

Sequence Listing

<110> SinoCellTech Ltd.

<120> POLYVALENT IMMUNOGENICITY COMPOSITION FOR HUMAN PAPILLOMAVIRUS

<130> CIE200062PCT

<160> 162

<170> BiSSAP 1.3.6

 $\langle 210 \rangle$ 1

<211> 469

<212> PRT

<213> Homo sapiens

 $\langle 220 \rangle$

<223> 0601 Amino acid sequence of HPV type 6 L1 protein aa 1-469

 $\langle 400 \rangle$ 1

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Val	Ser	Lys	Val 20	Val	Ala	Thr	Asp	Ala 25	Tyr	Val	Thr	Arg	Thr 30	Asn	Ile
Phe	Tyr	His 35	Ala	Ser	Ser	Ser	Arg 40	Leu	Leu	Ala	Val	Gly 45	His	Pro	Tyr
Phe 50	Ser	Ile	Lys	Arg	Ala	Asn 55	Lys	Thr	Val	Val	Pro 60	Lys	Val	Ser	Gly
Tyr 65	Gln	Tyr	Arg	Val	Phe 70	Lys	Val	Val	Leu	Pro 75	Asp	Pro	Asn	Lys	Phe 80
Ala	Leu	Pro	Asp	Ser 85	Ser	Leu	Phe	Asp	Pro 90	Thr	Thr	Gln	Arg	Leu 95	Val
Trp	Ala	Cys	Thr 100	Gly	Leu	Glu	Val	Gly 105	Arg	Gly	Gln	Pro	Leu 110	Gly	Val
Gly	Val	Ser 115	Gly	His	Pro	Phe	Leu 120	Asn	Lys	Tyr	Asp 125	Asp	Val	Glu	Asn
Ser	Gly 130	Ser	Gly	Gly	Asn 135	Pro	Gly	Gln	Asp	Asn	Arg 140	Val	Asn	Val	Gly
Met 145	Asp	Tyr	Lys	Gln 150	Thr	Gln	Leu	Cys	Met	Val 155	Gly	Cys	Ala	Pro	Pro 160
Leu	Gly	Glu	His 165	Trp	Gly	Lys	Gly	Lys	Gln 170	Cys	Thr	Asn	Thr 175	Pro	Val
Gln	Ala	Gly	Asp 180	Cys	Pro	Pro	Leu	Glu 185	Leu	Ile	Thr	Ser	Val 190	Ile	Gln
Asp	Gly 195	Asp	Met	Val	Asp	Thr	Gly 200	Phe	Gly	Ala	Met	Asn 205	Phe	Ala	Asp
Leu	Gln 210	Thr	Asn	Lys	Ser	Asp 215	Val	Pro	Ile	Asp 220	Ile	Cys	Gly	Thr	Thr
Cys 225	Lys	Tyr	Pro	Asp 230	Tyr	Leu	Gln	Met	Ala 235	Ala	Asp	Pro	Tyr	Gly	Asp 240
Arg	Leu	Phe	Phe 245	Phe	Leu	Arg	Lys	Glu 250	Gln	Met	Phe	Ala	Arg	His 255	Phe

Phe Asn Arg Ala Gly Glu Val Gly Glu Pro Val Pro Asp Thr Leu Ile
260 265 270
Ile Lys Gly Ser Gly Asn Arg Thr Ser Val Gly Ser Ser Ile Tyr Val
275 280 285
Asn Thr Pro Ser Gly Ser Leu Val Ser Ser Glu Ala Gln Leu Phe Asn
290 295 300
Lys Pro Tyr Trp Leu Gln Lys Ala Gln Gly His Asn Asn Gly Ile Cys
305 310 315 320
Trp Gly Asn Gln Leu Phe Val Thr Val Val Asp Thr Thr Arg Ser Thr
325 330 335
Asn Met Thr Leu Cys Ala Ser Val Thr Thr Ser Ser Thr Tyr Thr Asn
340 345 350
Ser Asp Tyr Lys Glu Tyr Met Arg His Val Glu Glu Tyr Asp Leu Gln
355 360 365
Phe Ile Phe Gln Leu Cys Ser Ile Thr Leu Ser Ala Glu Val Met Ala
370 375 380
Tyr Ile His Thr Met Asn Pro Ser Val Leu Glu Asp Trp Asn Phe Gly
385 390 395 400
Leu Ser Pro Pro Pro Asn Gly Thr Leu Glu Asp Thr Tyr Arg Tyr Val
405 410 415
Gln Ser Gln Ala Ile Thr Cys Gln Lys Pro Thr Pro Glu Lys Glu Lys
420 425 430
Pro Asp Pro Tyr Lys Asn Leu Ser Phe Trp Glu Val Asn Leu Lys Glu
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Lys Phe Ser Ser Glu Leu Asp Gln Tyr Pro Leu Gly Arg Lys Phe Leu
450 455 460
Leu Gln Ser Gly Tyr
465

<210> 2
<211> 26
<212> PRT
<213> Homo sapiens

<220>
<223> 0602 Amino acid sequence of HPV type 33 L1 protein aa 474-499

<400> 2
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Ser Ser Ala Lys Arg Lys Lys Val Lys Lys
20 25

<210> 3
<211> 495
<212> PRT
<213> Artificial sequence

<220>
<223> 0603 Amino acid sequence of chimeric HPV type 6 L1 protein

<400> 3

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Val	Ser	Lys	Val	Val	Ala	Thr	Asp	Ala	Tyr	Val	Thr	Arg	Thr	Asn	Ile
			20					25					30		
Phe	Tyr	His	Ala	Ser	Ser	Ser	Arg	Leu	Leu	Ala	Val	Gly	His	Pro	Tyr
		35					40					45			
Phe	Ser	Ile	Lys	Arg	Ala	Asn	Lys	Thr	Val	Val	Pro	Lys	Val	Ser	Gly
	50					55					60				
Tyr	Gln	Tyr	Arg	Val	Phe	Lys	Val	Val	Leu	Pro	Asp	Pro	Asn	Lys	Phe
65					70					75					80
Ala	Leu	Pro	Asp	Ser	Ser	Leu	Phe	Asp	Pro	Thr	Thr	Gln	Arg	Leu	Val
				85					90					95	
Trp	Ala	Cys	Thr	Gly	Leu	Glu	Val	Gly	Arg	Gly	Gln	Pro	Leu	Gly	Val
			100					105					110		
Gly	Val	Ser	Gly	His	Pro	Phe	Leu	Asn	Lys	Tyr	Asp	Asp	Val	Glu	Asn
		115					120					125			
Ser	Gly	Ser	Gly	Gly	Asn	Pro	Gly	Gln	Asp	Asn	Arg	Val	Asn	Val	Gly
	130					135					140				
Met	Asp	Tyr	Lys	Gln	Thr	Gln	Leu	Cys	Met	Val	Gly	Cys	Ala	Pro	Pro
145					150					155					160
Leu	Gly	Glu	His	Trp	Gly	Lys	Gly	Lys	Gln	Cys	Thr	Asn	Thr	Pro	Val
				165					170						175
Gln	Ala	Gly	Asp	Cys	Pro	Pro	Leu	Glu	Leu	Ile	Thr	Ser	Val	Ile	Gln
			180					185					190		
Asp	Gly	Asp	Met	Val	Asp	Thr	Gly	Phe	Gly	Ala	Met	Asn	Phe	Ala	Asp
		195					200					205			
Leu	Gln	Thr	Asn	Lys	Ser	Asp	Val	Pro	Ile	Asp	Ile	Cys	Gly	Thr	Thr
	210					215					220				
Cys	Lys	Tyr	Pro	Asp	Tyr	Leu	Gln	Met	Ala	Ala	Asp	Pro	Tyr	Gly	Asp
225					230				235						240
Arg	Leu	Phe	Phe	Phe	Leu	Arg	Lys	Glu	Gln	Met	Phe	Ala	Arg	His	Phe
				245					250					255	
Phe	Asn	Arg	Ala	Gly	Glu	Val	Gly	Glu	Pro	Val	Pro	Asp	Thr	Leu	Ile
			260					265					270		
Ile	Lys	Gly	Ser	Gly	Asn	Arg	Thr	Ser	Val	Gly	Ser	Ser	Ile	Tyr	Val
	275						280					285			
Asn	Thr	Pro	Ser	Gly	Ser	Leu	Val	Ser	Ser	Glu	Ala	Gln	Leu	Phe	Asn
	290					295					300				
Lys	Pro	Tyr	Trp	Leu	Gln	Lys	Ala	Gln	Gly	His	Asn	Asn	Gly	Ile	Cys
305					310					315					320
Trp	Gly	Asn	Gln	Leu	Phe	Val	Thr	Val	Val	Asp	Thr	Thr	Arg	Ser	Thr
				325					330					335	
Asn	Met	Thr	Leu	Cys	Ala	Ser	Val	Thr	Thr	Ser	Ser	Thr	Tyr	Thr	Asn
			340					345					350		
Ser	Asp	Tyr	Lys	Glu	Tyr	Met	Arg	His	Val	Glu	Glu	Tyr	Asp	Leu	Gln
		355					360					365			
Phe	Ile	Phe	Gln	Leu	Cys	Ser	Ile	Thr	Leu	Ser	Ala	Glu	Val	Met	Ala
	370					375					380				
Tyr	Ile	His	Thr	Met	Asn	Pro	Ser	Val	Leu	Glu	Asp	Trp	Asn	Phe	Gly
385					390					395					400
Leu	Ser	Pro	Pro	Pro	Asn	Gly	Thr	Leu	Glu	Asp	Thr	Tyr	Arg	Tyr	Val
				405					410					415	
Gln	Ser	Gln	Ala	Ile	Thr	Cys	Gln	Lys	Pro	Thr	Pro	Glu	Lys	Glu	Lys
			420					425					430		

Pro	Asp	Pro	Tyr	Lys	Asn	Leu	Ser	Phe	Trp	Glu	Val	Asn	Leu	Lys	Glu
		435					440					445			
Lys	Phe	Ser	Ser	Glu	Leu	Asp	Gln	Tyr	Pro	Leu	Gly	Arg	Lys	Phe	Leu
	450					455					460				
Leu	Gln	Ser	Gly	Tyr	Lys	Ala	Lys	Pro	Lys	Leu	Lys	Arg	Ala	Ala	Pro
465					470					475					480
Thr	Ser	Thr	Arg	Thr	Ser	Ser	Ala	Lys	Arg	Lys	Lys	Val	Lys	Lys	
				485					490					495	

<210> 4

<211> 1488

<212> DNA

<213> Artificial sequence

<220>

<223> 0604 Nucleotide sequence of chimeric HPV type 6 L1 protein

<400> 4

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gtggctacag atgcctatgt gaccaggacc aacatcttct accatgcctc ctccagcaga	120
ctgctggctg tgggacaccc atacttcagc atcaagaggg ctaacaagac agtggtgcca	180
aaggtgtctg gctaccaata cagggtgttc aaggtggtgc tgcctgacct aaacaagttt	240
gccctgcctg actcctccct gtttgacctc accaccaga gactggtgtg ggcttggtact	300
ggattggagg tgggcagggg acaaccactg ggagtgggag tgtctggaca cccattcctg	360
aacaaatatg atgatgtgga gaactctggc tctggaggca accctggaca agacaacagg	420
gtgaatgtgg ggatggacta caagcagacc caactttgta tgggtgggctg tgcccctcca	480
ctgggagAAC actggggcaa gggcaagcag tgtaccaaca cacctgtcca ggctggagac	540
tgtcctccat tggaactgat tacctctgtg attcaggatg gagatatggt ggacacaggc	600
tttggagcta tgaactttgc tgacctcaa accaacaagt ctgatgtgcc aattgacatc	660
tgtggcacca cttgtaaata ccctgactac ctcaaattgg ctgctgacct atatggagac	720
agactgttct tcttcctgag gaaggaacag atgtttgcca gacacttctt caacagggct	780
ggagaggtgg gagaacctgt gcctgacacc ctgattatca agggctcttg caacaggacc	840
tctgtgggct ccagcatcta tgtgaacaca ccatctggct ccctggtgtc ctctgaggct	900
caacttttca acaagccata ctggctcaa aaggctcaag gacacaaca tggcatctgt	960
tggggcaacc aactttttgt gacagtgtgt gacaccacca ggagcaccaa tatgacctg	1020
tgtgcctctg tgaccacctc cagcacctac accaactctg actacaagga atatatgagg	1080

catgtggagg aatatgacct ccaattcatc ttccaacttt gtagcatcac cctgtctgct	1140
gaggtgatgg cttacatcca cacaatgaac ccatctgtgt tggaggactg gaactttgga	1200
ctgagccctc ctccaaatgg caccttggag gacacctaca gatatgtcca gagccaggct	1260
atcacttgtc agaagccaac acctgagaag gagaagcctg acccatacaa gaacctgtcc	1320
ttctgggagg tgaacctgaa agagaagttc tcctctgaac tggaccaata cccactgggc	1380
aggaagtcc tgctccaatc tggctacaaa gccaaagcaa aactgaaaag ggctgcccc	1440
accagcacca ggacctcctc tgccaagagg aagaaggtga agaagtaa	1488

<210> 5

<211> 1522

<212> DNA

<213> Artificial sequence

<220>

<223> 0605 Synthetic HPV6 L1 gene

<400> 5

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tccagcagac tgctggctgt gggacacca tacttcagca tcaagagggc taacaagaca	180
gtggtgccaa aggtgtctgg ctaccaatac aggggtgtta aggtggtgct gcctgaccca	240
aacaagtttg ccctgcctga ctctccctg tttgaccaa ccaccagag actggtgtgg	300
gcttgactg gattggaggt gggcagggga caaccactgg gagtgggagt gtctggacac	360
ccattcctga acaaatatga tgatgtggag aactctggct ctggaggcaa ccctggacaa	420
gacaacaggg tgaatgtggg gatggactac aagcagaccc aactttgtat ggtgggctgt	480
gcccctccac tgggagaaca ctggggcaag ggcaagcagt gtaccaacac acctgtccag	540
gctggagact gtcctccatt ggaactgatt acctctgtga ttcaggatgg agatatggtg	600
gacacaggct ttggagctat gaactttgct gacctccaaa ccaacaagtc tgatgtgcca	660
attgacatct gtggcaccac ttgtaaatac cctgactacc tccaaatggc tgctgaccca	720
tatggagaca gactgttctt cttcctgagg aaggaacaga tgtttgccag acacttcttc	780
aacagggtg gagaggtggg agaacctgtg cctgacaccc tgattatcaa gggctctggc	840

aacaggacct ctgtgggctc cagcatctat gtgaacacac catctggctc cctggtgtcc	900
tctgaggctc aacttttcaa caagccatac tggctccaaa aggctcaagg acacaacaat	960
ggcatctgtt ggggcaacca actttttgtg acagtgggtg acaccaccag gagcaccaat	1020
atgaccctgt gtgcctctgt gaccacctcc agcacctaca ccaactctga ctacaaggaa	1080
tatatgaggc atgtggagga atatgacctc caattcatct tccaactttg tagcatcacc	1140
ctgtctgctg aggtgatggc ttacatccac acaatgaacc catctgtgtt ggaggactgg	1200
aactttggac tgagccctcc tccaaatggc accttggagg acacctacag atatgtccag	1260
agccaggcta tcacttgtca gaagccaaca cctgagaagg agaagcctga cccatacaag	1320
aacctgtcct tctgggaggt gaacctgaaa gagaagttct cctctgaact ggaccaatac	1380
ccactgggca ggaagttcct gctccaatct ggctacaggg gcaggtccag catcaggaca	1440
ggagtgaaga gacctgctgt gagcaaggca tctgctgccc caaagaggaa gagggctaag	1500
accaagaggt aaactcgagc tc	1522

<210> 6

<211> 1519

<212> DNA

<213> Artificial sequence

<220>

<223> 0606 Synthetic HPV33 L1 gene

<400> 6

ctgggtacca tgagtgtgtg gagaccatct gaggctacag tctacctgcc tcctgtgcct	60
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ggctccagca gactgctggc tgtgggacac ccatacttca gcatcaagaa cccaaccaat	180
gccaagaaac tgctggtgcc aaaggtgtct ggactccaat acagggtgtt cagggtgaga	240
ctgcctgacc caaacaagtt tggctttcct gacacctcct tctacaacct tgacaccag	300
agactggtgt gggcttgtgt gggattggag attggcaggg gacaaccact gggagtgggc	360
atctctggac acccactgct gaacaagttt gatgacacag agacaggcaa caaataccct	420
ggacaacctg gagcagaaa caggagagtgt ctgagtatgg actacaagca gacccaactt	480
tgtctgctgg gctgtaagcc tccaacagga gaacactggg gcaaggaggt ggcttgtacc	540
aatgctgccc ctgccaatga ctgtcctcca ttggaactga taaacaccat cattgaggat	600

ggagatatgg tggacacagg ctttggctgt atggacttca agaccctcca agccaacaag	660
tctgatgtgc caattgacat ctgtggcagc acttgtaaata accctgacta cctgaaaatg	720
acctctgaac catatggaga ctccctgttc ttcttcctga ggagggaaca gatgtttgtg	780
agacacttct tcaacagggc tggcaccctg ggagaggctg tgcctgatga cctctacatc	840
aagggtcttg gcaccacagc cagcatccag tcctctgcct tctttccaac accatctggc	900
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aggagcacca atatgaccct gtgtaccag gtgacctctg acagcaccta caagaatgag	1080
aacttcaagg aatacatcag gcatgtggag gaatatgacc tccaatttgt gttccaactt	1140
tgttaaggta ccctgacagc agagggtgatg acctacatcc atgctatgaa ccctgacatc	1200
ttggaggact ggcagtttgg actgacacct cctccatctg cctccctcca agacacctac	1260
aggtttgtga ccagccaggc tatcacttgt cagaagacag tgcctccaaa ggagaaggag	1320
gacccactgg gcaaatacac cttctgggag gtggacctga aagagaagtt ctctgctgac	1380
ctggaccagt ttccactggg caggaagttc ctgctccaag caggactgaa agccaagcca	1440
aaactgaaaa gggctgcccc aaccagcacc aggacctcct ctgccaagag gaagaagggtg	1500
aagaagtaaa ctcgagctc	1519

<210> 7
 <211> 35
 <212> DNA
 <213> Artificial sequence

<220>
 <223> 0607 HPV6L1 F1

<400> 7 cttggtacca tgtggagacc atctgacagc acagt	35
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<210> 8
 <211> 36
 <212> DNA
 <213> Artificial sequence

<220>

<223> 0608 HPV6L1 R1

<400> 8

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36

<210> 9

<211> 1426

<212> DNA

<213> Artificial sequence

<220>

<223> 0609 HPV6L1 amplified sequence 1

<400> 9

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tccagcagac tgctggctgt gggacacca tacttcagca tcaagagggc taacaagaca	180
gtggtgcaa aggtgtctgg ctaccaatac aggggtgttca aggtggtgct gcctgaccca	240
aacaagtttg ccctgcctga ctctccctg ttgacccaa ccaccagag actggtgtgg	300
gcttgtagtg gattggaggt gggcagggga caaccactgg gaggggagt gtctggacac	360
ccattcctga acaaatatga tgatgtggag aactctggct ctggaggcaa ccctggacaa	420
gacaacaggg tgaatgtggg gatggactac aagcagaccc aactttgtat ggtgggctgt	480
gcccctccac tgggagaaca ctggggcaag ggcaagcagt gtaccaacac acctgtccag	540
gctggagact gtcctccatt ggaactgatt acctctgtga ttcaggatgg agatatggtg	600
gacacaggct ttggagctat gaactttgct gacctcaaa ccaacaagtc tgatgtgcca	660
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tatggagaca gactgttctt cttcctgagg aaggaacaga tgtttgccag acacttcttc	780
aacagggttg gagaggtggg agaacctgtg cctgacaccc tgattatcaa gggctctggc	840
aacaggacct ctgtgggctc cagcatctat gtgaacacac catctggctc cctggtgtcc	900
tctgaggctc aacttttcaa caagccatac tggctccaaa aggctcaagg acacaacaat	960
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atgaccctgt gtgcctctgt gaccacctcc agcacctaca ccaactctga ctacaaggaa	1080
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ctgtctgctg aggtgatggc ttacatccac acaatgaacc catctgtgtt ggaggactgg	1200
aactttggac tgagccctcc tccaaatggc accttggagg acacctacag atatgtccag	1260
agccaggcta tcacttgtca gaagccaaca cctgagaagg agaagcctga cccatacaag	1320
aacctgtcct tctgggaggt gaacctgaaa gagaagttct cctctgaact ggaccaatac	1380
ccactgggca ggaagttcct gctccaatct ggctacaaag ccaagc	1426

<210> 10
 <211> 35
 <212> DNA
 <213> Artificial sequence

<220>
 <223> 0610 HPV6L1 F2

<400> 10	
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<210> 11
 <211> 37
 <212> DNA
 <213> Artificial sequence

<220>
 <223> 0611 HPV6L1 R2

<400> 11	
ctgtctagat ttacttcttc accttcttcc tcttggc	37

<210> 12
 <211> 101
 <212> DNA
 <213> Artificial sequence

<220>
 <223> 0612 HPV6L1 amplified sequence 2

<400> 12	
atctggctac aaagccaagc caaaactgaa aagggctgcc ccaaccagca ccaggacctc	60
ctctgccaag aggaagaagg tgaagaagta aatctagaca g	101

<210> 13
 <211> 38

<212> PRT
 <213> Homo sapiens

<220>
 <223> 0613 Amino acid sequence of HPV type 59 L1 protein aa 471-508

<400> 13
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 Ala Ala Pro Ala Pro Thr Ser Thr Pro Ser Pro Lys Arg Val Lys Arg
 20 25 30
 Arg Lys Ser Ser Arg Lys
 35

