

81595649_ST25.txt
SEQUENCE LISTING

<110> Oral Health Australia Pty Ltd
<120> PREVENTION, TREATMENT AND DIAGNOSIS OF P. GINGIVALIS INFECTION
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<150> AU2008904476
<151> 2008-08-29
<150> AU2008905483
<151> 2008-10-23
<150> US61/151,132
<151> 2009-02-09
<150> AU2009903052
<151> 2009-06-30
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Asp Pro Xaa Xaa
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Thr Ala Trp Ala Asp Pro
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Asn Ser Asn Gln
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Ser Val Ile Pro Ala Thr Gly Pro Leu Phe Thr Gly Thr Ala Ser Ser
 35 40 45

Asn Leu Tyr Ser Ala Asn Phe Glu Tyr Leu Ile Pro Ala Asn Ala Asp
 50 55 60

Pro Val Val Thr Thr Gln Asn Ile Ile Val Thr Gly Gln Gly Glu Val
 65 70 75 80

Val Ile Pro Gly Gly Val Tyr Asp Tyr Cys Ile Thr Asn Pro Glu Pro
 85 90 95

Ala Ser Gly Lys Met Trp Ile Ala Gly Asp Gly Gly Asn Gln Pro Ala
 100 105 110

Arg Tyr Asp Asp Phe Thr Phe Glu Ala Gly Lys Lys Tyr Thr Phe Thr
 115 120 125

Met Arg Arg Ala Gly Met Gly Asp Gly Thr Asp Met Glu Val Glu Asp
 130 135 140

Asp Ser Pro Ala Ser Tyr Thr Tyr Thr Val Tyr Arg Asp Gly Thr Lys
 145 150 155 160

Ile Lys Glu Gly Leu Thr Ala Thr Thr Phe Glu Glu Asp Gly Val Ala
 165 170 175

Ala Gly Asn His Glu Tyr Cys Val Glu Val Lys Tyr Thr Ala Gly Val
 180 185 190

Ser Pro Lys Val Cys Lys Asp Val Thr Val Glu Gly Ser Asn Glu Phe
 195 200 205

Ala Pro Val Gln Asn Leu Thr Gly Ser Ser Val Gly Gln Lys Val Thr
 210 215 220

Leu Lys Trp Asp Ala Pro Asn Gly Thr Pro Asn Pro Asn Pro Asn Pro
 225 230 235 240

Asn Pro Asn Pro Gly Thr Thr Leu Ser Glu Ser Phe Glu Asn Gly Ile
 245 250 255

Pro Ala Ser Trp Lys Thr Ile Asp Ala Asp Gly Asp Gly His Gly Trp
 260 265 270

Lys Pro Gly Asn Ala Pro Gly Ile Ala Gly Tyr Asn Ser Asn Gly Cys
 275 280 285

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

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Asp Asn Tyr Leu Ile Thr Pro Ala Leu Asp Leu Pro Asn Gly Gly Lys
 305 310 315 320

Leu Thr Phe Trp Val Cys Ala Gln Asp Ala Asn Tyr Ala Ser Glu His
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Tyr Ala Val Tyr Ala Ser Ser Thr Gly Asn Asp Ala Ser Asn Phe Thr
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Asn Ala Leu Leu Glu Glu Thr Ile Thr Ala
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Thr Gly Pro Leu Phe Thr Gly Thr Ala Ser Ser Asn Leu Tyr Ser Ala
 20 25 30

Asn Phe Glu Tyr Leu Ile Pro Ala Asn Ala Asp Pro Val Val Thr Thr
 35 40 45

Gln Asn Ile Ile Val Thr Gly Gln Gly Glu Val Val Ile Pro Gly Gly
 50 55 60

Val Tyr Asp Tyr Cys Ile Thr Asn Pro Glu Pro Ala Ser Gly Lys Met
 65 70 75 80

Trp Ile Ala Gly Asp Gly Gly Asn Gln Pro Ala Arg Tyr Asp Asp Phe
 85 90 95

Thr Phe Glu Ala Gly Lys Lys Tyr Thr Phe Thr Met Arg Arg Ala Gly
 100 105 110

Met Gly Asp Gly Thr Asp Met Glu Val Glu Asp Asp Ser Pro Ala Ser
 115 120 125

Tyr Thr Tyr Thr Val Tyr Arg Asp Gly Thr Lys Ile Lys Glu Gly Leu
 130 135 140

Thr Ala Thr Thr Phe Glu Glu Asp Gly Val Ala Ala Gly Asn His Glu
 145 150 155 160

Tyr Cys Val Glu Val Lys Tyr Thr Ala Gly Val Ser Pro Lys Val Cys
 165 170 175

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

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Leu Thr Gly Ser Ser Val Gly Gln Lys Val Thr Leu Lys Trp Asp Ala
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Thr Phe Gly Ser Val Ile Pro Ala Thr Gly Pro Leu Phe Thr Gly Thr
20 25 30

Ala Ser Ser Asn Leu Tyr Ser Ala Asn Phe Glu Tyr Leu Ile Pro Ala
35 40 45

Asn Ala Asp Pro Val Val Thr Thr Gln Asn Ile Ile Val Thr Gly Gln
50 55 60

Gly Glu Val Val Ile Pro Gly Gly Val Tyr Asp Tyr Cys Ile Thr Asn
65 70 75 80

Pro Glu Pro Ala Ser Gly Lys Met Trp Ile Ala Gly Asp Gly Gly Asn
85 90 95

Gln Pro Ala Arg Tyr Asp Asp Phe Thr Phe Glu Ala Gly Lys Lys Tyr
100 105 110

Thr Phe Thr Met Arg Arg Ala Gly Met Gly Asp Gly Thr Asp Met Glu
115 120 125

Val Glu Asp Asp Ser Pro Ala Ser Tyr Thr Tyr Thr Val Tyr Arg Asp
130 135 140

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

Gly Val Ala Ala Gly Asn His Glu Tyr Cys Val Glu Val Lys Tyr Thr
165 170 175

Ala Gly Val Ser Pro Lys Val Cys Lys Asp Val Thr Val Glu Gly Ser
180 185 190

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Asn Glu Phe Ala Pro Val Gln Asn Leu Thr Gly Ser Ser Val Gly Gln
 195 200 205

Lys Val Thr Leu Lys Trp Asp Ala Pro Asn Gly Thr Pro Asn Pro Asn
 210 215 220

Pro Asn Pro Asn Pro Asn Pro Gly Thr Thr Leu Ser Glu Ser Phe Glu
 225 230 235 240

Asn Gly Ile Pro Ala Ser Trp Lys Thr Ile Asp Ala Asp Gly Asp Gly
 245 250 255

His Gly Trp Lys Pro Gly Asn Ala Pro Gly Ile Ala Gly Tyr Asn Ser
 260 265 270

Asn Gly Cys Val Tyr Ser Glu Ser Phe Gly Leu Gly Gly Ile Gly Val
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 35 40 45

Pro Ala Asn Leu Phe Ala Pro Phe Glu Tyr Thr Val Pro Glu Asn Ala
 50 55 60

Asp Pro Ser Cys Ser Pro Thr Asn Met Ile Met Asp Gly Thr Ala Ser
 65 70 75 80

Val Asn Ile Pro Ala Gly Thr Tyr Asp Phe Ala Ile Ala Ala Pro Gln
 85 90 95

Ala Asn Ala Lys Ile Trp Ile Ala Gly Gln Gly Pro Thr Lys Glu Asp
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Asp Tyr Val Phe Glu Ala Gly Lys Lys Tyr His Phe Leu Met Lys Lys
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 Met Gly Ser Gly Asp Gly Thr Glu Leu Thr Ile Ser Glu Gly Gly Gly
 130 135 140
 Ser Asp Tyr Thr Tyr Thr Val Tyr Arg Asp Gly Thr Lys Ile Lys Glu
 145 150 155 160
 Gly Leu Thr Ala Thr Thr Phe Glu Glu Asp Gly Val Ala Thr Gly Asn
 165 170 175
 His Glu Tyr Cys Val Glu Val Lys Tyr Thr Ala Gly Val Ser Pro Lys
 180 185 190
 Val Cys Lys Asp Val Thr Val Glu Gly Ser Asn Glu Phe Ala Pro Val
 195 200 205
 Gln Asn Leu Thr Gly Ser Ala Val Gly Gln Lys Val Thr Leu Lys Trp
 210 215 220
 Asp Ala Pro Asn Gly Thr Pro Asn Pro Asn Pro Asn Pro Asn
 225 230 235 240
 Pro Asn Pro Gly Thr Thr Thr Leu Ser Glu Ser Phe Glu Asn Gly Ile
 245 250 255
 Pro Ala Ser Trp Lys Thr Ile Asp Ala Asp Gly Asp Gly His Gly Trp
 260 265 270
 Lys Pro Gly Asn Ala Pro Gly Ile Ala Gly Tyr Asn Ser Asn Gly Cys
 275 280 285
 Val Tyr Ser Glu Ser Phe Gly Leu Gly Gly Ile Gly Val Leu Thr Pro
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 Asp Asn Tyr Leu Ile Thr Pro Ala Leu Asp Leu Pro Asn Gly Gly Lys
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 Leu Thr Phe Trp Val Cys Ala Gln Asp Ala Asn Tyr Ala Ser Glu His
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 Asn Ala Leu Leu Glu Glu Thr Ile Thr Ala
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Gly Ser Asp Tyr Thr Tyr Thr Val Tyr Arg Asp Gly Thr Lys Ile Lys
 35 40 45

Glu Gly Leu Thr Ala Thr Thr Phe Glu Glu Asp Gly Val Ala Thr Gly
 50 55 60

Asn His Glu Tyr Cys Val Glu Val Lys Tyr Thr Ala Gly Val Ser Pro
 65 70 75 80

Lys Val Cys Lys Asp Val Thr Val Glu Gly Ser Asn Glu Phe Ala Pro
 85 90 95

Val Gln Asn Leu Thr Gly Ser Ala Val Gly Gln Lys Val Thr Leu Lys
 100 105 110

Trp Asp Ala Pro Asn Gly Thr Pro Asn Pro Asn Pro Asn Pro Asn Pro
 115 120 125

Asn Pro Asn Pro Gly Thr Thr Thr Leu Ser Glu Ser Phe
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 20 25 30

