

I

HPV and Animal PV Nucleic Acid Sequences

For Part I of the 1995 compendium we have adopted (for the most part) a recently proposed binomial classification system of the papillomaviruses [1]. This classification, which results from the deduced evolutionary relationships among the papillomaviruses, divides the known universe of papillomavirus genomes into five "Supergroups," A-E, each of which is divided into a number of "Groups."

Supergroup	Description
A	genital HPVs
B	EV HPVs
C	ungulate fibropapillomaviruses
D	BPVs causing true papillomas
E	animal and human cutaneous PVs

This classification supplants the simple groupings (A, B, C, ...I) by which we ordered our sequences in last year's publication. The relationship of the old to the new classification scheme is given in Table I-1; the new classification is listed horizontally with old group equivalents below.

Table I-1 Correlation of new and old classification of Papillomaviruses

Supergroup	<u>A</u>											<u>B</u>	<u>C</u>	<u>D</u>	<u>E</u>		
Group	1	2	3	4	5	6	7	8	9	10	11	1	2	1	2	1	1
old group	F	F	E	F	D	D	C	F	A	B	B	H	G	I	I	I	G

For simplicity of presentation, we lump all the animal PVs together, i.e., supergroups C and D, ROPV, RPV, etc., are treated as "animal papillomaviruses." RhPV and PCPV, however, are placed in groups A8 and A9 respectively. The new groupings are in accord with the published findings of H.-U. Bernard and coworkers [1,2,3,6] and of van Ranst and coworkers [4]. A review by De Villiers [5] discusses the extent to which the phylogenetic relationships agree with, in some instances, and deviate from, in other instances, phenotypic and clinical observations.

There are now 189 sequences of human PVs, animal PVs, and related cellular proteins in our database. To aid the reader in locating sequences of interest we present on the following pages an exhaustive list and cross reference of all HPV and animal PV sequences. An analogous table for cellular sequences is included in Part IV, page 1. Included in this Table I-2 are the viral TYPE, the LOCUS names we use, the GROUP designation as used in last year's compendium, the equivalent new GROUP designation [1], the original GenBank LOCUS name, the GenBank ACCESSION NUMBER, the REGION of the genome sequenced, and the page number on which the sequence is located. The page number is preceded by a (94) or (95) indicating the year of the compendium in which the sequence was published. As of this writing several new sequences have been released that probably represent new viral types. Among these are the sequences whose names begin with HPVTRX. Furthermore, several animal papilloma sequences (e.g., MMPV) that are only distantly related to other PVs probably represent taxa at the "supergroup" level. These are indicated in the fourth column of the table by the letter S.

References

- [1] Chan, S-Y, Delius, H., Halpern, A. L., and Bernard, H-U: Analysis of Genomic Sequences of 95 Papillomavirus Types: Uniting Typing, Phylogeny, and Taxonomy, *Journal of Virology* 1995;**69**:5, 3074–3083.
- [2] Bernard H.-U., Chan S.-Y., and Delius H: Evolution of Papillomaviruses. In: *Human Pathogenic Papillomaviruses* H. zur Hausen (Ed.). Springer-Verlag, Berlin, 1994; pp. 33–54.
- [3] Bernard H.-U., Chan S.-Y., Ong C.-K., Villa L.L., Delius H., Peyton C.L., Bauer H.M., Manos M.M., and Wheeler C.M: Identification and Assessment of Known and Novel Papillomaviruses by Polymerase Chain Reaction, Restriction Digestion Fingerprinting, Nucleotide Sequence, and Phylogenetic Algorithms. *Journal of Infectious Diseases* 1994 (in press, Nov 1994).
- [4] van Ranst M., Kaplan J.B., and Burk R.D: Phylogenetic Classification of Human Papillomaviruses: Correlation with Clinical Manifestations. *Journal of General Virology* 1992;**73**:2653–2660.
- [5] De Villiers E.-M: Human Pathogenic Papillomavirus Types: An Update. In: *Human Pathogenic Papillomaviruses* H. zur Hausen (Ed.). Springer-Verlag, Berlin, 1994; pp. 1–12.

