

# VI

## HIV-2/SIV Proteins

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### VI-1 Introduction

The number of HIV-2 and SIV sequences is growing much more slowly than for HIV-1, particularly for complete or near-complete genomes. In selecting the set of sequences to present here, we eliminated some sequences derived from the same sample, patient, or isolate. We further omitted a few that were very closely related. Within each of the protein alignments, we have included a slightly different set of sequences, drawing on both genome-length and subgenomic fragments in order to best represent viral diversity. Thus for HIV-2, we selected A and B genomes and subgenomic fragments that best represent the diversity of the virus in that region. We also include CRF01\_AB and the genomes available for subtypes G and U.

In these alignments, as in the database, we label sequences according to their native host. Thus, transfers of SIVsmm into humans have produced HIV-2 groups A through G. Unintentional transfers of SIVsmm into captive macaques are named according to the receptive host (Rhesus macaques = mac, Stumptailed macaques = stm, and Pig-tailed macaques = mne). However, intentional, experimental cross-species transfers of virus remain labeled as being from the original host (e.g., HIV-1 injected into a chimpanzee is labeled HIV-1, not SIVcpz; and SIVsmm injected into a Rhesus macaque is labeled SIVsmm, not SIVmac).

## VI-2 Annotated features

Features of HIV-2 annotated in the alignment that follows.

Feature	Protein	Location	Page
Gag p15 start	Gag	1	384
p15 end	Gag	135	384
p27 start	Gag	136	384
p27 end	Gag	364	386
p2 start	Gag	365	386
p2 end	Gag	381	386
p8 start	Gag	382	386
p8 end	Gag	433	386
p1 start	Gag	434	386
p1 end	Gag	447	386
p6 start	Gag	448	386
PTAP motif	Gag	458-461	386
PSAP in HIV-2 B, U	Gag	476-479	386
p6 end	Gag	511	387
Gag end	Gag	511	387
Pol p15 start	Pol	1	388
p15 end	Pol	67	388
protease start	Pol	68	388
protease end	Pol	166	389
p51 RT start	Pol	167	389
D catalytic site	Pol	276	389
DD catalytic site	Pol	351	390
p51 RT end	Pol	605	391
p15 RNase H start	Pol	606	391
p15 RNase H end	Pol	725	392
p31 Integrase start	Pol	726	392
p31 Integrase end	Pol	1020	394
Pol end	Pol	1020	394
Vif start	Vif	1	395
Vif end	Vif	215	396
Vpx start	Vpx	1	397
Vpx end	Vpx	113	397
Vpr start	Vpr	1	398
Vpr end	Vpr	102	398
Tat start	Tat	1	399
exon 1 end	Tat	99	399
exon 2 start	Tat	100	399
Tat end	Tat	131	399
Rev start	Rev	1	400
exon 1 end	Rev	24	400
exon 2 start	Rev	25	400
Rev end	Rev	108	401
Env start	Env	1	402
signal peptide end	Env	22	402
gp120 start	Env	23	402
V1	Env	113-167	402
V2	Env	169-211	403
V3	Env	311-344	403

Feature	Protein	Location	Page
V3 tip	Env	328-334	404
V4	Env	402-432	404
V5	Env	472-477	405
gp120 end	Env	525	405
gp41 start	Env	526	405
Env end	Env	880	407
gp41 end	Env	880	407
Nef start	Nef	1	408
R17Y mutation	Nef	17	408
max HIV-1 similarity	Nef	153-182	408
premature stop in Mac239	Nef	93	408
normal Nef end	Nef	264	409

### VI-3 Sequences

Sequences included in the HIV-2/SIV protein alignments.

Name	Accession	Proteins	Author	Reference
MAC.US.x.239	M33262	All	Kestler, H.	<i>Science</i> <b>248</b> (4959):1109-1112 (1990)
A.CI.88.UC2	U38293	All	Barnett, S.W.	<i>Virology</i> <b>222</b> (1): 257-61 (1996)
A.DE.x.BEN	M30502	All	Kirchhoff, F.	<i>Virology</i> <b>177</b> (1):305-311 (1990)
A.DE.x.PEI2_KR_KRCG	U22047	All	Kraus, G.	<i>ARHR</i> <b>14</b> (1); 65-77 (1998)
A.GH.x.GH1	M30895	All	Hasegawa, A.	<i>ARHR</i> <b>5</b> (6):593-604 (1989)
A.GM.87.D194	J04542	All	Kuehnel, H.	<i>Proc Natl Acad Sci USA</i> <b>86</b> (7):2383-2387 (1989)
A.GM.x.ISY_SBL_6669_85	J04498	All	Franchini, G.	<i>Proc Natl Acad Sci USA</i> <b>86</b> (7):2433-2437 (1989)
A.GM.x.MCN13	AY509259	All	Schmitz, C.	<i>J Virol</i> <b>78</b> (4):2006-2016 (2004)
A.GM.x.MCR35	AY509260	All	Schmitz, C.	<i>J Virol</i> <b>78</b> (4):2006-2016 (2004)
A.GW.86.FG_clone_NIHZ	J03654	All	Zagury, J.F.	<i>Proc Natl Acad Sci USA</i> <b>85</b> (16):5941-5945 (1988)
A.GW.87.CAM2CG	D00835	All	Tristem, M.	<i>J Gen Virol</i> <b>72</b> (PT 3):721-724 (1991)
A.GW.x.MDS	Z48731	All	Becker	Unpublished
A.IN.07.NNVA	EU980602	All	Gurjar, S.R.	<i>JAIDS</i> <b>52</b> (3); 329-35 (2009)
A.IN.95.CRIK_147	DQ307022	All	Santhosh, C.V.	<i>ARHR</i> <b>24</b> (10); 1315-7 (2008)
A.JP.08.NMC786_clone_41	AB731742	All	Umeki-Sakamoto	Unpublished
A.PT.x.ALI	AF082339	All	Reeves, J.D.	<i>J Virol</i> <b>73</b> (9); 7795-804 (1999)
A.SN.85.ROD	M15390	All	Clavel, F.	<i>Nature</i> <b>324</b> (6098):691-695 (1986)
A.SN.86.ST_JSP4_27	M31113	All	Kumar, P.	<i>J Virol</i> <b>64</b> (2):890-901 (1990)
B.CI.88.UC1	L07625	All	Barnett, S.W.	<i>J Virol</i> <b>67</b> (2):1006-1014 (1993)
B.CI.x.20_56	AB485670	All	Takekawa	Unpublished
B.CI.x.EHO	U27200	All	Rey-Cuille, M.A.	<i>Virology</i> <b>202</b> (1):471-476 (1994)
B.GH.86.D205_ALT	X61240	All	Dietrich, U.	<i>Nature</i> <b>342</b> (6252):948-950 (1989)
B.JP.01.IMCJ_KR020_1	AB100245	All	Kusagawa, S.	<i>ARHR</i> <b>19</b> (11):1045-1049 (2003)
G.CI.92.Abt96	AF208027	All	Brennan, C.A.	<i>ARHR</i> <b>13</b> (5):401-404 (1997)
AB.CM.03.03CM_510_03	EU028345	All	Yamaguchi, J.	<i>ARHR</i> <b>24</b> (1):86-91 (2008)
H2_01_AB.CI.90.7312A	L36874	All	Gao	Unpublished
H2_01_AB.JP.04.NMC307_20	AB731738	All	Umeki-Sakamoto	Unpublished
H2_01_AB.JP.07.NMC716_01	AB731740	All	Umeki-Sakamoto	Unpublished

Name	Accession	Proteins	Author	Reference
H2_01_AB.JP.08.NMC842_10	AB731744	All	Umeki-Sakamoto	Unpublished
U.CI.07.07IC_TNP3	KC693505	All	Ayouba, A.	<i>AIDS</i> <b>27</b> (15):2488-2491 (2013)
U.FR.96.12034	AY530889	All	Damond, F.	<i>ARHR</i> <b>20</b> (6):666-672 (2004)
MAC.US.x.17EC1	AY033233	All	Anderson, M.G.	<i>Virology</i> <b>195</b> (2):616-626 (1993)
MAC.US.x.1937	AY611495	All	O'Connor, D.H.	<i>J Virol</i> <b>78</b> (24):14012-14022 (2004)
MAC.US.x.2065	AY611493	All	O'Connor, D.H.	<i>J Virol</i> <b>78</b> (24):14012-14022 (2004)
MAC.US.x.251_1A11	M76764	All	Marthas, M.L.	<i>J Med Primatol</i> <b>18</b> (3-4):311-9 (1989)
MAC.US.x.251_32H_PJ5	D01065	All	Rud, E.W.	(in) Brown, F, Chanock, RM and Ginsberg, HS(Eds); <i>VACCINES 92: MODERN APPROACHES TO NEW VACCINES INCLUDING PREVENTION OF AIDS: 229-235</i> ; Cold Spring Harbor Laboratory Press, New York (1992)
MAC.US.x.251_BK28	M19499	All	Hirsch, V.	<i>Cell</i> <b>49</b> (3):307-319 (1987)
MAC.US.x.80035	AY611486	All	O'Connor, D.H.	<i>J Virol</i> <b>78</b> (24):14012-14022 (2004)
MAC.US.x.81035	AY599200	All	O'Connor, D.H.	<i>J Virol</i> <b>78</b> (24):14012-14022 (2004)
MAC.US.x.85013	AY611490	All	O'Connor, D.H.	<i>J Virol</i> <b>78</b> (24):14012-14022 (2004)
MAC.US.x.87082	AY600249	All	O'Connor, D.H.	<i>J Virol</i> <b>78</b> (24):14012-14022 (2004)
MAC.US.x.92050	AY603959	All	O'Connor, D.H.	<i>J Virol</i> <b>78</b> (24):14012-14022 (2004)
MAC.US.x.92077	AY599201	All	O'Connor, D.H.	<i>J Virol</i> <b>78</b> (24):14012-14022 (2004)
MAC.US.x.93057	AY611492	All	O'Connor, D.H.	<i>J Virol</i> <b>78</b> (24):14012-14022 (2004)
MAC.US.x.93062	AY607704	All	O'Connor, D.H.	<i>J Virol</i> <b>78</b> (24):14012-14022 (2004)
MAC.US.x.95058	AY611494	All	O'Connor, D.H.	<i>J Virol</i> <b>78</b> (24):14012-14022 (2004)
MAC.US.x.95086	AY607703	All	O'Connor, D.H.	<i>J Virol</i> <b>78</b> (24):14012-14022 (2004)
MAC.US.x.95112	AY588946	All	O'Connor, D.H.	<i>J Virol</i> <b>78</b> (24):14012-14022 (2004)
MAC.US.x.96016	AY607701	All	O'Connor, D.H.	<i>J Virol</i> <b>78</b> (24):14012-14022 (2004)
MAC.US.x.96020	AY611488	All	O'Connor, D.H.	<i>J Virol</i> <b>78</b> (24):14012-14022 (2004)
MAC.US.x.96072	AY611491	All	O'Connor, D.H.	<i>J Virol</i> <b>78</b> (24):14012-14022 (2004)
MAC.US.x.96081	AY597209	All	O'Connor, D.H.	<i>J Virol</i> <b>78</b> (24):14012-14022 (2004)
MAC.US.x.96093	AY611489	All	O'Connor, D.H.	<i>J Virol</i> <b>78</b> (24):14012-14022 (2004)
MAC.US.x.96114	AY588945	All	O'Connor, D.H.	<i>J Virol</i> <b>78</b> (24):14012-14022 (2004)
MAC.US.x.96123	AY611487	All	O'Connor, D.H.	<i>J Virol</i> <b>78</b> (24):14012-14022 (2004)
MAC.US.x.96135	AY607702	All	O'Connor, D.H.	<i>J Virol</i> <b>78</b> (24):14012-14022 (2004)
MAC.US.x.97009	AY599199	All	O'Connor, D.H.	<i>J Virol</i> <b>78</b> (24):14012-14022 (2004)
MAC.US.x.97074	AY599198	All	O'Connor, D.H.	<i>J Virol</i> <b>78</b> (24):14012-14022 (2004)
MAC.US.x.MM142_IVMXX	Y00277	All	Chakrabarti, L.	<i>Nature</i> <b>328</b> (6130):543-547 (1987)
MAC.US.x.r80025	AY576480	All	O'Connor, D.H.	<i>J Virol</i> <b>78</b> (24):14012-14022 (2004)
MAC.US.x.r90131	AY576481	All	O'Connor, D.H.	<i>J Virol</i> <b>78</b> (24):14012-14022 (2004)
MNE.US.82.MNE_8	M32741	All	Kimata, J.T.	<i>J Virol</i> <b>72</b> (1):245-256 (1998)
MNE.US.x.MNE027	U79412	All	Kimata, J.T.	<i>J Virol</i> <b>72</b> (1):245-256 (1998)
SMM.CI.79.SIVsmCI2	JX860430	All	Fischer, W.	<i>J Virol</i> <b>86</b> (24):13217-13231 (2012)
SMM.LR.89.SIVsmLIB1	JX860431	All	Fischer, W.	<i>J Virol</i> <b>86</b> (24):13217-13231 (2012)
SMM.SL.92.SIVsmSL92A	JX860432	All	Fischer, W.	<i>J Virol</i> <b>86</b> (24):13217-13231 (2012)
SMM.SL.92.SL92B	AF334679	All	Chen, Z.	<i>J Virol</i> <b>70</b> (6):3617-3627 (1996)
SMM.US.04.G078	JX860415	All	Fischer, W.	<i>J Virol</i> <b>86</b> (24):13217-13231 (2012)
SMM.US.04.G932	JX860416	All	Fischer, W.	<i>J Virol</i> <b>86</b> (24):13217-13231 (2012)
SMM.US.04.M919	JX860417	All	Fischer, W.	<i>J Virol</i> <b>86</b> (24):13217-13231 (2012)
SMM.US.04.M922	JX860418	All	Fischer, W.	<i>J Virol</i> <b>86</b> (24):13217-13231 (2012)
SMM.US.04.M923	JX860419	All	Fischer, W.	<i>J Virol</i> <b>86</b> (24):13217-13231 (2012)
SMM.US.04.M926	JX860420	All	Fischer, W.	<i>J Virol</i> <b>86</b> (24):13217-13231 (2012)
SMM.US.04.M934	JX860421	All	Fischer, W.	<i>J Virol</i> <b>86</b> (24):13217-13231 (2012)

Name	Accession	Proteins	Author	Reference
SMM.US.04.M935	JX860422	All	Fischer, W.	<i>J Virol</i> <b>86</b> (24):13217-13231 (2012)
SMM.US.04.M940	JX860423	All	Fischer, W.	<i>J Virol</i> <b>86</b> (24):13217-13231 (2012)
SMM.US.04.M946	JX860424	All	Fischer, W.	<i>J Virol</i> <b>86</b> (24):13217-13231 (2012)
SMM.US.04.M947	JX860425	All	Fischer, W.	<i>J Virol</i> <b>86</b> (24):13217-13231 (2012)
SMM.US.04.M949	JX860426	All	Fischer, W.	<i>J Virol</i> <b>86</b> (24):13217-13231 (2012)
SMM.US.04.M950	JX860427	All	Fischer, W.	<i>J Virol</i> <b>86</b> (24):13217-13231 (2012)
SMM.US.04.M951	JX860428	All	Fischer, W.	<i>J Virol</i> <b>86</b> (24):13217-13231 (2012)
SMM.US.04.M952	JX860429	All	Fischer, W.	<i>J Virol</i> <b>86</b> (24):13217-13231 (2012)
SMM.US.05.D215	JX860413	All	Fischer, W.	<i>J Virol</i> <b>86</b> (24):13217-13231 (2012)
SMM.US.06.FTq	JX860414	All	Fischer, W.	<i>J Virol</i> <b>86</b> (24):13217-13231 (2012)
SMM.US.11.SIVsmE660_FL10	JQ864084	All	Wu, F.	<i>J Virol</i> <b>86</b> (16); 8835-47 (2012)
SMM.US.86.CFU212	JX860407	All	Fischer, W.	<i>J Virol</i> <b>86</b> (24):13217-13231 (2012)
SMM.US.x.F236_H4	X14307	All	Hirsch, V.M.	<i>Nature</i> <b>339</b> (6223); 389-92 (1989)
SMM.US.x.H9	M80194	All	Courgnaud, V.	<i>J Virol</i> <b>66</b> (1):414-419 (1992)
SMM.US.x.PBJ14_15	L03295	All	Dewhurst, S.	<i>Nature</i> <b>345</b> (6276):636-640 (1990)
SMM.US.x.PBJA	M31325	All	Dewhurst, S.	<i>Nature</i> <b>345</b> (6276):636-640 (1990)
SMM.US.x.PBJ_143	M80193	All	Courgnaud, V.	<i>J Virol</i> <b>66</b> (1):414-419 (1992)
SMM.US.x.PBJ_6P6	L09212	All	Novembre, F.J.	<i>J Virol</i> <b>67</b> (5):2466-2474 (1993)
SMM.US.x.PGM53	AF077017	All	Novembre, F.J.	<i>J Virol</i> <b>72</b> (11):8841-8851 (1998)
SMM.US.x.SME543	U72748	All	Hirsch, V.	<i>J Virol</i> <b>71</b> (2):1608-1620 (1997)
SMM.x.x.pE660.CG7G	JX648292	All	Lopker	Unpublished
STM.US.89.STM_37_16	M83293	All	Novembre, F.J.	<i>Virology</i> <b>186</b> (2):783-787 (1992)

