

SEQUENCE LISTING

<110> ONCOTHERAPY SCIENCE, INC.

<120> DEPDG1 PEPTIDES AND VACCINES INCLUDING THE SAME

<130> ONC-A1602P

<150> JP 2015-159291

<151> 2015-08-12

<150> JP 2015-165779

<151> 2015-08-25

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<170> PatentIn version 3.5

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 1 5 10

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22

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ggcgcgggg ccaacggttg tgccgagact cgccactgcc gcggccgctg ggccctgagt 180

tcgccttcgc cgccatggac gccaccgggc gctgacagac ct atg gag agt cag 234

Met Glu Ser Gln

1

ggt gtg cct ccc ggg cct tat cgg gcc acc aag ctg tgg aat gaa gtt 282

Gly Val Pro Pro Gly Pro Tyr Arg Ala Thr Lys Leu Trp Asn Glu Val

5 10 15 20

acc aca tct ttt cga gca gga atg cct cta aga aaa cac aga caa cac 330

Thr Thr Ser Phe Arg Ala Gly Met Pro Leu Arg Lys His Arg Gln His

25 30 35

ttt aaa aaa tat ggc aat tgt ttc aca gca gga gaa gca gtg gat tgg 378

Phe Lys Lys Tyr Gly Asn Cys Phe Thr Ala Gly Glu Ala Val Asp Trp

40 45 50

ctt tat gac cta tta aga aat aat agc aat ttt ggt cct gaa gtt aca 426

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

55 60 65

agg caa cag act atc caa ctg ttg agg aaa ttt ctt aag aat cat gta 474

Arg Gln Gln Thr Ile Gln Leu Leu Arg Lys Phe Leu Lys Asn His Val

70 75 80

att gaa gat atc aaa ggg agg tgg gga tca gaa aat gtt gat gat aac 522

Ser Lys Arg Gly Val Val Ile Leu Gln Asn Lys Ser Asp Asp Leu Pro	
230 235 240	
cac tgg gta tta tct gcc atg aag tgc cta gca aat tgg cca aga agc	1002
His Trp Val Leu Ser Ala Met Lys Cys Leu Ala Asn Trp Pro Arg Ser	
245 250 255 260	
aat gat atg aat aat cca act tat gtt gga ttt gaa cga gat gta ttc	1050
Asn Asp Met Asn Asn Pro Thr Tyr Val Gly Phe Glu Arg Asp Val Phe	
265 270 275	
aga aca atc gca gat tat ttt cta gat ctc cct gaa cct cta ctt act	1098
Arg Thr Ile Ala Asp Tyr Phe Leu Asp Leu Pro Glu Pro Leu Leu Thr	
280 285 290	
ttt gaa tat tac gaa tta ttt gta aac att ttg gtt gtt tgt ggc tac	1146
Phe Glu Tyr Tyr Glu Leu Phe Val Asn Ile Leu Val Val Cys Gly Tyr	
295 300 305	
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Ile Thr Val Ser Asp Arg Ser Ser Gly Ile His Lys Ile Gln Asp Asp	
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Pro Gln Ser Ser Lys Phe Leu His Leu Asn Asn Leu Asn Ser Phe Lys	
325 330 335 340	
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Ser Thr Glu Cys Leu Leu Leu Ser Leu Leu His Arg Glu Lys Asn Lys	
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gaa gaa tca gat tct act gag aga cta cag ata agc aat cca gga ttt	1338
Glu Glu Ser Asp Ser Thr Glu Arg Leu Gln Ile Ser Asn Pro Gly Phe	
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aga gtg agt gct aat gac ata atg gga gga agt tgt cat aat tta ata	1434
Arg Val Ser Ala Asn Asp Ile Met Gly Gly Ser Cys His Asn Leu Ile	
390	395 400
ggg tta agt aat atg cat gat cta tcc tct aac agc aaa cca agg tgc	1482
Gly Leu Ser Asn Met His Asp Leu Ser Ser Asn Ser Lys Pro Arg Cys	
405	410 415 420
tgt tct ttg gaa gga att gta gat gtg cca ggg aat tca agt aaa gag	1530
