

Sequence Listing

<110> SinoCellTech Ltd.

<120> CHIMERIC PAPILLOMAVIRUS L1 PROTEIN

<130> CIE200063PCT

<160> 156

<170> BiSSAP 1.3.6

<210> 1

<211> 469

<212> PRT

<213> Homo sapiens

<220>

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

<400> 1

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

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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
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 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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 450 455 460
 Leu Gln Ser Gly Tyr
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<210> 2
 <211> 26
 <212> PRT
 <213> Homo sapiens

<220>
 <223> 0602 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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<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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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	
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Ser	Gly	Ser	Gly	Gly	Asn	Pro	Gly	Gln	Asp	Asn	Arg	Val	Asn	Val	Gly	130	135	140	
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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	
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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
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	450					455					460				
Leu	Gln	Ser	Gly	Tyr	Lys	Ala	Lys	Pro	Lys	Leu	Lys	Arg	Ala	Ala	Pro
465					470					475					480
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<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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ctgctggctg tgggacaccc atacttcagc atcaagaggg ctaacaagac agtggtgcc	180
aaggtgtctg gctaccaata cagggtgttc aaggtggtgc tgcctgacct aaacaagttt	240
gccctgcctg actcctccct gtttgacct accaccaga gactggtgtg ggcttggtact	300
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aacaaatatg atgatgtgga gaactctggc tctggaggca accctggaca agacaacagg	420
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ctgggagAAC actggggcaa gggcaagcag tgtaccaaca cacctgtcca ggctggagac	540
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tttggagcta tgaactttgc tgacctcaa accaacaagt ctgatgtgcc aattgacatc	660
tgtggcacca cttgtaaata ccctgactac ctcaaattgg ctgctgacct atatggagac	720
agactgttct tcttcctgag gaaggaacag atgtttgcc gacacttctt caacagggt	780
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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
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ttctgggagg tgaacctgaa agagaagttc tcctctgaac tggaccaata cccactgggc	1380
aggaagttcc tgctccaatc tggctacaaa gccaaagcaa aactgaaaag ggctgccccca	1440
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<210> 5

<211> 1522

<212> DNA

<213> Artificial sequence

<220>

<223> 0605 Synthetic HPV6 L1 gene

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gcttgactg gattggaggt gggcagggga caaccactgg gagtgggagt gtctggacac	360
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gacaacaggg tgaatgtggg gatggactac aagcagaccc aactttgtat ggtgggctgt	480
gcccctccac tgggagaaca ctggggcaag ggcaagcagt gtaccaacac acctgtccag	540
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gacacaggct ttggagctat gaactttgct gacctccaaa ccaacaagtc tgatgtgcca	660
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ccactgggca ggaagtctct 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

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ggctccagca gactgctggc tgtgggacac ccatacttca gcatcaagaa cccaaccaat	180
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acctctgaac catatggaga ctccctgttc ttcttcctga ggagggaaca gatgtttgtg	780
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ctggaccagt ttccactggg caggaagttc ctgctccaag caggactgaa agccaagcca	1440
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aagaagtaaa ctcgagctc	1519

<210> 7

<211> 35

<212> DNA

<213> Artificial sequence

<220>

<223> 0607 HPV6L1 F1

<400> 7

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35

<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

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<220>

<223> 0609 HPV6L1 amplified sequence 1

<400> 9

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tccagcagac tgctggctgt gggacacca tacttcagca tcaagagggc taacaagaca	180
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aacaagtttg ccctgcctga ctctccctg tttagaccaa ccaccagag actggtgtgg	300
gcttgtagtg gattggaggt gggcagggga caaccactgg gaggggagtg gtctggacac	360
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gacaacaggg tgaatgtggg gatggactac aagcagaccc aactttgtat ggtgggctgt	480
gcccctccac tgggagaaca ctggggcaag ggcaagcagt gtaccaacac acctgtccag	540
gctggagact gtcctccatt ggaactgatt acctctgtga ttcaggatgg agatatggtg	600
gacacaggct ttggagctat gaactttgct gacctcaaaa ccaacaagtc tgatgtgcca	660
attgacatct gtggcaccac ttgtaaatac cctgactacc tccaaatggc tgctgaccca	720
tatggagaca gactgttctt cttcctgagg aaggaacaga tgtttgccag acacttcttc	780
aacagggttg gagaggtggg agaacctgtg cctgacaccc tgattatcaa gggctctggc	840
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<210> 10
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 <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	
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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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 20 25 30
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 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	Ser
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	Tyr
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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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
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agtttctggg aggtgaacct gaaagagaag ttctcctctg aactggacca gtttccactg	1380
ggcaggaagt tcctgctcca atctggctac aaagccaagc caaaactgaa aagggtgctc	1440
ccaaccagca ccaggacctc ctctgccaag aggaagaagg tgaagaagta aa	1492

<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 acagactggt 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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tggaactttg gactgagccc tcctccaaat ggcaccttgg aggacaccta cagatatgtc	1260
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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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 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
ggagatatgg tggacacagg ctttggctgt atggacttca agaccctcca agccaacaag	660
tctgatgtgc caattgacat ctgtggcagc acttgtaaata accctgacta cctgaaaatg	720
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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> 20

<211> 35

<212> DNA

<213> Artificial sequence

<220>

<223> 1107 HPV11L1 F1

<400> 20

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35

<210> 21

<211> 36

<212> DNA
 <213> Artificial sequence

<220>
 <223> 1108 HPV11L1 R1

<400> 21
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<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 tcaagaaggt gaacaagaca 180
 gtggtgccaa aggtgtctgg ctaccaatac aggggtgttca aggtggtgct gcctgaccca 240
 aacaagtttg ccctgcctga ctctccctg tttgaccaa 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 agttagcaa cacctctgtc 540
 cagaatggag actgtcctcc attggaactg attacctctg tgattcagga tggagatatg 600
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 aatggcatct gttggggcaa ccacgtgtt gtgacagtgg tggacaccac caggagcacc 1020

aatatgaccc tgtgtgcctc tgtgagcaag tctgccacct acaccaactc tgactacaag	1080
gaatatatga ggcatgtgga ggagtttgac ctccaattca tcttccaact ttgtagcatc	1140
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tggaactttg gactgagccc tcctccaaat ggcaccttgg aggacaccta cagatatgtc	1260
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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 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> 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
 Met Ser Leu Trp Leu Pro Ser Glu Ala Thr Val Tyr Leu Pro Pro Val
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 20 25 30
 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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20     25     30
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
 500

