ser Trp Ser Tyr Ile Val Glu Thr
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Pro Ser Ser Asp Asn Gly Thr Cys Tyr Pro Gly Asp Phe Ile Asp Tyr
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Glu Glu Leu Arg Glu Gln Leu Ser Ser Val Ser Ser Phe Glu Arg Phe
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Glu Ile Phe Pro Lys Thr Ser Ser Trp Pro Asn His Asp Ser Asn Lys
580 585 590

Gly Val Thr Ala Ala Cys Pro His Ala Gly Ala Lys Ser Phe Tyr Lys
595 600 605

Asn Leu Ile Trp Leu Val Lys Lys Gly Asn Ser Tyr Pro Lys Leu Ser
610 615 620

Lys Ser Tyr Ile Asn Asp Lys Gly Lys Glu Val Leu Val Leu Trp Gly
625 630 635 640

Ile His His Pro Ser Thr Ser Ala Asp Gln Gln Ser Leu Tyr Gln Asn
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Ala Asp Ala Tyr Val Phe Val Gly Ser Ser Arg Tyr Ser Lys Lys Phe
660 665 670

Lys Pro Glu Ile Ala Ile Arg Pro Lys Val Arg Asp Gln Glu Gly Arg
675 680 685

Met Asn Tyr Tyr Trp Thr Leu Val Glu Pro Gly Asp Lys Ile Thr Phe
690 695 700

Glu Ala Thr Gly Asn Leu Val Val Pro Arg Tyr Ala Phe Ala Met Glu
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Arg Asn Ala Gly Ser Gly Ile Ile Ile Ser

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aacattgctg gttggattct gggtaaccca gagtgtgaga gcctgtccac cgcgagcagc 660

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Ser Ser Gly Leu Arg Ile Asn Ser Ala Lys Asp Asp Ala Ala Gly Gln
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Ala Ile Ala Asn Arg Phe Thr Ala Asn Ile Lys Gly Leu Thr Gln Ala
50 55 60

Ser Arg Asn Ala Asn Asp Gly Ile Ser Ile Ala Gln Thr Thr Glu Gly
65 70 75 80

Ala Leu Asn Glu Ile Asn Asn Asn Leu Gln Arg Val Arg Glu Leu Ala
85 90 95

Val Gln Ser Ala Asn Ser Thr Asn Ser Gln Ser Asp Leu Asp Ser Ile
100 105 110

Gln Ala Glu Ile Thr Gln Arg Leu Asn Glu Ile Asp Arg Val Ser Gly
115 120 125

Gln Thr Gln Phe Asn Gly Val Lys Val Leu Ala Gln Asp Asn Thr Leu
130 135 140

Thr Ile Gln Val Gly Ala Asn Asp Gly Glu Thr Ile Asp Ile Asp Leu
145 150 155 160

Lys Gln Ile Asn Ser Gln Thr Leu Gly Leu Asp Ser Leu Asn Val Gln
165 170 175

Lys Ala Tyr Asp Val Lys Asp Thr Ala Val Thr Thr Lys Ala Gly Val
180 185 190

Ala Pro Leu His Leu Gly Lys Cys Asn Ile Ala Gly Trp Ile Leu Gly
195 200 205

Asn Pro Glu Cys Glu Ser Leu Ser Thr Ala Ser Ser Trp Ser Tyr Ile
210 215 220

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Val Glu Thr Pro Ser Ser Asp Asn Gly Thr Cys Tyr Pro Gly Asp Phe
225                 230                 235                 240

Ile Asp Tyr Glu Glu Leu Arg Glu Gln Leu Ser Ser Val Ser Ser Phe
                245                 250                 255

Glu Arg Phe Glu Ile Phe Pro Lys Thr Ser Ser Trp Pro Asn His Asp
            260                 265                 270

Ser Asn Lys Gly Val Thr Ala Ala Cys Pro His Ala Gly Ala Lys Ser
        275                 280                 285

Phe Tyr Lys Asn Leu Ile Trp Leu Val Lys Lys Gly Asn Ser Tyr Pro
    290                 295                 300

Lys Leu Ser Lys Ser Tyr Ile Asn Asp Lys Gly Lys Glu Val Leu Val
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Leu Trp Gly Ile His His Pro Ser Thr Ser Ala Asp Gln Gln Ser Leu
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Tyr Gln Asn Ala Asp Ala Tyr Val Phe Val Gly Ser Ser Arg Tyr Ser
            340                 345                 350

