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SEQUENCE LISTING

<110> PRIMERADX INC.

<120> COMPOSITIONS AND METHODS FOR MULTIMODAL ANALYSIS OF CMET NUCLEIC ACIDS

<130> 046264-077471-PCT

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<150> 61/865,755
<151> 2013-08-14

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<170> PatentIn version 3.5

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<223> /note="Description of Artificial Sequence: Synthetic primer"

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<220>

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35 40 45

Glu Thr Pro Ile Gln Asn Val Ile Leu His Glu His His Ile Phe Leu
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Gly Ala Thr Asn Tyr Ile Tyr Val Leu Asn Glu Glu Asp Leu Gln Lys
65 70 75 80

Val Ala Glu Tyr Lys Thr Gly Pro Val Leu Glu His Pro Asp Cys Phe
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Pro Cys Gln Asp Cys Ser Ser Lys Ala Asn Leu Ser Gly Gly Val Trp
100 105 110

Lys Asp Asn Ile Asn Met Ala Leu Val Val Asp Thr Tyr Tyr Asp Asp
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Gln Leu Ile Ser Cys Gly Ser Val Asn Arg Gly Thr Cys Gln Arg His
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Val Phe Pro His Asn His Thr Ala Asp Ile Gln Ser Glu Val His Cys
145 150 155 160

Ile Phe Ser Pro Gln Ile Glu Glu Pro Ser Gln Cys Pro Asp Cys Val
165 170 175

Val Ser Ala Leu Gly Ala Lys Val Leu Ser Ser Val Lys Asp Arg Phe
180 185 190

Ile Asn Phe Phe Val Gly Asn Thr Ile Asn Ser Ser Tyr Phe Pro Asp
195 200 205

His Pro Leu His Ser Ile Ser Val Arg Arg Leu Lys Glu Thr Lys Asp
210 215 220

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 245 250 255
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 260 265 270
 Thr Phe His Thr Arg Ile Ile Arg Phe Cys Ser Ile Asn Ser Gly Leu
 275 280 285
 His Ser Tyr Met Glu Met Pro Leu Glu Cys Ile Leu Thr Glu Lys Arg
 290 295 300
 Lys Lys Arg Ser Thr Lys Lys Glu Val Phe Asn Ile Leu Gln Ala Ala
 305 310 315 320
 Tyr Val Ser Lys Pro Gly Ala Gln Leu Ala Arg Gln Ile Gly Ala Ser
 325 330 335
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 Ser Ala Glu Pro Met Asp Arg Ser Ala Met Cys Ala Phe Pro Ile Lys
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 Tyr Val Asn Asp Phe Phe Asn Lys Ile Val Asn Lys Asn Asn Val Arg
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 405 410 415
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 420 425 430
 Gln Phe Ser Glu Val Leu Leu Thr Ser Ile Ser Thr Phe Ile Lys Gly
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 Asp Leu Thr Ile Ala Asn Leu Gly Thr Ser Glu Gly Arg Phe Met Gln
 450 455 460
 Val Val Val Ser Arg Ser Gly Pro Ser Thr Pro His Val Asn Phe Leu
 465 470 475 480
 Leu Asp Ser His Pro Val Ser Pro Glu Val Ile Val Glu His Thr Leu
 485 490 495

