

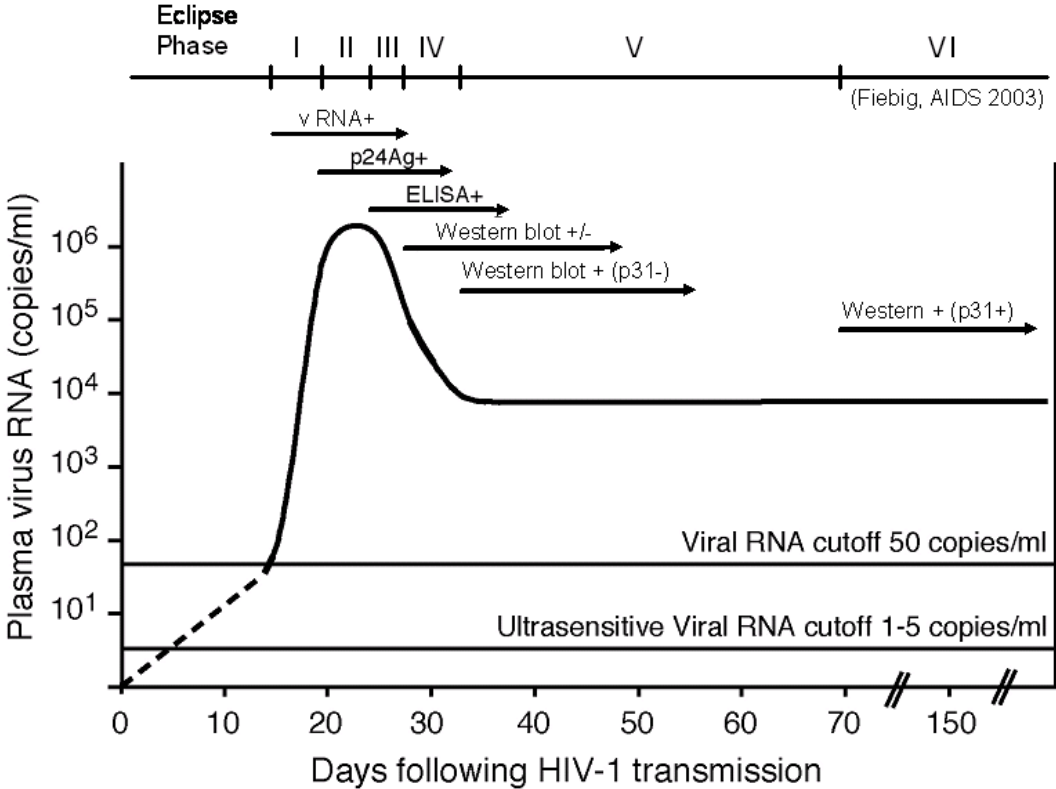
Registry of Molecularly Cloned HIV-1, SIV and SHIV gp160 Genes for Use as Env- Pseudotyped Viruses in Neutralizing Antibody Assays

**Compiled by:
Laboratory for AIDS Vaccine Research & Development
Duke University Medical Center
Durham, NC 27710**

This registry is also available at:

<http://www.hiv.lanl.gov/content/nab-reference-strains/html/home.htm>

Natural History and Laboratory Staging of HIV Infection



LEGEND for the tables that follow:

¹Clones with an asterisk and in bold type comprise standard panels of reference strains (clade B reference strains are available as a complete set from the NIH ARRRP, cat # 11227; African clade C reference strains are available as a complete set from the NIH ARRRP, cat # 11326)

²ccPBMC, co-cultured PBMC; ucPBMC, uncultured PBMC.

³Values are the concentration (µg/ml) at which relative luminescence units (RLUs) were reduced 50% compared to virus control wells (no test sample). TriMab is an equal concentration mixture of IgG1b12, 2G12 and 2F5.