	Gag p15 start		p15 end_p27 start	
MAC.US.x.239	MGVNRNSVLSGKKADELEKIRLRLPNGKKYMLKHVVWAANELDRFLAESLLENKEGCKQILSVLAPLPTGSENLKSLYNTVCVWICVIAHAEKVKHTEEAQIVORHLVVEVETGTTETMPKTSRPTAPSSGRGGNYPVQQ	IGGNYVHLPLSPRTLNAWVKLIEEKKFGAE	169	
A.CI.88.UC2	-A--R-----G--R--I-----R--N--S-----T--D-----F-----L-----D-----KL--A--A--K--N--P--K--F--A--V-----V-----		169	
A.DE.x.BEN	-A--R-----V--G--R--I-----K-----S-----R--D-----F-----L-----D-----KLA--A--A--K--N--P--KR--F--A--V-----V-----		169	
A.DE.x.PE12_KR_KRCC	-A--S-----V-----G-----R--I-----GK-----S-----IT--D-----F-----L-----D-----G--A--A--ADK--S--A--P--R--F--TG--I--V-----V--D-----		170	
A.GH.x.GH1	-A--R-----V-----S-----R--I-----K-----S-----T--D-----F-----L-----D-----KL--A--A--K--NI--P--K--F--A--I--V-----V-----		169	
A.GM.07.D104	-A--R-----V-----G--R--I-----T-----S-----I--E-----F-----T-----L-----D-----R--G--A--E--A--K--NI--P--K--F--A--I--V-----V-----		169	
A.GM.x.ISY_SBL_6669_85	-AK--R-----G--R--I-----T-----S-----I--E-----F-----T-----L-----D-----R--G--A--E--A--K--NI--P--K--F--A--I--V-----V-----		169	
A.GM.x.MCN13	-A--K-----T-----G--R--I-----S-----R--T--G-----F-----D--G-----AA--A--K--N--P--K--F--V--T--V-----V-----		169	
A.GM.x.MCR35	-A--K-----T-----G--R--I-----S-----R--T--D-----F-----D--G-----AA--A--K--N--P--K--F--V--T--V-----V-----		169	
A.GW.86.FG_clone_NIHZ	-A--R-----V-----G--K--I-----S-----R--T--D-----F-----D--G-----AA--A--K--N--P--K--F--VA--T--I--G-----V-----		167	
A.GW.87_CAM2CG	-A--R-----V-----G--K--I-----S-----R--T--D-----F-----D--G-----AA--A--K--N--P--K--F--VA--T--I--G-----V-----		169	
A.GW.x.MDS	-A--S-----V-----G--R--I-----S-----R--T--D-----F-----F-----D-----R--AL--AA--A--K--D--P--K--F--N--T--V-----V-----		169	
A.IN.07.NNVA	-AK--R-----R--G--RV-----T-----S-----T--D-----F-----F-----D-----K--FAR--A--A--K--N--P--EG--F--R--T--V-----V-----		169	
A.IN.95.CR1K_147	-AKS--R-----R--G--R-----K--T-----S-----T--D-----F-----F-----D-----K--A--A--K--N--P--EG--F--H--T--V-----V-----		169	
A.JP.08.NMC786_clone_41	-A--R-----R--G--K--I-----S-----R--T--N--I-----F-----L-----D-----KL--A--A--K--E--P--K--F--VA--T--V-----V-----		169	
A.JT.x.AL1	-A--R--R-----R--G--Q--I-----S-----R--K--E-----F-----V--V-----D--G-----I--AA--IE--A--K--S--P--EQ--F--VA--T--V-----D-----V-----		169	
A.SN.85.ROD	-A--R-----R--G--R--I-----K-----S-----T--D--M-----F-----D--G-----R--A--A--K--S--P--EK--H--V--T--I-----V-----		169	
A.SN.86.ST_JSP4_27	-A--R-----R--G--R--I-----S-----T--D-----F-----A--D--K--A--K--S--P--N--F--VA--T--V-----V-----		169	
B.CI.88.UC1	-A--S-----T-----V--G--R--C--II--V-----S-----H--T-----F-----Y--L-----D-----K--A--AAD--K--A--P-----A--M-----V-----		164	
B.CI.x.20_56	-A--G-----T-----V--G--C-----V--Y--T-----S--Q--H--T--M-----F-----Y--L-----D-----K--A--S--A--DK--K--A--P-----A--V--D-----		164	
B.CI.x.EHO	-A--G-----T-----V--G--R--I--V--E-----R--GS--R--RK--G-----F-----L-----D-----K--A--AAD--K--AM--K--SK--T--RLA--A--S-----V-----		164	
B.GH.86.D205_ALT	-A--G-----T-----V--G--R--I--V--Y-----S-----H--T--E-----F-----I--F--L--V--D--D--K--A--AAD--K--A--NK--P-----LA-----V-----		164	
B.JP.01.IMCJ_KR020_1	-A--G-----T-----V--G--C--I--V--Y-----S-----H--T--E-----F-----Y--L--V--D--D--K--A--S--AAN--K--A--K--P--R-----VA--T-----V-----		164	
G.CI.92.Abt96	-A--S-----T-----V--G--S-----S-----H--T-----F-----L--Q-----V-----KV--A--I--P-----V-----V-----		169	
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MAC.US.x.239	GLGVNPTLEEMLTAC0GVGGQKARLMAEALKEALAPVPIFAAAQQR	.GPRK.PIKWCNCGKEGHSARQCRAPRRQCGKWCXKMDHVMAC	CPDRQAGFLGLGPWGKKPRNFMAQVHQGLMPTAPPE	.....	DPAVDLLKMYNMGKQOQREKQR	485										
A.CI.88.UC2	.....M	.....T-P	.....R-T-R	.....K	.....PG-I-N	.....M-SR	.....V-AP-I	.....A	.....A-EK-L-Q-R	479						
A.DE.x.BEN	.....M	.....MG-S	.....A-RY	.....D	.....PG-I-N	.....E	.....I-R	.....VT-P-I	.....A	.....AE-ER-Q-R	479					
A.DE.x.PE12_KR_KRCC	.....M	.....I	.....A	.....R-T	.....D	.....SG-N-E	.....E	.....I	.....VTR-P-T	.....A	.....A-EK-L-Q-R	479				
A.GH.x.GH1	.....M	.....T-P	.....V-R	.....K	.....SG-I-N	.....E	.....M-R-Q	.....A-AP-I	.....T	.....A	.....ER-Q-R	480				
A.GM.x.D104	.....M	.....I	.....S	.....MR-A	.....KR-A	.....SG-I-N	.....E	.....VVPSS	.....T-M	.....H	.....EK-Q-R	479				
A.GM.x.ISY_SBL_6669_85	.....M	.....I	.....S	.....MR-A	.....KR-A	.....SG-I-N	.....E	.....VVPSS	.....T-M	.....H	.....EK-Q-R	478				
A.GM.x.MCN13	.....M	.....I	.....S	.....MR-A	.....KR-A	.....SG-I-N	.....E	.....VVPSS	.....T-M	.....H	.....EK-Q-R	478				
A.GM.x.MCR35	.....M	.....I	.....S	.....MR-A	.....KR-A	.....SG-I-N	.....E	.....VVPSS	.....T-M	.....H	.....EK-Q-R	479				
A.GW.86.FG_clone_NIHZ	.....M	.....T	.....VM-A	.....I	.....TF	.....WS	.....PG-I-N	.....V-M-R	.....V-P-T	.....V	.....EK-Q-R	479				
A.GW.87_CAM2CG	.....M	.....T	.....VM-A	.....I	.....TF	.....WS	.....PG-I-N	.....V-M-R	.....V-P-T	.....V	.....EK-Q-R	477				
A.GW.x.MDS	.....M	.....T	.....VM-A	.....I	.....TF	.....WS	.....PG-I-N	.....V-M-R	.....V-P-T	.....V	.....EK-Q-R	479				
A.IN.07.NNVA	.....M	.....G	.....MG-T	.....V	.....T-R	.....K	.....PG-I-N	.....M-R	.....V-IP	.....T-M	.....EK-Q-R	479				
A.IN.95.CRIK_147	.....M	.....G	.....MG-T	.....V	.....T-R	.....K	.....PG-I-N	.....M-R	.....V-IP	.....T-M	.....EK-Q-R	479				
A.JP.08.NMC786_clone_41	.....M	.....MG	.....MT-A	.....R-T	.....AF	.....K	.....PG-I-N	.....E	.....IS-R	.....V-AP-I	.....A	.....M-EK-Q-R	479			
A.MT.x.ALT	.....M	.....MG	.....MT-A	.....R-T	.....AF	.....K	.....PG-I-N	.....E	.....IS-R	.....V-AP-I	.....A	.....M-EK-Q-R	479			
A.SN.85.ROD	.....M	.....I	.....VIG-A	.....R-T	.....AF	.....K	.....PG-I-N	.....E	.....IS-R	.....V-AP-I	.....A	.....E-A-EQ-Q-R	479			
A.SN.86.ST_JSP4_27	.....M	.....I	.....VIG-A	.....R-T	.....AF	.....K	.....PG-I-N	.....E	.....IS-R	.....V-AP-I	.....A	.....E-A-EQ-Q-R	479			
B.CI.88.UC1	.....M	.....I	.....T-A	.....K.A	.....KRGTVT	.....V-T-K	.....QG-I-S	.....E	.....F	.....T-P-VT-S	.....MDPAEGMTPRGATPSAPPA	.....EM-S-KM-R	.....Q	496		
B.CI.x.20_56	.....M	.....I	.....T-A	.....K.A	.....KRGTVT	.....G-T-K	.....PG-SQ	.....E	.....F	.....P-RVT-S	.....MDPTODMTPOGATPSAPPA	.....EM-S	.....Q	495		
B.CI.x.EHO	.....M	.....I	.....T-STN	.....P.A	.....KR.TVT	.....A-T-K	.....QQG-I-S	.....E	.....F	.....V-AP-IV-S	.....MMPAFGMTPOGATPSAPPA	.....EEM-S	.....K	494		
B.GH.86.D205_ALT	.....M	.....I	.....T-A	.....V.K.A	.....KRGTVT	.....Q-T	.....TG-I-S	.....E	.....F	.....T-P-VT-S	.....MNPAGMTPRGATPSAPPA	.....EM-S-M-R	.....Q	496		
B.JP.01.IMCJ_KR020_1	.....M	.....I	.....T-P-L	.....V.A	.....KRGAVT	.....I-T-K	.....QG-I-S	.....E	.....F	.....V-AP-IL-S	.....MNPENMTPOGAMPSAPPA	.....EM-D	.....R	496		
G.CI.92.Abt96	.....M	.....X	.....N-TAL	.....K.T	.....GKRST	.....TV	.....PG-I	.....E	.....F	.....T-P-T-S	.....M	.....X-R	.....K	484		
AB.CM.03.03CM_510_03	.....M	.....I	.....K	.....T-A	.....F.K.T	.....KRGTVT	.....G-T-K	.....K	.....QG-I-S	.....E	.....F	.....T-P-VT-S	.....MNPAXMTPOGVTSPAPPA	.....EM-S-M	.....Q	495
H2_01_AB.CI.90.7312A	.....PH	.....I	.....T-A	.....K.A	.....RGTVT	.....G-T-K	.....PG-N	.....N-E	.....F	.....P-ETV-S	.....MNTAEGKTHOGATPSAPPA	.....EM-S	.....Q	496		
H2_01_AB.JP.04.NMC307_20	.....PH	.....I	.....T-A	.....K.A	.....KRGTVT	.....G-T-K	.....PG-N	.....N-E	.....F	.....P-ETV-S	.....MNTAEGKTHOGATPSAPPA	.....EM-S	.....Q	496		
H2_01_AB.JP.07.NMC715_01	.....PH	.....I	.....T-A	.....K.A	.....KRGTVT	.....G-T-K	.....PG-N	.....N-E	.....F	.....P-ETV-S	.....MNTAEGKTHOGATPSAPPA	.....EM-S	.....Q	496		
H2_01_AB.JP.08.NMC842_10	.....PH	.....I	.....T-A	.....K.A	.....KRGTVT	.....G-T-K	.....PG-N	.....N-E	.....F	.....P-ETV-S	.....MNTAEGKTHOGATPSAPPA	.....EM-S	.....Q	496		
U.CI.07.07IC_TNP3	.....M	.....XX	.....G-L	.....V	.....G-K-SM	.....T	.....PG-I	.....E	.....F	.....T-IP	.....T-A	.....M-R	.....K	484		
U.FR.96.12034	.....M	.....I	.....Q-M	.....V	.....G-R-VR	.....T-K	.....E-PG-N	.....S	.....ETKV	.....E	.....P-T	.....AEPAVDLL	.....TPTAPPA	.....S-Q	496	
MAC.US.x.17EC1	.....M	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	485		
MAC.US.x.1937	.....M	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	485		
MAC.US.x.2065	.....M	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	485		
MAC.US.x.251_1A11	.....M	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	485		
MAC.US.x.251_32H_PJ5	.....M	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	485		
MAC.US.x.251_BK28	.....M	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	485		
MAC.US.x.80035	.....M	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	485		
MAC.US.x.81035	.....M	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	485		
MAC.US.x.85013	.....M	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	485		
MAC.US.x.87082	.....M	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	485		
MAC.US.x.92056	.....M	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	485		
MAC.US.x.92077	.....M	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	485		
MAC.US.x.93057	.....M	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	485		
MAC.US.x.93062	.....M	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	485		
MAC.US.x.95058	.....M	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	485		
MAC.US.x.95086	.....M	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	485		
MAC.US.x.95112	.....M	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	485		
MAC.US.x.96016	.....M	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	485		
MAC.US.x.96020	.....M	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	485		
MAC.US.x.96072	.....M	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	485		
MAC.US.x.96081	.....M	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	485		
MAC.US.x.96093	.....M	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	485		
MAC.US.x.96114	.....M	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	485		
MAC.US.x.96123	.....M	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	485		
MAC.US.x.96135	.....M	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	485		
MAC.US.x.97009	.....M	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	485		
MAC.US.x.97074	.....M	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	.....X	485		
MAC.US.x.MM142_IVMXX	.....M	.....T	.....A	.....K	.....K	.....K	.....N	.....X	.....T	.....E	.....H	.....Q	.....Q	481		
MAC.US.x.r80025	.....M	.....T	.....A	.....K	.....K	.....K	.....N	.....X	.....T	.....E	.....H	.....Q	.....Q	481		
MAC.US.x.r90131	.....M	.....T	.....A	.....K	.....K	.....K	.....N	.....X	.....T	.....E	.....H	.....Q	.....Q	481		
MNE.US.82.MNE_8	.....M	.....G-L	.....K	.....K	.....K	.....K	.....Q-G	.....F	.....M	.....T	.....Q	.....Q	.....Q	481		
MNE.US.x.MNE027	.....M	.....G-L	.....K	.....K	.....K	.....K	.....Q-G	.....F	.....M	.....T	.....Q	.....Q	.....Q	481		
SMM.CI.79.SIVsmCI27	.....M	.....I	.....R-FQ-G-L	.....GG-V-R	.....K	.....K	.....SG	.....E	.....F	.....T-LQ	.....T	.....MDPA	.....VAAPPM	.....M-R-LK-Q	493	
SMM.LR.89.SIVsmLRB1	.....M	.....I	.....R-FQ-ASL	.....GT-RTVR	.....R	.....K	.....TG-I	.....E	.....F	.....M-T	.....A	.....A	.....A	.....D-K-R	481	
SMM.SL.92.SIVsmSL92A	.....M	.....I	.....R-FQ-ASL	.....GT-RTVR	.....R	.....K	.....TG-I	.....E	.....F	.....M-T	.....A	.....A	.....A	.....D-K-R	481	
SMM.SL.92.SL92B	.....M	.....I	.....M-D-TGSLVAAQFRGAAGQGN	.....PI-R-F	.....T	.....K	.....EEGRIQ-N	.....N-QK	.....T-TS	.....T-S	.....A	.....ARIV-E	.....LEKAO	.....REK	482	
SMM.US.04.G078	.....M	.....I	.....G-L	.....G	.....TV	.....T-K	.....TG	.....E	.....F	.....P-R-V	.....A	.....R	.....R	483		
SMM.US.04.G932	.....M	.....I	.....G-L	.....V-K	.....Q	.....T	.....TG	.....E	.....F	.....M-T	.....A	.....R	.....Q	482		
SMM.US.04.M919	.....M	.....I	.....T-GOL	.....V-K	.....Q	.....T	.....PG	.....E	.....F	.....M-T	.....A	.....R	.....Q	482		
SMM.US.04.M922	.....M	.....S	.....T-GOL	.....V-K	.....Q	.....T	.....PG	.....E	.....F	.....M-T	.....A	.....R	.....Q	482		
SMM.US.04.M923	.....M	.....I	.....D-TGOL	.....V-K	.....Q	.....T	.....TG	.....E	.....F	.....M-T	.....A	.....R	.....Q	482		
SMM.US.04.M926	.....M	.....I	.....R-G-ASL	.....V-K	.....Q	.....T	.....G	.....E	.....F	.....M-T	.....A	.....R	.....Q	482		
SMM.US.04.M934	.....M	.....I	.....A-L	.....V-K	.....Q	.....T	.....TG	.....E	.....F	.....M-T	.....A	.....R	.....Q	481		
SMM.US.04.M935	.....M	.....I	.....T-GOF	.....V-K	.....Q	.....T	.....TG	.....E	.....F	.....M-T	.....A	.....R	.....Q	482		
SMM.US.04.M940	.....M	.....S	.....I-V	.....G-L	.....V-K	.....Q	.....TG	.....E	.....F	.....M-T	.....A	.....R	.....Q	483		
SMM.US.04.M946	.....M	.....I	.....G-L	.....V-K	.....Q	.....T	.....TG	.....E	.....F	.....M-T	.....A	.....R	.....Q	482		
SMM.US.04.M947	.....M	.....I	.....T-GOL	.....V-K	.....Q	.....T	.....AG	.....E	.....F	.....M-T	.....A	.....R	.....Q	482		
SMM.US.04.M949	.....M	.....S	.....TTG-L	.....V-K	.....Q	.....T	.....TG	.....E	.....F	.....M-T	.....A	.....R	.....Q	483		
SMM.US.04.M950	.....M	.....S	.....I	.....T-A-L	.....V-K	.....Q	.....F	.....E	.....F	.....M-T	.....A	.....R	.....Q	482		
SMM.US.04.M951	.....M	.....I	.....T-A-L	.....V-K	.....Q	.....T	.....F	.....E	.....F	.....M-T	.....A	.....R	.....Q	483		
SMM.US.04.M952	.....M	.....I	.....V-ASL	.....V-K	.....Q	.....T	.....TG	.....E	.....F	.....M-T	.....A	.....R	.....Q	482		
SMM.US.05.D215	.....M	.....I	.....D-Q-GHL	.....V-K	.....Q	.....T	.....G-T-N	.....E	.....F	.....M-T	.....A	.....R	.....Q	483		
SMM.US.06.FTq	.....M	.....MS	.....S	.....GVL	.....K.G	.....LRHTV	.....K	.....G-I	.....E	.....V-F	.....F	.....T-MP	.....T-DLAR	.....E-R-Q	488	
SMM.US.11.SIVsmE660_FL10	.....M	.....I	.....R-DOL	.....V-K	.....Q	.....R-T	.....G	.....E	.....F	.....M-T	.....A	.....R	.....Q	482		
SMM.US.86.CFU212	.....M	.....X	.....X	.....R-DOL	.....V-K	.....Q	.....G	.....E	.....F	.....M-T	.....A	.....R	.....Q	483		
SMM.US.x.F236_H4	.....M	.....X	.....X	.....R-DOL	.....V-K	.....										



