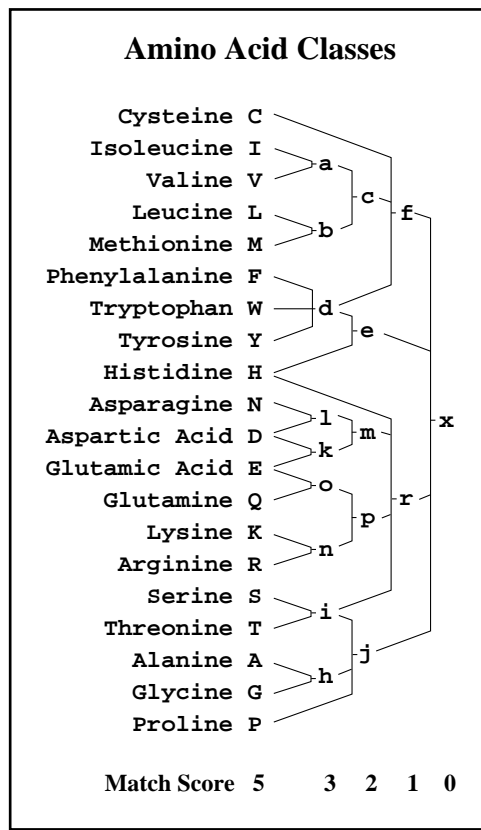


# HPV Patterns and Their Similarities

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The following patterns of invariant and conserved amino acid sequences were created using the PIMA algorithm (Smith and Smith, *PNAS* **87**:118-122, 1990) on previously aligned sequence sets. This method assigns to every position of the alignment an amino acid class that is the smallest class including all amino acids observed in the sequence set at the given position. The diagram below defines the amino acid covering classes, or AACCs.



Using these sequence patterns, conserved sub-patterns were determined using the subpat program (also in the PIMA package), which locates regions of the pattern whose information densities are above a specified threshold. In this analysis, the information density thresholds were defined so that approximately one-third of the non-gap, non-wildcard positions in the original pattern would be included in the sub-patterns. Thresholds of higher stringency (information density) were applied to subgroups of PVs, as defined in Part I of this compendium. Regions with sufficient information to be called invariant or conserved in this analysis are marked by asterisks. Note that individual amino acid residues may be invariant (or conserved) but may not be so marked because they are not part of a motif.

The sub-patterns are “consensus-like” expressions built of symbols representing a reduced amino acid code as defined in the above diagram. To facilitate the translation of this code into consensus amino acids, ordinary consensus sequences (50% threshold) are also shown. If no amino acid was present in at least half the sequences in the set, this position was represented by an ‘X’.

## Patterns and Similarities

Because special attention has been given to E6, E7, L1 and L2 proteins in this release, only pattern outputs for these are included. Patterns common to all PVs are rare: one large stretch in the C-terminal half of E7s, the zinc-finger motif, is found in all PVs (at a relatively low threshold); a smaller, similarly located stretch is found in all E6s; etc. More patterns become evident at higher thresholds, but these are group-specific.

To uncover sequence similarities, these converted sub-patterns were then run against the GenPept database using BLAST (basic local alignment search tool; Altschul et al., *J. Mol. Biol.* **215**:403-410, 1990), with cutoff score thresholds adjusted so that between one and twenty of the best matches would be reported for each sub-sequence. BLAST is designed to quickly find most high-scoring matches among gapless segments. The output of our BLAST searches has been reformatted to facilitate comparison of sequence matches to the consensus sub-sequences, and the order of presentation (herein or in the complete file to be found on the Web site) follows the appearance of the patterns in the PV sequences, so that serially related high-scoring matches might be spotted.

The first column in the similarity output files contains, in addition to a query identifier, the accession numbers of all sequences found in the search. Note that for cases in which the same sequence contained several matches to the query, the matches are displayed on consecutive lines, with all sequence information repeated.

The second column contains the position in the database sequence at which the match to the query sub-sequence begins.

The third column is an alignment table, in which the following conventions have been established:

- 1) Identities to the query sub-sequence are displayed in bold, uppercase letters;
- 2) Amino acids displaying similarity to the query amino acid (based on the PAM 120 matrix) are displayed in bold lowercase;
- 3) Mismatches are denoted by the use of letters in a tiny font.

The fourth column contains a short description of the database sequence. Again, when multiple hits against the query are found in a sequence, these descriptions are repeated on consecutive lines.

Note on sequence sets: Although some animal PV sequences can be found in SuperGroup A (PCPV1, RhPV1, CgPV1), these were not included in the analysis, due to their obvious phenetic differences. Similarly, the hpv\_all patterns include only human papillomaviruses and exclude all animal PV sequences.

Amino acid sequence matches of seven and eight contiguous residues are easily obtained by chance. Hence, the bulk of this output is probably of little importance beyond highlighting shared structures. With exception of a few curious group-specific similarities, only similarities involving patterns shared by all HPV E6, all E7, all L1 and all L2 proteins are included below; group-specific matches for each of the four proteins can be browsed on the Web site, <http://hpv-web.lanl.gov>.

Among E6 proteins, for which there is only a single conserved pattern (representing the third cysteine doublet), none of the similarities is compelling. The C-terminal pattern for all E7s is of greater interest insofar as it contains a good match to the motif IRILQQLL conserved in all HIV-1 vpR proteins, (a virion protein) and thought to be involved in protein binding (Zhao et al., *J.B.C.* **269**:15577, 1994). L1 proteins in their entirety possess five motifs, no two of which are found in any other single protein. L2 proteins possess three conserved motifs, the first of which is glycine-rich.

A9 group-specific motifs for the E6 protein are of some interest given what is known about HPV-16 E6 function (see E6 Section of Part III, 1995): the motifs SKISEYRHY and CQXPLCP, for example, are known to be heavily involved in p53 binding and degradation. The A9 motif TDLYCYEQLXDSSDE in E7 protein is found to some degree in other papovaviruses and adenoviruses, as could have been expected. The 16L1 motif QRAQGHNNGICW (found in other HPVs to a lesser extent) is of passing interest because of the similarity to insulin-like growth factor binding proteins; IGF and IGF-1R are thought to be involved in SV40 and HPV transformation. The E7 motif ILKWGSLGVFFGGLGIGTG is also found, in part, in the 16kDa subunit of the vacuolar ATPase.

hpv_E6_all.con	XXXXXpXtXXXlcXXlXiplXdXXXXCXfCXXXlXXXevXXfXXkXlXXvwrXXXXpXaX	23
hpv_E6_all.pat	XggXgXXXcXXfXXXXXXXXfXXfXcXCXXCXXXcXXXrXXXfXXXXfXcDXXXgXXXhX	60
hpv_E6_superA.con	XXfXXXXXrprXlXXLcXXXXXXlXXlXlXCvXCkXXLXXXevyXfaXXdlXvvyrXg.Xpyaa	31
hpv_E6_superA.pat	XXXXXXXXXgjXrcXXLXrXXXXXfXrcXcXCaXCXXXLXXXkXXXfXfXrcXcdnXX.XjXhX	63
hpv_E6_A2+A3+A4.con	MSmXXXcPrNIflLcRyXgXXXeDLRlXCvfCXkXltXaelXAFalXELXvVWrXg.XPyGa *****	45
hpv_E6_A2+A3+A4.pat	MSXXXXXPrNIflLcRnXXcXfkdLRcXCadCXRXLiXXkcXAFXcnELXcVWnXX.XPdGX	61
hpv_E6_A5+A6.con	XFentXERPRtlHhLcEvlNxp1lXlqlXCvYCKkeLtXaevYnfActXlXlVYRdX.XPYav *****	52
hpv_E6_A5+A6.pat	XFr1XXERPRicHrLXEXXrXjbXmcpXCvDCKpXLXXXkcYrfAfXkcncVYRmX.XPYhX	62
hpv_E6_A7.con	MARFXXPeRPyKLPDLcttLXttLXDitIXCVyCkXXLqXtEVyeFAFXDLfXVYRdg.XpyAA *****	52
hpv_E6_A7.pat	MAXFXlPXpRPyKLPDLXrXlXjLrDarIXCvdCnXXLoXrEVdoFAFXDLXaVYRlX.XjXAA	64
hpv_E6_A9.con	MFqdpaePrkLhdLcXXleXsiheiXLXCvYCKXXLqrsEVydFafXDLXiVYRdg.nPygv	53
hpv_E6_A9.pat	MFpljXrnPXrLXrLXrXcoXjfrmcXLRcVXCKXXLXprEVfrFXfXDLXaVYRkX.rPeHa	62
hpv_E6_A10.con	MESanASTsAXsIDQLCKecNlsmHXLQIILCVFCrktLtTAEvYsfaYKXLYvvXRgn.fPfAA *****	59
hpv_E6_A10.pat	MESXlASTjAriIDQLCKrfNcjbHrLQIXCVFCnrjLiTAEaYjdXYKrlXacdRXX.dPdAA	63
hpv_E6_superB.con	XXXXlpXtiXXlaXXlXiplXdclXpCnFCgXflXylelcefXKXlXliwkdXXXvfac *****	40
hpv_E6_superB.pat	XggXXjXXcXXfXXXXXajfXkfXcXCXFCXXXcXXXrXXXfXXXfXccdrXXgXXXhX	60
hpv_E6_B1.con	XXXplPXtiXXLaXXLXiPlXdc1XPCnFCgXFLXyleXcefdXKXlXliWkdXXXVfac *****	40
hpv_E6_B1.pat	XggXXPXraXXLjXXLXaPfXkfXcPCrFCXXFLXeXEXXXfmKXXfXlCWrXXgXVXhf	60
hpv_E6_B2.con	medXrpXXlddyCXXfdIsffDLXLCiFCXfXvXlXdLasFyXKkLslvXrXX.XXfAc *****	42
hpv_E6_B2.pat	XXXXXjXXcXrdCrXXrIjfxkLXLrCcFCreXcrXXrLAXFeXKrLXcadnXX.XXdAX	59
hpv_E6_superC.con	mrgnpXsgLXCvwCrepLtXVdAFRCmKXXXXvvXRXG.XrcXX	31
hpv_E6_superC.pat	XXjmXdXXLXCcdCXXXLXpVkAXRCXXXrfrXXfRXG.XrfhX	43

**Patterns  
E6**

hpv_E6_all.con	CXXClXXXXXXXXXrXyXsvygXXXeXtXXXXXXXXXIRcXXCkPLXXeKlXXXXXXXXrFhX *****	47
hpv_E6_all.pat	CXXCXXXXXXXXXXXXeXXXXXXXXcXXXXXcXXXXRCXXCXXLXXXkXXXXXXXXXXfXX	125
hpv_E6_superA.con	CXXClfXXkXrXyrhyXysYygXtleXXtXXXlXXlIRcXXCkPLXpXeKXrhXXXkXrfhX *****	68
hpv_E6_superA.pat	CXXCcXXXXXXXXfnXdXXjXdXXjcXXXXXXXXcXrXXcRCXXCXXPLXXXkXXXXXXXXXrfXX	128
hpv_E6_A2+A3+A4.con	CarCLlXXgXXRrlXhWXYScyXXXVEXeTgXsiXtXXiRCymChKPLvXeEKKXhrneXrrXHk *****	91
hpv_E6_A2+A3+A4.pat	CXXCLXXXXXXXXRpfneWreSfdXXjVEXrTXXjcXrXXcRCeXCrKPLXXoEKXXXXXXXXXrfHX	126
hpv_E6_A5+A6.con	CkXClfYSKvrkyRyYXySvYGatLeaXTKKXLdLXIRCyRCQXPLtPEEKQlhcdXKXRFHX *****	107
hpv_E6_A5+A6.pat	CrXCccFYSKarpfRXYrXScYgjlXjCtTKKrLXlLXIRCeRCQXPLjPEEKQXXfkXKnRFHX	127
hpv_E6_A7.con	CqkClkFyaXiRELRyYsdSVYxtTLEXiTnTkLynLlIRcMrClKPLcPaeKlrHlnXKRRFHX *****	112
hpv_E6_A7.pat	CXrCIRFejnaRELReYrmSVYhrTLEXtTrTXLemLXIRcfXCXKPLXPjkKXnHcrrKRRFhr	129
hpv_E6_A9.con	CXkClrfySKiSEyRhYXYSvYGXTLEXXnKXlCxlIRcIXCQXPLCPXEKqRHldXkkRFHN *****	106
hpv_E6_A9.pat	CXXCLnffSKaEdReYXYSvYGrTLEpXXrKXcXrcXIRcIXCQrPLCPXEKpRHcmXrprRFHN	127
hpv_E6_A10.con	CAcCLElqGKiNQfRHFdyAgyAXTVEEeTkqsILdVlIRCYLCHKPLCevEKvrHILXKARFIK *****	122
hpv_E6_A10.pat	CAfCLEfrGKaNdRHFldAhdAXTVEEkTrprILrVfIRCYLCHKPLCraEKcnHILXKARFIK	128
hpv_E6_superB.con	CrXCcXatAXyEfnXfyeXtvXgrXieXXXgXsifdiXiRCXXClkXLdXiEKldXcgrXXXfhk *****	85
hpv_E6_superB.pat	CXXCXXXiAXXEXrXdeXXXXXjXXcrXXXXXcXXcXcRCXXCfXXLrXXEKfXXfXXXXfXX	125
hpv_E6_B1.con	CrXCcXatAtyEfnXfyeXtvXgrdiEXXgXsifdidiRCXXClkfLdXiEKldiCgrXXpFhk *****	91
hpv_E6_B1.pat	CXXCXXXiAXXefrXdeXXXcXjXkcEXXXXXXcXXcXcRCXXCfXXLlXcEKLXXCXXXXfEX	125
hpv_E6_B2.con	CXXCLRLsAXfEXenyfqCsiKaXXLeLXXXXlseiXiRCXXClXlLdXXEKldXlysdXXfyL *****	87
hpv_E6_B2.pat	CjXCLRLiAXdEXkrddXCXXKjXXLrXcXXXXcrrcXaRCXXCfXfLrfXEKfXXcfrXXXfXL	124
hpv_E6_superC.con	CTXCLEnXLylERrLwXgvPvXgXeaeXXXXXldrlcIRcXYCGGkLTXXEKKRHXlfnEpfC *****	79
hpv_E6_superC.pat	CTXCLErLXXERLXXjXPaXXXrXXgXXXXXcXXXXIRcYCGGXLtnLEKrRHXfdXEXdfX	108

hpv_E6_all.con	iXgXw...XgXCXXCXXXX	53
hpv_E6_all.pat	cXXXf...XjXCXXCg	141
hpv_E6_superA.con	iXgXw...tGXCCwXXXXXXXX	76
hpv_E6_superA.pat	cXXXd...XGXCCg	150
hpv_E6_A2+A3+A4.con	IsGXW...XGScYcWsrCtXrXpX	107
hpv_E6_A2+A3+A4.pat	IjGXW...rGrCCXXXXXXXX	148
hpv_E6_A5+A6.con	IaXXW...tGsClXCWr...XXXrqXtEXXV	123
hpv_E6_A5+A6.pat	IjXXW...rGXCCWg...grrrrgrEiXV	152
hpv_E6_A7.con	IAGXy...tGQCrXCwtXaRedRrrrrretqv ***	138
hpv_E6_A7.pat	IAGXd...rGQCrXCrrXRrRXXXXpXpioX	158
hpv_E6_A9.con	IXGRW...tGRCXXCwrX...XXXRreTqv *****	123
hpv_E6_A9.pat	IXGRW...jGRCXXCfng...ggXRXTXc	151
hpv_E6_A10.con	LnXtW...KGRCfHCWts...CMEXiLP * * * * *	142
hpv_E6_A10.pat	LrXrW...KGRCfHCWii...CMercLP	150
hpv_E6_superB.con	vRXXW...kgXCRXCkXXX *****	94
hpv_E6_superB.pat	aRXXW...njXCRXCXXXX	141
hpv_E6_B1.con	VRXXW...KGiCRXCkhfX *****	103
hpv_E6_B1.pat	VRXXW...KGXCRXCXXfX	141
hpv_E6_B2.con	iRGXW...RgyCRNCiXkX *****	100
hpv_E6_B2.pat	aRGXW...RjfcRNCfrro	140
hpv_E6_superC.con	XRXXXX...rGRCYdCXRHGsrSxYp *****	95
hpv_E6_superC.pat	XRXrag...XGRCYXCXRHGXjXXX	131