<210> 14
 <211> 470
 <212> PRT
 <213> Homo sapiens

<220>
 <223> 1101 Amino acid sequence of HPV type 11 L1 protein aa 1-470

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 Phe Tyr His Ala Ser Ser Ser Arg Leu Leu Ala Val Gly His Pro Tyr
 35 40 45
 Tyr Ser Ile Lys Lys Val Asn Lys Thr Val Val Pro Lys Val Ser Gly
 50 55 60
 Tyr Gln Tyr Arg Val Phe Lys Val Val Leu Pro Asp Pro Asn Lys Phe
 65 70 75 80
 Ala Leu Pro Asp Ser Ser Leu Phe Asp Pro Thr Thr Gln Arg Leu Val
 85 90 95
 Trp Ala Cys Thr Gly Leu Glu Val Gly Arg Gly Gln Pro Leu Gly Val
 100 105 110
 Gly Val Ser Gly His Pro Leu Leu Asn Lys Tyr Asp Asp Val Glu Asn
 115 120 125
 Ser Gly Gly Tyr Gly Gly Asn Pro Gly Gln Asp Asn Arg Val Asn Val
 130 135 140
 Gly Met Asp Tyr Lys Gln Thr Gln Leu Cys Met Val Gly Cys Ala Pro
 145 150 155 160
 Pro Leu Gly Glu His Trp Gly Lys Gly Thr Gln Cys Ser Asn Thr Ser
 165 170 175
 Val Gln Asn Gly Asp Cys Pro Pro Leu Glu Leu Ile Thr Ser Val Ile
 180 185 190
 Gln Asp Gly Asp Met Val Asp Thr Gly Phe Gly Ala Met Asn Phe Ala
 195 200 205
 Asp Leu Gln Thr Asn Lys Ser Asp Val Pro Leu Asp Ile Cys Gly Thr
 210 215 220
 Val Cys Lys Tyr Pro Asp Tyr Leu Gln Met Ala Ala Asp Pro Tyr Gly

225					230					235				240
Asp	Arg	Leu	Phe	Phe	Tyr	Leu	Arg	Lys	Glu	Gln	Met	Phe	Ala	Arg
				245					250					255
Phe	Phe	Asn	Arg	Ala	Gly	Thr	Val	Gly	Glu	Pro	Val	Pro	Asp	Asp
			260					265					270	Leu
Leu	Val	Lys	Gly	Gly	Asn	Asn	Arg	Ser	Ser	Val	Ala	Ser	Ser	Ile
		275					280					285		Tyr
Val	His	Thr	Pro	Ser	Gly	Ser	Leu	Val	Ser	Ser	Glu	Ala	Gln	Leu
	290					295					300			Phe
Asn	Lys	Pro	Tyr	Trp	Leu	Gln	Lys	Ala	Gln	Gly	His	Asn	Asn	Gly
305					310				315					320
Cys	Trp	Gly	Asn	His	Leu	Phe	Val	Thr	Val	Val	Asp	Thr	Thr	Arg
			325					330						335
Thr	Asn	Met	Thr	Leu	Cys	Ala	Ser	Val	Ser	Lys	Ser	Ala	Thr	Tyr
		340						345					350	Thr
Asn	Ser	Asp	Tyr	Lys	Glu	Tyr	Met	Arg	His	Val	Glu	Glu	Phe	Asp
	355						360					365		Leu
Gln	Phe	Ile	Phe	Gln	Leu	Cys	Ser	Ile	Thr	Leu	Ser	Ala	Glu	Val
	370					375					380			Met
Ala	Tyr	Ile	His	Thr	Met	Asn	Pro	Ser	Val	Leu	Glu	Asp	Trp	Asn
385					390					395				400
Gly	Leu	Ser	Pro	Pro	Pro	Asn	Gly	Thr	Leu	Glu	Asp	Thr	Tyr	Arg
			405					410						415
Val	Gln	Ser	Gln	Ala	Ile	Thr	Cys	Gln	Lys	Pro	Thr	Pro	Glu	Lys
		420					425					430		Glu
Lys	Gln	Asp	Pro	Tyr	Lys	Asp	Met	Ser	Phe	Trp	Glu	Val	Asn	Leu
	435					440					445			Lys
Glu	Lys	Phe	Ser	Ser	Glu	Leu	Asp	Gln	Phe	Pro	Leu	Gly	Arg	Lys
	450					455					460			Phe
Leu	Leu	Gln	Ser	Gly	Tyr									
465					470									

<210> 15

<211> 26

<212> PRT

<213> Homo sapiens

<220>

<223> 1102 Amino acid sequence of HPV type 33 L1 protein aa 474-499

<400> 15

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<210> 16

<211> 496

<212> PRT

<213> Artificial sequence

<220>

<223> 1103 Amino acid sequence of chimeric HPV type 11 L1 protein

<400> 16

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Phe Tyr His Ala Ser Ser Ser Arg Leu Leu Ala Val Gly His Pro Tyr
          35          40          45
Tyr Ser Ile Lys Lys Val Asn Lys Thr Val Val Pro Lys Val Ser Gly
          50          55          60
Tyr Gln Tyr Arg Val Phe Lys Val Val Leu Pro Asp Pro Asn Lys Phe
65          70          75          80
Ala Leu Pro Asp Ser Ser Leu Phe Asp Pro Thr Thr Gln Arg Leu Val
          85          90          95
Trp Ala Cys Thr Gly Leu Glu Val Gly Arg Gly Gln Pro Leu Gly Val
          100          105          110
Gly Val Ser Gly His Pro Leu Leu Asn Lys Tyr Asp Asp Val Glu Asn
          115          120          125
Ser Gly Gly Tyr Gly Gly Asn Pro Gly Gln Asp Asn Arg Val Asn Val
          130          135          140
Gly Met Asp Tyr Lys Gln Thr Gln Leu Cys Met Val Gly Cys Ala Pro
145          150          155          160
Pro Leu Gly Glu His Trp Gly Lys Gly Thr Gln Cys Ser Asn Thr Ser
          165          170          175
Val Gln Asn Gly Asp Cys Pro Pro Leu Glu Leu Ile Thr Ser Val Ile
          180          185          190
Gln Asp Gly Asp Met Val Asp Thr Gly Phe Gly Ala Met Asn Phe Ala
          195          200          205
Asp Leu Gln Thr Asn Lys Ser Asp Val Pro Leu Asp Ile Cys Gly Thr
          210          215          220
Val Cys Lys Tyr Pro Asp Tyr Leu Gln Met Ala Ala Asp Pro Tyr Gly
225          230          235          240
Asp Arg Leu Phe Phe Tyr Leu Arg Lys Glu Gln Met Phe Ala Arg His
          245          250          255
Phe Phe Asn Arg Ala Gly Thr Val Gly Glu Pro Val Pro Asp Asp Leu
          260          265          270
Leu Val Lys Gly Gly Asn Asn Arg Ser Ser Val Ala Ser Ser Ile Tyr
          275          280          285
Val His Thr Pro Ser Gly Ser Leu Val Ser Ser Glu Ala Gln Leu Phe
          290          295          300
Asn Lys Pro Tyr Trp Leu Gln Lys Ala Gln Gly His Asn Asn Gly Ile
305          310          315          320
Cys Trp Gly Asn His Leu Phe Val Thr Val Val Asp Thr Thr Arg Ser
          325          330          335
Thr Asn Met Thr Leu Cys Ala Ser Val Ser Lys Ser Ala Thr Tyr Thr
          340          345          350
Asn Ser Asp Tyr Lys Glu Tyr Met Arg His Val Glu Glu Phe Asp Leu
          355          360          365
Gln Phe Ile Phe Gln Leu Cys Ser Ile Thr Leu Ser Ala Glu Val Met
          370          375          380
Ala Tyr Ile His Thr Met Asn Pro Ser Val Leu Glu Asp Trp Asn Phe
385          390          395          400
Gly Leu Ser Pro Pro Pro Asn Gly Thr Leu Glu Asp Thr Tyr Arg Tyr

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				405					410					415			
Val	Gln	Ser	Gln	Ala	Ile	Thr	Cys	Gln	Lys	Pro	Thr	Pro	Glu	Lys	Glu		
			420					425					430				
Lys	Gln	Asp	Pro	Tyr	Lys	Asp	Met	Ser	Phe	Trp	Glu	Val	Asn	Leu	Lys		
		435					440					445					
Glu	Lys	Phe	Ser	Ser	Glu	Leu	Asp	Gln	Phe	Pro	Leu	Gly	Arg	Lys	Phe		
	450					455					460						
Leu	Leu	Gln	Ser	Gly	Tyr	Lys	Ala	Lys	Pro	Lys	Leu	Lys	Arg	Ala	Ala		
465				470				475						480			
Pro	Thr	Ser	Thr	Arg	Thr	Ser	Ser	Ala	Lys	Arg	Lys	Lys	Val	Lys	Lys		
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<210> 17

<211> 1492

<212> DNA

<213> Artificial sequence

<220>

<223> 1104 Nucleotide sequence of chimeric HPV type 11 L1 protein

<400> 17

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ctgctggctg tgggacaccc atactacagc atcaagaagg tgaacaagac agtggtgcca	180
aaggtgtctg gctaccaata cagggtgttc aaggtggtgc tgcctgacct aaacaagttt	240
gccctgcctg actcctccct gtttgacct accaccaga gactggtgtg ggcttgtact	300
ggattggagg tgggcagggg acaaccactg ggagtgggag tgtctggaca cccactgctg	360
aacaaatatg atgatgtgga gaactctgga ggctatggag gcaaccctgg acaagacaac	420
agggtgaatg tggggatgga ctacaagcag acccaacttt gtatggtggg ctgtgccct	480
ccactgggag aacactgggg caagggcacc cagtgtagca acacctctgt ccagaatgga	540
gactgtcctc cattggaact gattacctct gtgattcagg atggagatat ggtggacaca	600
ggctttggag ctatgaactt tgctgacctc caaaccaaca agtctgatgt gccactggac	660
atctgtggca cagtgtgtaa ataccctgac tacctccaaa tggctgctga cccatatgga	720
gacagactgt tcttctacct gaggaaggaa cagatgtttg ccagacactt cttcaacagg	780
gctggcacag tgggagaacc tgtgcctgat gacctgctgg tgaaggagg caacaacagg	840
tcctctgtgg catccagcat ctatgtgcat acaccatctg gctccctggt gtcctctgag	900

gctcaacttt tcaacaagcc atactggctc caaaaggctc aaggacacaa caatggcatc	960
tgttggggca accacctgtt tgtgacagt gtggacacca ccaggagcac caatatgacc	1020
ctgtgtgcct ctgtgagcaa gtctgccacc tacaccaact ctgactacaa ggaatatatg	1080
aggcatgtgg aggagtttga cctccaattc atcttccaac tttgtagcat caccctgtct	1140
gctgaggtga tggcttacat ccacacaatg aacccatctg tgttggagga ctggaacttt	1200
ggactgagcc ctctcctcaa tggcaccttg gaggacacct acagatatgt ccagagccag	1260
gctatcactt gtcagaagcc aacacctgag aaggagaagc aggaccata caaggatatg	1320
agtttctggg aggtgaacct gaaagagaag ttctcctctg aactggacca gtttccactg	1380
ggcaggaagt tcctgctcca atctggctac aaagccaagc caaaactgaa aagggtgctc	1440
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<210> 18

<211> 1525

<212> DNA

<213> Artificial sequence

<220>

<223> 1105 Synthetic HPV11 L1 gene

<400> 18

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tccagcagac tgctggctgt gggacacca tactacagca tcaagaaggt gaacaagaca	180
gtggtgcaa aggtgtctgg ctaccaatac aggggtgttca aggtggtgct gcctgaccca	240
aacaagtttg ccctgcctga ctctccctg ttgacccaa ccaccagag actggtgtgg	300
gcttgactg gattggaggt gggcagggga caaccactgg gaggggagt gtctggacac	360
ccactgctga acaaatatga tgatgtggag aactctggag gctatggagg caaccctgga	420
caagacaaca gggatgaatgt ggggatggac tacaagcaga cccaactttg tatggtgggc	480
tgtgcccctc cactgggaga aactggggc aagggcaccc agtgtagcaa cacctctgtc	540
cagaatggag actgtcctcc attggaactg attacctctg tgattcagga tggagatatg	600
gtggacacag gctttggagc tatgaacttt gctgacctcc aaaccaacaa gtctgatgtg	660
ccactggaca tctgtggcac agtgtgtaaa taccctgact acctccaaat ggctgctgac	720

ccatatggag acagactgtt cttctacctg aggaaggaac agatgtttgc cagacacttc	780
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aacaacaggt cctctgtggc atccagcatc tatgtgcata caccatctgg ctccctggtg	900
tcctctgagg ctcaactttt caacaagcca tactggctcc aaaaggctca aggacacaac	960
aatggcatct gttggggcaa ccacctgttt gtgacagtgg tggacaccac caggagcacc	1020
aatatgaccc tgtgtgcctc tgtgagcaag tctgccacct acaccaactc tgactacaag	1080
gaatatatga ggcatgtgga ggagtttgac ctccaattca tcttccaact ttgtagcatc	1140
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cagagccagg ctatcacttg tcagaagcca acacctgaga aggagaagca ggaccatac	1320
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tttccactgg gcaggaagtt cctgctcaa tctggctaca ggggcaggac ctctgccagg	1440
acaggcatca agagacctgc tgtgagcaag ccaagcacag ccccaaagag gaagaggacc	1500
aagaccaaga agtaaactcg agctc	1525

<210> 19

<211> 1519

<212> DNA

<213> Artificial sequence

<220>

<223> 1106 Synthetic HPV33 L1 gene

<400> 19

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ggctccagca gactgctggc tgtgggacac ccatacttca gcatcaagaa cccaaccaat	180
gccaagaaac tgctggtgcc aaaggtgtct ggactccaat acagggtgtt cagggtgaga	240
ctgcctgacc caaacaagtt tggctttcct gacacctcct tctacaaccc tgacaccag	300
agactggtgt gggcttgtgt gggattggag attggcaggg gacaaccact gggagtgggc	360
atctctggac acccactgct gaacaagttt gatgacacag agacaggcaa caaataccct	420

ggacaacctg gagcagacaa cagggagtgt ctgagtatgg actacaagca gacccaactt	480
tgtctgctgg gctgtaagcc tccaacagga gaacactggg gcaagggagt ggcttgtacc	540
aatgctgccc ctgccaatga ctgtcctcca ttggaactga taaacaccat cattgaggat	600
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tctgatgtgc caattgacat ctgtggcagc acttgtaaata accctgacta cctgaaaatg	720
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aagaagtaaa ctcgagctc	1519

<210> 20
 <211> 35
 <212> DNA
 <213> Artificial sequence

<220>
 <223> 1107 HPV11L1 F1

<400> 20	
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<210> 21
 <211> 36

<212> DNA
 <213> Artificial sequence

<220>
 <223> 1108 HPV11L1 R1

<400> 21
 gcttggcctt gtagccagat tggagcagga acttcc 36

<210> 22
 <211> 1429
 <212> DNA
 <213> Artificial sequence

<220>
 <223> 1109 HPV11L1 amplified sequence 1

<400> 22
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 agcaagggtgg tggctacaga tgcctatgtg aagaggacca acatcttcta ccatgcctcc 120
 tccagcagac tgctggctgt gggacacca tactacagca tcaagaagggt gaacaagaca 180
 gtggtgccaa aggtgtctgg ctaccaatac aggggtgttca aggtggtgct gcctgaccca 240
 aacaagtttg ccctgcctga ctctccctg tttgaccaa ccaccagag actggtgtgg 300
 gcttgactg gattggagggt gggcagggga caaccactgg gaggggagt gtctggacac 360
 ccactgctga acaaatatga tgatgtggag aactctggag gctatggagg caaccctgga 420
 caagacaaca gggatgaatgt ggggatggac tacaagcaga cccaactttg tatggtgggc 480
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 gtggacacag gctttggagc tatgaacttt gctgacctcc aaaccaacaa gtctgatgtg 660
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cagagccagg ctatcacttg tcagaagcca acacctgaga aggagaagca ggaccatac	1320
aaggatatga gtttctggga ggtgaacctg aaagagaagt tctcctctga actggaccag	1380
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<210> 23
 <211> 35
 <212> DNA
 <213> Artificial sequence

<220>
 <223> 1110 HPV11L1 F2

<400> 23	
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<210> 24
 <211> 37
 <212> DNA
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<220>
 <223> 1111 HPV11L1 R2

<400> 24	
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<210> 25
 <211> 101
 <212> DNA
 <213> Artificial sequence

<220>
 <223> 1112 HPV11L1 amplified sequence 2

<400> 25	
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ctctgccaaag aggaagaagg tgaagaagta aatctagaca g

101

<210> 26
 <211> 38
 <212> PRT
 <213> Homo sapiens

<220>
 <223> 1113 Amino acid sequence of HPV type 59 L1 protein aa 471-508

<400> 26
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 Arg Lys Ser Ser Arg Lys
 35

<210> 27
 <211> 474
 <212> PRT
 <213> Homo sapiens

<220>
 <223> 1601 Amino acid sequence of HPV type 16 L1 protein aa 1-474

<400> 27
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 Ile Tyr Tyr His Ala Gly Thr Ser Arg Leu Leu Ala Val Gly His Pro
 35 40 45
 Tyr Phe Pro Ile Lys Lys Pro Asn Asn Asn Lys Ile Leu Val Pro Lys
 50 55 60
 Val Ser Gly Leu Gln Tyr Arg Val Phe Arg Ile His Leu Pro Asp Pro
 65 70 75 80
 Asn Lys Phe Gly Phe Pro Asp Thr Ser Phe Tyr Asn Pro Asp Thr Gln
 85 90 95
 Arg Leu Val Trp Ala Cys Val Gly Val Glu Val Gly Arg Gly Gln Pro
 100 105 110
 Leu Gly Val Gly Ile Ser Gly His Pro Leu Leu Asn Lys Leu Asp Asp
 115 120 125
 Thr Glu Asn Ala Ser Ala Tyr Ala Ala Asn Ala Gly Val Asp Asn Arg
 130 135 140
 Glu Cys Ile Ser Met Asp Tyr Lys Gln Thr Gln Leu Cys Leu Ile Gly
 145 150 155 160
 Cys Lys Pro Pro Ile Gly Glu His Trp Gly Lys Gly Ser Pro Cys Thr
 165 170 175
 Asn Val Ala Val Asn Pro Gly Asp Cys Pro Pro Leu Glu Leu Ile Asn
 180 185 190

Thr	Val	Ile	Gln	Asp	Gly	Asp	Met	Val	Asp	Thr	Gly	Phe	Gly	Ala	Met
	195						200					205			
Asp	Phe	Thr	Thr	Leu	Gln	Ala	Asn	Lys	Ser	Glu	Val	Pro	Leu	Asp	Ile
	210					215					220				
Cys	Thr	Ser	Ile	Cys	Lys	Tyr	Pro	Asp	Tyr	Ile	Lys	Met	Val	Ser	Glu
225					230					235					240
Pro	Tyr	Gly	Asp	Ser	Leu	Phe	Phe	Tyr	Leu	Arg	Arg	Glu	Gln	Met	Phe
				245					250					255	
Val	Arg	His	Leu	Phe	Asn	Arg	Ala	Gly	Ala	Val	Gly	Glu	Asn	Val	Pro
			260					265					270		
Asp	Asp	Leu	Tyr	Ile	Lys	Gly	Ser	Gly	Ser	Thr	Ala	Asn	Leu	Ala	Ser
		275					280					285			
Ser	Asn	Tyr	Phe	Pro	Thr	Pro	Ser	Gly	Ser	Met	Val	Thr	Ser	Asp	Ala
	290					295					300				
Gln	Ile	Phe	Asn	Lys	Pro	Tyr	Trp	Leu	Gln	Arg	Ala	Gln	Gly	His	Asn
305					310					315					320
Asn	Gly	Ile	Cys	Trp	Gly	Asn	Gln	Leu	Phe	Val	Thr	Val	Val	Asp	Thr
			325						330					335	
Thr	Arg	Ser	Thr	Asn	Met	Ser	Leu	Cys	Ala	Ala	Ile	Ser	Thr	Ser	Glu
			340					345						350	
Thr	Thr	Tyr	Lys	Asn	Thr	Asn	Phe	Lys	Glu	Tyr	Leu	Arg	His	Gly	Glu
		355					360					365			
Glu	Tyr	Asp	Leu	Gln	Phe	Ile	Phe	Gln	Leu	Cys	Lys	Ile	Thr	Leu	Thr
	370					375					380				
Ala	Asp	Val	Met	Thr	Tyr	Ile	His	Ser	Met	Asn	Ser	Thr	Ile	Leu	Glu
385					390					395					400
Asp	Trp	Asn	Phe	Gly	Leu	Gln	Pro	Pro	Pro	Gly	Gly	Thr	Leu	Glu	Asp
			405						410					415	
Thr	Tyr	Arg	Phe	Val	Thr	Ser	Gln	Ala	Ile	Ala	Cys	Gln	Lys	His	Thr
			420					425					430		
Pro	Pro	Ala	Pro	Lys	Glu	Asp	Pro	Leu	Lys	Lys	Tyr	Thr	Phe	Trp	Glu
		435					440					445			
Val	Asn	Leu	Lys	Glu	Lys	Phe	Ser	Ala	Asp	Leu	Asp	Gln	Phe	Pro	Leu
	450					455					460				
Gly	Arg	Lys	Phe	Leu	Leu	Gln	Ala	Gly	Leu						
465					470										

<210> 28
 <211> 26
 <212> PRT
 <213> Homo sapiens

<220>
 <223> 1602 Amino acid sequence of HPV type 33 L1 protein aa 474-499

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Ser	Ser	Ala	Lys	Arg	Lys	Lys	Val	Lys	Lys						
			20					25							