Cys Ser Leu Glu Gly Ile Val Asp Val Pro Gly Asn Ser Ser Lys Glu	
425	430 435
gca tcc agt gtc ttt cat caa tct ttt ccg aac ata gaa gga caa aat	1578
Ala Ser Ser Val Phe His Gln Ser Phe Pro Asn Ile Glu Gly Gln Asn	
440	445 450
aat aaa ctg ttt tta gag tct aag ccc aaa cag gaa ttc ctg ttg aat	1626
Asn Lys Leu Phe Leu Glu Ser Lys Pro Lys Gln Glu Phe Leu Leu Asn	
455	460 465
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Leu His Ser Glu Glu Asn Ile Gln Lys Pro Phe Ser Ala Gly Phe Lys	
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Arg Thr Ser Thr Leu Thr Val Gln Asp Gln Glu Glu Leu Cys Asn Gly	
485	490 495 500
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Lys Cys Lys Ser Lys Gln Leu Cys Arg Ser Gln Ser Leu Leu Leu Arg	
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Ser Ser Thr Arg Arg Asn Ser Tyr Ile Asn Thr Pro Val Ala Glu Ile	
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Ile Met Lys Pro Asn Val Gly Gln Gly Ser Thr Ser Val Gln Thr Ala	
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Met Glu Ser Glu Leu Gly Glu Ser Ser Ala Thr Ile Asn Lys Arg Leu	
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Cys Lys Ser Thr Ile Glu Leu Ser Glu Asn Ser Leu Leu Pro Ala Ser	
565 570 575 580	
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Val Ala Ile Asp Ala Leu Gln Leu Cys Cys Leu Leu Leu Pro Pro Pro	
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aat cgt aga aag ctt caa ctt tta atg cgt atg att tcc cga atg agt	2106
Asn Arg Arg Lys Leu Gln Leu Leu Met Arg Met Ile Ser Arg Met Ser	
615 620 625	
caa aat gtt gat atg ccc aaa ctt cat gat gca atg ggt acg agg tca	2154
Gln Asn Val Asp Met Pro Lys Leu His Asp Ala Met Gly Thr Arg Ser	
630 635 640	
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Leu Met Ile His Thr Phe Ser Arg Cys Val Leu Cys Cys Ala Glu Glu	
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Val Asp Leu Asp Glu Leu Leu Ala Gly Arg Leu Val Ser Phe Leu Met	
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Asp His His Gln Glu Ile Leu Gln Val Pro Ser Tyr Leu Gln Thr Ala	
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Val Glu Lys His Leu Asp Tyr Leu Lys Lys Gly His Ile Glu Asn Pro	
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Pro Lys Phe Arg Ser Leu Arg

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810

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 35 40 45

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

Lys Asn His Val Ile Glu Asp Ile Lys Gly Arg Trp Gly Ser Glu Asn
 85 90 95

Val Asp Asp Asn Asn Gln Leu Phe Arg Phe Pro Ala Thr Ser Pro Leu
 100 105 110

Lys Thr Leu Pro Arg Arg Tyr Pro Glu Leu Arg Lys Asn Asn Ile Glu
 115 120 125

Asn Phe Ser Lys Asp Lys Asp Ser Ile Phe Lys Leu Arg Asn Leu Ser
 130 135 140

Arg Arg Thr Pro Lys Arg His Gly Leu His Leu Ser Gln Glu Asn Gly
 145 150 155 160

Glu Lys Ile Lys His Glu Ile Ile Asn Glu Asp Gln Glu Asn Ala Ile
 165 170 175

Asp Asn Arg Glu Leu Ser Gln Glu Asp Val Glu Glu Val Trp Arg Tyr
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Val Ile Leu Ile Tyr Leu Gln Thr Ile Leu Gly Val Pro Ser Leu Glu
 195 200 205