hpv_E6_all_1		<b>IRCXXCXKPLXXXEK</b>	
U07024	434	<b>RC<sub>av</sub>C<sub>s</sub>KP<sub>i</sub>v<sub>p</sub>eE</b>	AVU07024_1 AvL3-1 [Acanthocheilonema viteae]
U14530	350	<b>RC<sub>av</sub>C<sub>s</sub>KP<sub>i</sub>p<sub>e</sub>E</b>	OVU14530_1 OvL3-1 [Onchocerca volvulus]
M96235	30	<b>IRC<sub>aa</sub>C<sub>i</sub>tPv</b>	ECOMARAR_1 multiple antibiotic resistance protein [Escherichia coli]
X05926	4	<b>IRC<sub>kn</sub>C<sub>n</sub>K<sub>l</sub>L</b>	D108GIN_1 Bacteriophage D108 gin gene 3' end and mod gene regulatory region. [Bacteriophage D108]
U11287	1240	<b>IRC<sub>ea</sub>C<sub>k</sub>Ka</b>	HSU11287_1 N-methyl-D-aspartate receptor subunit NR3 [Homo sapiens]
D10651	1240	<b>IRC<sub>ea</sub>C<sub>k</sub>Ka</b>	MUSGRP2_1 glutamate receptor channel subunit epsilon 2 [Mus musculus]
M91562	1240	<b>IRC<sub>ea</sub>C<sub>k</sub>Ka</b>	RATNMDA2B_1 NMDA receptor subtype 2B [Rattus norvegicus]
U11419	1240	<b>IRC<sub>ea</sub>C<sub>k</sub>Ka</b>	RNU11419_1 NMDAR2B glutamate receptor subunit [Rattus norvegicus]
Z18167	21	<b>IRC<sub>sn</sub>C<sub>g</sub>K</b>	ATTS0668_1 40S ribosomal protein S26 [Arabidopsis thaliana]
X03363	330	<b>RC<sub>ek</sub>C<sub>s</sub>KP</b>	HSERB2R_2 Human c-erb-B-2 mRNA. [Homo sapiens]

hpv_E6_A9_1		<b>SKISEYRHY</b>	
Z36894	145	<b>pEYRHY</b>	STPPAG_1 soluble inorganic pyrophosphatase [Solanum tuberosum]
X16901	237	<b>pEYRHY</b>	HSRAP30_1 30kb subunit of RAB30 /74 [Homo sapiens]
X59745	237	<b>pEYRHY</b>	HSRAP30M_1 RAP30 [Homo sapiens]
D10665	237	<b>pEYRHY</b>	RATRAP30_1 RAP30 [Rattus norvegicus]
L01267	237	<b>pEYRHY</b>	RATRAP30A_1 helicase [Rattus norvegicus]
Z15132	252	<b>pEYRHY</b>	XLTFRAP30_1 transcription factor RAP30 [Xenopus laevis]
X61209	934	<b>ISEYR<sub>e</sub>Y</b>	DMTOPII_1 DNA topoisomerase type II [Drosophila melanogaster]
M59473	111	<b>nnIS<sub>h</sub>YkHY</b>	PFAASN5514_1 asparagine-rich antigen Pfa55-14 [Plasmodium falciparum]

hpv_E6_A9_2		<b>YGXTLE</b>	
M93419	222	<b>YG<sub>i</sub>TLE</b>	BACASPKN_1 aspartokinase II [Bacillus sp.]
X57248	34	<b>YG<sub>a</sub>TLE</b>	LHGALKTM_3 mutarotase [Lactobacillus helveticus]
X15657	661	<b>YG<sub>i</sub>TLE</b>	DMELF1_1 Drosophila mRNA for DNA-binding protein Elf1 (Elf1 = element I-binding activity). [Drosophila melanogaster]
D28582	357	<b>YG<sub>s</sub>TLE</b>	ATHATCDPK3_1 calcium-dependent protein kinase [Arabidopsis thaliana]
M64990	220	<b>YG<sub>e</sub>TLE</b>	CHKPSYN_1 prostaglandin synthase [Gallus gallus]
M80425	287	<b>YG<sub>k</sub>TLE</b>	APMGSHII_2 glutathione synthetase [Anaplasma centrale]
X73308	232	<b>YG<sub>i</sub>TLE</b>	BCPYR_1 aspartate carbamoyltransferase [Bacillus caldolyticus]
L13458	804	<b>YG<sub>g</sub>TLE</b>	CELUNC52X_1 basement membrane proteoglycan [Caenorhabditis elegans]
A19015	18	<b>YG<sub>i</sub>TLd</b>	A19015_1 amidase gene product [Unknown]
M60264	18	<b>YG<sub>i</sub>TLd</b>	BRLAMDA_1 enantiomer-selective amidase [Brevibacterium sp.]

hpv_E6_A9_3		<b>CQXP</b>	<b>PLCP</b>	
J04519	280	<b>C<sub>n</sub>e</b>	<b>PLCP</b>	CHKCYT_1 Chicken cytactin 200kD mRNA, complete cds. [Gallus gallus]
M23121	280	<b>C<sub>n</sub>e</b>	<b>PLCP</b>	CHKTEN_2 Chicken alternatively spliced tenascin 190, 200 and 230 kd variants mRNA, complete cds. [Gallus gallus]
M23121	280	<b>C<sub>n</sub>e</b>	<b>PLCP</b>	CHKTEN_3 Chicken alternatively spliced tenascin 190, 200 and 230 kd variants mRNA, complete cds. [Gallus gallus]
M23121	280	<b>C<sub>n</sub>e</b>	<b>PLCP</b>	CHKTEN_1 Chicken alternatively spliced tenascin 190, 200 and 230 kd variants mRNA, complete cds. [Gallus gallus]
M74792	428	<b>C<sub>p</sub>n</b>	<b>PLCP</b>	TTHDNALGS_1 DNA ligase [Thermus thermophilus]
M36417	428	<b>C<sub>p</sub>n</b>	<b>PLCP</b>	TTHDNALIG_1 DNA ligase [Thermus thermophilus]
Z29528	425	<b>C<sub>p</sub>n</b>	<b>PLCP</b>	TSDNALIG_1 DNA ligase [Thermus scotoductus]
M89471	119	<b>Ch</b>	<b>PvCP</b>	HSMMDVECOQ_1 MDV Eco Q protein [Gallid herpesvirus 1]
U18778	150	<b>CQ</b>	<b>eP<sub>t</sub>CP</b>	SCE9537_25 subunit gamma of translational initiation factor eIF2 [Saccharomyces cerevisiae]
L04268	150	<b>CQ</b>	<b>eP<sub>t</sub>CP</b>	YSCGCD11NR_1 negative regulator of GCN4 [Saccharomyces cerevisiae]

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**Patterns**  
**E7**

hpv_E7_all.con	MXGXXXtLXXXdivlXlXpXXXXXXXXXpXXdlXcXeqlXXXXXXXXXXEeXXXXXXXXXXXXXXXXXXXX	19
hpv_E7_all.pat	MXGXXXcXggrfXXXggXgggggggggggXXgXXXXXggggggggggXgggggggggggggggg	69
hpv_E7_superA.con	MhGXXptlX..divlXlXpXXXXXXXXeXXXdlXCXeqlXXXXX..dssXeeXXdexdXXXXXXXXXXXX	27
hpv_E7_superA.pat	MrGXXXrcX..rfXcXXXgggggggggggXXgCXXrfggggg..ggggrgggggggggXXgggggg	65
hpv_E7_A2+A3+A4.con	MHGpXptXk..DIeLXlapXX.....EXv.XlhCneQlX.....dssXeeXXXXXXXXXvEpaqQA. **	35
hpv_E7_A2+A3+A4.pat	MHGXXjicX..DIXLXXXXgg.....EXa.XXgClXQfg.....gggkrkrXgggggggXEXXXQA.	53
hpv_E7_A5+A6.con	MhGXvptlX..dvileLXPQtEI.....DLqCyEQLXXXXX..dSSeXedeDEvDXlqeqpqaRq *****	47
hpv_E7_A5+A6.pat	MrGraXrcX..rfacrLXPQjEI.....DLrCXEQfggggg..lSSkkgggDEXDrbXrpggogRp	57
hpv_E7_A7.con	MhGpkpTlq..eIVLdLePqNei...Xpv.DLvChEQLX.....dSXEXEXDEpDXgVnHXqhqlL *****	48
hpv_E7_A7.pat	MrGPnXTcX..kIVLrLXPXNXX...gXg.DLcCeEQLX.....kSggkmEXDEXDgXVrHggXgLX	56
hpv_E7_A9.con	MrGXXpTlX..dYvLDLXP.....EXT.DLyCYEQLX.....DSSdEeeXXXiD.gPaGQAXpdt *****	41
hpv_E7_A9.pat	MrGrXjTcr..kYcLDLXP.....EjT.DLeCYEQLX.....DSSkEkkgggcD.XPXGQApXXr	51
hpv_E7_A10.con	MHGxyXtLK..dIVLXLXPp.....DPV.GLHCnEQLX.....DSS.EDEVDeXa.tQatQXXXXt *** **	41
hpv_E7_A10.pat	MHGGrXXtLK..kIVLrLrPg.....DPV.GLHCXEQLg.....DSS.EDEVDPXX.XQXjQggggr	51
hpv_E7_superB.con	MiGkevtXXXXdivLelXelqXXv...XpXXdLXceEelpXeXXXXqeteeeXXXXerXXXXX.....	35
hpv_E7_superB.pat	MXGXXXcXggkfXLpggrXgggg...ggggrLXXXEXcggggggggggXXgggggggggg.....	60
hpv_E7_B1.con	MIGKevtXq..divLelXelqpev...qpvXDlFceEelpXeXXXXqeteeeXXXXerXXXXX..... *****	41
hpv_E7_B1.pat	MIGKoXXcX..kfXLpggoXgggg...ggggDLXCXEmljgggggggrXXXXgggggggXggg.....	58
hpv_E7_B2.con	MrGXXptvXXXDXnLExXeLVLpX.....nLlSdEXl.....XXXXXdXXEeEXXP..... *****	27
hpv_E7_B2.pat	MXGXXjraXggDcXLEggkLVLpX.....rLcjkEXc.....ggggrXXXXjErEgXXP.....	49
hpv_E7_superC.con	mvqgPXThrn..LXdsXXXpLXXLXXXXgtptrXpaapdapdfXlpchfgXpXXXXXXXXXXXXXXXXXXXX	36
hpv_E7_superC.pat	XfXXPXTXnr..LXXXXjjXLXccXXXXjjXXXXXXXXjXXrXXXXXXXXXgnXrgggggggggggggggg	68



hpv_E7_all.con	XXXXXXXXXXXXXyXivXXCXXXcXXXlrlXvXXtXXXirXlqqllX.gXlXXvXCpXCX *****	42
hpv_E7_all.pat	gggggggggggeXcXXXCgXgggXXXcXfXfXXXXXXcXXXXXXfX.XXXXXXgCXXCg	129
hpv_E7_superA.con	XXXXXXXXXXXXXyXivtXCcX..CXXvrLvVXXXXdirXlXqllm.gtlXiv.CpXCaXX *** *****	56
hpv_E7_superA.pat	gggggggggggeXcXXXCXX..CXXcXLXarXjXXcXXfXXfb.XXfXfX.CXXCggg	124
hpv_E7_A2+A3+A4.con	.....YrVVtCXK..CsXXXRLVVecXXaDiraleqLlL.gtlXV.CPrCX *****	71
hpv_E7_A2+A3+A4.pat	.....YXVVTXCXX..CXXcRLVVoXjXXDcnXfrolfL.XrLrcV.CPXCX	97
hpv_E7_A5+A6.con	aeQhXC.....YlIeXXCcr..CXsvVQLavqSsXXelRvXqQmLM.galXlv.CplCAXXX *****	89
hpv_E7_A5+A6.pat	XXQXXC.....YXIrXXCXX..CXXVQLXaoSjXrrcRXcoQbLM.XXcrcX.CXXCagg	110
hpv_E7_A7.con	ARRaEpQR....HtiqCXCKK..CnnXlqLvVEaSXXXLRXlqqLFm.dtLsFV.CPwCatXnQ ***** *	97
hpv_E7_A7.pat	ARRXEXQR....HrcXCXCKK..CmXXcrLXVEjSXkXLRXfXXLfb.rilXFV.CPfCAjgrQ ** *****	112
hpv_E7_A9.con	sn.....YnIVTXCcX..CXXTlRLCvqSTXXDiRtlqXlLm.GtXgiV.CPXCsqrx *****	80
hpv_E7_A9.pat	jr.....YXIVTXCXX..CXjTcRLCarSTXXDcRXcorbLb.GifXaV.CPXCgXpX	100
hpv_E7_A10.con	QhXXXXXX....yQIvTXCXX..CXsnVRLVvqCTgtDIXXlhXLLL.GtLnIv.CPXCAPKX *****	81
hpv_E7_A10.pat	QXgggggg....dQIcTXCXX..CXrrVRLVVoCTXjDIXrcrrLLL.GiLmIc.CPcCAPKX *** **	106
hpv_E7_superB.con	.....ykiXapCgcXXcXvklrifvXatXfgirXfqXllX.XelqllXCpXCXgncXhggs *****	77
hpv_E7_superB.pat	.....draXXXCgXgggXXXcnfXfXAXXXhcXXXpXXcX.XXXXXXgCXXCgXXgrrXXX	116
hpv_E7_B1.con	.....yKvvpCgcXXcXvklrifvXATXfgirXfqXlLX.XXlqll.CPXCXgncXhggs *****	84
hpv_E7_B1.pat	.....dKaaXXCgXgggXXrLncfaXATXXhcRXXoXXLX.XXcXfc.CPXCrgXrfrXXX	113
hpv_E7_B2.con	.....frIDtcCXX..CXXvRXtXXateXgXrXleqLlX.XeXXXfXCXXCsrXLXRnGRs *****	60
hpv_E7_B2.pat	.....drIDiXCXX..CXXaRfXfXAXXXhcXXfpXlcX.rXXXXXgCXXCjnrLgRrGRi	103
hpv_E7_superC.con	XXXX.....rrvYsVTVCcXX..CXKXltFavkTssttXLXXhLLn.sDLDXL.CXrCEsreX *****	76
hpv_E7_superC.pat	gggg.....nnXYrVTVCcXX..CXKrLrFXXnTjXjicLjforLLX.rDLDFL.CjXCEjrrX *****	123