	Pol p15 start		p15 end protease start	
MAC.US.x.239	FFRPWSMGKEAPQFPHGSSASGADANCSP	.....	RGPSGCSAKELHAVGOAERKAERKOREALQG	.....
A.CI.88.UC2	---DGLT---	L-R-P-S---	T-ST	-----
A.DE.x.BEN	---VGPT---	S-L-RDP-P---	T-ST	-----
A.DE.x.PE12 KR KRCCG	---D-P---	S-L-RDP-PA---	T-ST	-----
A.GH.x.GH1	---DG---	L-R-P-S---	T-ST	-----
A.GM.87.0104	---DGPT---	L-R-P-S---	T-ST	-----
A.GM.x.ISY SBL_6669_85	---A-T---	L-R-PKFA-NT-	ST	-----
A.GM.x.MCN13	---DGPP---	L-R-P-PA-NT-	ST	-----
A.GM.x.MCR35	---DGPP---	L-R-P-PA-NT-	ST	-----
A.GW.86.FG clone NIHZ	---D-PL---	G-L-R-P-PA-NT-	ST	-----
A.GW.87_CAM2CG	---D-PL---	L-R-P-SA-NT-	ST	-----
A.GW.x.MDS	---D-PL---	L-R-PGSA-NT-	ST	-----
A.IN.07.NNVA	---DGPP---	L-R-PNPA-NT-	ST	-----
A.IN.95.CRIK 147	---DKPP---	S-L-R-P-ST-NT-	ST	-----
A.JP.08.NMC786 clone 41	---DK-T---	S-L-R-P-S-T-T-	ST	-----
A.MT.x.ALT	---A-P---	S-L-RNP-SA-INT-	ST	-----
A.SN.85.R0D	---TGPL---	L-R-P-SA---	T-ST	-----
A.SN.86.ST.JSP4_27	---VGP---	---C-PNPA---	T-ST	-----
B.CI.88.UC1	---VRTL---	S-L-DP---	S-TI-T-DGPSR	GHDTSGGGTICAPCRS-S-D-EK
B.CI.x.20_56	---IRTL---	S-L-P---	EG-TI-T-DGPN	TGHDTSGGDSICTPCRS-S-D-EK
B.CI.x.EHO	---VRPL---	S-R-PGPT-DS-	I-A-DEPSIRHDTSGGDSICTPCRS-R-D	-----
B.GH.86.D205 ALT	---VRTL---	S-L-DP---	S-TI-T-DGPSR	GHDTSGGGTICAPCRS-S-D-EK
B.JP.01.IMCJ.KR020_1	---I-PL---	S-L-CSP-TP-DT-	I-TTNEPSREHDTSGGCAICAPCRS-S-DVEG	-----
G.CI.92.Abt96	---V-TL---	S-L-DP-P-S-	SISST	-----
AB.CM.03.C3CM_510_03	---VRTL---	S-L-DPG---	S-TI-T-DEPSRXHDTSGGGTICAPCRS-S-D-EK	-----
H2_01_AB.CI.90_7312A	---A-TL---	S-L-P-DS-	I-A-DEHSRGDTSGGDTICAPCRS-G-D-EK	-----
H2_01_AB.JP.04.NMC307_20	---A-TL---	S-L-R-P-GG-	I-A-DGHSREDDTSGGGTICAPCRS-S-D-K	-----
H2_01_AB.JP.07.NMC716_01	---V-TL---	S-L-P-GG-	I-A-DGHSREDDTSGGGTICAPCRS-S-D-K	-----
H2_01_AB.JP.08.NMC842_10	---A-TL---	S-L-R-P-GG-	I-A-DGHSREDDTSGGGTICAPCRS-S-D-K	-----
U.CI.07.071C.TMP3	---V-P---	S-L-DPDP-V-T-	SA-SR-S-E	-----
U.FR.96.12034	---A-PL-K-S-L-	P-PA-T-P-SPS	-----	
MAC.US.x.17EC1	---X-X---	-----	-----	-----
MAC.US.x.1937	-----	-----	-----	-----
MAC.US.x.2065	-----	X	-----	-----
MAC.US.x.251_1A11	-----	-----	T	-----
MAC.US.x.251_32H_PJ5	-----	-----	A	-----
MAC.US.x.251_BK28	-----	-----	-----	L
MAC.US.x.80035	-----	-----	-----	K
MAC.US.x.81035	-----	-----	-----	-----
MAC.US.x.85013	-----	-----	-----	-----
MAC.US.x.87082	-----	-----	-----	-----
MAC.US.x.92056	-----	-----	-----	-----
MAC.US.x.92077	-----	-----	-----	-----
MAC.US.x.93057	-----	-----	-----	-----
MAC.US.x.93062	-----	-----	X	-----
MAC.US.x.95058	-----	-----	-----	X
MAC.US.x.95086	-----	-----	-----	-----
MAC.US.x.95112	-----	-----	-----	-----
MAC.US.x.96016	-----	-----	-----	-----
MAC.US.x.96020	-----	-----	-----	-----
MAC.US.x.96072	-----	P	-----	-----
MAC.US.x.96081	-----	-----	-----	-----
MAC.US.x.96093	-----	-----	-----	X
MAC.US.x.96114	-----	-----	-----	-----
MAC.US.x.96123	-----	-----	-----	-----
MAC.US.x.96135	-----	-----	-----	-----
MAC.US.x.97009	-----	-----	-----	-----
MAC.US.x.97074	-----	X	-----	-----
MAC.US.x.MM142_IVMXX	-----	PL	-----	-----
MAC.US.x.r80025	-----	-----	RT	-----
MAC.US.x.r90131	-----	-----	-----	L
MNE.US.82.MNE_8	-----	-----	-----	K
MNE.US.x.MNE027	-----	-----	-----	-----
SMM.CI.79.SIVsmC12	---I-P---	S-L-DPTPA-	T-GA-NGSSCGGAPN-S-HVE-SETRS-T-EE-K-R	-----
SMM.LR.89.SIVsmL1B1	---L-L---	SK-PN-T	-----	-----
SMM.SL.92.SIVsmSL92A	---I-L---	S-L-PN-P-TDSP	-----	-----
SMM.SL.92.SL92B	---P---	S-L-ADNI#-#-TVSTP	-----	-----
SMM.US.04.G078	---V-P---	S-L-P-T-E-G-G	-----	-----
SMM.US.04.G932	---L-P---	L-PN	-----	-----
SMM.US.04.M919	---A-P---	L-PD	-----	-----
SMM.US.04.M922	---A-PV---	PD-T	-----	-----
SMM.US.04.M923	---V-P---	PN-S	-----	-----
SMM.US.04.M926	---V-PL---	PN-S	-----	-----
SMM.US.04.M934	---A-P---	PDT-T	-----	-----
SMM.US.04.M935	---V-P---	K-S-P-T-E-T	-----	-----
SMM.US.04.M940	---V-PL---	PN-YS	-----	-----
SMM.US.04.M946	---A-P---	PD-T	-----	-----
SMM.US.04.M947	---V-P---	S-P-T-E	-----	-----
SMM.US.04.M949	---I-PL---	PN-S	-----	-----
SMM.US.04.M950	---V-PL---	S-PN	-----	-----
SMM.US.04.M951	---I-PL---	S-P-T	-----	-----
SMM.US.04.M952	---L---	S-L-DPDP-Y-GPS	-----	-----
SMM.US.05.D215	---I-PL---	S-L-DPDP-Y-GPS	-----	-----
SMM.US.06.FTQ	---A-P---	L-PD-NT	-----	-----
SMM.US.11.SIVsmE660_FL10	---X-P---	P-T-ST	-----	-----
SMM.US.86.CFU212	---A-P---	PD-T	-----	-----
SMM.US.x.F236_H4	---A-P---	PD-T-X	-----	-----
SMM.US.x.H9	---A-P---	PD-T	-----	-----
SMM.US.x.PBJ14_15	---A-P---	PD-T	-----	-----
SMM.US.x.PBJA	---A-P---	PD-T	-----	-----
SMM.US.x.PBJ_143	---A-P---	PD-T-X	-----	-----
SMM.US.x.PBJ_6P6	---A-P---	PD-T	-----	-----
SMM.US.x.PGMS3	---V-P---	PD-T	-----	-----
SMM.US.x.SME543	---A-P---	L-PD-T	-----	-----
SMM.x.x.pE660.CG7G	---A-P---	L-PD-T	-----	-----
STM.US.89.STM_37_16	---I-PL---	L-PNT-PS	-----	-----

	protease end	p51 RT start		D catalytic site	
MAC.US.x.239	LGKRIKGTIMTGDTPINIFGRNLLTALGMSLNFPJAKVPEPKVVALKPGKDGPKLKWPLSKKEKIVALREIC.	EKMEKDGQLEEAPPTNPYNTPTFAIKKKDKNKWRMLIDFRELNRVTQDFTEVQLGIPHPAGLAKKRITVLDIGDAYFSIPLDEEFQRYAFTLPSVN			303
A.CI.88.UC2	-N-VRA-----I-----L-V-RI-I-IT-----R-----T-VE-K-----E-----I-----K-----V-----Y-D-P-----				316
A.DE.x.BEN	-N-VRA-----I-----L-V-I-I-I-----R-----T-E-K-----E-----I-----K-----SI-V-----H-D-A-----				316
A.DE.x.PE22_KR_KRCG	-N-KV-A-----I-----L-V-D-I-I-----VR-----T-E-E-K-----RE-----I-----K-----E-----I-----K-----V-----H-D-T-----				316
A.GH.x.GH1	-N-VRA-----I-----L-V-I-I-I-----R-----T-E-E-K-----E-----I-----K-----V-----H-D-----				316
A.GM.07.0104	-N-VRA-----I-AT-----L-V-LD-I-T-----R-----T-E-E-K-----E-----I-----K-----V-----H-D-----				316
A.GM.x.ISY_SBL_6669_85	-N-KVRA-----I-----L-V-I-I-I-----OR-----TR-----E-E-K-----RE-----I-----K-----V-----Y-D-----				316
A.GM.x.MCN13	-KVRA-----I-----L-V-I-I-IM-----R-----T-E-E-K-----RE-----I-----K-----I-----K-----H-D-I-----				316
A.GM.x.MCR35	-KVRA-----I-----L-V-I-I-IM-----R-----T-E-E-K-----RE-----I-----K-----I-----K-----H-D-I-----				316
A.GW.86.FG_clone_NIHZ	-V-A-----V-----L-V-I-I-IM-----R-----T-E-E-K-----E-----I-----K-----V-----H-D-----				316
A.GW.87_CAM2CG	-VRA-----I-----L-V-I-I-IM-----R-----T-E-E-K-----E-----I-----K-----V-----H-D-----				316
A.GW.x.MDS	-VRA-----I-----L-V-I-I-IM-----R-----T-E-E-K-----E-----I-----K-----V-----H-D-----				316
A.IN.07.NNVA	-KVRA-----I-V-----L-V-I-I-K-----R-----T-E-E-K-----RE-----I-----K-----E-----I-----K-----V-----H-D-----				316
A.IN.95.CR1K_147	-KVRA-----I-V-----L-V-I-I-IM-----R-----T-E-E-K-----E-----I-----K-----E-----I-----K-----V-----H-D-----				316
A.JP.08.NMC786_clone_41	-N-VRA-----I-A-----L-V-I-I-T-----R-----T-E-E-K-----E-----I-----K-----V-----Y-D-----				316
A.T.x.AL1	-N-V-A-----I-----L-V-I-IE-R-----R-----T-E-E-K-----T-RE-----I-----K-----V-----H-S-----				316
A.SN.85.ROD	-N-KVRA-----I-----L-V-----I-IM-----R-----T-E-E-K-----E-----I-----K-----V-----H-D-P-----				317
A.SN.86.ST_JSP4_27	-N-VRA-----I-----L-V-I-I-IM-----R-----T-E-E-K-----RE-----I-----K-----I-----K-----H-D-I-----				316
B.CI.88.UC1	V-VRA-----I-NT-T-----V-I-K-----IR-----L-K-----E-----R-----EKR-V-----PN-----I-----				317
B.CI.x.20_56	V-VRA-----I-NT-T-----V-I-K-----IR-----L-K-----E-----R-----EKR-V-----V-PD-----P-----				317
B.CI.x.EHO	V-VRA-V-----I-NS-T-----V-RI-Q-E-----IR-----L-K-----E-----S-----K-----E-----V-----V-PD-----A-----				316
B.GB.86.D205_ALT	V-VRA-----I-NT-T-----V-E-----IR-----R-L-K-----E-----E-----EKR-V-----V-PD-----				317
B.JP.01.IMCJ_KR020_1	V-K-RA-----I-NT-T-----V-I-K-----IR-----L-K-----#K-----E-----R-----R-----EKR-V-----V-PD-----				317
G.CI.92.Abt96	V-QA-V-----I-VK-----V-----T-M-----IR-----Q-----D-OE-----T-----EKR-V-----VD-----				299
AB.CM.03.03CM_510_03	V-TVRA-----I-NTX-T-----V-XX-EX-X-X-----RX-L-XK-----D-X-E-----X-----K-----X-----EKR-V-----PX-X-T-----				317
H2_01_AB.CI.90.7312A	V-KVRS-----I-NT-T-----V-I-Q-----IR-----L-K-----E-----S-----EKR-V-----V-PD-----I-----				317
H2_01_AB.JP.04.NMC307_20	V-VRA-----I-S-----M-L-Q-----IR-----L-----E-----VR-R-----K-----E-----V-----V-PD-----I-----				317
H2_01_AB.JP.07.NMC716_01	V-VRA-----I-S-----M-L-Q-----IR-----L-----E-----R-----EKR-V-----V-PD-----I-----				317
H2_01_AB.JP.08.NMC842_10	V-VRA-----I-S-----M-L-Q-----IR-----L-----E-----R-----EKR-V-----V-PD-----I-----				317
U.CI.07.07IC_TMP3	-KVRA-----I-VK-----V-----T-T-M-----IR-X-----E-K-----OE-----R-----EKR-V-----Q-P-----				299
U.FR.96.12034	-T-R-----E-----G-EAL-IGG-----R-----LE-K-----E-----E-----EK-V-----C-D-----I-----				313
MAC.US.x.17EC1					303
MAC.US.x.1937					303
MAC.US.x.2065					303
MAC.US.x.251_1A11	R-----L-----V-----				303
MAC.US.x.251_32H_PJ5					303
MAC.US.x.251_BK28	L-----T-----V-----				299
MAC.US.x.80035					303
MAC.US.x.81035					303
MAC.US.x.85013					303
MAC.US.x.87082					303
MAC.US.x.92056					303
MAC.US.x.92077					303
MAC.US.x.93057					303
MAC.US.x.93062					303
MAC.US.x.95058					303
MAC.US.x.95086					303
MAC.US.x.95112					303
MAC.US.x.96016					303
MAC.US.x.96020					303
MAC.US.x.96072					303
MAC.US.x.96081					303
MAC.US.x.96093	L-----				303
MAC.US.x.96114					303
MAC.US.x.96123					303
MAC.US.x.96135					303
MAC.US.x.97009					303
MAC.US.x.97074	L-----				303
MAC.US.x.MM142_IVMXX	L-----SP-----				299
MAC.US.x.r80025					303
MAC.US.x.r90131					303
MNE.US.82.MNE_8					299
MNE.US.x.MNE027					299
SMM.CI.79.SIVsmCT2					308
SMM.LR.89.SIVsmL1B1	-V-R-----I-E-----C-L-----T-E-----E-----E-----S-----K-----N-----EKR-V-----W-----A-----				299
SMM.SL.92.SIVsmSL92A	-VRA-L-----I-E-----I-Y-V-Q-----T-OR-----E-E-K-----E-----E-----K-----I-----QO-R-----V-----PD-----				299
SMM.US.02.SL92B	-V-RE-L-----I-A-V-----Y-V-YT-K-E-M-----R-----Q-T-----E-R-----N-D-----KM-E-----KEME-V-----V-P-----I-----				295
SMM.US.04.G078	-K-----M-----L-V-----K-E-----R-----I-----E-----E-----S-----K-----I-----R-----V-----H-----				299
SMM.US.04.G932	-K-----T-----M-----L-V-----T-----R-----I-----E-----E-----K-----I-----R-----V-----H-----				299
SMM.US.04.M919	-V-----M-----L-V-----T-----R-----I-----E-----E-----K-----I-----R-----V-----H-----				299
SMM.US.04.M922	-V-----M-----L-V-----I-----T-----R-----I-----E-----E-----K-----I-----R-----V-----H-----				299
SMM.US.04.M923	-V-----M-----L-V-----I-----T-----R-----I-----E-----E-----K-----I-----R-----V-----H-----				299
SMM.US.04.M926	-K-----TM-----C-V-----T-----R-----I-----G-----E-----E-----K-----I-----R-----V-----D-----				299
SMM.US.04.M934	-V-----M-----L-V-----I-----T-----R-----I-----E-----E-----K-----I-----R-----V-----D-----				299
SMM.US.04.M935	-V-----M-----L-V-----I-----T-----R-----I-----E-----E-----K-----I-----R-----V-----D-----				299
SMM.US.04.M940	-K-R-----TM-----C-----I-----T-----R-----I-----E-----E-----K-----I-----R-----V-----D-----				299
SMM.US.04.M946	-V-----A-M-----L-V-----I-----T-----R-----I-----E-----E-----K-----I-----R-----V-----D-----				299
SMM.US.04.M947	-K-----TM-----L-V-----K-E-----R-----I-----E-----D-----E-----K-----I-----R-----V-----D-----				299
SMM.US.04.M949	-K-----TM-----L-V-----R-----T-----E-----R-----I-----E-----D-----E-----K-----I-----R-----V-----E-----				299
SMM.US.04.M950	-K-----TM-----L-V-----R-----T-----E-----R-----I-----E-----D-----E-----K-----I-----R-----V-----E-----				299
SMM.US.04.M951	-K-----N-----TM-----C-----I-----T-----R-----I-----E-----E-----K-----I-----R-----V-----N-----				299
SMM.US.04.M952	-K-----N-----TM-----C-----I-----T-----R-----I-----E-----E-----K-----I-----R-----V-----N-----				299
SMM.US.05.D215	-K-----N-----TM-----C-----I-----T-----R-----I-----E-----E-----K-----I-----R-----V-----N-----				299
SMM.US.06.FTq	-T-R-V-----R-----V-R-----T-Q-----R-----E-----K-----E-----E-----K-----I-----R-----V-----P-----				303
SMM.US.11.SIVsmE660_FL10	-V-R-L-----M-----L-M-Q-----I-----T-----E-VR-----I-----Q-K-----Q-----K-----I-----R-----V-----D-----				299
SMM.US.86.CFU212	-V-----M-----L-----I-----T-----E-VR-----I-----Q-K-----Q-----K-----I-----R-----V-----D-----				299
SMM.US.x.F236_H4	-V-----M-----L-----X-I-----T-----E-VR-----I-----Q-K-----Q-----K-----I-----R-----V-----D-----				299
SMM.US.x.H9	-V-----M-----L-----X-I-----T-----E-VR-----I-----Q-K-----Q-----K-----I-----R-----V-----D-----				299
SMM.US.x.PBJ14_15	-V-----M-----L-----I-----T-----R-----I-----E-----E-----K-----I-----R-----V-----D-----				299
SMM.US.x.PBJA	-V-----M-----L-----I-----T-----R-----I-----E-----E-----K-----I-----R-----V-----D-----				299
SMM.US.x.PBJ_143	-V-----M-----L-----X-I-----T-----R-----I-----E-----E-----K-----I-----R-----V-----D-----				299
SMM.US.x.PBJ_6P6	-V-----M-----L-----X-I-----T-----R-----I-----E-----E-----K-----I-----R-----V-----D-----				299
SMM.US.x.PGMS3	-V-----M-----L-----I-----T-----R-----I-----E-----E-----K-----I-----R-----V-----D-----				299
SMM.US.x.SME543	-V-----M-----L-----I-----T-----R-----I-----E-----E-----K-----I-----R-----V-----D-----				299
SMM.x.x.pE660.CG7G	-V-----M-----L-----I-----T-----R-----I-----E-----E-----K-----I-----R-----V-----D-----				299
STM.US.89.STM_37_16	-K-----V-----V-----T-----I-----E-K-----E-----R-----I-----R-----V-----G-----				299