<210> 29
 <211> 500

<212> PRT
 <213> Artificial sequence

<220>

<223> 1603 Amino acid sequence of chimeric HPV type 16 L1 protein

<400> 29

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Ile Tyr Tyr His Ala Gly Thr Ser Arg Leu Leu Ala Val Gly His Pro
35     40     45
Tyr Phe Pro Ile Lys Lys Pro Asn Asn Asn Lys Ile Leu Val Pro Lys
50     55     60
Val Ser Gly Leu Gln Tyr Arg Val Phe Arg Ile His Leu Pro Asp Pro
65     70     75     80
Asn Lys Phe Gly Phe Pro Asp Thr Ser Phe Tyr Asn Pro Asp Thr Gln
85     90     95
Arg Leu Val Trp Ala Cys Val Gly Val Glu Val Gly Arg Gly Gln Pro
100    105    110
Leu Gly Val Gly Ile Ser Gly His Pro Leu Leu Asn Lys Leu Asp Asp
115    120    125
Thr Glu Asn Ala Ser Ala Tyr Ala Ala Asn Ala Gly Val Asp Asn Arg
130    135    140
Glu Cys Ile Ser Met Asp Tyr Lys Gln Thr Gln Leu Cys Leu Ile Gly
145    150    155    160
Cys Lys Pro Pro Ile Gly Glu His Trp Gly Lys Gly Ser Pro Cys Thr
165    170    175
Asn Val Ala Val Asn Pro Gly Asp Cys Pro Pro Leu Glu Leu Ile Asn
180    185    190
Thr Val Ile Gln Asp Gly Asp Met Val Asp Thr Gly Phe Gly Ala Met
195    200    205
Asp Phe Thr Thr Leu Gln Ala Asn Lys Ser Glu Val Pro Leu Asp Ile
210    215    220
Cys Thr Ser Ile Cys Lys Tyr Pro Asp Tyr Ile Lys Met Val Ser Glu
225    230    235    240
Pro Tyr Gly Asp Ser Leu Phe Phe Tyr Leu Arg Arg Glu Gln Met Phe
245    250    255
Val Arg His Leu Phe Asn Arg Ala Gly Ala Val Gly Glu Asn Val Pro
260    265    270
Asp Asp Leu Tyr Ile Lys Gly Ser Gly Ser Thr Ala Asn Leu Ala Ser
275    280    285
Ser Asn Tyr Phe Pro Thr Pro Ser Gly Ser Met Val Thr Ser Asp Ala
290    295    300
Gln Ile Phe Asn Lys Pro Tyr Trp Leu Gln Arg Ala Gln Gly His Asn
305    310    315    320
Asn Gly Ile Cys Trp Gly Asn Gln Leu Phe Val Thr Val Val Asp Thr
325    330    335
Thr Arg Ser Thr Asn Met Ser Leu Cys Ala Ala Ile Ser Thr Ser Glu
340    345    350
Thr Thr Tyr Lys Asn Thr Asn Phe Lys Glu Tyr Leu Arg His Gly Glu
355    360    365

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Glu Tyr Asp Leu Gln Phe Ile Phe Gln Leu Cys Lys Ile Thr Leu Thr
 370 375 380
 Ala Asp Val Met Thr Tyr Ile His Ser Met Asn Ser Thr Ile Leu Glu
 385 390 395 400
 Asp Trp Asn Phe Gly Leu Gln Pro Pro Pro Gly Gly Thr Leu Glu Asp
 405 410 415
 Thr Tyr Arg Phe Val Thr Ser Gln Ala Ile Ala Cys Gln Lys His Thr
 420 425 430
 Pro Pro Ala Pro Lys Glu Asp Pro Leu Lys Lys Tyr Thr Phe Trp Glu
 435 440 445
 Val Asn Leu Lys Glu Lys Phe Ser Ala Asp Leu Asp Gln Phe Pro Leu
 450 455 460
 Gly Arg Lys Phe Leu Leu Gln Ala Gly Leu Lys Ala Lys Pro Lys Leu
 465 470 475 480
 Lys Arg Ala Ala Pro Thr Ser Thr Arg Thr Ser Ser Ala Lys Arg Lys
 485 490 495
 Lys Val Lys Lys
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<210> 30

<211> 1504

<212> DNA

<213> Artificial sequence

<220>

<223> 1604 Nucleotide sequence of chimeric HPV type 16 L1 protein

<400> 30

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agactgctgg ctgtgggaca cccatacttt ccaatcaaga agccaaacaa caacaagatt	180
ctggtgccaa aggtgtctgg actccaatac aggggtgttca ggattcacct gcctgaccca	240
aacaagtttg gctttcctga cacctccttc tacaaccctg acaccagag actggtgtgg	300
gcttgtgtgg gaggagggt gggcagggga caaccactgg gaggggcat ctctggacac	360
ccactgctga acaactgga tgacacagag aatgcctctg cctatgctgc caatgctgga	420
gtggacaaca gggagtgtat cagtatggac tacaagcaga cccaactttg tctgattggc	480
tgtaagcctc caattggaga aactggggc aagggcagcc catgtaccaa tgtggctgtg	540
aaccctggag actgtcctcc attggaactg ataaacacag tgattcagga tggagatatg	600
gtggacacag gctttggagc tatggacttc accaccctcc aagccaacaa gtctgagggtg	660
ccactggaca tctgtaccag catctgtaaa taccctgact acatcaagat ggtgtctgaa	720
ccatatggag actccctgtt cttctacctg aggagggaac agatgtttgt gagacacctg	780

ttcaacaggg ctggagcagt gggagagaat gtgcctgatg acctctacat caagggctct	840
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acctctgatg cccagatttt caacaagcca tactggctcc aaagggctca aggacacaac	960
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aaggaatacc tgagacatgg agaggaatat gacctccaat tcattcttcca actttgtaag	1140
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gactggaact ttggactcca acctcctcct ggaggcacct tggaggacac ctacaggttt	1260
gtgaccagcc aggctattgc ctgtcagaaa cacacacctc ctgccccaaa ggaggaccca	1320
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cagtttccac tgggcaggaa gttcctgctc caagcaggac tgaaagccaa gccaaaactg	1440
aaaagggctg cccaaccag caccaggacc tcctctgcca agaggaagaa ggtgaagaag	1500
taaa	1504

<210> 31

<211> 1537

<212> DNA

<213> Artificial sequence

<220>

<223> 1605 Synthetic HPV16 L1 gene

<400> 31

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ggcaccagca gactgctggc tgtgggacac ccatactttc caatcaagaa gccaaacaac	180
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cctgacccaa acaagtttgg ctttcctgac acctccttct acaaccctga caccagaga	300
ctgggtgtggg cttgtgtggg agtggagggtg ggcaggggac aaccactggg agtgggcatc	360
tctggacacc cactgctgaa caaactggat gacacagaga atgcctctgc ctatgctgcc	420
aatgctggag tggacaacag ggagtgtatc agtatggact acaagcagac ccaactttgt	480

ctgattggct gtaagcctcc aattggagaa cactggggca agggcagccc atgtaccaat	540
gtggctgtga accctggaga ctgtcctcca ttggaactga taaacacagt gattcaggat	600
ggagatatgg tggacacagg ctttggagct atggacttca ccaccctcca agccaacaag	660
tctgagggtgc cactggacat ctgtaccagc atctgtaaat accctgacta catcaagatg	720
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aggagcacca atatgagtct gtgtgctgcc atcagcacct ctgagaccac ctacaagaac	1080
accaacttca aggaatacct gagacatgga gaggaatatg acctccaatt catcttccaa	1140
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gacctggacc agtttccact gggcaggaag ttctgtctcc aagcaggact gaaagccaag	1440
ccaaagttca ccctgggcaa gaggaaggct acaccaacca cctccagcac cagcaccaca	1500
gccaagagga agaagaggaa actgtaaact cgagctc	1537

<210> 32

<211> 1519

<212> DNA

<213> Artificial sequence

<220>

<223> 1606 Synthetic HPV33 L1 gene

<400> 32

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gtgagcaagg tggtagcac agatgaatat gtgagcagga ccagcatcta ctactatgct	120
ggctccagca gactgtggc tgtgggacac ccatacttca gcatcaagaa cccaaccaat	180
gccaagaaac tgctggtgcc aaaggtgtct ggactccaat acagggtgtt cagggtgaga	240

ctgcctgacc caaacaagtt tggcttttcct gacacctcct tctacaaccc tgacacccag	300
agactggtgt gggcttgtgt gggattggag attggcaggg gacaaccact gggagtgggc	360
atctctggac acccactgct gaacaagttt gatgacacag agacaggcaa caaataccct	420
ggacaacctg gagcagacaa cagggagtgt ctgagtatgg actacaagca gacccaactt	480
tgtctgctgg gctgtaagcc tccaacagga gaacactggg gcaagggagt ggcttgtacc	540
aatgctgccc ctgccaatga ctgtcctcca ttggaactga taaacaccat cattgaggat	600
ggagatatgg tggacacagg ctttggctgt atggacttca agaccctcca agccaacaag	660
tctgatgtgc caattgacat ctgtggcagc acttgtaaata accctgacta cctgaaaatg	720
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agacacttct tcaacagggc tggcaccctg ggagaggctg tgcctgatga cctctacatc	840
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ctggaccagt ttccactggg caggaagttc ctgctccaag caggactgaa agccaagcca	1440
aaactgaaaa gggctgcccc aaccagcacc aggacctcct ctgccaagag gaagaagggtg	1500
aagaagtaaa ctcgagctc	1519

<210> 33

<211> 34

<212> DNA

<213> Artificial sequence

<220>

<223> 1607 HPV16L1 F1

<400> 33
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<210> 34
 <211> 36
 <212> DNA
 <213> Artificial sequence

<220>
 <223> 1608 HPV16L1 R1

<400> 34
 gcttggcttt cagtcctgct tggagcagga acttcc 36

<210> 35
 <211> 1441
 <212> DNA
 <213> Artificial sequence

<220>
 <223> 1609 HPV16L1 amplified sequence 1

<400> 35
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 ggaccagca gactgctggc tgtgggacac ccatactttc caatcaagaa gccaaacaac 180
 aacaagattc tggtgccaaa ggtgtctgga ctccaataga ggggtgttcag gattcacctg 240
 cctgacccaa acaagtttgg ctttcctgac acctccttct acaaccctga caccagaga 300
 ctggtgtggg cttgtgtggg agtggaggtg ggcaggggac aaccactggg agtgggcatc 360
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 aatgctggag tggacaacag ggagtgtatc agtatggact acaagcagac ccaactttgt 480
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 gtgtctgaac catatggaga ctccctgttc ttctacctga ggagggaaca gatgtttgtg 780

agacacctgt tcaacagggc tggagcagtg ggagagaatg tgcctgatga cctctacatc	840
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gaggaccac tgaaaaaata caccttctgg gaggtgaacc tgaaagagaa gttctctgct	1380
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c	1441

<210> 36
 <211> 35
 <212> DNA
 <213> Artificial sequence

<220>
 <223> 1610 HPV16L1 F2

<400> 36	
agcaggactg aaagccaagc caaaactgaa aaggg	35

<210> 37
 <211> 36
 <212> DNA
 <213> Artificial sequence

<220>
 <223> 1611 HPV16L1 R2

<400> 37	
ctgtctagat ttacttcttc accttcttcc tcttgg	36

<210> 38
 <211> 101
 <212> DNA

<213> Artificial sequence

<220>

<223> 1612 HPV16L1 amplified sequence 2

<400> 38

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ctctgccaag aggaagaagg tgaagaagta aatctagaca g 101

<210> 39

<211> 38

<212> PRT

<213> Homo sapiens

<220>

<223> 1613 Amino acid sequence of HPV type 59 L1 protein aa 471-508

<400> 39

Leu Gln Leu Gly Ala Arg Pro Lys Pro Thr Ile Gly Pro Arg Lys Arg

1 5 10 15

Ala Ala Pro Ala Pro Thr Ser Thr Pro Ser Pro Lys Arg Val Lys Arg

20 25 30

Arg Lys Ser Ser Arg Lys

35

<210> 40

<211> 470

<212> PRT

<213> Homo sapiens

<220>

<223> 1801 Amino acid sequence of HPV type 18 L1 protein aa 1-470

<400> 40

Met Ala Leu Trp Arg Pro Ser Asp Asn Thr Val Tyr Leu Pro Pro Pro

1 5 10 15

Ser Val Ala Arg Val Val Asn Thr Asp Asp Tyr Val Thr Arg Thr Ser

20 25 30

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

35 40 45

Tyr Phe Arg Val Pro Ala Gly Gly Gly Asn Lys Gln Asp Ile Pro Lys

50 55 60

Val Ser Ala Tyr Gln Tyr Arg Val Phe Arg Val Gln Leu Pro Asp Pro

65 70 75 80

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

85 90 95

Arg Leu Val Trp Ala Cys Ala Gly Val Glu Ile Gly Arg Gly Gln Pro

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Leu Gly Val Gly Leu Ser Gly His Pro Phe Tyr Asn Lys Leu Asp Asp

<400> 41

Lys Ala Lys Pro Lys Leu Lys Arg Ala Ala Pro Thr Ser Thr Arg Thr
1 5 10 15
Ser Ser Ala Lys Arg Lys Lys Val Lys Lys
20 25

<210> 42

<211> 496

<212> PRT

<213> Artificial sequence

<220>

<223> 1803 Amino acid sequence of chimeric HPV type 18 L1 protein

<400> 42

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20 25 30
Ile Phe Tyr His Ala Gly Ser Ser Arg Leu Leu Thr Val Gly Asn Pro
35 40 45
Tyr Phe Arg Val Pro Ala Gly Gly Gly Asn Lys Gln Asp Ile Pro Lys
50 55 60
Val Ser Ala Tyr Gln Tyr Arg Val Phe Arg Val Gln Leu Pro Asp Pro
65 70 75 80
Asn Lys Phe Gly Leu Pro Asp Thr Ser Ile Tyr Asn Pro Glu Thr Gln
85 90 95
Arg Leu Val Trp Ala Cys Ala Gly Val Glu Ile Gly Arg Gly Gln Pro
100 105 110
Leu Gly Val Gly Leu Ser Gly His Pro Phe Tyr Asn Lys Leu Asp Asp
115 120 125
Thr Glu Ser Ser His Ala Ala Thr Ser Asn Val Ser Glu Asp Val Arg
130 135 140
Asp Asn Val Ser Val Asp Tyr Lys Gln Thr Gln Leu Cys Ile Leu Gly
145 150 155 160
Cys Ala Pro Ala Ile Gly Glu His Trp Ala Lys Gly Thr Ala Cys Lys
165 170 175
Ser Arg Pro Leu Ser Gln Gly Asp Cys Pro Pro Leu Glu Leu Lys Asn
180 185 190
Thr Val Leu Glu Asp Gly Asp Met Val Asp Thr Gly Tyr Gly Ala Met
195 200 205
Asp Phe Ser Thr Leu Gln Asp Thr Lys Cys Glu Val Pro Leu Asp Ile
210 215 220
Cys Gln Ser Ile Cys Lys Tyr Pro Asp Tyr Leu Gln Met Ser Ala Asp
225 230 235 240
Pro Tyr Gly Asp Ser Met Phe Phe Cys Leu Arg Arg Glu Gln Leu Phe
245 250 255
Ala Arg His Phe Trp Asn Arg Ala Gly Thr Met Gly Asp Thr Val Pro
260 265 270
Gln Ser Leu Tyr Ile Lys Gly Thr Gly Met Arg Ala Ser Pro Gly Ser
275 280 285
Cys Val Tyr Ser Pro Ser Pro Ser Gly Ser Ile Val Thr Ser Asp Ser

290		295		300
Gln Leu Phe Asn Lys	Pro Tyr Trp Leu His	Lys Ala Gln Gly His Asn		
305	310	315		320
Asn Gly Val Cys Trp	His Asn Gln Leu Phe	Val Thr Val Val Asp Thr		
	325	330		335
Thr Arg Ser Thr Asn	Leu Thr Ile Cys Ala	Ser Thr Gln Ser Pro Val		
	340	345		350
Pro Gly Gln Tyr Asp	Ala Thr Lys Phe Lys	Gln Tyr Ser Arg His Val		
	355	360		365
Glu Glu Tyr Asp Leu	Gln Phe Ile Phe Gln	Leu Cys Thr Ile Thr Leu		
	370	375		380
Thr Ala Asp Val Met	Ser Tyr Ile His Ser	Met Asn Ser Ser Ile Leu		
385	390	395		400
Glu Asp Trp Asn Phe	Gly Val Pro Pro Pro	Pro Thr Thr Ser Leu Val		
	405	410		415
Asp Thr Tyr Arg Phe	Val Gln Ser Val Ala	Ile Thr Cys Gln Lys Asp		
	420	425		430
Ala Ala Pro Ala Glu	Asn Lys Asp Pro Tyr	Asp Lys Leu Lys Phe Trp		
	435	440		445
Asn Val Asp Leu Lys	Glu Lys Phe Ser Leu	Asp Leu Asp Gln Tyr Pro		
	450	455		460
Leu Gly Arg Lys Phe	Leu Lys Ala Lys Pro	Lys Leu Lys Arg Ala Ala		
465	470	475		480
Pro Thr Ser Thr Arg	Thr Ser Ser Ala Lys	Arg Lys Lys Val Lys Lys		
	485	490		495

<210> 43

<211> 1492

<212> DNA

<213> Artificial sequence

<220>

<223> 1804 Nucleotide sequence of chimeric HPV type 18 L1 protein

<400> 43

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gtggtgaaca cagacgacta cgtcaccaga acctcaatct tctaccacgc cgggtccagc	120
cggctgctga ccgtgggcaa cccctacttc cgcgtgcccg ccggcggcgg aaacaaacaa	180
gacatcccca aagtcagcgc ctatcagtac cgggtgttcc gcgtccaact gccgatccc	240
aacaagttcg gcctgcccga cacctccatc tacaaccccg agaccagag gctggtctgg	300
gcttgcgccg gcgtcgagat cgggaggggc caaccctgg gcgtgggggtt gtccggccac	360
cccttctaca acaagctgga cgataccgag tccagccacg cagcaaccag caacgtctcc	420
gaagatgtgc gcgataacgt cagcgtggac taaaacaaa cccaactgtg catcctggga	480

tgcgaccccg ccatcggcga gcattgggcc aaggggaccg cctgcaagag caggcccctg	540
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gtggacaccg gctacggcgc tatggatttc tccaccctcc aggacaccaa gtgcgaagtg	660
cccctcgaca tctgccaaag catctgcaag taccctgact acctccagat gagcgccgac	720
ccctacggcg acagcatgtt cttctgtctc agaagggaac aattgttcgc ccgccacttc	780
tggaaccggg ccggcacaat gggagataca gtccccaga gcctgtacat caaggggacc	840
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aacgggggtgt gttggcaca ccagctgttc gtgaccgtcg tggacacaac caggtccaca	1020
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ttcaaacat actctcggca cgtggaagag tacgacctcc aattcatctt ccaactctgc	1140
accatcacc tcaccgccga cgtgatgagc tacatccact ccatgaactc ctccatcctg	1200
gaagactgga atttcggcgt gccaccacc cctaccacct ccctcgtcga cacctacaga	1260
ttcgtgcaga gcgtggccat cacatgccag aaagacgccg ccccgccga gaacaaagac	1320
ccatacgaca aactgaaatt ctggaacgtc gacctgaaag agaaattcag cctggatctg	1380
gaccagtacc cattgggcag gaagttcctc aaagccaagc caaaactgaa aagggtgcc	1440
ccaaccagca ccaggacctc ctctgccaag aggaagaagg tgaagaagta aa	1492

<210> 44

<211> 1543

<212> DNA

<213> Artificial sequence

<220>

<223> 1805 Synthetic HPV18 L1 gene

<400> 44

ctgggtacca tggccctctg gagaccatcc gataacacag tgtacttgcc cccaccagc	60
gtcgcccggtg tggatgaacac agacgactac gtcaccagaa cctcaatctt ctaccacgcc	120
gggtccagcc ggctgctgac cgtgggcaac ccctacttcc gcgtgcccgc cggcggcgga	180
aacaaacaag acatcccaa agtcagcgcc tatcagtacc gggtgttcg cgtccaactg	240
cccgatcca acaagttcgg cctgcccgcac acctccatct acaaccccga gaccagagg	300

ctggtctggg cttgcgccgg cgtcgagatc gggagggggcc aacccttggg cgtgggggttg	360
tccggccacc ctttctacaa caagctggac gataccgagt ccagccacgc agcaaccagc	420
aacgtctccg aagatgtgcg cgataacgtc agcgtggact acaaacaac ccaactgtgc	480
atcctgggat gcgcacccgc catcggcgag cattggggcca aggggaccgc ctgcaagagc	540
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ggcgacatgg tggacaccgg ctacggcgct atggatttct ccaccctcca ggacaccaag	660
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agcgccgacc cctacggcga cagcatgttc ttctgtctca gaagggaaca attgttcgcc	780
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ggccacaata acggggtgtg ttggcacaac cagctgttcg tgaccgtcgt ggacacaacc	1020
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gccacaaagt tcaaacaata ctctcggcac gtggaagagt acgacctcca attcatcttc	1140
caactctgca ccatcacctt caccgccgac gtgatgagct acatccactc catgaactcc	1200
tccatcctgg aagactggaa tttcggcgtg ccaccacccc ctaccacctc cctcgtcgac	1260
acctacagat tcgtgcagag cgtggccatc acatgccaga aagacgccgc ccccgccgag	1320
aacaaagacc catacgaaa actgaaattc tggaacgtcg acctgaaaga gaaattcagc	1380
ctggatctgg accagtaccc attgggcagg aagttcctcg tgcaagccgg cctcaggaga	1440
aaaccaacaa tcggggcccag gaagaggagc gccccagcg caaccaccag cagcaagccc	1500
gcaaaaaggg tcagagttag ggcacgcaaa taaactcgag ctc	1543

<210> 45

<211> 1519

<212> DNA

<213> Artificial sequence

<220>

<223> 1806 Synthetic HPV33 L1 gene

<400> 45

ctgggtacca tgagtgtgtg gagaccatct gaggctacag tctacctgcc tcctgtgcct	60
gtgagcaagg tggtagcac agatgaatat gtgagcagga ccagcatcta ctactatgct	120
ggctccagca gactgctggc tgtgggacac ccatacttca gcatcaagaa cccaaccaat	180
gccaagaaac tgctgggtgcc aaaggtgtct ggactccaat acagggtgtt cagggtgaga	240
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agactgggtgt gggcttgtgt gggattggag attggcaggg gacaaccact gggagtgggc	360
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<210> 46

<211> 34
 <212> DNA
 <213> Artificial sequence

<220>
 <223> 1807 HPV18L1 F1

<400> 46
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<210> 47
 <211> 35
 <212> DNA
 <213> Artificial sequence