Lys Lys Phe Lys Pro Glu Ile Ala Ile Arg Pro Lys Val Arg Asp Gln
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Glu Gly Arg Met Asn Tyr Tyr Trp Thr Leu Val Glu Pro Gly Asp Lys
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Ile Thr Phe Glu Ala Thr Gly Asn Leu Val Val Pro Arg Tyr Ala Phe
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Ala Met Glu Arg Asn Ala Gly Ser Gly Ile Ile Ile Ser Ser Val Val
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Ser Ala Asp Ala Lys Asn Ala Leu Ile Ala Gly Gly Val Asp Ala Thr
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Asp Ala Asn Gly Ala Glu Leu Val Lys Met Ser Tyr Thr Asp Lys Asn
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Gly Lys Thr Ile Glu Gly Gly Tyr Ala Leu Lys Ala Gly Asp Lys Tyr
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Tyr Ala Ala Asp Tyr Asp Glu Ala Thr Gly Ala Ile Lys Ala Lys Thr
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Thr Ser Tyr Thr Ala Ala Asp Gly Thr Thr Lys Thr Ala Ala Asn Gln
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Thr Tyr Asn Ala Ser Lys Ala Ala Gly His Asp Phe Lys Ala Gln Pro
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Glu Leu Ala Glu Ala Ala Ala Lys Thr Thr Glu Asn Pro Leu Gln Lys
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Ile Asp Ala Ala Leu Ala Gln Val Asp Ala Leu Arg Ser Asp Leu Gly
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Ala Val Gln Asn Arg Phe Asn Ser Ala Ile Thr Asn Leu Gly Asn Thr
565 570 575

Val Asn Asn Leu Ser Glu Ala Arg Ser Arg Ile Glu Asp Ser Asp Tyr
580 585 590

Ala Thr Glu Val Ser Asn Met Ser Arg Ala Gln Ile Leu Gln Gln Ala
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Ser Leu Leu Arg
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Ser Ser Gly Leu Arg Ile Asn Ser Ala Lys Asp Asp Ala Ala Gly Gln
        35                  40                  45

Ala Ile Ala Asn Arg Phe Thr Ala Asn Ile Lys Gly Leu Thr Gln Ala
    50                  55                  60

Ser Arg Asn Ala Asn Asp Gly Ile Ser Ile Ala Gln Thr Thr Glu Gly
65                  70                  75                  80

Ala Leu Asn Glu Ile Asn Asn Asn Leu Gln Arg Val Arg Glu Leu Ala
                85                  90                  95

Val Gln Ser Ala Asn Ser Thr Asn Ser Gln Ser Asp Leu Asp Ser Ile
            100                 105                 110

Gln Ala Glu Ile Thr Gln Arg Leu Asn Glu Ile Asp Arg Val Ser Gly
        115                 120                 125

Gln Thr Gln Phe Asn Gly Val Lys Val Leu Ala Gln Asp Asn Thr Leu
    130                 135                 140

Thr Ile Gln Val Gly Ala Asn Asp Gly Glu Thr Ile Asp Ile Asp Leu
145                 150                 155                 160

Lys Gln Ile Asn Ser Gln Thr Leu Gly Leu Asp Ser Leu Asn Val Gln
                165                 170                 175

Lys Ala Tyr Asp Val Lys Asp Thr Ala Val Thr Thr Lys Ala Gly Val
            180                 185                 190

Ala Pro Leu His Leu Gly Lys Cys Asn Ile Ala Gly Trp Ile Leu Gly
        195                 200                 205

Asn Pro Glu Cys Glu Ser Leu Ser Thr Ala Ser Ser Trp Ser Tyr Ile
    210                 215                 220

Val Glu Thr Pro Ser Ser Asp Asn Gly Thr Cys Tyr Pro Gly Asp Phe
225                 230                 235                 240

Ile Asp Tyr Glu Glu Leu Arg Glu Gln Leu Ser Ser Val Ser Ser Phe
                245                 250                 255

Glu Arg Phe Glu Ile Phe Pro Lys Thr Ser Ser Trp Pro Asn His Asp
            260                 265                 270
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Ser Asn Lys Gly Val Thr Ala Ala Cys Pro His Ala Gly Ala Lys Ser
275 280 285