Table I-2 Sequence List and Cross Reference for HPV Database**HUMAN PAPILLOMAVIRUSES**

Type	Locus Name	“Old” Group	“New” Group	GenBank Locus Name	GenBank Accession	Region Sequenced	Page No.
HPV1a	HPV1a	G	E1	PAPAPI	V01116	Complete	(94) I-G-3
HPV2	HPV2a	F	A4	PAHPV2A	X55964	Complete	(94) I-F-4
HPV3	HPV3	F	A2	HPV3	X74462	Complete	(94) I-F-8
HPV4	HPV4	G	B2	PAPPH4	X70827	Complete	(94) I-G-8
HPV5	HPV5	H	B1	PPH5CG	M17463	Complete	(94) I-H-4
HPV5	HPV5b	H	B1	PPH5BCG	D90252	Complete	(94) I-H-8
HPV5	HPV5d	H	B1	PPHDELCG	M22961	Complete	(94) I-H-12
HPV6	HPV6b	B	A10	PAPA6B	X00203	Complete	(94) I-B-5
HPV7	HPV7	F	A8	HPV7	X74463	Complete	(94) I-F-12
HPV8	HPV8	H	B1	PPH8CG	M12737	Complete	(94) I-H-16
HPV9	HPV9	H	B1	HPV9	X74464	Complete	(94) I-H-20
HPV10	HPV10	F	A2	HPV10	X74465	Complete	(94) I-F-16
HPV11	HPV11	B	A10	PPH11	M14119	Complete	(94) I-B-10
HPV12	HPV12	H	B1	HPV12	X74466	Complete	(94) I-H-24
HPV13	HPV13	B	A10	HPVT13DNA	X62843	Complete	(94) I-B-14
HPV14	HPV14d	H	B1	HPV14D	X74467	Complete	(94) I-H-28
HPV15	HPV15	H	B1	HPV15	X74468	Complete	(94) I-H-32
HPV16	HPV16	A	A9	PPH16	K02718	Complete	(94) I-A-3
HPV16	HPV16R	A	A9	?	?	Complete	(95) I-A9-56
HPV17	HPV17	H	B1	HPV17	X74469	Complete	(94) I-H-36
HPV18	HPV18	C	A7	PAPHPV18	X05015	Complete	(94) I-C-4
HPV19	HPV19	H	B1	HPV19	X74470	Complete	(94) I-H-40
HPV20	HPV20	H	B1	HPU31778	U31778	Complete	(95) I-B1-174
HPV20	HPV20E6	H	B1	PPH20E6	D90261	E6	(94) I-H-44
HPV20	HPV20E7	H	B1	PPHC7C	D50547	E7	
HPV20	HPV20My911	H	B1	PPHL1AB	L38910	L1	
HPV21	HPV21	H	B1	HPU31779	U31779	Complete	(95) I-B1-178
HPV21	HPV21E6	H	B1	PPH21E6	D90263	E6	(94) I-H-46
HPV21	HPV21E7	H	B1	PPHE7D	D50548	E7	
HPV21	HPV21My911	H	B1	PPHL1AC	L38911	L1	
HPV22	HPV22	H	B1	HPU31780	U31780	Complete	(95) I-B1-182
HPV22	HPV22My911	H	B1	PPHL1AD	L38912	L1	
HPV23	HPV23	H	B1	HPU31781	U31781	Complete	(95) I-B1-186
HPV23	HPV23My911	H	B1	PPHL1AE	L38913	L1	
HPV24	HPV24	H	B1	HPU31782	U31782	Complete	(95) I-B1-190
HPV24	HPV24My911	H	B1	PPHL1AP	L38924	L1	
HPV25	HPV25	H	B1	HPV25	X74471	Complete	(94) I-H-48
HPV26	HPV26	D	A5	HPV26	X74472	Complete	(94) I-D-3
HPV27	HPV27	F	A4	HPV27	X74473	Complete	(94) I-F-20
HPV28	HPV28	F	A2	HPU31783	U31783	Complete	(95) I-A2-15
HPV28	HPV28MY911	F	A2	HPU1250211	U12502	L1	(94) I-F-24
HPV29	HPV29	F	A2	HPU31784	U31784	Complete	(95) I-A2-19
HPV29	HPV29MY911	F	A2	HPU1250311	U12503	L1	(94) I-F-25
HPV30	HPV30	D	A6	HPV30	X74474	Complete	(94) I-D-7
HPV31	HPV31	A	A9	PPH31A	J04353	Complete	(94) I-A-9