DD catalytic site

MAC.US.x.239	NAEPGKRYIYKLPQGWKSPAI	FQYTMRHVLEPFRKANPVT	LVQYMDLIIASDRDLEHDRV	VLQSKELLNSIGFSTPEEK	FQKDPFQMGYELWPWK	LKQKIELPQRETWT	VNDIQKLVGLN	WAAQIYPG	IKTKHLR	CLRIGKMLT	TEEVQWTEMAE	AEYEEN	473
A.CI.88.UC2	-V	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	486
A.DE.x.BEN	-M	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	486
A.DE.x.PE12_KR_KRCC	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	486
A.GH.x.GH1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	486
A.GM.87.D104	E	V	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	486
A.GM.x.ISY_SBL_6669_85	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	486
A.GM.x.MCN13	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	486
A.GM.x.MCR35	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	486
A.GW.86.FG_clone_NIHZ	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	486
A.GW.87_CAM2CG	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	486
A.GW.x.MDS	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	486
A.IN.07.NNVA	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	486
A.IN.95.CR1K_147	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	486
A.JP.08.NMC786_clone_41	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	486
A.FT.x.AL1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	486
A.SN.85.ROD	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	487
A.SN.86.ST_JSP4_27	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	486
B.CI.88.UC1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	487
B.CI.x.20_56	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	487
B.CI.x.EHO	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	486
B.GH.86.D205_ALT	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	484
B.JP.01.IMCJ_KR020_1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	487
G.CI.92.Abt96	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	469
AB.CM.03.03CM_510_03	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	487
H2_01_AB.CI.90_7312A	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	487
H2_01_AB.JP.04.NMC307_20	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	487
H2_01_AB.JP.07.NMC716_01	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	487
H2_01_AB.JP.08.NMC842_10	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	487
U.CI.07.07IC_TNP3	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	469
U.FR.96.12034	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	483
MAC.US.x.17EC1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	473
MAC.US.x.1937	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	473
MAC.US.x.2065	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	473
MAC.US.x.251_1A11	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	473
MAC.US.x.251_32H_PJ5	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	473
MAC.US.x.251_BK28	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	469
MAC.US.x.80035	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	473
MAC.US.x.81035	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	473
MAC.US.x.85013	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	473
MAC.US.x.87087	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	473
MAC.US.x.92050	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	473
MAC.US.x.92077	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	473
MAC.US.x.93057	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	473
MAC.US.x.93062	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	473
MAC.US.x.95058	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	473
MAC.US.x.95086	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	473
MAC.US.x.95112	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	473
MAC.US.x.96016	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	473
MAC.US.x.96020	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	473
MAC.US.x.96072	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	473
MAC.US.x.96081	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	473
MAC.US.x.96093	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	473
MAC.US.x.96114	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	473
MAC.US.x.96123	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	473
MAC.US.x.96135	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	473
MAC.US.x.97009	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	473
MAC.US.x.97074	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	473
MAC.US.x.MM142_IVMXX	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	469
MAC.US.x.r80025	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	473
MAC.US.x.r90131	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	473
MNE.US.82.MNE_8	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	469
MNE.US.x.MNE027	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	469
SMM.CI.79.SIVsmCI2	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	478
SMM.LR.89.SIVsmLBR1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	468
SMM.SL.92.SIVsmSL92A	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	469
SMM.SL.92.SL92B	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	465
SMM.US.04.G078	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	469
SMM.US.04.G932	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	469
SMM.US.04.M919	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	469
SMM.US.04.M922	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	469
SMM.US.04.M923	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	469
SMM.US.04.M926	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	469
SMM.US.04.M934	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	469
SMM.US.04.M935	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	469
SMM.US.04.M940	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	469
SMM.US.04.M946	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	469
SMM.US.04.M947	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	469
SMM.US.04.M949	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	469
SMM.US.04.M950	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	469
SMM.US.04.M951	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	469
SMM.US.04.M952	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	469
SMM.US.05.D215	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	469
SMM.US.06.FTQ	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	473
SMM.US.11.SIVsmE660_FL10	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	469
SMM.US.86.CFU212	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	469
SMM.US.x.F236_H4	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	469
SMM.US.x.H9	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	469
SMM.US.x.PBJ14_15	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	469
SMM.US.x.PBJA	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	469
SMM.US.x.PBJ_143	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	469
SMM.US.x.PBJ_6P6	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	469
SMM.US.x.PGMS3	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	469
SMM.US.x.SME543	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	469
SMM.x.x.pE660.CG7G	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	469
STM.US.89.STM_37_16	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	469

MAC.US.x.239	MAC.US.x.17EC1	MAC.US.x.1937	MAC.US.x.2065	MAC.US.x.251_1A11	MAC.US.x.251_32H_PJ5	MAC.US.x.251_BK28	MAC.US.x.80035	MAC.US.x.81035	MAC.US.x.85013	MAC.US.x.87082	MAC.US.x.92056	MAC.US.x.92077	MAC.US.x.93057	MAC.US.x.93062	MAC.US.x.95058	MAC.US.x.95086	MAC.US.x.95112	MAC.US.x.96016	MAC.US.x.96020	MAC.US.x.96072	MAC.US.x.96081	MAC.US.x.96093	MAC.US.x.96114	MAC.US.x.96123	MAC.US.x.96135	MAC.US.x.97009	MAC.US.x.97074	MAC.US.x.MM142_IVMXX	MAC.US.x.r80025	MAC.US.x.r90131	MNE.US.82.MNE_8	MNE.US.x.MNE027	SMM.CI.79.SIVsmCT2	SMM.LR.89.SIVsmLbT1	SMM.SL.92.SIVsmSL92A	SMM.US.04.G078	SMM.US.04.G932	SMM.US.04.M919	SMM.US.04.M922	SMM.US.04.M923	SMM.US.04.M926	SMM.US.04.M934	SMM.US.04.M935	SMM.US.04.M940	SMM.US.04.M946	SMM.US.04.M947	SMM.US.04.M949	SMM.US.04.M950	SMM.US.04.M951	SMM.US.04.M952	SMM.US.05.D215	SMM.US.06.FTq	SMM.US.11.SIVsmE660_FL10	SMM.US.86.CFU212	SMM.US.x.F236_H4	SMM.US.x.H9	SMM.US.x.PBJ14_15	SMM.US.x.PBJA	SMM.US.x.PBJ_143	SMM.US.x.PBJ_6P6	SMM.US.x.PGMS3	SMM.US.x.SMES43	SMM.x.x.pE660.CG7G	STM.US.89.STM_37_16
MAC.US.x.239	MAC.US.x.17EC1	MAC.US.x.1937	MAC.US.x.2065	MAC.US.x.251_1A11	MAC.US.x.251_32H_PJ5	MAC.US.x.251_BK28	MAC.US.x.80035	MAC.US.x.81035	MAC.US.x.85013	MAC.US.x.87082	MAC.US.x.92056	MAC.US.x.92077	MAC.US.x.93057	MAC.US.x.93062	MAC.US.x.95058	MAC.US.x.95086	MAC.US.x.95112	MAC.US.x.96016	MAC.US.x.96020	MAC.US.x.96072	MAC.US.x.96081	MAC.US.x.96093	MAC.US.x.96114	MAC.US.x.96123	MAC.US.x.96135	MAC.US.x.97009	MAC.US.x.97074	MAC.US.x.MM142_IVMXX	MAC.US.x.r80025	MAC.US.x.r90131	MNE.US.82.MNE_8	MNE.US.x.MNE027	SMM.CI.79.SIVsmCT2	SMM.LR.89.SIVsmLbT1	SMM.SL.92.SIVsmSL92A	SMM.US.04.G078	SMM.US.04.G932	SMM.US.04.M919	SMM.US.04.M922	SMM.US.04.M923	SMM.US.04.M926	SMM.US.04.M934	SMM.US.04.M935	SMM.US.04.M940	SMM.US.04.M946	SMM.US.04.M947	SMM.US.04.M949	SMM.US.04.M950	SMM.US.04.M951	SMM.US.04.M952	SMM.US.05.D215	SMM.US.06.FTq	SMM.US.11.SIVsmE660_FL10	SMM.US.86.CFU212	SMM.US.x.F236_H4	SMM.US.x.H9	SMM.US.x.PBJ14_15	SMM.US.x.PBJA	SMM.US.x.PBJ_143	SMM.US.x.PBJ_6P6	SMM.US.x.PGMS3	SMM.US.x.SMES43	SMM.x.x.pE660.CG7G	STM.US.89.STM_37_16
MAC.US.x.239	MAC.US.x.17EC1	MAC.US.x.1937	MAC.US.x.2065	MAC.US.x.251_1A11	MAC.US.x.251_32H_PJ5	MAC.US.x.251_BK28	MAC.US.x.80035	MAC.US.x.81035	MAC.US.x.85013	MAC.US.x.87082	MAC.US.x.92056	MAC.US.x.92077	MAC.US.x.93057	MAC.US.x.93062	MAC.US.x.95058	MAC.US.x.95086	MAC.US.x.95112	MAC.US.x.96016	MAC.US.x.96020	MAC.US.x.96072	MAC.US.x.96081	MAC.US.x.96093	MAC.US.x.96114	MAC.US.x.96123	MAC.US.x.96135	MAC.US.x.97009	MAC.US.x.97074	MAC.US.x.MM142_IVMXX	MAC.US.x.r80025	MAC.US.x.r90131	MNE.US.82.MNE_8	MNE.US.x.MNE027	SMM.CI.79.SIVsmCT2	SMM.LR.89.SIVsmLbT1	SMM.SL.92.SIVsmSL92A	SMM.US.04.G078	SMM.US.04.G932	SMM.US.04.M919	SMM.US.04.M922	SMM.US.04.M923	SMM.US.04.M926	SMM.US.04.M934	SMM.US.04.M935	SMM.US.04.M940	SMM.US.04.M946	SMM.US.04.M947	SMM.US.04.M949	SMM.US.04.M950	SMM.US.04.M951	SMM.US.04.M952	SMM.US.05.D215	SMM.US.06.FTq	SMM.US.11.SIVsmE660_FL10	SMM.US.86.CFU212	SMM.US.x.F236_H4	SMM.US.x.H9	SMM.US.x.PBJ14_15	SMM.US.x.PBJA	SMM.US.x.PBJ_143	SMM.US.x.PBJ_6P6	SMM.US.x.PGMS3	SMM.US.x.SMES43	SMM.x.x.pE660.CG7G	STM.US.89.STM_37_16