hpv_E7_all_1		<b>YXIVXXCXXXXCXXLRLVXXTXXXIRXLQQLLXGXLXXVXCPXC</b>	
L08424	169	<b>IR<sub>a</sub>LQQLL</b>	HUMASH1A_1 achaete scute protein [Homo sapiens]
M95603	162	<b>IR<sub>a</sub>LQQLL</b>	MUSHASH1X_1 helix-loop-helix protein [Mus musculus]
X53725	164	<b>IR<sub>a</sub>LQQLL</b>	RNMASH1_1 Rat MASH-1 mRNA expressed in neuronal precursor cells (mammalian achaete-scute homologue). [Rattus norvegicus]
A07108	61	<b>IR<sub>i</sub>LQQLL</b>	A07108_4 Human immunodeficiency virus type 1 (LAV.ELI) proviral DNA. [Human immunodeficiency virus type 1]
A07116	61	<b>IR<sub>s</sub>LQQLL</b>	A07116_4 Human immunodeficiency virus type 1 (LAV.MAL) proviral DNA. [Human immunodeficiency virus type 1]
M96155	61	<b>IR<sub>i</sub>LQQLL</b>	HIV1PROV_2 vpr gene product [Human immunodeficiency virus type 1]
L20587	61	<b>IR<sub>i</sub>LQQLL</b>	HIVANT70C_4 vpr polyprotein [Human immunodeficiency virus type 1]
M15654	61	<b>IR<sub>i</sub>LQQLL</b>	HIVBH102_4 Human immunodeficiency virus type 1, isolate BH10, genome. [Human immunodeficiency virus type 1]
K02013	61	<b>IR<sub>i</sub>LQQLL</b>	HIVBRUCG_3 Human immunodeficiency virus type 1, isolate BRU, complete genome (LAV-1). [Human immunodeficiency virus type 1]
D10112	61	<b>IR<sub>s</sub>LQQLL</b>	HIVCAM1_4 vpr polyprotein [Human immunodeficiency virus type 1]

hpv_E7_A9_2		<b>TDLYCYEQLXDSSDE</b>	
A07578	9	<b>TDLYCYEQ</b>	A07578_1 E7 protein (I), region 1 [Unknown]
L35047	117	<b>LYCYqeLiD</b>	YSCSMK1A_1 MAP kinase [Saccharomyces cerevisiae]
X54637	913	<b>LYCYd<sub>p t n</sub>Dgt<sub>g</sub>E</b>	HSTYK2_1 Human tyk2 mRNA for non-receptor protein tyrosine kinase. [Homo sapiens]
J02226	104	<b>DLfC<sub>n</sub>Eem<sub>f a</sub>S<sub>d</sub>DE</b>	PLYCG_5 JC polyomavirus (JCV), complete genome. [Polyomavirus]
K02562	130	<b>DLfC<sub>s</sub>E<sub>t</sub>m<sub>s</sub>SSDE</b>	PPL_4 Lymphotropic papovavirus (LPV), complete genome. [Lymphotropic papovavirus]
M30540	130	<b>DLfC<sub>s</sub>E<sub>t</sub>m<sub>s</sub>SSDE</b>	PPMCG_1 Monkey B-lymphotropic papovavirus complete genome. [Monkey B-lymphotropic papovavirus]
M22245	113	<b>DL<sub>r</sub>CYEQL<sub>s p</sub>Spe</b>	ADR1AB_1 Mouse adenovirus type 1 early regions 1A and 1B DNA. [Mastadenovirus mus]
M22245	113	<b>DL<sub>r</sub>CYEQL<sub>s p</sub>Spe</b>	ADR1AB_2 Mouse adenovirus type 1 early regions 1A and 1B DNA. [Mastadenovirus mus]
X62430	71	<b>eLY<sub>s</sub>f<sub>q</sub>QL<sub>v</sub>DS</b>	SCPCPETIT_1 S.cerevisiae gene for protein complementing petite-type mutation. [Saccharomyces cerevisiae]
L02496	109	<b>DLYCYE</b>	LLHORF04_8 Bacteriophage LL-H ORF1, 3' end, ORF2 (g20) complete cds, major capsid protein (g34) complete cds, ORF4, complete cds, ORF5, 5' end. [Bacteriophage LL-H]

hpv_L2_all.con	MXXXraXrrXX.....kRasatXlYXtCkqaXgtCpDvinkvEXtTXADXiLkXXgslg	41
hpv_L2_all.pat	MggggXXgggg.....nRXXXrcYXXCXXjgXrCXXDaXXnfEXrTXADxfLpfgjjXg	55
hpv_L2_superA.con	MXXXraXrrXX.....KRASaTqLYXTCKaX.GTCPPDvipkvEgtTLADxiLXw.gslg *****	43
hpv_L2_superA.pat	MggggXXgXgg.....KRASXTrcYrTCKXj.GTCPXDaaXncEXrTfADpfLpd.jjXX	53
hpv_L2_A2+A3+A4.con	MvaXraXRR.....KRASaTdLYrTCKqa.GTCPPDviPkvEgtTLADrILXW.gsLG ** ***** **	48
hpv_L2_A2+A3+A4.pat	MggggXnRR.....KRASjTrLYnTCKXj.GTCPPDaaPncEXrTLADnILpW.hjLG	51
hpv_L2_A5+A6.con	MVAhRARR.....KRASaTqLYkTCKXX.GTCPeDvinKiEXkTXADkILQW.gsLf ** **** *****	47
hpv_L2_A5+A6.pat	MVAXRAXRR.....KRASXTrLYrTCKXj.GTCPXDvaXKaEXrTfADnILQW.jjLX	51
hpv_L2_A7.con	MVShRAARR.....KRASaTdlykTCKQs.GTCPPDVXnKVEGTTLADkiLQW.tSLG ** ***** **	50
hpv_L2_A7.pat	MVSrRAjRR.....KRASXtkcYnTCKQj.GTCPjDvaXKVEGTTLADnfLQW.jSLG	51
hpv_L2_A9.con	MRhkRStkRX.....KRASATQLYqTCKaa.GTCPPDvIPKvEgXTiADQiLkY.GSmg *****	50
hpv_L2_A9.pat	MRXnRSjgRg.....KRASATQLYpTCKXj.GTCPjDaIPKaEXrTaADQcLpY.GSbh	52
hpv_L2_A10.con	MahsRARRR.....KRASATQLYQTCKaX.GTCPPDvIPKVEhnTiADqILKW.GSLG *****	50
hpv_L2_A10.pat	MXgjRARRR.....KRASATQLYQTCKXj.GTCPjDaIPKVErrTcADpILKW.GSLG	51
hpv_L2_superB.con	Ma..rarrXX.....KRdSvtXiYrtCkqa.gtCpDvInKvEqtTiADxiLkyXGsgag *****	46
hpv_L2_superB.pat	MX..XXXggg.....KRXSXXrcYXXCXXj.XrCXjDVXNKfEXrTcADxcLpfgGjXg	51
hpv_L2_B1.con	Ma..Rarrv.....KRdSvTXiYrtCkqa.gtCpDvInKVEqtTiADkILky.Gsag *****	48
hpv_L2_B1.pat	MX..RjprX.....KRXSXTrIYpjCKXj.XrCPjDvCNKVErrTcADrILpd.GjXh	49
hpv_L2_B2.con	MX..XrrrXX.....KRdSXXnLYXXCqlg.gdCXPdVknKvEXXTlADrLLXifGsX. *****	37
hpv_L2_B2.pat	MX..XXXggg.....KRXSXXlLYXrCXXj.hlCXPdVpNKfEXrTcADXLlpffGjc.	50
hpv_L2_superC.con	MsXXXXkRV.....KRAnvYDLyRTCKqaXgtCpDvipKVEGXTiADkilkX.GXXX *** *****	42
hpv_L2_superC.pat	MjgggnRV.....KRArXYDLyRTCKpXgggCPXXXfXKVEGrTaADkffrf.Gjbh	52

**Patterns  
L2**

hpv_L2_all.con	vffGgLGIGtgXGtGGrtgyvplgXXXXXXXXXXXXXXXXXrPpvvXeXXXXXXXXXXXXXXXXXXXX *****	71
hpv_L2_all.pat	XdfGXLGIjihXGjGgXXgggggggggXgXggXXgggggnPXXXXggggggggggggggggg	120
hpv_L2_superA.con	vffGgLGIGtGsGtGGrtGYvPlgtrpXtXXvdXXXXXXXXXrPPvveXXXXX..... *****	80
hpv_L2_superA.pat	XdfGXLGIGiGjGiGGRjGYXPcXjXjXXgXggXXgXgggnPPcXXggggg.....	106
hpv_L2_A2+A3+A4.con	vXXGGLGIGTGSGTGGRTGYvPvgtRPgT.VVDvXvpX...rPPVvIe..... *****	88
hpv_L2_A2+A3+A4.pat	adfGGLGIGTGSGTGGRTGYXPcjirPjT.VVDajXXj...nPPVaIk.....	95
hpv_L2_A5+A6.con	tffGgLGIGTGsGsGGRXGYXPLGXrpstXvVDvtPa...RPPIvve..... *****	87
hpv_L2_A5+A6.pat	XdfGXLGIGTGjGiGGRjGYaPLGjXjrjgaVDXjPj...RPPiIaak.....	95
hpv_L2_A7.con	IFLGGLGIGTGsGtGGRTGYiPLGGrpnT.vVDVsPa...rPPVvIE..... *****	93
hpv_L2_A7.pat	IFLGGLGIGTGjGiGGRjGYaPLGgnjrT.aVDVjPj...nPPVvIE.....	94
hpv_L2_A9.con	VFFGGLGIGtGsGtGGrtGYvPlgtXPpta..XXXXpi..RPPvtvdXXXXX..... *****	89
hpv_L2_A9.pat	VFFGGLGIGiGjGiGGRjGYaPcjirPjiXj..XXgXja..RPPciakgggg.....	101
hpv_L2_A10.con	VFFGGLGIGTGsGtGGrtGYiPlqstprPXIXsgPta...RPPilVd..... *****	92
hpv_L2_A10.pat	VFFGGLGIGTGjGiGGRjGYaPcXiijnPXIjjXPXj...RPPacVk.....	95
hpv_L2_superB.con	vffGgLGIGtGrGtGGatGYvPlgXXegpgvrvggtptvv.RPXlvpeXigpXdiipidXXXXXt *****	100
hpv_L2_superB.pat	cdfGXLGIjiGnGiGGXXGYXPfXggggjgXrXjXXXXX.RPXXXXXXjXXcXjXXggggg	115
hpv_L2_B1.con	VFFGGLGIGtGrGtGGatGYvPlg..egpgvRVGgtptvv.RPXlvPeXigpXdiipid....t *****	102
hpv_L2_B1.pat	VFFGGLGIjiGnGiGGXTGYXPcX..ggjgarVVGXjjiaa.RPjcXPkXaGPXkccPcD....i	106
hpv_L2_B2.con	XYlGnLGIGtGrGsGGsXGYXPLGXXXXXsrptXXXXX.RPXvvXeXlgpsXIXpXdXXXXX *****	74
hpv_L2_B2.pat	cYfGXLGIGiGnGiGGjGYrPfGggggjjjrXjXXXXX.RPXXXXXXjXXIXjXXggggg	114
hpv_L2_superC.con	XYlgglgigtXSXgXvaXGxsPXXXXXrXgGSttSLXSXgsraXtaXXXrXfagGIPLX....T *****	82
hpv_L2_superC.pat	aYfXXXXXggXSjXXXXhGXXPXggggRjjGSiiSLjSggggggggggXjXXjGIPLk....T	112

hpv_L2_all.con	XXpvXpXXpsivXlXeXsXXiXXgXXXpXXXXXXXXXgfXXtXsXXXXXXXXXXXXXXXXXXXXX	88
hpv_L2_all.pat	ggggggXXXjccXXgsgggggggXgggggXXgggggggggXXgggggggggggggggggggg	185
hpv_L2_superA.con	..pvgpXdpSivXlvEessXiXsgapXptfXgXXXtXGFeitssXXX..... *****	112
hpv_L2_superA.pat	..XfXXXkjSaarbcEki jfaXXjXjXggXXXgggggGFrcXi jggg.....	151
hpv_L2_A2+A3+A4.con	..PVGXsdPSIVXLXEdSSiInXGXtXPTFTG...tgGFevtsS..... ***	121
hpv_L2_A2+A3+A4.pat	..PVGjkkPSIVrLcEkSSaImjGjiXPTFiG...iXGFmaXiS.....	134
hpv_L2_A5+A6.con	..svgpTdPSIVtLVEeSSviXsGaXiPnFtG...tXGFevTsS..... ***** *****	123
hpv_L2_A5+A6.pat	..XfXXtkPSIVrLVEkSSaarjGjjfPrFiG...jXGFecTiS.....	134
hpv_L2_A7.con	..PVGptXPSIVLvEdSSVXtSGXPvPTFTG...TSGFeItss..... **** *****	128
hpv_L2_A7.pat	..PVGpikPSIVrLaEkSSvajSGjPXPTFTG...TSGfkIij.....	133
hpv_L2_A9.con	..tvGPldsSIVslvEetsfieXGAPaXpsiPpXXsGFditTs..... *****	126
hpv_L2_A9.pat	..jaGPXkjSIVSbaEEijfakXGAPXggXXXPjgXiGFrajTi.....	143
hpv_L2_A10.con	..tVaPXDPsIVSLvEESAIINsGaPeXvPPXhg...GFeITtS..... ***** *****	128
hpv_L2_A10.pat	..jVhpjDPSIVSLaEESAIINjGXPKXcPPXrh...GFrITiS.....	134
hpv_L2_superB.con	XXpvXptasSivpltesXgXXXXdllpgXevetiaeXXihpXpXXpXXXdtpvvtXXXXXXXX	138
hpv_L2_superB.pat	ggggggXXjScajXXkXggXggggXggjggXXXXXhggggggXXggggXrXXXXXXXXggggggg	180
hpv_L2_B1.con	XXPvePtasSivplTessgXX...DLlPg.evEtIAE...ihPvpXXpXXXdtpvvtXXX.... ***** **	144
hpv_L2_B1.pat	cXPakPXXjScVjXtkjggXg...DLfPg.rXEiIAE...arPXjXXXgXrjXcXjXggg....	160
hpv_L2_B2.con	XXXXXXXXasSivPLXeXXpXXXXiX.XXdXgpgXggXXXXXXXXdiXXXtXXdpXXDVXgvsXXPT *****	102
hpv_L2_B2.pat	ggggggjjjSaaPLXkXXXXXXXXX.gjXgXXXXXhggggggXraggggXrmjXjDVXhXXjXPT	178
hpv_L2_superC.con	LEtiGAXRPGiyEdtXXXXX.....vLPXAPAXVTPXAVPXDGLXgLXigXXssXEtlitXL ** *****	123
hpv_L2_superC.pat	LEjcGafRPGXfEkXgggggg.....aLPkAPAAvTPkAVPXDrgcrhLrajrKXirErccifL	171