Asn Gln Asn Gly Tyr Thr Leu Val Ile Thr Gly Lys Lys Ile Thr Lys
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 Ile Pro Leu Asn Gly Leu Gly Cys Arg His Phe Gln Ser Cys Ser Gln
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 Cys Leu Ser Ala Pro Pro Phe Val Gln Cys Gly Trp Cys His Asp Lys
 530 535 540
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 580 585 590
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 Ala Val Lys Leu Lys Ile Asp Leu Ala Asn Arg Glu Thr Ser Ile Phe
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 Ser Tyr Arg Glu Asp Pro Ile Val Tyr Glu Ile His Pro Thr Lys Ser
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 885 890 895
 Asn Lys Ser Cys Glu Asn Ile His Leu His Ser Glu Ala Val Leu Cys
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 Thr Val Pro Asn Asp Leu Leu Lys Leu Asn Ser Glu Leu Asn Ile Glu
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 Thr Ala Leu Leu Leu Leu Leu Gly Phe Phe Leu Trp Leu Lys Lys Arg
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 Val His Thr Pro His Leu Asp Arg Leu Val Ser Ala Arg Ser Val Ser
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 Pro Thr Thr Glu Met Val Ser Asn Glu Ser Val Asp Tyr Arg Ala
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 Thr Phe Pro Glu Asp Gln Phe Pro Asn Ser Ser Gln Asn Gly Ser
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Thr	Ser	Gly	Asp	Ser	Asp	Ile	Ser	Ser	Pro	Leu	Leu	Gln	Asn	Thr
	1055					1060					1065			
Val	His	Ile	Asp	Leu	Ser	Ala	Leu	Asn	Pro	Glu	Leu	Val	Gln	Ala
	1070					1075					1080			
Val	Gln	His	Val	Val	Ile	Gly	Pro	Ser	Ser	Leu	Ile	Val	His	Phe
	1085					1090					1095			
Asn	Glu	Val	Ile	Gly	Arg	Gly	His	Phe	Gly	Cys	Val	Tyr	His	Gly
	1100					1105					1110			
Thr	Leu	Leu	Asp	Asn	Asp	Gly	Lys	Lys	Ile	His	Cys	Ala	Val	Lys
	1115					1120					1125			
Ser	Leu	Asn	Arg	Ile	Thr	Asp	Ile	Gly	Glu	Val	Ser	Gln	Phe	Leu
	1130					1135					1140			
Thr	Glu	Gly	Ile	Ile	Met	Lys	Asp	Phe	Ser	His	Pro	Asn	Val	Leu
	1145					1150					1155			
Ser	Leu	Leu	Gly	Ile	Cys	Leu	Arg	Ser	Glu	Gly	Ser	Pro	Leu	Val
	1160					1165					1170			
Val	Leu	Pro	Tyr	Met	Lys	His	Gly	Asp	Leu	Arg	Asn	Phe	Ile	Arg
	1175					1180					1185			
Asn	Glu	Thr	His	Asn	Pro	Thr	Val	Lys	Asp	Leu	Ile	Gly	Phe	Gly
	1190					1195					1200			
Leu	Gln	Val	Ala	Lys	Gly	Met	Lys	Tyr	Leu	Ala	Ser	Lys	Lys	Phe
	1205					1210					1215			
Val	His	Arg	Asp	Leu	Ala	Ala	Arg	Asn	Cys	Met	Leu	Asp	Glu	Lys
	1220					1225					1230			
Phe	Thr	Val	Lys	Val	Ala	Asp	Phe	Gly	Leu	Ala	Arg	Asp	Met	Tyr
	1235					1240					1245			
Asp	Lys	Glu	Tyr	Tyr	Ser	Val	His	Asn	Lys	Thr	Gly	Ala	Lys	Leu
	1250					1255					1260			
Pro	Val	Lys	Trp	Met	Ala	Leu	Glu	Ser	Leu	Gln	Thr	Gln	Lys	Phe
	1265					1270					1275			
Thr	Thr	Lys	Ser	Asp	Val	Trp	Ser	Phe	Gly	Val	Leu	Leu	Trp	Glu
	1280					1285					1290			

Leu Met Thr Arg Gly Ala Pro Pro Tyr Pro Asp Val Asn Thr Phe
1295 1300 1305

Asp Ile Thr Val Tyr Leu Leu Gln Gly Arg Arg Leu Leu Gln Pro
1310 1315 1320

Glu Tyr Cys Pro Asp Pro Leu Tyr Glu Val Met Leu Lys Cys Trp
1325 1330 1335

His Pro Lys Ala Glu Met Arg Pro Ser Phe Ser Glu Leu Val Ser
1340 1345 1350

Arg Ile Ser Ala Ile Phe Ser Thr Phe Ile Gly Glu His Tyr Val
1355 1360 1365

His Val Asn Ala Thr Tyr Val Asn Val Lys Cys Val Ala Pro Tyr
1370 1375 1380

Pro Ser Leu Leu Ser Ser Glu Asp Asn Ala Asp Asp Glu Val Asp
1385 1390 1395

Thr Arg Pro Ala Ser Phe Trp Glu Thr Ser
1400 1405

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<212> PRT
<213> Homo sapiens

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Met Arg Pro Ser Gly Thr Ala Gly Ala Ala Leu Leu Ala Leu Leu Ala
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Ala Leu Cys Pro Ala Ser Arg Ala Leu Glu Glu Lys Lys Val Cys Gln
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Gly Thr Ser Asn Lys Leu Thr Gln Leu Gly Thr Phe Glu Asp His Phe
35 40 45

