

**Supplementary Table 1:** Complete genomic proteins of HPV45 early and late amino acid sequences retrieved from UniProt KB

S.No.	Name of the entry	Protein Name	Gene Name	Length	Overall Antigen Prediction score (VaxiJen)
1	P36728	Replication protein E1	E1	643	0.4991
2	A9XFL6	Replication protein E1	E1	643	0.4991
3	A9XFQ6	Replication protein E1	E1	643	0.4969
4	A9XFT0	Replication protein E1	E1	643	0.4977
5	T2A627	Replication protein E1	E1	643	0.4954
6	T2A6X9	Replication protein E1	E1	643	0.5018
7	T2A596	Replication protein E1	E1	643	0.5005
8	T2A7A1	Replication protein E1	E1	643	<b>0.5027</b>
9	T2A776	Replication protein E1	E1	643	0.499
10	T2A606	Replication protein E1	E1	643	0.497
11	B4ZYB6	Replication protein E1	E1	145	0.4166
12	P36794	Regulatory protein E2	E2	368	0.4255
13	A9XFM5	Regulatory protein E2	E2	368	<b>0.4353</b>
14	A9XFT1	Regulatory protein E2	E2	368	0.4185
15	A9XFQ7	Regulatory protein E2	E2	368	0.4249
16	T2A623	Regulatory protein E2	E2	368	0.4308
17	T2A771	Regulatory protein E2	E2	368	0.4286
18	T2A704	Regulatory protein E2	E2	368	0.4204
19	T2A59	Regulatory protein E2	E2	368	0.4298
20	A9XFP1	Regulatory protein E2	E2	368	0.4352
21	T2A604	Regulatory protein E2	E2	368	0.4266
22	A9XFL7	Regulatory protein E2	E2	368	0.4239
23	S4W2E3	Regulatory protein E2	E2	174	0.3626
24	A9XFL8	E4	E4	90	<b>0.4668</b>
25	A9XFM6	E4	E4	90	0.3925
26	A9XFQ8	E4	E4	90	0.4507
27	A9XFT2	E4	E4	90	0.4168
28	A9XFL9	E5	E5	73	0.2375
29	A9XFQ9	E5	E5	73	0.2350
30	A9XFM7	E5	E5	73	<b>0.2376</b>
31	P21735	Protein E6	E6	158	0.5462
32	O10608	Protein E6	E6	158	0.5042
33	A9XFL4	Protein E6	E6	158	0.5462
34	A9XFN8	Protein E6	E6	158	0.539
35	A0A1U9WYI9	Protein E6	E6	72	0.4251
36	A9XFM2	Protein E6	E6	158	0.5541
37	<b>T2A578</b>	Protein E6	E6	158	<b>0.5795</b>
38	M4H3Y1	Protein E6	E6	158	0.5689
39	M4H3S9	Protein E6	E6	158	0.5236
40	M4H4T8	Protein E6	E6	158	0.4948
41	M4H3T7	Protein E6	E6	158	0.576
42	M4H4A2	Protein E6	E6	158	0.5405
43	M4H4A7	Protein E6	E6	158	0.5399

44	M4H4K0	Protein E6	E6	158	0.5311
45	M4H475	Protein E6	E6	158	0.5656
46	M4H4L1	Protein E6	E6	158	0.5748
47	A9XFU4	Protein E6	E6	158	0.5556
48	A9XFT6	Protein E6	E6	158	0.5087
49	W5RRW4	Protein E6	E6	158	0.5205
50	W5RS42	Protein E6	E6	158	0.5605
51	W5RS62	Protein E6	E6	158	0.5052
52	W5RRX3	Protein E6	E6	158	0.5422
53	W5RS47	Protein E6	E6	158	0.5381
54	W5RRZ7	Protein E6	E6	158	0.5348
55	W5RS27	Protein E6	E6	158	0.5601
56	W5RRW9	Protein E6	E6	158	0.5185
57	W5RRX4	Protein E6	E6	158	0.567
58	P21736	Protein E7	E7	106	0.6384
59	A9XFL5	Protein E7	E7	106	0.6384
60	O10609	Protein E7	E7	106	0.6508
61	A9XFQ5	Protein E7	E7	106	0.6456
62	A9XFS9	Protein E7	E7	106	0.6616
63	T2A6N7	Protein E7	E7	106	0.7091
64	W5RS09	Protein E7	E7	106	0.6976
65	M4H4I0	Protein E7	E7	106	0.7143
66	M4H3U4	Protein E7	E7	106	0.7
67	<b>M4H3T6</b>	Protein E7	E7	106	<b>0.7251</b>
68	W5RRX6	Protein E7	E7	106	0.6507
69	M4H406	Protein E7	E7	106	0.6965
70	M4H4V7	Protein E7	E7	106	0.7108
71	W5RRX5	Protein E7	E7	106	0.5579
72	M4H4G1	Protein E7	E7	106	0.5188
73	W5RS50	Protein E7	E7	106	0.5051
74	W5RRW7	Protein E7	E7	106	0.6651
75	M4H499	Protein E7	E7	106	0.6788
76	W5RS52	Protein E7	E7	106	0.6573
77	M4H3T8	Protein E7	E7	106	0.5174
78	M4H4H4	Protein E7	E7	106	0.5195
79	M4H3Y6	Protein E7	E7	106	0.5332
80	W5RRZ8	Protein E7	E7	106	0.5687
81	W5RS30	Protein E7	E7	106	0.453
82	W5RS56	Protein E7	E7	106	0.4742
83	W5RRX8	Protein E7	E7	106	0.5048
84	P36741	Major capsid protein L1	L1	536	0.4954
85	Q81043	Major capsid protein L1	L1	152	0.5431
86	Q81045	Major capsid protein L1	L1	152	0.5497
87	Q81049	Major capsid protein L1	L1	152	0.5593
88	Q81052	Major capsid protein L1	L1	152	0.5194
89	Q81044	Major capsid protein L1	L1	152	0.5427
90	Q81047	Major capsid protein L1	L1	152	0.5593
91	Q81051	Major capsid protein L1	L1	152	0.5378