Cys Leu Ser Ser Gly Gln Leu Asp Trp Leu Thr Ala His Gly Gly Ser
 35 40 45

Asn Val Val Ser Ser Phe Ser Trp Asn Gly Met Ala Leu Asn Pro Asp
 50 55 60

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

Tyr Tyr Ala Val Asn Asp Gly Phe Pro Gly Asp His Tyr Ala Val Met
 Page 15

81595649_ST25.txt

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Ile Ser Lys Thr Gly Thr Asn Ala Gly Asp Phe Thr Val Val Phe Glu
 100 105 110

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

Asp Tyr Thr Tyr Thr Val Tyr Arg Asp Gly Thr Lys Ile Lys Glu Gly
 50 55 60

Leu Thr Glu Thr Thr Phe Glu Glu Asp Gly Val Ala Thr Gly Asn His
 65 70 75 80

Glu Tyr Cys Val Glu Val Lys Tyr Thr Ala Gly Val Ser Pro Lys Lys
 85 90 95

Cys Val Asn Val Thr Val Asn Ser Thr Gln Phe Asn Pro Val Gln Asn
 100 105 110

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

Ser Ser Ala Ser Tyr Ile Asn Phe Glu Gly Pro Gln Asn Pro Asp Asn
 50 55 60

Tyr Leu Val Thr Pro Glu Leu Ser Leu Pro Gly Gly Gly Thr Leu Thr
 65 70 75 80

Phe Trp Val Cys Ala Gln Asp Ala Asn Tyr Ala Ser Glu His Tyr Ala
 85 90 95

Val Tyr Ala Ser Ser Thr Gly Asn Asp Ala Ser Asn Phe Ala Asn Ala
 100 105 110

Leu Leu Glu Glu Val Leu Thr Ala
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 20 25 30

Ala Phe Arg His Phe Gly Cys Thr Asp Phe Phe Trp Ile Asn Leu Asp
 35 40 45

Asp Val Val Ile Thr Ser Gly Asn Ala Pro Ser Tyr Thr Tyr Thr Ile
 50 55 60

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

Arg Asp Pro Asp Leu Ala Thr Gly Phe Tyr Thr Tyr Gly Val Lys Val
 85 90 95

Val Tyr Pro Asn Gly Glu Ser Ala Ile Glu Thr Ala Thr Leu Asn Ile
 100 105 110

Thr Ser Leu Ala Asp Val Thr Ala Gln Lys Pro Tyr Thr Leu Thr Val
 115 120 125

Val Gly Lys Thr Ile Thr Val Thr Cys Gln Gly Glu Ala Met Ile Tyr
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Asp Met Asn Gly Arg Arg Leu Ala Ala Gly Arg Asn Thr Val Val Tyr
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Thr Ala Gln Gly Gly His Tyr Ala Val Met Val Val Val Asp Gly Lys
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Ser Tyr Val Glu Lys Leu Ala Val Lys
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 20 25 30

Cys Leu Ser Ser Gly Gln Leu Asp Trp Leu Thr Ala His Gly Gly Thr
 35 40 45

Asn Val Val Ser Ser Phe Ser Trp Asn Gly Met Ala Leu Asn Pro Asp
 50 55 60

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

Tyr Tyr Ala Val Asn Asp Gly Phe Pro Gly Asp His Tyr Ala Val Met
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Glu Thr Pro Asn Gly Ile Asn
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 20 25 30

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 35 40 45

81595649_ST25.txt

Asp Tyr Thr Tyr Thr Val Tyr Arg Asp Gly Thr Lys Ile Lys Glu Gly
50 55 60

Leu Thr Glu Thr Thr Phe Glu Glu Asp Gly Val Ala Thr Gly Asn His
65 70 75 80

Glu Tyr Cys Val Glu Val Lys Tyr Thr Ala Gly Val Ser Pro Lys Lys
85 90 95

Cys Val Asn Val Thr Val Asn Ser Thr Gln Phe Asn Pro Val Lys Asn
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20 25 30

Ser Val Ile Pro Ala Thr Gly Pro Leu Phe Thr Gly Thr Ala Ser Ser
35 40 45

Asp Leu Tyr Ser Ala Asn Phe Glu Ser Leu Ile Pro Ala Asn Ala Asp
50 55 60

Pro Val Val Thr Thr Gln Asn Ile Ile Val Thr Gly Gln Gly Glu Val
65 70 75 80

Val Ile Pro Gly Gly Val Tyr Asp Tyr Cys Ile Thr Asn Pro Glu Pro
85 90 95

Ala Ser Gly Lys Met Trp Ile Ala Gly Asp Gly Gly Asn Gln Pro Ala
100 105 110

Arg Tyr Asp Asp Phe Thr Phe Glu Ala Gly Lys Lys Tyr Thr Phe Thr
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Met Arg Arg Ala Gly Met Gly Asp Gly Thr Asp Met Glu Val Glu Asp
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81595649_ST25.txt

Asp Ser Pro Ala Ser Tyr Thr Tyr Thr Val Tyr Arg Asp Gly Thr Lys
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Ile Lys Glu Gly Leu Thr Glu Thr Thr Tyr Arg Asp Ala Gly Met Ser
165 170 175

Ala Gln Ser His Glu Tyr Cys Val Glu Val Lys Tyr Thr Ala Gly Val
180 185 190

Ser Pro Lys Val Cys Val Asp Tyr Ile Pro Asp Gly Val Ala Asp Val
195 200 205

Thr Ala Gln Lys Pro Tyr Thr Leu Thr Val Val Gly Lys Thr Ile Thr
210 215 220

Val Thr Cys Gln Gly Glu Ala Met Ile Tyr Asp Met Asn Gly Arg Arg
225 230 235 240

Leu Ala Ala Gly Arg Asn Thr Val Val Tyr Thr Ala Gln Gly Gly Tyr
245 250 255

Tyr Ala Val Met Val Val Val Asp Gly Lys Ser Tyr Val Glu Lys Leu
260 265 270

Ala Ile Lys
275

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49

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<211> 36
<212> DNA
<213> Porphyromonas gingivalis

<400> 48
gactcgagtt atttgtcctt attagtgagt gctttc

36

<210> 49
<211> 31
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<213> Porphyromonas gingivalis

<400> 49
gaccatggct tggggagaca atacgggtta c

31

<210> 50
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<212> DNA
<213> Porphyromonas gingivalis

81595649_ST25.txt

<400> 50
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 <211> 41
 <212> DNA
 <213> Porphyromonas gingivalis

<400> 51
 ccgtattgtc tccccatttg tccttattag tgagtgc ttt c 41

<210> 52
 <211> 37
 <212> DNA
 <213> Porphyromonas gingivalis

<400> 52
 cactaataag gacaaatggg gagacaatac gggttac 37

<210> 53
 <211> 51
 <212> DNA
 <213> Porphyromonas gingivalis

<400> 53
 catggatctg agaccgcatg ggctgatcca cttttcttgt tggatgccga t 51

<210> 54
 <211> 62
 <212> DNA
 <213> Porphyromonas gingivalis

<400> 54
 ccatggcttt gaataccgga gtcagctttg caaactatac agcgcattga tctgagaccg 60
 ca 62

<210> 55
 <211> 25
 <212> DNA
 <213> Porphyromonas gingivalis

<400> 55
 ctcgaggaat gattcggaaa gtgtt 25

<210> 56
 <211> 53
 <212> DNA
 <213> Porphyromonas gingivalis

<400> 56
 ccatggctga ttatagctgg aattcccagg tagtcagctt tgcaaactat aca 53

<210> 57
 <211> 52
 <212> DNA
 <213> Porphyromonas gingivalis

<400> 57
 ctttgcaaac tatacagcgc atggatctga gaccgcatgg gctgatccac tt 52

81595649_ST25.txt

<210> 58
 <211> 52
 <212> DNA
 <213> Porphyromonas gingivalis

<400> 58
 atgggctgat ccacttctga attcttattg gggcgagatc ggcaatatta cc 52

<210> 59
 <211> 52
 <212> DNA
 <213> Porphyromonas gingivalis

<400> 59
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<210> 60
 <211> 52
 <212> DNA
 <213> Porphyromonas gingivalis

<400> 60
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<210> 61
 <211> 1706
 <212> PRT
 <213> Porphyromonas gingivalis