Clade B gp160 clones for use as Tier 2 Env-pseudotyped viruses

Clade B ¹	Country of origin	Fiebig Stage	Mode of trans.	Source ²	Accession number	ARRRP cat #	ID50 (µg/ml) in TZM-bl cells ³						Ref
							sCD4	IgG1b12	2G12	2F5	4E10	TriMab	
6535.3*	USA	V	M-M	ccPBMC	AY835438	11017	0.8	1.4	2.0	1.9	0.2	1.2	1
QH0692.42*	Trinidad	V	F-M	ccPBMC	AY835439	11018	0.5	0.3	2.8	1.0	1.4	0.3	1
SC422661.8*	Trinidad	IV	F-M	Plasma	AY835441	11058	4.7	0.2	2.1	0.7	0.9	0.3	1
PVO.4*	Italy	III	M-M	ccPBMC	AY835444	11022	6.7	>50	1.2	>50	6.5	4.2	1
TRO.11*	Italy	III	M-M	ccPBMC	AY835445	11023	11.5	>50	0.4	>50	0.3	0.8	1
AC10.0.29*	USA	III	M-M	ccPBMC	AY835446	11024	8.5	1.9	>50	1.3	0.3	0.9	1
RHPA4259.7*	USA	≤V	M-F	Plasma	AY835447	11036	1.8	0.1	>50	12.0	6.9	0.1	1
THRO4156.18*	USA	II	M-M	Plasma	AY835448	11037	0.3	0.5	>50	>50	0.3	1.0	1
REJO4541.67*	USA	II	F-M	Plasma	AY835449	11035	0.5	0.7	>50	0.6	0.7	0.5	1
TRJO4551.58*	USA	II	M-M	Plasma	AY835450	11034	20.2	>50	>50	>50	4.5	>25	1
WITO4160.33*	USA	II	F-M	Plasma	AY835451	11033	5.4	3.1	1.1	0.6	0.3	0.7	1
CAAN5342.A2*	USA	≤VI	M-M	Plasma	AY835452	11038	16.0	>50	>50	3.6	2.7	17.9	1
QH0515.1	Trinidad	IV	F-M	ccPBMC	AY835440		8.0	2.6	0.1	10	5.0	0.1	1
BG1168.1	USA	III	M-M	ccPBMC	AY835443		10.0	>50	>50	0.8	1.8	3.5	1
6101.10	USA	V	M-M	ccPBMC	AY835434		6.0	>50	3.0	>50	0.3	10.1	1
5768.4	USA	V	M-M	ccPBMC	AY835435		4.0	3.0	9.0	12	6.1	0.9	1
3988.25	USA	VI	M-M	ccPBMC	AY835436		12.0	0.4	0.3	>50	0.5	0.8	1
7165.18	USA	V	M-M	ccPBMC	AY835437		4.3	>50	0.9	3.9	1.1	1.2	1
H022.7	Peru	VI	Sexual	ccPBMC	EF210725		8.8	9.3	>50	3.9	2.6	9.8	3
H029.12	Peru	VI	Sexual	ccPBMC	EF210726		8.5	>50	0.1	0.4	0.7	0.4	3
H030.7	Peru	VI	Sexual	ccPBMC	EF210727		16.0	>50	>50	2.3	3.0	3.7	3
H031.7	Peru	VI	Sexual	ccPBMC	EF210728		24.3	0.9	1.4	0.2	0.4	0.1	3
H035.18	Peru	VI	Sexual	ccPBMC	EF210729		1.6	>50	36.7	0.2	0.4	0.5	3
H061.14	Peru	VI	Sexual	ccPBMC	EF210730		1.4	0.2	0.5	0.1	0.9	0.4	3
H079.2	Peru	VI	Sexual	ccPBMC	EF210731		3.2	6.5	>50	6.4	1.7	4.8	3
H086.8	Peru	VI	Sexual	ccPBMC	EF210732		2.1	>50	>50	0.2	1.2	1.1	3
H077.31	Peru	VI	Sexual	ccPBMC	EF210734		13.9	>50	>50	3.4	6.2	8.0	3
H078.14	Peru	VI	Sexual	ccPBMC	EF210733		21.3	>50	>50	>50	5.4	>25	3
H080.23	Peru	VI	Sexual	ccPBMC	EF210735		6.8	>50	3.8	>50	1.4	5.6	3

Clade B gp160 clones for use as Tier 2 Env-pseudotyped viruses- CHAVI Transmitted Envs