<210> 30

<211> 1504

<212> DNA

<213> Artificial sequence

<220>

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

<400> 30

atgagtctgt ggctgccatc tgaggctaca gtctacctgc ctctgtgcc tgtgagcaag	60
gtggtgagca cagatgaata tgtggcaagg accaacaatct actaccatgc tggcaccagc	120
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
aatggcatct gttggggcaa ccaacttttt gtgacagtgg tggacaccac caggagcacc	1020
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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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gtgagcaagg tggtagcac agatgaatat gtggcaagga ccaacatcta ctaccatgct	120
ggcaccagca gactgctggc tgtgggacac ccatactttc caatcaagaa gccaaacaac	180
aacaagattc tggtgccaaa ggtgtctgga ctccaatata gggtgttcag gattcacctg	240
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
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accaacttca aggaatacct gagacatgga gaggaatatg acctccaatt catcttccaa	1140
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gaggaccac tgaaaaaata caccttctgg gaggtgaacc tgaaagagaa gttctctgct	1380
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

ctgggtacca tgagtgtgtg gagaccatct gaggctacag tctacctgcc tcctgtgcct	60
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
acctctgaac catatggaga ctccctgttc ttcttcctga ggagggaaca gatgtttgtg	780
agacacttct tcaacagggc tggcaccctg ggagaggctg tgcctgatga cctctacatc	840
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aggttttgtga 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> 33

<211> 34

<212> DNA

<213> Artificial sequence

<220>

<223> 1607 HPV16L1 F1

<400> 33
 cttggtacca tgagtctgtg gctgccatct gagg 34

<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
 cttggtacca tgagtctgtg gctgccatct gaggctacag tctacctgcc tcctgtgcct 60
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 ggcaccagca 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
 tctggacacc cactgctgaa caaactggat gacacagaga atgcctctgc ctatgctgcc 420
 aatgctggag tggacaacag ggagtgtatc agtatggact acaagcagac ccaactttgt 480
 ctgattggct gtaagcctcc aattggagaa cactggggca agggcagccc atgtaccaat 540
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 tctgaggtgc cactggacat ctgtaccagc atctgtaaat accctgacta catcaagatg 720
 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
gacctggacc agtttccact gggcaggaag ttcctgctcc aagcaggact gaaagccaag	1440
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

agcaggactg aaagccaagc caaaactgaa aagggtgcc ccaaccagca ccaggacctc 60

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

100 105 110

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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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
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 aaacaacaa	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
agccaagggg actgtccacc cctggagttg aagaataccg tgctcgagga cggcgacatg	600
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
ggaatgaggg ccagccccgg gtcctgcgtc tacagcccaa gccctccgg gagcatcgtc	900
acaagcgata gccaaactctt caacaagccc tactggctcc acaaagcca aggccacaat	960
aacgggggtgt gttggcaca ccagctgttc gtgaccgtcg tggacacaac caggtccaca	1020
aacctgacca tctgcgccag cacccaaagc cccgtgcccg gccagtacga cgccacaaag	1080
ttcaaacat actctcggca cgtggaagag tacgacctc 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
cccgatccca acaagttcgg cctgcccgcac acctccatct acaaccccga gaccagagg	300

ctggtctggg cttgcgccgg cgtcgagatc gggagggggcc aaccctggg cgtggggttg	360
tccggccacc ctttctacaa caagctggac gataccgagt ccagccacgc agcaaccagc	420
aacgtctccg aagatgtgcg cgataacgtc agcgtggact acaaacaac ccaactgtgc	480
atcctgggat gcgcacccgc catcggcgag cattggggcca aggggaccgc ctgcaagagc	540
aggcccccta gccaaagggga ctgtccaccc ctggagttga agaataaccgt gctcgaggac	600
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aaggggaccg gaatgagggc cagccccggg tcctgcgtct acagcccaag cccctccggg	900
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aggtccacaa acctgacat ctgcgccagc acccaaagcc ccgtgcccgg ccagtacgac	1080
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 catacgacaa 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 tgctggtgcc aaaggtgtct ggactccaat acagggtgtt cagggtgaga	240
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agactggtgt gggcttgtgt gggattggag attggcaggg gacaaccact gggagtgggc	360
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ggacaacctg gagcagacaa caggagtggt ctgagtatgg actacaagca gacccaactt	480
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ggacacaaca atggcatctg ttggggcaac cagggtgttg tgacagtggg ggacaccacc	1020
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
gaccactgg gcaaatacac cttctgggag gtggacctga aagagaagtt ctctgctgac	1380
ctggaccagt ttccactggg caggaagttc ctgctccaag caggactgaa agccaagcca	1440
aaactgaaaa gggctgcccc aaccagcacc aggacctcct ctgccaagag gaagaagggtg	1500
aagaagtaaa ctcgagctc	1519

<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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 gtcgcccggg tggatgaacac agacgactac gtcaccagaa cctcaatctt ctaccacgcc 120
 ggggtccagcc ggctgctgac cgtgggcaac ccctacttcc gcgtgcccgc cggcgggcgga 180
 aacaaacaag acatccccaa agtcagcgcc tatcagtacc ggggtgttccg cgtccaactg 240
 cccgatccca acaagttcgg cctgcccgcac acctccatct acaaccccga gacccagagg 300
 ctgggtctggg cttgcgccgg cgtcgagatc gggagggggcc aacccttggg cgtgggggttg 360
 tccggccacc ctttctacaa caagctggac gataccgagt ccagccacgc agcaaccagc 420
 aacgtctccg aagatgtgac cgataacgtc agcgtggact acaaacaaac ccaactgtgc 480
 atcctgggat gcgcacccgc catcggcgag cattggggcca aggggaccgc ctgcaagagc 540
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agcgccgacc cctacggcga cagcatgttc ttctgtctca gaagggaaca attgttcgcc	780
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caactctgca ccatcaccct caccgccgac gtgatgagct acatccactc catgaactcc	1200
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acctacagat tcgtgcagag cgtggccatc acatgccaga aagacgccgc ccccgccgag	1320
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	