Leu Ser Leu Gln Arg Met Phe Asn Asn Cys Glu Val Val Leu Gly Asn
50 55 60

Leu Glu Ile Thr Tyr Val Gln Arg Asn Tyr Asp Leu Ser Phe Leu Lys
65 70 75 80

Thr Ile Gln Glu Val Ala Gly Tyr Val Leu Ile Ala Leu Asn Thr Val
85 90 95

Glu Arg Ile Pro Leu Glu Asn Leu Gln Ile Ile Arg Gly Asn Met Tyr
100 105 110

Tyr Glu Asn Ser Tyr Ala Leu Ala Val Leu Ser Asn Tyr Asp Ala Asn
Page 42

115

120

125

Lys Thr Gly Leu Lys Glu Leu Pro Met Arg Asn Leu Gln Glu Ile Leu
 130 135 140

His Gly Ala Val Arg Phe Ser Asn Asn Pro Ala Leu Cys Asn Val Glu
 145 150 155 160

Ser Ile Gln Trp Arg Asp Ile Val Ser Ser Asp Phe Leu Ser Asn Met
 165 170 175

Ser Met Asp Phe Gln Asn His Leu Gly Ser Cys Gln Lys Cys Asp Pro
 180 185 190

Ser Cys Pro Asn Gly Ser Cys Trp Gly Ala Gly Glu Glu Asn Cys Gln
 195 200 205

Lys Leu Thr Lys Ile Ile Cys Ala Gln Gln Cys Ser Gly Arg Cys Arg
 210 215 220

Gly Lys Ser Pro Ser Asp Cys Cys His Asn Gln Cys Ala Ala Gly Cys
 225 230 235 240

Thr Gly Pro Arg Glu Ser Asp Cys Leu Val Cys Arg Lys Phe Arg Asp
 245 250 255

Glu Ala Thr Cys Lys Asp Thr Cys Pro Pro Leu Met Leu Tyr Asn Pro
 260 265 270

Thr Thr Tyr Gln Met Asp Val Asn Pro Glu Gly Lys Tyr Ser Phe Gly
 275 280 285

Ala Thr Cys Val Lys Lys Cys Pro Arg Asn Tyr Val Val Thr Asp His
 290 295 300

Gly Ser Cys Val Arg Ala Cys Gly Ala Asp Ser Tyr Glu Met Glu Glu
 305 310 315 320

Asp Gly Val Arg Lys Cys Lys Lys Cys Glu Gly Pro Cys Arg Lys Val
 325 330 335

Cys Asn Gly Ile Gly Ile Gly Glu Phe Lys Asp Ser Leu Ser Ile Asn
 340 345 350

Ala Thr Asn Ile Lys His Phe Lys Asn Cys Thr Ser Ile Ser Gly Asp
 355 360 365

Leu His Ile Leu Pro Val Ala Phe Arg Gly Asp Ser Phe Thr His Thr
 370 375 380

Pro Pro Leu Asp Pro Gln Glu Leu Asp Ile Leu Lys Thr Val Lys Glu
 Page 43

385 390 395 400
 Ile Thr Gly Phe Leu₄₀₅ Leu Ile Gln Ala Trp₄₁₀ Pro Glu Asn Arg Thr₄₁₅ Asp
 Leu His Ala Phe₄₂₀ Glu Asn Leu Glu Ile₄₂₅ Ile Arg Gly Arg Thr₄₃₀ Lys Gln
 His Gly Gln₄₃₅ Phe Ser Leu Ala Val₄₄₀ Val Ser Leu Asn Ile₄₄₅ Thr Ser Leu
 Gly Leu₄₅₀ Arg Ser Leu Lys Glu₄₅₅ Ile Ser Asp Gly Asp₄₆₀ Val Ile Ile Ser
 Gly₄₆₅ Asn Lys Asn Leu Cys₄₇₀ Tyr Ala Asn Thr Ile₄₇₅ Asn Trp Lys Lys Leu₄₈₀
 Phe Gly Thr Ser Gly₄₈₅ Gln Lys Thr Lys Ile₄₉₀ Ile Ser Asn Arg Gly₄₉₅ Glu
 Asn Ser Cys Lys₅₀₀ Ala Thr Gly Gln Val₅₀₅ Cys His Ala Leu Cys₅₁₀ Ser Pro
 Glu Gly Cys₅₁₅ Trp Gly Pro Glu Pro₅₂₀ Arg Asp Cys Val Ser₅₂₅ Cys Arg Asn
 Val Ser₅₃₀ Arg Gly Arg Glu Cys₅₃₅ Val Asp Lys Cys Asn₅₄₀ Leu Leu Glu Gly
 Glu₅₄₅ Pro Arg Glu Phe Val₅₅₀ Glu Asn Ser Glu Cys₅₅₅ Ile Gln Cys His Pro₅₆₀
 Glu Cys Leu Pro Gln₅₆₅ Ala Met Asn Ile Thr₅₇₀ Cys Thr Gly Arg Gly₅₇₅ Pro
 Asp Asn Cys Ile₅₈₀ Gln Cys Ala His Tyr₅₈₅ Ile Asp Gly Pro His₅₉₀ Cys Val
 Lys Thr Cys₅₉₅ Pro Ala Gly Val Met₆₀₀ Gly Glu Asn Asn Thr₆₀₅ Leu Val Trp
 Lys Tyr₆₁₀ Ala Asp Ala Gly His₆₁₅ Val Cys His Leu Cys₆₂₀ His Pro Asn Cys
 Thr₆₂₅ Tyr Gly Cys Thr Gly₆₃₀ Pro Gly Leu Glu Gly₆₃₅ Cys Pro Thr Asn Gly₆₄₀
 Pro Lys Ile Pro Ser₆₄₅ Ile Ala Thr Gly Met₆₅₀ Val Gly Ala Leu Leu₆₅₅ Leu
 Leu Leu Val Val Ala Leu Gly Ile Gly Leu Phe Met Arg Arg Arg His
 Page 44