**Patterns  
L2**

hpv_L2_all.con	XXXXXXXXtpavldvXpXXXXXXXXXXXXXXXXX.....XXtXXnpXfXXpXXXpXXXgeXsgXX	106
hpv_L2_all.pat	gggggXXhXXggggggggXXggggggg.....gggggXXXXXXXXXXgXXXggXXXgXX	244
hpv_L2_superA.con	...XtttPAvlditpXXXXvXXs.....stXfXNPXftdPsXXeXpqXgeXsghX	143
hpv_L2_superA.pat	...XXXXPAaclgggggggXXg.....ggXXXNPXdXkPXgXrXXXXXkXXgrf	198
hpv_L2_A2+A3+A4.con	...atTtPAVLdITPXgXnVXvs.....SXXFXNPIfTePsXXEXPQXGevsGhv *****	158
hpv_L2_A2+A3+A4.pat	...jXTrPAVLdITPjXVXai.....SirFXNPXdTkPjccEXPQXGkXjGra	181
hpv_L2_A5+A6.con	...StTTPAVLDITPsgtVHVs.....STXitNPLXiXPPvIeaPQtGEvsGnI ***** **	167
hpv_L2_A5+A6.pat	...SjTTPAVLDITPijjivHVi.....STrfrNPXdakPPgIkXPQjGEXSgrI	181
hpv_L2_A7.con	...sTTPAVLDITPssgSVqis.....stsftNPAFXDPsiIEVPQTGEvsGNi ***** **	174
hpv_L2_A7.pat	...jTTPAVLDITPjXgSVrai.....iirdXNPAFjDPicIEVPQTGEXjGNa	180
hpv_L2_A9.con	...adtTPAILdXXXXXXXXvts.....vstHXNPtFTdPSvLXPptPAEtsGHf *****	163
hpv_L2_A9.pat	...jlrTPAIClgggggggarl.....aiTHXNPiFTkPSacrPPjPAEjjGHf	190
hpv_L2_A10.con	...estTPAILDVSvtThtTtsX.....XvFrNPXFxePsVxQsQPXvEaggHi *****	168
hpv_L2_A10.pat	...oijTPAILDVSvtTrrrTiig.....gaFpNPXFjkPSaXQjQPjaEjXhHa	180
hpv_L2_superB.con	XXXXXXgssAvlevapepXppXrvrX.....vsrtqyhnpfsqiitestpXXXgesslad	181
hpv_L2_superB.pat	gggggXXAXckXXgXXXXXXXXXgg.....gggggXXXXXXXXXjXXXXggXXXXXl	235
hpv_L2_B1.con	.....gssAvLEVapepXppXrvr.....vsrTqYhNPsFqiitestPXX.GEsslAD *****	187
hpv_L2_B1.pat	.....XXrAaLEVXgXXXPXXXg.....ajXTrYrNPjFracikXXPXX.GEjjXjD	207
hpv_L2_B2.con	XisXednXXAvldXXPXXppKXxiXl.....XXXXdstXXXsXXXXXXXXXXXXsdlN	126
hpv_L2_B2.pat	XXiXXkXXXAXcDXXPXXjXXKpcXf.....gggggrjXXXXXXXXjXXXXFggXXXXlXN	233
hpv_L2_superC.con	ePEGpXDi.AVLElXPXXhdqwXXsXXXXXXXXX.....XXXPLXlqXsXXXXXX.AETSGlE ***** **	153
hpv_L2_superC.pat	rPEGpKDa.AVLEcPpXkrXrXrcXrjXrgggg.....eXXPLXXXjXXggggg.AETSGXE	226

hpv_L2_all.con	XXXXXXXXtXgXhXXXXXXXXXXXXXeeiplXtFXsXXXXXXXXXXXXXXXXXXXX...sSTPxPX	122
hpv_L2_all.pat	gXXXggXXXXXXXXXggggggggggXXfXbXXfgXXgXXXggggggggggggg...gSTPXXX	305
hpv_L2_superA.con	lxst..ptXgthXy.....EeIPmdtFaXsXgXgXepi.....sSTXPg	173
hpv_L2_superA.pat	XXXX..XXXjXXXX.....EmIPbrXfXXXgXXXgggg.....rSTXPX	236
hpv_L2_A2+A3+A4.con	lvsT..pTsGsHgy.....EEIPMXTFatsXGtGXepi.....SSTPvPG	193
	* *****	*****
hpv_L2_A2+A3+A4.pat	cXjT..jtjGXHjd.....EEIPMrTFaijgGXGgggg.....SSTPcPG	219
hpv_L2_A5+A6.con	list..ptsGXHsY.....EEIPmqtFAvhXgtGtEPI.....SSTPiPG	203
	*** ***** **	****
hpv_L2_A5+A6.pat	fXXX..XXjGXHjY.....EEIPMoXFAXrgjiGXEPI.....SSTPXPG	219
hpv_L2_A7.con	fvsT..PTSGtHGY.....EEIPmqXFAXh.GtGtEPI.....SSTXPX	207
	* **** * **	***
hpv_L2_A7.pat	fXjT..PTSGjHGY.....EEIPboXFair.GiGXEPI.....SSTXPj	217
hpv_L2_A9.con	XlSS..stiSThnY.....EeIPMDTFivSTdsXnvT.....sSTPIPG	198
	* *****	*****
hpv_L2_A9.pat	XfSS..jiaSTrrY.....EmIPMDTFaXSTlXXraT.....rSTPIPG	227
hpv_L2_A10.con	lISX..stisshpv.....EeIPLDTFivSSSDSnPa.....SSTXPpa	203
	***** *****	
hpv_L2_A10.pat	fISj..jiaijrXX.....EkIPLDTFaVSSSDSXPj.....SSTPcPX	217
hpv_L2_superB.con	hvlVtsgsgGqXiggXXXXXXXXXXeXielqeX.psrysfeieeptpprX.....sSTPxqr	222
hpv_L2_superB.pat	gafVXXXXjGXxaJXggggggggXXfXbXXf.XXXXXXggggggggg.....gSTPXXX	291
hpv_L2_B1.con	hilVtsGsGGqXiGgXXXXXXXXXXeXielqeX.psRysFeieepTPPRr.....sSTPlqr	230
hpv_L2_B1.pat	rafVXrGXGGXXaGXXggggggggXXfEbrXf.XrRviFkXrrjTPPRg.....XSTPcXX	263
hpv_L2_B2.con	.VfVdpXfaGdXigXXXX.....EEIpLeXl.nXXXXfeieXXXppXX.....XSTPXXX	154
hpv_L2_B2.pat	.VfVljXXjGkraJXXgg.....EEIXLXXc.lXXXXXggggggggg.....gSTPxR	281
hpv_L2_superC.con	NiFVGGSgLGXtgG.....EnIELTlFgsPr.....TSTPXXp	183
	***** * ***** **	****
hpv_L2_superC.pat	NaFVGJGcGrrjG.....EmIELTfFhrPn.....TSTPpXX	259

**Patterns  
L2**

hpv_L2_all.con	XXXXXXXXrXXXlyXrXXXqQvXvXdpX.flXXpsXlvXX..tfdNPafeXXXXdXtXXfeXXXXX	150
hpv_L2_all.pat	XXXXXXXXgggXgggXggXQXXXXXXXXX.ffXXjXXXcgg..XXrNPXdXgggggXiXXdXXXXgg	367
hpv_L2_superA.con	XrrXaXprXX.LYsraX.qQvXvXdpa.FlXXPXXlv...tXdNPafeXXXXdXtlfXXXXXX	206
hpv_L2_superA.pat	XXXXXXXXXgg.LYXnXX.rQXXaXrXX.FcXXPXrfc...rXmNPXdrgggXkXicXdXXXXgg	294
hpv_L2_A2+A3+A4.con	vXRvAgPRXX.LYsXAn.XQvkVXdPa.FlXrPaslv...TfdNPvXdX..pXETIIFeXPXXX *****	235
hpv_L2_A2+A3+A4.pat	arRcAXPRgg.LYjnAX.rQapVXlPj.FcXrPXrfc...TdDNPXdkg..XkETIIForPXXX	275
hpv_L2_A5+A6.con	XrRiaAPR...LYskaf.qQVkvTDPa.FlXkPXTlX...tXdNPXfeX..aDtltfspgX. *** ** *****	248
hpv_L2_A5+A6.pat	frRcjAPR...LYrnjd.rQVnVTlPX.FcXrPXTfa...rXlNPXdoX..XDricjdXXjXg.	272
hpv_L2_A7.con	vXRvaGPR...LYSRAX.qQVrVsnfd.FXTXPSsfv...TfdNPafeP..vDTtLtfepaX.. *** *****	254
hpv_L2_A7.pat	arRVXGPR...LYSRAX.rQVrVXrXr.FcTrPSifa...TdDNPAdkP..XDtiLidkjXr..	269
hpv_L2_A9.con	sRpXaRLG...LYSrXT.QQVKVvDPa.FXtsPXkLi...TYdNPayEgXnpdXtlqFXhXdis *** ***** *	246
hpv_L2_A9.pat	XRXXjRLG...LYSnXT.QQVKVaDPj.FcijXpLa...TYmNPXdEjflXkricXFrRRrXX	283
hpv_L2_A10.con	XXaRPRXG...LYSrAL.hQVQVTDPA.FLSsPQRli...TfdNPXYEG..EDvslqFaHntIH ***** **	253
hpv_L2_A10.pat	jXjRPRcG...LYSnAL.rQVQVTDPA.FLSiPQRla...TdDNPXYEG..EDaicrFjHmiIH	271
hpv_L2_superB.con	XXXXXrrrXXXlXnRrlvqQvXvXnpl.flXqPSrlvrF..XfdNPafeX..eevtqiFeXDlXX	265
hpv_L2_superB.pat	XXXXXXXXXgggXXrRXgXXQXXrXXX.ffXrPSpXaXF..XdrNPXFg..XraiXXForDcXX	351
hpv_L2_B1.con	XXXXXrrrgXXLtNRRLvqQVXVXdPl.FlXXPSrlvrF..qFdNPvFe...eevTqiFEXDXXX *****	274
hpv_L2_B1.pat	XXXXXXrXggjLXNRRLXoQVXVr1Pc.FfXrPSpVrF..XFkNPXFk...kraTrXFerDcXX	322
hpv_L2_B2.con	XXrXXXrArd.lYnRf.vqQXptXnpX.flXqPSravqF..efeNPAFdX..XditXXFerDleX ***** *****	198
hpv_L2_B2.pat	XXXXXXXXApr.XYrRX.cXQXjXrXXX.fljPsrXaXF..XdpNPAFXg..XkaiXXFopDcrX	339
hpv_L2_superC.con	iXrsRGIXN..WFsXrYYTQvPXEDPdXXXXXXXXX...XFeNplYdXXXXXXXXXXXXXXXXX *****	211
hpv_L2_superC.pat	XrrjRGIfN..WFrnrYYTQaPXEDPkXfjXggg...XFXNjcYkgggggggggggggggg	316



hpv_L2_all.con	XXXXpdXdfldiXXlhrpaXtXXrXgXvRXSRlGXraXtXrTRsGXqiGarvHfyXDlSXlXXXX *****	192
hpv_L2_all.pat	ggXXgXXXfXlaXXcXn jXfXXgXXXgcRfSRXGrrXgXcXTRXGXXfGXXXHddXdcSxaXggg	432
hpv_L2_superA.con	XXXaPdPdFldIXXLHRPaltsXrrgtvRfSRlGqka .tmXTRsGkXiGarvHyyXDiSpiXXXX *****	257
hpv_L2_superA.pat	ggXXPDXXFblIcXLHRPxfXjgnpXXaRfSRcGrnX .icXTRrGXXfGjraHddXdcSxaXggg	358
hpv_L2_A2+A3+A4.con	X.XXPdPdFldIvXLHRPALTSXrRGTvRfSRlGqXa .XXrTRSGkXiGARVHXyHDXSPiXpX. *****	284
hpv_L2_A2+A3+A4.pat	g.rXPDjDFbDIcXLHRPALTSgRpGTvRdSRcGrnX .ibrTRSGrXcGARVHdYrDcSPaXjg.	337
hpv_L2_A5+A6.con	..VAPDPDFldIvaLHRPAfTt .RrggVrFsrLgXKA .TmrTRsGkQIGARVHYyDiSpIaqaX *****	307
hpv_L2_A5+A6.pat	..VAPDPDFblIa jLHRPAfTi .RnjjVRdSRlGrKA .TcptRrGrQIGARVHYyDaSXlXXg	333
hpv_L2_A7.con	..XXPDpDFXDIvRLHRPALts .RrgTVRfSRlGXXA .TMfTRXGtQIGaXVHXyHdiSpIapaX *****	306
hpv_L2_A7.pat	..XXPDjDFbDIaRLHRPALis .RnjTVRfSRcGpnA .TMfTRrGrQIGhpVHdYHdaSXiJXjg	330
hpv_L2_A9.con	XXXAPDPDFldIiALHRPALTS .RrgtvRySRvGnKX .TlrTRSGkXIGArvHYyqDlSXlXpXX *****	300
hpv_L2_A9.pat	ggXAPDPDFbDIaALHRPAcTS .RnXjaRdSRcGrKX .TbrTRSGXXIGAnaHYyXdcSjIXggg	346
hpv_L2_A10.con	..XpPDeAFMDIIRLHRPAIXS .RRglVrFsrIGQRG .SMYTRSGkHIGgRiHffqDISPisaAA *****	312
hpv_L2_A10.pat	..rjPDkaFMDIIRLHRPAIXS .RRGXVRdSRIGQRG .SMeTRSGpHIGhRaHddXDlSPajXAA	332
hpv_L2_superB.con	feepDrdFldvXXlgRpXysetpagyvRvSRlGXra .tirTRsGaqiGsqVHFyrDlSXInte. *****	323
hpv_L2_superB.pat	fXXjPXXXFXDaXXcXRjXfjXiXXhXcRcSRXGrnX .XcrTRjGXraGXXVHddXdcSXlXjg.	414
hpv_L2_B1.con	feEPPdRdFLDvXXLgRpqysetpagyvRvSRlGXra .tirTRsGaqiGsqVHFyrDlSsInte. *****	334
hpv_L2_B1.pat	fXEPPlRrFLDaXrLXPxfjriXXhXcRcSRXGrRX .icrTRjGjraGjpVHFdrDcSiIljg.	385
hpv_L2_B2.con	vaAAPdXdFADivXlgRprfSXTsXGXiRvSRlGXrg .tXkTRSGlXiGqXVHFyXDlSXlXta. *****	249
hpv_L2_B2.pat	cXAAPXXXFADaXXcjrjrfSXTTrXGXaRaSRcGrnh .XcrTRSGcraGXXVHdYfdcSXlXjg.	402
hpv_L2_superC.con	X..XXXXXXXXXXleXXXXXXXXPSGRvGXsXXyrPX .sXgTRsGvrVGPXXHXrySXSTIheX. *****	243
hpv_L2_superC.pat	g..gggggggggggXXjgggggPSGRaGfSpaXnPr .XcXTRjGxpVGPXfHcRXSfSTIrrX.	377

**Patterns  
L2**

hpv_L2_all.con	XXXXXXXXeXielqplXXXXXXXXXXXXXXXXXXsXXXXXXXXXdyXXXXXXXXXXXXXXXXXXXXXXXXsXXX	204
hpv_L2_all.pat	gggggggXfobXXfggggggggggggggggggggggggggggggggXXXXgggggggggggggggggggggg	497
hpv_L2_superA.con	XXXXXXXXeXiElqplXXXXXXXXXXXXXXXXXXXXXXXXXlyDiyadXXXXXXXXXXXXXXXXXXXXXXXX	273
hpv_L2_superA.pat	ggggggrXfEbrjcggggggggggggggggggggggggggggdDafXgXXXXgXXXXgXXXXgggggggggg	423
hpv_L2_A2+A3+A4.con	.....ediEmePL.....lppasXXXXdXlYDXyAdvdXldXXftXXXrXXtXsXgX	314
hpv_L2_A2+A3+A4.pat	.....kXcEboPL.....gggXgXXggggXYDadAkXkXXrXXXrXXXXgXrXggjX	384
hpv_L2_A5+A6.con	XX....eEiEmQPL.....lsXXnsfdglyDIYAniDeapXssXXsXatPsXXlp	344
hpv_L2_A5+A6.pat	gg....kEcEbQPL.....Xi jr r r X g g X d D I Y A l X D r X X j X X X X X X X i P X X g X X	380
hpv_L2_A7.con	.....eXIElQPL.....XXXXasXdXdlXDiYAddXdaXXXXXXXXXXtXXXXXX	327
hpv_L2_A7.pat	.....kXIEbQPL.....gggXXjrXXXggdDaYagXXXXXXXXXXXXXXXXXjXgXXXX	377
hpv_L2_A9.con	XXXXXXXXeXiElQpl...XXXXXXXXXXXXtsXXsNdGlyDiYadXXXXXXXXXXXXXXXXXXXXXXXX	321
hpv_L2_A9.pat	gggggggorfEbQjc...ggggggggXrjXXjXicNlGbdDaYAXXXXrXrXXXXgXXXXgggggggg	408
hpv_L2_A10.con	.....EEIElHPL.....VAaaXDtsXlFDIYAEpdXXXXXXXXXXXXXsXstpf	343
	**** **	** *****
hpv_L2_A10.pat	.....EEIEbHPL.....VAjXrDggggFDIYAEjXXXgXXXXXjXXXgggiXf	377
hpv_L2_superB.con	.....dpielqlgqhsdativqgpvestfXdXniXenplXeXXXXXXXXXXXXXXXXXXXXsXdl	360
hpv_L2_superB.pat	.....gjcobrXfXXrjXXXiXarXXXXXiXflXXXXXXXXXXgggggggggggggggggggggXXrX	473
hpv_L2_B1.con	.....dpiElqLLGqHSGDativqgpveStfXdXnidenplseXXXXXXXXXXXXXXXXXXXXSDl	373
	*****	
hpv_L2_B1.pat	.....gjcEbrLLGoHSGDjiaarXXXoSifclXlclXmXXXXgggggggggggggggggXXSXDX	444
hpv_L2_B2.con	.....daIeLXTlgXXsXXXsiVDXXXestXXdXXeXXXXtXX.....XeXX	269
hpv_L2_B2.pat	.....kjIoLrTfXXrjXXXiXVDXfXXXiXflXXXXXXXXXX.....XkrX	444
hpv_L2_superC.con	.....XXXXXipvdeXXqgXXXtXXXeXXgfXeielDddlesXaXXppllXXXpigsgvrrXl	279
hpv_L2_superC.pat	.....XrXXXXfjXXXgrrXXXfXjcXErXXXXkggggDXXXrrXXXXXXXXXjXgXXXjXXXXXX	436