Phe Val Arg His Phe Phe Asn Arg Ser Gly Thr Val Gly Glu Ser Val
 260 265 270
 Pro Thr Asp Leu Tyr Ile Lys Gly Ser Gly Ser Thr Ala Thr Leu Ala
 275 280 285
 Asn Ser Thr Tyr Phe Pro Thr Pro Ser Gly Ser Met Val Thr Ser Asp
 290 295 300
 Ala Gln Ile Phe Asn Lys Pro Tyr Trp Met Gln Arg Ala Gln Gly His
 305 310 315 320
 Asn Asn Gly Ile Cys Trp Gly Asn Gln Leu Phe Val Thr Val Val Asp
 325 330 335
 Thr Thr Arg Ser Thr Asn Met Ser Val Cys Ala Ala Ile Ala Asn Ser
 340 345 350
 Asp Thr Thr Phe Lys Ser Ser Asn Phe Lys Glu Tyr Leu Arg His Gly
 355 360 365
 Glu Glu Phe Asp Leu Gln Phe Ile Phe Gln Leu Cys Lys Ile Thr Leu
 370 375 380
 Ser Ala Asp Ile Met Thr Tyr Ile His Ser Met Asn Pro Ala Ile Leu
 385 390 395 400
 Glu Asp Trp Asn Phe Gly Leu Thr Thr Pro Pro Ser Gly Ser Leu Glu
 405 410 415
 Asp Thr Tyr Arg Phe Val Thr Ser Gln Ala Ile Thr Cys Gln Lys Ser
 420 425 430
 Ala Pro Gln Lys Pro Lys Glu Asp Pro Phe Lys Asp Tyr Val Phe Trp
 435 440 445
 Glu Val Asn Leu Lys Glu Lys Phe Ser Ala Asp Leu Asp Gln Phe Pro
 450 455 460
 Leu Gly Arg Lys Phe Leu Leu Gln Ala Gly Tyr Lys Ala Lys Pro Lys
 465 470 475 480
 Leu Lys Arg Ala Ala Pro Thr Ser Thr Arg Thr Ser Ser Ala Lys Arg
 485 490 495
 Lys Lys Val Lys Lys
 500

<210> 56

<211> 1507

<212> DNA

<213> Artificial sequence

<220>

<223> 3104 Nucleotide sequence of chimeric HPV type 31 L1 protein

<400> 56

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gtggtgagca ccgacgagta cgtgaccagg accaacaatct actaccacgc cggcagcgcc 120

aggctgctga ccgtgggcca cccctactac agcatcccca agagcgacaa cccaagaag 180

atcgtggtgc ccaaggtgag cggcctgcag tacagggtgt tcagggtgag gctgcccgc 240

cccaacaagt tcggcttccc cgacaccagc ttctacaacc ccgagacca gaggctggtg 300

tgggcctgcg tgggcctgga ggtgggcagg ggccagcccc tgggcgtggg catcagcggc 360

cacccccctgc tgaacaagtt cgacgacacc gagaacagca acaggtacgc cggcggcccc	420
ggcaccgaca acagggagtg catcagcatg gactacaagc agaccagct gtgcctgctg	480
ggctgcaagc ccccatcgg cgagcactgg ggcaaggga gccctgcag caacaacgcc	540
atcacccccg gcgactgccc cccctggag ctgaagaaca gcgtgatcca ggacggcgac	600
atggtggaca ccggcttcgg cgccatggac ttcaccgccc tgcaggacac caagagcaac	660
gtgcccctgg acatctgcaa cagcatctgc aagtaccccc actacctgaa gatggtggcc	720
gagccctacg gcgacaccct gttcttctac ctgaggagg agcagatgtt cgtgaggcac	780
ttcttcaaca ggagcggcac cgtgggcgag agcgtgcccc ccgacctgta catcaagggc	840
agcggcagca ccgccaccct ggccaacagc acctacttcc ccacccccag cggcagcatg	900
gtgaccagcg acgcccagat cttcaacaag ccctactgga tgcagagggc ccagggccac	960
aacaacggca tctgctgggg caaccagctg ttcgtgaccg tgggtggacac caccaggagc	1020
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ttcaaggagt acctgaggca cggcgaggag ttcgacctgc agttcatctt ccagctgtgc	1140
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gaggactgga acttcggcct gaccaccccc ccagcggca gcctggagga cacctacagg	1260
ttcgtgacca gccaggccat cacctgccag aagtccgccc ccagaagcc caaggaggac	1320
cccttcaagg actacgtgtt ctgggaggtg aacctgaagg agaagttcag cgccgacctg	1380
gaccagttcc ccctgggcag gaagttcctg ctgcaggccg gctacaaagc caagccaaaa	1440
ctgaaaagg ctgccccaac cagcaccagg acctcctctg ccaagaggaa gaaggtgaag	1500
aagtaaa	1507