660

665

670

Ile Val Arg Lys Arg Thr Leu Arg Arg Leu Leu Gln Glu Arg Glu Leu
675 680 685

Val Glu Pro Leu Thr Pro Ser Gly Glu Ala Pro Asn Gln Ala Leu Leu
690 695 700

Arg Ile Leu Lys Glu Thr Glu Phe Lys Lys Ile Lys Val Leu Gly Ser
705 710 715 720

Gly Ala Phe Gly Thr Val Tyr Lys Gly Leu Trp Ile Pro Glu Gly Glu
725 730 735

Lys Val Lys Ile Pro Val Ala Ile Lys Glu Leu Arg Glu Ala Thr Ser
740 745 750

Pro Lys Ala Asn Lys Glu Ile Leu Asp Glu Ala Tyr Val Met Ala Ser
755 760 765

Val Asp Asn Pro His Val Cys Arg Leu Leu Gly Ile Cys Leu Thr Ser
770 775 780

Thr Val Gln Leu Ile Thr Gln Leu Met Pro Phe Gly Cys Leu Leu Asp
785 790 795 800

Tyr Val Arg Glu His Lys Asp Asn Ile Gly Ser Gln Tyr Leu Leu Asn
805 810 815

Trp Cys Val Gln Ile Ala Lys Gly Met Asn Tyr Leu Glu Asp Arg Arg
820 825 830

Leu Val His Arg Asp Leu Ala Ala Arg Asn Val Leu Val Lys Thr Pro
835 840 845

Gln His Val Lys Ile Thr Asp Phe Gly Leu Ala Lys Leu Leu Gly Ala
850 855 860

Glu Glu Lys Glu Tyr His Ala Glu Gly Gly Lys Val Pro Ile Lys Trp
865 870 875 880

Met Ala Leu Glu Ser Ile Leu His Arg Ile Tyr Thr His Gln Ser Asp
885 890 895

Val Trp Ser Tyr Gly Val Thr Val Trp Glu Leu Met Thr Phe Gly Ser
900 905 910

Lys Pro Tyr Asp Gly Ile Pro Ala Ser Glu Ile Ser Ser Ile Leu Glu
915 920 925

Lys Gly Glu Arg Leu Pro Gln Pro Pro Ile Cys Thr Ile Asp Val Tyr

930

935

940

Met Ile Met Val Lys Cys Trp Met Ile Asp Ala Asp Ser Arg Pro Lys
 945 950 955 960

Phe Arg Glu Leu Ile Ile Glu Phe Ser Lys Met Ala Arg Asp Pro Gln
 965 970 975

Arg Tyr Leu Val Ile Gln Gly Asp Glu Arg Met His Leu Pro Ser Pro
 980 985 990

Thr Asp Ser Asn Phe Tyr Arg Ala Leu Met Asp Glu Glu Asp Met Asp
 995 1000 1005

Asp Val Val Asp Ala Asp Glu Tyr Leu Ile Pro Gln Gln Gly Phe
 1010 1015 1020

Phe Ser Ser Pro Ser Thr Ser Arg Thr Pro Leu Leu Ser Ser Leu
 1025 1030 1035

Ser Ala Thr Ser Asn Asn Ser Thr Val Ala Cys Ile Asp Arg Asn
 1040 1045 1050

Gly Leu Gln Ser Cys Pro Ile Lys Glu Asp Ser Phe Leu Gln Arg
 1055 1060 1065

Tyr Ser Ser Asp Pro Thr Gly Ala Leu Thr Glu Asp Ser Ile Asp
 1070 1075 1080

Asp Thr Phe Leu Pro Val Pro Glu Tyr Ile Asn Gln Ser Val Pro
 1085 1090 1095

Lys Arg Pro Ala Gly Ser Val Gln Asn Pro Val Tyr His Asn Gln
 1100 1105 1110

Pro Leu Asn Pro Ala Pro Ser Arg Asp Pro His Tyr Gln Asp Pro
 1115 1120 1125

His Ser Thr Ala Val Gly Asn Pro Glu Tyr Leu Asn Thr Val Gln
 1130 1135 1140

Pro Thr Cys Val Asn Ser Thr Phe Asp Ser Pro Ala His Trp Ala
 1145 1150 1155

Gln Lys Gly Ser His Gln Ile Ser Leu Asp Asn Pro Asp Tyr Gln
 1160 1165 1170

Gln Asp Phe Phe Pro Lys Glu Ala Lys Pro Asn Gly Ile Phe Lys
 1175 1180 1185