<220>
 <223> 1808 HPV18L1 R1

<400> 47
 gcttggcttt gaggaacttc ctgccaatg ggtac 35

<210> 48
 <211> 1429
 <212> DNA
 <213> Artificial sequence

<220>
 <223> 1809 HPV18L1 amplified sequence 1

<400> 48
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 ggggtccagcc ggctgctgac cgtgggcaac ccctacttcc gcgtgcccgc cggcggcgga 180
 aacaaacaag acatccccaag agtcagcgcc tatcagtacc ggggtgttccg cgtccaactg 240
 cccgatccca acaagttcgg cctgcccgc acctccatct acaaccccga gacccagagg 300
 ctgggtctggg cttgcgccgg cgtcgagatc gggagggggc aaccctggg cgtgggggtg 360
 tccggccacc ctttctacaa caagctggac gataccgagt ccagccacgc agcaaccagc 420
 aacgtctccg aagatgtgac cgataacgtc agcgtggact acaaacaaac ccaactgtgc 480
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caactctgca ccatcaccct caccgccgac gtgatgagct acatccactc catgaactcc	1200
tccatcctgg aagactggaa tttcggcgtg ccaccacccc ctaccacctc cctcgtcgac	1260
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aacaaagacc catacgaaa actgaaattc tggaacgtcg acctgaaaga gaaattcagc	1380
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<210> 49

<211> 35

<212> DNA

<213> Artificial sequence

<220>

<223> 1810 HPV18L1 F2

<400> 49

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<210> 50

<211> 36

<212> DNA

<213> Artificial sequence

<220>

<223> 1811 HPV18L1 R2

<400> 50

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<210> 51
 <211> 101
 <212> DNA
 <213> Artificial sequence

<220>
 <223> 1812 HPV18L1 amplified sequence 2

<400> 51
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 ctctgccaag aggaagaagg tgaagaagta aatctagaca g 101

<210> 52
 <211> 38
 <212> PRT
 <213> Homo sapiens

<220>
 <223> 1813 Amino acid sequence of HPV type 59 L1 protein aa 471-508

<400> 52
 Leu Gln Leu Gly Ala Arg Pro Lys Pro Thr Ile Gly Pro Arg Lys Arg
 1 5 10 15
 Ala Ala Pro Ala Pro Thr Ser Thr Pro Ser Pro Lys Arg Val Lys Arg
 20 25 30
 Arg Lys Ser Ser Arg Lys
 35

<210> 53
 <211> 475
 <212> PRT
 <213> Homo sapiens

<220>
 <223> 3101 Amino acid sequence of HPV type 31 L1 protein aa 1-475

<400> 53
 Met Ser Leu Trp Arg Pro Ser Glu Ala Thr Val Tyr Leu Pro Pro Val
 1 5 10 15
 Pro Val Ser Lys Val Val Ser Thr Asp Glu Tyr Val Thr Arg Thr Asn
 20 25 30
 Ile Tyr Tyr His Ala Gly Ser Ala Arg Leu Leu Thr Val Gly His Pro
 35 40 45
 Tyr Tyr Ser Ile Pro Lys Ser Asp Asn Pro Lys Lys Ile Val Val Pro
 50 55 60
 Lys Val Ser Gly Leu Gln Tyr Arg Val Phe Arg Val Arg Leu Pro Asp
 65 70 75 80

<213> Homo sapiens

<220>

<223> 3102 Amino acid sequence of HPV type 33 L1 protein aa 474-499

<400> 54

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Ser	Ser	Ala	Lys	Arg	Lys	Lys	Val	Lys	Lys						
			20					25							

<210> 55

<211> 501

<212> PRT

<213> Artificial sequence

<220>

<223> 3103 Amino acid sequence of chimeric HPV type 31 L1 protein

<400> 55

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Pro	Val	Ser	Lys	Val	Val	Ser	Thr	Asp	Glu	Tyr	Val	Thr	Arg	Thr	Asn
			20					25					30		
Ile	Tyr	Tyr	His	Ala	Gly	Ser	Ala	Arg	Leu	Leu	Thr	Val	Gly	His	Pro
			35				40					45			
Tyr	Tyr	Ser	Ile	Pro	Lys	Ser	Asp	Asn	Pro	Lys	Lys	Ile	Val	Val	Pro
			50			55					60				
Lys	Val	Ser	Gly	Leu	Gln	Tyr	Arg	Val	Phe	Arg	Val	Arg	Leu	Pro	Asp
65					70				75					80	
Pro	Asn	Lys	Phe	Gly	Phe	Pro	Asp	Thr	Ser	Phe	Tyr	Asn	Pro	Glu	Thr
				85					90					95	
Gln	Arg	Leu	Val	Trp	Ala	Cys	Val	Gly	Leu	Glu	Val	Gly	Arg	Gly	Gln
			100					105					110		
Pro	Leu	Gly	Val	Gly	Ile	Ser	Gly	His	Pro	Leu	Leu	Asn	Lys	Phe	Asp
			115				120					125			
Asp	Thr	Glu	Asn	Ser	Asn	Arg	Tyr	Ala	Gly	Gly	Pro	Gly	Thr	Asp	Asn
			130			135					140				
Arg	Glu	Cys	Ile	Ser	Met	Asp	Tyr	Lys	Gln	Thr	Gln	Leu	Cys	Leu	Leu
145					150					155				160	
Gly	Cys	Lys	Pro	Pro	Ile	Gly	Glu	His	Trp	Gly	Lys	Gly	Ser	Pro	Cys
				165					170					175	
Ser	Asn	Asn	Ala	Ile	Thr	Pro	Gly	Asp	Cys	Pro	Pro	Leu	Glu	Leu	Lys
			180					185					190		
Asn	Ser	Val	Ile	Gln	Asp	Gly	Asp	Met	Val	Asp	Thr	Gly	Phe	Gly	Ala
			195				200					205			
Met	Asp	Phe	Thr	Ala	Leu	Gln	Asp	Thr	Lys	Ser	Asn	Val	Pro	Leu	Asp
						215					220				
Ile	Cys	Asn	Ser	Ile	Cys	Lys	Tyr	Pro	Asp	Tyr	Leu	Lys	Met	Val	Ala
225					230					235					240
Glu	Pro	Tyr	Gly	Asp	Thr	Leu	Phe	Phe	Tyr	Leu	Arg	Arg	Glu	Gln	Met
				245					250					255	

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atggtggaca ccggcttcgg cgccatggac ttcaccgcc tgcaggacac caagagcaac	660
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ttcttcaaca ggagcggcac cgtgggcgag agcgtgccc cgcacctgta catcaagggc	840
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gaccagttcc ccctgggcag gaagttcctg ctgcaggccg gctacaaagc caagccaaaa	1440
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aagtaaa	1507

<210> 57

<211> 1534

<212> DNA

<213> Artificial sequence

<220>

<223> 3105 Synthetic HPV31 L1 gene

<400> 57

ctgggtacca tgagcctgtg gaggcccagc gaggccaccg tgtacctgcc cccctgccc	60
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cccaagaaga	tcgtgggtgcc	caaggtgagc	ggcctgcagt	acagggtggt	cagggtgagg	240
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ggcggccccc	gcaccgacaa	caggagtgct	atcagcatgg	actacaagca	gaccagctg	480
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aacaacgcca	tcacccccgg	cgactgcccc	cccctggagc	tgaagaacag	cgtgatccag	600
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gccgacctgg	accagttccc	cctgggcagg	aagttcctgc	tcaggccgg	ctacagggcc	1440
aggcccaagt	tcaaggccgg	caagaggagc	gccccagcg	ccagcaccac	cacccccgcc	1500
aagaggaaga	agaccaagaa	gtaaactcga	gctc			1534

<210> 58

<211> 1519

<212> DNA

<213> Artificial sequence

<220>

<223> 3106 Synthetic HPV33 L1 gene

<400> 58

ctgggtacca tgagtgtgtg gagaccatct gaggctacag tctacctgcc tcctgtgcct	60
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ggctccagca gactgctggc tgtgggacac ccatacttca gcatcaagaa cccaaccaat	180
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ggagatatgg tggacacagg ctttggctgt atggacttca agaccctcca agccaacaag	660
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ctggaccagt ttccactggg caggaagttc ctgctccaag caggactgaa agccaagcca	1440

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aagaagtaaa ctcgagctc 1519

<210> 59
<211> 33
<212> DNA
<213> Artificial sequence

<220>
<223> 3107 HPV31L1 F1

<400> 59
cttggtacca tgagcctgtg gaggcccagc gag 33

<210> 60
<211> 38
<212> DNA
<213> Artificial sequence

<220>
<223> 3108 HPV31L1 R1

<400> 60
gcttggcttt gtagccggcc tgcagcagga acttcctg 38

<210> 61
<211> 1444
<212> DNA
<213> Artificial sequence

<220>
<223> 3109 HPV31L1 amplified sequence 1

<400> 61
cttggtacca tgagcctgtg gaggcccagc gaggccaccg tgtacctgcc ccccggtgccc 60
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ggcagcgcca ggctgctgac cgtggggccac ccctactaca gcatccccaa gagcgacaac 180
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atcagcggcc accccctgct gaacaagttc gacgacaccg agaacagcaa caggtacgcc	420
ggcggccccc gcaccgacaa cagggagtgc atcagcatgg actacaagca gaccagctg	480
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aagc	1444

<210> 62
 <211> 35
 <212> DNA
 <213> Artificial sequence

<220>
 <223> 3110 HPV31L1 F2

<400> 62	
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<210> 63
 <211> 41

<212> DNA
<213> Artificial sequence

<220>
<223> 3111 HPV31L1 R2

<400> 63
ctgtctagat ttacttcttc accttcttcc tcttggcaga g 41

<210> 64
<211> 101
<212> DNA
<213> Artificial sequence

<220>
<223> 3112 HPV31L1 amplified sequence 2

<400> 64
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ctctgccaag aggaagaagg tgaagaagta aatctagaca g 101

<210> 65
<211> 38
<212> PRT
<213> Homo sapiens

<220>
<223> 3113 Amino acid sequence of HPV type 59 L1 protein aa 471-508

<400> 65
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Ala Ala Pro Ala Pro Thr Ser Thr Pro Ser Pro Lys Arg Val Lys Arg
20 25 30
Arg Lys Ser Ser Arg Lys
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<210> 66
<211> 499
<212> PRT
<213> Homo sapiens

<220>
<223> 3301 Amino acid sequence of HPV type 33 L1 protein

<400> 66
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			20					25					30				
Ile	Tyr	Tyr	Tyr	Ala	Gly	Ser	Ser	Arg	Leu	Leu	Ala	Val	Gly	His	Pro		
		35					40					45					
Tyr	Phe	Ser	Ile	Lys	Asn	Pro	Thr	Asn	Ala	Lys	Lys	Leu	Leu	Val	Pro		
	50					55					60						
Lys	Val	Ser	Gly	Leu	Gln	Tyr	Arg	Val	Phe	Arg	Val	Arg	Leu	Pro	Asp		
65				70						75					80		
Pro	Asn	Lys	Phe	Gly	Phe	Pro	Asp	Thr	Ser	Phe	Tyr	Asn	Pro	Asp	Thr		
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Gln	Arg	Leu	Val	Trp	Ala	Cys	Val	Gly	Leu	Glu	Ile	Gly	Arg	Gly	Gln		
			100					105					110				
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		115					120					125					
Asp	Thr	Glu	Thr	Gly	Asn	Lys	Tyr	Pro	Gly	Gln	Pro	Gly	Ala	Asp	Asn		
	130					135					140						
Arg	Glu	Cys	Leu	Ser	Met	Asp	Tyr	Lys	Gln	Thr	Gln	Leu	Cys	Leu	Leu		
145					150					155					160		
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				165					170						175		
Thr	Asn	Ala	Ala	Pro	Ala	Asn	Asp	Cys	Pro	Pro	Leu	Glu	Leu	Ile	Asn		
			180					185					190				
Thr	Ile	Ile	Glu	Asp	Gly	Asp	Met	Val	Asp	Thr	Gly	Phe	Gly	Cys	Met		
	195					200						205					
Asp	Phe	Lys	Thr	Leu	Gln	Ala	Asn	Lys	Ser	Asp	Val	Pro	Ile	Asp	Ile		
	210					215				220							
Cys	Gly	Ser	Thr	Cys	Lys	Tyr	Pro	Asp	Tyr	Leu	Lys	Met	Thr	Ser	Glu		
225					230					235					240		
Pro	Tyr	Gly	Asp	Ser	Leu	Phe	Phe	Phe	Leu	Arg	Arg	Glu	Gln	Met	Phe		
				245					250						255		
Val	Arg	His	Phe	Phe	Asn	Arg	Ala	Gly	Thr	Leu	Gly	Glu	Ala	Val	Pro		
			260					265						270			
Asp	Asp	Leu	Tyr	Ile	Lys	Gly	Ser	Gly	Thr	Thr	Ala	Ser	Ile	Gln	Ser		
	275					280						285					
Ser	Ala	Phe	Phe	Pro	Thr	Pro	Ser	Gly	Ser	Met	Val	Thr	Ser	Glu	Ser		
	290					295					300						
Gln	Leu	Phe	Asn	Lys	Pro	Tyr	Trp	Leu	Gln	Arg	Ala	Gln	Gly	His	Asn		
305					310					315					320		
Asn	Gly	Ile	Cys	Trp	Gly	Asn	Gln	Val	Phe	Val	Thr	Val	Val	Asp	Thr		
				325				330						335			
Thr	Arg	Ser	Thr	Asn	Met	Thr	Leu	Cys	Thr	Gln	Val	Thr	Ser	Asp	Ser		
			340					345						350			
Thr	Tyr	Lys	Asn	Glu	Asn	Phe	Lys	Glu	Tyr	Ile	Arg	His	Val	Glu	Glu		
		355					360					365					
Tyr	Asp	Leu	Gln	Phe	Val	Phe	Gln	Leu	Cys	Lys	Val	Thr	Leu	Thr	Ala		
	370					375					380						
Glu	Val	Met	Thr	Tyr	Ile	His	Ala	Met	Asn	Pro	Asp	Ile	Leu	Glu	Asp		
385					390					395					400		
Trp	Gln	Phe	Gly	Leu	Thr	Pro	Pro	Pro	Ser	Ala	Ser	Leu	Gln	Asp	Thr		
				405					410					415			
Tyr	Arg	Phe	Val	Thr	Ser	Gln	Ala	Ile	Thr	Cys	Gln	Lys	Thr	Val	Pro		
			420					425					430				
Pro	Lys	Glu	Lys	Glu	Asp	Pro	Leu	Gly	Lys	Tyr	Thr	Phe	Trp	Glu	Val		

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gaatacatca ggcatgtgga ggaatatgac ctccaatttg tgttccaact ttgtaagggtg	1140
accctgacag cagaggtgat gacctacatc catgctatga accctgacat cttggaggac	1200
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tttccactgg gcaggaagtt cctgctccaa gcaggactga aagccaagcc aaaactgaaa	1440
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<210> 68

<211> 1519

<212> DNA

<213> Artificial sequence

<220>

<223> 3303 Synthetic HPV33 L1 gene

<400> 68

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ggctccagca gactgctggc tgtgggacac ccatacttca gcatcaagaa cccaaccaat	180
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ctgcctgacc caaacaagtt tggctttcct gacacctcct tctacaacc tgacaccag	300
agactggtgt gggcttgtgt gggattggag attggcaggg gacaaccact gggagtgggc	360
atctctggac acccactgct gaacaagttt gatgacacag agacaggcaa caaataccct	420
ggacaacctg gagcagacaa caggagtggt ctgagtatgg actacaagca gaccgaactt	480
tgtctgctgg gctgtaagcc tccaacagga gaacactggg gcaaggaggt ggcttgtacc	540
aatgctgccc ctgccaatga ctgtcctcca ttggaactga taaacaccat cattgaggat	600
ggagatatgg tggacacagg ctttggctgt atggacttca agaccctcca agccaacaag	660
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acctctgaac catatggaga ctccctgttc ttcttcctga ggagggaaca gatgtttgtg	780

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aggtttgtga ccagccaggc tatcacttgt cagaagacag tgcctccaaa ggagaaggag     1320
gaccactggg gcaaatacac cttctgggag gtggacctga aagagaagtt ctctgctgac     1380
ctggaccagt ttccactggg caggaagttc ctgctccaag caggactgaa agccaagcca     1440
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aagaagtaaa ctcgagctc                                     1519

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<210> 69
<211> 472
<212> PRT
<213> Homo sapiens

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<220>
<223> 3501 Amino acid sequence of HPV type 35 L1 protein aa 1-472

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<400> 69
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Ser Val Ser Lys Val Val Ser Thr Asp Glu Tyr Val Thr Arg Thr Asn
          20          25          30
Ile Tyr Tyr His Ala Gly Ser Ser Arg Leu Leu Ala Val Gly His Pro
          35          40          45
Tyr Tyr Ala Ile Lys Lys Gln Asp Ser Asn Lys Ile Ala Val Pro Lys
          50          55          60
Val Ser Gly Leu Gln Tyr Arg Val Phe Arg Val Lys Leu Pro Asp Pro
65          70          75          80
Asn Lys Phe Gly Phe Pro Asp Thr Ser Phe Tyr Asp Pro Ala Ser Gln
          85          90          95
Arg Leu Val Trp Ala Cys Thr Gly Val Glu Val Gly Arg Gly Gln Pro
          100          105          110
Leu Gly Val Gly Ile Ser Gly His Pro Leu Leu Asn Lys Leu Asp Asp
          115          120          125

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Thr	Glu	Asn	Ser	Asn	Lys	Tyr	Val	Gly	Asn	Ser	Gly	Thr	Asp	Asn	Arg
130						135					140				
Glu	Cys	Ile	Ser	Met	Asp	Tyr	Lys	Gln	Thr	Gln	Leu	Cys	Leu	Ile	Gly
145					150					155					160
Cys	Arg	Pro	Pro	Ile	Gly	Glu	His	Trp	Gly	Lys	Gly	Thr	Pro	Cys	Asn
				165					170					175	
Ala	Asn	Gln	Val	Lys	Ala	Gly	Glu	Cys	Pro	Pro	Leu	Glu	Leu	Leu	Asn
			180					185					190		
Thr	Val	Leu	Gln	Asp	Gly	Asp	Met	Val	Asp	Thr	Gly	Phe	Gly	Ala	Met
	195					200					205				
Asp	Phe	Thr	Thr	Leu	Gln	Ala	Asn	Lys	Ser	Asp	Val	Pro	Leu	Asp	Ile
	210					215					220				
Cys	Ser	Ser	Ile	Cys	Lys	Tyr	Pro	Asp	Tyr	Leu	Lys	Met	Val	Ser	Glu
225					230					235					240
Pro	Tyr	Gly	Asp	Met	Leu	Phe	Phe	Tyr	Leu	Arg	Arg	Glu	Gln	Met	Phe
				245					250					255	
Val	Arg	His	Leu	Phe	Asn	Arg	Ala	Gly	Thr	Val	Gly	Glu	Thr	Val	Pro
			260					265					270		
Ala	Asp	Leu	Tyr	Ile	Lys	Gly	Thr	Thr	Gly	Thr	Leu	Pro	Ser	Thr	Ser
		275					280					285			
Tyr	Phe	Pro	Thr	Pro	Ser	Gly	Ser	Met	Val	Thr	Ser	Asp	Ala	Gln	Ile
	290					295					300				
Phe	Asn	Lys	Pro	Tyr	Trp	Leu	Gln	Arg	Ala	Gln	Gly	His	Asn	Asn	Gly
305					310					315					320
Ile	Cys	Trp	Ser	Asn	Gln	Leu	Phe	Val	Thr	Val	Val	Asp	Thr	Thr	Arg
				325					330					335	
Ser	Thr	Asn	Met	Ser	Val	Cys	Ser	Ala	Val	Ser	Ser	Ser	Asp	Ser	Thr
			340					345					350		
Tyr	Lys	Asn	Asp	Asn	Phe	Lys	Glu	Tyr	Leu	Arg	His	Gly	Glu	Glu	Tyr
		355					360					365			
Asp	Leu	Gln	Phe	Ile	Phe	Gln	Leu	Cys	Lys	Ile	Thr	Leu	Thr	Ala	Asp
	370					375					380				
Val	Met	Thr	Tyr	Ile	His	Ser	Met	Asn	Pro	Ser	Ile	Leu	Glu	Asp	Trp
385					390					395					400
Asn	Phe	Gly	Leu	Thr	Pro	Pro	Pro	Ser	Gly	Thr	Leu	Glu	Asp	Thr	Tyr
				405					410					415	
Arg	Tyr	Val	Thr	Ser	Gln	Ala	Val	Thr	Cys	Gln	Lys	Pro	Ser	Ala	Pro
			420					425					430		
Lys	Pro	Lys	Asp	Asp	Pro	Leu	Lys	Asn	Tyr	Thr	Phe	Trp	Glu	Val	Asp
		435					440				445				
Leu	Lys	Glu	Lys	Phe	Ser	Ala	Asp	Leu	Asp	Gln	Phe	Pro	Leu	Gly	Arg
	450					455					460				
Lys	Phe	Leu	Leu	Gln	Ala	Gly	Leu								
465					470										

<210> 70

<211> 26

<212> PRT

<213> Homo sapiens

<220>

<223> 3502 Amino acid sequence of HPV type 33 L1 protein aa 474-499

<400> 70

Lys Ala Lys Pro Lys Leu Lys Arg Ala Ala Pro Thr Ser Thr Arg Thr
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Ser Ser Ala Lys Arg Lys Lys Val Lys Lys
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<210> 71

<211> 498

<212> PRT

<213> Artificial sequence

<220>

<223> 3503 Amino acid sequence of chimeric HPV type 35 L1 protein

<400> 71

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20 25 30
Ile Tyr Tyr His Ala Gly Ser Ser Arg Leu Leu Ala Val Gly His Pro
35 40 45
Tyr Tyr Ala Ile Lys Lys Gln Asp Ser Asn Lys Ile Ala Val Pro Lys
50 55 60
Val Ser Gly Leu Gln Tyr Arg Val Phe Arg Val Lys Leu Pro Asp Pro
65 70 75 80
Asn Lys Phe Gly Phe Pro Asp Thr Ser Phe Tyr Asp Pro Ala Ser Gln
85 90 95
Arg Leu Val Trp Ala Cys Thr Gly Val Glu Val Gly Arg Gly Gln Pro
100 105 110
Leu Gly Val Gly Ile Ser Gly His Pro Leu Leu Asn Lys Leu Asp Asp
115 120 125
Thr Glu Asn Ser Asn Lys Tyr Val Gly Asn Ser Gly Thr Asp Asn Arg
130 135 140
Glu Cys Ile Ser Met Asp Tyr Lys Gln Thr Gln Leu Cys Leu Ile Gly
145 150 155 160
Cys Arg Pro Pro Ile Gly Glu His Trp Gly Lys Gly Thr Pro Cys Asn
165 170 175
Ala Asn Gln Val Lys Ala Gly Glu Cys Pro Pro Leu Glu Leu Leu Asn
180 185 190
Thr Val Leu Gln Asp Gly Asp Met Val Asp Thr Gly Phe Gly Ala Met
195 200 205
Asp Phe Thr Thr Leu Gln Ala Asn Lys Ser Asp Val Pro Leu Asp Ile
210 215 220
Cys Ser Ser Ile Cys Lys Tyr Pro Asp Tyr Leu Lys Met Val Ser Glu
225 230 235 240
Pro Tyr Gly Asp Met Leu Phe Phe Tyr Leu Arg Arg Glu Gln Met Phe
245 250 255
Val Arg His Leu Phe Asn Arg Ala Gly Thr Val Gly Glu Thr Val Pro
260 265 270
Ala Asp Leu Tyr Ile Lys Gly Thr Thr Gly Thr Leu Pro Ser Thr Ser
275 280 285
Tyr Phe Pro Thr Pro Ser Gly Ser Met Val Thr Ser Asp Ala Gln Ile
290 295 300