<210> 57

<211> 1534

<212> DNA

<213> Artificial sequence

<220>

<223> 3105 Synthetic HPV31 L1 gene

<400> 57

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ggcagcgcca	ggctgctgac	cgtggggccac	ccctactaca	gcatcccca	gagcgacaac	180
cccaagaaga	tcgtgggtgcc	caaggtgagc	ggcctgcagt	acaggggtgtt	cagggtgagg	240
ctgcccgacc	ccaacaagtt	cggcttcccc	gacaccagct	tctacaaccc	cgagacccag	300
aggctgggtgt	gggcctgcgt	gggcctggag	gtgggcaggg	gccagcccct	gggcgtgggc	360
atcagcggcc	accccctgct	gaacaagttc	gacgacaccg	agaacagcaa	caggtacgcc	420
ggcggccccc	gcaccgacaa	cagggagtg	atcagcatgg	actacaagca	gacccagctg	480
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aacaacgcca	tcacccccgg	cgactgcccc	cccctggagc	tgaagaacag	cgtgatccag	600
gacggcgaca	tggtggacac	cggcttcggc	gccatggact	tcaccgccct	gcaggacacc	660
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ggcagcatgg	tgaccagcga	cgcccagatc	ttcaacaagc	cctactggat	gcagagggcc	960
cagggccaca	acaacggcat	ctgctggggc	aaccagctgt	tcgtgaccgt	ggtggacacc	1020
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acctacaggt	tcgtgaccag	ccaggccatc	acctgccaga	agtccgcccc	ccagaagccc	1320
aaggaggacc	ccttcaagga	ctacgtgttc	tgggaggtga	acctgaagga	gaagttcagc	1380
gccgacctgg	accagttccc	cctgggcagg	aagttcctgc	tgaggccgg	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
gtgagcaagg tggtagcac agatgaatat gtgagcagga ccagcatcta ctactatgct	120
ggctccagca gactgctggc tgtgggacac ccatacttca gcatcaagaa cccaaccaat	180
gccaagaaac tgctgggtgcc aaaggtgtct ggactccaat acagggtgtt cagggtgaga	240
ctgcctgacc caaacaagtt tggctttcct gacacctcct tctacaaccc tgacaccag	300
agactgggtgt gggcttgtgt gggattggag attggcaggg gacaaccact gggagtgggc	360
atctctggac acccactgct gaacaagttt gatgacacag agacaggcaa caaataccct	420
ggacaacctg gagcagacaa caggagagtgt ctgagtatgg actacaagca gaccacactt	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
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agtatgggtga cctctgagag ccaacttttc aacaagccat actggctcca aagggtcaa	960
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aggagcacca atatgaccct gtgtaccag gtgacctctg acagcaccta caagaatgag	1080
aacttcaagg aatacatcag gcatgtggag gaatatgacc tccaatttgt gttccaactt	1140
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gaccactgg gcaaatacac cttctgggag gtggacctga aagagaagtt ctctgctgac	1380
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
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gtgagcaagg tggtagcac cgacgagtag gtgaccagga ccaacatcta ctaccacgcc 120
ggcagcgcca ggctgctgac cgtggggccac ccctactaca gcatccccaa gagcgacaac 180
cccaagaaga tcgtggtgcc caaggtgagc ggcctgcagt acagggtggt cagggtgagg 240
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aacaacgcca tcacccccgg cgactgcccc cccctggagc tgaagaacag cgtgatccag	600
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accaggagca ccaacatgag cgtgtgcgcc gccatcgcca acagcgacac caccttcaag	1080
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cagctgtgca agatcacctt gagcgccgac atcatgacct acatccacag catgaacccc	1200
gccatcctgg aggactggaa cttcggcctg accaccccc ccagcggcag cctggaggac	1260
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aaggaggacc cttcaagga ctacgtgttc tgggaggtga acctgaagga gaagttcagc	1380
gccgacctgg accagttccc cctgggcagg aagttcctgc tgcaggccgg ctacaaagcc	1440
aagc	1444

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

<220>
 <223> 3110 HPV31L1 F2

<400> 62	
ggccggctac aaagccaagc caaaactgaa aaggg	35

<210> 63
 <211> 41

<212> DNA
<213> Artificial sequence

<220>
<223> 3111 HPV31L1 R2

<400> 63
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<210> 64
<211> 101
<212> DNA
<213> Artificial sequence

<220>
<223> 3112 HPV31L1 amplified sequence 2

<400> 64
ggccggctac aaagccaagc caaaactgaa aagggtgcc ccaaccagca ccaggacctc 60
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
35

<210> 66
<211> 472
<212> PRT
<213> Homo sapiens

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

<400> 66
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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			
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Glu	Cys	Ile	Ser	Met	Asp	Tyr	Lys	Gln	Thr	Gln	Leu	Cys	Leu	Ile	Gly		
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Thr	Val	Leu	Gln	Asp	Gly	Asp	Met	Val	Asp	Thr	Gly	Phe	Gly	Ala	Met		
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Tyr	Phe	Pro	Thr	Pro	Ser	Gly	Ser	Met	Val	Thr	Ser	Asp	Ala	Gln	Ile		
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Phe	Asn	Lys	Pro	Tyr	Trp	Leu	Gln	Arg	Ala	Gln	Gly	His	Asn	Asn	Gly		
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		420					425						430				
Lys	Pro	Lys	Asp	Asp	Pro	Leu	Lys	Asn	Tyr	Thr	Phe	Trp	Glu	Val	Asp		

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 450 455 460
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<210> 67
 <211> 26
 <212> PRT
 <213> Homo sapiens

<220>
 <223> 3502 Amino acid sequence of HPV type 33 L1 protein aa 474-499

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<210> 68
 <211> 498
 <212> PRT
 <213> Artificial sequence

<220>
 <223> 3503 Amino acid sequence of chimeric HPV type 35 L1 protein

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 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

gtggtgagca cagatgaata tgtgaccagg accaacatct actaccatgc tggctccagc	120
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<210> 70

<211> 1528

<212> DNA

<213> Artificial sequence

<220>

<223> 3505 Synthetic HPV35 L1 gene

<400> 70

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<210> 71

<211> 1519

<212> DNA

<213> Artificial sequence

<220>

<223> 3506 Synthetic HPV33 L1 gene

<400> 71

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aagaagtaaa ctcgagctc	1519

<210> 72
 <211> 34
 <212> DNA
 <213> Artificial sequence

<220>
 <223> 3507 HPV35L1 F1

<400> 72	
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<210> 73
 <211> 36
 <212> DNA
 <213> Artificial sequence

<220>
 <223> 3508 HPV35L1 R1

<400> 73	
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<210> 74
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 <212> DNA
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<220>
 <223> 3509 HPV35L1 amplified sequence 1

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<210> 75

<211> 35

<212> DNA

<213> Artificial sequence

<220>

<223> 3510 HPV35L1 F2

<400> 75

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

<220>
<223> 3511 HPV35L1 R2

<400> 76
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<210> 77
<211> 101
<212> DNA
<213> Artificial sequence

<220>
<223> 3512 HPV35L1 amplified sequence 2

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<210> 78
<211> 38
<212> PRT
<213> Homo sapiens

<220>
<223> 3513 Amino acid sequence of HPV type 59 L1 protein aa 471-508

<400> 78
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Arg Lys Ser Ser Arg Lys
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<210> 79
<211> 469
<212> PRT
<213> Homo sapiens

<220>

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

<400> 79

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Asn	Lys	Phe	Ser	Ile	Pro	Asp	Ala	Ser	Leu	Tyr	Asn	Pro	Glu	Thr	Gln	
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	210					215					220					
Gln	Ser	Ile	Cys	Lys	Tyr	Pro	Asp	Tyr	Leu	Gln	Met	Ser	Ala	Asp	Val	
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<210> 82
<211> 1525
<212> DNA
<213> Artificial sequence
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<220>

<223> 3904 Nucleotide sequence of chimeric HPV type 39 L1 protein

<400> 82

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<210> 83

<211> 1537

<212> DNA

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<220>

<223> 3905 Synthetic HPV39 L1 gene

<400> 83

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<210> 84

<211> 1546

<212> DNA

<213> Artificial sequence

<220>

<223> 3906 Synthetic HPV59 L1 gene

<400> 84

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<210> 85
 <211> 38
 <212> DNA
 <213> Artificial sequence

<220>
 <223> 3907 HPV39L1 F1

<400> 85	
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<210> 86
 <211> 38
 <212> DNA
 <213> Artificial sequence