<400> 61

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

Asn Val Arg Leu Leu Glu Ser Thr Gln Gln Ser Val Thr Lys Val Gln
 35 40 45

Phe Arg Met Asp Asn Leu Lys Phe Thr Glu Val Gln Thr Pro Lys Gly
 50 55 60

Ile Gly Gln Val Pro Thr Tyr Thr Glu Gly Val Asn Leu Ser Glu Lys
 65 70 75 80

Gly Met Pro Thr Leu Pro Ile Leu Ser Arg Ser Leu Ala Val Ser Asp
 85 90 95

Thr Arg Glu Met Lys Val Glu Val Val Ser Ser Lys Phe Ile Glu Lys
 100 105 110

Lys Asn Val Leu Ile Ala Pro Ser Lys Gly Met Ile Met Arg Asn Glu
 115 120 125

81595649_ST25.txt

Asp Pro Lys Lys Ile Pro Tyr Val Tyr Gly Lys Thr Tyr Ser Gln Asn
 130 135 140

Lys Phe Phe Pro Gly Glu Ile Ala Thr Leu Asp Asp Pro Phe Ile Leu
 145 150 155 160

Arg Asp Val Arg Gly Gln Val Val Asn Phe Ala Pro Leu Gln Tyr Asn
 165 170 175

Pro Val Thr Lys Thr Leu Arg Ile Tyr Thr Glu Ile Thr Val Ala Val
 180 185 190

Ser Glu Thr Ser Glu Gln Gly Lys Asn Ile Leu Asn Lys Lys Gly Thr
 195 200 205

Phe Ala Gly Phe Glu Asp Thr Tyr Lys Arg Met Phe Met Asn Tyr Glu
 210 215 220

Pro Gly Arg Tyr Thr Pro Val Glu Glu Lys Gln Asn Gly Arg Met Ile
 225 230 235 240

Val Ile Val Ala Lys Lys Tyr Glu Gly Asp Ile Lys Asp Phe Val Asp
 245 250 255

Trp Lys Asn Gln Arg Gly Leu Arg Thr Glu Val Lys Val Ala Glu Asp
 260 265 270

Ile Ala Ser Pro Val Thr Ala Asn Ala Ile Gln Gln Phe Val Lys Gln
 275 280 285

Glu Tyr Glu Lys Glu Gly Asn Asp Leu Thr Tyr Val Leu Leu Ile Gly
 290 295 300

Asp His Lys Asp Ile Pro Ala Lys Ile Thr Pro Gly Ile Lys Ser Asp
 305 310 315 320

Gln Val Tyr Gly Gln Ile Val Gly Asn Asp His Tyr Asn Glu Val Phe
 325 330 335

Ile Gly Arg Phe Ser Cys Glu Ser Lys Glu Asp Leu Lys Thr Gln Ile
 340 345 350

Asp Arg Thr Ile His Tyr Glu Arg Asn Ile Thr Thr Glu Asp Lys Trp
 355 360 365

Leu Gly Gln Ala Leu Cys Ile Ala Ser Ala Glu Gly Gly Pro Ser Ala
 370 375 380

Asp Asn Gly Glu Ser Asp Ile Gln His Glu Asn Val Ile Ala Asn Leu
 385 390 395 400

81595649_ST25.txt

Leu Thr Gln Tyr Gly Tyr Thr Lys Ile Ile Lys Cys Tyr Asp Pro Gly
 405 410 415

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

Ala Asn Tyr Thr Gly His Gly Ser Glu Thr Ala Trp Gly Thr Ser His
 435 440 445

Phe Gly Thr Thr His Val Lys Gln Leu Thr Asn Ser Asn Gln Leu Pro
 450 455 460

Phe Ile Phe Asp Val Ala Cys Val Asn Gly Asp Phe Leu Phe Ser Met
 465 470 475 480

Pro Cys Phe Ala Glu Ala Leu Met Arg Ala Gln Lys Asp Gly Lys Pro
 485 490 495

Thr Gly Thr Val Ala Ile Ile Ala Ser Thr Ile Asn Gln Ser Trp Ala
 500 505 510

Ser Pro Met Arg Gly Gln Asp Glu Met Asn Glu Ile Leu Cys Glu Lys
 515 520 525

His Pro Asn Asn Ile Lys Arg Thr Phe Gly Gly Val Thr Met Asn Gly
 530 535 540

Met Phe Ala Met Val Glu Lys Tyr Lys Lys Asp Gly Glu Lys Met Leu
 545 550 555 560

Asp Thr Trp Thr Val Phe Gly Asp Pro Ser Leu Leu Val Arg Thr Leu
 565 570 575

Val Pro Thr Lys Met Gln Val Thr Ala Pro Ala Gln Ile Asn Leu Thr
 580 585 590

Asp Ala Ser Val Asn Val Ser Cys Asp Tyr Asn Gly Ala Ile Ala Thr
 595 600 605

Ile Ser Ala Asn Gly Lys Met Phe Gly Ser Ala Val Val Glu Asn Gly
 610 615 620

Thr Ala Thr Ile Asn Leu Thr Gly Leu Thr Asn Glu Ser Thr Leu Thr
 625 630 635 640

Leu Thr Val Val Gly Tyr Asn Lys Glu Thr Val Ile Lys Thr Ile Asn
 645 650 655

Thr Asn Gly Glu Pro Asn Pro Tyr Gln Pro Val Ser Asn Leu Thr Ala
 660 665 670

81595649_ST25.txt

Thr Thr Gln Gly Gln Lys Val Thr 680 Leu Lys Trp Asp Ala 685 Pro Ser Thr
675

Lys Thr Asn Ala Thr Thr Asn Thr Ala Arg Ser Val 700 Asp Gly Ile Arg
690 695

Glu Leu Val Leu Leu Ser Val Ser Asp Ala Pro 715 Glu Leu Leu Arg Ser
705 710 720

Gly Gln Ala Glu Ile 725 Val Leu Glu Ala His 730 Asp Val Trp Asn 735 Asp Gly
735

Ser Gly Tyr Gln Ile Leu Leu Asp Ala 745 Asp His Asp Gln Tyr 750 Gly Gln
740

Val Ile Pro Ser Asp Thr His Thr 760 Leu Trp Pro Asn Cys 765 Ser Val Pro
755

Ala Asn Leu Phe Ala Pro Phe 775 Glu Tyr Thr Val Pro 780 Glu Asn Ala Asp
770

Pro Ser Cys Ser Pro Thr 790 Asn Met Ile Met Asp 795 Gly Thr Ala Ser Val
785 800

Asn Ile Pro Ala Gly Thr Tyr Asp Phe Ala 810 Ile Ala Ala Pro Gln Ala
805 815

Asn Ala Lys Ile Trp Ile Ala Gly Gln 825 Gly Pro Thr Lys Glu 830 Asp Asp
820

Tyr Val Phe Glu Ala Gly Lys Lys 840 Tyr His Phe Leu Met 845 Lys Lys Met
835

Gly Ser Gly Asp Gly Thr Glu 855 Leu Thr Ile Ser Glu 860 Gly Gly Gly Ser
850

Asp Tyr Thr Tyr Thr Val 870 Tyr Arg Asp Gly Thr 875 Lys Ile Lys Glu Gly
865 880

Leu Thr Ala Thr Thr 885 Phe Glu Glu Asp Gly 890 Val Ala Thr Gly Asn His
895

Glu Tyr Cys Val 900 Glu Val Lys Tyr Thr 905 Ala Gly Val Ser Pro 910 Lys Val
910

Cys Lys Asp Val Thr Val Glu Gly 920 Ser Asn Glu Phe Ala 925 Pro Val Gln
915

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

81595649_ST25.txt

Ala Pro Asn Gly Thr Pro Asn Pro Asn Pro Asn Pro Asn Pro
 945 950 955 960

Asn Pro Gly Thr Thr Thr Leu Ser Glu Ser Phe Glu Asn Gly Ile Pro
 965 970 975

Ala Ser Trp Lys Thr Ile Asp Ala Asp Gly Asp Gly His Gly Trp Lys
 980 985 990

Pro Gly Asn Ala Pro Gly Ile Ala Gly Tyr Asn Ser Asn Gly Cys Val
 995 1000 1005

Tyr Ser Glu Ser Phe Gly Leu Gly Gly Ile Gly Val Leu Thr Pro
 1010 1015 1020

Asp Asn Tyr Leu Ile Thr Pro Ala Leu Asp Leu Pro Asn Gly Gly
 1025 1030 1035

Lys Leu Thr Phe Trp Val Cys Ala Gln Asp Ala Asn Tyr Ala Ser
 1040 1045 1050

Glu His Tyr Ala Val Tyr Ala Ser Ser Thr Gly Asn Asp Ala Ser
 1055 1060 1065

Asn Phe Thr Asn Ala Leu Leu Glu Glu Thr Ile Thr Ala Lys Gly
 1070 1075 1080

Val Arg Ser Pro Glu Ala Met Arg Gly Arg Ile Gln Gly Thr Trp
 1085 1090 1095

Arg Gln Lys Thr Val Asp Leu Pro Ala Gly Thr Lys Tyr Val Ala
 1100 1105 1110

Phe Arg His Phe Gln Ser Thr Asp Met Phe Tyr Ile Asp Leu Asp
 1115 1120 1125

Glu Val Glu Ile Lys Ala Asn Gly Lys Arg Ala Asp Phe Thr Glu
 1130 1135 1140

Thr Phe Glu Ser Ser Thr His Gly Glu Ala Pro Ala Glu Trp Thr
 1145 1150 1155

Thr Ile Asp Ala Asp Gly Asp Gly Gln Gly Trp Leu Cys Leu Ser
 1160 1165 1170

Ser Gly Gln Leu Asp Trp Leu Thr Ala His Gly Gly Thr Asn Val
 1175 1180 1185

Val Ser Ser Phe Ser Trp Asn Gly Met Ala Leu Asn Pro Asp Asn
 1190 1195 1200

81595649_ST25.txt

Tyr	Leu	Ile	Ser	Lys	Asp	Val	Thr	Gly	Ala	Thr	Lys	Val	Lys	Tyr
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Tyr	Tyr	Ala	Val	Asn	Asp	Gly	Phe	Pro	Gly	Asp	His	Tyr	Ala	Val
	1220					1225					1230			
Met	Ile	Ser	Lys	Thr	Gly	Thr	Asn	Ala	Gly	Asp	Phe	Thr	Val	Val
	1235					1240					1245			
Phe	Glu	Glu	Thr	Pro	Asn	Gly	Ile	Asn	Lys	Gly	Gly	Ala	Arg	Phe
	1250					1255					1260			
Gly	Leu	Ser	Thr	Glu	Ala	Asp	Gly	Ala	Lys	Pro	Gln	Ser	Val	Trp
	1265					1270					1275			
Ile	Glu	Arg	Thr	Val	Asp	Leu	Pro	Ala	Gly	Thr	Lys	Tyr	Val	Ala
	1280					1285					1290			
Phe	Arg	His	Tyr	Asn	Cys	Ser	Asp	Leu	Asn	Tyr	Ile	Leu	Leu	Asp
	1295					1300					1305			
Asp	Ile	Gln	Phe	Thr	Met	Gly	Gly	Ser	Pro	Thr	Pro	Thr	Asp	Tyr
	1310					1315					1320			
Thr	Tyr	Thr	Val	Tyr	Arg	Asp	Gly	Thr	Lys	Ile	Lys	Glu	Gly	Leu
	1325					1330					1335			
Thr	Glu	Thr	Thr	Phe	Glu	Glu	Asp	Gly	Val	Ala	Thr	Gly	Asn	His
	1340					1345					1350			
Glu	Tyr	Cys	Val	Glu	Val	Lys	Tyr	Thr	Ala	Gly	Val	Ser	Pro	Lys
	1355					1360					1365			
Lys	Cys	Val	Asn	Val	Thr	Val	Asn	Ser	Thr	Gln	Phe	Asn	Pro	Val
	1370					1375					1380			
Lys	Asn	Leu	Lys	Ala	Gln	Pro	Asp	Gly	Gly	Asp	Val	Val	Leu	Lys
	1385					1390					1395			
Trp	Glu	Ala	Pro	Ser	Ala	Lys	Lys	Thr	Glu	Gly	Ser	Arg	Glu	Val
	1400					1405					1410			
Lys	Arg	Ile	Gly	Asp	Gly	Leu	Phe	Val	Thr	Ile	Glu	Pro	Ala	Asn
	1415					1420					1425			
Asp	Val	Arg	Ala	Asn	Glu	Ala	Lys	Val	Val	Leu	Ala	Ala	Asp	Asn
	1430					1435					1440			
Val	Trp	Gly	Asp	Asn	Thr	Gly	Tyr	Gln	Phe	Leu	Leu	Asp	Ala	Asp
	1445					1450					1455			