Table I-2 (cont.) Sequence List and Cross Reference for HPV Database**HUMAN PAPILOMAVIRUSES (cont.)**

Type	Locus Name	“Old” Group	“New” Group	GenBank Locus Name	GenBank Accession	Region Sequenced	Page No.
HPV32	HPV32	F	A1	HPV32	X74475	Complete	(94) I-F-26
HPV33	HPV33	A	A9	PPH33CG	M12732	Complete	(94) I-A-14
HPV34	HPV34	B	A11	HPV34	X74476	Complete	(94) I-B-19
HPV35	HPV35	A	A9	PPH35CG	M74117	Complete	(94) I-A-19
HPV35	HPV35h	A	A9	HPV35H	X74477	Complete	(94) I-A-24
HPV36	HPV36	H	B1	HPU31785	U31785	Complete	(95) I-B1-194
HPV36	HPV36LCR	H	B1	HPVLCR4	X52061	LCR	
HPV36	HPV36My911	H	B1	PPHL1AG	L38915	L1	
HPV37	HPV37	H	B1	HPU31786	U31786	Complete	(95) I-B1-198
HPV38	HPV38	H	B1	HPU31787	U31787	Complete	(95) I-B1-202
HPV38	HPV38My911	H	B1	PPHL1AI	L38917	L1	
HPV39	HPV39	C	A7	PPHT39	M62849	Complete	(94) I-C-8
HPV40	HPV40	F	A8	HPV40	X74478	Complete	(94) I-F-30
HPV41	HPV41	G	E	PAP41CG	X56147	Complete	(94) I-G-12
HPV42	HPV42	F	A1	PPHPAPV42A	M73236	Complete	(94) I-F-34
HPV43	HPV43E6	F	A8	PPH43E6A	M27022	E6	(94) I-F-38
HPV43	HPV43MY911	F	A8	HPU1250411	U12504	L1	(94) I-F-39
HPV44	HPV44	B	A10	HPU31788	U31788	Complete	(95) I-A10-154
HPV44	HPV44E6	B	A10	PPH44E6A	M27023	E6	(94) I-B-23
HPV44	HPV44MY911	B	A10	HPU1249311	U12493	L1	(94) I-B-24
HPV45	HPV45	C	A7	HPV45	X74479	Complete	(94) I-C-12
HPV47	HPV47	H	B1	PPH47CG	M32305	Complete	(94) I-H-52
HPV48	HPV48	G	B2	HPU31789	U31789	Complete	(95) I-B2-224
HPV49	HPV49	H	B1	HPV49	X74480	Complete	(94) I-H-56
HPV50	HPV50	G	B2	HPU31790	U31790	Complete	(95) I-B2-227
HPV51	HPV51	D	A5	PPHDNA	M62877	Complete	(94) I-D-11
HPV52	HPV52	A	A9	HPV52	X74481	Complete	(94) I-A-29
HPV53	HPV53	D	A6	HPV53	X74482	Complete	(94) I-D-15
HPV54	HPV54	F	A	HPU37488	U37488	Complete	(95) I-A-164
HPV54	HPV54MY911	F	A	HPU1250111	U12501	L1	(94) I-F-40
HPV55	HPV55	B	A10	HPU31791	U31791	Complete	(95) I-A10-158
HPV56	HPV56	D	A6	HPV56	X74483	Complete	(94) I-D-19
HPV57	HPV57	F	A4	PAHPV57	X55965	Complete	(94) I-F-41
HPV58	HPV58	A	A9	PPH58	D90400	Complete	(94) I-A-33
HPV59	HPV59	C	A7	HPV59VG	X77858	Complete	(95) I-A7-43
HPV59	HPV59MY911	C	A7	HPU1249611	U12496	L1	(94) I-C-16
HPV59	HPV59X03	C	A7	S42987	S42987	L1	
HPV60	HPV60	G	B2	HPU31792	U31792	Complete	(95) I-B1-230
HPV61	HPV61	E	A3	HPU31793	U31793	Complete	(95) I-A3-25
HPV61	HPV61L1AE4	E	A3	HPU01534	U01534	L1	(94) I-E-2
HPV61	HPV61MY911	E	A3	HPU1250011	U12500	L1	(94) I-E-3
HPV62	HPV62MY911	E	A3	HPU1249911	U12499	L1	(94) I-E-4
HPV63	HPV63	G	E1	PAPPH63	X70828	Complete	(94) I-G-16