Gly Ser Thr Ala Glu Asn Ala Glu Tyr Leu Arg Val Ala Pro Gln

1190

1195

1200

Ser Ser Glu Phe Ile Gly Ala
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<213> Homo sapiens

<400> 127
Met Ala Thr Lys Ala Val Cys Val Leu Lys Gly Asp Gly Pro Val Gln
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Gly Ile Ile Asn Phe Glu Gln Lys Glu Ser Asn Gly Pro Val Lys Val
20 25 30

Trp Gly Ser Ile Lys Gly Leu Thr Glu Gly Leu His Gly Phe His Val
35 40 45

His Glu Phe Gly Asp Asn Thr Ala Gly Cys Thr Ser Ala Gly Pro His
50 55 60

Phe Asn Pro Leu Ser Arg Lys His Gly Gly Pro Lys Asp Glu Glu Arg
65 70 75 80

His Val Gly Asp Leu Gly Asn Val Thr Ala Asp Lys Asp Gly Val Ala
85 90 95

Asp Val Ser Ile Glu Asp Ser Val Ile Ser Leu Ser Gly Asp His Cys
100 105 110

Ile Ile Gly Arg Thr Leu Val Val His Glu Lys Ala Asp Asp Leu Gly
115 120 125

Lys Gly Gly Asn Glu Glu Ser Thr Lys Thr Gly Asn Ala Gly Ser Arg
130 135 140

Leu Ala Cys Gly Val Ile Gly Ile Ala Gln
145 150

<210> 128
<211> 308
<212> PRT
<213> Homo sapiens

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Met Gly Glu Ile Lys Val Ser Pro Asp Tyr Asn Trp Phe Arg Gly Thr
1 5 10 15

Val Pro Leu Lys Lys Ile Ile Val Asp Asp Asp Asp Ser Lys Ile Trp
20 25 30

Ser Leu Tyr Asp Ala Gly Pro Arg Ser Ile Arg Cys Pro Leu Ile Phe
Page 47

35

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

Ala Leu Thr Gly Trp Gly Tyr Arg Val Ile Ala Leu Gln Tyr Pro Val
65 70 75 80

Tyr Trp Asp His Leu Glu Phe Cys Asp Gly Phe Arg Lys Leu Leu Asp
85 90 95

His Leu Gln Leu Asp Lys Val His Leu Phe Gly Ala Ser Leu Gly Gly
100 105 110

Phe Leu Ala Gln Lys Phe Ala Glu Tyr Thr His Lys Ser Pro Arg Val
115 120 125

His Ser Leu Ile Leu Cys Asn Ser Phe Ser Asp Thr Ser Ile Phe Asn
130 135 140

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

Lys Lys Ile Val Leu Gly Asn Phe Ser Ser Gly Pro Val Asp Pro Met
165 170 175

Met Ala Asp Ala Ile Asp Phe Met Val Asp Arg Leu Glu Ser Leu Gly
180 185 190

Gln Ser Glu Leu Ala Ser Arg Leu Thr Leu Asn Cys Gln Asn Ser Tyr
195 200 205

Val Glu Pro His Lys Ile Arg Asp Ile Pro Val Thr Ile Met Asp Val
210 215 220

Phe Asp Gln Ser Ala Leu Ser Thr Glu Ala Lys Glu Glu Met Tyr Lys
225 230 235 240

Leu Tyr Pro Asn Ala Arg Arg Ala His Leu Lys Thr Gly Gly Asn Phe
245 250 255

Pro Tyr Leu Cys Arg Ser Ala Glu Val Asn Leu Tyr Val Gln Ile His
260 265 270

Leu Leu Gln Phe His Gly Thr Lys Tyr Ala Ala Ile Asp Pro Ser Met
275 280 285

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

Gln Glu Glu Gln

305

<210> 129
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 <212> PRT
 <213> Homo sapiens