Glu Val Ile Asn Pro Lys Gln Val Ile Pro Gln Tyr Ile Met Tyr Asn
 210 215 220

Met Ala Asn Thr Ser Lys Arg Gly Val Val Ile Leu Gln Asn Lys Ser
 225 230 235 240

Asp Asp Leu Pro His Trp Val Leu Ser Ala Met Lys Cys Leu Ala Asn
 245 250 255

Trp Pro Arg Ser Asn Asp Met Asn Asn Pro Thr Tyr Val Gly Phe Glu
 260 265 270

Arg Asp Val Phe Arg Thr Ile Ala Asp Tyr Phe Leu Asp Leu Pro Glu
 275 280 285

Pro Leu Leu Thr Phe Glu Tyr Tyr Glu Leu Phe Val Asn Ile Leu Val
 290 295 300

Val Cys Gly Tyr Ile Thr Val Ser Asp Arg Ser Ser Gly Ile His Lys
 305 310 315 320

Ile Gln Asp Asp Pro Gln Ser Ser Lys Phe Leu His Leu Asn Asn Leu
 325 330 335

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 340 345 350

Glu Lys Asn Lys Glu Glu Ser Asp Ser Thr Glu Arg Leu Gln Ile Ser
 355 360 365

Asn Pro Gly Phe Gln Glu Arg Cys Ala Lys Lys Met Gln Leu Val Asn
 370 375 380

Leu Arg Asn Arg Arg Val Ser Ala Asn Asp Ile Met Gly Gly Ser Cys
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His Asn Leu Ile Gly Leu Ser Asn Met His Asp Leu Ser Ser Asn Ser
 405 410 415

Lys Pro Arg Cys Cys Ser Leu Glu Gly Ile Val Asp Val Pro Gly Asn
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Ser Ser Lys Glu Ala Ser Ser Val Phe His Gln Ser Phe Pro Asn Ile
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Glu Gly Gln Asn Asn Lys Leu Phe Leu Glu Ser Lys Pro Lys Gln Glu
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Phe Leu Leu Asn Leu His Ser Glu Glu Asn Ile Gln Lys Pro Phe Ser
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Ala Gly Phe Lys Arg Thr Ser Thr Leu Thr Val Gln Asp Gln Glu Glu
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Leu Cys Asn Gly Lys Cys Lys Ser Lys Gln Leu Cys Arg Ser Gln Ser
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Leu Leu Leu Arg Ser Ser Thr Arg Arg Asn Ser Tyr Ile Asn Thr Pro
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Val Ala Glu Ile Ile Met Lys Pro Asn Val Gly Gln Gly Ser Thr Ser
 530 535 540

Val Gln Thr Ala Met Glu Ser Glu Leu Gly Glu Ser Ser Ala Thr Ile
 545 550 555 560

Asn Lys Arg Leu Cys Lys Ser Thr Ile Glu Leu Ser Glu Asn Ser Leu
 565 570 575

Leu Pro Ala Ser Ser Met Leu Thr Gly Thr Gln Ser Leu Leu Gln Pro
 580 585 590

His Leu Glu Arg Val Ala Ile Asp Ala Leu Gln Leu Cys Cys Leu Leu
 595 600 605

Leu Pro Pro Pro Asn Arg Arg Lys Leu Gln Leu Leu Met Arg Met Ile
 610 615 620

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

Ser Phe Leu Met Asp His His Gln Glu Ile Leu Gln Val Pro Ser Tyr
 675 680 685

Leu Gln Thr Ala Val Glu Lys His Leu Asp Tyr Leu Lys Lys Gly His
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Ile Glu Asn Pro Gly Asp Gly Leu Phe Ala Pro Leu Pro Thr Tyr Ser
 705 710 715 720

Tyr Cys Lys Gln Ile Ser Ala Gln Glu Phe Asp Glu Gln Lys Val Ser
 725 730 735

Thr Ser Gln Ala Ala Ile Ala Glu Leu Leu Glu Asn Ile Ile Lys Asn
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Arg Ser Leu Pro Leu Lys Glu Lys Arg Lys Lys Leu Lys Gln Phe Gln
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Lys Glu Tyr Pro Leu Ile Tyr Gln Lys Arg Phe Pro Thr Thr Glu Ser
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Thr Thr Ser Phe Arg Ala Gly Met Pro Leu Arg Lys His Arg Gln His	
25 30 35	
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Phe Lys Lys Tyr Gly Asn Cys Phe Thr Ala Gly Glu Ala Val Asp Trp	
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Leu Tyr Asp Leu Leu Arg Asn Asn Ser Asn Phe Gly Pro Glu Val Thr	
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70 75 80	
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Ile Glu Asp Ile Lys Gly Arg Trp Gly Ser Glu Asn Val Asp Asp Asn	
85 90 95 100	
aac cag ctc ttc aga ttt cct gca act tcg cca ctt aaa act cta cca	570
Asn Gln Leu Phe Arg Phe Pro Ala Thr Ser Pro Leu Lys Thr Leu Pro	
105 110 115	
cga agg tat cca gaa ttg aga aaa aac aac ata gag aac ttt tcc aaa	618
Arg Arg Tyr Pro Glu Leu Arg Lys Asn Asn Ile Glu Asn Phe Ser Lys	