Table I-2 (cont.) Sequence List and Cross Reference for HPV Database

HUMAN PAPILLOMAVIRUSES (cont.)

Type	Locus Name	“Old” Group	“New” Group	GenBank Locus Name	GenBank Accession	Region Sequenced	Page No.
HPV64	HPV64MY911	B	A11	HPU1249511	U12495	L1	(94) I-B-26
HPV65	HPV65	G	B2	PAPPH65	X70829	Complete	(94) I-G-20
HPV66	HPV66	D	A6	HPU31794	U31794	Complete	(95) I-A6-36
HPV66	HPV66L1AE3	D	A6	HPU01533	U01533	L1	(94) I-D-23
HPV66	HPV66MY911	D	A6	HPU1249811	U12498	L1	(94) I-D-24
HPV66	HPV66E6E7	D	A6	PPHE6E7GEN	M75123	LCR,E6,E7	
HPV67	HPV67MY911	A	A9	HPU1249211	U12492	L1	(94) I-A-37
HPV68	HPV68ME180	C	A7	HUMHPVME18	M73258	LCR,E6,E7,E1,L1,L2	(94) I-C-17
HPV69	HPV69MY911	D	A5	HPU1249711	U12497	L1	(94) I-D-25
HPV70	HPV70	C	A7	HPU21941	U21941	Complete	(95) I-A7-47
HPV70	HPV70CP141	C	A7	HPU12476	U12476	L1	(94) I-C-20
HPV70	HPVL1AE1	C	A7	HPU01535	U01535	L1	(94) I-C-22
HPV70	HPV70LVX160	C	A7	HPU124860	U12486	L1	(94) I-C-23
HPV70	HPV70X11	C	A7	S42991	S42991	L1	
HPV72	HPV72CP4173	E	A3	HPU124773	U12477	L1	(94) I-E-5
HPV72	HPV72LVX100	E	A3	HPU124850	U12485	L1	(94) I-E-11
HPV73	HPVMM9	B	A11	HPU12491	U12491	L1	(94) I-B-27
HPV75	HPV75L1	H	B1	HPVS207	X79942	L1	(95) I-B1-214
HPV76	HPV76L1	H	B1	HPCR148	X79948	L1	(95) I-B1-215
HPV77	HPV77L1	F	A2	HPVS931	X79947	L1	(95) I-A2-23
?	HPVL1AE2	D	A5	HPU01532	U01532	L1	(94) I-D-27
?	HPVIS039	D	A5	HPU12481	U12481	L1	(94) I-D-26
?	HPVMM4	D	A5	HPU12488	U12488	L1	(94) I-D-28
?	HPVCP6108	E	A3	HPU124788	U12478	L1	(94) I-E-7
?	HPVCP8304	E	A3	HPU124804	U12480	L1	(94) I-E-9
?	HPVLVX82	E	A	HPU12487	U12487	L1	(94) I-E-12
?	HPVMM7	E	A	HPU12489	U12489	L1	(94) I-E-13
?	HPVMM8	E	A3	HPU12490	U12490	L1	(94) I-E-14
?	HPVCP8061	F	A	HPU124791	U12479	L1	(94) I-F-45
?	HPVVS73L1	H	B1	HPVS731	X79944	L1	(95) I-B1-218
?	HPVVS75L1	H	B1	HPVS753	X79945	L1	(95) I-B1-219
?	HPVVS92L1	H	B1	HPVS921	X79949	L1	(95) I-B1-220
?	HPVVS102L1	H	B1	HPVS1024	X79946	L1	(95) I-B1-221
?	HPVICPX1	H	B1	PPHL1AF	L38914	L1	(95) I-B1-206
?	HPVRTRX1	H	B1	PPHL1AJ	L38918	L1	(95) I-B1-207
?	HPVRTRX2	H	B1	PPHL1AK	L38919	L1	(95) I-B1-208
?	HPVRTRX3	H	B1	PPHL1AL	L38920	L1	(95) I-B1-209
?	HPVRTRX4	H	B1	PPHL1AM	L38921	L1	(95) I-B1-210
?	HPVRTRX5	H	B1	PPHL1AN	L38922	L1	(95) I-B1-211
?	HPVRTRX6	H	B1	PPHL1AO	L38923	L1	(95) I-B1-212
?	HPVTogawa	H	B1	PPHL1FR	L38388	L1	(95) I-B1-213
?	HPVX06	E	A3	S42984	S42984	L1	(95) I-A3-29
?	HPVVS20L1	H	B1	HPVS204	X79941	L1	(95) I-B1-216
?	HPVVS42L1	H	B1	HPVS421	X79943	L1	(95) I-B1-217