Transmitted Clade B ¹	Country of origin	Fiebig Stage	Mode of trans.	Source ²	Accession number	ARRRP cat #	ID50 (µg/ml) in TZM-bl cells ³						Ref
							sCD4	IgG1b12	2G12	2F5	4E10	HIVIG	
WEAU-d15.410.787*	USA	II		Plasma		11578	1.8	1.1	0.2	0.9	1.0	386	9
BB1006-11.C3.1601*	USA	III		Plasma	EU289183	11560	14.3	3.9	2.6	7.5	6.1	542	9
BB1054-07.TC4.1499*	USA	II		Plasma	EU289185	11561	11.7	11.1	>25	>25	1.1	1070	9
BB1056-10.TA11.1826*	USA	II		Plasma	EU289186	11562	20.7	2.0	22.9	0.4	0.6	590	9
BB1012-11.TC21*	USA	III		Plasma	EU289184	11559	10.2	>25	>25	2.4	3.5	540	9
6240.08.TA5.4622*	USA	II		Plasma	EU289190	11567	18.5	>25	0.6	12.8	8.3	1268	9
6244.13.B5.4576*	USA	II		Plasma	EU289191	11566	9.1	>25	>25	>25	0.5	490	9
62357.14.D3.4589*	USA	II		Plasma	EU289189	11565	1.5	>25	>25	3.7	1.9	454	9
9021-14.B2.4571*	USA	II		Plasma	EU289196	11572	4.0	>25	>25	5.8	4.8	577	9
700010040.C9.4520*	USA	V		Plasma	EU289193	11569	4.4	1.2	>25	21.9	>25	514	9
PRB926-04.A9.4237*	USA	II		Plasma	EU289197	11573	4.5	1.3	>25	1.3	2.8	316	9
SC05.8C11.2344*	Trinidad	II		Plasma	EU289200	11576	6.4	3.1	18.7	3.7	6.4	569	9
BORI-d9.4F8	USA			Plasma			>25	2.5	>25	>25	3.4	422	9
BORI-d9.4D7	USA			Plasma			>25	6.2	>25	>25	13.0	456	9
SUMA-d5.8-2	USA			Plasma			13.1	4.2	1.3	9.1	13.2	468	9
BB1051-12.C22	USA			Plasma			18.8	3.6	>25	21.8	>25	1302	9
BB1051-12.TD12	USA			Plasma			1.8	0.5	>25	3.9	5.6	542	9
9020.2.A13	USA	II		Plasma			17.7	>25	14.6	2.0	1.1	393	9
TT29P-CRC01810.3A1	USA			Plasma			13.8	1.9	>25	5.5	6.9	1043	9
TT31P-CRC03428.2F10	USA			Plasma			12.8	0.6	3.8	4.3	3.6	634	9
1058-11.B11.1550	USA	IV		Plasma	EU289187	11563							9
1059-09.A4.1460	USA	III		Plasma	EU289188	11564							9
63358.P3.4013	USA	II		Plasma	EU289192	11568							9
700010058.A4.4375	USA	III		Plasma	EU289194	11570							9
PRB931-06.TC3.4930	USA	III		Plasma	EU289198	11574							9
PRB958-06.TB1.4305	USA	III		Plasma	EU289199	11575							9
SC45.4B5.2631	Trinidad	II		Plasma	EU289201	11577							9
9014-01 TB1	USA	II		Plasma		11571							9