<220>
 <223> 3908 HPV39L1 R1

<400> 86	
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<210> 87
 <211> 1428
 <212> DNA
 <213> Artificial sequence

<220>

<223> 3909 HPV39L1 amplified sequence 1

<400> 87

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<210> 88

<211> 37
<212> DNA
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<220>
<223> 3910 HPV39L1 F2

<400> 88
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<210> 89
<211> 40
<212> DNA
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<220>
<223> 3911 HPV39L1 R2

<400> 89
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<210> 90
<211> 139
<212> DNA
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<220>
<223> 3912 HPV39L1 amplified sequence 2

<400> 90
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aggaagtaaa tctagacag 139

<210> 91
<211> 26
<212> PRT
<213> Homo sapiens

<220>
<223> 3913 Amino acid sequence of HPV type 33 L1 protein aa 474-499

<400> 91
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<210> 92

<211> 478

<212> PRT

<213> Homo sapiens

<220>

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

<400> 92

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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
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Gln Arg Leu Val Trp Ala Cys Val Gly Met Glu Ile Gly Arg Gly Gln
      100     105     110
Pro Leu Gly Ile Gly Leu Ser Gly His Pro Phe Tyr Asn Lys Leu Asp
      115     120     125
Asp Thr Glu Ser Ala His Ala Ala Thr Ala Val Ile Thr Gln Asp Val
      130     135     140
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
      195     200     205
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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Phe Ala Arg His Phe Trp Asn Arg Ala Gly Val Met Gly Asp Thr Val
      260     265     270
Pro Thr Asp Leu Tyr Ile Lys Gly Thr Ser Ala Asn Met Arg Glu Thr
      275     280     285
Pro Gly Ser Cys Val Tyr Ser Pro Ser Pro Ser Gly Ser Ile Thr Thr
      290     295     300
Ser Asp Ser Gln Leu Phe Asn Lys Pro Tyr Trp Leu His Lys Ala Gln
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385					390					395					400	
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Lys	Phe	Trp	Thr	Val	Asp	Leu	Lys	Glu	Lys	Phe	Ser	Ser	Asp	Leu	Asp	
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<210> 93
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 <212> PRT
 <213> Homo sapiens

<220>
 <223> 4502 Amino acid sequence of HPV type 33 L1 protein aa 474-499

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<210> 94
 <211> 504
 <212> PRT
 <213> Artificial sequence

<220>
 <223> 4503 Amino acid sequence of chimeric HPV type 45 L1 protein

<400> 94
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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 Val Pro Ser Gly Ala Gly Asn Lys Gln Ala Val Pro
 50 55 60
 Lys Val Ser Ala Tyr Gln Tyr Arg Val Phe Arg Val Ala Leu Pro Asp

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Gln	Arg	Leu	Val	Trp	Ala	Cys	Val	Gly	Met	Glu	Ile	Gly	Arg	Gly	Gln
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		115					120					125			
Asp	Thr	Glu	Ser	Ala	His	Ala	Ala	Thr	Ala	Val	Ile	Thr	Gln	Asp	Val
	130					135					140				
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
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Lys	Pro	Ala	Gln	Leu	Gln	Pro	Gly	Asp	Cys	Pro	Pro	Leu	Glu	Leu	Lys
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Gly	His	Asn	Asn	Gly	Ile	Cys	Trp	His	Asn	Gln	Leu	Phe	Val	Thr	Val
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465					470					475					480
Lys	Pro	Lys	Leu	Lys	Arg	Ala	Ala	Pro	Thr	Ser	Thr	Arg	Thr	Ser	Ser
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 <211> 1516
 <212> DNA
 <213> Artificial sequence

<220>

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

<400> 95

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<210> 96

<211> 1552

<212> DNA

<213> Artificial sequence

<220>

<223> 4505 Synthetic HPV45 L1 gene

<400> 96

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<210> 97

<211> 1519

<212> DNA

<213> Artificial sequence

<220>

<223> 4506 Synthetic HPV33 L1 gene

<400> 97

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<210> 98

<211> 33

<212> DNA

<213> Artificial sequence

<220>

<223> 4507 HPV45L1 F1

<400> 98

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<210> 99

<211> 32

<212> DNA

<213> Artificial sequence

<220>

<223> 4508 HPV45L1 R1

<400> 99

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<210> 100
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<211> 35
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<220>
<223> 4510 HPV45L1 F2

<400> 101
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<210> 102
<211> 37
<212> DNA
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<220>
<223> 4511 HPV45L1 R2

<400> 102
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<210> 103
<211> 101
<212> DNA
<213> Artificial sequence

<220>
<223> 4512 HPV45L1 amplified sequence 2

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<210> 104
<211> 38
<212> PRT
<213> Homo sapiens

<220>

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

<400> 104

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Ala Ala Pro Ala Pro Thr Ser Thr Pro Ser Pro Lys Arg Val Lys Arg
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Arg Lys Ser Ser Arg Lys
          35
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<210> 105

<211> 474

<212> PRT

<213> Homo sapiens

<220>

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

<400> 105

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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
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Arg His Tyr Tyr Asn Lys Leu Val Gly Val Gly Glu Asp Ile Pro Asn
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 Asp Tyr Tyr Ile Lys Gly Ser Gly Asn Gly Arg Asp Pro Ile Glu Ser
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 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
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 Gly Arg Lys Phe Leu Leu Gln Val Gly Val
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<210> 106

<211> 26

<212> PRT

<213> Homo sapiens

<220>

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

<400> 106

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<210> 107

<211> 500

<212> PRT

<213> Artificial sequence

<220>

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

<400> 107

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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	
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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
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Val Asp Leu Lys Glu Arg Phe Ser Leu Asp Leu Asp Gln Phe Ala Leu
450 455 460
Gly Arg Lys Phe Leu Leu Gln Val Gly Val Lys Ala Lys Pro Lys Leu
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Lys Arg Ala Ala Pro Thr Ser Thr Arg Thr Ser Ser Ala Lys Arg Lys
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Lys Val Lys Lys
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<210> 108

<211> 1504

<212> DNA

<213> Artificial sequence

<220>

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

<400> 108

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aagtttggaac tgcctgaccc aaacctctac aaccctgaca cagacagact ggtgtggggc      300
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<210> 109