p15 RNase H end\_p31 Integrase start

MAC.US.x.239	A.ELEAFMLALTDSPGKANIIVDSQYVMGIITGCPTESESRLVNQQIEEMIKKSEIYVAWPAHKGGIGGQEIIDLHVSQGIQVLF.LEKIEPAQEEHDKYHSNVKELVFKGLPRIVARQIVDTCDKCHOKGEAIGHQANSDLGTWQMDCTHLEGKIIIVAVHVASGFIE	811
A.CI.88.UC2	A A V VASQ I D EAV I V E I IH I QL N AO V AEI V	824
A.DE.x.BEN	V R A V VAQ N I EAV V E II TH I LL NS AO V AEI V Y	824
A.DE.x.PE12 KR KRCCG	A V V VAQ K I ETL V V SH KL N AO VDAE V	824
A.GH.x.GH1	A T V VVQ I D EAV V R E M TH I QL N AO V AEI V	824
A.GM.87.D184	A A V VAQ N I EAV V S G I TH I QL N AO V AEI V	824
A.GM.x.ISY SBL_6669_85	A V V V VAQ A I K EA V R G G AH NL N AO V AEI V	824
A.GM.x.MCN13	A V V VAQ I EA V Q SH KL N AO VDAE V	824
A.GM.x.MCR35	A V V VAQ I EA V Q SH KL N AO VDAE V	824
A.GW.86.FG c1one NIHZ	A V V VAQ N I EA V I SH I KL N AHVO V AE V	823
A.GW.87.CAM2CG	A V V VAQ N I EA V T SH DT QL N ADYO V AEV V	824
A.GW.x.MDS	A V V VAQ N I EA V V SH QL N AO V AE V	824
A.IN.07.NNVA	A V V VAQ N I EA V N SH KL N AO V AE V	824
A.IN.95.CRIK 147	S A V V VAQ NKI EA V E SH R KL N AO V AE V	824
A.JP.08.NMC786 c1one_41	A A T V VASQ I D EAV V I I E TH I QL N PO V AEI V	824
A.JT.x.ALT	AL V V VAQ N I EA V E SH I NL N AO V AE V I	824
A.SN.85.ROD	A V V VASQ I EA V V SH I NL NS AO V AE V	825
A.SN.86.ST.JSP4_27	A V V V VAQ KI EA V SH KL N TQ V AE V	824
B.CI.88.UC1	AL Q V V VAQ T P EA G R L V E G H I QL K NS V AE V	825
B.CI.x.20_56	AL Q V V VAQ TD PI K EA G L V E G H I QL K NS V AE V	825
B.CI.x.EHO	AL Q V V VAAQ T PI RE EK G L V E N H I QL K NS V E V	824
B.GH.86.D205 ALT	AL Q E V VAAQ T PI AK EAV G L V E G H I QL K NS V A V	822
B.JP.01.IMCJ_KR020_1	AL Q V V VAAQ T PI KT V EA G L V E G H I QL K NS V AE V	825
G.CI.92.Abt96	X A Q V V X X AXQ T P K X EXL G V X X EXP TH I QL K NSYHS Q V AE V V	807
AB.CM.03.C3CM_510_03	AL XQ X V V AAX T PXTX XEA G L V X X G X H X X OLX K NX QX X V AE V X	825
H2_01_AB.CI.90.7312A	AL Q V V VAQ T PI K EA G L V E G H I QL K NS V AE V	825
H2_01_AB.JP.04.NMC307_20	AL Q V V VAQ T SI R EAV G L V E G H I QL K NS V AE V	825
H2_01_AB.JP.07.NMC716_01	AL Q V V VAQ T SI R EAV G L V E G H I QL K NS V AE V	825
H2_01_AB.JP.08.NMC842_10	AL Q V V VAQ T SV R EA V G L V E G H I QL K NS V AE V	825
U.CI.07.071C_TNP3	Q V V V VAQ T P K M EAL XG L V F I L K V TE V	807
U.FR.96.12034	A E V V V I A Q T P SK L R EAV G V E OH I QL K N HV Q M V TEV	820
MAC.US.x.17EC1		811
MAC.US.x.1937		811
MAC.US.x.2065		811
MAC.US.x.251_1A11		811
MAC.US.x.251_32H_PJ5		811
MAC.US.x.251_BK28		811
MAC.US.x.80035		807
MAC.US.x.81035		811
MAC.US.x.85013		811
MAC.US.x.87082		811
MAC.US.x.92056		811
MAC.US.x.92077		811
MAC.US.x.93057		811
MAC.US.x.93062		811
MAC.US.x.95058		811
MAC.US.x.95086		811
MAC.US.x.95112		811
MAC.US.x.96016		811
MAC.US.x.96020		811
MAC.US.x.96072		811
MAC.US.x.96081		811
MAC.US.x.96093		811
MAC.US.x.96114		811
MAC.US.x.96123		811
MAC.US.x.96135		811
MAC.US.x.97009		811
MAC.US.x.97074		811
MAC.US.x.MM142_IVMXX		807
MAC.US.x.r80025		811
MAC.US.x.r90131		811
MNE.US.82.MNE_8		807
MNE.US.x.MNE027		807
SMM.CI.79.SIVsmCT2	IAP R A V VVT VA H TD P E L EA G L V V Q E Q H I QL K N TQ Q V AE V V	816
SMM.LR.89.SIVsmL1B1	A MQ E V VA Q N V TA L R V R S # E I Y I L K N V AE I	801
SMM.SL.92.SIVsmSL92A	A A V VVT L N V PI E NH ML E L V R N E I Y I L K N V AE I	806
SMM.SL.92.SL92B	Q L L K PS V VVT LN V S D DI A QLVQ EAV IG L N V R S D AQ YNI QL K NA N Q T AEV V	803
SMM.US.04.G078	V TE V V Q KI TA L N V R E I L K Q V E V V	807
SMM.US.04.G932	I V V I TA L N V R E I L K Q V E V V	807
SMM.US.04.M919	CL A V A Q N H EA V S E I L K I Q V AE V	807
SMM.US.04.M922	YL A V VAQ N EA V S E I L K I Q V AE V	807
SMM.US.04.M926	I V V K E V ER Y I L K V V V	807
SMM.US.04.M934	YL A V VAQ N EA V S E I L K I Q V AE V	807
SMM.US.04.M935	YL A V VAQ N EA V S E I L K I Q V AE V	807
SMM.US.04.M940	V TE V V Q KI TAV T L V ER Y I L K I Q V TE V VV	807
SMM.US.04.M946	V V V N TAV T L V ER Y I L K I Q V TE V V A	807
SMM.US.04.M947	YL A V VAQ N H EA V S E I L K I Q V AE V	807
SMM.US.04.M949	V AE V V Q KI TAV L V ER Y I L K N Q V TE V V	807
SMM.US.04.M950	V V V S G ER Y I L K I Q V TE V V	807
SMM.US.04.M951	V TE V V V Q KI TA L V ER Y I L K I Q V TE V V E	807
SMM.US.04.M952	V V V S TA L V ER Y I L K I Q V TE V V	807
SMM.US.05.D215	V V V V VAQ NSI TA V D E Y I L K V AE V	807
SMM.US.06.FTq	V E V VAQ V TA ER RI L K I V AE V	811
SMM.US.11.SIVsmE660_FL10	YL A R A Q EA TA T L V Y I L K V AE V	807
SMM.US.86.CFU212	YL A V VAQ N KI S EA TA L V Y I L K V AE V	807
SMM.US.x.F236_H4	YL A V VAQ EA V E #*K K X L K L X V XX G	807
SMM.US.x.H9	YL A V VAQ K EA X E V E #*K K X L K L X V XX G	807
SMM.US.x.PBJ14_15	SL A V VAQ EA V E #*K K X L K L X V XX G	807
SMM.US.x.PBJA	YL A V VAQ EA X V V X X G	807
SMM.US.x.PBJ_143	YL A V VAQ EA X V V X X G	807
SMM.US.x.PBJ_16P6	YL A V VAQ EA V V AE V	807
SMM.US.x.PGMS3	YL A V VAQ EA V H V AE V	807
SMM.US.x.SME543	YL A V VAQ EA V R V AE V	807
SMM.x.x.pE660.CG7G	YL A V VAQ EA S L K V AE V	807
STM.US.89.STM_37_16	A A V V Q K EA V I L K V AE V	807





MAC. US. x.239	Vif start	MEEKRWIAVPTWRIPER	LERWHSLIKYLKYKTKDLOKVCYVPHFKVGMWMTCSRVI	IFPLQEGSHLEVQGYWHL	TPEKGLWSTAYVRITWYSKNFWDVTPNYADILLHSTYVFCPTAGEVRR	IRAEQQLS	CCRF	PPRAHKYQVPSLQYLAKVV	SDVRSOGENP																					
A.CI.88.UC2	---G-S-V	---V-G-M	---V-R	---EG-R	---H	---KGE	---I-A-N	---SHS	---L-TEK	---DC	---I	---C	---A	---K	---NY	---Q	---A	---V	---QONDRPORK	167										
A.DE.x.BEN	---DRN-V	---V-G-M	---K-A-V	---HR	---E-R	---H	---GK	---I-A-N	---SH	---L-TEK	---DC	---I	---S	---K	---NY	---Q	---A	---V	---QONDRPORK	167										
A.GH.x.GH1	---GE-V	---V-G-M	---K-V	---HR	---E-R	---H	---GK	---I-A-N	---SH	---L-TEK	---DC	---S	---I	---K	---NY	---Q	---RSK	---L	---F	---V	---QONDRPORKS	167								
A.GM.x.104	---G-N	---V-G-M	---K-V	---HR	---E-R	---H	---GK	---I-A-N	---SHS	---L-TEK	---DC	---I	---S	---K	---NY	---Q	---V	---V	---V	---QONDRPORK	167									
A.GM.x.ISY_SBL_6669_85	---G-N	---V-G-M	---K-V	---HR	---E-R	---H	---GK	---I-A-N	---SHS	---L-TEK	---DC	---I	---S	---K	---NY	---Q	---A	---V	---V	---QONDRPORK	167									
A.GM.x.MC13	---DQD	---V-G-M	---K-V	---HR	---E-R	---H	---GK	---I-A-N	---SHS	---L-TEK	---DC	---I	---S	---K	---NY	---Q	---SK	---F	---V	---QONDRPORN	167									
A.GM.x.MCR35	---G-N	---V-G-M	---K-V	---HR	---E-R	---H	---GK	---I-A-N	---SHS	---L-TEK	---DC	---S	---I	---K	---NY	---Q	---RA	---F	---V	---QONDRPORN	167									
A.GW.86.FG clone NIHZ	---G-N	---V-G-M	---K-V	---HR	---E-R	---H	---GK	---I-A-N	---SHS	---L-TEK	---DC	---S	---I	---K	---NY	---Q	---RA	---F	---V	---QONDRPORN	167									
A.GW.87.CAM2CG	---G-V	---I-V-G-M	---K-V	---HR	---E-R	---H	---GK	---I-A-N	---SHS	---L-TEK	---DC	---I	---S	---K	---NY	---Q	---RS	---F	---V	---QONDRPORN	167									
A.GW.x.MDS	---G-S	---V-G-M	---K-V	---HR	---E-R	---H	---GK	---I-A-N	---SHS	---L-TEK	---DC	---I	---S	---K	---NY	---Q	---RS	---F	---V	---QONDRPORN	167									
A.IN.07.NNVA	---G-T	---V-G-M	---K-V	---HR	---E-R	---H	---GK	---I-A-N	---SHS	---L-TEK	---DC	---S	---I	---K	---NY	---Q	---T	---F	---V	---QONDRPORDS	167									
A.IN.95.CRIK 147	---G-V	---V-G-M	---K-V	---HR	---E-R	---H	---GK	---I-A-N	---SHS	---L-TEK	---DC	---S	---I	---K	---NY	---Q	---T	---F	---V	---QONDRSORDS	167									
A.JP.08.NMC786 clone 41	---D-N	---V-G-M	---K-V	---HR	---E-R	---H	---GK	---I-A-N	---SHS	---L-TEK	---DC	---S	---I	---K	---NY	---Q	---RT	---T	---F	---V	---QONDRSORD	167								
A.KI.x.ALT	---D-N	---V-G-M	---K-V	---HR	---E-R	---H	---GK	---I-A-N	---SHS	---L-TEK	---DC	---S	---I	---K	---NY	---Q	---V	---V	---V	---QONDRPORDS	167									
A.SN.85.ROD	---G-S	---V-G-M	---K-V	---HR	---E-R	---H	---GK	---I-A-N	---SHS	---L-TEK	---DC	---S	---I	---K	---NY	---Q	---V	---V	---V	---QONDRPORDS	167									
A.SN.86.ST.JSP4_27	---D	---V-G-M	---K-V	---HR	---E-R	---H	---GK	---I-A-N	---SHS	---L-TEK	---DC	---S	---I	---K	---NY	---Q	---RA	---F	---V	---QONDRPORDS	167									
B.CI.88.UC1	---G-N	---V-G-M	---K-V	---HR	---E-R	---H	---GK	---I-A-N	---SHS	---L-TEK	---DC	---S	---I	---K	---NY	---Q	---RA	---F	---V	---QONDRPORDS	167									
B.CI.x.20_56	---N	---V-G-M	---K-V	---HR	---E-R	---H	---GK	---I-A-N	---SHS	---L-TEK	---DC	---S	---I	---K	---NY	---Q	---RA	---F	---V	---QONDRPORDS	167									
B.CI.x.EHO	---N	---V-G-M	---K-V	---HR	---E-R	---H	---GK	---I-A-N	---SHS	---L-TEK	---DC	---S	---I	---K	---NY	---Q	---RA	---F	---V	---QONDRPORDS	167									
B.GH.86.D205 ALT	---D-V	---V-G-M	---K-V	---HR	---E-R	---H	---GK	---I-A-N	---SHS	---L-TEK	---DC	---S	---I	---K	---NY	---Q	---RA	---F	---V	---QONDRPORDS	167									
B.JP.01.IMCJ.KR020_1	---N	---V-G-M	---K-V	---HR	---E-R	---H	---GK	---I-A-N	---SHS	---L-TEK	---DC	---S	---I	---K	---NY	---Q	---RA	---F	---V	---QONDRPORDS	167									
G.CI.92.Abt96	---D	---V-G-M	---K-V	---HR	---E-R	---H	---GK	---I-A-N	---SHS	---L-TEK	---DC	---S	---I	---K	---NY	---Q	---RA	---F	---V	---QONDRPORDS	167									
AB.CM.03.03CM.510_03	---D	---V-G-M	---K-V	---HR	---E-R	---H	---GK	---I-A-N	---SHS	---L-TEK	---DC	---S	---I	---K	---NY	---Q	---RA	---F	---V	---QONDRPORDS	167									
H2_01.AB.CI.90.7312A	---G-N	---V-G-M	---K-V	---HR	---E-R	---H	---GK	---I-A-N	---SHS	---L-TEK	---DC	---S	---I	---K	---NY	---Q	---RA	---F	---V	---QONDRPORDS	167									
H2_01.AB.JP.04.NMC307_20	---N	---V-G-M	---K-V	---HR	---E-R	---H	---GK	---I-A-N	---SHS	---L-TEK	---DC	---S	---I	---K	---NY	---Q	---RA	---F	---V	---QONDRPORDS	167									
H2_01.AB.JP.07.NMC715_01	---D	---V-G-M	---K-V	---HR	---E-R	---H	---GK	---I-A-N	---SHS	---L-TEK	---DC	---S	---I	---K	---NY	---Q	---RA	---F	---V	---QONDRPORDS	167									
H2_01.AB.JP.08.NMC842_10	---D	---V-G-M	---K-V	---HR	---E-R	---H	---GK	---I-A-N	---SHS	---L-TEK	---DC	---S	---I	---K	---NY	---Q	---RA	---F	---V	---QONDRPORDS	167									
U.CI.07.07IC.TMP3	---V	---V-G-M	---K-V	---HR	---E-R	---H	---GK	---I-A-N	---SHS	---L-TEK	---DC	---S	---I	---K	---NY	---Q	---RA	---F	---V	---QONDRPORDS	167									
U.FR.96.12034	---N	---V-G-M	---K-V	---HR	---E-R	---H	---GK	---I-A-N	---SHS	---L-TEK	---DC	---S	---I	---K	---NY	---Q	---RA	---F	---V	---QONDRPORDS	167									
MAC.US.x.17EC1																					166									
MAC.US.x.1937																					166									
MAC.US.x.2065																					166									
MAC.US.x.251_1A11																					166									
MAC.US.x.251_32H_PJ5	G																				166									
MAC.US.x.251_BK28																					166									
MAC.US.x.80035																					166									
MAC.US.x.81035																					166									
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MAC.US.x.92056																					166									
MAC.US.x.92077																					166									
MAC.US.x.93057																					166									
MAC.US.x.93062																					166									
MAC.US.x.95058																					166									
MAC.US.x.95086																					166									
MAC.US.x.95112																					166									
MAC.US.x.96016																					166									
MAC.US.x.96020																					166									
MAC.US.x.96072																					166									
MAC.US.x.96081																					166									
MAC.US.x.96093																					166									
MAC.US.x.96114																					166									
MAC.US.x.96123																					166									
MAC.US.x.96135																					166									
MAC.US.x.97009																					166									
MAC.US.x.97074																					166									
MAC.US.x.MM142_IVMXX	V																				166									
MAC.US.x.r80025																					166									
MAC.US.x.r90131																					166									
MNE.US.82.MNE.8																					166									
MNE.US.x.MNE027																					166									
SMM.CI.79.SIVsmCI2	S-VT	R-M	H-FN	E-N	N	EKE	N	S	R	DV	Q-T	S-Y	Q	I	KY	S	R	F	RIL	HKQNGKCKR	168									
SMM.LR.89.SIVsmLBT1	V	K-G	H-N	E-N	A-H	EKEA	N	S	R	DV	Q-T	S-Y	Q	I	KY	S	R	F	RIL	HKQNGKCKR	168									
SMM.SL.92.SIVsmSL92A	V	K-H	R-V	H-N	E-N	A-H	EKEA	N	S	R	DV	Q-T	S-Y	Q	I	KY	S	R	F	RIL	HKQNGKCKR	168								
SMM.SL.92.SL92B	G-V	V-SR	IV-C	FH	RE	E-A	H-Y	A	E	V-N	S	L	TR	DL	I	GA	S-Y	Q	I	N	S	Q	K	S	F	RAL	Q	DG	KRTD	165
SMM.US.04.G078	Q-VV	V-G	H-N	E-N	A-H	GET	I-N	S	R	G	TRG	D-V	G-T	SE	K	K	N	R	Y	R	D	166								
SMM.US.04.G932	V	G	H-N	E-N	A-H	GET	I-N	S	R	G	TRG	D-V	G-T	SE	K	K	N	R	Y	R	D	166								
SMM.US.04.M919	N-V	G	H-N	E-N	A-H	GET	I-N	S	R	G	TRG	D-V	G-T	SE	K	K	N	R	Y	R	D	166								
SMM.US.04.M922	N-V	G	H-N	E-N	A-H	GET	I-N	S	R	G	TRG	D-V	G-T	SE	K	K	N	R	Y	R	D	166								
SMM.US.04.M923	N-V	G	H-N	E-N	A-H	GET	I-N	S	R	G	TRG	D-V	G-T	SE	K	K	N	R	Y	R	D	166								
SMM.US.04.M926	N-V	G	H-N	E-N	A-H	GET	I-N	S	R	G	TRG	D-V	G-T	SE	K	K	N	R	Y	R	D	166								
SMM.US.04.M934	N-V	G	H-N	E-N	A-H	GET	I-N	S	R	G	TRG																			