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 Met Asn Ile Phe Arg Leu Thr Gly Asp Leu Ser His Leu Ala Ala Ile
 1 5 10 15

Val Ile Leu Leu Leu Lys Ile Trp Lys Thr Arg Ser Cys Ala Gly Ile
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Ser Gly Lys Ser Gln Leu Leu Phe Ala Leu Val Phe Thr Thr Arg Tyr
 35 40 45

Leu Asp Leu Phe Thr Ser Phe Ile Ser Leu Tyr Asn Thr Ser Met Lys
 50 55 60

Val Ile Tyr Leu Ala Cys Ser Tyr Ala Thr Val Tyr Leu Ile Tyr Leu
 65 70 75 80

Lys Phe Lys Ala Thr Tyr Asp Gly Asn His Asp Thr Phe Arg Val Glu
 85 90 95

Phe Leu Val Val Pro Val Gly Gly Leu Ser Phe Leu Val Asn His Asp
 100 105 110

Phe Ser Pro Leu Glu Ile Leu Trp Thr Phe Ser Ile Tyr Leu Glu Ser
 115 120 125

Val Ala Ile Leu Pro Gln Leu Phe Met Ile Ser Lys Thr Gly Glu Ala
 130 135 140

Glu Thr Ile Thr Thr His Tyr Leu Phe Phe Leu Gly Leu Tyr Arg Ala
 145 150 155 160

Leu Tyr Leu Val Asn Trp Ile Trp Arg Phe Tyr Phe Glu Gly Phe Phe
 165 170 175

Asp Leu Ile Ala Val Val Ala Gly Val Val Gln Thr Ile Leu Tyr Cys
 180 185 190

Asp Phe Phe Tyr Leu Tyr Ile Thr Lys Val Leu Lys Gly Lys Lys Leu
 195 200 205

Ser Leu Pro Ala
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<210> 130
 <211> 4
 <212> PRT

<213> Unknown

<220>

<221> source

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Lys Asp Glu Leu

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<210> 131

<211> 1408

<212> PRT

<213> Homo sapiens

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 <223> /note="Variant residues given in the sequence have no
 preference with respect to those in the annotations
 for variant positions"