Phe Asn Lys Pro Tyr Trp Leu Gln Arg Ala Gln Gly His Asn Asn Gly
305 310 315 320
Ile Cys Trp Ser Asn Gln Leu Phe Val Thr Val Val Asp Thr Thr Arg
325 330 335
Ser Thr Asn Met Ser Val Cys Ser Ala Val Ser Ser Ser Asp Ser Thr
340 345 350
Tyr Lys Asn Asp Asn Phe Lys Glu Tyr Leu Arg His Gly Glu Glu Tyr
355 360 365
Asp Leu Gln Phe Ile Phe Gln Leu Cys Lys Ile Thr Leu Thr Ala Asp
370 375 380
Val Met Thr Tyr Ile His Ser Met Asn Pro Ser Ile Leu Glu Asp Trp
385 390 395 400
Asn Phe Gly Leu Thr Pro Pro Pro Ser Gly Thr Leu Glu Asp Thr Tyr
405 410 415
Arg Tyr Val Thr Ser Gln Ala Val Thr Cys Gln Lys Pro Ser Ala Pro
420 425 430
Lys Pro Lys Asp Asp Pro Leu Lys Asn Tyr Thr Phe Trp Glu Val Asp
435 440 445
Leu Lys Glu Lys Phe Ser Ala Asp Leu Asp Gln Phe Pro Leu Gly Arg
450 455 460
Lys Phe Leu Leu Gln Ala Gly Leu Lys Ala Lys Pro Lys Leu Lys Arg
465 470 475 480
Ala Ala Pro Thr Ser Thr Arg Thr Ser Ser Ala Lys Arg Lys Lys Val
485 490 495
Lys Lys

<210> 72

<211> 1498

<212> DNA

<213> Artificial sequence

<220>

<223> 3504 Nucleotide sequence of chimeric HPV type 35 L1 protein

<400> 72

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agactgctgg ctgtgggaca cccatactat gccatcaaga agcaggacag caacaagatt 180
gctgtgccaa aggtgtctgg actccaatac aggggtgttca gggtgaaact gcctgaccca 240
aacaagtttg gctttcctga cacctccttc tatgaccctg ccagccagag actggtgtgg 300
gcttgacttg gaggagggt gggcagggga caaccactgg gaggggcat ctctggacac 360
ccactgctga acaaactgga tgacacagag aacagcaaca aatatgtggg caactctggc 420
acagacaaca gggagtgtat cagtatggac tacaagcaga cccaactttg tctgattggc 480
tgtagacctc caattggaga aactggggc aagggcacac catgtaatgc caaccaggtg 540

aaggctggag agtgtcctcc attggaactg ctgaacacag tgctccaaga tggagatatg	600
gtggacacag gctttggagc tatggacttc accaccctcc aagccaacaa gtctgatgtg	660
ccactggaca tctgttccag catctgtaaa taccctgact acctgaaaat ggtgtctgaa	720
ccatatggag atatgctgtt cttctacctg aggagggaac agatgtttgt gagacacctg	780
ttcaacaggg ctggcacagt gggagagaca gtgcctgctg acctctacat caagggcacc	840
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gatgcccaga ttttcaacaa gccatactgg ctccaaaggg ctcaaggaca caacaatggc	960
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tacctgagac atggagagga atatgacctc caattcatct tccaactttg taagattacc	1140
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aactacacct tctgggaggt ggacctgaaa gagaagttct ctgctgacct ggaccagttt	1380
ccactgggca ggaagttcct gctccaagca ggactgaaag ccaagccaaa actgaaaagg	1440
gctgccccaa ccagcaccag gacctcctct gccaaaggga agaaggtgaa gaagtaaa	1498

<210> 73

<211> 1528

<212> DNA

<213> Artificial sequence

<220>

<223> 3505 Synthetic HPV35 L1 gene

<400> 73

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ggctccagca gactgctggc tgtgggacac ccatactatg ccatcaagaa gcaggacagc	180
aacaagattg ctgtgcaaaa ggtgtctgga ctccaataga ggggtgttcag ggtgaaactg	240
cctgacccaa acaagtttgg ctttcctgac acctccttct atgacctgc cagccagaga	300

ctggtgtggg cttgtactgg agtggagggtg ggcaggggac aaccactggg agtgggcatc	360
tctggacacc cactgctgaa caaactggat gacacagaga acagcaacaa atatgtgggc	420
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<210> 74

<211> 1519

<212> DNA

<213> Artificial sequence

<220>

<223> 3506 Synthetic HPV33 L1 gene

<400> 74

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aagaagtaaa ctcgagctc	1519

<210> 75

<211> 34

<212> DNA
<213> Artificial sequence

<220>
<223> 3507 HPV35L1 F1

<400> 75
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<210> 76
<211> 36
<212> DNA
<213> Artificial sequence

<220>
<223> 3508 HPV35L1 R1

<400> 76
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<210> 77
<211> 1435
<212> DNA
<213> Artificial sequence

<220>
<223> 3509 HPV35L1 amplified sequence 1

<400> 77
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ggctccagca gactgctggc tgtgggacac ccatactatg ccatcaagaa gcaggacagc 180
aacaagattg ctgtgcaaaa ggtgtctgga ctccaataga ggggtgttcag ggtgaaactg 240
cctgacccaa acaagtttgg ctttcctgac acctccttct atgaccctgc cagccagaga 300
ctgggtgtggg cttgtactgg agtggaggtg ggcaggggac aaccactggg agtgggcatc 360
tctggacacc cactgctgaa caaactggat gacacagaga acagcaacaa atatgtgggc 420
aactctggca cagacaacag ggagtgtatc agtatggact acaagcagac ccaactttgt 480
ctgattggct gtagacctcc aattggagaa cactggggca agggcacacc atgtaatgcc 540
aaccaggtga aggctggaga gtgtcctcca ttggaactgc tgaacacagt gtcctaagat 600

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<223> 3510 HPV35L1 F2

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<223> 3511 HPV35L1 R2

<400> 79

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 <223> 3513 Amino acid sequence of HPV type 59 L1 protein aa 471-508

<400> 81
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 <212> PRT
 <213> Homo sapiens

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 <223> 3901 Amino acid sequence of HPV type 39 L1 protein aa 1-469

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 35 40 45
 Tyr Phe Lys Val Gly Met Asn Gly Gly Arg Lys Gln Asp Ile Pro Lys
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<220>

<223> 3902 Amino acid sequence of HPV type 59 L1 protein aa 471-508

<400> 83

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Arg Lys Ser Ser Arg Lys
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<211> 507

<212> PRT

<213> Artificial sequence

<220>

<223> 3903 Amino acid sequence of chimeric HPV type 39 L1 protein

<400> 84

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          35          40          45
Tyr Phe Lys Val Gly Met Asn Gly Gly Arg Lys Gln Asp Ile Pro Lys
          50          55          60
Val Ser Ala Tyr Gln Tyr Arg Val Phe Arg Val Thr Leu Pro Asp Pro
65          70          75          80
Asn Lys Phe Ser Ile Pro Asp Ala Ser Leu Tyr Asn Pro Glu Thr Gln
          85          90          95
Arg Leu Val Trp Ala Cys Val Gly Val Glu Val Gly Arg Gly Gln Pro
          100          105          110
Leu Gly Val Gly Ile Ser Gly His Pro Leu Tyr Asn Arg Gln Asp Asp
          115          120          125
Thr Glu Asn Ser Pro Phe Ser Ser Thr Thr Asn Lys Asp Ser Arg Asp
          130          135          140
Asn Val Ser Val Asp Tyr Lys Gln Thr Gln Leu Cys Ile Ile Gly Cys
145          150          155          160
Val Pro Ala Ile Gly Glu His Trp Gly Lys Gly Lys Ala Cys Lys Pro
          165          170          175
Asn Asn Val Ser Thr Gly Asp Cys Pro Pro Leu Glu Leu Val Asn Thr
          180          185          190
Pro Ile Glu Asp Gly Asp Met Ile Asp Thr Gly Tyr Gly Ala Met Asp
          195          200          205
Phe Gly Ala Leu Gln Glu Thr Lys Ser Glu Val Pro Leu Asp Ile Cys
          210          215          220
Gln Ser Ile Cys Lys Tyr Pro Asp Tyr Leu Gln Met Ser Ala Asp Val
225          230          235          240
Tyr Gly Asp Ser Met Phe Phe Cys Leu Arg Arg Glu Gln Leu Phe Ala
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<212> DNA

<213> Artificial sequence

<220>

<223> 3905 Synthetic HPV39 L1 gene

<400> 86

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<220>
 <223> 3907 HPV39L1 F1

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<210> 89
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 <212> DNA
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<210> 91

<211> 37

<212> DNA

<213> Artificial sequence

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<223> 3910 HPV39L1 F2

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<210> 92

<211> 40

<212> DNA

<213> Artificial sequence

<220>

<223> 3911 HPV39L1 R2

<400> 92

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<212> DNA

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<223> 3912 HPV39L1 amplified sequence 2

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<212> PRT

<213> Homo sapiens

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<223> 3913 Amino acid sequence of HPV type 33 L1 protein aa 474-499

<400> 94

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<210> 95

<211> 478

<212> PRT

<213> Homo sapiens

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<223> 4501 Amino acid sequence of HPV type 45 L1 protein aa 1-478

<400> 95

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<210> 96
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<212> PRT
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<223> 4502 Amino acid sequence of HPV type 33 L1 protein aa 474-499

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Ser Ser Ala Lys Arg Lys Lys Val Lys Lys
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<212> PRT
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<223> 4503 Amino acid sequence of chimeric HPV type 45 L1 protein

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Ile Phe Tyr His Ala Gly Ser Ser Arg Leu Leu Thr Val Gly Asn Pro
35 40 45
Tyr Phe Arg Val Val Pro Ser Gly Ala Gly Asn Lys Gln Ala Val Pro
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Lys Val Ser Ala Tyr Gln Tyr Arg Val Phe Arg Val Ala Leu Pro Asp
65 70 75 80
Pro Asn Lys Phe Gly Leu Pro Asp Ser Thr Ile Tyr Asn Pro Glu Thr
85 90 95
Gln Arg Leu Val Trp Ala Cys Val Gly Met Glu Ile Gly Arg Gly Gln
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Arg Asp Asn Val Ser Val Asp Tyr Lys Gln Thr Gln Leu Cys Ile Leu
145 150 155 160
Gly Cys Val Pro Ala Ile Gly Glu His Trp Ala Lys Gly Thr Leu Cys
165 170 175
Lys Pro Ala Gln Leu Gln Pro Gly Asp Cys Pro Pro Leu Glu Leu Lys
180 185 190

Asn Thr Ile Ile Glu Asp Gly Asp Met Val Asp Thr Gly Tyr Gly Ala
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 Met Asp Phe Ser Thr Leu Gln Asp Thr Lys Cys Glu Val Pro Leu Asp
 210 215 220
 Ile Cys Gln Ser Ile Cys Lys Tyr Pro Asp Tyr Leu Gln Met Ser Ala
 225 230 235 240
 Asp Pro Tyr Gly Asp Ser Met Phe Phe Cys Leu Arg Arg Glu Gln Leu
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<211> 1516

<212> DNA

<213> Artificial sequence

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<223> 4504 Nucleotide sequence of chimeric HPV type 45 L1 protein

<400> 98

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<211> 1552

<212> DNA

<213> Artificial sequence

<220>

<223> 4505 Synthetic HPV45 L1 gene

<400> 99

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ggctccagca gactgctgac agtgggcaac ccatacttca ggggtgggtgcc aagtggagca	180
ggcaacaagc aggctgtgcc aaagggtgtct gcctaccaat acagggtgtt cagggtggct	240
ctgcctgacc caaacaagtt tggactgcct gacagcacca tctacaacct tgagaccag	300
agactgggtgt gggcttgtgt ggggatggag attggcaggg gacaaccact gggcattgga	360
ctgtctggac acccattcta caacaaactg gatgacacag agtctgcccc tgctgccaca	420
gcagtgatta cccaggatgt gagggacaat gtgtctgtgg actacaagca gacccaactt	480
tgtatcctgg gctgtgtgcc tgccattgga gaacactggg ctaagggcac cctgtgtaag	540
cctgccccac tccaacctgg agactgtcct ccattggaac tgaaaaacac catcattgag	600
gatggagata tggatggacac aggctatgga gctatggact tcagcacctt ccaagacacc	660
aagtgtgagg tgccactgga catctgtcag agcatctgta aataccctga ctacctcaa	720
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gccagacact tctggaacag ggctggagtg atgggagaca cagtgccaac agacctctac	840
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aagttctcct ctgacctgga ccaataccca ctgggcagga agttcctggt ccaggctgga	1440

ctgaggagga gaccaaccat tggaccaagg aagagacctg ctgccagcac cagcacagcc	1500
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<210> 100
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 <212> DNA
 <213> Artificial sequence

<220>
 <223> 4506 Synthetic HPV33 L1 gene

<400> 100	
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ggctccagca gactgctggc tgtgggacac ccatacttca gcatcaagaa cccaaccaat	180
gccaagaaac tgctgggtgcc aaagggtgtct ggactccaat acagggtgtt cagggtgaga	240
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agactggtgt gggcttgtgt gggattggag attggcaggg gacaaccact gggagtgggc	360
atctctggac acccactgct gaacaagttt gatgacacag agacaggcaa caaataccct	420
ggacaacctg gagcagacaa caggagtggt ctgagtatgg actacaagca gacccaactt	480
tgtctgctgg gctgtaagcc tccaacagga gaacactggg gcaaggagggt ggcttgtacc	540
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ggagatatgg tggacacagg ctttggctgt atggacttca agaccctcca agccaacaag	660
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ctggaccagt ttccactggg caggaagttc ctgctccaag caggactgaa agccaagcca	1440
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aagaagtaaa ctcgagctc	1519

<210> 101
 <211> 33
 <212> DNA
 <213> Artificial sequence

<220>
 <223> 4507 HPV45L1 F1

<400> 101	
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<210> 102
 <211> 32
 <212> DNA
 <213> Artificial sequence

<220>
 <223> 4508 HPV45L1 R1

<400> 102	
gcttggcttt cagtccagcc tggaccagga ac	32

<210> 103
 <211> 1453
 <212> DNA
 <213> Artificial sequence

<220>
 <223> 4509 HPV45L1 amplified sequence 1

<400> 103	
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ggcaacaagc aggctgtgcc aaagggtgtct gcctaccaat acagggtgtt cagggtggct	240
ctgcctgacc caaacaagtt tggactgcct gacagcacca tctacaaccc tgagaccag	300
agactggtgt gggcttgtgt ggggatggag attggcaggg gacaaccact gggcattgga	360
ctgtctggac acccattcta caacaaactg gatgacacag agtctgcca tgctgccaca	420
gcagtgatta cccaggatgt gagggacaat gtgtctgtgg actacaagca gacccaactt	480
tgtatcctgg gctgtgtgcc tgccattgga gaacactggg ctaagggcac cctgtgtaag	540
cctgccaac tccaacctgg agactgtcct ccattggaac tgaaaaacac catcattgag	600
gatggagata tggatggacac aggctatgga gctatggact tcagcaccct ccaagacacc	660
aagtgtgagg tgccactgga catctgtcag agcatctgta aataccctga ctacctcaa	720
atgagtgtg acccatatgg agacagtatg ttcttctgtc tgaggaggga acaacttttt	780
gccagacact tctggaacag ggctggagtg atgggagaca cagtgccaac agacctctac	840
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aaggctcaag gacacaaca tggcatctgt tggcacaacc aactttttgt gacagtgggtg	1020
gacaccacca ggagcaccaa cctgaccctg tgtgccagca ccagaaccc tgtgccaac	1080
acctatgacc caaccaagtt caagcactac agcaggcatg tggaggaata tgacctcaa	1140
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cctcctgaga agcaggaccc atatgacaaa ctgaagttct ggacagtgga cctgaaagag	1380
aagttctcct ctgacctgga ccaatacca ctgggcagga agttcctggt ccaggctgga	1440
ctgaaagcca agc	1453

<210> 104

<211> 35

<212> DNA

<213> Artificial sequence

<220>

<223> 4510 HPV45L1 F2

<400> 104

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35

<210> 105

<211> 37

<212> DNA

<213> Artificial sequence

<220>

<223> 4511 HPV45L1 R2

<400> 105

ctgtctagat ttacttcttc accttcttcc tcttggc

37

<210> 106

<211> 101

<212> DNA

<213> Artificial sequence

<220>

<223> 4512 HPV45L1 amplified sequence 2

<400> 106

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60

ctctgccaag aggaagaagg tgaagaagta aatctagaca g

101

<210> 107

<211> 38

<212> PRT

<213> Homo sapiens

<220>

<223> 4513 Amino acid sequence of HPV type 59 L1 protein aa 471-508

<400> 107

Leu Gln Leu Gly Ala Arg Pro Lys Pro Thr Ile Gly Pro Arg Lys Arg

1

5

10

15

Ala Ala Pro Ala Pro Thr Ser Thr Pro Ser Pro Lys Arg Val Lys Arg

20

25

30

Arg Lys Ser Ser Arg Lys

35

<210> 108

<211> 474

<212> PRT

<213> Homo sapiens

<220>

<223> 5101 Amino acid sequence of HPV type 51 L1 protein aa 1-474

<400> 108

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			20					25					30			
Ile	Tyr	Tyr	Tyr	Ala	Gly	Ser	Ser	Arg	Leu	Ile	Thr	Leu	Gly	His	Pro	
		35				40						45				
Tyr	Phe	Pro	Ile	Pro	Lys	Thr	Ser	Thr	Arg	Ala	Ala	Ile	Pro	Lys	Val	
	50				55					60						
Ser	Ala	Phe	Gln	Tyr	Arg	Val	Phe	Arg	Val	Gln	Leu	Pro	Asp	Pro	Asn	
65					70					75					80	
Lys	Phe	Gly	Leu	Pro	Asp	Pro	Asn	Leu	Tyr	Asn	Pro	Asp	Thr	Asp	Arg	
				85					90					95		
Leu	Val	Trp	Gly	Cys	Val	Gly	Val	Glu	Val	Gly	Arg	Gly	Gln	Pro	Leu	
			100					105					110			
Gly	Val	Gly	Leu	Ser	Gly	His	Pro	Leu	Phe	Asn	Lys	Tyr	Asp	Asp	Thr	
		115					120					125				
Glu	Asn	Ser	Arg	Ile	Ala	Asn	Gly	Asn	Ala	Gln	Gln	Asp	Val	Arg	Asp	
	130					135					140					
Asn	Thr	Ser	Val	Asp	Asn	Lys	Gln	Thr	Gln	Leu	Cys	Ile	Ile	Gly	Cys	
145					150					155					160	
Ala	Pro	Pro	Ile	Gly	Glu	His	Trp	Gly	Ile	Gly	Thr	Thr	Cys	Lys	Asn	
				165				170						175		
Thr	Pro	Val	Pro	Pro	Gly	Asp	Cys	Pro	Pro	Leu	Glu	Leu	Val	Ser	Ser	
			180					185					190			
Val	Ile	Gln	Asp	Gly	Asp	Met	Ile	Asp	Thr	Gly	Phe	Gly	Ala	Met	Asp	
		195				200						205				
Phe	Ala	Ala	Leu	Gln	Ala	Thr	Lys	Ser	Asp	Val	Pro	Leu	Asp	Ile	Ser	
	210					215					220					
Gln	Ser	Val	Cys	Lys	Tyr	Pro	Asp	Tyr	Leu	Lys	Met	Ser	Ala	Asp	Thr	
225					230					235					240	
Tyr	Gly	Asn	Ser	Met	Phe	Phe	His	Leu	Arg	Arg	Glu	Gln	Ile	Phe	Ala	
				245					250					255		
Arg	His	Tyr	Tyr	Asn	Lys	Leu	Val	Gly	Val	Gly	Glu	Asp	Ile	Pro	Asn	
			260					265					270			
Asp	Tyr	Tyr	Ile	Lys	Gly	Ser	Gly	Asn	Gly	Arg	Asp	Pro	Ile	Glu	Ser	
		275					280					285				
Tyr	Ile	Tyr	Ser	Ala	Thr	Pro	Ser	Gly	Ser	Met	Ile	Thr	Ser	Asp	Ser	
		290				295					300					
Gln	Ile	Phe	Asn	Lys	Pro	Tyr	Trp	Leu	His	Arg	Ala	Gln	Gly	His	Asn	
305					310					315					320	
Asn	Gly	Ile	Cys	Trp	Asn	Asn	Gln	Leu	Phe	Ile	Thr	Cys	Val	Asp	Thr	
				325					330					335		
Thr	Arg	Ser	Thr	Asn	Leu	Thr	Ile	Ser	Thr	Ala	Thr	Ala	Ala	Val	Ser	
			340					345						350		
Pro	Thr	Phe	Thr	Pro	Ser	Asn	Phe	Lys	Gln	Tyr	Ile	Arg	His	Gly	Glu	
		355				360						365				
Glu	Tyr	Glu	Leu	Gln	Phe	Ile	Phe	Gln	Leu	Cys	Lys	Ile	Thr	Leu	Thr	