hpv_L2_all.con	XXXXXXXXXXXXsXXXXXXXXnXtXpXXXXXXXXXXXXXXXXXgpdXXXXXXXXXXXXXpXpXXXXXXXXXX	214
hpv_L2_all.pat	gggggggggggggggggggggXXXXXgXXXXXXXXgggggXXXXXgggggXXXXXgXXgXXXgXX	562
hpv_L2_superA.con	XXXXXXXXXXXXXXXXXXXXnttipLXXXXdXpXXXXXXXXGpDiXpXXXXXpXpXpXXXXXXXXvX	290
hpv_L2_superA.pat	gggggggggggggggggggXjXfXXXXrXXXggggGjDcXXXXXgXXXXXjXgXXXXXXXXgaX	488
hpv_L2_A2+A3+A4.con	attsvXsXXXstlXtXXXnvTiPXvsXvDvpXXt...GPDIXpXspXqWPvXPpadtthyvY	358
hpv_L2_A2+A3+A4.pat	XrXjXXjgggrgggggggXTXPfXjDcXcXj...GPDaXXjXXjgXXPXPfXPXXXjrgaY	446
hpv_L2_A5+A6.con	XXXXXlfssttXXXXNVTiPlgtXwevPiys...GpDivlPTgpXtWPYvPqspXdtthdv	392
hpv_L2_A5+A6.pat	XrXXgXXXXjXrXgggggNVTXPFjrXdrXPfei...GjDafXPTjjjXWPXXPXjjXrXXXaf	442
hpv_L2_A7.con	XXtXsXpsXaSsXXXXysNXTXPlttXWdvPvnT...GPDivLPsttpXlPXvXptpidtXaIX	372
hpv_L2_A7.pat	XXggXXgggjSiggggdjNXTaPfiXjWlXPAT...GPDaXLPXXrXXXXPXXjjXIXIXIX	439
hpv_L2_A9.con	XXXX..XXXXXXXXYvpsNtipLXXgXdipiXsXXXXGPDipXXXXXXXXXXXXPiXpXpXsIi	350
hpv_L2_A9.pat	gggg..gggggggggXjXNXjaXfXXXXrXjXjgggGPDaXXXXXXXXXXXXfPcXPXXPiIf	471
hpv_L2_A10.con	XXssXsXtpX.....WGNTTVPLSLPXDXFvQp...GPDItFPTAstXTPysPVTPALPTGPVF	391
hpv_L2_A10.pat	XrijXiXjXg.....WGNTTVPLScPXDFcQj...GPDIXFPTAJXTPdrPVTPALPTGPVF	433
hpv_L2_superB.con	LldeaXedFsgsqlvXgXXrrstXsyvprfetXrXXsyyXqdXXgyyvaypesrXXXXXiiypX	408
hpv_L2_superB.pat	LXkXXXXrmFrXjrXfXXgrpXXXgXXXXXXXXgggXXXXXXXXXXXXXXXXXXXXXXXXXgXXXXX	538
hpv_L2_B1.con	LLdeavedFsgSgLVXGnXrRstXsyvPrfettrXXsyYXqDtXGyyVaYPesrXXXXXiIyPt	426
hpv_L2_B1.pat	LLkmXXkkFrXSrLVfGXgrRSXXgfiaPrfriXjprXXfYXrDXrGXXVXPXXrXXgXcIfPX	509
hpv_L2_B2.con	LlDpltenFXnshlvXXXXdegXsXXiptIppgXXXXXXXXXXXXsdXXvXXXXXXXXiXXXXlpXX	300
hpv_L2_B2.pat	LXDxfXrlFrrjrcXfXjXrpXXrXXXXIXXXgggXXXXXXXXXXXXXXXXXXXXXXXXXXXXXr	509
hpv_L2_superC.con	ipXqXfXatXptgvvtygspdXsysaspvXyXdXXXXXlXidXpTXXXXXiIidXhXXXXXXX...	314
hpv_L2_superC.pat	XXXXXXrjjXXXjXXXXrXXXXXXXXggggXXrrjjrgXXXrXTXXXgXXIXXjXrfXXggg...	498

**Patterns  
L2**

hpv_L2_all.con	XXgXXXXXXXXXXXXdfylhPsXXXXXrRrkrXXX	227
hpv_L2_all.pat	ggXXggggggggggXdxXfXPXXgggggggnnXXgg	600
hpv_L2_superA.con	iXgX.....dfyLXPXyXXXXXrkrRkRkXpyf fadgXvAa	314
hpv_L2_superA.pat	gghX.....XdXLXPXXXgggXnnRkXfgggf jXggcAX	523
hpv_L2_A2+A3+A4.con	IdGg.....DXyLwPvXXXXXpXRRKRvsYffadGfvAX	384
hpv_L2_A2+A3+A4.pat	IXGj.....DddLfPXXfXfggXnRRKRcXYXf jDGXcAX	481
hpv_L2_A5+A6.con	iqGs.....tfaLWPvylX..rrRRKriPYFFadGXVaa	423
hpv_L2_A5+A6.pat	aXGX.....rdXLWPFXefX..rnRRKRcPYFFjDGXVAX	475
hpv_L2_A7.con	IXGt.....nYyLXPlyyff..XkRRKriPYFFadGfvAX	400
hpv_L2_A7.pat	IXGi.....rYdLfPffddf..XnRRKRcPYFFjDGXcAX	472
hpv_L2_A9.con	vDgg.....DFyLHPSYyXL..rrRRKriPYFFXDVsvAa *****	380
hpv_L2_A9.pat	XDhj.....DFfLHPSYdcL..nnRRKXfjYFFjDVrcAX	504
hpv_L2_A10.con	Itgs.....XFYLyPtWYFa..RkRRKRvsLFFXD..VAA *	420
hpv_L2_A10.pat	Iihj.....XFYLePjWYFj..RnRRKRajLFFjD..VAA	464
hpv_L2_superB.con	pdXpXvXihtXdXsgXdfylhPslXX.XXrkrkrkyl	435
hpv_L2_superB.pat	XXXXXgXXXXXXgXgrdXfrPXffg.ggggggnnrXX	575
hpv_L2_B1.con	pdXPvvihtXdXsg.dfyLhPSLXX.XXrkrkrkYL *****	455
hpv_L2_B1.pat	jrXPXaaXrXXrXjX.rdf frPSLgg.ggXnRnRrYL	545
hpv_L2_B2.con	XXvpXXXpXXXXdXysDfXlXPXlXX..XXrKkrXdxX	317
hpv_L2_B2.pat	XXXXXgXXXXXXgXrDdXfrPXffg...gggKnnnXXXf	546
hpv_L2_superC.con	.....XXYyLHPSLLX...rkrXKRkha *****	330
hpv_L2_superC.pat	.....grYXLHPSLLg...gggnKRrXX	518

hpv_L2_all_1		<b>FFGGLGIGTGXGTGG</b>	
Y00842	108	<b>G<sub>t</sub>G<sub>t</sub>GTG<sub>t</sub>GTGG</b>	OSRAB21_1 RAB21 protein [Oryza sativa]
Y00842	105	<b>GG<sub>t</sub>G<sub>t</sub>GTG<sub>t</sub>GTG</b>	OSRAB21_1 RAB21 protein [Oryza sativa]
X54251	989	<b>GvGvG<sub>v</sub>G<sub>v</sub>G<sub>n</sub>GG</b>	DMMASTER_1 nuclear protein [Drosophila melanogaster]
X54251	986	<b>GGvGvG<sub>v</sub>G<sub>v</sub>G<sub>v</sub>G</b>	DMMASTER_1 nuclear protein [Drosophila melanogaster]
M29256	24	<b>F<sub>g</sub>GGLGIG<sub>g</sub>G<sub>f</sub>G</b>	UROINF24_1 U.appendiculatus infection structure-specific protein gene, complete cds. [Uromyces appendiculatus]
M29256	19	<b>F<sub>n</sub>G<sub>g</sub>G<sub>f</sub>G<sub>g</sub>G<sub>i</sub>G<sub>i</sub>GG</b>	UROINF24_1 U.appendiculatus infection structure-specific protein gene, complete cds. [Uromyces appendiculatus]
M92914	1580	<b>GGvGvG<sub>v</sub>G<sub>v</sub>G<sub>v</sub>G</b>	DROMASTM_1 mastermind [Drosophila virilis]
M92914	575	<b>FGG<sub>f</sub>GvG<sub>i</sub>G</b>	DROMASTM_1 mastermind [Drosophila virilis]
M92914	1585	<b>GvGvG<sub>v</sub>G<sub>v</sub>G<sub>v</sub>vG</b>	DROMASTM_1 mastermind [Drosophila virilis]
X57581	2	<b>sG<sub>t</sub>G<sub>t</sub>GTG<sub>r</sub>GTG</b>	BOMVCPA_1 coat protein [Bamboo mosaic virus]
X57581	7	<b>G<sub>t</sub>G<sub>r</sub>GTG<sub>t</sub>G<sub>v</sub>GG</b>	BOMVCPA_1 coat protein [Bamboo mosaic virus]
S53300	32	<b>GG<sub>t</sub>G<sub>t</sub>GTG<sub>t</sub>GTG</b>	S53300_1 per gene product [Drosophila teissieri]
S53300	53	<b>G<sub>t</sub>G<sub>t</sub>GTG<sub>t</sub>G<sub>n</sub>Gs</b>	S53300_1 per gene product [Drosophila teissieri]
M19723	478	<b>GLGvG<sub>f</sub>G<sub>s</sub>G<sub>g</sub>Gs</b>	HUMKERK5A_1 Human type II keratin K5 mRNA, 3' end. [Homo sapiens]
M19723	11	<b>GG<sub>y</sub>G<sub>f</sub>G<sub>g</sub>G<sub>a</sub>GsG</b>	HUMKERK5A_1 Human type II keratin K5 mRNA, 3' end. [Homo sapiens]
M21389	560	<b>GLGvG<sub>f</sub>G<sub>s</sub>G<sub>g</sub>Gs</b>	HUMKER2A_1 Human keratin type II (58 kD) mRNA, complete cds. [Homo sapiens]
M21389	93	<b>GG<sub>y</sub>G<sub>f</sub>G<sub>g</sub>G<sub>a</sub>GsG</b>	HUMKER2A_1 Human keratin type II (58 kD) mRNA, complete cds. [Homo sapiens]
L08127	36	<b>GGiGIGaG<sub>v</sub>Gs</b>	POUSPB_1 usp2 gene product [Puccinia graminis]
L08127	6	<b>FFaaLs<sub>a</sub>asG</b>	POUSPB_1 usp2 gene product [Puccinia graminis]
X61914	185	<b>GGLG<sub>t</sub>G<sub>i</sub>G<sub>t</sub>Gsa</b>	DCECP40_1 ECP40 [Daucus carota]
X61914	112	<b>GLGTG<sub>t</sub>GT<sub>t</sub>G</b>	DCECP40_1 ECP40 [Daucus carota]

hpv_L2_all_2		<b>VRXSRLGX</b>	
L11365	133	<b>VR<sub>v</sub>nRLG</b>	EBORNA_3 matrix protein [Ebola virus]
X61274	133	<b>VR<sub>v</sub>nRLG</b>	EVVP23_2 vp3 gene product [Ebola virus]
Z12132	121	<b>VR<sub>v</sub>nRLG</b>	MVREPCYC_3 vp40 [Marburg virus]
X64406	121	<b>VR<sub>v</sub>nRLG</b>	MVRNA23_2 vp3 [Marburg virus]
Z29337	121	<b>VR<sub>v</sub>nRLG</b>	MVVIRPR_3 VP40 protein [Marburg virus]
D15061	75	<b>VR<sub>p</sub>pRLG</b>	ECORRNHK12_2 ORF235 [Escherichia coli]
L28920	20	<b>VR<sub>a</sub>aRLG</b>	YSCCHR1RAA_11 Yar040p [Saccharomyces cerevisiae]
X73633	285	<b>lR<sub>s</sub>SRLG</b>	SLTNRB_2 TnrB3 gene product [Streptomyces longisporoflavus]
X79108	163	<b>VR<sub>e</sub>SRLa</b>	AMMIXTA_1 mixta gene product [Antirrhinum majus]
X55274	343	<b>iR<sub>r</sub>tRLG</b>	BCSLG8_1 S-locus glycoprotein [Brassica campestris]

hpv_L2_all_3		<b>HFYXDL SXI</b>	
X56692	56	<b>HFY<sub>t</sub>eLS</b>	HSCREACT_1 C-reactive protein [Homo sapiens]
X56214	56	<b>HFY<sub>t</sub>eLS</b>	HSCRPMR_1 C-reactive protein [Homo sapiens]
M11880	56	<b>HFY<sub>t</sub>eLS</b>	HUMCRPG_1 Human C-reactive protein gene, complete cds. [Homo sapiens]
M11725	56	<b>HFY<sub>t</sub>eLS</b>	HUMCRPGA_1 Human C-reactive protein gene, complete cds. [Homo sapiens]
M36299	376	<b>HFY<sub>t</sub>DLg</b>	HSE1GPEIA_2 Equine herpes virus type 1 glycoproteins gE, gI and 10 kDa protein genes, complete cds. [Equine herpesvirus type 1]
M86664	376	<b>HFY<sub>t</sub>DLg</b>	HSECOMGEN_74 membrane glycoprotein E [Equine herpesvirus type 1]
U04691	109	<b>HFY<sub>e</sub>DLp<sub>q</sub>v</b>	HSU04691_1 olfactory receptor [Homo sapiens]
X17496	57	<b>HFY<sub>t</sub>aLS<sub>t</sub>v</b>	MMCRP1_1 Murine mRNA for C-reactive protein (CRP). [Mus musculus]
X17496	38	<b>HFY<sub>t</sub>aLS<sub>t</sub>v</b>	MMCRP1_3 Murine mRNA for C-reactive protein (CRP). [Mus musculus]
X13588	57	<b>HFY<sub>t</sub>aLS<sub>t</sub>v</b>	MMCRPG_1 C-reactive protein [Mus musculus]