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

Ser Glu Met Asn Val Asn Met Lys Tyr Gln Leu Pro Asn Phe Thr Ala
 35 40 45

Glu Thr Pro Ile Gln Asn Val Ile Leu His Glu His His Ile Phe Leu
 50 55 60

Gly Ala Thr Asn Tyr Ile Tyr Val Leu Asn Glu Glu Asp Leu Gln Lys
 65 70 75 80

Val Ala Glu Tyr Lys Thr Gly Pro Val Leu Glu His Pro Asp Cys Phe
 85 90 95

Pro Cys Gln Asp Cys Ser Ser Lys Ala Asn Leu Ser Gly Gly Val Trp
 100 105 110

Lys Asp Asn Ile Asn Met Ala Leu Val Val Asp Thr Tyr Tyr Asp Asp
 115 120 125

Gln Leu Ile Ser Cys Gly Ser Val Asn Arg Gly Thr Cys Gln Arg His
 130 135 140

Val Phe Pro His Asn His Thr Ala Asp Ile Gln Ser Glu Val His Cys
 145 150 155 160

Ile Phe Ser Pro Gln Ile Glu Glu Pro Ser Gln Cys Pro Asp Cys Val
 165 170 175

Val Ser Ala Leu Gly Ala Lys Val Leu Ser Ser Val Lys Asp Arg Phe
 Page 51

180

185

190

Ile Asn Phe Phe Val Gly Asn Thr Ile Asn Ser Ser Tyr Phe Pro Asp
 195 200 205

His Pro Leu His Ser Ile Ser Val Arg Arg Leu Lys Glu Thr Lys Asp
 210 215 220

Gly Phe Met Phe Leu Thr Asp Gln Ser Tyr Ile Asp Val Leu Pro Glu
 225 230 235 240

Phe Arg Asp Ser Tyr Pro Ile Lys Tyr Val His Ala Phe Glu Ser Asn
 245 250 255

Asn Phe Ile Tyr Phe Leu Thr Val Gln Arg Glu Thr Leu Asp Ala Gln
 260 265 270

Thr Phe His Thr Arg Ile Ile Arg Phe Cys Ser Ile Asn Ser Gly Leu
 275 280 285

His Ser Tyr Met Glu Met Pro Leu Glu Cys Ile Leu Thr Glu Lys Arg
 290 295 300

Lys Lys Arg Ser Thr Lys Lys Glu Val Phe Asn Ile Leu Gln Ala Ala
 305 310 315 320

Tyr Val Ser Lys Pro Gly Ala Gln Leu Ala Arg Gln Ile Gly Ala Ser
 325 330 335

Leu Asn Asp Asp Ile Leu Phe Gly Val Phe Ala Gln Ser Lys Pro Asp
 340 345 350

Ser Ala Glu Pro Met Asp Arg Ser Ala Met Cys Ala Phe Pro Ile Lys
 355 360 365

Tyr Val Asn Asp Phe Phe Asn Lys Ile Val Asn Lys Asn Asn Val Arg
 370 375 380

Cys Leu Gln His Phe Tyr Gly Pro Asn His Glu His Cys Phe Asn Arg
 385 390 395 400

Thr Leu Leu Arg Asn Ser Ser Gly Cys Glu Ala Arg Arg Asp Glu Tyr
 405 410 415

Arg Thr Glu Phe Thr Thr Ala Leu Gln Arg Val Asp Leu Phe Met Gly
 420 425 430

Gln Phe Ser Glu Val Leu Leu Thr Ser Ile Ser Thr Phe Ile Lys Gly
 435 440 445

Asp Leu Thr Ile Ala Asn Leu Gly Thr Ser Glu Gly Arg Phe Met Gln
 Page 52

450

455

460

Val Val Val Ser Arg Ser Gly Pro Ser Thr Pro His Val Asn Phe Leu
 465 470 475 480

Leu Asp Ser His Pro Val Ser Pro Glu Val Ile Val Glu His Thr Leu
 485 490 495

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

Ile Pro Leu Asn Gly Leu Gly Cys Arg His Phe Gln Ser Cys Ser Gln
 515 520 525

Cys Leu Ser Ala Pro Pro Phe Val Gln Cys Gly Trp Cys His Asp Lys
 530 535 540

Cys Val Arg Ser Glu Glu Cys Leu Ser Gly Thr Trp Thr Gln Gln Ile
 545 550 555 560

Cys Leu Pro Ala Ile Tyr Lys Val Phe Pro Asn Ser Ala Pro Leu Glu
 565 570 575

Gly Gly Thr Arg Leu Thr Ile Cys Gly Trp Asp Phe Gly Phe Arg Arg
 580 585 590

Asn Asn Lys Phe Asp Leu Lys Lys Thr Arg Val Leu Leu Gly Asn Glu
 595 600 605

Ser Cys Thr Leu Thr Leu Ser Glu Ser Thr Met Asn Thr Leu Lys Cys
 610 615 620

Thr Val Gly Pro Ala Met Asn Lys His Phe Asn Met Ser Ile Ile Ile
 625 630 635 640

Ser Asn Gly His Gly Thr Thr Gln Tyr Ser Thr Phe Ser Tyr Val Asp
 645 650 655

Pro Val Ile Thr Ser Ile Ser Pro Lys Tyr Gly Pro Met Ala Gly Gly