370		375		380											
Thr	Glu	Val	Met	Ala	Tyr	Leu	His	Thr	Met	Asp	Pro	Thr	Ile	Leu	Glu
385					390					395					400
Gln	Trp	Asn	Phe	Gly	Leu	Thr	Leu	Pro	Pro	Ser	Ala	Ser	Leu	Glu	Asp
				405					410					415	
Ala	Tyr	Arg	Phe	Val	Arg	Asn	Ala	Ala	Thr	Ser	Cys	Gln	Lys	Asp	Thr
				420				425					430		
Pro	Pro	Gln	Ala	Lys	Pro	Asp	Pro	Leu	Ala	Lys	Tyr	Lys	Phe	Trp	Asp
		435					440					445			
Val	Asp	Leu	Lys	Glu	Arg	Phe	Ser	Leu	Asp	Leu	Asp	Gln	Phe	Ala	Leu
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Gly	Arg	Lys	Phe	Leu	Leu	Gln	Val	Gly	Val						
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<210> 109
 <211> 26
 <212> PRT
 <213> Homo sapiens

<220>
 <223> 5102 Amino acid sequence of HPV type 33 L1 protein aa 474-499

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Lys Ala Lys Pro Lys Leu Lys Arg Ala Ala Pro Thr Ser Thr Arg Thr
1 5 10 15
Ser Ser Ala Lys Arg Lys Lys Val Lys Lys
20 25

<210> 110
 <211> 500
 <212> PRT
 <213> Artificial sequence

<220>
 <223> 5103 Amino acid sequence of chimeric HPV type 51 L1 protein

<400> 110
Met Ala Leu Trp Arg Thr Asn Asp Ser Lys Val Tyr Leu Pro Pro Ala
1 5 10 15
Pro Val Ser Arg Ile Val Asn Thr Glu Glu Tyr Ile Thr Arg Thr Gly
20 25 30
Ile Tyr Tyr Tyr Ala Gly Ser Ser Arg Leu Ile Thr Leu Gly His Pro
35 40 45
Tyr Phe Pro Ile Pro Lys Thr Ser Thr Arg Ala Ala Ile Pro Lys Val
50 55 60
Ser Ala Phe Gln Tyr Arg Val Phe Arg Val Gln Leu Pro Asp Pro Asn
65 70 75 80
Lys Phe Gly Leu Pro Asp Pro Asn Leu Tyr Asn Pro Asp Thr Asp Arg
85 90 95
Leu Val Trp Gly Cys Val Gly Val Glu Val Gly Arg Gly Gln Pro Leu
100 105 110
Gly Val Gly Leu Ser Gly His Pro Leu Phe Asn Lys Tyr Asp Asp Thr

<220>

<223> 5104 Nucleotide sequence of chimeric HPV type 51 L1 protein

<400> 111

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agactgatta ccctgggaca ccatacttt ccaatcccaa agaccagcac cagggctgcc	180
atcccaaagg tgtctgcctt ccaatacagg gtgttcaggg tccaacttcc tgacccaaac	240
aagtttgac tgcctgacct aaacctctac aacctgaca cagacagact ggtgtggggc	300
tgtgtgggag tggaggtggg caggggacaa ccactgggag tgggactgtc tggacaccca	360
ctgttcaaca aatatgatga cacagagaac agcaggattg ccaatggcaa tgcccaacag	420
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cagtggaaact ttggactgac cctgcctcca tctgcctcct tggaggatgc ctacaggttt	1260
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taaa	1504

<210> 112
 <211> 1534
 <212> DNA
 <213> Artificial sequence

<220>
 <223> 5105 Synthetic HPV51 L1 gene

<400> 112	
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ggctccagca gactgattac cctgggacac ccatactttc caatcccaa gaccagcacc	180
agggctgcc tcccaaaggt gtctgccttc caatacaggg tgttcagggt ccaacttcct	240
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gtgtggggct gtgtgggagt ggaggtgggc aggggacaac cactgggagt gggactgtct	360
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atcttgaac agtgaactt tggactgacc ctgcctccat ctgcctcctt ggaggatgcc	1260
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cctgaccac tggctaaata caagttctgg gatgtggacc tgaaagagag gttctcctg	1380
gacctggacc agtttgcctt gggcaggaag ttcctgctcc aagtgggagt ccagaggaag	1440
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aagaggaaga gggatgaaga gtaaactcga gctc	1534

<210> 113
 <211> 1519
 <212> DNA
 <213> Artificial sequence

<220>
 <223> 5106 Synthetic HPV33 L1 gene

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ggctccagca gactgctggc tgtgggacac ccatacttca gcatcaagaa cccaaccaat	180
gccaagaaac tgctggtgcc aaaggtgtct ggactccaat acagggtggt cagggtgaga	240
ctgcctgacc caaacaagtt tggctttcct gacacctcct tctacaacc tgacaccag	300
agactggtgt gggcttgtgt gggattggag attggcaggg gacaaccact gggagtgggc	360
atctctggac acccactgct gaacaagttt gatgacacag agacaggcaa caaataccct	420
ggacaacctg gagcagaaa caggagtggt ctgagtatgg actacaagca gacccaactt	480
tgtctgctgg gctgtaagcc tccaacagga gaacactggg gcaaggaggt ggcttgtacc	540
aatgtgccc ctgccaatga ctgtcctcca ttggaactga taaacacat cattgaggat	600
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tctgatgtgc caattgacat ctgtggcagc acttgtaaact accctgacta cctgaaaatg	720
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ggacacaaca atggcatctg ttggggcaac caggtgtttg tgacagtggg ggacaccacc	1020
aggagcacca atatgaccct gtgtaccag gtgacctctg acagcaccta caagaatgag	1080
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aggtttgtga ccagccaggc tatcacttgt cagaagacag tgcctccaaa ggagaaggag	1320
gacccactgg gcaaatacac cttctgggag gtggacctga aagagaagtt ctctgctgac	1380
ctggaccagt ttccactggg caggaagttc ctgctccaag caggactgaa agccaagcca	1440
aaactgaaaa gggctgcccc aaccagcacc aggacctcct ctgccaagag gaagaagggtg	1500
aagaagtaaa ctcgagctc	1519

<210> 114
 <211> 34
 <212> DNA
 <213> Artificial sequence

<220>
 <223> 5107 HPV51L1 F1

<400> 114	
cttggtacca tggctctgtg gaggaccaat gaca	34

<210> 115
 <211> 32
 <212> DNA
 <213> Artificial sequence

<220>
 <223> 5108 HPV51L1 R1

<400> 115	
gcttggcttt gactcccact tggagcagga ac	32

<210> 116
 <211> 1441
 <212> DNA
 <213> Artificial sequence

<220>

<223> 5109 HPV51L1 amplified sequence 1

<400> 116

cttggtagca	tggtctgtg	gaggaccaat	gacagcaagg	tctacctgcc	tcctgcccct	60
gtgagcagga	ttgtgaacac	agaggaatac	atcaccagga	caggcatcta	ctactatgct	120
ggctccagca	gactgattac	cctgggacac	ccatactttc	caatcccaaa	gaccagcacc	180
agggctgcca	tcccaaaggt	gtctgccttc	caatacaggg	tgttcagggt	ccaacttcct	240
gacccaaaca	agtttgact	gcctgacca	aacctctaca	accctgacac	agacagactg	300
gtgtggggct	gtgtgggagt	ggaggtgggc	aggggacaac	cactgggagt	gggactgtct	360
ggacacccac	tgttcaaca	atatgatgac	acagagaaca	gcaggattgc	caatggcaat	420
gccaacagg	atgtgaggga	caacacctct	gtggacaaca	agcagacca	actttgtatc	480
attggctgtg	cccctccaat	tggagaacac	tggggcattg	gcaccacttg	taagaacaca	540
cctgtgcctc	ctggagactg	tcctccattg	gaactggtgt	cctctgtgat	tcaggatgga	600
gatatgattg	acacaggctt	tggagctatg	gactttgctg	ccctccaagc	caccaagtct	660
gatgtgccac	tggacatcag	ccagtctgtg	tgtaaatacc	ctgactacct	gaaaatgagt	720
gctgacacct	atggcaacag	tatgttcttc	cacctgagga	gggaacagat	ttttgccaga	780
cactactaca	acaaactggt	gggagtggga	gaggacatcc	caaatagacta	ctacatcaag	840
ggctctggca	atggcaggga	ccaattgag	tcctacatct	actctgccac	accatctggc	900
agtatgatta	cctctgacag	ccagattttc	aacaagccat	actggctgca	cagggtcaa	960
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aggagcacca	acctgacat	cagcacagcc	acagcagcag	tgagcccaac	cttcacacca	1080
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atcttgggaac	agtggaaactt	tggactgacc	ctgcctccat	ctgcctcctt	ggaggatgcc	1260
tacaggtttg	tgaggaatgc	tgccacctcc	tgtcagaagg	acacacctcc	acaggctaag	1320
cctgaccac	tggctaaata	caagttctgg	gatgtggacc	tgaaagagag	gttctccctg	1380
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c						1441

<210> 117
<211> 35
<212> DNA
<213> Artificial sequence

<220>
<223> 5110 HPV51L1 F2

<400> 117
agtgggagtc aaagccaagc caaaactgaa aaggg 35

<210> 118
<211> 36
<212> DNA
<213> Artificial sequence

<220>
<223> 5111 HPV51L1 R2

<400> 118
ctgtctagat ttacttcttc accttcttcc tcttgg 36

<210> 119
<211> 101
<212> DNA
<213> Artificial sequence

<220>
<223> 5112 HPV51L1 amplified sequence 2

<400> 119
agtgggagtc aaagccaagc caaaactgaa aagggctgcc ccaaccagca ccaggacctc 60

ctctgccaag aggaagaagg tgaagaagta aatctagaca g 101

<210> 120
<211> 38
<212> PRT
<213> Homo sapiens

<220>
<223> 5113 Amino acid sequence of HPV type 59 L1 protein aa 471-508

<400> 120
Leu Gln Leu Gly Ala Arg Pro Lys Pro Thr Ile Gly Pro Arg Lys Arg

1			5					10				15			
Ala	Ala	Pro	Ala	Pro	Thr	Ser	Thr	Pro	Ser	Pro	Lys	Arg	Val	Lys	Arg
			20					25					30		
Arg	Lys	Ser	Ser	Arg	Lys										
			35												

<210> 121
 <211> 478
 <212> PRT
 <213> Homo sapiens

<220>
 <223> 5201 Amino acid sequence of HPV type 52 L1 protein aa 1-478

<400> 121

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Pro	Val	Ser	Lys	Val	Val	Ser	Thr	Asp	Glu	Tyr	Val	Ser	Arg	Thr	Ser
			20					25					30		
Ile	Tyr	Tyr	Tyr	Ala	Gly	Ser	Ser	Arg	Leu	Leu	Thr	Val	Gly	His	Pro
			35				40					45			
Tyr	Phe	Ser	Ile	Lys	Asn	Thr	Ser	Ser	Gly	Asn	Gly	Lys	Lys	Val	Leu
	50				55					60					
Val	Pro	Lys	Val	Ser	Gly	Leu	Gln	Tyr	Arg	Val	Phe	Arg	Ile	Lys	Leu
65					70				75					80	
Pro	Asp	Pro	Asn	Lys	Phe	Gly	Phe	Pro	Asp	Thr	Ser	Phe	Tyr	Asn	Pro
			85					90						95	
Glu	Thr	Gln	Arg	Leu	Val	Trp	Ala	Cys	Thr	Gly	Leu	Glu	Ile	Gly	Arg
			100				105						110		
Gly	Gln	Pro	Leu	Gly	Val	Gly	Ile	Ser	Gly	His	Pro	Leu	Leu	Asn	Lys
		115					120					125			
Phe	Asp	Asp	Thr	Glu	Thr	Ser	Asn	Lys	Tyr	Ala	Gly	Lys	Pro	Gly	Ile
	130					135					140				
Asp	Asn	Arg	Glu	Cys	Leu	Ser	Met	Asp	Tyr	Lys	Gln	Thr	Gln	Leu	Cys
145					150					155					160
Ile	Leu	Gly	Cys	Lys	Pro	Pro	Ile	Gly	Glu	His	Trp	Gly	Lys	Gly	Thr
			165					170						175	
Pro	Cys	Asn	Asn	Asn	Ser	Gly	Asn	Pro	Gly	Asp	Cys	Pro	Pro	Leu	Gln
		180					185						190		
Leu	Ile	Asn	Ser	Val	Ile	Gln	Asp	Gly	Asp	Met	Val	Asp	Thr	Gly	Phe
		195					200					205			
Gly	Cys	Met	Asp	Phe	Asn	Thr	Leu	Gln	Ala	Ser	Lys	Ser	Asp	Val	Pro
	210				215						220				
Ile	Asp	Ile	Cys	Ser	Ser	Val	Cys	Lys	Tyr	Pro	Asp	Tyr	Leu	Gln	Met
225					230					235					240
Ala	Ser	Glu	Pro	Tyr	Gly	Asp	Ser	Leu	Phe	Phe	Phe	Leu	Arg	Arg	Glu
			245						250					255	
Gln	Met	Phe	Val	Arg	His	Phe	Phe	Asn	Arg	Ala	Gly	Thr	Leu	Gly	Asp
			260					265					270		
Pro	Val	Pro	Gly	Asp	Leu	Tyr	Ile	Gln	Gly	Ser	Asn	Ser	Gly	Asn	Thr
		275					280					285			
Ala	Thr	Val	Gln	Ser	Ser	Ala	Phe	Phe	Pro	Thr	Pro	Ser	Gly	Ser	Met
	290					295					300				

Val Thr Ser Glu Ser Gln Leu Phe Asn Lys Pro Tyr Trp Leu Gln Arg
 305 310 315 320
 Ala Gln Gly His Asn Asn Gly Ile Cys Trp Gly Asn Gln Leu Phe Val
 325 330 335
 Thr Val Val Asp Thr Thr Arg Ser Thr Asn Met Thr Leu Cys Ala Glu
 340 345 350
 Val Lys Lys Glu Ser Thr Tyr Lys Asn Glu Asn Phe Lys Glu Tyr Leu
 355 360 365
 Arg His Gly Glu Glu Phe Asp Leu Gln Phe Ile Phe Gln Leu Cys Lys
 370 375 380
 Ile Thr Leu Thr Ala Asp Val Met Thr Tyr Ile His Lys Met Asp Ala
 385 390 395 400
 Thr Ile Leu Glu Asp Trp Gln Phe Gly Leu Thr Pro Pro Pro Ser Ala
 405 410 415
 Ser Leu Glu Asp Thr Tyr Arg Phe Val Thr Ser Thr Ala Ile Thr Cys
 420 425 430
 Gln Lys Asn Thr Pro Pro Lys Gly Lys Glu Asp Pro Leu Lys Asp Tyr
 435 440 445
 Met Phe Trp Glu Val Asp Leu Lys Glu Lys Phe Ser Ala Asp Leu Asp
 450 455 460
 Gln Phe Pro Leu Gly Arg Lys Phe Leu Leu Gln Ala Gly Leu
 465 470 475

<210> 122
 <211> 26
 <212> PRT
 <213> Homo sapiens

<220>
 <223> 5202 Amino acid sequence of HPV type 33 L1 protein aa 474-499

<400> 122
 Lys Ala Lys Pro Lys Leu Lys Arg Ala Ala Pro Thr Ser Thr Arg Thr
 1 5 10 15
 Ser Ser Ala Lys Arg Lys Lys Val Lys Lys
 20 25

<210> 123
 <211> 504
 <212> PRT
 <213> Artificial sequence

<220>
 <223> 5203 Amino acid sequence of chimeric HPV type 52 L1 protein

<400> 123
 Met Ser Val Trp Arg Pro Ser Glu Ala Thr Val Tyr Leu Pro Pro Val
 1 5 10 15
 Pro Val Ser Lys Val Val Ser Thr Asp Glu Tyr Val Ser Arg Thr Ser
 20 25 30
 Ile Tyr Tyr Tyr Ala Gly Ser Ser Arg Leu Leu Thr Val Gly His Pro
 35 40 45

Tyr	Phe	Ser	Ile	Lys	Asn	Thr	Ser	Ser	Gly	Asn	Gly	Lys	Lys	Val	Leu	50	55	60
Val	Pro	Lys	Val	Ser	Gly	Leu	Gln	Tyr	Arg	Val	Phe	Arg	Ile	Lys	Leu	65	70	75
Pro	Asp	Pro	Asn	Lys	Phe	Gly	Phe	Pro	Asp	Thr	Ser	Phe	Tyr	Asn	Pro	85	90	95
Glu	Thr	Gln	Arg	Leu	Val	Trp	Ala	Cys	Thr	Gly	Leu	Glu	Ile	Gly	Arg	100	105	110
Gly	Gln	Pro	Leu	Gly	Val	Gly	Ile	Ser	Gly	His	Pro	Leu	Leu	Asn	Lys	115	120	125
Phe	Asp	Asp	Thr	Glu	Thr	Ser	Asn	Lys	Tyr	Ala	Gly	Lys	Pro	Gly	Ile	130	135	140
Asp	Asn	Arg	Glu	Cys	Leu	Ser	Met	Asp	Tyr	Lys	Gln	Thr	Gln	Leu	Cys	145	150	155
Ile	Leu	Gly	Cys	Lys	Pro	Pro	Ile	Gly	Glu	His	Trp	Gly	Lys	Gly	Thr	165	170	175
Pro	Cys	Asn	Asn	Asn	Ser	Gly	Asn	Pro	Gly	Asp	Cys	Pro	Pro	Leu	Gln	180	185	190
Leu	Ile	Asn	Ser	Val	Ile	Gln	Asp	Gly	Asp	Met	Val	Asp	Thr	Gly	Phe	195	200	205
Gly	Cys	Met	Asp	Phe	Asn	Thr	Leu	Gln	Ala	Ser	Lys	Ser	Asp	Val	Pro	210	215	220
Ile	Asp	Ile	Cys	Ser	Ser	Val	Cys	Lys	Tyr	Pro	Asp	Tyr	Leu	Gln	Met	225	230	235
Ala	Ser	Glu	Pro	Tyr	Gly	Asp	Ser	Leu	Phe	Phe	Phe	Leu	Arg	Arg	Glu	245	250	255
Gln	Met	Phe	Val	Arg	His	Phe	Phe	Asn	Arg	Ala	Gly	Thr	Leu	Gly	Asp	260	265	270
Pro	Val	Pro	Gly	Asp	Leu	Tyr	Ile	Gln	Gly	Ser	Asn	Ser	Gly	Asn	Thr	275	280	285
Ala	Thr	Val	Gln	Ser	Ser	Ala	Phe	Phe	Pro	Thr	Pro	Ser	Gly	Ser	Met	290	295	300
Val	Thr	Ser	Glu	Ser	Gln	Leu	Phe	Asn	Lys	Pro	Tyr	Trp	Leu	Gln	Arg	305	310	315
Ala	Gln	Gly	His	Asn	Asn	Gly	Ile	Cys	Trp	Gly	Asn	Gln	Leu	Phe	Val	325	330	335
Thr	Val	Val	Asp	Thr	Thr	Arg	Ser	Thr	Asn	Met	Thr	Leu	Cys	Ala	Glu	340	345	350
Val	Lys	Lys	Glu	Ser	Thr	Tyr	Lys	Asn	Glu	Asn	Phe	Lys	Glu	Tyr	Leu	355	360	365
Arg	His	Gly	Glu	Glu	Phe	Asp	Leu	Gln	Phe	Ile	Phe	Gln	Leu	Cys	Lys	370	375	380
Ile	Thr	Leu	Thr	Ala	Asp	Val	Met	Thr	Tyr	Ile	His	Lys	Met	Asp	Ala	385	390	395
Thr	Ile	Leu	Glu	Asp	Trp	Gln	Phe	Gly	Leu	Thr	Pro	Pro	Pro	Ser	Ala	405	410	415
Ser	Leu	Glu	Asp	Thr	Tyr	Arg	Phe	Val	Thr	Ser	Thr	Ala	Ile	Thr	Cys	420	425	430
Gln	Lys	Asn	Thr	Pro	Pro	Lys	Gly	Lys	Glu	Asp	Pro	Leu	Lys	Asp	Tyr	435	440	445
Met	Phe	Trp	Glu	Val	Asp	Leu	Lys	Glu	Lys	Phe	Ser	Ala	Asp	Leu	Asp	450	455	460
Gln	Phe	Pro	Leu	Gly	Arg	Lys	Phe	Leu	Leu	Gln	Ala	Gly	Leu	Lys	Ala	465	470	475
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Lys Pro Lys Leu Lys Arg Ala Ala Pro Thr Ser Thr Arg Thr Ser Ser
485 490 495
Ala Lys Arg Lys Lys Val Lys Lys
500

<210> 124
<211> 1516
<212> DNA
<213> Artificial sequence

<220>
<223> 5204 Nucleotide sequence of chimeric HPV type 52 L1 protein

<400> 124
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gtggtgagca ccgacgagta cgtgagcagg accagcatct actactacgc cggcagcagc 120
aggctgctga ccgtgggcca cccctacttc agcatcaaga acaccagcag cggcaacggc 180
aagaaggtgc tggtgcccaa ggtgagcggc ctgcagtaca ggggtgttcag gatcaagctg 240
cccgacccca acaagttcgg cttccccgac accagcttct acaaccccga gaccagagg 300
ctggtgtggg cctgcaccgg cctggagatc ggcagggggc agcccctggg cgtgggcatc 360
agcggccacc ccctgctgaa caagttcgac gacaccgaga ccagcaacaa gtacgccggc 420
aagcccggca tcgacaacag ggagtgcctg agcatggact acaagcagac ccagctgtgc 480
atcctgggct gcaagcccc catcggcgag cactggggca agggcacccc ctgcaacaac 540
aacagcggca accccggcga ctgccccccc ctgcagctga tcaacagcgt gatccaggac 600
ggcgacatgg tggacaccgg cttcggctgc atggacttca acaccctgca ggccagcaag 660
agcgacgtgc ccatcgacat ctgcagcagc gtgtgcaagt accccgacta cctgcagatg 720
gccagcgagc cctacggcga cagcctgttc ttcttctga ggaggagca gatgttcgtg 780
aggcatttct tcaacagggc cggcaccctg ggcgaccccg tgcccggcga cctgtacatc 840
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agcggcagca tggtgaccag cgagagccag ctgttcaaca agccctactg gctgcagagg 960
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aacgagaact tcaaggagta cctgaggcac ggcgaggagt tcgacctgca gttcatcttc 1140
cagctgtgca agatcacctt gaccgccgac gtgatgacct acatccacaa gatggacgcc 1200

accatcctgg aggactggca gttcggcctg accccccccc ccagcgccag cctggaggac	1260
acctacaggt tcgtgaccag caccgccatc acctgccaga agaacacccc cccaagggc	1320
aaggaggacc ccctgaagga ctacatgttc tgggaggtgg acctgaagga gaagttcagc	1380
gccgacctgg accagttccc cctgggcagg aagttcctgc tgcaggccgg cctgaaagcc	1440
aagccaaaac tgaaaagggc tgccccaacc agcaccagga cctcctctgc caagaggaag	1500
aaggtgaaga agtaaa	1516