81595649_ST25.txt

His Asn Thr Phe Gly Ser Val Ile Pro Ala Thr Gly Pro Leu Phe
 1460 1465 1470

Thr Gly Thr Ala Ser Ser Asp Leu Tyr Ser Ala Asn Phe Glu Ser
 1475 1480 1485

Leu Ile Pro Ala Asn Ala Asp Pro Val Val Thr Thr Gln Asn Ile
 1490 1495 1500

Ile Val Thr Gly Gln Gly Glu Val Val Ile Pro Gly Gly Val Tyr
 1505 1510 1515

Asp Tyr Cys Ile Thr Asn Pro Glu Pro Ala Ser Gly Lys Met Trp
 1520 1525 1530

Ile Ala Gly Asp Gly Gly Asn Gln Pro Ala Arg Tyr Asp Asp Phe
 1535 1540 1545

Thr Phe Glu Ala Gly Lys Lys Tyr Thr Phe Thr Met Arg Arg Ala
 1550 1555 1560

Gly Met Gly Asp Gly Thr Asp Met Glu Val Glu Asp Asp Ser Pro
 1565 1570 1575

Ala Ser Tyr Thr Tyr Thr Val Tyr Arg Asp Gly Thr Lys Ile Lys
 1580 1585 1590

Glu Gly Leu Thr Glu Thr Thr Tyr Arg Asp Ala Gly Met Ser Ala
 1595 1600 1605

Gln Ser His Glu Tyr Cys Val Glu Val Lys Tyr Thr Ala Gly Val
 1610 1615 1620

Ser Pro Lys Val Cys Val Asp Tyr Ile Pro Asp Gly Val Ala Asp
 1625 1630 1635

Val Thr Ala Gln Lys Pro Tyr Thr Leu Thr Val Val Gly Lys Thr
 1640 1645 1650

Ile Thr Val Thr Cys Gln Gly Glu Ala Met Ile Tyr Asp Met Asn
 1655 1660 1665

Gly Arg Arg Leu Ala Ala Gly Arg Asn Thr Val Val Tyr Thr Ala
 1670 1675 1680

Gln Gly Gly Tyr Tyr Ala Val Met Val Val Val Asp Gly Lys Ser
 1685 1690 1695

Tyr Val Glu Lys Leu Ala Ile Lys
 1700 1705

81595649_ST25.txt

<210> 62
 <211> 1732
 <212> PRT
 <213> Porphyromonas gingivalis

<400> 62

Met Arg Lys Leu Leu Leu Ile Ala Ala Ser Leu Leu Gly Val Gly
 1 5 10 15

Leu Tyr Ala Gln Ser Ala Lys Ile Lys Leu Asp Ala Pro Thr Thr Arg
 20 25 30

Thr Thr Cys Thr Asn Asn Ser Phe Lys Gln Phe Asp Ala Ser Phe Ser
 35 40 45

Phe Asn Glu Val Glu Leu Thr Lys Val Glu Thr Lys Gly Gly Thr Phe
 50 55 60

Ala Ser Val Ser Ile Pro Gly Ala Phe Pro Thr Gly Glu Val Gly Ser
 65 70 75 80

Pro Glu Val Pro Ala Val Arg Lys Leu Ile Ala Val Pro Val Gly Ala
 85 90 95

Thr Pro Val Val Arg Val Lys Ser Phe Thr Glu Gln Val Tyr Ser Leu
 100 105 110

Asn Gln Tyr Gly Ser Glu Lys Leu Met Pro His Gln Pro Ser Met Ser
 115 120 125

Lys Ser Asp Asp Pro Glu Lys Val Pro Phe Val Tyr Asn Ala Ala Ala
 130 135 140

Tyr Ala Arg Lys Gly Phe Val Gly Gln Glu Leu Thr Gln Val Glu Met
 145 150 155 160

Leu Gly Thr Met Arg Gly Val Arg Ile Ala Ala Leu Thr Ile Asn Pro
 165 170 175

Val Gln Tyr Asp Val Val Ala Asn Gln Leu Lys Val Arg Asn Asn Ile
 180 185 190

Glu Ile Glu Val Ser Phe Gln Gly Ala Asp Glu Val Ala Thr Gln Arg
 195 200 205

Leu Tyr Asp Ala Ser Phe Ser Pro Tyr Phe Glu Thr Ala Tyr Lys Gln
 210 215 220

Leu Phe Asn Arg Asp Val Tyr Thr Asp His Gly Asp Leu Tyr Asn Thr
 225 230 235 240

Pro Val Arg Met Leu Val Val Ala Gly Ala Lys Phe Lys Glu Ala Leu
 Page 29

81595649_ST25.txt

245

250

255

Lys Pro Trp Leu Thr Trp Lys Ala Gln Lys Gly Phe Tyr Leu Asp Val
 260 265 270

His Tyr Thr Asp Glu Ala Glu Val Gly Thr Thr Asn Ala Ser Ile Lys
 275 280 285

Ala Phe Ile His Lys Lys Tyr Asn Asp Gly Leu Ala Ala Ser Ala Ala
 290 295 300

Pro Val Phe Leu Ala Leu Val Gly Asp Thr Asp Val Ile Ser Gly Glu
 305 310 315 320

Lys Gly Lys Lys Thr Lys Lys Val Thr Asp Leu Tyr Tyr Ser Ala Val
 325 330 335

Asp Gly Asp Tyr Phe Pro Glu Met Tyr Thr Phe Arg Met Ser Ala Ser
 340 345 350

Ser Pro Glu Glu Leu Thr Asn Ile Ile Asp Lys Val Leu Met Tyr Glu
 355 360 365

Lys Ala Thr Met Pro Asp Lys Ser Tyr Leu Glu Lys Val Leu Leu Ile
 370 375 380

Ala Gly Ala Asp Tyr Ser Trp Asn Ser Gln Val Gly Gln Pro Thr Ile
 385 390 395 400

Lys Tyr Gly Met Gln Tyr Tyr Tyr Asn Gln Glu His Gly Tyr Thr Asp
 405 410 415

Val Tyr Asn Tyr Leu Lys Ala Pro Tyr Thr Gly Cys Tyr Ser His Leu
 420 425 430

Asn Thr Gly Val Ser Phe Ala Asn Tyr Thr Ala His Gly Ser Glu Thr
 435 440 445

Ala Trp Ala Asp Pro Leu Leu Thr Thr Ser Gln Leu Lys Ala Leu Thr
 450 455 460

Asn Lys Asp Lys Tyr Phe Leu Ala Ile Gly Asn Cys Cys Ile Thr Ala
 465 470 475 480

Gln Phe Asp Tyr Val Gln Pro Cys Phe Gly Glu Val Ile Thr Arg Val
 485 490 495

Lys Glu Lys Gly Ala Tyr Ala Tyr Ile Gly Ser Ser Pro Asn Ser Tyr
 500 505 510

Trp Gly Glu Asp Tyr Tyr Trp Ser Val Gly Ala Asn Ala Val Phe Gly
 Page 30

81595649_ST25.txt

515

520

525

Val Gln Pro Thr Phe Glu Gly Thr Ser Met Gly Ser Tyr Asp Ala Thr
 530 535 540

Phe Leu Glu Asp Ser Tyr Asn Thr Val Asn Ser Ile Met Trp Ala Gly
 545 550 555 560

Asn Leu Ala Ala Thr His Ala Gly Asn Ile Gly Asn Ile Thr His Ile
 565 570 575

Gly Ala His Tyr Tyr Trp Glu Ala Tyr His Val Leu Gly Asp Gly Ser
 580 585 590

Val Met Pro Tyr Arg Ala Met Pro Lys Thr Asn Thr Tyr Thr Leu Pro
 595 600 605

Ala Ser Leu Pro Gln Asn Gln Ala Ser Tyr Ser Ile Gln Ala Ser Ala
 610 615 620

Gly Ser Tyr Val Ala Ile Ser Lys Asp Gly Val Leu Tyr Gly Thr Gly
 625 630 635 640

Val Ala Asn Ala Ser Gly Val Ala Thr Val Ser Met Thr Lys Gln Ile
 645 650 655

Thr Glu Asn Gly Asn Tyr Asp Val Val Ile Thr Arg Ser Asn Tyr Leu
 660 665 670

Pro Val Ile Lys Gln Ile Gln Val Gly Glu Pro Ser Pro Tyr Gln Pro
 675 680 685

Val Ser Asn Leu Thr Ala Thr Thr Gln Gly Gln Lys Val Thr Leu Lys
 690 695 700

Trp Glu Ala Pro Ser Ala Lys Lys Ala Glu Gly Ser Arg Glu Val Lys
 705 710 715 720

Arg Ile Gly Asp Gly Leu Phe Val Thr Ile Glu Pro Ala Asn Asp Val
 725 730 735

Arg Ala Asn Glu Ala Lys Val Val Leu Ala Ala Asp Asn Val Trp Gly
 740 745 750

Asp Asn Thr Gly Tyr Gln Phe Leu Leu Asp Ala Asp His Asn Thr Phe
 755 760 765