Table I-2 (cont.) Sequence List and Cross Reference for HPV Database

ANIMAL PAPILLOMAVIRUSES

Type	Locus Name	“Old” Group	“New” Group	GenBank Locus Name	GenBank Accession	Region Sequenced	Page No.
BPV1	BPV1L1	I	C1	BPU23379	U23379	L1	
BPV1	BPV1R	I	C1	?	?	Complete	(95) I-C1-235
BPV1	BPV1	I	C1	PPBCG	J02044	Complete	(94) I-I-23
BPV2	BPV2	I	C1	PPB2CG	M20219	Complete	(94) I-I-28
BPV3	BPV3	I	D1	BP3ORF	X59062	L1,E8,E7,E1	
BPV3	BPV3L1	I	D1	BPU21862	U21862	L1	(95) I-D1-248
BPV4	BPV4	I	D1	PABPV4XX	X05817	Complete	(94) I-I-32
BPV5	BPV5L1	I	C	BPU21863	U21863	L1	(95) I-C-246
BPV6	BPV6	I	D1	BP6ORF	X59064	L1,E8,E7,E1	
BPV6	BPV6L1	I	D1	BPU21864	U21864	L1	(95) I-D1-249
CgPV1	CgPV1E1	I	A	MPAWART1	M64365	E1	(95) I-A-167
CgPV1	CgPV1L1	I	A	MPAWART2	M64366	L1	(95) I-A-168
COPV	COPV	I	E	PPHCG	L22695	Complete	(94) I-I-5
CRPV	CRPV	I	E	RAPRBFCG	K02708	Complete	(94) I-I-9
CRPV	PSU09494	I	E	PSU09494	U09494	E7	
DPV	DPV	I	C2	PPDCG	M11910	Complete	(94) I-I-18
EEPV	EEPV	I	C2	PPECG	M15953	Complete	(94) I-I-13
FPV1	FPV1L1	I	S	PPA12	K02020	L1	(95) I-S-257
FPV1	FPV1E1	I	S	PPA11	K02019	E1	(95) I-S-256
MmPV	MMPVE6	I	S	MMPVE6	X65200	E6	(95) I-S-258
MnPV	MnPV	I	S	U01834	U01834	Complete	(94) I-I-42
OvPV	OvPV	I	C2	OPU21861	U21861	L1	(95) I-C2-241
PCPV1	PCPV1	I	A10	PCPVT1DNA	X62844	Complete	(94) I-I-37
RhPV1	RhPV1	I	A9	RPLCG	M60184	Complete	(94) I-I-46
ROPV	ROPVL2	I	E	RAP02	M19498	L2	
ROPV	ROPVE2L2	I	E	RAP01	M19497	E2,E4,L2	
RPV	RPVE5E9	I	C2	S74218	S74218	E9	(95) I-C2-244
RPV	RPVE5	I	C2	PPRE5A	M18176	E5	(95) I-C2-243
RPV	RPVE5B	I	C2	PPRE5A	M18176	E5	
RPV	RPVE1L1	I	C2	PPRE5GA	M18175	E1,L1	(95) I-C2-242

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Group C1 Sequences

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