<211> 1534

<212> DNA

<213> Artificial sequence

<220>

<223> 5105 Synthetic HPV51 L1 gene

<400> 109

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<210> 110

<211> 1519

<212> DNA

<213> Artificial sequence

<220>

<223> 5106 Synthetic HPV33 L1 gene

<400> 110

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

<220>
 <223> 5107 HPV51L1 F1

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 <211> 32
 <212> DNA

<213> Artificial sequence

<220>

<223> 5108 HPV51L1 R1

<400> 112

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32

<210> 113

<211> 1441

<212> DNA

<213> Artificial sequence

<220>

<223> 5109 HPV51L1 amplified sequence 1

<400> 113

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agggctgcca tcccaaaggt gtctgccttc caatacaggg tgttcagggt ccaacttcct 240

gacccaaaca agtttggact gcctgacca aacctctaca accctgacac agacagactg 300

gtgtggggct gtgtgggagt ggaggtgggc aggggacaac cactgggagt gggactgtct 360

ggacaccac tgttcaaca atatgatgac acagagaaca gcaggattgc caatggcaat 420

gccaacagg atgtgaggga caacacctct gtggacaaca agcagacca actttgtatc 480

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<220>
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<400> 115	
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 <223> 5112 HPV51L1 amplified sequence 2

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101

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 <213> Homo sapiens

<220>
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 20 25 30
 Arg Lys Ser Ser Arg Lys
 35

<210> 118
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 <212> PRT
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 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

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Ile	Asp	Ile	Cys	Ser	Ser	Val	Cys	Lys	Tyr	Pro	Asp	Tyr	Leu	Gln	Met		
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Ala	Ser	Glu	Pro	Tyr	Gly	Asp	Ser	Leu	Phe	Phe	Phe	Leu	Arg	Arg	Glu		
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Gln	Met	Phe	Val	Arg	His	Phe	Phe	Asn	Arg	Ala	Gly	Thr	Leu	Gly	Asp		
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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		
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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		
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Thr	Val	Val	Asp	Thr	Thr	Arg	Ser	Thr	Asn	Met	Thr	Leu	Cys	Ala	Glu		
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Arg	His	Gly	Glu	Glu	Phe	Asp	Leu	Gln	Phe	Ile	Phe	Gln	Leu	Cys	Lys		
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385					390				395						400		
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Gln	Lys	Asn	Thr	Pro	Pro	Lys	Gly	Lys	Glu	Asp	Pro	Leu	Lys	Asp	Tyr		
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<210> 119

<211> 26

<212> PRT

<213> Homo sapiens

<220>

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

<400> 119

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<210> 120

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

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

<400> 120

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      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

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agcggcagca tggtgaccag cgagagccag ctgttcaaca agccctactg gctgcagagg	960
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<210> 122

<211> 1531

<212> DNA

<213> Artificial sequence

<220>

<223> 5205 Synthetic HPV52 L1 gene

<400> 122

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ggcagcagca ggctgctgac cgtgggccac ccctacttca gcatcaagaa caccagcagc	180
ggcaacggca agaaggtgct ggtgcccagg gtgagcggcc tgcagtacag ggtgttcagg	240
atcaagctgc ccgaccccaa caagttcggc ttccccgaca ccagcttcta caaccccag	300
accagaggc tgggtgtgggc ctgcaccggc ctggagatcg gcaggggcca gccctgggc	360
gtgggcatca gcggccaccc cctgctgaac aagttcgacg acaccgagac cagcaacaag	420
tacgccggca agcccggcat cgacaacagg gagtgcctga gcatggacta caagcagacc	480

cagctgtgca tcctgggctg caagcccccc atcggcgagc actggggcaa gggcaccccc	540
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ctgcagatgg ccagcgagcc ctacggcgac agcctgttct tcttcctgag gagggagcag	780
atgttcgtga ggcacttctt caacagggcc ggcaccctgg gcgaccccgt gcccggcgac	840
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aagttcagcg ccgacctgga ccagttcccc ctgggcagga agttcctgct gcaggccggc	1440
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aagaagaagg tgaagaggta aactcgagct c	1531

<210> 123

<211> 1519

<212> DNA

<213> Artificial sequence

<220>

<223> 5206 Synthetic HPV33 L1 gene

<400> 123

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ggctccagca gactgctggc tgtgggacac ccatacttca gcatcaagaa cccaaccaat	180

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<210> 124

<211> 34

<212> DNA

<213> Artificial sequence

<220>

<223> 5207 HPV52L1 F1

<400> 124

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<210> 125

<211> 35

<212> DNA

<213> Artificial sequence

<220>

<223> 5208 HPV52L1 R1

<400> 125

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<210> 126

<211> 1453

<212> DNA

<213> Artificial sequence

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<223> 5209 HPV52L1 amplified sequence 1

<400> 126

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 <211> 35
 <212> DNA
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 <223> 5210 HPV52L1 F2

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<210> 128
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 <212> DNA
 <213> Artificial sequence

<220>
 <223> 5211 HPV52L1 R2

<400> 128 ctgtctagat ttacttcttc accttcttcc tcttgg	36
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<210> 129
 <211> 101

<212> DNA
 <213> Artificial sequence

<220>
 <223> 5212 HPV52L1 amplified sequence 2

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 <212> PRT
 <213> Homo sapiens

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

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 Arg Lys Ser Ser Arg Lys
 35

<210> 131
 <211> 467
 <212> PRT
 <213> Homo sapiens

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 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

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145					150					155					160
Thr	Pro	Ala	Met	Gly	Glu	His	Trp	Thr	Lys	Gly	Ala	Val	Cys	Lys	Ser
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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
				405					410					415	
Arg	Tyr	Val	Arg	Ser	Thr	Ala	Ile	Thr	Cys	Gln	Arg	Glu	Gln	Pro	Pro
			420				425						430		
Thr	Glu	Lys	Gln	Asp	Pro	Leu	Ala	Lys	Tyr	Lys	Phe	Trp	Asp	Val	Asn
		435					440					445			
Leu	Gln	Asp	Ser	Phe	Ser	Thr	Asp	Leu	Asp	Gln	Phe	Pro	Leu	Gly	Arg
	450					455					460				
Lys	Phe	Leu													
465															

<210> 132

<211> 31

<212> PRT

<213> Homo sapiens

<220>

<223> 5602 Amino acid sequence of HPV type 33 L1 protein aa 469-499

<400> 132

Leu	Gln	Ala	Gly	Leu	Lys	Ala	Lys	Pro	Lys	Leu	Lys	Arg	Ala	Ala	Pro
1				5				10					15		
Thr	Ser	Thr	Arg	Thr	Ser	Ser	Ala	Lys	Arg	Lys	Lys	Val	Lys	Lys	
			20					25					30		