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Asp Lys Asp Ser Ile Phe Lys Leu Arg Asn Leu Ser Arg Arg Thr Pro			
135	140	145	
aaa agg cat gga tta cat tta tct cag gaa aat ggc gag aaa ata aag			714
Lys Arg His Gly Leu His Leu Ser Gln Glu Asn Gly Glu Lys Ile Lys			
150	155	160	
cat gaa ata atc aat gaa gat caa gaa aat gca att gat aat aga gaa			762
His Glu Ile Ile Asn Glu Asp Gln Glu Asn Ala Ile Asp Asn Arg Glu			
165	170	175	180
cta agc cag gaa gat gtt gaa gaa gtt tgg aga tat gtt att ctg atc			810
Leu Ser Gln Glu Asp Val Glu Glu Val Trp Arg Tyr Val Ile Leu Ile			
185	190	195	
tac ctg caa acc att tta ggt gtg cca tcc cta gaa gaa gtc ata aat			858
Tyr Leu Gln Thr Ile Leu Gly Val Pro Ser Leu Glu Glu Val Ile Asn			
200	205	210	
cca aaa caa gta att ccc caa tat ata atg tac aac atg gcc aat aca			906
Pro Lys Gln Val Ile Pro Gln Tyr Ile Met Tyr Asn Met Ala Asn Thr			
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Ser Lys Arg Gly Val Val Ile Leu Gln Asn Lys Ser Asp Asp Leu Pro			
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265	270	275	
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Arg Thr Ile Ala Asp Tyr Phe Leu Asp Leu Pro Glu Pro Leu Leu Thr			
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ttt gaa tat tac gaa tta ttt gta aac att ttg ggc ttg ctg caa cct			1146
Phe Glu Tyr Tyr Glu Leu Phe Val Asn Ile Leu Gly Leu Leu Gln Pro			
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Leu Pro Pro Pro Asn Arg Arg Lys Leu Gln Leu Leu Met Arg Met Ile			
325	330	335	340
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Ser Arg Met Ser Gln Asn Val Asp Met Pro Lys Leu His Asp Ala Met			
345	350	355	
ggt acg agg tca ctg atg ata cat acc ttt tct cga tgt gtg tta tgc			1338
Gly Thr Arg Ser Leu Met Ile His Thr Phe Ser Arg Cys Val Leu Cys			
360	365	370	
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Cys Ala Glu Glu Val Asp Leu Asp Glu Leu Leu Ala Gly Arg Leu Val			
375	380	385	
tct ttc tta atg gat cat cat cag gaa att ctt caa gta ccc tct tac			1434
Ser Phe Leu Met Asp His His Gln Glu Ile Leu Gln Val Pro Ser Tyr			
390	395	400	
tta cag act gca gtg gaa aaa cat ctt gac tac tta aaa aag gga cat			1482
Leu Gln Thr Ala Val Glu Lys His Leu Asp Tyr Leu Lys Lys Gly His			