hpv_L2_A10_3		<b>ILKWGSLGVFFGGLGIGTG</b>	
U18997	253	<b>LGVFFG</b>	ECOUW67_57 Escherichia coli K-12 chromosomal region from 67.4 to 76.0 minutes. [Escherichia coli]
U18997	108	<b>L<sub>a</sub>WagismFF</b>	ECOUW67_57 Escherichia coli K-12 chromosomal region from 67.4 to 76.0 minutes. [Escherichia coli]
L16784	11	<b>WaSL<sub>l</sub>VFFGGL</b>	DVURRF12OR_4 Desulfovibrio vulgaris hmc-operon ORFS 2-6, (rrf1 and rrf2) genes, complete cds. [Desulfovibrio vulgaris]
U10398	239	<b>GtL<sub>t</sub>VFF<sub>p</sub>GL<sub>v</sub>IGa</b>	YSCH9315_12 YHR133c gene product [Saccharomyces cerevisiae]
M73530	380	<b>m<sub>t</sub>i<sub>l</sub>FG<sub>y</sub>LGIG<sub>v</sub>G</b>	BACNHAC_1 Na <sup>+</sup> /H <sup>+</sup> antiporter [Bacillus firmus]
M73530	349	<b>WG<sub>v</sub>sGaFFas</b>	BACNHAC_1 Na <sup>+</sup> /H <sup>+</sup> antiporter [Bacillus firmus]
M23009	251	<b>L<sub>m</sub>W<sub>l</sub>SLG<sub>y</sub>wF<sub>y</sub>GLGI<sub>n</sub>T</b>	STRLACS_1 S.thermophilus lactose transport system protein (lacS) gene, complete cds, and beta-galactosidase, 3' end. [Streptococcus thermophilus]
L16884	8	<b>G<sub>p</sub>FFG<sub>v</sub>mG<sub>a</sub>asa</b>	HELATPASEV_1 H <sup>+</sup> -ATPase V-type subunit [Heliiothis virescens]
L16884	95	<b>agLaV<sub>g</sub>FsGLa<sub>a</sub>G</b>	HELATPASEV_1 H <sup>+</sup> -ATPase V-type subunit [Heliiothis virescens]
X65051	8	<b>G<sub>p</sub>FFG<sub>v</sub>mG<sub>a</sub>asa</b>	MSVATP16S_1 vacuolar ATPase 16 kD proteolipid subunit [Manduca sexta]
X65051	95	<b>agLaV<sub>g</sub>FsGLa<sub>a</sub>G</b>	MSVATP16S_1 vacuolar ATPase 16 kD proteolipid subunit [Manduca sexta]
X77936	13	<b>G<sub>p</sub>FFG<sub>v</sub>mG<sub>a</sub>asa</b>	DMCSDUC_1 ductin, subunit C proteolipid vacuolar proton channel [Drosophila melanogaster]
X77936	99	<b>agLaV<sub>g</sub>FsGLa<sub>a</sub>G</b>	DMCSDUC_1 ductin, subunit C proteolipid vacuolar proton channel [Drosophila melanogaster]
X55979	13	<b>G<sub>p</sub>FFG<sub>v</sub>mG<sub>a</sub>asa</b>	DMVHATP_1 Drosophila mRNA for vacuolar H <sup>+</sup> -ATPase. [Drosophila melanogaster]
X55979	99	<b>agLaV<sub>g</sub>FsGLa<sub>a</sub>G</b>	DMVHATP_1 Drosophila mRNA for vacuolar H <sup>+</sup> -ATPase. [Drosophila melanogaster]
M85301	158	<b>IL<sub>w</sub>WagLG<sub>a</sub>l<sub>i</sub>n<sub>a</sub>fGIG</b>	RATNHEXIV_1 sodium-hydrogen exchange protein-isoform 4 [Rattus norvegicus]

hpv_L1_all.con	MXaXWrpXXXkvYlPpXXpvakvXstdeYvXrTniyyhagssRlltvGhPyfXXXXXXXXXXkX *****	44
hpv_L1_all.pat	MgggWXXXXXfYcPjggjaXrXXXikXYaXTXffejXiXRbcXcGrPXfXcgXggggggggg	65
hpv_L1_superA.con	M.alWrpsdXXvYlPPXXpVskvvsTdXyVtrTniyYhagssRlltvGhPyfXiXkXXXXXXXXkX	49
hpv_L1_superA.pat	M.ggWXXkXcYcPPggjVjracXTkXYaXTXffYehjijRlCxcGrPefXcgXgggggggrX	64
hpv_L1_A2+A3+A4.con	M.A1WRpXdXkvYLPP.TPVSKV1STDXYVtrTNXyYygGsSRLlTVGHPyysiXksXXXsnkX ***** *****	54
hpv_L1_A2+A3+A4.pat	M.AbWRjXkXXVYLPP.TPVSKVcSTDXYVrRTNcdYehGiSRLcTVGHPefjcXXggggjgrnX	63
hpv_L1_A5+A6.con	M.AXWRpsdsKVYLPPt.PVskvvXTdXyvkRTXIfYhAGSSRLlXvGHPYysisKXX...XtkX ***** *****	51
hpv_L1_A5+A6.pat	M.AXWRjrkRkVYLPPj.PVSnAAXTkXYarRTXIdYeAGSSRLcjcGHPYdjajkXg...ggnj	60
hpv_L1_A7.con	M.A1WRsSDntVYLPPP.SVAkVvntDdYVtrTXIXYXAGsSRLlTVGhPYFkVXpXg...ggrkQ ***** **	56
hpv_L1_A7.pat	M.AbWRjSDrXVYLPPP.SVAnVvrTDkYViXTjIdYeAGiSRLlTVGrPYFnVgJXX...hXnQ	61
hpv_L1_A9.con	M.S1WRpsEATVYLPPV.pVSKVSTDEYVXRtnIYYhAGssRLLaVghPyfsIkkXXXnXkKi ***** *****	57
hpv_L1_A9.pat	M.ScWxjrEATVYLPPV.jVSKVSTDEYVjRTrIYYeAGijRLLjVGrPYdjIXrgggglXrKc	63
hpv_L1_A10.con	M...WRPSdnXvYVPPPpVSKViXTDAYVkrTNI fYHASSSRLlAVGhPYfXIkXaN...KT * **** ***** ***** ***** *****	53
hpv_L1_A10.pat	M...WRPSkrrcYVPPPpVSKVajTDAYVrTNI fYHASSSRLlAVGrPYdjInXXN...KT	57
hpv_L1_superB.con	MXavWXXaXGkvYLPPstPVARVqsTDeYvqrTniyyhaXsdRlLtVghPyfnvyXXX.XXgXkX ***** *****	52
hpv_L1_superB.pat	MgjXWXXXGpcYLPPjXPVAnVXrTDkYarXTrcfdejXikRbLXVGrPddXaXrgg.XXXggg	64
hpv_L1_B1.con	MXavWXXaXGkvYLPPstPVARVqsTDeYvqrTniyYHAXsDRLLTVGHPYfnvyXX...XXgXki ***** *****	53
hpv_L1_B1.pat	MgjcWXjjrGKaYLPPjjPVAnVQrTDkYaoRTladYHAXiDRLLTVGHPddlaXrg...XXXXXc	63
hpv_L1_B2.con	M.aXWlStXGkvYLPPsXPVARVLXTDEYvXXTXlyFhagteRlLiVghPYfdvXdXX.XXXXXX ***** *****	47
hpv_L1_B2.pat	M.jXWXXXGpcYLPPjXPVARVlrTDEYarXTrcfFejXikRbLXVGrPYdXaXlXg.XXXggg	63
hpv_L1_superC.con	M.AXWQXgQ.kLYLPP.TPVXKVLcSEXYXqrkXiFYHXETERXLTvGhpyyXv...XXXXgXk ***** **	44
hpv_L1_superC.pat	M.AfWQXjQ.XLYLPP.TPViKVLcSErYarXnraFYHhETERbLTXGrXfXXX...ggiXXXr	58

**Patterns  
L1**

hpv_L1_all.con	XvPKvSgXqyRvfrvXlPdpNkFAlpdXsXynpdXeRlvWacXGXEigrGqplGvgXsGhPlfNk *****	100
hpv_L1_all.pat	gaPKfSjXxeRXfrfXfjlpNrfjfxkXxfeljXXXRbcWXfXGcEajrGXXfGXXXXGrPffNn	130
hpv_L1_superA.con	XvPKvSgXqyRVFrvXLPDPNKfGlpdXsXynpXtqRlvWacvGvEvGRGqPLGvGXSGhPlXNk *****	106
hpv_L1_superA.pat	XaPKVShXQdRVFrcXLPDPNKfjfkXrfdljXxrRbcWhcXGcEaGRGXPLGXGXSGrPffNn	129
hpv_L1_A2+A3+A4.con	XvPKvSgyQyRVFrvVrLPDPNKfGLPDarXynPdXeRlvWactGvEVGRGqPLGVGLSGHPlYnk *****	116
hpv_L1_A2+A3+A4.pat	XaPKVShdQYRVFrvVpLPDPNKfHLPDhrcYlPkjoRbcWACXGaEVGRGXPLGVGXSGHPfYnn	128
hpv_L1_A5+A6.con	XiPKVSAXQYRVFRvrLPDPNKfGLPDxnXynPdqeRLVWacVGLEvGRGQPLGvGLSGhPLFNX *****	111
hpv_L1_A5+A6.pat	XaPKVSAdQYRVFRvrLPDPNKfGLPDjrfdNPrkrLrLVWhcVgCeaGRGQPLGXGcSGrPLFNn	125
hpv_L1_A7.con	diPKVSAYQYRVFRvXLPDPNKfGlpdXxlYnPetQRLVWAcvGvEiGRGQPLGvGLSGHPlYnX *****	117
hpv_L1_A7.pat	XaPKVSAYQYRVFRaXLPDPNKfjcPkXicYlPmiQRLVWACXGcEaGRGQPLGaGcSGHPfYnn	126
hpv_L1_A9.con	lVPKvSGLQYRVFRvXLPDPNKfGFPDTSFYnPXtQRLVWAcvGleVGRGQPLGVGiSGHPlLNK *****	120
hpv_L1_A9.pat	XVPKvSGLQYRVFRarLPDPNKfGFPDTSFYlPXXQRLVWACXGcEaGRGQPLGVGaSGHPfLNK	128
hpv_L1_A10.con	vVPKvSgyQyRVFKvVLPDPNKfALPDtSifDpTtQRLVWactGLEVGRGQPLGVGiSGHPlLNK *****	118
hpv_L1_A10.pat	cVPKvSGdQdRVFKcVLPDPNKfALPDiScdDjTiQRLVWACXGLEVGRGQPLGVGaSGHPfLNK	122
hpv_L1_superB.con	evPKvSgnQhRvfrlklPDPNrfALaDmsvynpdkeRLVWacrGleIigrGqplGvgstGHPlfNk *****	117
hpv_L1_superB.pat	gaPKfShrQeRXfrfXfPDPNnFABdXXXfeljkrXRLVWxfXGcEajrGXXfGaXiXGHPffNk	129
hpv_L1_B1.con	evPKvSgnQhRvFRlklPDPNrfALaDmsvynpdkeRLVWacrGleIigrGqplGvgstGHPlfNk *****	118
hpv_L1_B1.pat	XaPKvSgnQeRXFRcXfPDPNnFALXDMraelPknXRLVWjCXGcEijrGXXfGaXiXGHPffNk	128
hpv_L1_B2.con	XVPKvSgnQyRVfRXXlPDPNKfAlidXXXynsdXERLVWkLXGiEiGRGGPLGiGttGHPLXNK *****	103
hpv_L1_B2.pat	gVPKfShrQdRVfRfXfPDPNnFAbaDrXfdljkrERLVWnLXGcEaGRGGPLGaGiiGHPlfNk	128
hpv_L1_superC.con	TvPKvSXNqyRVFXiqLPDPNQFALPDXXvhnPSKERLVWavXGVQVSRGQPLGGtVtGHXXfNX *****	101
hpv_L1_superC.pat	TaPKVsjNqRVFnaXLPDPNQFALPDnjcelPSKERLVWjVaGVQVSRGQPLGGrVrGHjXXNj	123



hpv_L1_all.con	XXDtEnsXyXXXXXXXXXXXXXXXXDXRXnXsXDxKQtQlXiXGcXPXXGehWXkgXXCXXXXXXXX *****	127
hpv_L1_all.pat	XXDXEXXXGgggggggggggggDXRXXXjfdXKQXQcfccGXPPXXGpeWXXgXXCggggggg	195
hpv_L1_superA.con	ldDtEnsXXXXXXXXg....XXXXDXRXnXsmDyKQTQLciXGCXPPiGEhWgkGtXCXXXXXXXX *****	142
hpv_L1_superA.pat	XmDXEXXXGgggXXg....gggDXRXXXjcDXKQTQLficcGXCPjXGEeWjXGXXCggXgggg	189
hpv_L1_A2+A3+A4.con	ldDTENsniahXdXX.....XDsRdnisvDyKQTQLcIlGCTPpmGEhWgKGTXCXXXXXaX ****	162
hpv_L1_A2+A3+A4.pat	XmDTENjrXXggXXg.....XDjRkXajcDXKQTQLfIcGCrPjCgEeWjKGTXCXXXXgXX	185
hpv_L1_A5+A6.con	lDDTEsSXXAnXnXX.....eDsRDNiSVDXKQTQLCIiGCXPaiGEHWtkGtXCkstpXXX *****	157
hpv_L1_A5+A6.pat	fDDTEXSrcAXXlXX.....XDXRDNXSVDXKQTQLCIaGcJPjCgEHWjXGjXcNrjXXXX	182
hpv_L1_A7.con	lDDTEnsHfXsavXt.....kDsRDnVSVDYKQTQLCIiGcVPAiGEHWaKGXaCKpXXvXX *****	167
hpv_L1_A7.pat	XDDTErjXXjiXXg.....pDXRDNVSVDYKQTQLCIcGCXPacGEHWjKGrXCKjXXgg	183
hpv_L1_A9.con	fDDTEnsnkYXgXpG....XXXXDNREciSMDYKQTQLcliGcKPPiGEHWGKGXpCnnaXXX *****	170
hpv_L1_A9.pat	fDDTErXrXYXhXjG....gggXDNREccSMDYKQTQLCccGcNPPXGEHWGKGXjCrXXXXXX	188
hpv_L1_A10.con	yDDVENSasyaanPG.....QDNrVNVaMDYKQTQLClVGCAPPLGEHWGkGkqCxnXsvqX ***** **	172
hpv_L1_A10.pat	fDDVENSjhghXPG.....QDNrVNVhMDYKQTQLCbVGCAPPLGEHWGpGrXCrXXXvrx	179
hpv_L1_superB.con	vXDtENXnXyXXXsXXXXXXXXXXDdRqntSfDPKQXQmfiiGCXPcXGehWdkaXpCXXXXXXXX *****	155
hpv_L1_superB.pat	fXDjENXXXXXgggggggggggDmRXlXSFDPKQXQcfaaGCXPXXGpeWkXhXXCgggXXgg	194
hpv_L1_B1.con	vXDtENXnXyXXXsXXXXXXXXXXDDRqntSfDPKQXQMFiiGCXPcXGehWdkaXpCXXXXXXXX *****	156
hpv_L1_B1.pat	cXDjENXXXXXXjXgggggggggDDRlXSFDPKQcQMFaaGCXPccGpeWkXhXXCgggXXg	193
hpv_L1_B2.con	XGDtENPXXYXXXXXXXXX.XXqXdDnRqdvSXDPKQtQXfIvGCXPAXGEhWDXAePCXXpXpXX *****	143
hpv_L1_B2.pat	fGDienPXXYXggggggg....gggrDmRXlScDPKQXQcfIaGCXPAXGEeWDXApPCgrXXgg	191
hpv_L1_superC.con	l1DAENVXXKVtaQX.....TDDRkQtGXDaKQQQiLlLGCTPAXGEYWTtARPCVTDRXen *****	152
hpv_L1_superC.pat	fcDAENVrnKvrjQj.....TDDRkQjGbDXKQQQaLbLGCTPAXGEYWTtARPCVTDRXkX	180