Gly Ser Val Ile Pro Ala Thr Gly Pro Leu Phe Thr Gly Thr Ala Ser
 770 775 780

Ser Asn Leu Tyr Ser Ala Asn Phe Glu Tyr Leu Ile Pro Ala Asn Ala

81595649_ST25.txt

785 790 795 800

Asp Pro Val Val Thr Thr Gln Asn Ile Ile Val Thr Gly Gln Gly Glu
 805 810 815

Val Val Ile Pro Gly Gly Val Tyr Asp Tyr Cys Ile Thr Asn Pro Glu
 820 825 830

Pro Ala Ser Gly Lys Met Trp Ile Ala Gly Asp Gly Gly Asn Gln Pro
 835 840 845

Ala Arg Tyr Asp Asp Phe Thr Phe Glu Ala Gly Lys Lys Tyr Thr Phe
 850 855 860

Thr Met Arg Arg Ala Gly Met Gly Asp Gly Thr Asp Met Glu Val Glu
865 870 875 880

Asp Asp Ser Pro Ala Ser Tyr Thr Tyr Thr Val Tyr Arg Asp Gly Thr
 885 890 895

Lys Ile Lys Glu Gly Leu Thr Ala Thr Thr Phe Glu Glu Asp Gly Val
 900 905 910

Ala Ala Gly Asn His Glu Tyr Cys Val Glu Val Lys Tyr Thr Ala Gly
 915 920 925

Val Ser Pro Lys Val Cys Lys Asp Val Thr Val Glu Gly Ser Asn Glu
930 935 940

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

Thr Leu Lys Trp Asp Ala Pro Asn Gly Thr Pro Asn Pro Asn Pro Asn
 965 970 975

Pro Asn Pro Asn Pro Gly Thr Thr Leu Ser Glu Ser Phe Glu Asn Gly
 980 985 990

Ile Pro Ala Ser Trp Lys Thr Ile Asp Ala Asp Gly Asp Gly His Gly
 995 1000 1005

Trp Lys Pro Gly Asn Ala Pro Gly Ile Ala Gly Tyr Asn Ser Asn
1010 1015 1020

Gly Cys Val Tyr Ser Glu Ser Phe Gly Leu Gly Gly Ile Gly Val
1025 1030 1035

Leu Thr Pro Asp Asn Tyr Leu Ile Thr Pro Ala Leu Asp Leu Pro
1040 1045 1050

Asn Gly Gly Lys Leu Thr Phe Trp Val Cys Ala Gln Asp Ala Asn

81595649_ST25.txt
1065

1055

1060

Tyr	Ala	Ser	Glu	His	Tyr	Ala	Val	Tyr	Ala	Ser	Ser	Thr	Gly	Asn
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Asp	Ala	Ser	Asn	Phe	Thr	Asn	Ala	Leu	Leu	Glu	Glu	Thr	Ile	Thr
1085						1090					1095			
Ala	Lys	Gly	Val	Arg	Ser	Pro	Lys	Ala	Ile	Arg	Gly	Arg	Ile	Gln
1100						1105					1110			
Gly	Thr	Trp	Arg	Gln	Lys	Thr	Val	Asp	Leu	Pro	Ala	Gly	Thr	Lys
1115						1120					1125			
Tyr	Val	Ala	Phe	Arg	His	Phe	Gln	Ser	Thr	Asp	Met	Phe	Tyr	Ile
1130						1135					1140			
Asp	Leu	Asp	Glu	Val	Glu	Ile	Lys	Ala	Asn	Gly	Lys	Arg	Ala	Asp
1145						1150					1155			
Phe	Thr	Glu	Thr	Phe	Glu	Ser	Ser	Thr	His	Gly	Glu	Ala	Pro	Ala
1160						1165					1170			
Glu	Trp	Thr	Thr	Ile	Asp	Ala	Asp	Gly	Asp	Gly	Gln	Gly	Trp	Leu
1175						1180					1185			
Cys	Leu	Ser	Ser	Gly	Gln	Leu	Asp	Trp	Leu	Thr	Ala	His	Gly	Gly
1190						1195					1200			
Ser	Asn	Val	Val	Ser	Ser	Phe	Ser	Trp	Asn	Gly	Met	Ala	Leu	Asn
1205						1210					1215			
Pro	Asp	Asn	Tyr	Leu	Ile	Ser	Lys	Asp	Val	Thr	Gly	Ala	Thr	Lys
1220						1225					1230			
Val	Lys	Tyr	Tyr	Tyr	Ala	Val	Asn	Asp	Gly	Phe	Pro	Gly	Asp	His
1235						1240					1245			
Tyr	Ala	Val	Met	Ile	Ser	Lys	Thr	Gly	Thr	Asn	Ala	Gly	Asp	Phe
1250						1255					1260			
Thr	Val	Val	Phe	Glu	Glu	Thr	Pro	Asn	Gly	Ile	Asn	Lys	Gly	Gly
1265						1270					1275			
Ala	Arg	Phe	Gly	Leu	Ser	Thr	Glu	Ala	Asn	Gly	Ala	Lys	Pro	Gln
1280						1285					1290			
Ser	Val	Trp	Ile	Glu	Arg	Thr	Val	Asp	Leu	Pro	Ala	Gly	Thr	Lys
1295						1300					1305			
Tyr	Val	Ala	Phe	Arg	His	Tyr	Asn	Cys	Ser	Asp	Leu	Asn	Tyr	Ile

81595649_ST25.txt

1310		1315		1320
Leu 1325	Leu 1325	Asp 1325	Asp 1325	Ile 1325
Gln 1330	Phe 1330	Thr 1330	Met 1330	Gly 1330
Gly 1335	Ser 1335	Pro 1335	Thr 1335	Pro 1335
Thr 1340	Asp 1340	Tyr 1340	Thr 1340	Tyr 1340
Thr 1345	Val 1345	Tyr 1345	Arg 1345	Asp 1345
Gly 1350	Thr 1350	Lys 1350	Ile 1350	Lys 1350
Glu 1355	Gly 1355	Leu 1355	Thr 1355	Glu 1355
Thr 1360	Thr 1360	Phe 1360	Glu 1360	Glu 1360
Asp 1365	Gly 1365	Val 1365	Ala 1365	Thr 1365
Gly 1370	Asn 1370	His 1370	Glu 1370	Tyr 1370
Cys 1375	Val 1375	Glu 1375	Val 1375	Lys 1375
Thr 1380	Thr 1380	Ala 1380	Gly 1380	Val 1380
Ser 1385	Pro 1385	Lys 1385	Lys 1385	Cys 1385
Val 1390	Asn 1390	Val 1390	Thr 1390	Val 1390
Asn 1395	Ser 1395	Thr 1395	Gln 1395	Phe 1395
Asn 1400	Pro 1400	Val 1400	Gln 1400	Asn 1400
Leu 1405	Thr 1405	Ala 1405	Glu 1405	Gln 1405
Ala 1410	Pro 1410	Asn 1410	Ser 1410	Met 1410
Asp 1415	Ala 1415	Ile 1415	Leu 1415	Lys 1415
Trp 1420	Asn 1420	Ala 1420	Pro 1420	Ala 1420
Ser 1425	Lys 1425	Arg 1425	Ala 1425	Glu 1425
Val 1430	Leu 1430	Asn 1430	Glu 1430	Asp 1430
Phe 1435	Glu 1435	Asn 1435	Gly 1435	Ile 1435
Pro 1440	Ala 1440	Ser 1440	Trp 1440	Lys 1440
Thr 1445	Ile 1445	Asp 1445	Ala 1445	Asp 1445
Gly 1450	Asp 1450	Gly 1450	Asn 1450	Asn 1450
Trp 1455	Thr 1455	Thr 1455	Pro 1455	
Pro 1460	Pro 1460	Gly 1460	Gly 1460	Ser 1460
Ser 1465	Phe 1465	Ala 1465	Gly 1465	His 1465
Asn 1470	Ser 1470	Ala 1470	Ile 1470	Cys 1470
Val 1475	Ser 1475	Ala 1475	Ser 1475	Tyr 1475
Ile 1480	Asn 1480	Phe 1480	Glu 1480	Gly 1480
Pro 1485	Gln 1485	Asn 1485	Pro 1485	
Asp 1490	Asn 1490	Tyr 1490	Leu 1490	Val 1490
Thr 1495	Pro 1495	Glu 1495	Leu 1495	Ser 1495
Leu 1500	Pro 1500	Gly 1500	Gly 1500	Gly 1500
Thr 1505	Leu 1505	Thr 1505	Phe 1505	Trp 1505
Val 1510	Cys 1510	Ala 1510	Gln 1510	Asp 1510
Ala 1515	Asn 1515	Tyr 1515	Ala 1515	Ser 1515
Glu 1520	His 1520	Tyr 1520	Ala 1520	Val 1520
Tyr 1525	Ala 1525	Ser 1525	Ser 1525	Thr 1525
Gly 1530	Asn 1530	Asp 1530	Ala 1530	Ser 1530
Asn 1535	Phe 1535	Ala 1535	Asn 1535	Ala 1535
Leu 1540	Leu 1540	Glu 1540	Glu 1540	Val 1540
Leu 1545	Thr 1545	Ala 1545	Lys 1545	Thr 1545
Val 1550	Val 1550	Thr 1550	Ala 1550	Pro 1550
Glu 1555	Ala 1555	Ile 1555	Arg 1555	Gly 1555
Thr 1560	Arg 1560	Ala 1560	Gln 1560	Gly 1560
Thr 1565	Trp 1565	Tyr 1565	Gln 1565	Lys 1565
Thr 1570	Val 1570	Thr 1570	Lys 1570	Tyr 1570