	Vpr start	Vpr end
MAC.US.x.239	MEER...PPENEGPQREPWDEWVVEELEEKKEEAKLHFDPRLLTALGNHIYNRHGDTELEGAGELIRILQRALFMHFRGGCIHSRIGOPGGGNPLSAITPPSRML*	
A.CI.88.UC2	-M-GA.....#-MIV*IT---*R-----I-D-Y-----N---R-K-----S-L-V-GSR---*TRRRRT-CP-T-TP-G-H-	101
A.DE.x.BEN	-T-APTEF...DGT-R-DLGS-D-I-T-R-I-----I-YY-H-----R-KT-----V-A-NR---*TRRRRT-CP-A-TP-A-H-	83
A.DE.x.PE22_KR_KRCG	-T-APAEF...D-T-P-G-G---IGI-R-R-----T-Y-CA-----S-R-NV---V-A-KI---TR-ET-F---TP-G-Q-	105
A.GH.x.GH1	-T-APTEF...DGT-R-LGGD-IRI-G-I-----I-Y-HS-----P-R-----V-L-A-NR---S-TRRRRT-PP-A-TP-G-Y-	106
A.GM.87.D194	-T-APTEF...DGT-R-LGST-I-T-K-I-----C-I-Y-----R-V-----V-L-A-DR---TRRA-CP-A-TP-G-H-	106
A.GM.x.ISY_SBL_6669_85	-T-APTEF...DGT-P-G---I-R-I-----YY-T-----R-V---T-A-G---TRRA-CP-A-TP-G-Q-	106
A.GM.x.MCN13	-T-APTEF...DGT-P-G---II-IRKI-K-----Y-HT-----R-NV---A-RL---T-RT-TP-TSTP-T-Q-	106
A.GM.x.MCR35	-T-APTEF...DGT-P-G---II-IRKI-K-----Y-HT-----R-NV---A-RL---T-RT-TP-TSTP-T-Q-	106
A.GW.86.FG_clone_NIHZ	-T-APTEL...DRT-P-G-A-I-I-R-IE---R-----RY-T-----R---A-A-GR---TR---TP-G-H-	106
A.GW.87_CAM2CG	-T-APTEL...DGT-P-G---I-IRDI-----R---G-A-----R-R-V---T-A-N---TR---TP-R*	106
A.GW.x.MDS	-T-APTEL...DGT-P-G---I-IRIT-----RS-----R-T-----R---R-V---T-A-N---TR---TP-R*	105
A.IN.07.NNVA	-T-APTEL...DRT-P-G-I-I-R-I---R-----RY-T-Y-P-R-V---T-A-G---R---TP-Q-	106
A.IN.95.CR1K_147	-T-APTEL...DGT-P-G---I-IR-I---R-----IY-D-Y-----R-V---T-A-G---R---TP-R-	106
A.JP.08.NMC786_clone_41	-T-APTEF...DGT---LGGD-IIRI---IR---G-P-I---Y-A-----RK-VD---V-L-KA-SRPKVN-TR-TS-PVA-TP-N-Q-	106
A.MT.x.ALI	-T-APTEF...AGM-HQGAR---I-R-I---R---M-I---GY-T-----R-R-NA---A-GR-V-TR-R---TP-N-Q-	106
A.SN.85.R0D	-A-APTEL...VDGT-L-G---II-IR-I---R-----I-KY-T-----R-KV---T-A-G---TR---TP-N-Q-	106
A.SN.86.ST_JSP4_27	-T-APTES...DRT-P-G---I-T-R-I---*-----IT-Y-A-----RG-----LL-A-GR---R-R---TP-G-R-	105
B.CI.88.UC1	-A-AAPET...-S---E-ED-M-I-Q---R-----F-S---A---K---L-A-Q-----*R-	105
B.CI.x.20_56	-A-AAPET...-D---E-ED---I-Q---R-----F-S---A---K---L---Q-----*G-Q-	105
B.CI.x.EHO	-A-AVPEI...-DKN---EQ---D---I-Q---R-----F---N---K-L---L---Q-----*G-Q-	105
B.GH.86.D205_ALT	-A-AAPEI...-N---E-IG-I---I-Q---R-----F-S---A---K---L-A-Q---S---T---P*-G-R-	105
B.JP.01.IMCJ_KR020_1	-T-AAPEI...-D---E-ED---I-Q---R-----F-G-IA-----L---Q---S---V---*K-	105
G.CI.92.Abt96	-A...EI---D-A-----I---Y-D---A---K---L-D-RC---GNA---T---GVF-	103
AB.CM.03.03CM_510_03	-A-AXXI...-S---Q-E-RXG-I---I-Q-X---X---F-S-Y---A---VK---L-A-R---GNA---X---P*-G-Q-	106
H2_01_AB.CI.90.7312A	-A-AASET...-D---E-ED---I-Q---R-----F-S---E---A---K---L---Q-----T---EG-Q-	105
H2_01_AB.JP.04.NMC307_20	-A-AAPEI...-D-M---G-E-EDI---I-Q---R-----F-S---A---R---K---L---Q-----PGG**	105
H2_01_AB.JP.07.NMC116_01	-A-AAPEI...-D-N---G-E-EDI---I-Q---R-----F-S---A---K---L---Q-----PGG**	105
H2_01_AB.JP.08.NMC842_10	-A-AAPEI...-D-S---GS-E-EDI---I-Q---R-----F-S-Y---A---K---L---Q-----PGG**	105
U.CI.07.07IC_TNP3	-A...-D---DGA---G---R-I---VR---S---Y-D-Y---A---K---V---A---GOR---A-V---NV-	102
U.FR.96.12034	-A-I...-DGA---G---R-I---VR---Y---Y---K---I-L---R---SSR---TTV---*GV-	101
MAC.US.x.17EC1	-----X-X-----T-----X-	102
MAC.US.x.1937	-----*G-----G-----R-----T-----GV-	102
MAC.US.x.2065	-----N-----T-----GV-	101
MAC.US.x.251_1A11	-----T-----T-----GV-	102
MAC.US.x.251_32H_PJ5	-----N-----T-----GV-	101
MAC.US.x.251_BK28	-----T-----T-----GV-	102
MAC.US.x.80035	-----X-----T-----GV-	102
MAC.US.x.81035	-----X-----T-----GV-	102
MAC.US.x.85013	-----X-----T-----GV-	102
MAC.US.x.87082	-----X-----T-----GV-	102
MAC.US.x.92050	-----X-----T-----GV-	102
MAC.US.x.92077	-----X-----T-----GV-	102
MAC.US.x.93057	-----X-----T-----GV-	102
MAC.US.x.93062	-----X-----T-----GV-	102
MAC.US.x.95058	-----X-----T-----GV-	102
MAC.US.x.95086	-----X-----T-----GV-	102
MAC.US.x.95112	-----X-----T-----GV-	102
MAC.US.x.96016	-----X-----T-----GV-	102
MAC.US.x.96020	-----X-----T-----GV-	102
MAC.US.x.96072	-----X-----T-----GV-	102
MAC.US.x.96081	-----X-----T-----GV-	102
MAC.US.x.96093	-----X-----T-----GV-	102
MAC.US.x.96114	-----X-----T-----GV-	102
MAC.US.x.96123	-----X-----T-----GV-	102
MAC.US.x.96135	-----X-----T-----GV-	102
MAC.US.x.97009	-----X-----T-----GV-	102
MAC.US.x.97074	-----X-----T-----GV-	102
MAC.US.x.MM142_IVMXX	-----K-----I-S-S-----T-----T-----GV-	102
MAC.US.x.r80025	-----K-----I-S-S-----T-----T-----GV-	102
MAC.US.x.r90131	-----K-----I-S-S-----T-----T-----GV-	102
MNE.US.82.MNE_8	-----D-----Y-D-----K-----T-----S-----T-----R-	102
MNE.US.x.MNE027	-----D-----Y-D-----K-----T-----S-----T-----R-	102
SMM.CI.79_SIVsmCI2	-A-H...-D-P-A-D-I---Y-D---K---I-A-L-HS---TV---GV-	102
SMM.LR.89_SIVsmLIB1	-A-S...-D-P-A-D-I---Y-D---K---I-A-L-HS---TV---GV-	102
SMM.SL.92_SIVsmSL92A	-SLS...-D-A-T-I-T---N---Y-D-Y---K---L---R---CRR---AT---NV-	103
SMM.SL.92_SIVsmSL92B	-H...-A-D-TNP-IRD---YV-DTY-I-I-K-K-L-H-T---R-P-GS-SA-DV-	101
SMM.US.04.G078	-A...-D-T-I-Q---Y-D---K---N-V-S---AT---EV-	102
SMM.US.04.G932	-T...-D-I-H---Y-D-Y---K---T-V-S---T---RV-	102
SMM.US.04.M919	-T...-D-A-I---Y-D---K---L-T-S---T---GV-	102
SMM.US.04.M922	-T...-D-A-V---Y-D---K---L-V-S---A---GV-	102
SMM.US.04.M923	-T...-D-A-I-N---Y-D---K---L-V-S---T---GV-	102
SMM.US.04.M926	-A...-D-A-L-V---Y-D-Y---K---I-T-S---T---GV-	102
SMM.US.04.M934	-A...-D-A-I-S---Y-D-Y---K---I-T-S---TV---GV-	102
SMM.US.04.M935	-T...-D-A-I-V---Y-D---K---L-V-S---A---GV-	102
SMM.US.04.M940	-A...-D-D-S-T-I-Q-N---Y-D---K---L-N-L-AR---AT---EV-	102
SMM.US.04.M946	-T...-D-A-I-S---Y-D-Y---K---I-N-L-AR---AT---A-GV-	102
SMM.US.04.M947	-A...-D-A-V---Y-D---K---I-S-S---T---GV-	102
SMM.US.04.M949	-A...-D-A-T-V-Q-T---Y-D---K---L-A-A-AR---A---GV-	102
SMM.US.04.M950	-T...-D-A-I-I-S---Y-D-Y---K---L-T-S---T---GV-	102
SMM.US.04.M951	-A...-D-A-T-V-Q---Y-D---K---I-KA-L-A---AT---RV-	102
SMM.US.04.M952	-T...-D-A-I-S---Y-D-Y---K---I-S---T---GV-	102
SMM.US.05.D215	-AGV...-D-G-I-S---I-Y-D---K---I-S---T---AT---GV-	102
SMM.US.06.FTQ	-A...-D-T-N---Y-D---K---L-T-TNR---TV-T-NV-	102
SMM.US.11_SIVsmE660_FL10	-A...-D-A-T---Y-D---K---L-S-A-SR---T---D-	102
SMM.US.86.CFU212	-A...-D-A-M---KR-L---Y-D---K---I-S-A-H-R---AT---T-DV-	102
SMM.US.x.F236_H4	-T...-D-A-X-X-NX-X---Y-D---G---I-S-A-SR---X---T-X-GV-	90
SMM.US.x.H9	-T...-D-A-X-X-NX-X---Y-D---G---I-S-A-SR---X---T-X-GV-	102
SMM.US.x.PBJ14_15	-T...-D-A-I-N---Y-D---I-R-R-S---T---X-GV-	102
SMM.US.x.PBJA	-T...-D-A-I-N---Y-D---I-R-R-S---T---X-GV-	102
SMM.US.x.PBJ_143	-T...-D-A-X-R-NX-X---Y-D---I-R-R-S---X---T-X-GV-	102
SMM.US.x.PBJ_6P6	-T...-D-A-I-N---Y-D---I-R-R-S---T---X-GV-	102
SMM.US.x.PGMS3	-A...-D-A-K-I---Y-D---I-S-A-SR---T---GV-	102
SMM.US.x.SME543	-A...-D-A-I---Y-D---I-S-A-SR---T---A-	102
SMM.x.x.pE660.CG7G	-A...-D-A-I---Y-D---I-S-A-SR---T---D-	102
STM.US.89.STM_37_16	-TH...-D---I-Q-R---S---Y-D---K---R---AT---T-GV-	102

MAC.US.x.239
A.CI.88.UC2
A.DE.x.BEN
A.DE.x.PE12 KR KRCC
A.GH.x.GH1
A.GM.87.1044
A.GM.x.ISY SBL 6669\_85
A.GM.x.MCN13
A.GM.x.MCR35
A.GW.86.FG clone NIHZ
A.GW.87.CAM2CG
A.GW.x.MDS
A.IN.07.NNVA
A.IN.95.CR1K 147
A.JP.08.NMC786 clone 41
A.SN.85.ROD
A.SN.86.ST.JSP4\_27
B.CI.88.UC1
B.CI.x.20.56
B.CI.x.EHO
B.GH.86.D205 ALT
B.JP.01.IMCJ.KR020\_1
G.CI.92.Abt96
AB.CM.03.C3CM.510\_03
H2.01.AB.CI.90.7312A
H2.01.AB.JP.04.NMC307\_20
H2.01.AB.JP.07.NMC716\_01
H2.01.AB.JP.08.NMC842\_10
U.CI.07.071C.TMP3
U.FR.96.12034
MAC.US.x.17EC1
MAC.US.x.1937
MAC.US.x.2065
MAC.US.x.251.1A11
MAC.US.x.251.32H.PJ5
MAC.US.x.251.BK28
MAC.US.x.80035
MAC.US.x.81035
MAC.US.x.85013
MAC.US.x.87088
MAC.US.x.92050
MAC.US.x.92077
MAC.US.x.93057
MAC.US.x.93062
MAC.US.x.95058
MAC.US.x.95086
MAC.US.x.95112
MAC.US.x.96016
MAC.US.x.96020
MAC.US.x.96072
MAC.US.x.96081
MAC.US.x.96093
MAC.US.x.96114
MAC.US.x.96123
MAC.US.x.96135
MAC.US.x.97009
MAC.US.x.97074
MAC.US.x.MM142.IVMXX
MAC.US.x.r80025
MAC.US.x.r90131
MNE.US.82.MNE.8
MNE.US.x.MNE027
SMM.CI.79.SIVsmCT2
SMM.LR.89.SIVsmLTB1
SMM.SL.92.SIVsmSL92A
SMM.SL.92.SL92B
SMM.US.04.G078
SMM.US.04.G932
SMM.US.04.M919
SMM.US.04.M922
SMM.US.04.M923
SMM.US.04.M926
SMM.US.04.M934
SMM.US.04.M935
SMM.US.04.M940
SMM.US.04.M946
SMM.US.04.M947
SMM.US.04.M949
SMM.US.04.M950
SMM.US.04.M951
SMM.US.04.M952
SMM.US.05.D215
SMM.US.06.FTq
SMM.US.11.SIVsmE660\_FL10
SMM.US.86.CFU212
SMM.US.x.F236.H4
SMM.US.x.H9
SMM.US.x.PBJ14\_15
SMM.US.x.PBJA
SMM.US.x.PBJ\_143
SMM.US.x.PBJ\_6P6
SMM.US.x.PGMS3
SMM.US.x.SME543
SMM.x.x.pE660.CG7G
STM.US.89.STM\_37\_16

Table with columns: Tat start, exon 1 end, exon 2 start, Tat end. Rows contain amino acid sequences for various HIV-1 and HIV-2 strains, including MAC.US.x.239, SMM.US.04.G078, and STM.US.89.STM\_37\_16.

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200

Tat

HIV-2/SIV Proteins



	Rev end	
MAC.US.x.239	.....*	107
A.CI.88.UC2	.....	104
A.DE.x.BEN	.....	104
A.DE.x.PE12_KR_KRCG	RGSGINRETL	180
A.GH.x.GH1	.....	104
A.GM.87.D194	.....	104
A.GM.x.ISY_SBL_6669_85	RDRDISKETL	169
A.GM.x.MCN13	.....	108
A.GM.x.MCR35	.....	108
A.GW.86.FG_c1one_NIHZ	.....	108
A.GW.87.CAM2CG	.....	101
A.GW.x.MDS	.....	101
A.IN.07.NNVA	.....	101
A.IN.95.CRIK_147	.....	101
A.JP.08.NMC786_c1one_41	.....	97
A.FT.x.ALT	.....	108
A.SN.95.ROD	.....	101
A.SN.86.ST_JSP4_27	.....	108
B.CI.88.UC1	.....	151
B.CI.x.20_56	.....	151
B.CI.x.EHO	.....	151
B.GH.86.D205_ALT	.....	154
B.JP.01.IMCJ_KR020_1	KGEGNRV	172
G.CI.92.Abt96	.....	101
AB.CM.03.03CM_510_03	.....	149
H2_01_AB.CI.90.7312A	.....	151
H2_01_AB.JP.04.NMC307_20	.....	151
H2_01_AB.JP.07.NMC716_01	.....	151
H2_01_AB.JP.08.NMC842_10	.....	151
U.CI.07.07IC_TNP3	.....	103
U.FR.96.12034	.....	99
MAC.US.x.17EC1	.....	108
MAC.US.x.1937	.....	108
MAC.US.x.2065	.....	108
MAC.US.x.251_1A11	.....	108
MAC.US.x.251_32H_PJ5	.....	108
MAC.US.x.251_BK28	.....	108
MAC.US.x.80035	.....	108
MAC.US.x.81035	.....	108
MAC.US.x.85013	.....	108
MAC.US.x.87082	.....	108
MAC.US.x.92050	.....	108
MAC.US.x.92077	.....	108
MAC.US.x.93057	.....	108
MAC.US.x.93062	.....	108
MAC.US.x.95058	.....	108
MAC.US.x.95086	.....	108
MAC.US.x.95112	.....	108
MAC.US.x.96016	.....	108
MAC.US.x.96020	.....	108
MAC.US.x.96072	.....	108
MAC.US.x.96081	.....	108
MAC.US.x.96093	.....	108
MAC.US.x.96114	.....	108
MAC.US.x.96123	.....	108
MAC.US.x.96135	.....	108
MAC.US.x.97009	.....	108
MAC.US.x.97074	.....	108
MAC.US.x.MM142_IVMXX	.....	108
MAC.US.x.r80025	.....	108
MAC.US.x.r90131	.....	108
MNE.US.82.MNE_8	.....	108
MNE.US.x.MNE027	.....	108
SMM.CI.79.SIVsmCI2	.....	104
SMM.LR.89.SIVsmLIB1	.....	105
SMM.SL.92.SIVsmSL92A	.....	104
SMM.SL.92.SL92B	.....	100
SMM.US.04.G078	.....	108
SMM.US.04.G932	.....	108
SMM.US.04.M919	.....	108
SMM.US.04.M922	.....	108
SMM.US.04.M923	.....	105
SMM.US.04.M926	.....	108
SMM.US.04.M934	.....	108
SMM.US.04.M935	.....	108
SMM.US.04.M940	.....	108
SMM.US.04.M946	.....	108
SMM.US.04.M947	.....	105
SMM.US.04.M949	.....	108
SMM.US.04.M950	.....	108
SMM.US.04.M951	.....	108
SMM.US.04.M952	.....	108
SMM.US.05.D215	.....	108
SMM.US.06.FTq	.....	107
SMM.US.11.SIVsmE660_FL10	.....	101
SMM.US.86.CFU212	.....	106
SMM.US.x.F236_H4	.....	105
SMM.US.x.H9	.....	105
SMM.US.x.PBJ14_15	.....	101
SMM.US.x.PBJA	.....	101
SMM.US.x.PBJ_143	.....	105
SMM.US.x.PBJ_6P6	.....	101
SMM.US.x.PGM53	.....	105
SMM.US.x.SME543	.....	105
SMM.x.x.pE660.CG7G	.....	101
STM.US.89.STM_37_16	.....	100