<210> 125

<211> 1531

<212> DNA

<213> Artificial sequence

<220>

<223> 5205 Synthetic HPV52 L1 gene

<400> 125

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gtgagcaagg tggtagcac cgacgagtac gtgagcagga ccagcatcta ctactacgcc	120
ggcagcagca ggctgctgac cgtgggccac ccctacttca gcatcaagaa caccagcagc	180
ggcaacggca agaaggtgct ggtgcccag gtgagcggcc tgcagtacag ggtgttcagg	240
atcaagctgc ccgacccaa caagttcggc ttccccgaca ccagcttcta caaccccag	300
accagaggc tgggtgtgggc ctgcaccggc ctggagatcg gcaggggcca gccctgggc	360
gtgggcatca gcggccacc cctgctgaac aagttcgacg acaccgagac cagcaacaag	420
tacgccggca agcccggcat cgacaacagg gagtgcctga gcatggacta caagcagacc	480
cagctgtgca tcctgggctg caagcccc atcggcgagc actggggcaa gggcaccccc	540
tgcaacaaca acagcggcaa ccccggcgac tgccccccc tgcagctgat caacagcgtg	600
atccaggacg gcgacatggt ggacaccggc ttcggctgca tggacttcaa caccctgcag	660
gccagcaaga gcgacgtgcc catcgacatc tgcagcagcg tgtgcaagta ccccgactac	720
ctgcagatgg ccagcgagcc ctacggcgac agcctgttct tcttcctgag gagggagcag	780
atgttcgtga ggcacttctt caacagggcc ggcaccctgg gcgaccccgt gcccggcgac	840
ctgtacatcc agggcagcaa cagcggcaac accgccaccg tgcagagcag cgccttcttc	900

cccccccca gcggcagcat ggtgaccagc gagagccagc tgttcaacaa gccctactgg	960
ctgcagagggg cccagggcca caacaacggc atctgctggg gcaaccagct gttcgtgacc	1020
gtgggtggaca ccaccaggag caccaacatg accctgtgcg ccgaggtgaa gaaggagagc	1080
acctacaaga acgagaactt caaggagtac ctgaggcacg gcgaggagtt cgacctgcag	1140
ttcatcttcc agctgtgcaa gatcacctg accgccgacg tgatgaccta catccacaag	1200
atggacgcca ccatcctgga ggactggcag ttccggcctga ccccccccc cagcgccagc	1260
ctggaggaca cctacaggtt cgtgaccagc accgccatca cctgccagaa gaacaccccc	1320
cccaaggga aggaggaccc cctgaaggac tacatgttct gggaggtgga cctgaaggag	1380
aagttcagcg ccgacctgga ccagttcccc ctgggcagga agttcctgct gcaggccggc	1440
ctgcaggcca ggccaagct gaagaggccc gccagcagcg cccccaggac cagcaccaag	1500
aagaagaagg tgaagaggta aactcgagct c	1531

<210> 126

<211> 1519

<212> DNA

<213> Artificial sequence

<220>

<223> 5206 Synthetic HPV33 L1 gene

<400> 126

ctgggtacca tgagtgtgtg gagaccatct gaggctacag tctacctgcc tcctgtgcct	60
gtgagcaagg tggtagcac agatgaatat gtgagcagga ccagcatcta ctactatgct	120
ggctccagca gactgctggc tgtgggacac ccatacttca gcatcaagaa cccaaccaat	180
gccaagaaac tgctggtgcc aaaggtgtct ggactccaat acagggtgtt cagggtgaga	240
ctgcctgacc caaacaagtt tggctttcct gacacctcct tctacaacc tgacaccag	300
agactggtgt gggcttgtgt gggattggag attggcaggg gacaaccact gggagtgggc	360
atctctggac acccactgct gaacaagttt gatgacacag agacaggcaa caaataccct	420
ggacaacctg gagcagaaa caggagtggt ctgagtatgg actacaagca gacccaactt	480
tgtctgctgg gctgtaagcc tccaacagga gaacactggg gcaaggaggt ggcttgtacc	540
aatgctgccc ctgccaatga ctgtcctcca ttggaactga taaacaccat cattgaggat	600
ggagatatgg tggacacagg ctttggctgt atggacttca agaccctcca agccaacaag	660

tctgatgtgc caattgacat ctgtggcagc acttgtaaata accctgacta cctgaaaatg	720
acctctgaac catatggaga ctccctgttc ttcttcctga ggagggaaca gatgtttgtg	780
agacacttct tcaacagggc tggcaccctg ggagaggctg tgcctgatga cctctacatc	840
aagggtctctg gcaccacagc cagcatccag tcctctgcct tctttccaac accatctggc	900
agtatggtga cctctgagag ccaacttttc aacaagccat actggctcca aagggtcaa	960
ggacacaaca atggcatctg ttggggcaac caggtgtttg tgacagtggg ggacaccacc	1020
aggagcacca atatgaccct gtgtaccag gtgacctctg acagcaccta caagaatgag	1080
aacttcaagg aatacatcag gcatgtggag gaatatgacc tccaatttgt gttccaactt	1140
tgtaagggtga ccctgacagc agaggtgatg acctacatcc atgctatgaa ccctgacatc	1200
ttggaggact ggaggtttgg actgacacct cctccatctg cctccctcca agacacctac	1260
aggtttgtga ccagccaggc tatcacttgt cagaagacag tgcctccaaa ggagaaggag	1320
gacccactgg gcaaatacac cttctgggag gtggacctga aagagaagtt ctctgctgac	1380
ctggaccagt ttccactggg caggaagttc ctgctccaag caggactgaa agccaagcca	1440
aaactgaaaa gggctgcccc aaccagcacc aggacctcct ctgccaagag gaagaagggtg	1500
aagaagtaaa ctcgagctc	1519

<210> 127

<211> 34

<212> DNA

<213> Artificial sequence

<220>

<223> 5207 HPV52L1 F1

<400> 127

cttggtacca tgagcgtgtg gaggcccagc gagg

34

<210> 128

<211> 35

<212> DNA

<213> Artificial sequence

<220>

<223> 5208 HPV52L1 R1

<400> 128
gcttggcttt caggccggcc tgcagcagga acttc 35

<210> 129
<211> 1453
<212> DNA
<213> Artificial sequence

<220>
<223> 5209 HPV52L1 amplified sequence 1

<400> 129
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ggcagcagca ggctgctgac cgtggggccac ccctacttca gcatcaagaa caccagcagc 180
ggcaacggca agaagggtgt ggtgcccagg gtgagcggcc tgcagtacag ggtgttcagg 240
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accagaggc tgggtgtgggc ctgcaccggc ctggagatcg gcaggggcca gcccttgggc 360
gtgggcatca gcggccaccc cctgctgaac aagttcgacg acaccgagac cagcaacaag 420
tacgccggca agcccggcat cgacaacagg gagtgcctga gcatggacta caagcagacc 480
cagctgtgca tcctgggctg caagcccccc atcggcgagc actggggcaa gggcaccccc 540
tgcaacaaca acagcggcaa ccccggcgac tgcccccccc tgcagctgat caacagcgtg 600
atccaggacg gcgacatggt ggacaccggc ttgggtgca tggacttcaa caccctgcag 660
gccagcaaga gcgacgtgcc catcgacatc tgcagcagcg tgtgcaagta ccccgactac 720
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cccaagggca aggaggaccc cctgaaggac tacatgttct gggagggtgga cctgaaggag	1380
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<220>
 <223> 5210 HPV52L1 F2

<400> 130	
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 <223> 5211 HPV52L1 R2

<400> 131	
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 <212> DNA
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<220>
 <223> 5212 HPV52L1 amplified sequence 2

<400> 132	
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<210> 133
 <211> 38

<212> PRT
 <213> Homo sapiens

<220>
 <223> 5213 Amino acid sequence of HPV type 59 L1 protein aa 471-508

<400> 133
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 Ala Ala Pro Ala Pro Thr Ser Thr Pro Ser Pro Lys Arg Val Lys Arg
 20 25 30
 Arg Lys Ser Ser Arg Lys
 35

<210> 134
 <211> 467
 <212> PRT
 <213> Homo sapiens

<220>
 <223> 5601 Amino acid sequence of HPV type 56 L1 protein aa 1-467

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 20 25 30
 Ile Phe Tyr His Ala Gly Ser Ser Arg Leu Leu Ala Val Gly His Pro
 35 40 45
 Tyr Tyr Ser Val Thr Lys Asp Asn Thr Lys Thr Asn Ile Pro Lys Val
 50 55 60
 Ser Ala Tyr Gln Tyr Arg Val Phe Arg Val Arg Leu Pro Asp Pro Asn
 65 70 75 80
 Lys Phe Gly Leu Pro Asp Thr Asn Ile Tyr Asn Pro Asp Gln Glu Arg
 85 90 95
 Leu Val Trp Ala Cys Val Gly Leu Glu Val Gly Arg Gly Gln Pro Leu
 100 105 110
 Gly Ala Gly Leu Ser Gly His Pro Leu Phe Asn Arg Leu Asp Asp Thr
 115 120 125
 Glu Ser Ser Asn Leu Ala Asn Asn Asn Val Ile Glu Asp Ser Arg Asp
 130 135 140
 Asn Ile Ser Val Asp Gly Lys Gln Thr Gln Leu Cys Ile Val Gly Cys
 145 150 155 160
 Thr Pro Ala Met Gly Glu His Trp Thr Lys Gly Ala Val Cys Lys Ser
 165 170 175
 Thr Gln Val Thr Thr Gly Asp Cys Pro Pro Leu Ala Leu Ile Asn Thr
 180 185 190
 Pro Ile Glu Asp Gly Asp Met Ile Asp Thr Gly Phe Gly Ala Met Asp
 195 200 205
 Phe Lys Val Leu Gln Glu Ser Lys Ala Glu Val Pro Leu Asp Ile Val
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 Gln Ser Thr Cys Lys Tyr Pro Asp Tyr Leu Lys Met Ser Ala Asp Ala

<223> 5603 Amino acid sequence of chimeric HPV type 56 L1 protein

<400> 136

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      20      25      30
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      35      40      45
Tyr Tyr Ser Val Thr Lys Asp Asn Thr Lys Thr Asn Ile Pro Lys Val
      50      55      60
Ser Ala Tyr Gln Tyr Arg Val Phe Arg Val Arg Leu Pro Asp Pro Asn
65      70      75      80
Lys Phe Gly Leu Pro Asp Thr Asn Ile Tyr Asn Pro Asp Gln Glu Arg
      85      90      95
Leu Val Trp Ala Cys Val Gly Leu Glu Val Gly Arg Gly Gln Pro Leu
      100      105      110
Gly Ala Gly Leu Ser Gly His Pro Leu Phe Asn Arg Leu Asp Asp Thr
      115      120      125
Glu Ser Ser Asn Leu Ala Asn Asn Asn Val Ile Glu Asp Ser Arg Asp
      130      135      140
Asn Ile Ser Val Asp Gly Lys Gln Thr Gln Leu Cys Ile Val Gly Cys
145      150      155      160
Thr Pro Ala Met Gly Glu His Trp Thr Lys Gly Ala Val Cys Lys Ser
      165      170      175
Thr Gln Val Thr Thr Gly Asp Cys Pro Pro Leu Ala Leu Ile Asn Thr
      180      185      190
Pro Ile Glu Asp Gly Asp Met Ile Asp Thr Gly Phe Gly Ala Met Asp
      195      200      205
Phe Lys Val Leu Gln Glu Ser Lys Ala Glu Val Pro Leu Asp Ile Val
      210      215      220
Gln Ser Thr Cys Lys Tyr Pro Asp Tyr Leu Lys Met Ser Ala Asp Ala
225      230      235      240
Tyr Gly Asp Ser Met Trp Phe Tyr Leu Arg Arg Glu Gln Leu Phe Ala
      245      250      255
Arg His Tyr Phe Asn Arg Ala Gly Lys Val Gly Glu Thr Ile Pro Ala
      260      265      270
Glu Leu Tyr Leu Lys Gly Ser Asn Gly Arg Glu Pro Pro Pro Ser Ser
      275      280      285
Val Tyr Val Ala Thr Pro Ser Gly Ser Met Ile Thr Ser Glu Ala Gln
      290      295      300
Leu Phe Asn Lys Pro Tyr Trp Leu Gln Arg Ala Gln Gly His Asn Asn
305      310      315      320
Gly Ile Cys Trp Gly Asn Gln Leu Phe Val Thr Val Val Asp Thr Thr
      325      330      335
Arg Ser Thr Asn Met Thr Ile Ser Thr Ala Thr Glu Gln Leu Ser Lys
      340      345      350
Tyr Asp Ala Arg Lys Ile Asn Gln Tyr Leu Arg His Val Glu Glu Tyr
      355      360      365
Glu Leu Gln Phe Val Phe Gln Leu Cys Lys Ile Thr Leu Ser Ala Glu
      370      375      380
Val Met Ala Tyr Leu His Asn Met Asn Ala Asn Leu Leu Glu Asp Trp
385      390      395      400
Asn Ile Gly Leu Ser Pro Pro Val Ala Thr Ser Leu Glu Asp Lys Tyr

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ccactgggca ggaagttcct gctccaagca ggactgaaag ccaagccaaa actgaaaagg	1440
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<210> 138

<211> 1519

<212> DNA

<213> Artificial sequence

<220>

<223> 5605 Synthetic HPV56 L1 gene

<400> 138

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ggctccagca gactgctggc tgtgggacac ccatactact ctgtgaccaa ggacaacacc	180
aagaccaaca tcccaaagggt gtctgcctac caatacaggg tgttcagggt gagactgcct	240
gacccaaaca agtttggact gcctgacacc aacatctaca accctgacca ggagagactg	300
gtgtgggctt gtgtgggatt ggaggtgggc aggggacaac cactgggagc aggactgtct	360
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tgattgagg acagcagga caacatctct gtggatggca agcagacca actttgtatt	480
gtgggctgta ctctgctat gggagaacac tggaccaagg gagcagtgtg taagagcacc	540
caggtgacca caggagactg tcctccactg gctctgataa acacaccaat tgaggatgga	600
gatatgattg acacaggctt tggagctatg gacttcaagg tgctccaaga gagcaaggct	660
gaggtgccac tggacattgt ccagagcact tgtaaatacc ctgactacct gaaaatgagt	720

gctgatgcct atggagacag tatgtggttc tacctgagga gggaacaact ttttgccaga	780
cactacttca acagggctgg caaggtggga gagaccatcc ctgctgaact ctacctgaaa	840
ggcagcaatg gcaggggaacc tcctccatcc tctgtctatg tggctacacc atctggcagt	900
atgattacct ctgaggctca acttttcaac aagccatact ggctccaaag ggctcaagga	960
cacaacaatg gcatctgttg gggcaaccaa ctttttgtga cagtgggtgga caccaccagg	1020
agcaccaata tgaccatcag cacagccaca gaacaactta gcaaatatga tgccaggaag	1080
ataaaccaat acctgaggca tgtggaggaa tatgaactcc aatttgtgtt ccaactttgt	1140
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ccactggcta aatacaagtt ctgggatgtg aacctccaag actccttcag cacagacctg	1380
gaccagtttc cactgggcag gaagttcctg atgcaacttg gcaccaggag caagcctgct	1440
gtggctacca gcaagaagag gtctgccccca accagcacca gcacacctgc caagaggaag	1500
aggaggtaaa ctcgagctc	1519

<210> 139

<211> 1519

<212> DNA

<213> Artificial sequence

<220>

<223> 5606 Synthetic HPV33 L1 gene

<400> 139

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ggctccagca gactgctggc tgtgggacac ccatacttca gcatcaagaa cccaaccaat	180
gccaagaaac tgctgggtgcc aaaggtgtct ggactccaat acaggggtgtt cagggtgaga	240
ctgcctgacc caaacaagtt tggctttcct gacacctcct tctacaaccc tgacaccag	300
agactgggtgt gggcttgtgt gggattggag attggcaggg gacaaccact gggagtgggc	360
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ggacaacctg gagcagacaa cagggagtgt ctgagtatgg actacaagca gacccaactt	480
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aatgctgccc ctgccaatga ctgtcctcca ttggaactga taaacaccat cattgaggat	600
ggagatatgg tggacacagg ctttggctgt atggacttca agaccctcca agccaacaag	660
tctgatgtgc caattgacat ctgtggcagc acttgtaaata accctgacta cctgaaaatg	720
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ctggaccagt ttccactggg caggaagttc ctgctccaag caggactgaa agccaagcca	1440
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aagaagtaaa ctcgagctc	1519

<210> 140

<211> 33

<212> DNA

<213> Artificial sequence

<220>

<223> 5607 HPV56L1 F1

<400> 140

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33

<210> 141

<211> 31

<212> DNA
 <213> Artificial sequence

<220>
 <223> 5608 HPV56L1 R1

<400> 141
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<210> 142
 <211> 1420
 <212> DNA
 <213> Artificial sequence

<220>
 <223> 5609 HPV56L1 amplified sequence 1

<400> 142
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 ggctccagca gactgctggc tgtggggacac ccatactact ctgtgaccaa ggacaacacc 180
 aagaccaaca tcccaaaggt gtctgcctac caatacaggg tgttcagggt gagactgcct 240
 gacccaaaca agtttggact gcctgacacc aacatctaca accctgacca ggagagactg 300
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<210> 143
 <211> 36
 <212> DNA
 <213> Artificial sequence

<220>
 <223> 5610 HPV56L1 F2

<400> 143	
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<210> 144
 <211> 36
 <212> DNA
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<220>
 <223> 5611 HPV56L1 R2

<400> 144	
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<210> 145
 <211> 116
 <212> DNA
 <213> Artificial sequence

<220>
 <223> 5612 HPV56L1 amplified sequence 2

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116

<210> 146

<211> 38

<212> PRT

<213> Homo sapiens

<220>

<223> 5613 Amino acid sequence of HPV type 59 L1 protein aa 471-508

<400> 146

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Ala	Ala	Pro	Ala	Pro	Thr	Ser	Thr	Pro	Ser	Pro	Lys	Arg	Val	Lys	Arg
			20					25					30		
Arg	Lys	Ser	Ser	Arg	Lys										
			35												

<210> 147

<211> 473

<212> PRT

<213> Homo sapiens

<220>

<223> 5801 Amino acid sequence of HPV type 58 L1 protein aa 1-473

<400> 147

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Pro	Val	Ser	Lys	Val	Val	Ser	Thr	Asp	Glu	Tyr	Val	Ser	Arg	Thr	Ser
			20					25					30		
Ile	Tyr	Tyr	Tyr	Ala	Gly	Ser	Ser	Arg	Leu	Leu	Ala	Val	Gly	Asn	Pro
			35				40					45			
Tyr	Phe	Ser	Ile	Lys	Ser	Pro	Asn	Asn	Asn	Lys	Lys	Val	Leu	Val	Pro
	50					55				60					
Lys	Val	Ser	Gly	Leu	Gln	Tyr	Arg	Val	Phe	Arg	Val	Arg	Leu	Pro	Asp
65					70				75					80	
Pro	Asn	Lys	Phe	Gly	Phe	Pro	Asp	Thr	Ser	Phe	Tyr	Asn	Pro	Asp	Thr
				85				90					95		
Gln	Arg	Leu	Val	Trp	Ala	Cys	Val	Gly	Leu	Glu	Ile	Gly	Arg	Gly	Gln
			100					105					110		
Pro	Leu	Gly	Val	Gly	Val	Ser	Gly	His	Pro	Tyr	Leu	Asn	Lys	Phe	Asp
		115					120					125			
Asp	Thr	Glu	Thr	Ser	Asn	Arg	Tyr	Pro	Ala	Gln	Pro	Gly	Ser	Asp	Asn
		130				135					140				
Arg	Glu	Cys	Leu	Ser	Met	Asp	Tyr	Lys	Gln	Thr	Gln	Leu	Cys	Leu	Ile
145					150				155						160
Gly	Cys	Lys	Pro	Pro	Thr	Gly	Glu	His	Trp	Gly	Lys	Gly	Val	Ala	Cys
				165					170					175	
Asn	Asn	Asn	Ala	Ala	Ala	Thr	Asp	Cys	Pro	Pro	Leu	Glu	Leu	Phe	Asn
			180					185					190		

Ser Ile Ile Glu Asp Gly Asp Met Val Asp Thr Gly Phe Gly Cys Met
 195 200 205
 Asp Phe Gly Thr Leu Gln Ala Asn Lys Ser Asp Val Pro Ile Asp Ile
 210 215 220
 Cys Asn Ser Thr Cys Lys Tyr Pro Asp Tyr Leu Lys Met Ala Ser Glu
 225 230 235 240
 Pro Tyr Gly Asp Ser Leu Phe Phe Phe Leu Arg Arg Glu Gln Met Phe
 245 250 255
 Val Arg His Phe Phe Asn Arg Ala Gly Lys Leu Gly Glu Ala Val Pro
 260 265 270
 Asp Asp Leu Tyr Ile Lys Gly Ser Gly Asn Thr Ala Val Ile Gln Ser
 275 280 285
 Ser Ala Phe Phe Pro Thr Pro Ser Gly Ser Ile Val Thr Ser Glu Ser
 290 295 300
 Gln Leu Phe Asn Lys Pro Tyr Trp Leu Gln Arg Ala Gln Gly His Asn
 305 310 315 320
 Asn Gly Ile Cys Trp Gly Asn Gln Leu Phe Val Thr Val Val Asp Thr
 325 330 335
 Thr Arg Ser Thr Asn Met Thr Leu Cys Thr Glu Val Thr Lys Glu Gly
 340 345 350
 Thr Tyr Lys Asn Asp Asn Phe Lys Glu Tyr Val Arg His Val Glu Glu
 355 360 365
 Tyr Asp Leu Gln Phe Val Phe Gln Leu Cys Lys Ile Thr Leu Thr Ala
 370 375 380
 Glu Ile Met Thr Tyr Ile His Thr Met Asp Ser Asn Ile Leu Glu Asp
 385 390 395 400
 Trp Gln Phe Gly Leu Thr Pro Pro Pro Ser Ala Ser Leu Gln Asp Thr
 405 410 415
 Tyr Arg Phe Val Thr Ser Gln Ala Ile Thr Cys Gln Lys Thr Ala Pro
 420 425 430
 Pro Lys Glu Lys Glu Asp Pro Leu Asn Lys Tyr Thr Phe Trp Glu Val
 435 440 445
 Asn Leu Lys Glu Lys Phe Ser Ala Asp Leu Asp Gln Phe Pro Leu Gly
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 Arg Lys Phe Leu Leu Gln Ser Gly Leu
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<210> 148