Phe Tyr Lys Asn Leu Ile Trp Leu Val Lys Lys Gly Asn Ser Tyr Pro
290 295 300

Lys Leu Ser Lys Ser Tyr Ile Asn Asp Lys Gly Lys Glu Val Leu Val
305 310 315 320

Leu Trp Gly Ile His His Pro Ser Thr Ser Ala Asp Gln Gln Ser Leu
325 330 335

Tyr Gln Asn Ala Asp Ala Tyr Val Phe Val Gly Ser Ser Arg Tyr Ser
340 345 350

Lys Lys Phe Lys Pro Glu Ile Ala Ile Arg Pro Lys Val Arg Asp Gln
355 360 365

Glu Gly Arg Met Asn Tyr Tyr Trp Thr Leu Val Glu Pro Gly Asp Lys
370 375 380

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

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

Ser Ala Asp Ala Lys Asn Ala Leu Ile Ala Gly Gly Val Asp Ala Thr
420 425 430

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

Gly Lys Thr Ile Glu Gly Gly Tyr Ala Leu Lys Ala Gly Asp Lys Tyr
450 455 460

Tyr Ala Ala Asp Tyr Asp Glu Ala Thr Gly Ala Ile Lys Ala Lys Thr
465 470 475 480

Thr Ser Tyr Thr Ala Ala Asp Gly Thr Thr Lys Thr Ala Ala Asn Gln
485 490 495

Leu Gly Gly Val Asp Gly Lys Thr Glu Val Val Thr Ile Asp Gly Lys
500 505 510

Thr Tyr Asn Ala Ser Lys Ala Ala Gly His Asp Phe Lys Ala Gln Pro
515 520 525

Glu Leu Ala Glu Ala Ala Ala Lys Thr Thr Glu Asn Pro Leu Gln Lys
530 535 540

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Ile Asp Ala Ala Leu Ala Gln Val Asp Ala Leu Arg Ser Asp Leu Gly
545                 550                 555                 560

Ala Val Gln Asn Arg Phe Asn Ser Ala Ile Thr Asn Leu Gly Asn Thr
                565                 570                 575

Val Asn Asn Leu Ser Glu Ala Arg Ser Arg Ile Glu Asp Ser Asp Tyr
            580                 585                 590

Ala Thr Glu Val Ser Asn Met Ser Arg Ala Gln Ile Leu Gln Gln Ala
        595                 600                 605

Gly Thr Ser Val Leu Ala Gln Ala Asn Gln Val Pro Gln Asn Val Leu
    610                 615                 620

Ser Leu Leu Ala Ser Gly Val Ala Pro Leu His Leu Gly Lys Cys Asn
625                 630                 635                 640

Ile Ala Gly Trp Ile Leu Gly Asn Pro Glu Cys Glu Ser Leu Ser Thr
                645                 650                 655

Ala Ser Ser Trp Ser Tyr Ile Val Glu Thr Pro Ser Ser Asp Asn Gly
            660                 665                 670

Thr Cys Tyr Pro Gly Asp Phe Ile Asp Tyr Glu Glu Leu Arg Glu Gln
        675                 680                 685

Leu Ser Ser Val Ser Ser Phe Glu Arg Phe Glu Ile Phe Pro Lys Thr
    690                 695                 700

Ser Ser Trp Pro Asn His Asp Ser Asn Lys Gly Val Thr Ala Ala Cys
705                 710                 715                 720

Pro His Ala Gly Ala Lys Ser Phe Tyr Lys Asn Leu Ile Trp Leu Val
                725                 730                 735

Lys Lys Gly Asn Ser Tyr Pro Lys Leu Ser Lys Ser Tyr Ile Asn Asp
            740                 745                 750

Lys Gly Lys Glu Val Leu Val Leu Trp Gly Ile His His Pro Ser Thr
        755                 760                 765

Ser Ala Asp Gln Gln Ser Leu Tyr Gln Asn Ala Asp Ala Tyr Val Phe
    770                 775                 780

Val Gly Ser Ser Arg Tyr Ser Lys Lys Phe Lys Pro Glu Ile Ala Ile
785                 790                 795                 800

Arg Pro Lys Val Arg Asp Gln Glu Gly Arg Met Asn Tyr Tyr Trp Thr
                805                 810                 815
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Leu Val Glu Pro Gly Asp Lys Ile Thr Phe Glu Ala Thr Gly Asn Leu
            820                 825                 830

Val Val Pro Arg Tyr Ala Phe Ala Met Glu Arg Asn Ala Gly Ser Gly
        835                 840                 845

Ile Ile Ile Ser
    850
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