	V1	V2	V3	
MAC.US.x.239	DNCT.GLEDEQMI	SCKFNMTGLKRD	KKKEYNETWYSADL	VCEQGN.....
A.CI.88.UC2	..GD.G.VN	..EQ.I.G.TD	..D.V.DST.K	..TNTT.R.K
A.DE.x.BEN	..NT.A.GY.E.MO	..E.K.EQ.RR.KD	..LE.V.DNT	..TAGT.R.I.K
A.DE.x.PE12.KR.KRCC	..NS.S.D.GS.EVVD	..R.QL.PQQ.S	..K.V.DTT	..TSRK.T.M
A.GH.x.GH1	..GK.EIVN.O.Y	..EQ.RK	..R.V.SN.T	..KDGKN.T.K
A.GM.87.0104	..N.S.GK.EVVE	..E.Q	..R.V.DKT	..NCTGT.R.K
A.GM.x.ISY.SBL.6669.85	..N.S.RE.D.VE	..Q	..K.V.SD	..STDRK.T.M
A.GM.x.MCN13	..N.S.GE.EVNV	..Q.S	..K.V.GN	..TTDT.T.M
A.GM.x.MCR35	..N.S.GK.EVNV	..Q.S	..K.V.GN	..TTDT.T.M
A.GW.86.FG.clone.NIHZ	..N.S.KE.E.D.O.S	..E.F.R.O.T.A	..K.V.DNNT	..SSQ.K.T.M
A.GW.87.CAM2CG	..N.S.E.KIVK.H	..Q	..S.V.DNSTD	..Q.T.TT.T.M
A.GW.x.MDS	..N.S.E.VK.O	..Q.I	..P.R	..S.V.GEM.T.Q
A.IN.07.NNVA	..N.S.RE.EIVI	..Q	..I.P.R	..S.V.PDST
A.IN.95.CRIK.147	..N.S.GE.EVNV	..E.V.P.T	..R.VD.PDS	..T.SRK.T.D
A.JP.08.NMC786.clone.41	..N.S.T.GE.E.VN	..Q	..E.T.R	..R.V.PN.OT
A.SN.85.ROD	..PR.T.GD.E.VN	..R	..Q.P	..K.V.PF.T
A.SN.86.ST.JSP4.27	..T.GE.E.VD	..Q	..L	..K.V.SN
B.CI.88.UC1	..N.S.IGL.NTVD	..Y	..R.E.Q.KD	..EK.E.NGN
B.CI.x.20.56	..N.S.IGL.DVNV	..T	..RR.E.Q.D	..RR.E.GT
B.CI.x.EHO	..S.A.IGL.E.D.O.K	..K	..ES.Q.KD	..KQ.K.T
B.GH.86.D205.ALT	..S.GE.EIMO	..N	..R.EL.Q.KD	..E.E.NNTR
B.JP.01.IMJC.KR020.1	..I.F.N.VT	..R	..V.EP.T.D	..AE.VQ.NGS
G.CI.92.Abt96	..IQS.S.VG	..QR	..O.QX.S.K	..SE
AB.CM.03.03CM.910.03	..N.S.N.E.VT	..N.S	..EQ.R	..Q.V.DKN.S
H2.01.AB.CI.90.7312A	..GE.E.VD	..Q	..S	..K.V.SN.A
H2.01.AB.JP.04.NMC307.20	..NS.T.G.EIVN	..O.D	..I	..R
H2.01.AB.JP.07.NMC716.01	..NS.T.GE.EVVO	..Q.D	..I	..R
H2.01.AB.JP.08.NMC842.10	..NS.T.GE.EVVO	..Q.D	..I	..R
U.CI.07.07IC.TMP3	..N.S.T.S.P.VG	..Q	..R.QE.Q.S	..R.I.S
U.FR.96.12034	..NS.S.PLV	..R	..N	..Q.K
MAC.US.x.17EC1	..A	..N	..N	..N
MAC.US.x.1937	..X	..G	..T	..S
MAC.US.x.2065	..X	..G	..T	..S
MAC.US.x.251.1A11	..X	..G	..T	..S
MAC.US.x.251.32H.PJ5	..N	..T	..T	..T
MAC.US.x.251.BK28	..N	..T	..T	..T
MAC.US.x.80035	..X	..X	..X	..X
MAC.US.x.81035	..X	..X	..X	..X
MAC.US.x.85013	..X	..X	..X	..X
MAC.US.x.87082	..X	..X	..X	..X
MAC.US.x.92056	..X	..X	..X	..X
MAC.US.x.92077	..X	..X	..X	..X
MAC.US.x.93057	..X	..X	..X	..X
MAC.US.x.93062	..X	..X	..X	..X
MAC.US.x.95058	..X	..X	..X	..X
MAC.US.x.95086	..X	..X	..X	..X
MAC.US.x.95112	..X	..X	..X	..X
MAC.US.x.96016	..X	..X	..X	..X
MAC.US.x.96020	..X	..X	..X	..X
MAC.US.x.96072	..X	..X	..X	..X
MAC.US.x.96081	..X	..X	..X	..X
MAC.US.x.96093	..X	..X	..X	..X
MAC.US.x.96114	..X	..X	..X	..X
MAC.US.x.96123	..X	..X	..X	..X
MAC.US.x.96135	..X	..X	..X	..X
MAC.US.x.97009	..X	..X	..X	..X
MAC.US.x.97074	..X	..X	..X	..X
MAC.US.x.MM142.IVMXX	..P	..X	..S	..C
MAC.US.x.r80025	..X	..X	..S	..C
MAC.US.x.r90131	..X	..X	..S	..C
MNE.US.82.MNE.8	..P	..RR	..S	..E
MNE.US.x.MNE027	..P	..RR	..S	..E
SMM.CI.79.SIVsmCT2	..S.P	..P	..PL.G	..Q
SMM.LR.89.SIVsmLBT1	..N.S	..I	..P.G.R	..S
SMM.SL.92.SIVsmSL92A	..N.S	..I	..P.G.S	..R
SMM.SL.92.SL92B	..NS	..D	..P.G.Q	..R
SMM.US.04.G078	..D	..E	..P.V	..R
SMM.US.04.G932	..S	..I	..P.V	..R
SMM.US.04.M919	..N	..P	..V	..S
SMM.US.04.M922	..S	..I	..P.V	..R
SMM.US.04.M923	..N	..P	..V	..R
SMM.US.04.M926	..S	..I	..P.V	..R
SMM.US.04.M934	..N	..P	..V	..R
SMM.US.04.M935	..S	..I	..P.V	..R
SMM.US.04.M940	..N	..P	..V	..R
SMM.US.04.M946	..S	..I	..P.V	..R
SMM.US.04.M947	..N	..P	..V	..R
SMM.US.04.M949	..S	..I	..P.V	..R
SMM.US.04.M950	..N	..P	..V	..R
SMM.US.04.M951	..S	..I	..P.V	..R
SMM.US.04.M952	..N	..P	..V	..R
SMM.US.05.D215	..NS	..P	..I	..P.V
SMM.US.06.FTQ	..N	..IGS	..ELV	..R
SMM.US.11.SIVsmE660.FL10	..NS	..A	..P	..G
SMM.US.86.CFU212	..NS	..A	..P	..G
SMM.US.x.F236.H4	..NS	..A	..P	..G
SMM.US.x.H9	..NS	..A	..P	..G
SMM.US.x.PBJ14.15	..NS	..A	..P	..G
SMM.US.x.PBJA	..NS	..A	..P	..G
SMM.US.x.PBJ.143	..NS	..A	..P	..G
SMM.US.x.PBJ.6P6	..NS	..A	..P	..G
SMM.US.x.PGMS3	..NS	..A	..P	..G
SMM.US.x.SME543	..NS	..A	..P	..G
SMM.x.x.pE660.CG7G	..NS	..A	..P	..G
STM.US.89.STM_37.16	..N	..E	..SLVG	..R

	V3 tip	V3	V4	
MAC.US.x.239	.....	.....	.....	471
A.CI.88.UC2	.....	.....	.....	463
A.DE.x.BEN	.....	.....	.....	456
A.DE.x.PET2 KR KRCC	.....	.....	.....	451
A.GH.x.GH1	.....	.....	.....	450
A.GM.87.D14	.....	.....	.....	449
A.GM.x.ISY SBL 6669_85	.....	.....	.....	450
A.GM.x.MCN13	.....	.....	.....	453
A.GM.x.MCR35	.....	.....	.....	451
A.GW.86.FG clone NIHZ	.....	.....	.....	451
A.GW.87.CAM2CG	.....	.....	.....	459
A.GW.x.MDS	.....	.....	.....	470
A.IN.07.NNVA	.....	.....	.....	460
A.IN.95.CRIK 147	.....	.....	.....	460
A.JP.08.NMC786 clone 41	.....	.....	.....	460
A.LT.x.ALT	.....	.....	.....	456
A.SN.85.R0D	.....	.....	.....	458
A.SN.86.ST.JSP4_27	.....	.....	.....	453
B.CI.88.UC1	.....	.....	.....	458
B.CI.x.20.56	.....	.....	.....	451
B.CI.x.EHO	.....	.....	.....	456
B.GH.86.D205 ALT	.....	.....	.....	461
B.JP.01.IMCJ KR020_1	.....	.....	.....	449
G.CI.92.Abt96	.....	.....	.....	472
AB.CM.03.03CM 510_03	.....	.....	.....	451
H2_01.AB.JP.08.NMC786 clone 41	.....	.....	.....	460
H2_01.AB.JP.08.NMC786 clone 41	.....	.....	.....	454
H2_01.AB.JP.08.NMC786 clone 41	.....	.....	.....	452
H2_01.AB.JP.08.NMC842_10	.....	.....	.....	459
U.CI.07.07IC TMP3	.....	.....	.....	477
U.FR.96.12034	.....	.....	.....	467
MAC.US.x.17EC1	.....	.....	.....	471
MAC.US.x.1937	.....	.....	.....	471
MAC.US.x.2065	.....	.....	.....	471
MAC.US.x.251.1A11	.....	.....	.....	470
MAC.US.x.251.32H.PJ5	.....	.....	.....	470
MAC.US.x.251.BK28	.....	.....	.....	473
MAC.US.x.80035	.....	.....	.....	471
MAC.US.x.81035	.....	.....	.....	471
MAC.US.x.85013	.....	.....	.....	471
MAC.US.x.87088	.....	.....	.....	471
MAC.US.x.92050	.....	.....	.....	471
MAC.US.x.92077	.....	.....	.....	471
MAC.US.x.93057	.....	.....	.....	471
MAC.US.x.93062	.....	.....	.....	465
MAC.US.x.95058	.....	.....	.....	471
MAC.US.x.95086	.....	.....	.....	471
MAC.US.x.95112	.....	.....	.....	471
MAC.US.x.96016	.....	.....	.....	471
MAC.US.x.96020	.....	.....	.....	471
MAC.US.x.96072	.....	.....	.....	471
MAC.US.x.96081	.....	.....	.....	471
MAC.US.x.96093	.....	.....	.....	471
MAC.US.x.96114	.....	.....	.....	471
MAC.US.x.96123	.....	.....	.....	471
MAC.US.x.96135	.....	.....	.....	471
MAC.US.x.97009	.....	.....	.....	471
MAC.US.x.97074	.....	.....	.....	469
MAC.US.x.MM142.IVMXX	.....	.....	.....	474
MAC.US.x.r80025	.....	.....	.....	471
MAC.US.x.r90131	.....	.....	.....	471
MNE.US.82.MNE.8	.....	.....	.....	473
MNE.US.x.MNE027	.....	.....	.....	474
SMM.CI.79.SIVsmC27	.....	.....	.....	473
SMM.LR.89.SIVsmLB1	.....	.....	.....	478
SMM.SL.92.SIVsmSL92A	.....	.....	.....	478
SMM.SL.92.SL92B	.....	.....	.....	479
SMM.US.04.G078	.....	.....	.....	483
SMM.US.04.G932	.....	.....	.....	479
SMM.US.04.M919	.....	.....	.....	485
SMM.US.04.M922	.....	.....	.....	485
SMM.US.04.M923	.....	.....	.....	482
SMM.US.04.M926	.....	.....	.....	483
SMM.US.04.M934	.....	.....	.....	475
SMM.US.04.M935	.....	.....	.....	477
SMM.US.04.M940	.....	.....	.....	492
SMM.US.04.M946	.....	.....	.....	483
SMM.US.04.M947	.....	.....	.....	481
SMM.US.04.M949	.....	.....	.....	474
SMM.US.04.M950	.....	.....	.....	480
SMM.US.04.M951	.....	.....	.....	476
SMM.US.04.M952	.....	.....	.....	481
SMM.US.05.D215	.....	.....	.....	477
SMM.US.06.FTq	.....	.....	.....	473
SMM.US.11.SIVsmE660_FL10	.....	.....	.....	479
SMM.US.86.CFU212	.....	.....	.....	479
SMM.US.x.F236.H4	.....	.....	.....	485
SMM.US.x.H9	.....	.....	.....	478
SMM.US.x.PBJ14.15	.....	.....	.....	481
SMM.US.x.PBJA	.....	.....	.....	481
SMM.US.x.PBJ.143	.....	.....	.....	483
SMM.US.x.PBJ.6P6	.....	.....	.....	481
SMM.US.x.PGMS3	.....	.....	.....	481
SMM.US.x.SME543	.....	.....	.....	479
SMM.x.x.pE660.CG76	.....	.....	.....	478
STM.US.89.STM_37_16	.....	.....	.....	475