 660 665 670

Thr Leu Leu Thr Leu Thr Gly Asn Tyr Leu Asn Ser Gly Asn Ser Arg
 675 680 685

His Ile Ser Ile Gly Gly Lys Thr Cys Thr Leu Lys Ser Val Ser Asn
 690 695 700

Ser Ile Leu Glu Cys Tyr Thr Pro Ala Gln Thr Ile Ser Thr Glu Phe
 705 710 715 720

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

725

730

735

Ser Tyr Arg Glu Asp Pro Ile Val Tyr Glu Ile His Pro Thr Lys Ser
740 745 750

Phe Ile Ser Thr Trp Trp Lys Glu Pro Leu Asn Ile Val Ser Phe Leu
755 760 765

Phe Cys Phe Ala Ser Gly Gly Ser Thr Ile Thr Gly Val Gly Lys Asn
770 775 780

Leu Asn Ser Val Ser Val Pro Arg Met Val Ile Asn Val His Glu Ala
785 790 795 800

Gly Arg Asn Phe Thr Val Ala Cys Gln His Arg Ser Asn Ser Glu Ile
805 810 815

Ile Cys Cys Thr Thr Pro Ser Leu Gln Gln Leu Asn Leu Gln Leu Pro
820 825 830

Leu Lys Thr Lys Ala Phe Phe Met Leu Asp Gly Ile Leu Ser Lys Tyr
835 840 845

Phe Asp Leu Ile Tyr Val His Asn Pro Val Phe Lys Pro Phe Glu Lys
850 855 860

Pro Val Met Ile Ser Met Gly Asn Glu Asn Val Leu Glu Ile Lys Gly
865 870 875 880

Asn Asp Ile Asp Pro Glu Ala Val Lys Gly Glu Val Leu Lys Val Gly
885 890 895

Asn Lys Ser Cys Glu Asn Ile His Leu His Ser Glu Ala Val Leu Cys
900 905 910

Thr Val Pro Asn Asp Leu Leu Lys Leu Asn Ser Glu Leu Asn Ile Glu
915 920 925

Trp Lys Gln Ala Ile Ser Ser Thr Val Leu Gly Lys Val Ile Val Gln
930 935 940

Pro Asp Gln Asn Phe Thr Gly Leu Ile Ala Gly Val Val Ser Ile Ser
945 950 955 960

Thr Ala Leu Leu Leu Leu Gly Phe Phe Leu Trp Leu Lys Lys Arg
965 970 975

Lys Gln Ile Lys Asp Leu Gly Ser Glu Leu Val Arg Tyr Asp Ala Arg
980 985 990

Val His Thr Pro His Leu Asp Arg Leu Val Ser Ala Arg Ser Val Ser
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995

Pro	Thr 1010	Thr	Glu	Met	Val	Ser 1015	Asn	Glu	Ser	Val	Asp 1020	Tyr	Arg	Ala
Thr	Phe 1025	Pro	Glu	Asp	Gln	Phe 1030	Pro	Asn	Ser	Ser	Gln 1035	Asn	Gly	Ser
Cys	Arg 1040	Gln	Val	Gln	Tyr	Pro 1045	Leu	Thr	Asp	Met	Ser 1050	Pro	Ile	Leu
Thr	Ser 1055	Gly	Asp	Ser	Asp	Ile 1060	Ser	Ser	Pro	Leu	Leu 1065	Gln	Asn	Thr
Val	His 1070	Ile	Asp	Leu	Ser	Ala 1075	Leu	Asn	Pro	Glu	Leu 1080	Val	Gln	Ala
Val	Gln 1085	His	Val	Val	Ile	Gly 1090	Pro	Ser	Ser	Leu	Ile 1095	Val	His	Phe
Asn	Glu 1100	Val	Ile	Gly	Arg	Gly 1105	His	Phe	Gly	Cys	Val 1110	Tyr	His	Gly
Thr	Leu 1115	Leu	Asp	Asn	Asp	Gly 1120	Lys	Lys	Ile	His	Cys 1125	Ala	Val	Lys
Ser	Leu 1130	Asn	Arg	Ile	Thr	Asp 1135	Ile	Gly	Glu	Val	Ser 1140	Gln	Phe	Leu
Thr	Glu 1145	Gly	Ile	Ile	Met	Lys 1150	Asp	Phe	Ser	His	Pro 1155	Asn	Val	Leu
Ser	Leu 1160	Leu	Gly	Ile	Cys	Leu 1165	Arg	Ser	Glu	Gly	Ser 1170	Pro	Leu	Val
Val	Leu 1175	Pro	Tyr	Met	Lys	His 1180	Gly	Asp	Leu	Arg	Asn 1185	Phe	Ile	Arg
Asn	Glu 1190	Thr	His	Asn	Pro	Thr 1195	Val	Lys	Asp	Leu	Ile 1200	Gly	Phe	Gly
Leu	Gln 1205	Val	Ala	Lys	Gly	Met 1210	Lys	Tyr	Leu	Ala	Ser 1215	Lys	Lys	Phe
Val	His 1220	Arg	Asp	Leu	Ala	Ala 1225	Arg	Asn	Cys	Met	Leu 1230	Asp	Glu	Lys
Phe	Thr 1235	Val	Lys	Val	Ala	Asp 1240	Phe	Gly	Leu	Ala	Arg 1245	Asp	Met	Tyr
Asp	Lys	Glu	Tyr	Tyr	Ser	Val	His	Asn	Lys	Thr	Gly	Ala	Lys	Leu

1250

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1260

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His Val Asn Ala Thr Tyr Val Asn Val Lys Cys Val Ala Pro Tyr
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