<211> 26

<212> PRT

<213> Homo sapiens

<220>

<223> 5802 Amino acid sequence of HPV type 33 L1 protein aa 474-499

<400> 148

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 Ser Ser Ala Lys Arg Lys Lys Val Lys Lys
 20 25

<210> 149

<211> 499

<212> PRT
 <213> Artificial sequence

<220>

<223> 5803 Amino acid sequence of chimeric HPV type 58 L1 protein

<400> 149

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20      25      30
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35      40      45
Tyr Phe Ser Ile Lys Ser Pro Asn Asn Asn Lys Lys Val Leu Val Pro
50      55      60
Lys Val Ser Gly Leu Gln Tyr Arg Val Phe Arg Val Arg Leu Pro Asp
65      70      75      80
Pro Asn Lys Phe Gly Phe Pro Asp Thr Ser Phe Tyr Asn Pro Asp Thr
85      90      95
Gln Arg Leu Val Trp Ala Cys Val Gly Leu Glu Ile Gly Arg Gly Gln
100     105     110
Pro Leu Gly Val Gly Val Ser Gly His Pro Tyr Leu Asn Lys Phe Asp
115     120     125
Asp Thr Glu Thr Ser Asn Arg Tyr Pro Ala Gln Pro Gly Ser Asp Asn
130     135     140
Arg Glu Cys Leu Ser Met Asp Tyr Lys Gln Thr Gln Leu Cys Leu Ile
145     150     155     160
Gly Cys Lys Pro Pro Thr Gly Glu His Trp Gly Lys Gly Val Ala Cys
165     170     175
Asn Asn Asn Ala Ala Ala Thr Asp Cys Pro Pro Leu Glu Leu Phe Asn
180     185     190
Ser Ile Ile Glu Asp Gly Asp Met Val Asp Thr Gly Phe Gly Cys Met
195     200     205
Asp Phe Gly Thr Leu Gln Ala Asn Lys Ser Asp Val Pro Ile Asp Ile
210     215     220
Cys Asn Ser Thr Cys Lys Tyr Pro Asp Tyr Leu Lys Met Ala Ser Glu
225     230     235     240
Pro Tyr Gly Asp Ser Leu Phe Phe Phe Leu Arg Arg Glu Gln Met Phe
245     250     255
Val Arg His Phe Phe Asn Arg Ala Gly Lys Leu Gly Glu Ala Val Pro
260     265     270
Asp Asp Leu Tyr Ile Lys Gly Ser Gly Asn Thr Ala Val Ile Gln Ser
275     280     285
Ser Ala Phe Phe Pro Thr Pro Ser Gly Ser Ile Val Thr Ser Glu Ser
290     295     300
Gln Leu Phe Asn Lys Pro Tyr Trp Leu Gln Arg Ala Gln Gly His Asn
305     310     315     320
Asn Gly Ile Cys Trp Gly Asn Gln Leu Phe Val Thr Val Val Asp Thr
325     330     335
Thr Arg Ser Thr Asn Met Thr Leu Cys Thr Glu Val Thr Lys Glu Gly
340     345     350
Thr Tyr Lys Asn Asp Asn Phe Lys Glu Tyr Val Arg His Val Glu Glu
355     360     365

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Tyr Asp Leu Gln Phe Val Phe Gln Leu Cys Lys Ile Thr Leu Thr Ala
 370 375 380
 Glu Ile Met Thr Tyr Ile His Thr Met Asp Ser Asn Ile Leu Glu Asp
 385 390 395 400
 Trp Gln Phe Gly Leu Thr Pro Pro Pro Ser Ala Ser Leu Gln Asp Thr
 405 410 415
 Tyr Arg Phe Val Thr Ser Gln Ala Ile Thr Cys Gln Lys Thr Ala Pro
 420 425 430
 Pro Lys Glu Lys Glu Asp Pro Leu Asn Lys Tyr Thr Phe Trp Glu Val
 435 440 445
 Asn Leu Lys Glu Lys Phe Ser Ala Asp Leu Asp Gln Phe Pro Leu Gly
 450 455 460
 Arg Lys Phe Leu Leu Gln Ser Gly Leu Lys Ala Lys Pro Lys Leu Lys
 465 470 475 480
 Arg Ala Ala Pro Thr Ser Thr Arg Thr Ser Ser Ala Lys Arg Lys Lys
 485 490 495
 Val Lys Lys

<210> 150

<211> 1501

<212> DNA

<213> Artificial sequence

<220>

<223> 5804 Nucleotide sequence of chimeric HPV type 58 L1 protein

<400> 150

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aggctgctgg ccgtgggcaa cccctacttc agcatcaaga gcccacaaca caacaagaag	180
gtgctggtgc ccaaggtgag cggcctgcag tacagggtgt tcagggtgag gctgcccgc	240
cccaacaagt tcggcttccc cgacaccagc ttctacaacc ccgacacca gaggctggtg	300
tgggcctgcg tgggcctgga gatcggcagg ggccagcccc tgggcgtggg cgtgagcggc	360
caccctacc tgaacaagtt cgacgacacc gagaccagca acaggtaccc cgcccagccc	420
ggcagcgaca acaggagtg cctgagcatg gactacaagc agaccagct gtgcctgac	480
ggctgcaagc cccccaccgg cgagcactgg ggcaagggcg tggcctgcaa caacaacgcc	540
gccgccaccg actgcccccc cctggagctg ttcaacagca tcatcgagga cggcgacatg	600
gtggacaccg gcttcggctg catggacttc ggcaccctgc aggccaaca gagcgacgtg	660
cccatcgaca tctgcaacag cacctgcaag taccgact acctgaagat ggccagcgag	720
ccctacggcg acagcctgtt cttcttctg aggaggagc agatgttcgt gaggcacttc	780

ttcaacaggg ccggcaagct gggcgaggcc gtgcccgcg acctgtacat caagggcagc	840
ggcaacaccg ccgtgatcca gagcagcgcc ttcttcccca cccccagcgg cagcatcgtg	900
accagcgaga gccagctggt caacaagccc tactggctgc agagggccca gggccacaac	960
aacggcatct gctggggcaa ccagctgttc gtgaccgtgg tggacaccac caggagcacc	1020
aacatgaccc tgtgcaccga ggtgaccaag gagggcacct acaagaacga caacttcaag	1080
gagtacgtga ggcacgtgga ggagtacgac ctgcagttcg tgttccagct gtgcaagatc	1140
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aacaagtaca ctttctggga ggtgaacctg aaggagaagt tcagcgccga cctggaccag	1380
ttccccctgg gcaggaagtt cctgctgcag agcggcctga aagccaagcc aaaactgaaa	1440
agggtgccc caaccagcac caggacctcc tctgccaaga ggaagaaggt gaagaagtaa	1500
a	1501

<210> 151

<211> 1516

<212> DNA

<213> Artificial sequence

<220>

<223> 5805 Synthetic HPV58 L1 gene

<400> 151

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ggcagcagca ggctgctggc cgtgggcaac ccctacttca gcatcaagag cccaacaac	180
aacaagaagg tgctggtgcc caaggtgagc ggcctgcagt acagggtggt cagggtgagg	240
ctgcccgacc ccaacaagtt cggcttcccc gacaccagct tctacaaccc cgacaccag	300
aggctggtgt gggcctgcgt gggcctggag atcggcaggg gccagcccct gggcgtgggc	360
gtgagcggcc acccctacct gaacaagttc gacgacaccg agaccagcaa caggtagccc	420
gcccagcccc gcagcgacaa cagggagtgct ctgagcatgg actacaagca gaccagctg	480

tgctgatcg gctgcaagcc cccaccggc gagcactggg gcaagggcgt ggctgcaac	540
aacaacgccg ccgccaccga ctgccccccc ctggagctgt tcaacagcat catcgaggac	600
ggcgacatgg tggacaccgg cttcggctgc atggacttcg gcaccctgca ggccaacaag	660
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gccagcgagc cctacggcga cagcctgttc ttcttctga ggaggagca gatgttcgtg	780
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aagtaaactc gagctc	1516

<210> 152

<211> 1519

<212> DNA

<213> Artificial sequence

<220>

<223> 5806 Synthetic HPV33 L1 gene

<400> 152

ctgggtacca tgagtgtgtg gagaccatct gaggctacag tctacctgcc tcctgtgcct	60
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ggctccagca gactgtggc tgtgggacac ccatacttca gcatcaagaa cccaaccaat	180
gccaagaaac tgctggtgcc aaaggtgtct ggactccaat acagggtgtt cagggtgaga	240

ctgcctgacc caaacaagtt tggcttttcct gacacctcct tctacaaccc tgacacccag	300
agactggtgt gggcttgtgt gggattggag attggcaggg gacaaccact gggagtgggc	360
atctctggac acccactgct gaacaagttt gatgacacag agacaggcaa caaataccct	420
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tgtctgctgg gctgtaagcc tccaacagga gaacactggg gcaagggagt ggcttgtacc	540
aatgctgccc ctgccaatga ctgtcctcca ttggaactga taaacaccat cattgaggat	600
ggagatatgg tggacacagg ctttggctgt atggacttca agaccctcca agccaacaag	660
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aggagcacca atatgaccct gtgtaccag gtgacctctg acagcaccta caagaatgag	1080
aacttcaagg aatacatcag gcatgtggag gaatatgacc tccaatttgt gttccaactt	1140
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aggtttgtga ccagccaggc tatcacttgt cagaagacag tgcctccaaa ggagaaggag	1320
gacccactgg gcaaatacac cttctgggag gtggacctga aagagaagtt ctctgctgac	1380
ctggaccagt ttccactggg caggaagttc ctgctccaag caggactgaa agccaagcca	1440
aaactgaaaa gggctgcccc aaccagcacc aggacctcct ctgccaagag gaagaagggtg	1500
aagaagtaaa ctcgagctc	1519

<210> 153

<211> 34

<212> DNA

<213> Artificial sequence

<220>

<223> 5807 HPV58L1 F1

<400> 153
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<210> 154
 <211> 36
 <212> DNA
 <213> Artificial sequence

<220>
 <223> 5808 HPV58L1 R1

<400> 154
 gcttggcttt caggccgctc tgcagcagga acttcc 36

<210> 155
 <211> 1438
 <212> DNA
 <213> Artificial sequence

<220>
 <223> 5809 HPV58L1 amplified sequence 1

<400> 155
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 ggagcagca ggctgctggc cgtgggcaac ccctacttca gcatcaagag cccaacaac 180
 aacaagaagg tgctggtgcc caaggtgagc ggcctgcagt acagggtgtt cagggtgagg 240
 ctgcccagacc ccaacaagtt cggcttcccc gacaccagct tctacaacct cgacaccag 300
 aggctggtgt gggcctgcgt gggcctggag atcggcaggg gccagcccct gggcgtgggc 360
 gtgagcggcc acccctacct gaacaagttc gacgacaccg agaccagcaa caggtagccc 420
 gccagcccgc gcagcgacaa caggagatgc ctgagcatgg actacaagca gaccagctg 480
 tgctgatcg gctgcaagcc cccaccggc gagcactggg gcaagggcgt ggcctgcaac 540
 aacaacgccg ccgccaccga ctgccccccc ctggagctgt tcaacagcat catcaggagc 600
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gacccccctga acaagtacac cttctgggag gtgaacctga aggagaagtt cagcgccgac	1380
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<210> 156
 <211> 35
 <212> DNA
 <213> Artificial sequence

<220>
 <223> 5810 HPV58L1 F2

<400> 156	
gagcggcctg aaagccaagc caaaactgaa aaggg	35

<210> 157
 <211> 36
 <212> DNA
 <213> Artificial sequence

<220>
 <223> 5811 HPV58L1 R2

<400> 157	
ctgtctagat ttacttcttc accttcttcc tcttgg	36

<210> 158
 <211> 101
 <212> DNA
 <213> Artificial sequence

<220>

<223> 5812 HPV58L1 amplified sequence 2

<400> 158

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ctctgccaag aggaagaagg tgaagaagta aatctagaca g 101

<210> 159

<211> 38

<212> PRT

<213> Homo sapiens

<220>

<223> 5813 Amino acid sequence of HPV type 59 L1 protein aa 471-508

<400> 159

Leu Gln Leu Gly Ala Arg Pro Lys Pro Thr Ile Gly Pro Arg Lys Arg

1 5 10 15

Ala Ala Pro Ala Pro Thr Ser Thr Pro Ser Pro Lys Arg Val Lys Arg

20 25 30

Arg Lys Ser Ser Arg Lys

35

<210> 160

<211> 508

<212> PRT

<213> Homo sapiens

<220>

<223> 5901 Amino acid sequence of HPV type 59 L1 protein

<400> 160

Met Ala Leu Trp Arg Ser Ser Asp Asn Lys Val Tyr Leu Pro Pro Pro

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Ser Val Ala Lys Val Val Ser Thr Asp Glu Tyr Val Thr Arg Thr Ser

20 25 30

Ile Phe Tyr His Ala Gly Ser Ser Arg Leu Leu Thr Val Gly His Pro

35 40 45

Tyr Phe Lys Val Pro Lys Gly Gly Asn Gly Arg Gln Asp Val Pro Lys

50 55 60

Val Ser Ala Tyr Gln Tyr Arg Val Phe Arg Val Lys Leu Pro Asp Pro

65 70 75 80

Asn Lys Phe Gly Leu Pro Asp Asn Thr Val Tyr Asp Pro Asn Ser Gln

85 90 95

Arg Leu Val Trp Ala Cys Val Gly Val Glu Ile Gly Arg Gly Gln Pro

100 105 110

Leu Gly Val Gly Leu Ser Gly His Pro Leu Tyr Asn Lys Leu Asp Asp

115 120 125

Thr Glu Asn Ser His Val Ala Ser Ala Val Asp Thr Lys Asp Thr Arg

130		135		140											
Asp	Asn	Val	Ser	Val	Asp	Tyr	Lys	Gln	Thr	Gln	Leu	Cys	Ile	Ile	Gly
145					150					155					160
Cys	Val	Pro	Ala	Ile	Gly	Glu	His	Trp	Thr	Lys	Gly	Thr	Ala	Cys	Lys
				165					170						175
Pro	Thr	Thr	Val	Val	Gln	Gly	Asp	Cys	Pro	Pro	Leu	Glu	Leu	Ile	Asn
			180				185						190		
Thr	Pro	Ile	Glu	Asp	Gly	Asp	Met	Val	Asp	Thr	Gly	Tyr	Gly	Ala	Met
		195				200					205				
Asp	Phe	Lys	Leu	Leu	Gln	Asp	Asn	Lys	Ser	Glu	Val	Pro	Leu	Asp	Ile
210					215					220					
Cys	Gln	Ser	Ile	Cys	Lys	Tyr	Pro	Asp	Tyr	Leu	Gln	Met	Ser	Ala	Asp
225					230					235					240
Ala	Tyr	Gly	Asp	Ser	Met	Phe	Phe	Cys	Leu	Arg	Arg	Glu	Gln	Val	Phe
			245				250							255	
Ala	Arg	His	Phe	Trp	Asn	Arg	Ser	Gly	Thr	Met	Gly	Asp	Gln	Leu	Pro
			260				265						270		
Glu	Ser	Leu	Tyr	Ile	Lys	Gly	Thr	Asp	Ile	Arg	Ala	Asn	Pro	Gly	Ser
		275				280						285			
Tyr	Leu	Tyr	Ser	Pro	Ser	Pro	Ser	Gly	Ser	Val	Val	Thr	Ser	Asp	Ser
290					295					300					
Gln	Leu	Phe	Asn	Lys	Pro	Tyr	Trp	Leu	His	Lys	Ala	Gln	Gly	Leu	Asn
305					310				315						320
Asn	Gly	Ile	Cys	Trp	His	Asn	Gln	Leu	Phe	Leu	Thr	Val	Val	Asp	Thr
			325				330							335	
Thr	Arg	Ser	Thr	Asn	Leu	Ser	Val	Cys	Ala	Ser	Thr	Thr	Ser	Ser	Ile
		340					345					350			
Pro	Asn	Val	Tyr	Thr	Pro	Thr	Ser	Phe	Lys	Glu	Tyr	Ala	Arg	His	Val
		355				360					365				
Glu	Glu	Phe	Asp	Leu	Gln	Phe	Ile	Phe	Gln	Leu	Cys	Lys	Ile	Thr	Leu
370					375					380					
Thr	Thr	Glu	Val	Met	Ser	Tyr	Ile	His	Asn	Met	Asn	Thr	Thr	Ile	Leu
385				390					395						400
Glu	Asp	Trp	Asn	Phe	Gly	Val	Thr	Pro	Pro	Pro	Thr	Ala	Ser	Leu	Val
			405				410							415	
Asp	Thr	Tyr	Arg	Phe	Val	Gln	Ser	Ala	Ala	Val	Thr	Cys	Gln	Lys	Asp
		420					425					430			
Thr	Ala	Pro	Pro	Val	Lys	Gln	Asp	Pro	Tyr	Asp	Lys	Leu	Lys	Phe	Trp
		435				440				445					
Pro	Val	Asp	Leu	Lys	Glu	Arg	Phe	Ser	Ala	Asp	Leu	Asp	Gln	Phe	Pro
450					455					460					
Leu	Gly	Arg	Lys	Phe	Leu	Leu	Gln	Leu	Gly	Ala	Arg	Pro	Lys	Pro	Thr
465				470					475						480
Ile	Gly	Pro	Arg	Lys	Arg	Ala	Ala	Pro	Ala	Pro	Thr	Ser	Thr	Pro	Ser
			485				490							495	
Pro	Lys	Arg	Val	Lys	Arg	Arg	Lys	Ser	Ser	Arg	Lys				
		500					505								

<210> 161

<211> 1528

<212> DNA

<213> Homo sapiens

<220>

<223> 5902 Nucleotide sequence of HPV type 59 L1 protein

<400> 161

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agactgctga cagtgggaca cccatacttc aaggtgccaa agggaggcaa tggcagacag	180
gatgtgccaa aggtgtctgc ctaccaatac aggggtgttca ggggtgaaact gcctgaccca	240
aacaagtttg gactgcctga caacacagtc tatgacccaa acagccagag actggtgtgg	300
gcttgtgtgg gagtggagat tggcagggga caaccactgg gagtgggact gtctggacac	360
ccactctaca acaaactgga tgacacagag aactctcatg tggcatctgc tgtggacacc	420
aaggacacca gggacaatgt gtctgtggac tacaagcaga cccaactttg tatcattggc	480
tgtgtgcctg ccattggaga aactggacc aagggcacag cctgtaagcc aaccacagtg	540
gtccaggagg actgtcctcc attggaactg ataaacacac caattgagga tggagatatg	600
gtggacacag gctatggagc tatggacttc aaactgctcc aagacaacaa gtctgaggtg	660
ccactggaca tctgtcagag catctgtaaa taccctgact acctccaaat gagtgtctgat	720
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aatggcatct gttggcacia ccaacttttc ctgacagtgg tggacaccac caggagcacc	1020
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gaccagtttc cactgggcag gaagttcctg ctccaacttg gagccagacc aaagccaacc	1440
attggaccaa ggaagagggc tgcccctgcc ccaaccagca caccaagccc aaagagggtg	1500

aagaggagga agtccagcag gaagtaaa 1528

<210> 162
 <211> 1546
 <212> DNA
 <213> Artificial sequence

<220>
 <223> 5903 Synthetic HPV59 L1 gene

<400> 162

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gtggctaagg tggtagcac agatgaatat gtgaccagga ccagcatctt ctaccatgct	120
ggctccagca gactgctgac agtgggacac ccatacttca aggtgccaaa gggaggcaat	180
ggcagacagg atgtgccaaa ggtgtctgcc taccaatata ggggtgttcag ggtgaaactg	240
cctgacccaa acaagtttgg actgcctgac aacacagtct atgacccaaa cagccagaga	300
ctgggtgtggg cttgtgtggg agtggagatt ggcaggggac aaccactggg agtgggactg	360
tctggacacc cactctacaa caaactggat gacacagaga actctcatgt ggcactctgct	420
gtggacacca aggacaccag ggacaatgtg tctgtggact acaagcagac ccaactttgt	480
atcattggct gtgtgcctgc cattggagaa cactggacca agggcacagc ctgtaagcca	540
accacagtgg tccagggaga ctgtcctcca ttggaactga taaacacacc aattgaggat	600
ggagatatgg tggacacagg ctatggagct atggacttca aactgctcca agacaacaag	660
tctgaggtgc cactggacat ctgtcagagc atctgtaaat accctgacta cctccaaatg	720
agtgtgatg cctatggaga cagtatgttc ttctgtctga ggagggaaca ggtgtttgcc	780
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ccaacctcct tcaaggaata tgccaggcat gtggaggagt ttgacctcca attcatcttc	1140
caactttgta agattaccct gaccacagag gtgatgagtt acatccaca tatgaacacc	1200
accatcttgg aggactggaa ctttggagtg acacctcctc caacagcctc cctggtggac	1260

acctacaggt ttgtccagtc tgctgctgtg acttgtcaga aggacacagc ccctcctgtg	1320
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gctgacctgg accagtttcc actgggcagg aagttcctgc tccaacttgg agccagacca	1440
aagccaacca ttggaccaag gaagagggtg gccctgccc caaccagcac accaagccca	1500
aagagggtga agaggaggaa gtccagcagg aagtaaactc gagctc	1546