	V5	gp120 end_gp41 start																	
MAC.US.x.239	W...IDGNQTNITMSAEVALYRLLELDYKLVLEITPIGLAPTQVDRKRYTGG	TSRNKRGVFLGLGFLATAGSAMGAASLTLTAQSRLLAGIVQOQQQLLDVVKRQELLRLTVMGTKNLQTRVTAIEKYLKDOAQLNAWGCAFRQVCHTTVPW...	PNASLTPKWN 633																
A.CI.88.UC2	T...F...F...I...F...SE...SSA...PA...L...S...I...A...S...T...		V-D-R-R- 623																
A.DE.x.BEN	I...DKNRTH...F...I...F...OR...SST...PV...R...S...M...A...H...R...S...Y...L...E...N...IV...D...		V-D-S-D-K 618																
A.DE.x.PET2_KR_KRCG	M...FD...S...F...F...SE...SSA...PO...V...S...HPGLYW...M...A...R...R...S...Y...L...E...N...IV...D...		E-N-IV-D 611																
A.GH.x.GH1	V...NS...F...I...V...PF...RE...SSA...PV...G...S...M...A...A...V...D...S...D...		V-D-S-D- 610																
A.GM.07.D104	S...D...F...I...V...PF...RE...SSA...PV...G...S...M...A...A...V...D...S...D...		V-D-A-D 609																
A.GM.x.ISY_SBL_6669_85	V...DGD-R...F...V...F...AE...SSA...PG-H...L...T...A...G...FR...M...A...A...R...S...V...DT...E...		V-DT-E- 611																
A.GM.x.MCN13	A...N-N...F...F...AE...SST...PM...S...M...A...A...R...S...V...DT...E...		V-DT-E- 613																
A.GM.x.MCR35	A...NE-N-D...F...F...AE...SST...PM...S...M...A...A...R...S...V...DT...E...		V-DT-E- 613																
A.GW.86.FG_clone_NIHZ	A...GD...F...A...F...S...SSA...HO-HT...S...M...A...A...R...S...V...DT...D...		V-DT-D- 610																
A.GW.87_CAM2CG	E...R-NQT...F...D...F...OR...SST...PA...HG-P...A...T...V...T...S...I...A...S...S...		A-E-D- 620																
A.GW.x.MDS	E...KQ...F...D...F...PE...SSA...HG-H...T...A...S...M...A...A...S...E...D...E...		V-S-E-D-E 630																
A.IN.07.NNVA	E...KQ...F...V-F-G-D...V...F...PE...SFA...SR-OT...L...E...D...S...P...M...A...A...DS...E...DT...V-N-K...		E-DT-V-N-K 618																
A.IN.95.CRIK_147	VN.E...K.R...F...V...F...SE...SS...#...G-HT...L...E...S...P...M...A...A...S...V...D...D-K...		V-D-D-K 622																
A.JP.08.NMC786_clone_41	M...GK-S...F...V...F...S0...SST...PG...L...T...A...S...M...A...A...S...V...D...S-D-D...		V-D-S-D-D 620																
A.SW.85.R0D	T...QNN...F...F...SER...SST...PR...L...T...A...S...M...A...A...R...S...V...N...K-D-D...		V-N-K-D-D 616																
A.SN.86.ST_JSP4_27	G...GE...F...I-V...F...P...SSA...HG-HT...T...A...S...M...A...A...Q...R...S...V...D...A-D...		V-D-A-D 619																
B.CI.88.UC1	VYVDGNDTK...G...F...EI...SST...P...M...L...M...T...S...L...S...E...T...D...E...		ET-D-E 622																
B.CI.x.20_56	...S-E...G...F...NI...SSA...P-R...M...S...A...S...L...S...E...N...T...		E-N-T 612																
B.CI.x.EHO	...K-L...V...S...K...F...SI...SSV...P...L...S...A...S...V...E...K-D...		V-E-K-D 617																
B.GH.86.D205_ALT	S...NST...SV...S...K...F...R...SSV...KP...M...T...S...PV...A...S...E...T...N...		ET-N- 621																
B.JP.01.IMCJ_KR020_1	TNN-R...S...S...S...S...P...P...M...T...S...L...S...A...S...L...S...K...N...F...N-D...		KNF-N-D 610																
G.CI.92.Abt96	E...NRSN-H...IF...F...N...SSA...PK...M...T...S...M...A...A...R...S...DALGA-KT-E-Q...		DALGA-KT-E-Q 638																
AB.CM.03.03CM_510_03	T...K...F...I...F...TEG...SST...PG...S...M...A...A...X...S...X...V...E...N-D...		V-E-N-D 611																
H2_01_AB.CI.90.7312A	V...DVG-N-R...F...I-V...F...SE...SST...PG-H...T...A...S...M...A...A...S...V...D...D-D...		V-D-D-D 622																
H2_01_AB.JP.04.NMC307_20	GP...DNIS...F...I-V...F...GE...SSA...PG-H...T...V...S...M...A...A...S...V...D...A-D-D...		V-D-A-D-D 616																
H2_01_AB.JP.07.NMC716_01	R...DMSS-A...F...I-V...F...EE...SSA...PE-H...DML...T...V...T...S...M...A...A...S...V...D...A-D...		V-D-A-D 613																
H2_01_AB.JP.08.NMC842_10	L...T...F...I-V...F...EE...SSA...PE-H...DML...T...V...T...S...M...A...A...S...V...D...D-D...		V-D-D-D 620																
U.CI.07.07IC_TNP3	T...T-R...F...S...SSA...P...T...T...S...S...V...N...Q-D...		V-N-Q-D 638																
U.FR.96.12034	R...NK...S...R...F...P...SSV...P...T...T...S...S...I...D...N-D...		I-D-N-D 628																
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MAC.US.x.251_32H_PJ5			D 632																
MAC.US.x.251_BK28	T	S	D 635																
MAC.US.x.80035		X	D 633																
MAC.US.x.81035		N	X 633																
MAC.US.x.85013		X	X 633																
MAC.US.x.87088		X	X 633																
MAC.US.x.92056		X	X 633																
MAC.US.x.92077		X	I 633																
MAC.US.x.93057		H	X 633																
MAC.US.x.93062		G	X 627																
MAC.US.x.95058		X	X D 633																
MAC.US.x.95086		N	X 633																
MAC.US.x.95112		X	X 633																
MAC.US.x.96016		X	X 633																
MAC.US.x.96020		H	A 633																
MAC.US.x.96072		X	D 633																
MAC.US.x.96081		X	E 633																
MAC.US.x.96093		X	E 633																
MAC.US.x.96114		X	X 633																
MAC.US.x.96123		G	X 633																
MAC.US.x.96135		G	N 633																
MAC.US.x.97009		X	S 633																
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SMM.US.04.M919	NSN				N	R	TS	A						T	V	S		647	
SMM.US.04.M922	R				N	R	MA	A						Q	T	L	N	E	644
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SMM.US.04.M926	K	E			M	N	TS	A						Q	D	I	D		645
SMM.US.04.M934	DKEK	T		D	S	AS	A							Q	G	V	D		638
SMM.US.04.M935	HD	E			N	R	NT	AP							ET	V	N	S	639
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SMM.US.04.M946	YD_EHKNKI				S	A	A							Q	D	V	D		647
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SMM.US.04.M949	NE			G	M	S	S								D	I	D		635
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SMM.US.86.CFU212	YK	E			I	N	TT	A							E	AV	D		641
SMM.US.x.F236_H4	NS	E			F	S	T	A							V	S			639
SMM.US.x.H9	N	K			F	S	T	A							XX	S		X	640
SMM.US.x.PBJ14_15	N	E			AF	S	T	A							S	V	S		643
SMM.US.x.PBJA	N	E			AF	S	T	A							A				643
SMM.US.x.PBJ_143	N	K			F	S	T	A							A				645
SMM.US.x.PBJ_6P6	N	E			F	S	T	A							XX	S		X	643
SMM.US.x.PGMS3	N	E			F	S	T	A							V	S			643
SMM.US.x.SME543	N	N	E			R	T	A							H				641
SMM.x.x.pE660.CG7G	TNN	E			S	R	T	A							H	S			640
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MAC. US. x. 239	Env end gp41 end	879
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A.DE.x.BEN	S....TA-DW-LKAAQ---CEWIO-F-FA-TTR---W-AA-I-G-V---A-A---	861
A.DE.x.PE12_KR_KRCG	S-QRA-TT-DW-LTIA---CEWIO-VL-VLA-TTR---S-R-GAMG-I-G-V---A-A---	858
A.GH.x.GH1	N....TA-DW-LKAA---CEWIO-F-FAKTR---S-G-CAAVQ-V-G-V---A-IA---	852
A.GW.87.D184	S....TA-DW-LKAA---CEWIO-FR-FA-T-R-T---RG-CAAQ-I-G-V---A-IA---	852
A.GM.x.ISY_SBL_6669_85	S-QRA-TA-DW-LKAA---CEWIO-F-LA-VTR---TS-GRS-GA-I-G-V---A-IA---	847
A.GM.x.MCN13	S-QRA-TA-DW-LKAA---CEWIO-F-FA-ATR---T-R-GA-Q-I-G-V---A-IA---	860
A.GM.x.MCR35	S-QRA-TA-DW-LKAA---CEWIO-F-FA-ATR---T-R-GA-Q-I-G-V---A-IA---	859
A.GW.86.FG_clone_NIHZ	S-QRA-TA-DW-LKAA---CEWIO-F-LA-TTR---GR-RA-Q-I-G-V---A-A---	857
A.GW.87_CAM2CG	N....DW-PKVAF---CEWIO-F-AA-A-R---CR-V-GM-Q-I-G-V---A-A---	860
A.GW.x.MDS	N.....DQ-LRTAF---CEWIO-F-FA-VTR---TS-CRG-G-I-G-V---A-IA---	870
A.IN.07.NNVA	N.....DW-LRTAF---CEWIO-F-AA-TTG---S-CRS-G-I-G-V---A-A---	858
A.IN.95.CR1K_147	N.....DW-LKTAF---CEWIO-F-FA-T-GK---S-GRN-CG-VE-I-G-V---A-VA---	860
A.JP.08.NMC786_clone_41	S-QRA-TT-DW-LKAA---CEWIO-F-FA-T-R---EF-TA-F-G-V---A-IA---	856
A.ST.x.ALT	N....DW-LRTAF---CEWIO-F-AA-ATR---CRG-RV-E-I-G-V---A-IA---	863
A.SN.85.R0D	S-RRÄ-TÄV-DW-FNTA---GEWIO-FR-FA-ATG---TN-RGF-G-GQI-G-V---A-IA---	859
A.SN.86.ST_JSP4_27	.....QP-LS-A---I-W-Q-I-AT-A-R---NTGRA-KA-TAEA-I---A---	858
B.CI.88.UC1	.....QP-LS-A---I-WLO-I-AT-A-G---N-GRÄ-A-TAGA-I-V---A---	848
B.CI.x.20_56	.....QP-LPPA-R-I-W-Q-I-AA-A-G---S-ARTS-GV-AAGE-I---A-A---	853
B.GH.86.D205_ALT	N.....QP-LPVA---I-W-Q-LR-AA-ATG---S-GET-A-AA-A-I---A---	860
B.JP.01.IMCJ_KR020_1	N.....QQ-LP-A---IGW-Q-I-AT-A-G---TNTGRA-A-TA-A-V---A---	846
G.CI.92.Abt96	-I-R---A-H-L-AA-FS---FRWLQ-CT-AT-A-Q---TST-RA-K-G-V-G---	885
AB.CM.03.03CM_510_03	.....QP-LPFA---IGW-Q-LR-AA-ATR---S-GET-A-GAA-A---A---	847
H2_01_AB.CI.90.7312A	.....QP-LLFA---IGW-Q---AAGATG---STGRT-A-TA-G-I-V---A---	858
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H2_01_AB.JP.07.NMC16_01	.....P-LP-AH---I-WLO---AA-A-G---TS-SRTI-A-TA-G-I---A---	849
H2_01_AB.JP.08.NMC842_10	.....P-LP-AH---I-WLO---AA-A-G---TS-SRTI-A-TA-G-I---A---	856
U.CI.07.07IC_TNP3	.....RV-TA---H-L-GA-X---CQW-Q-L-G-KAXR---S-R---G-V-G---F-A---	882
U.FR.96.12034	SI.....R-HL-IA---Q-K-F-FGKA-R---SRTGRE---G-V-LR---F-A---	868
MAC.US.x.17EC1	.....X.....Y.....	880
MAC.US.x.1937	.....X.....X.....Y.....	880
MAC.US.x.2065	.....X.....X.....Y.....	880
MAC.US.x.251_1A11	.....R.....N.....VD.....*A.....X.....	877
MAC.US.x.251_32H_PJ5	.....A.....R.....V.....G.....R.....	879
MAC.US.x.251_BK28	.....R.....V.....G.....R.....	881
MAC.US.x.80035	.....X.....	880
MAC.US.x.81035	.....X.....	880
MAC.US.x.85013	.....X.....	880
MAC.US.x.85013	.....X.....	880
MAC.US.x.87086	.....A.....	880
MAC.US.x.92050	.....A.....	880
MAC.US.x.92077	.....A.....	880
MAC.US.x.93057	.....A.....	880
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MAC.US.x.93062	.....C-Q.....X.....X-X.....	874
MAC.US.x.95058	.....C-Q.....X.....X-X.....	880
MAC.US.x.95086	.....C-Q.....X.....X-X.....	880
MAC.US.x.95112	.....C-Q.....X.....X-X.....	880
MAC.US.x.96016	.....C-Q.....X.....X-X.....	880
MAC.US.x.96020	.....C-Q.....X.....X-X.....	880
MAC.US.x.96072	.....X-X.....I.....Y.....F.....X.....	880
MAC.US.x.96081	.....X-X.....I.....Y.....F.....X.....	880
MAC.US.x.96093	.....X-X.....I.....Y.....F.....X.....	880
MAC.US.x.96114	.....X-X.....I.....Y.....F.....X.....	880
MAC.US.x.96123	.....X-X.....I.....Y.....F.....X.....	880
MAC.US.x.96135	.....X-X.....I.....Y.....F.....X.....	880
MAC.US.x.97009	.....X-X.....I.....Y.....F.....X.....	880
MAC.US.x.97074	.....X-X.....I.....Y.....F.....X.....	880
MAC.US.x.MM142_IVMXX	.....R.....L.....Q.....AQ.....E-A-Q.....	882
MAC.US.x.r80025	.....R.....L.....Q.....AQ.....E-A-Q.....	882
MAC.US.x.r90131	.....R.....L.....Q.....AQ.....E-A-Q.....	880
MNE.US.82.MNE_8	.....F-T.....V.....Q.....VA.....G-V.....	881
MNE.US.x.MNE027	.....F-T.....V.....Q.....VA.....G-V.....	883
SMM.CI.79.SIVsmCI2	...LVS-AA-NRI-PRIA---Q-Q-C-EAA-A-R---S-GR---G-I-GL-A---AF---	887
SMM.LR.89.SIVsmL1B1	...LVS-AA-NRI-PRIA---Q-Q-C-EAA-A-R---S-GR---G-I-GL-A---AF---	879
SMM.SL.92.SIVsmSL92A	...LVS-AA-NRI-PRIA---Q-Q-C-EAA-A-R---S-GR---G-I-GL-A---AF---	886
SMM.SL.92.SIVsmSL92B	...LVS-AA-NRI-PRIA---Q-Q-C-EAA-A-R---S-GR---G-I-GL-A---AF---	887
SMM.US.04.G078	...LVS-AA-NRI-PRIA---Q-Q-C-EAA-A-R---S-GR---G-I-GL-A---AF---	891
SMM.US.04.G932	...LVS-AA-NRI-PRIA---Q-Q-C-EAA-A-R---S-GR---G-I-GL-A---AF---	887
SMM.US.04.M919	...LVS-AA-NRI-PRIA---Q-Q-C-EAA-A-R---S-GR---G-I-GL-A---AF---	894
SMM.US.04.M922	...LVS-AA-NRI-PRIA---Q-Q-C-EAA-A-R---S-GR---G-I-GL-A---AF---	893
SMM.US.04.M923	...LVS-AA-NRI-PRIA---Q-Q-C-EAA-A-R---S-GR---G-I-GL-A---AF---	891
SMM.US.04.M926	...LVS-AA-NRI-PRIA---Q-Q-C-EAA-A-R---S-GR---G-I-GL-A---AF---	892
SMM.US.04.M934	...LVS-AA-NRI-PRIA---Q-Q-C-EAA-A-R---S-GR---G-I-GL-A---AF---	885
SMM.US.04.M935	...LVS-AA-NRI-PRIA---Q-Q-C-EAA-A-R---S-GR---G-I-GL-A---AF---	886
SMM.US.04.M940	...LVS-AA-NRI-PRIA---Q-Q-C-EAA-A-R---S-GR---G-I-GL-A---AF---	890
SMM.US.04.M946	...LVS-AA-NRI-PRIA---Q-Q-C-EAA-A-R---S-GR---G-I-GL-A---AF---	894
SMM.US.04.M947	...LVS-AA-NRI-PRIA---Q-Q-C-EAA-A-R---S-GR---G-I-GL-A---AF---	890
SMM.US.04.M949	...LVS-AA-NRI-PRIA---Q-Q-C-EAA-A-R---S-GR---G-I-GL-A---AF---	882
SMM.US.04.M950	...LVS-AA-NRI-PRIA---Q-Q-C-EAA-A-R---S-GR---G-I-GL-A---AF---	890
SMM.US.04.M951	...LVS-AA-NRI-PRIA---Q-Q-C-EAA-A-R---S-GR---G-I-GL-A---AF---	886
SMM.US.04.M952	...LVS-AA-NRI-PRIA---Q-Q-C-EAA-A-R---S-GR---G-I-GL-A---AF---	886
SMM.US.05.D215	...LVS-AA-NRI-PRIA---Q-Q-C-EAA-A-R---S-GR---G-I-GL-A---AF---	885
SMM.US.06.FTQ	...LVS-AA-NRI-PRIA---Q-Q-C-EAA-A-R---S-GR---G-I-GL-A---AF---	882
SMM.US.11.SIVsmE660_FL10	...LVS-AA-NRI-PRIA---Q-Q-C-EAA-A-R---S-GR---G-I-GL-A---AF---	888
SMM.US.86.CFU212	...LVS-AA-NRI-PRIA---Q-Q-C-EAA-A-R---S-GR---G-I-GL-A---AF---	888
SMM.US.x.F236_H4	...LVS-AA-NRI-PRIA---Q-Q-C-EAA-A-R---S-GR---G-I-GL-A---AF---	886
SMM.US.x.H9	...LVS-AA-NRI-PRIA---Q-Q-C-EAA-A-R---S-GR---G-I-GL-A---AF---	887
SMM.US.x.PBJ14_15	...LVS-AA-NRI-PRIA---Q-Q-C-EAA-A-R---S-GR---G-I-GL-A---AF---	890
SMM.US.x.PBJA	...LVS-AA-NRI-PRIA---Q-Q-C-EAA-A-R---S-GR---G-I-GL-A---AF---	890
SMM.US.x.PBJ_143	...LVS-AA-NRI-PRIA---Q-Q-C-EAA-A-R---S-GR---G-I-GL-A---AF---	892
SMM.US.x.PBJ_6P6	...LVS-AA-NRI-PRIA---Q-Q-C-EAA-A-R---S-GR---G-I-GL-A---AF---	890
SMM.US.x.PGMS3	...LVS-AA-NRI-PRIA---Q-Q-C-EAA-A-R---S-GR---G-I-GL-A---AF---	886
SMM.US.x.SMES43	...LVS-AA-NRI-PRIA---Q-Q-C-EAA-A-R---S-GR---G-I-GL-A---AF---	888
SMM.x.x.pE660.CG7G	...LVS-AA-NRI-PRIA---Q-Q-C-EAA-A-R---S-GR---G-I-GL-A---AF---	887
STM.US.89.STM_37_16	...LVS-AA-NRI-PRIA---Q-Q-C-EAA-A-R---S-GR---G-I-GL-A---AF---	883

	Nef start	R17Y mutation	premature stop in Mac239	max HIV-1 similarity
MAC.US.x.239	MGGAISMRSRSPGDLRQLLRARGETYGRLLRGEVEDGYQSYPGLDKGLSSLSCE.GQK.YNQGQYMNTPWRN.PAEREKRLAYRKQNMDDIDE*DDD.LVGV.SVRPKVPLRTMSYKLAIDMSHFIEKGGLEGIIYSARRHRILDIYLEKEEGIIPOWDQYTSGPG			163
A.CI.88.UC2	--ASG-KKL-KQ-OG-E-----GG-V-QCSASGGES--Q-SGREOK-P-----Q--R-D-----T--M-GO-ES-KQ-----V-SD-N-Q-----TSR--P-T--V-----MF-RD-----L-----V-----N-H-----			164
A.DE.x.BEN	--ASG-KKL-KH-RG-E-----DG-KQRDASGGE--FOEESGREON-P-----Q-Q-E-S-----T-Q-DL-Q-----V-SD-----I--P-T-R-R-E-T-----Q-MF-R-----N-H-----			164
A.DE.x.PET2_KR_KRCC	--ASG-KKC-SLOG-E-----C-GQWDGSGAGE-L-FOE-SGR-QNLP-----R-Q-DF-----T--AG-GTL-KQ-----V-ADN-N-I--P-T-R-A-T--V-I-LN-----D-M-F-----M-----N-H-----			164
A.GH.x.GH1	--ASG-KKH-KH-OR-E-----H-GG-VQCNASGGE--QE-SG-QK-P-----Q-Q-DF-----T--I-GO-KL-KQ-----SS-----P-T-R-A-T--V-----KR-D-MF-RD-----L-----N-H-----			163
A.GM.07.0104	--ASG-KK-EH-OG-E-----GG-VKQRNASGGES--QE-SGREOK-P-----Q-Q-E-F-----T--ATG-NS-KQ-----V-SD-----P-M-R-E-T-----V-----LF-----N-H-----			164
A.GM.x.ISY_SBL_6669_85	--ASG-KK---RG-QE-----GAC-G-WD-S-G-FHE-SGREOKLP-----R-Q-DF-----T--K-ES-----V-SD-----DTSR-A-T-RM-V-DL-D-----M-E-----N-H-L-----			164
A.GM.x.MCN13	--ASG-KE---OG-E-----C-GHCSGSGGE-L-OEESGREOR-P-Y-----R-Q-DF-----T--K-G-EL-KQ-R-V-SD-----K-T-R-ELTHR-V-----M-E-----A-N-H-----			164
A.GM.x.MCR35	--ASG-KE---OG-E-----C-GHCSGSGGE-L-OEESGREOR-P-Y-----R-Q-DF-----T--K-G-EL-KQ-R-V-SD-----K-T-R-ELTHR-V-----M-E-----K-----N-H-----			163
A.GM.86.FG clone NIHZ	--ASG-KK-K-LOG-OE-Q-----C-GRCN-SGG-L-H-SGREON-P-----R-Q-DF-----T--A-EL-KQ-----V-LD-Q-F-P-T-R-P-T-F-V-----LF-O-----L-D-----A-N-----			148
A.GW.87_CAM2CG	--ASG-KK---LQG-OE-----AG-C-ECYNAL-GESLR-QE-S-REQM-P-----R-Q-DF-----T--A-GK-N-Q-----V-SD-----P-M-R-E-T-----V-----LF-----N-H-----			164
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