**Patterns  
L1**

hpv_L1_all.con	XXgdcPplelXnXviedgdmXdxGfGamnfXXLqXnksdvpldiXXXXckyPDylkMXXdXyGds	176
hpv_L1_all.pat	gggXXPXcXfXrXXcoXhkMXrXGfGXXLXXXLXXrnXXXjckcXXXXXdPfcXMXkXeGlX	260
hpv_L1_superA.con	..gdCPpLeLXnXXiqDGMVdtGfGamdFXXLQXnksdVPLDiCXSxcKYPDYLXMaadPYGds *****	196
hpv_L1_superA.pat	..gkCPXLXfXrXXcoDGMXrXGdGXclFXXLQXrnXmVPcDcXXXXXKYPDYcXMXjkXYGlX	252
hpv_L1_A2+A3+A4.con	..gDCPPLelXtXXIqDGMVdtGfGamDFaaLQXNkSdVPLDICqXtCKYPDYLgMAAePYGDS *****	220
hpv_L1_A2+A3+A4.pat	..jDCPPLofXrjXIoDGMVktGdGAcDFjXLQXNnSkVPcDICrrXCKYPDYLXMAAkPYGDx	248
hpv_L1_A5+A6.con	..GDCPPLeLXnspIedGDMXdTGFgAmDFkaLQesKsdVPLDIXQStCKYPDYLKMSADaYgDs *****	217
hpv_L1_A5+A6.pat	..GDCPPLXLarIXIoDGMaDXGFGAbLFXLQXiKjkVPcDIXQsXCKYPDYLKMSADjYGlS	245
hpv_L1_A7.con	..GDCPPLeLvNtpieDGMXDTGYGAMDFstLQXtKsEVPLDICQSiCKYPDYLQMSADvYGDS *****	228
hpv_L1_A7.pat	..GDCPPLeLXNTXcoDGMaDTGYGAMDFXXLQkrKXEVPLDICQSaCKYPDYLQMSADXYGDS	246
hpv_L1_A9.con	..gdCPPLeLXNtviqDGMVdtGfGAMDFttLQanKsdVPLDICXSicKYPDYLkMvsEPYGDS *****	231
hpv_L1_A9.pat	..gkCPPLoLXNiacoDGMVrTGfGXMDfXjLQXrKSmVPcDIXSxCKYPDYcpMXjEPYGDx	251
hpv_L1_A10.con	..GDCPPLeLItSVIqDGMVDTGfGAMNFaeLQXNKSDVPLDICtXtCKYPDYLQMAADPYGDR *****	233
hpv_L1_A10.pat	..GDCPPLeLiSVIoDGMVDTGfGAMNFAkLQjNKSDVPCDICjXCKYPDYLQMAADPYGDR	242
hpv_L1_superB.con	X.gXcPPieLkntvIedGdMXDiGfGnXNfkXLqXnrsdvsldivnetckyPDFLkMXnDvYGDS *****	212
hpv_L1_superB.pat	g.XXXPPcpLXrjXIoXGkMXDXGdGXXNXXXLXXrnjXXjckcXXrXXXdPDLrMXrDaYGDx	258
hpv_L1_B1.con	X.gXcPPieLkntvIedGDMaDIGfGNiNfkXLqXnrsDVSldiVnetCKYPDFLkMqNDvYGDa *****	216
hpv_L1_B1.pat	g.XXcPPcpLXrjXIoXGDMXDiGdGNeNXnXLrXrnjDVScDcVlmXCKYPDFLrMXNDaYGDj	257
hpv_L1_B2.con	..GXcPPIXLvnsyIqDgdMcDiGfGaaNFXXLqqDksgvPLdXXXXickwPDFLKMtKDiYGDS *****	198
hpv_L1_B2.pat	..GXXPPIpLXrifIoDgkMXDXGfGXXNFXXLXXDnjXPLkcXXrcXXdPDLKmjKDaYGDx	254
hpv_L1_superC.con	..GXcPPXELKnkhIEDGMMXiGfGAAAnFkelNAXKSDLPLDIXneICLYPDYLKMXEXAAGNS *****	208
hpv_L1_superC.pat	..GjCPPcELKXrXIEDGMMkIGfGAAIfKrcNAiKSDLPLDIXrrICLYPDYLKmjEkaAGNS	243

hpv_L1_all.con	XfFXxrEqXfarHffnrXgXXgdXipXXXXXXXXXXXXXXXXXXXXXXXXXgXsYfptpSG **	205
hpv_L1_all.pat	fdFXnpEXfdXRHXfXXXXXXXXgkXXXXXXXXgggggggggggggggggggggXXXXdXjXSG	325
hpv_L1_superA.con	mfFXlRrEQmFarHffNragXvGXXpXXlyikG.....XXXXrXXXsXXyXptPSG *****	231
hpv_L1_superA.pat	bdFXcRnEQcFXRHffNXXXXGkXcjXXffXrjg.....gggggggXXXXdXXiPSG	307
hpv_L1_A2+A3+A4.con	MFFXLRrEQlFarHffNragXXGdXiPdXlyXKgX.....XXXXgXXpGSavYspTPSG ****	261
hpv_L1_A2+A3+A4.pat	MFFXLRnEQbfJRHFfNXXjXXGkXcPkXffXkjX.....ggggXXXXGSaYXjTPSG	303
hpv_L1_A5+A6.con	MwFyLRREQlFarHyfNragXvGeXiPXdlyiKGS.....XngRdPppSsvYvATPSG ****	266
hpv_L1_A5+A6.pat	MdFeLRREQcFjRHddNnXXXaGkXcPXrfYfKj.....grXrkPXXSxaYXATPSG	298
hpv_L1_A7.con	MFFCLRrEQlFARHFWRNgGmXGdtiPXXLYIKGT.....X.XdiraXPgsXvYsPSPSG *****	275
hpv_L1_A7.pat	MFFCLRnEQcFARHFWRNgGXcGDxcPXrLYIKGT.....g.ggcXXrPjiXcYXPSPSG	300
hpv_L1_A9.con	LFFyLRREQMFVRHfFNRAgtvGeXVPXDLYIkGX.....XsgXTatlXssYfPPTPSG *****	278
hpv_L1_A9.pat	LFFdLRREQMFVRHfFNrjGrcGkXVPXDLYIpGg.....gggrThXcXriXdFPTPSG	305
hpv_L1_A10.con	LFFyLRKEQMFARHFFNRAGtVGEXvpXdLXXKg.....XXXXtvXnsIYXnTPSG *** *****	274
hpv_L1_A10.pat	LFFdLRKEQMFARHFFNRAGrVGEXa jXrLffKj.....gXgggicjrjIYfrTPSG	294
hpv_L1_superB.con	cFFyarrEqcYarHffvrgGXXGdXiPXXXXXXXXXXnXXyXpXXXqXqXXXlgnsXYfpTvSG ***	252
hpv_L1_superB.pat	fffXnpEpfYjRHXdXrhGXXGkXcPXXgggggggggXXXXgggggggXXcXXXXYfjTXSG	323
hpv_L1_B1.con	CFFyarREqCYARHffVRGGkXGDdiPXXXvXXgXXknXfyipaXXXqXqXXXlgnsYfPTvSG ****	265
hpv_L1_B1.pat	CFFfXRREpCYARHXdVRGGXXGDxcPXXXaXXXgggrXdfcXjgggggggXXcXrjXYfPTXSG	322
hpv_L1_B2.con	vFFfgkrEQlYaRHfVraGXmGdXlPXXXvXXXX...yXXXaqXXXqXXlGXXXyfXTPSG ****	235
hpv_L1_B2.pat	cFFdhnPEQfYjRHfFXrhGXXGkjcPrXXggggg...XXXXXrXrXrcGjXXYfjTPSG	315
hpv_L1_superC.con	MFFFARKEQVYVRHIWtrgGXXKEaPpeXXyLKXX.....XGXXtlKXPSvXFgsPSG *****	250
hpv_L1_superC.pat	MFFFARKEQVYVRHIwiXXGikEXpjXddLKXX.....gGkXrXKcPSaXfjXPSG	296

**Patterns  
L1**

hpv_L1_all.con	SlvtsdaQlFNkpyWlqragghNNGicwXNqlFvTvvdtttrstnXtisXXXXXXXXXXXXXXXXXXXX *****	251
hpv_L1_all.pat	ScXjirXQcFNnjfWcrpXrXXNXXcfdXNrXFcTfXXriXXXrfXcXXgggggXgXggggggg	390
hpv_L1_superA.con	SmvtSeaQlFNkpyWlqrAqghNNGicwXNqlFvTvVdTtrstNXtXca...XXXXX.XXXXXX *****	277
hpv_L1_superA.pat	ScaiSkXQcFNKjFwcrpArXXNNGcfdXNrcFcTfVXTiXrTNfXcXX...gXgXg.gXgggg	367
hpv_L1_A2+A3+A4.con	SMvsSeXQlFNkpyWlrrAqghNNGicwFNxlFvTVVDtTRSTNXtXcX...atXsX.XXeX.. ***	309
hpv_L1_A2+A3+A4.pat	SMaiSkXQcFNKjyWlppArXrNNGcFWXNpcFcTVVDtTRSTNfXcXX...jXXjX.gXrg..	361
hpv_L1_A5+A6.con	SMiTSeaQlFNkpyWlqRAQGHNNGICWgNqlFvTcVDtTRsTNlTist...aXXXX.XXXX.. *****	316
hpv_L1_A5+A6.pat	SMaTskjQcFNkpyWlRRAQGHNNGICWxNqCfaTfVdTRrTNbTcrj...XXXXg.XXgg..	356
hpv_L1_A7.con	SmvtSDSdQLFNkpyWlHKAQGHnNGicWHNQLFXTVVDtTRSTNftlsa...stesX.iPXX.. *	329
hpv_L1_A7.pat	ScaiSDSdQLFNkpyWlHKAQGXNNGaCWHNQLFcTVVDtTXSTNficXj...XXrrj.aPXX..	358
hpv_L1_A9.con	SmVTSdaQiFNkpyWlQRAQGHNNGICWgNqlFvTVVDtTRSTNMxlC...avXsX.XsT.. *	330
hpv_L1_A9.pat	ScVTSkjQcFNkpyWbQRAQGHNNGICWjNqCfVTVVDtTRSTNmifj...XXXrg.kjT...	362
hpv_L1_A10.con	SLVSSEaQLFNkpyWlQkAQGHNNGICWgNqlFvTVVDtTRSTNMtXCA...attXs.XsXT.. *****	328
hpv_L1_A10.pat	SLVSSEjQLFNkPdWlQnAQGHNNGICWgNrlFvTVVDtTRSTNMtCca...giXrr.gjXT..	352
hpv_L1_superB.con	SlvssdaQLFNRPfWlqRAQGHnNGilWxNqXFvTvVdNTrntNfsIsvXXXXXXXXXXXXXXXXXXXX *****	299
hpv_L1_superB.pat	ScXiirXQLFNRPdWcrRAQGXNXXIfWXNocFaTcXDrTrrXNfrIXaggggXXXXggggXXg	388
hpv_L1_B1.con	SLVssDaQLFNRPFWLqRAQGHnNGilWxNqmFvTVVdNTrnTNfIsV...XXXXX.XXXXiX ****	314
hpv_L1_B1.pat	SLViidjQLFNRPFWLpRAQGrNNGIfWXNqCfaTVXDrTrrTNfiIXa...gXrXX.gggXXX	382
hpv_L1_B2.con	SlXsSxSdQLFNRPYwLXRAQgtNngICWgNqlFvTxvDnThNtNftISVXXXXkXXaXXXXXXXX **	282
hpv_L1_B2.pat	ScXiSrrQLFNRPYwcrRAQgJNXXICWxNocFaTcfDNTrNXNfrISVggggrXXXXgXXXXXg	380
hpv_L1_superC.con	SLVSTdgQlFNRPYwLFRAGMnNGicWnnXlfxTVGDNTRGttLtItV...pXXgX.XXpLtE *****	303
hpv_L1_superC.pat	SLVSTDXQcFNRPYwcfRAQGMNNGaXWggggggTVGDNTRGirLiIiV...jXXXr.ggjLiE	356

hpv_L1_all.con	XyXXXXfkeylRHvEEydlqfifqLCKiXLtaevmayihXMnXXiledWnfgXXpppXXXlXdtY *****	301
hpv_L1_all.pat	gdXXXrfXrdXRHXEEdrcXfXfpLCXaXLXrXbXXcrXMrXXccXXWrfXfXXjXXXXcXrXY	455
hpv_L1_superA.con	.yXXXXfkeylRHXEYdlqfifQLCKitLtXevMaYiHXMnXXiLedWnfgLXpPpsXsLedtY	330
hpv_L1_superA.pat	.dXXXrfXodXRHXEEdkcofXfQLCxaXLrXmXMYcHXMrXXcLXXWrfXfXPPXjrLXkXY	431
hpv_L1_A2+A3+A4.con	.YXatnfkEyLRHXEEYDLQFIFQLCKitLTPeiMaYlHnMnXXLLXdWNFGvXpPPStSLXdTY *****	366
hpv_L1_A2+A3+A4.pat	.YrjirfnEdLRHXEEdDLQFIFQLCKarLTPkaMjYcHrMlXXLlkkWNFGcXXPPSjSLrkTY	425
hpv_L1_A5+A6.con	.fXpXXXkQyIRHgEEYELQFIFQLCKitLttevMAYlHtMnstiLeXWNfGLtLpPaSLEDaY *****	374
hpv_L1_A5+A6.pat	.drjXrfrQdcRHXEYELQFaFQLCKiLiIjkXMaycHXmLXXcLkXWNfGLiXPXjSLEDXY	420
hpv_L1_A7.con	.YdptkFkEYXRHVVEYDLQFIFQLCtiTLtaDVMsYIHtMNXXILXnWNfgVXPPpsaSLVDTY *****	388
hpv_L1_A7.pat	.YrjrrFKoYXRHVVEEdDLQFIFQLCraTLiJkVMjYIHrMnjjILXlWNfhvJPPPjSLVDTY	422
hpv_L1_A9.con	.yKnXNFKEYlRHgEEYDLQFIFQLCKitLtAdvMtYIHsMnpXILEdWFXGLtppPpsgLeDTY *****	391
hpv_L1_A9.pat	.dKrrNFKEYcRHXEEdDLQFaFQLCKaiLiAmaMrYIHxMlJXILEdWrFGLrjPPjhrLoDTY	426
hpv_L1_A10.con	.YtXXXkqYMRHVVEEdLQFIFQLCsItLtAEVMaYiHTMnPxILEdWNfGLSPPPNGTLEdtY *****	388
hpv_L1_A10.pat	.YrXrrYKoYMRHVVEEdDLQFcFQLCiIrLiAEVMjYcHTMNjjaLErWNfGLSPPPNGTLEDrY	416
hpv_L1_superB.con	XYXXXXfreylRHvEEyeXslilqLckvpLkaevlaqinaMnsXiLeXWQLGfVptpdnpihdtY *****	356
hpv_L1_superB.pat	gYrXXrfrodXRHXEEdocrfafpLCraXLXjrabjrcrXmLXXcLkmWQLXdVPjjXrjcXrXY	453
hpv_L1_B1.con	XYXsXXfrEylRHVVEYeiSlILQLCkvpLkaevLaqINAMNsXiLeXWQLGfVptpdnpihdtY *****	373
hpv_L1_B1.pat	rYrjXrfrEdXRHVVEYocSfILQLCnaJLXjraLjpINAMNXXcLEmWQLGfVpjkrjcrXY	447
hpv_L1_B2.con	XYkXXDFkQYlRHtEEyEXEfiqLckVpLtaDvLAHLnVMnpiLenWQLXfVPPpPsGIeDXY *****	341
hpv_L1_B2.pat	gYrXXDFrQYXRHXEEdEcEfafpLCrVXLrjDabAHLrVmlXrILkmWQLXdVPPjPrGIXDXY	445
hpv_L1_superC.con	.YDtsKFNvyXRHVVEYKLafileLCSVeltpeTvshLQgImPSXLenWeiXvqPptssiLEDtY	364
hpv_L1_superC.pat	.YDijKFNcdXRHcEEdKLafafLCSVrciXoTcJXLQjXXPSaLorWkaXcrPPjjiaLEDXY	420