<210> 133

<211> 498

<212> PRT

<213> Artificial sequence

<220>

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

<400> 133

Met	Ala	Thr	Trp	Arg	Pro	Ser	Glu	Asn	Lys	Val	Tyr	Leu	Pro	Pro	Thr
1				5				10					15		
Pro	Val	Ser	Lys	Val	Val	Ala	Thr	Asp	Ser	Tyr	Val	Lys	Arg	Thr	Ser
			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
	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
 405 410 415
 Arg Tyr Val Arg Ser Thr Ala Ile Thr Cys Gln Arg Glu Gln Pro Pro
 420 425 430
 Thr Glu Lys Gln Asp Pro Leu Ala Lys Tyr Lys Phe Trp Asp Val Asn
 435 440 445
 Leu Gln Asp Ser Phe Ser Thr 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> 134

<211> 1498

<212> DNA

<213> Artificial sequence

<220>

<223> 5604 Nucleotide sequence of chimeric HPV type 56 L1 protein

<400> 134

atggctacct ggagaccatc tgagaacaag gtctacctgc ctccaacacc tgtgagcaag	60
gtggtgggcta cagactccta tgtgaagagg accagcatct tctaccatgc tggctccagc	120
agactgctgg ctgtgggaca ccatactac tctgtgacca aggacaacac caagaccaac	180
atcccaaagg tgtctgccta ccaatacagg gtgttcaggg tgagactgcc tgacccaaac	240
aagtttggac tgcctgacac caacatctac aaccctgacc aggagagact ggtgtgggct	300
tgtgtgggat tggagggtggg caggggacaa ccactgggag caggactgtc tggacacca	360
ctgttcaaca gactggatga cacagagtc agcaacctgg ctaacaacaa tgtgattgag	420
gacagcaggg acaacatctc tgtggatggc aagcagaccc aactttgtat tgtgggctgt	480

actcctgcta tgggagaaca ctggaccaag ggagcagtgt gtaagagcac ccaggtgacc	540
acaggagact gtcctccact ggctctgata aacacaccaa ttgaggatgg agatatgatt	600
gacacaggct ttggagctat ggacttcaag gtgctccaag agagcaaggc tgaggtgcca	660
ctggacattg tccagagcac ttgtaaatac cctgactacc tgaaaatgag tgctgatgcc	720
tatggagaca gtatgtggtt ctacctgagg agggacaacac tttttgccag aactacttc	780
aacagggctg gcaaggtggg agagaccatc cctgctgaac tctacctgaa aggcagcaat	840
ggcaggggaa ctcctccatc ctctgtctat gtggctacac catctggcag tatgattacc	900
tctgaggctc aacttttcaa caagccatac tggctccaaa gggctcaagg acacaacaat	960
ggcatctgtt ggggcaacca actttttgtg acagtgggtg acaccaccag gaggaccaat	1020
atgaccatca gcacagccac agaacaactt agcaaatatg atgccaggaa gataaaccaa	1080
tacctgaggc atgtggagga atatgaactc caatttgtgt tccaactttg taagattacc	1140
ctgtctgctg aggtgatggc ttacctgcac aatatgaatg ccaacctgtt ggaggactgg	1200
aacattggac tgagccctcc tgtggctacc tccttggagg acaaatacag atatgtgagg	1260
agcacagcca tcacttgtca gagggacaac cctccaacag agaagcagga cccactggct	1320
aaatacaagt tctgggatgt gaacctcaa gactccttca gcacagacct ggaccagttt	1380
ccactgggca ggaagttcct gctccaagca ggactgaaag ccaagccaaa actgaaaagg	1440
gctgccccaa ccagcaccag gacctcctct gccaaagga agaaggtgaa gaagtaaa	1498

<210> 135

<211> 1519

<212> DNA

<213> Artificial sequence

<220>

<223> 5605 Synthetic HPV56 L1 gene

<400> 135

ctgggtacca tggctacctg gagaccatct gagaacaagg tctacctgcc tccaacacct	60
gtgagcaagg tgggtggctac agactcctat gtgaagagga ccagcatctt ctaccatgct	120
ggctccagca gactgctggc tgtgggacac ccatactact ctgtgaccaa ggacaacacc	180
aagaccaaca tcccaaagggt gtctgcctac caatacaggg tgttcagggt gagactgcct	240

gacccaaaca agtttggact gcctgacacc aacatctaca accctgacca ggagagactg	300
gtgtgggctt gtgtgggatt ggagggtgggc aggggacaac cactgggagc aggactgtct	360
ggacacccac tgttcaacag actggatgac acagagtcca gcaacctggc taacaacaat	420
gtgattgagg acagcaggga 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 gcagggaacc tcctccatcc tctgtctatg tggctacacc atctggcagt	900
atgattacct ctgaggctca acttttcaac aagccatact ggctccaaag ggctcaagga	960
cacaacaatg gcatctgttg gggcaaccaa ctttttgtga cagtgggtgga caccaccagg	1020
agcaccaata tgaccatcag cacagccaca gaacaactta gcaaataatga tgccaggaag	1080
ataaaccaat acctgaggca tgtggaggaa tatgaactcc aatttgtgtt ccaactttgt	1140
aagattaccc tgtctgctga ggtgatggct tacctgcaca atatgaatgc caacctgttg	1200
gaggactgga acattggact gagccctcct gtggctacct ccttggagga caaatacaga	1260
tatgtgagga gcacagccat cacttgtcag aggggaacaac ctccaacaga gaagcaggac	1320
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> 136

<211> 1519

<212> DNA

<213> Artificial sequence

<220>

<223> 5606 Synthetic HPV33 L1 gene

<400> 136

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
ctgcctgacc caaacaagtt tggctttcct gacacctcct tctacaacc tgacaccag	300
agactgggtgt gggcttgtgt gggattggag attggcaggg gacaaccact gggagtgggc	360
atctctggac acccactgct gaacaagttt gatgacacag agacaggcaa caaataccct	420
ggacaacctg gagcagacaa 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
agtatgggtga cctctgagag ccaacttttc aacaagccat actggctcca aagggtcaa	960
ggacacaaca atggcatctg ttggggcaac cagggtgttg tgacagtggg ggacaccacc	1020
aggagcacca atatgaccct gtgtaccag gtgacctctg acagcaccta caagaatgag	1080
aacttcaagg aatacatcag gcatgtggag gaatatgacc tccaatttgt gttccaactt	1140
tgtaagggtga ccctgacagc agagggtgatg acctacatcc atgctatgaa ccctgacatc	1200
ttggaggact ggcagtttgg actgacacct cctccatctg cctccctcca agacacctac	1260
aggtttgtga ccagccaggc tatcacttgt cagaagacag tgcctcaaaa ggagaaggag	1320
gacctactgg gcaaatacac cttctgggag gtggacctga aagagaagtt ctctgctgac	1380
ctggaccagt ttccactggg caggaagttc ctgctccaag caggactgaa agccaagcca	1440
aaactgaaaa gggctgcccc aaccagcacc aggacctcct ctgccaagag gaagaagggtg	1500
aagaagtaaa ctcgagctc	1519