81595649_ST25.txt

1565

1570

1575

Val Ala Phe Arg His Phe Gly Cys Thr Asp Phe Phe Trp Ile Asn
 1580 1585 1590

Leu Asp Asp Val Val Ile Thr Ser Gly Asn Ala Pro Ser Tyr Thr
 1595 1600 1605

Tyr Thr Ile Tyr Arg Asn Asn Thr Gln Ile Ala Ser Gly Val Thr
 1610 1615 1620

Glu Thr Thr Tyr Arg Asp Pro Asp Leu Ala Thr Gly Phe Tyr Thr
 1625 1630 1635

Tyr Gly Val Lys Val Val Tyr Pro Asn Gly Glu Ser Ala Ile Glu
 1640 1645 1650

Thr Ala Thr Leu Asn Ile Thr Ser Leu Ala Asp Val Thr Ala Gln
 1655 1660 1665

Lys Pro Tyr Thr Leu Thr Val Val Gly Lys Thr Ile Thr Val Thr
 1670 1675 1680

Cys Gln Gly Glu Ala Met Ile Tyr Asp Met Asn Gly Arg Arg Leu
 1685 1690 1695

Ala Ala Gly Arg Asn Thr Val Val Tyr Thr Ala Gln Gly Gly His
 1700 1705 1710

Tyr Ala Val Met Val Val Val Asp Gly Lys Ser Tyr Val Glu Lys
 1715 1720 1725

Leu Ala Val Lys
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<211> 2164

<212> PRT

<213> Porphyromonas gingivalis

<400> 63

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 20 25 30

Pro Ser Val Thr His Gln Ala Val Gln Lys Gly Ile Arg Thr Ser Lys
 35 40 45

Ala Lys Asp Leu Arg Asp Pro Ile Pro Ala Gly Met Ala Arg Ile Ile
 50 55 60

81595649_ST25.txt

Leu Glu Ala His Asp Val Trp Glu Asp Gly Thr Gly Tyr Gln Met Leu
65 70 75 80

Trp Asp Ala Asp His Asn Gln Tyr Gly Ala Ser Ile Pro Glu Glu Ser
85 90 95

Phe Trp Phe Ala Asn Gly Thr Ile Pro Ala Gly Leu Tyr Asp Pro Phe
100 105 110

Glu Tyr Lys Val Pro Val Asn Ala Asp Ala Ser Phe Ser Pro Thr Asn
115 120 125

Phe Val Leu Asp Gly Thr Ala Ser Ala Asp Ile Pro Ala Gly Thr Tyr
130 135 140

Asp Tyr Val Ile Ile Asn Pro Asn Pro Gly Ile Ile Tyr Ile Val Gly
145 150 155 160

Glu Gly Val Ser Lys Gly Asn Asp Tyr Val Val Glu Ala Gly Lys Thr
165 170 175

Tyr His Phe Thr Val Gln Arg Gln Gly Pro Gly Asp Ala Ala Ser Val
180 185 190

Val Val Thr Gly Glu Gly Gly Asn Glu Phe Ala Pro Val Gln Asn Leu
195 200 205

Gln Trp Ser Val Ser Gly Gln Thr Val Thr Leu Thr Trp Gln Ala Pro
210 215 220

Ala Ser Asp Lys Arg Thr Tyr Val Leu Asn Glu Ser Phe Asp Thr Gln
225 230 235 240

Thr Leu Pro Asn Gly Trp Thr Met Ile Asp Ala Asp Gly Asp Gly His
245 250 255

Asn Trp Leu Ser Thr Ile Asn Val Tyr Asn Thr Ala Thr His Thr Gly
260 265 270

Asp Gly Ala Met Phe Ser Lys Ser Trp Thr Ala Ser Ser Gly Ala Lys
275 280 285

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

Pro Glu Asn Gly Lys Leu Ser Tyr Trp Val Ser Ser Gln Glu Pro Trp
305 310 315 320

Thr Asn Glu His Tyr Gly Val Phe Leu Ser Thr Thr Gly Asn Glu Ala
325 330 335

81595649_ST25.txt

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

Pro Ala Pro Met Asn Leu Val Lys Ser Glu Gly Val Lys Ala Pro Ala
355 360 365

Pro Tyr Gln Glu Arg Thr Ile Asp Leu Ser Ala Tyr Ala Gly Gln Gln
370 375 380

Val Tyr Leu Ala Phe Arg His Phe Gly Cys Thr Gly Ile Phe Arg Leu
385 390 395 400

Tyr Leu Asp Asp Val Ala Val Ser Gly Glu Gly Ser Ser Asn Asp Tyr
405 410 415

Thr Tyr Thr Val Tyr Arg Asp Asn Val Val Ile Ala Gln Asn Leu Thr
420 425 430

Ala Thr Thr Phe Asn Gln Glu Asn Val Ala Pro Gly Gln Tyr Asn Tyr
435 440 445

Cys Val Glu Val Lys Tyr Thr Ala Gly Val Ser Pro Lys Val Cys Lys
450 455 460

Asp Val Thr Val Glu Gly Ser Asn Glu Phe Ala Pro Val Gln Asn Leu
465 470 475 480

Thr Gly Ser Ala Val Gly Gln Lys Val Thr Leu Lys Trp Asp Ala Pro
485 490 495

Asn Gly Thr Pro Asn Pro Asn Pro Gly Thr Thr Thr Leu Ser Glu Ser
500 505 510

Phe Glu Asn Gly Ile Pro Ala Ser Trp Lys Thr Ile Asp Ala Asp Gly
515 520 525

Asp Gly Asn Asn Trp Thr Thr Thr Pro Pro Pro Gly Gly Ser Ser Phe
530 535 540

Ala Gly His Asn Ser Ala Ile Cys Val Ser Ser Ala Ser Tyr Ile Asn
545 550 555 560

Phe Glu Gly Pro Gln Asn Pro Asp Asn Tyr Leu Val Thr Pro Glu Leu
565 570 575

Ser Leu Pro Asn Gly Gly Thr Leu Thr Phe Trp Val Cys Ala Gln Asp
580 585 590

Ala Asn Tyr Ala Ser Glu His Tyr Ala Val Tyr Ala Ser Ser Thr Gly
595 600 605

81595649_ST25.txt

Asn Asp Ala Ser Asn Phe Ala Asn Ala Leu Leu Glu Glu Val Leu Thr
 610 615 620
 Ala Lys Thr Val Val Thr Ala Pro Glu Ala Ile Arg Gly Thr Arg Val
 625 630 635 640
 Gln Gly Thr Trp Tyr Gln Lys Thr Val Gln Leu Pro Ala Gly Thr Lys
 645 650 655
 Tyr Val Ala Phe Arg His Phe Gly Cys Thr Asp Phe Phe Trp Ile Asn
 660 665 670
 Leu Asp Asp Val Glu Ile Lys Ala Asn Gly Lys Arg Ala Asp Phe Thr
 675 680 685
 Glu Thr Phe Glu Ser Ser Thr His Gly Glu Ala Pro Ala Glu Trp Thr
 690 695 700
 Thr Ile Asp Ala Asp Gly Asp Gly Gln Gly Trp Leu Cys Leu Ser Ser
 705 710 715 720
 Gly Gln Leu Gly Trp Leu Thr Ala His Gly Gly Thr Asn Val Val Ala
 725 730 735
 Ser Phe Ser Trp Asn Gly Met Ala Leu Asn Pro Asp Asn Tyr Leu Ile
 740 745 750
 Ser Lys Asp Val Thr Gly Ala Thr Lys Val Lys Tyr Tyr Tyr Ala Val
 755 760 765
 Asn Asp Gly Phe Pro Gly Asp His Tyr Ala Val Met Ile Ser Lys Thr
 770 775 780
 Gly Thr Asn Ala Gly Asp Phe Thr Val Val Phe Glu Glu Thr Pro Asn
 785 790 795 800
 Gly Ile Asn Lys Gly Gly Ala Arg Phe Gly Leu Ser Thr Glu Ala Asn
 805 810 815
 Gly Ala Lys Pro Gln Ser Val Trp Ile Glu Arg Thr Val Asp Leu Pro
 820 825 830
 Ala Gly Thr Lys Tyr Val Ala Phe Arg His Tyr Asn Cys Ser Asp Leu
 835 840 845
 Asn Tyr Ile Leu Leu Asp Asp Ile Gln Phe Thr Met Gly Gly Ser Pro
 850 855 860
 Thr Pro Thr Asp Tyr Thr Tyr Thr Val Tyr Arg Asp Gly Thr Lys Ile
 865 870 875 880

81595649_ST25.txt

Lys Glu Gly Leu Thr Glu Thr Thr Phe Glu Glu Asp Gly Val Ala Thr
 885 890 895
 Gly Asn His Glu Tyr Cys Val Glu Val Lys Tyr Thr Ala Gly Val Ser
 900 905 910
 Pro Lys Glu Cys Val Asn Val Thr Val Asp Pro Val Gln Phe Asn Pro
 915 920 925
 Val Gln Asn Leu Thr Gly Ser Ala Val Gly Gln Lys Val Thr Leu Lys
 930 935 940
 Trp Asp Ala Pro Asn Gly Thr Pro Asn Pro Asn Pro Gly Thr Thr Thr
 945 950 955 960
 Leu Ser Glu Ser Phe Glu Asn Gly Ile Pro Ala Ser Trp Lys Thr Ile
 965 970 975
 Asp Ala Asp Gly Asp Gly Asn Asn Trp Thr Thr Thr Pro Pro Pro Gly
 980 985 990
 Gly Thr Ser Phe Ala Gly His Asn Ser Ala Ile Cys Val Ser Ser Ala
 995 1000 1005
 Ser Tyr Ile Asn Phe Glu Gly Pro Gln Asn Pro Asp Asn Tyr Leu
 1010 1015 1020
 Val Thr Pro Glu Leu Ser Leu Pro Asn Gly Gly Thr Leu Thr Phe
 1025 1030 1035
 Trp Val Cys Ala Gln Asp Ala Asn Tyr Ala Ser Glu His Tyr Ala
 1040 1045 1050
 Val Tyr Ala Ser Ser Thr Gly Asn Asp Ala Ser Asn Phe Ala Asn
 1055 1060 1065
 Ala Leu Leu Glu Glu Val Leu Thr Ala Lys Thr Val Val Thr Ala
 1070 1075 1080
 Pro Glu Ala Ile Arg Gly Thr Arg Val Gln Gly Thr Trp Tyr Gln
 1085 1090 1095
 Lys Thr Val Gln Leu Pro Ala Gly Thr Lys Tyr Val Ala Phe Arg
 1100 1105 1110
 His Phe Gly Cys Thr Asp Phe Phe Trp Ile Asn Leu Asp Asp Val
 1115 1120 1125
 Glu Ile Lys Ala Asn Gly Lys Arg Ala Asp Phe Thr Glu Thr Phe
 1130 1135 1140

81595649_ST25.txt

Glu Ser Ser Thr His Gly Glu Ala Pro Ala Glu Trp Thr Thr Ile
 1145 1150 1155
 Asp Ala Asp Gly Asp Gly Gln Gly Trp Leu Cys Leu Ser Ser Gly
 1160 1165 1170
 Gln Leu Asp Trp Leu Thr Ala His Gly Gly Thr Asn Val Val Ala
 1175 1180 1185
 Ser Phe Ser Trp Asn Gly Met Ala Leu Asn Pro Asp Asn Tyr Leu
 1190 1195 1200
 Ile Ser Lys Asp Val Thr Gly Ala Thr Lys Val Lys Tyr Tyr Tyr
 1205 1210 1215
 Ala Val Asn Asp Gly Phe Pro Gly Asp His Tyr Ala Val Met Ile
 1220 1225 1230
 Ser Lys Thr Gly Thr Asn Ala Gly Asp Phe Thr Val Val Phe Glu
 1235 1240 1245
 Glu Thr Pro Asn Gly Ile Asn Lys Gly Gly Ala Arg Phe Gly Leu
 1250 1255 1260
 Ser Thr Glu Ala Asn Gly Ala Lys Pro Gln Ser Val Trp Ile Glu
 1265 1270 1275
 Arg Thr Val Asp Leu Pro Ala Gly Thr Lys Tyr Val Ala Phe Arg
 1280 1285 1290
 His Tyr Asn Cys Ser Asp Leu Asn Tyr Ile Leu Leu Asp Asp Ile
 1295 1300 1305
 Gln Phe Thr Met Gly Gly Ser Pro Thr Pro Thr Asp Tyr Thr Tyr
 1310 1315 1320
 Thr Val Tyr Arg Asp Gly Thr Lys Ile Lys Glu Gly Leu Thr Glu
 1325 1330 1335
 Thr Thr Phe Glu Glu Asp Gly Val Ala Thr Gly Asn His Glu Tyr
 1340 1345 1350
 Cys Val Glu Val Lys Tyr Thr Ala Gly Val Ser Pro Lys Glu Cys
 1355 1360 1365
 Val Asn Val Thr Val Asp Pro Val Gln Phe Asn Pro Val Gln Asn
 1370 1375 1380
 Leu Thr Gly Ser Ala Val Gly Gln Lys Val Thr Leu Lys Trp Asp
 1385 1390 1395