**Patterns  
L1**

hpv_L1_all.con	ryXXXsXAiXCqXXXppXekXXDpyXXXXFWXvdlXekfsXdLdQfplGrkflXQaglXXXXXXXX *****	340
hpv_L1_all.pat	rdfXggXAXXCXgXXXXgXggDXfXXfXFWXclbrmrfiXrLrQXjXGnndcfQXXXXggggXg	520
hpv_L1_superA.con	rFvX.sXAitCqkXXppXXkXXDpyXkXXFWXvdLkekfsXdLdQfplGRKFLlQXgXrXrpXXX *****	375
hpv_L1_superA.pat	rdfr.gXAXXCrXgXjXXgXXgDXfXXfXFWXalLrmrfiXrLrQdjXGRKFbcQXXXXgggXXg	495
hpv_L1_A2+A3+A4.con	rflq.SrAITCQkXaapXXpkXDpYaXlXFwDVLkdXfstDLdQfPLGRKFLlQXGXXXXsXvX *****	416
hpv_L1_A2+A3+A4.pat	rdfr.SrAITCQngXjXgXrgDXXXbrFWrVdLrkrfiXDLrQdPLGRKFLbQXGXggjXXg	489
hpv_L1_A5+A6.con	Rfvk.nXAttCqrdXPpXXKq.DPlaKyKFwDvdLkeXFSXDLDQfplGRKFlmQlGvrXkpXXX	427
hpv_L1_A5+A6.pat	Rdan.rXAXiCrnmXPjXXXK.DPFXKfKFWrVlLpmrFSXDLDQdjXGRKFbbQXGXpXXXXj	483
hpv_L1_A7.con	RylQ.SaAitCQKDapXpekK.DPYDXLkFWnVdLkEkFSXeLDQfPLGRKFLlQagXrRrPTIG * ***** *	447
hpv_L1_A7.pat	RdcQ.SXAajCQKDjXjXrp.DPYDXLrFWXVlLnEnFSXkLDQdPLGRKFLcQXXXRnPTIG	485
hpv_L1_A9.con	RfVT.sqAitCQKtXppkpKeXDPlkYtFWEvXLKEKFSADLDQfPLGRKFLlQaGlArPkfX *****	451
hpv_L1_A9.pat	RdVT.grAajCQKXjXXXXkgDPfXrYXFEalLKEKFSADLDQdPLGRKFLlQjGfpAnPrfg	490
hpv_L1_A10.con	RYVQ.SQAITCQKPtPeKeKq.DPYaXlSFWEVnLkEkFSSELDQyPLGRKFLlQtGvqXRssXR **** ***** *****	448
hpv_L1_A10.pat	RYVQ.SQAITCQKpjPkKXXK.DPYXXbSFWEVlLnEkFSSELDQdPLGRKFLlQiGfpjRiJXR	479
hpv_L1_superB.con	RyiX.SXATrCPdkXppkeke.DPyXXXXFWXvdltErLsldLdQyslGrkflfQaGlqXXtXXX	407
hpv_L1_superB.pat	RdcX.SXATXCPXXXXXXrXg.DPdXXfrFWXclbrEnfSxkLrQdjfGnndcdQXGcXggggXX	516
hpv_L1_B1.con	RyiX.SXATrCPdkXppkeke.DPyXXXXFWnVdltErLsldLDQyslGRKFlfQaGlqqXtvng *****	428
hpv_L1_B1.pat	RdcX.SXATXCPkXXXXXrnX.DPdXXfrFWrVlbiEnLSLkLDQdjfGRKFcFQXGcXXgggXX	510
hpv_L1_B2.con	RyiX.SXATXCPtXXpXteXe.DPYKXysFWXvdltErFSselsQfslGrrfLyQXGLlmgXXKR	392
hpv_L1_B2.pat	RdcX.SXATXCPjXXjXXkXg.DPYKXfiFWXclbrEnfSrklrQdjLgnndLdQXGLcggggKR	508
hpv_L1_superC.con	Ryie.SpAtKCadnvXpXXXe.DpYaglkFWXidLkEkLsldLDQfPLGRrflaqqgagcstvrk *****	422
hpv_L1_superC.pat	RdXk.SXAXKXrrXXjXgXg.DYXXXXrFWralLnEnfSXDLQfPLGRXflLXXrXXXXrXXXp	483

hpv_L1_all.con	XXkXXXXXXXXXXXXXXXXXXXXXkXkX	343
hpv_L1_all.pat	gggXXXgggggggggggggggggXXXX	548
hpv_L1_superA.con	XXkrXaXXXXXsXXXXXXXXXkrkXkX	384
hpv_L1_superA.pat	ggXXXXgXgggggggggggggggXXrX	523
hpv_L1_A2+A3+A4.con	sRKRXaXtXXXXXXXXXaa...krkrXkk	430
hpv_L1_A2+A3+A4.pat	XRKRXjXjXggggXjjjg...gggnXnn	514
hpv_L1_A5+A6.con	tXkrsasstststpsXXXXXXXXkrkrX	446
hpv_L1_A5+A6.pat	XgrXXXXXjjjijgggggggggnnXrn	511
hpv_L1_A7.con	PRKRpAXsXXXssXXXXXXXXkRkrvsK ****	464
hpv_L1_A7.pat	PRKRjAgjXiijgggggXKrgRrXrXrK	513
hpv_L1_A9.con	XgkrXAXPXXXsXXssX...KrkKvKX	465
hpv_L1_A9.pat	ggXrXAgPgggggXiijg...KnnKXXKX	514
hpv_L1_A10.con	vGrKRpAsXXtsXXXX...XXXkXXXXk	461
hpv_L1_A10.pat	XGXKRjAXjXjjjjgg...ggXnXXrnn	504
hpv_L1_superB.con	XXkXXsXXXsXXgXXXX...Xkrkrkn	417
hpv_L1_superB.pat	gggXXXgggggXXggggg...gnnnXXr	540
hpv_L1_B1.con	tXkXXsXXXsXrgtXX...KRkrkn	441
hpv_L1_B1.pat	gggXXXgggggXXggggg...KRnnXr	532
hpv_L1_B2.con	XrXXXXXXXXaXXXXXXXX...KRkRXX	398
hpv_L1_B2.pat	XXXXXXXXgXXrXggggg...KRnRXX	531
hpv_L1_superC.con	raXXtkXsskpaXXXXXXXXXrkkkkkX	437
hpv_L1_superC.pat	XXXXXXXXrnXXgggggggggggXXXXX	511

hpv_L1_all_1		<b>RLLTVGHP</b>	
Z46658	435	<b>LLTVGnP</b>	HAV6ORF2_1 capsid polyprotein precursor [Human astrovirus type 6]
X83868	134	<b>R<sub>γ</sub>LsiGHP</b>	HSEP2PR_1 EP2 prostaglandin receptor [Homo sapiens]
U19487	134	<b>R<sub>γ</sub>LsiGHP</b>	HSU19487_1 prostaglandin E2 receptor [Homo sapiens]
U00031	282	<b>RLLsVGq</b>	CELB0361_6 B0361.8 gene product [Caenorhabditis elegans]
D16555	93	<b>qLLTV<sub>v</sub>HP</b>	AHSRPS5_4 secretion protein Y [Acyrtosiphon kondoi]
X77921	498	<b>RLLaIGnP</b>	EAAMASL_4 membrane-associated ATP-hydrolase [Erwinia amylovora]
X77921	183	<b>RimsIGHP</b>	EAAMASL_8 glycosyl tranferase [Erwinia amylovora]
U18997	93	<b>qLLTV<sub>v</sub>HP</b>	ECOUW67_224 secY gene product [Escherichia coli]
X01563	93	<b>qLLTV<sub>v</sub>HP</b>	ECSPC_11 Escherichia coli spc ribosomal protein operon. [Escherichia coli]
M21159	66	<b>RLL<sub>e</sub>V<sub>e</sub>HP</b>	DROTCP1_1 T-cp1 gene product [Drosophila melanogaster]

hpv_L1_all_2		<b>LPDPNKFAL</b>	
L35053	161	<b>LPDPdKfT</b>	MGNGAGPOLH_1 gag gene product [Magnaporthe grisea]

hpv_L1_all_3		<b>RLVWACXGXEIGRG</b>	
Z14035	212	<b>VWAC<sub>a</sub>G<sub>g</sub>aIG</b>	SPCAR1GNA_1 car1 protein [Schizosaccharomyces pombe]
M11277	2	<b>RLVW<sub>k</sub>C<sub>g</sub>a<sub>i</sub>q<sub>a</sub>sR</b>	PIP11EREA_1 Plasmid pIP1100 erythromycin esterase (ereA) gene, complete cds. [Plasmid pIP1100]
U12977	79	<b>L<sub>V</sub>W<sub>1</sub>C<sub>k</sub>G<sub>1</sub>E<sub>e</sub>G<sub>s</sub>G</b>	PLU12977_1 Pseudomonas lemoignei poly(3-hydroxybutyrate) depolymerase (phaZ5) gene, complete cds, and glycerol-3-phosphate-dehydrogenase homolog, complete cds. [Pseudomonas lemoignei]
D00432	12	<b>RiiWAC<sub>e</sub>v<sub>k</sub>EI</b>	RICCPATP_2 ATP synthetase epsilon subunit [Chloroplast Oryza sativa]
S53719	2	<b>LVWAC<sub>k</sub>G</b>	S53719_1 myf5 gene product [Gallus sp.]
D11098	12	<b>RiiW<sub>a</sub>C<sub>e</sub>v<sub>k</sub>EI</b>	AEGATPS1_2 ATP synthase epsilon subunit [Chloroplast Aegilops columnaris]
D11099	12	<b>RiiW<sub>a</sub>C<sub>e</sub>v<sub>k</sub>EI</b>	AEGATPS2_2 ATP synthase epsilon subunit [Chloroplast Aegilops crassa]
X15901	12	<b>RiiW<sub>a</sub>C<sub>e</sub>v<sub>k</sub>EI</b>	CHOSXX_31 Rice complete chloroplast genome. [Chloroplast Oryza sativa]
J01421	12	<b>RiiW<sub>a</sub>C<sub>e</sub>v<sub>k</sub>EI</b>	MZECPATBE_2 Maize (Z.mays) cp coupling factor complex (CF-1) beta & epsilon subunit genes. [Chloroplast Zea mays]
M31464	12	<b>RiiW<sub>a</sub>C<sub>e</sub>v<sub>k</sub>EI</b>	RICCPCTA_2 Rice chloroplast beta and epsilon subunit (atpB and atpE) genes, complete cds. [Chloroplast Oryza sativa]

hpv_L1_all_4		<b>DXKQTQLXIXG</b>	
L02549	187	<b>KQTQL<sub>k</sub>I</b>	BOVPRLR_1 prolactin receptor [Bos taurus]
X69978	985	<b>D<sub>a</sub>qQTQL<sub>r</sub>I</b>	HSXPGAA_1 XP-G factor [Homo sapiens]
D16305	984	<b>D<sub>a</sub>qQTQL<sub>r</sub>I</b>	HUMERCC5_1 ERCC5 gene product [Homo sapiens]
L20046	985	<b>D<sub>a</sub>qQTQL<sub>r</sub>I</b>	HUMERCC5A_1 excision repair protein [Homo sapiens]
S37449	624	<b>QTQL<sub>q</sub>I<sub>γ</sub>G</b>	S37449_1 sar1 [Schizosaccharomyces pombe]
D10457	624	<b>QTQL<sub>q</sub>I<sub>γ</sub>G</b>	YSPGAP1_1 GTPase-activating protein [Schizosaccharomyces pombe]



hpv_L1_all_5		<b>SGSLVTSDAQLFNKPYWLQR</b>	
L01991	315	<b>y<sub>a</sub>KPYWLQ</b>	MUSNGP_1 neuronal glycoprotein [Mus musculus]
Z46659	130	<b>iTt<sub>t</sub>sQLFdra</b>	SC8337_2 S.cerevisiae chromosome XIII cosmid 8337. [Saccharomyces cerevisiae]
Z46659	9	<b>QLFsk<sub>e</sub>Y</b>	SC8337_2 S.cerevisiae chromosome XIII cosmid 8337. [Saccharomyces cerevisiae]
M97264	1289	<b>V<sub>p</sub>k<sub>e</sub>tQ<sub>p</sub>FdK<sub>r</sub>lW</b>	SLVRNAGENM_1 replicase [Shallot latent virus]
M97264	1337	<b>LFNks<sub>q</sub>Wv<sub>k</sub>k</b>	SLVRNAGENM_1 replicase [Shallot latent virus]
M31431	7	<b>QiykKaYWL</b>	MYCMGP_3 M.genitalium attachment protein (MgPa) gene, complete cds. [Mycoplasma genitalium]
X67316	429	<b>FN<sub>g</sub>PYW</b>	SCEMP70_1 p24a 70 kDa precursor [Saccharomyces cerevisiae]
X67316	372	<b>LV<sub>g</sub>S<sub>g</sub>vQLF</b>	SCEMP70_1 p24a 70 kDa precursor [Saccharomyces cerevisiae]
U11031	315	<b>y<sub>a</sub>KPYWvQ</b>	RNU11031_1 BIG-1 protein [Rattus norvegicus]
U07223	8	<b>SGS<sub>s</sub>VsSDAe<sub>e</sub>y<sub>q</sub>pPiW</b>	HSU07223_1 beta2-chimaerin [Homo sapiens]
L29126	8	<b>SGS<sub>s</sub>VsSDAe<sub>e</sub>y<sub>q</sub>pPiW</b>	HUMB2CHIM_1 beta2-chimaerin [Homo sapiens]
U12386	101	<b>tsa<sub>y</sub>V<sub>p</sub>S<sub>i</sub>s<sub>t</sub>LFN<sub>s</sub>a<sub>n</sub>WieR</b>	ACU12386_37 NADH dehydrogenase, subunit 9 [Mitochondrion Acanthamoeba castellanii]
K02121	1175	<b>QLFNn<sub>v</sub>lWLeq</b>	HRV_1 Human rhinovirus type 14 (HRV14), complete genome. [Human rhinovirus]

hpv_L1_A9_16		<b>QRAQGHNNGICW</b>	
L27559	233	<b>srGrk<sub>r</sub>GICW</b>	HUMIGFBP04_1 Human insulin-like growth factor binding protein 5 (IGFBP5) gene, partial exon 4. [Homo sapiens]
M62782	233	<b>srGrk<sub>r</sub>GICW</b>	HUMIGFBP5A_1 insulin-like growth factor binding protein 5 [Homo sapiens]
M65062	233	<b>srGrk<sub>r</sub>GICW</b>	HUMIGFBP6_1 insulin-like growth factor binding protein 6 [Homo sapiens]
X81583	232	<b>srGrk<sub>r</sub>GICW</b>	MMILGFBP5_1 insulin-like growth factor binding protein-5 [Mus musculus]
L12447	232	<b>srGrk<sub>r</sub>GICW</b>	MUSIGFBP5A_1 insulin-like growth factor binding protein 5 [Mus musculus]
M62781	232	<b>srGrk<sub>r</sub>GICW</b>	RATIGFBP5_1 insulin-like growth factor binding protein 5 [Rattus norvegicus]
U02025	231	<b>srGrk<sub>r</sub>GICW</b>	MMIGFBP4_1 insulin-like growth factor binding protein 5 [Mus musculus]
X04370	434	<b>QkAdaH<sub>q</sub>hGvC</b>	HEVZVXX_19 Varicella-Zoster virus complete genome. [Human herpesvirus 3]
X17022	263	<b>QkArGH<sub>g</sub>y<sub>t</sub>eCW</b>	CFCFR91_2 Restriction Endonuclease [Citrobacter freundii]
X74517	263	<b>QkArGH<sub>g</sub>y<sub>t</sub>eCW</b>	CFRESTR_2 type ii site-specific deoxyribonuclease [Citrobacter freundii]