<210> 137
 <211> 33
 <212> DNA
 <213> Artificial sequence

<220>
 <223> 5607 HPV56L1 F1

<400> 137
 cttggtacca tggctacctg gagaccatct gag 33

<210> 138
 <211> 31
 <212> DNA
 <213> Artificial sequence

<220>
 <223> 5608 HPV56L1 R1

<400> 138
 ctgcttggag caggaacttc ctgcccagtg g 31

<210> 139
 <211> 1420
 <212> DNA
 <213> Artificial sequence

<220>
 <223> 5609 HPV56L1 amplified sequence 1

<400> 139
 cttggtacca tggctacctg gagaccatct gagaacaagg tctacctgcc tccaacacct 60
 gtgagcaagg tggctggctac agactcctat gtgaagagga ccagcatctt ctaccatgct 120
 ggctccagca gactgctggc tgtgggacac ccatactact ctgtgaccaa ggacaacacc 180
 aagaccaaca tcccaaaggt gtctgcctac caatacaggg tgttcagggt gagactgcct 240
 gacccaaaca agtttggact gcctgacacc aacatctaca accctgacca ggagagactg 300
 gtgtgggctt gtgtgggatt ggagggtgggc aggggacaac cactgggagc aggactgtct 360
 ggacacccac tgttcaacag actggatgac acagagtcca gcaacctggc taacaacaat 420
 gtgattgagg acagcaggga 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
aagattaccc tgtctgctga ggtgatggct tacctgcaca atatgaatgc caacctgttg	1200
gaggactgga acattggact gagccctcct gtggctacct ctttgaggga caaatacaga	1260
tatgtgagga gcacagccat cacttgtcag aggggaacaac ctccaacaga gaagcaggac	1320
ccactggcta aatacaagtt ctgggatgtg aacctccaag actccttcag cacagacctg	1380
gaccagtttc cactgggcag gaagttcctg ctccaagcag	1420

<210> 140

<211> 36

<212> DNA

<213> Artificial sequence

<220>

<223> 5610 HPV56L1 F2

<400> 140

gaagttcctg ctccaagcag gactgaaagc caagcc	36
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<210> 141

<211> 36

<212> DNA

<213> Artificial sequence

<220>

<223> 5611 HPV56L1 R2

<400> 141

ctgtctagat ttacttcttc accttcttcc tcttgg

36

<210> 142

<211> 116

<212> DNA

<213> Artificial sequence

<220>

<223> 5612 HPV56L1 amplified sequence 2

<400> 142

gaagttcctg ctccaagcag gactgaaagc caagccaaaa ctgaaaaggg ctgccccaac 60

cagcaccagg acctcctctg ccaagaggaa gaaggtgaag aagtaaattct agacag 116

<210> 143

<211> 38

<212> PRT

<213> Homo sapiens

<220>

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

<400> 143

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> 144

<211> 473

<212> PRT

<213> Homo sapiens

<220>

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

<400> 144

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 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
	450					455					460				
Arg	Lys	Phe	Leu	Leu	Gln	Ser	Gly	Leu							
465					470										

<210> 145

<211> 26

<212> PRT
 <213> Homo sapiens

<220>
 <223> 5802 Amino acid sequence of HPV type 33 L1 protein aa 474-499

<400> 145
 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> 146
 <211> 499
 <212> PRT
 <213> Artificial sequence

<220>
 <223> 5803 Amino acid sequence of chimeric HPV type 58 L1 protein

<400> 146
 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 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

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caccctacc tgaacaagtt cgacgacacc gagaccagca acaggtaccc cgcccagccc	420
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accagcgaga gccagctggt caacaagccc tactggctgc agagggccca gggccacaac	960
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<210> 148

<211> 1516

<212> DNA

<213> Artificial sequence

<220>

<223> 5805 Synthetic HPV58 L1 gene

<400> 148

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--	----

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ctgcccgacc	ccaacaagtt	cggcttcccc	gacaccagct	tctacaaccc	cgacacccag	300
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gtgagcggcc	accctacct	gaacaagttc	gacgacaccg	agaccagcaa	caggtacccc	420
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aagtaaactc	gagctc					1516

<210> 149

<211> 1519

<212> DNA
 <213> Artificial sequence

<220>
 <223> 5806 Synthetic HPV33 L1 gene

<400> 149
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aagaagtaaa ctcgagctc 1519

<210> 150
<211> 34
<212> DNA
<213> Artificial sequence

<220>
<223> 5807 HPV58L1 F1

<400> 150
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<210> 151
<211> 36
<212> DNA
<213> Artificial sequence

<220>
<223> 5808 HPV58L1 R1

<400> 151
gcttggcttt caggccgctc tgcagcagga acttcc 36

<210> 152
<211> 1438
<212> DNA
<213> Artificial sequence

<220>
<223> 5809 HPV58L1 amplified sequence 1

<400> 152
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gacccccctga acaagtacac cttctgggag gtgaacctga aggagaagtt cagcgccgac	1380
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<210> 153

<211> 35

<212> DNA

<213> Artificial sequence

<220>

<223> 5810 HPV58L1 F2

<400> 153

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35

<210> 154

<211> 36

<212> DNA

<213> Artificial sequence

<220>

<223> 5811 HPV58L1 R2

<400> 154

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<210> 155

<211> 101

<212> DNA

<213> Artificial sequence

<220>

<223> 5812 HPV58L1 amplified sequence 2

<400> 155

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ctctgccaag aggaagaagg tgaagaagta aatctagaca g

101

<210> 156

<211> 38

<212> PRT

<213> Homo sapiens

<220>

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

<400> 156

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20 25 30

Arg Lys Ser Ser Arg Lys

35