81595649_ST25.txt

Ala Pro Asn Gly Thr Pro Asn Pro Asn Pro Gly Thr Thr Thr Leu
 1400 1405 1410
 Ser Glu Ser Phe Glu Asn Gly Ile Pro Ala Ser Trp Lys Thr Ile
 1415 1420 1425
 Asp Ala Asp Gly Asp Gly Asn Asn Trp Thr Thr Thr Pro Pro Pro
 1430 1435 1440
 Gly Gly Thr Ser Phe Ala Gly His Asn Ser Ala Ile Cys Val Ser
 1445 1450 1455
 Ser Ala Ser Tyr Ile Asn Phe Glu Gly Pro Gln Asn Pro Asp Asn
 1460 1465 1470
 Tyr Leu Val Thr Pro Glu Leu Ser Leu Pro Asn Gly Gly Thr Leu
 1475 1480 1485
 Thr Phe Trp Val Cys Ala Gln Asp Ala Asn Tyr Ala Ser Glu His
 1490 1495 1500
 Tyr Ala Val Tyr Ala Ser Ser Thr Gly Asn Asp Ala Ser Asn Phe
 1505 1510 1515
 Ala Asn Ala Leu Leu Glu Glu Val Leu Thr Ala Lys Thr Val Val
 1520 1525 1530
 Thr Ala Pro Glu Ala Ile Arg Gly Thr Arg Val Gln Gly Thr Trp
 1535 1540 1545
 Tyr Gln Lys Thr Val Gln Leu Pro Ala Gly Thr Lys Tyr Val Ala
 1550 1555 1560
 Phe Arg His Phe Gly Cys Thr Asp Phe Phe Trp Ile Asn Leu Asp
 1565 1570 1575
 Asp Val Glu Ile Lys Ala Asn Gly Lys Arg Ala Asp Phe Thr Glu
 1580 1585 1590
 Thr Phe Glu Ser Ser Thr His Gly Glu Ala Pro Ala Glu Trp Thr
 1595 1600 1605
 Thr Ile Asp Ala Asp Gly Asp Gly Gln Gly Trp Leu Cys Leu Ser
 1610 1615 1620
 Ser Gly Gln Leu Gly Trp Leu Thr Ala His Gly Gly Thr Asn Val
 1625 1630 1635
 Val Ala Ser Phe Ser Trp Asn Gly Met Ala Leu Asn Pro Asp Asn
 1640 1645 1650

81595649_ST25.txt

Tyr Leu Ile Ser Lys Asp Val Thr Gly Ala Thr Lys Val Lys Tyr
 1655 1660 1665
 Tyr Tyr Ala Val Asn Asp Gly Phe Pro Gly Asp His Tyr Ala Val
 1670 1675 1680
 Met Ile Ser Lys Thr Gly Thr Asn Ala Gly Asp Phe Thr Val Val
 1685 1690 1695
 Phe Glu Glu Thr Pro Asn Gly Ile Asn Lys Gly Gly Ala Arg Phe
 1700 1705 1710
 Gly Leu Ser Thr Glu Ala Asn Gly Ala Lys Pro Gln Ser Val Trp
 1715 1720 1725
 Ile Glu Arg Thr Val Asp Leu Pro Ala Gly Thr Lys Tyr Val Ala
 1730 1735 1740
 Phe Arg His Tyr Asn Cys Ser Asp Leu Asn Tyr Ile Leu Leu Asp
 1745 1750 1755
 Asp Ile Gln Phe Thr Met Gly Gly Ser Pro Thr Pro Thr Asp Tyr
 1760 1765 1770
 Thr Tyr Thr Val Tyr Arg Asp Gly Thr Lys Ile Lys Glu Gly Leu
 1775 1780 1785
 Thr Glu Thr Thr Phe Glu Glu Asp Gly Val Ala Thr Gly Asn His
 1790 1795 1800
 Glu Tyr Cys Val Glu Val Lys Tyr Thr Ala Gly Val Ser Pro Lys
 1805 1810 1815
 Glu Cys Val Asn Val Thr Ile Asn Pro Thr Gln Phe Asn Pro Val
 1820 1825 1830
 Gln Asn Leu Thr Ala Glu Gln Ala Pro Asn Ser Met Asp Ala Ile
 1835 1840 1845
 Leu Lys Trp Asn Ala Pro Ala Ser Lys Arg Ala Glu Val Leu Asn
 1850 1855 1860
 Glu Asp Phe Glu Asn Gly Ile Pro Ala Ser Trp Lys Thr Ile Asp
 1865 1870 1875
 Ala Asp Gly Asp Gly Asn Asn Trp Thr Thr Thr Pro Pro Pro Gly
 1880 1885 1890
 Gly Ser Ser Phe Ala Gly His Asn Ser Ala Ile Cys Val Ser Ser
 1895 1900 1905

81595649_ST25.txt

Ala	Ser	Tyr	Ile	Asn	Phe	Glu	Gly	Pro	Gln	Asn	Pro	Asp	Asn	Tyr
	1910					1915					1920			
Leu	Val	Thr	Pro	Glu	Leu	Ser	Leu	Pro	Gly	Gly	Gly	Thr	Leu	Thr
	1925					1930					1935			
Phe	Trp	Val	Cys	Ala	Gln	Asp	Ala	Asn	Tyr	Ala	Ser	Glu	His	Tyr
	1940					1945					1950			
Ala	Val	Tyr	Ala	Ser	Ser	Thr	Gly	Asn	Asp	Ala	Ser	Asn	Phe	Ala
	1955					1960					1965			
Asn	Ala	Leu	Leu	Glu	Glu	Val	Leu	Thr	Ala	Lys	Thr	Val	Val	Thr
	1970					1975					1980			
Ala	Pro	Glu	Ala	Ile	Arg	Gly	Thr	Arg	Val	Gln	Gly	Thr	Trp	Tyr
	1985					1990					1995			
Gln	Lys	Thr	Val	Gln	Leu	Pro	Ala	Gly	Thr	Lys	Tyr	Val	Ala	Phe
	2000					2005					2010			
Arg	His	Phe	Gly	Cys	Thr	Asp	Phe	Phe	Trp	Ile	Asn	Leu	Asp	Asp
	2015					2020					2025			
Val	Val	Ile	Thr	Ser	Gly	Asn	Ala	Pro	Ser	Tyr	Thr	Tyr	Thr	Ile
	2030					2035					2040			
Tyr	Arg	Asn	Asn	Thr	Gln	Ile	Ala	Ser	Gly	Val	Thr	Glu	Thr	Thr
	2045					2050					2055			
Tyr	Arg	Asp	Pro	Asp	Leu	Ala	Thr	Gly	Phe	Tyr	Thr	Tyr	Gly	Val
	2060					2065					2070			
Lys	Val	Val	Tyr	Pro	Asn	Gly	Glu	Ser	Ala	Ile	Glu	Thr	Ala	Thr
	2075					2080					2085			
Leu	Asn	Ile	Thr	Ser	Leu	Ala	Asp	Val	Thr	Ala	Gln	Lys	Pro	Tyr
	2090					2095					2100			
Thr	Leu	Thr	Val	Val	Gly	Lys	Thr	Ile	Thr	Val	Thr	Cys	Gln	Gly
	2105					2110					2115			
Glu	Ala	Met	Ile	Tyr	Asp	Met	Asn	Gly	Arg	Arg	Leu	Ala	Ala	Gly
	2120					2125					2130			
Arg	Asn	Thr	Val	Val	Tyr	Thr	Ala	Gln	Gly	Gly	His	Tyr	Ala	Val
	2135					2140					2145			
Met	Val	Val	Val	Asp	Gly	Lys	Ser	Tyr	Val	Glu	Lys	Leu	Ala	Val
	2150					2155					2160			

81595649_ST25.txt

Lys

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<220>
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 <222> (3)..(3)
 <223> X can be either Y or S

<220>
 <221> MISC_FEATURE
 <222> (6)..(6)
 <223> X can be either P or S

<220>
 <221> MISC_FEATURE
 <222> (7)..(7)
 <223> X can be either K or Q

<220>
 <221> MISC_FEATURE
 <222> (8)..(8)
 <223> X can be either I or V

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Asp Xaa Xaa Trp Asn Xaa Xaa Xaa
 1 5

<210> 65
 <211> 7
 <212> PRT
 <213> Porphyromonas gingivalis

<400> 65

Asn Ser Tyr Trp Gly Glu Asp
 1 5

<210> 66
 <211> 11
 <212> PRT
 <213> Porphyromonas gingivalis

<220>
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 <222> (4)..(4)
 <223> X can be either V or I

<400> 66

Ile Gly Asn Xaa Thr His Ile Gly Ala His Tyr
 Page 44

81595649_ST25.txt
10

1

5

<210> 67
 <211> 8
 <212> PRT
 <213> Porphyromonas gingivalis

<400> 67

Glu Gly Gly Pro Ser Ala Asp Asn
 1 5

<210> 68
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<220>
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 <222> (3)..(3)
 <223> X can be either S or Y

<220>
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 <222> (6)..(6)
 <223> X can be either S or P

<400> 68

Xaa Gln Xaa Trp Ala Xaa Pro
 1 5

<210> 69
 <211> 23
 <212> PRT
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<400> 69

Pro Val Ser Asn Leu Thr Ala Thr Thr Gln Gly Gln Lys Val Thr Leu
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Lys Trp Asp Ala Pro Ser Thr
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 <211> 23
 <212> PRT
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<400> 70