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att gaa aat cct gga gat gga cta ttt gct cct ttg cca act tac tca				1530
Ile Glu Asn Pro Gly Asp Gly Leu Phe Ala Pro Leu Pro Thr Tyr Ser				
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tac tgt aag cag att agt gct cag gag ttt gat gag caa aaa gtt tct				1578
Tyr Cys Lys Gln Ile Ser Ala Gln Glu Phe Asp Glu Gln Lys Val Ser				
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acc tct caa gct gca att gca gaa ctt tta gaa aat att att aaa aac				1626
Thr Ser Gln Ala Ala Ile Ala Glu Leu Leu Glu Asn Ile Ile Lys Asn				
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agg agt tta cct cta aag gag aaa aga aaa aaa cta aaa cag ttt cag				1674
Arg Ser Leu Pro Leu Lys Glu Lys Arg Lys Lys Leu Lys Gln Phe Gln				
	470	475	480	
aag gaa tat cct ttg ata tat cag aaa aga ttt cca acc acg gag agt				1722
Lys Glu Tyr Pro Leu Ile Tyr Gln Lys Arg Phe Pro Thr Thr Glu Ser				
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Glu Ala Ala Leu Phe Gly Asp Lys Pro Thr Ile Lys Gln Pro Met Leu				
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Ile Leu Arg Lys Pro Lys Phe Arg Ser Leu Arg				
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Trp Asn Glu Val Thr Thr Ser Phe Arg Ala Gly Met Pro Leu Arg Lys

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His Arg Gln His Phe Lys Lys Tyr Gly Asn Cys Phe Thr Ala Gly Glu

35 40 45

Ala Val Asp Trp Leu Tyr Asp Leu Leu Arg Asn Asn Ser Asn Phe Gly
 50 55 60

Pro Glu Val Thr Arg Gln Gln Thr Ile Gln Leu Leu Arg Lys Phe Leu
 65 70 75 80

Lys Asn His Val Ile Glu Asp Ile Lys Gly Arg Trp Gly Ser Glu Asn
 85 90 95

Val Asp Asp Asn Asn Gln Leu Phe Arg Phe Pro Ala Thr Ser Pro Leu
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Lys Thr Leu Pro Arg Arg Tyr Pro Glu Leu Arg Lys Asn Asn Ile Glu
 115 120 125

Asn Phe Ser Lys Asp Lys Asp Ser Ile Phe Lys Leu Arg Asn Leu Ser
 130 135 140

Arg Arg Thr Pro Lys Arg His Gly Leu His Leu Ser Gln Glu Asn Gly
 145 150 155 160

Glu Lys Ile Lys His Glu Ile Ile Asn Glu Asp Gln Glu Asn Ala Ile
 165 170 175

Asp Asn Arg Glu Leu Ser Gln Glu Asp Val Glu Glu Val Trp Arg Tyr
 180 185 190

Val Ile Leu Ile Tyr Leu Gln Thr Ile Leu Gly Val Pro Ser Leu Glu
 195 200 205

Glu Val Ile Asn Pro Lys Gln Val Ile Pro Gln Tyr Ile Met Tyr Asn
 210 215 220

Met Ala Asn Thr Ser Lys Arg Gly Val Val Ile Leu Gln Asn Lys Ser
 225 230 235 240

Asp Asp Leu Pro His Trp Val Leu Ser Ala Met Lys Cys Leu Ala Asn
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Trp Pro Arg Ser Asn Asp Met Asn Asn Pro Thr Tyr Val Gly Phe Glu
 260 265 270

Arg Asp Val Phe Arg Thr Ile Ala Asp Tyr Phe Leu Asp Leu Pro Glu
 275 280 285

Pro Leu Leu Thr Phe Glu Tyr Tyr Glu Leu Phe Val Asn Ile Leu Gly
 290 295 300

Leu Leu Gln Pro His Leu Glu Arg Val Ala Ile Asp Ala Leu Gln Leu
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Cys Cys Leu Leu Leu Pro Pro Pro Asn Arg Arg Lys Leu Gln Leu Leu
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Met Arg Met Ile Ser Arg Met Ser Gln Asn Val Asp Met Pro Lys Leu
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His Asp Ala Met Gly Thr Arg Ser Leu Met Ile His Thr Phe Ser Arg
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Cys Val Leu Cys Cys Ala Glu Glu Val Asp Leu Asp Glu Leu Leu Ala
 370 375 380

Gly Arg Leu Val Ser Phe Leu Met Asp His His Gln Glu Ile Leu Gln
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Val Pro Ser Tyr Leu Gln Thr Ala Val Glu Lys His Leu Asp Tyr Leu
 405 410 415

Lys Lys Gly His Ile Glu Asn Pro Gly Asp Gly Leu Phe Ala Pro Leu
 420 425 430

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