92	Q81046	Major capsid protein L1	L1	152	0.5593
93	Q81050	Major capsid protein L1	L1	152	0.5403
94	Q81042	Major capsid protein L1	L1	152	0.5419
95	Q81048	Major capsid protein L1	L1	152	0.547
96	I6SCV2	Major capsid protein L1	L1	145	<b>0.6404</b>
97	A9XFM1	Major capsid protein L1	L1	536	0.4928
98	T2A6L7	Major capsid protein L1	L1	536	0.4909
99	A9XFN7	Major capsid protein L1	L1	536	0.4924
100	A9XFU3	Major capsid protein L1	L1	536	0.5067
101	A9XFR1	Major capsid protein L1	L1	536	0.5069
102	T2A642	Major capsid protein L1	L1	536	0.5139
103	A9XFT5	Major capsid protein L1	L1	536	0.5025
104	A9XFM9	Major capsid protein L1	L1	536	0.4926
105	A0A0U3TR62	Major capsid protein L1	L1	536	0.4912
106	A0A0U3TP66	Major capsid protein L1	L1	536	0.4908
107	A0A0U3UFE7	Major capsid protein L1	L1	536	0.4899
108	A0A0U3KAC5	Major capsid protein L1	L1	536	0.4916
109	A0A0U3U6I8	Major capsid protein L1	L1	536	0.4843
110	A0A0U3TR19	Major capsid protein L1	L1	536	0.5058
111	Q4JJY5	Major capsid protein L1	L1	513	0.4608
112	E3UVI5	Major capsid protein L1	L1	121	0.5825
113	E3UVI3	Major capsid protein L1	L1	121	0.6029
114	E3UVI4	Major capsid protein L1	L1	121	0.6182
115	E3UVI2	Major capsid protein L1	L1	121	0.6182
116	P36761	Minor capsid protein L2	L2	463	0.5672
117	A9XFV0	Minor capsid protein L2	L2	463	0.5878
118	A9XFM0	Minor capsid protein L2	L2	463	0.5763
119	A9XFV8	Minor capsid protein L2	L2	463	0.5863
120	A9XFT4	Minor capsid protein L2	L2	463	0.5883
121	A9XFS6	Minor capsid protein L2	L2	463	0.5843
122	A9XFR8	Minor capsid protein L2	L2	463	0.5876
123	A9XFR0	Minor capsid protein L2	L2	463	0.582
124	<b>T2A7B7</b>	Minor capsid protein L2	L2	463	<b>0.5943</b>
125	T2A5B6	Minor capsid protein L2	L2	463	0.576
126	T2A621	Minor capsid protein L2	L2	463	0.5739
127	A0A0U3JE45	Minor capsid protein L2	L2	463	0.583
128	A0A0U3U7Q5	Minor capsid protein L2	L2	463	0.5779

		L2			
129	A0A0U3UT90	Minor capsid protein L2	L2	463	0.5753
130	A0A0U3SJF1	Minor capsid protein L2	L2	463	0.5904
131	Q4JY6	Minor capsid protein L2	L2	463	0.5773
132	A0A0U3JE12	Minor capsid protein L2	L2	463	0.5799
133	A0A0U3J977	Minor capsid protein L2	L2	463	0.5753
134	A0A0U3J959	Minor capsid protein L2	L2	463	0.5958
135	A0A0U3UT70	Minor capsid protein L2	L2	463	0.5535
136	A0A0U3TVK1	Minor capsid protein L2	L2	463	0.5908
137	A0A0U3SJH0	Minor capsid protein L2	L2	463	0.5761
138	A0A0U3SJD9	Minor capsid protein L2	L2	463	0.5907
139	A0A0U3JE28	Minor capsid protein L2	L2	463	0.5797