Pro Val Ser Asn Leu Thr Ala Thr Thr Gln Gly Gln Lys Val Thr Leu
 1 5 10 15

Lys Trp Glu Ala Pro Ser Ala

81595649_ST25.txt

20

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<400> 71

Pro Val Gln Asn Leu Thr Gly Ser Ser Val Gly Gln Lys Val Thr Leu
 1 5 10 15

Lys Trp Asp Ala Pro Ser Thr
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<210> 72
 <211> 23
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<400> 72

Pro Val Gln Asn Leu Thr Gly Ser Ala Val Gly Gln Lys Val Thr Leu
 1 5 10 15

Lys Trp Asp Ala Pro Asn Gly
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<210> 73
 <211> 23
 <212> PRT
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<400> 73

Pro Val Lys Asn Leu Lys Ala Gln Pro Asp Gly Gly Asp Val Val Leu
 1 5 10 15

Lys Trp Glu Ala Pro Ser Ala
 20

<210> 74
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 <213> Porphyromonas gingivalis

<400> 74

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

Ile Leu Lys Trp Asn Ala Pro
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<210> 75
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81595649_ST25.txt

<400> 75

Pro Val Gln Asn Leu Thr Gln Trp Ser Val Ser Gly Gln Thr Val Thr
 1 5 10 15

Leu Thr Trp Gln Ala Pro Ala Ser
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<210> 76

<211> 27

<212> PRT

<213> Porphyromonas gingivalis

<400> 76

Tyr Thr Tyr Thr Val Tyr Arg Asp Gly Thr Lys Ile Lys Glu Gly Leu
 1 5 10 15

Thr Glu Thr Thr Phe Glu Glu Asp Gly Val Ala
 20 25

<210> 77

<211> 27

<212> PRT

<213> Porphyromonas gingivalis

<400> 77

Tyr Thr Tyr Thr Val Tyr Arg Asp Asn Val Val Ile Ala Gln Asn Leu
 1 5 10 15

Thr Ala Thr Thr Phe Asn Gln Glu Asn Val Ala
 20 25

<210> 78

<211> 28

<212> PRT

<213> Porphyromonas gingivalis

<400> 78

Tyr Thr Tyr Thr Val Tyr Arg Asp Gly Thr Lys Ile Lys Glu Gly Leu
 1 5 10 15

Thr Ala Glu Thr Thr Phe Glu Glu Asp Gly Val Ala
 20 25

<210> 79

<211> 16

<212> PRT

<213> Porphyromonas gingivalis

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<222> (6)..(7)

<223> X can be NP or NPNP or NPNPNP or NPNPNPNP or NPNPNPNPNP or NPNPNPNPNPNP

<400> 79

81595649_ST25.txt

Pro Asn Gly Thr Pro Xaa Xaa Gly Thr Thr Thr Leu Ser Glu Ser Phe
 1 5 10 15

<210> 80
 <211> 325
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<400> 80

Gly Gly Pro Lys Thr Ala Pro Ser Val Thr His Gln Ala Val Gln Lys
 1 5 10 15

Gly Ile Arg Thr Ser Lys Ala Lys Asp Leu Arg Asp Pro Ile Pro Ala
 20 25 30

Gly Met Ala Arg Ile Ile Leu Glu Ala His Asp Val Trp Glu Asp Gly
 35 40 45

Thr Gly Tyr Gln Met Leu Trp Asp Ala Asp His Asn Gln Tyr Gly Ala
 50 55 60

Ser Ile Pro Glu Glu Ser Phe Trp Phe Ala Asn Gly Thr Ile Pro Ala
 65 70 75 80

Gly Leu Tyr Asp Pro Phe Glu Tyr Lys Val Pro Val Asn Ala Asp Ala
 85 90 95

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

Ile Pro Ala Gly Thr Tyr Asp Tyr Val Ile Ile Asn Pro Asn Pro Gly
 115 120 125

Ile Ile Tyr Ile Val Gly Glu Gly Val Ser Lys Gly Asn Asp Tyr Val
 130 135 140

Val Glu Ala Gly Lys Thr Tyr His Phe Thr Val Gln Arg Gln Gly Pro
 145 150 155 160

Gly Asp Ala Ala Ser Val Val Val Thr Gly Glu Gly Gly Asn Glu Phe
 165 170 175

Ala Pro Val Gln Asn Leu Gln Trp Ser Val Ser Gly Gln Thr Val Thr
 180 185 190

Leu Thr Trp Gln Ala Pro Ala Ser Asp Lys Arg Thr Tyr Val Leu Asn
 195 200 205

Glu Ser Phe Asp Thr Gln Thr Leu Pro Asn Gly Trp Thr Met Ile Asp
 210 215 220

81595649_ST25.txt

Ala Asp Gly Asp Gly His Asn Trp Leu Ser Thr Ile Asn Val Tyr Asn
225 230 235 240

Thr Ala Thr His Thr Gly Asp Gly Ala Met Phe Ser Lys Ser Trp Thr
245 250 255

Ala Ser Ser Gly Ala Lys Ile Asp Leu Ser Pro Asp Asn Tyr Leu Val
260 265 270

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

Ser Ser Gln Glu Pro Trp Thr Asn Glu His Tyr Gly Val Phe Leu Ser
290 295 300

Thr Thr Gly Asn Glu Ala Ala Asn Phe Thr Ile Lys Leu Leu Glu Glu
305 310 315 320

Thr Leu Gly Ser Gly
325

<210> 81
<211> 260
<212> PRT
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<400> 81

Ala Pro Ala Pro Tyr Gln Glu Arg Thr Ile Asp Leu Ser Ala Tyr Ala
1 5 10 15

Gly Gln Gln Val Tyr Leu Ala Phe Arg His Phe Gly Cys Thr Gly Ile
20 25 30

Phe Arg Leu Tyr Leu Asp Asp Val Ala Val Ser Gly Glu Gly Ser Ser
35 40 45

Asn Asp Tyr Thr Tyr Thr Val Tyr Arg Asp Asn Val Val Ile Ala Gln
50 55 60

Asn Leu Thr Ala Thr Thr Phe Asn Gln Glu Asn Val Ala Pro Gly Gln
65 70 75 80

Tyr Asn Tyr Cys Val Glu Val Lys Tyr Thr Ala Gly Val Ser Pro Lys
85 90 95

Val Cys Lys Asp Val Thr Val Glu Gly Ser Asn Glu Phe Ala Pro Val
100 105 110

Gln Asn Leu Thr Gly Ser Ala Val Gly Gln Lys Val Thr Leu Lys Trp
115 120 125

Asp Ala Pro Asn Gly Thr Pro Asn Pro Asn Pro Gly Thr Thr Thr Leu
Page 49

81595649_ST25.txt

130

135

140

Ser Glu Ser Phe Glu Asn Gly Ile Pro Ala Ser Trp Lys Thr Ile Asp
 145 150 155 160

Ala Asp Gly Asp Gly Asn Asn Trp Thr Thr Thr Pro Pro Pro Gly Gly
 165 170 175

Ser Ser Phe Ala Gly His Asn Ser Ala Ile Cys Val Ser Ser Ala Ser
 180 185 190

Tyr Ile Asn Phe Glu Gly Pro Gln Asn Pro Asp Asn Tyr Leu Val Thr
 195 200 205

Pro Glu Leu Ser Leu Pro Asn Gly Gly Thr Leu Thr Phe Trp Val Cys
 210 215 220

Ala Gln Asp Ala Asn Tyr Ala Ser Glu His Tyr Ala Val Tyr Ala Ser
 225 230 235 240

Ser Thr Gly Asn Asp Ala Ser Asn Phe Ala Asn Ala Leu Leu Glu Glu
 245 250 255

Val Leu Thr Ala
 260

<210> 82
 <211> 258
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Lys Tyr Val Ala Phe Arg His Tyr Asn Cys Ser Asp Leu Asn Tyr Ile
 20 25 30

Leu Leu Asp Asp Ile Gln Phe Thr Met Gly Gly Ser Pro Thr Pro Thr
 35 40 45

Asp Tyr Thr Tyr Thr Val Tyr Arg Asp Gly Thr Lys Ile Lys Glu Gly
 50 55 60

Leu Thr Glu Thr Thr Phe Glu Glu Asp Gly Val Ala Thr Gly Asn His
 65 70 75 80

Glu Tyr Cys Val Glu Val Lys Tyr Thr Ala Gly Val Ser Pro Lys Glu
 85 90 95

Cys Val Asn Val Thr Val Asp Pro Val Gln Phe Asn Pro Val Gln Asn
 100 105 110

81595649_ST25.txt

Leu Thr Gly Ser Ala Val Gly Gln Lys Val Thr Leu Lys Trp Asp Ala
 115 120 125

Pro Asn Gly Thr Pro Asn Pro Asn Pro Gly Thr Thr Thr Leu Ser Glu
 130 135 140

Ser Phe Glu Asn Gly Ile Pro Ala Ser Trp Lys Thr Ile Asp Ala Asp
 145 150 155 160

Gly Asp Gly Asn Asn Trp Thr Thr Thr Pro Pro Pro Gly Gly Thr Ser
 165 170 175

Phe Ala Gly His Asn Ser Ala Ile Cys Val Ser Ser Ala Ser Tyr Ile
 180 185 190

Asn Phe Glu Gly Pro Gln Asn Pro Asp Asn Tyr Leu Val Thr Pro Glu
 195 200 205

Leu Ser Leu Pro Asn Gly Gly Thr Leu Thr Phe Trp Val Cys Ala Gln
 210 215 220

Asp Ala Asn Tyr Ala Ser Glu His Tyr Ala Val Tyr Ala Ser Ser Thr
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Gly Asn Asp Ala Ser Asn Phe Ala Asn Ala Leu Leu Glu Glu Val Leu
 245 250 255

Thr Ala

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 <213> Porphyromonas gingivalis

<400> 83

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<210> 84
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 <213> Porphyromonas gingivalis

<400> 84

Glu Gly Leu Thr Ala Thr Thr Phe Glu Glu Asp Gly Val Ala Ala
 1 5 10 15

<210> 85
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81595649_ST25.txt

<400> 85

Gly	Thr	Pro	Asn	Pro	Asn	Pro	Asn	Pro	Asn	Pro	Asn	Pro	Asn	Pro	Gly
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Thr