Clade C gp160 clones for use as Tier 2 Env-pseudotyped viruses

Clade C ¹	Country of origin	Fiebig Stage	Mode of trans.	Source ²	Accession number	ARRRP cat #	ID50 (µg/ml) in TZM-bl cells ³						Ref
							sCD4	IgG1b12	2G12	2F5	4E10	TriMab	
Du156.12*	S. Africa	≤IV	M-F	ccPBMC	DQ411852	11306	13.4	0.8	>50	>50	0.2	1.2	2
Du172.17*	S. Africa	VI	M-F	ccPBMC	DQ411853	11307	1.7	1.0	>50	>50	0.3	2.6	2
Du422.1*	S. Africa	V	M-F	ccPBMC	DQ411854	11308	9.1	0.2	>50	>50	0.7	0.8	2
ZM197M.PB7*	Zambia	≤VI	F-M	ucPBMC	DQ388515	11309	3.9	19.9	>50	12.3	0.5	24.8	2
ZM214M.PL15*	Zambia	≤VI	F-M	Plasma	DQ388516	11310	8.0	3.0	>50	>50	4.0	9.7	2
ZM233M.PB6*	Zambia	≤VI	F-M	ucPBMC	DQ388517	11311	2.9	>50	>50	>50	1.2	>25	2
ZM249M.PL1*	Zambia	II	F-M	Plasma	DQ388514	11319	9.7	3.2	>50	>50	2.1	7.9	2
ZM53M.PB12*	Zambia	≤VI	F-M	ucPBMC	AY423984	11313	8.3	25.9	>50	>50	7.0	>25	2
ZM109F.PB4*	Zambia	≤VI	M-F	ucPBMC	AY424138	11314	0.2	>50	>50	>50	0.6	>25	2
ZM135M.PL10a*	Zambia	≤VI	F-M	Plasma	AY424079	11315	6.1	>50	>50	>50	0.6	>25	2
CAP45.2.00.G3*	S. Africa	IV	M-F	Plasma	DQ435682	11316	26.0	0.7	>50	>50	2.6	1.5	2
CAP210.2.00.E8*	S. Africa	IV	M-F	Plasma	DQ435683	11317	3.4	20.4	>50	>50	1.2	20.8	2
Du123.6	S. Africa	VI	M-F	ccPBMC	DQ411850		0.3	0.2	>50	>50	0.1	1.6	2
Du151.2	S. Africa	V	M-F	ccPBMC	DQ411851		3.0	1.4	>50	>50	0.8	13.5	2
CAP244.2.00.D3	S. Africa	V	M-F	Plasma	DQ435684		8.9	>50	>50	>50	1.9	>25	2
ZM215F.PB8	Zambia	≤VI	M-F	ucPBMC	DQ422948		14.0	>50	>50	>50	0.4	>25	2
ZM55F.PB28a	Zambia	≤VI	M-F	ucPBMC	AY423971		24.0	>50	>50	33.6	8.0	>25	2
ZM106F.PB9	Zambia	≤VI	M-F	ucPBMC	AY424163		23.0	>50	>50	>50	7.2	>25	2
96ZM651.02	Zambia	VI											
HIV-00836-2.5*	India	VI	M-F	ccPBMC	EF117265	11499	>50	>50	>50	>50	1.8	>25	5
HIV-001428-2.42*	India	IV	M-F	ccPBMC	EF117266	11500	5.2	>50	>50	>50	10.1	>25	5
HIV-0013095-2.11*	India	IV	M-F	ccPBMC	EF117267	11501	1.1	>50	>50	>50	0.1	>25	5
HIV-16055-2.3*	India	II	F-M	ccPBMC	EF117268	11502	11.4	>50	>50	>50	1.7	>25	5
HIV-16845-2.22*	India	V	M-F	ccPBMC	EF117269	11503	1.0	>50	>50	>50	0.1	>25	5
HIV-16936-2.21*	India	III	F-M	ccPBMC	EF117270	11504	4.4	>50	>50	>50	1.8	>25	5
HIV-25710-2.43*	India	V	F-M	ccPBMC	EF117271	11505	2.6	>50	>50	>50	0.2	>25	5
HIV-25711-2.4*	India	III	F-M	ccPBMC	EF117272	11506	29.0	25.9	>50	36.2	4.2	>25	5
HIV-25925-2.22*	India	III	F-M	ccPBMC	EF117273	11507	12.9	>50	>50	>50	1.5	>25	5
HIV-26191-2.48*	India	III	F-M	ccPBMC	EF117274	11508	17.1	4.9	>50	>50	3.1	14.1	5

CRF07_BC gp160 clones for use as Tier 2 Env-pseudotyped viruses

CRF07_BC	Country of origin	Fiebig Stage	Mode of trans.	Source ²	Accession number	ARRRP cat #	ID50 (µg/ml) in TZM-bl cells ³						Ref
							sCD4	IgG1b12	2G12	2F5	4E10	TriMab	
CH038.12	China	VI	IVDU	ccPBMC	EF042692		17.4	2.8	0.1	>50	5.4		4
CH064.20	China	VI	IVDU	ccPBMC	EF117254		8.8	>25	>25	>25	0.4		4
CH070.1	China	VI	IVDU	ccPBMC	EF117255		1.0	>25	>25	>25	0.3		4
CH091.9	China	VI	IVDU	ccPBMC	EF117256		7.6	>25	>25	>25	0.7		4
CH110.2	China	VI	IVDU	ccPBMC	EF117257		1.5	10.8	>25	>25	0.1		4
CH111.8	China	VI	IVDU	ccPBMC	EF117258		4.6	>50	>50	>50	1.5		4
CH181.12	China	VI	IVDU	ccPBMC	EF117259		5.5	2.5	>25	>25	0.8		4
CH120.6	China	VI	IVDU	ccPBMC	EF117260		9.7	>25	>25	>25	2.9		4
CH119.10	China	VI	IVDU	ccPBMC	EF117261		11.3	>25	>25	>25	1.6		4
CH117.4	China	VI	IVDU	ccPBMC	EF117262		3.3	>25	>25	>25	0.1		4
CH115.12	China	VI	IVDU	ccPBMC	EF117263		10.9	23.8	0.6	>25	1.8		4
CH114.8	China	VI	IVDU	ccPBMC	EF117264		1.6	>25	>25	>25	0.4		4

Clade A gp160 clones for use as Tier 2 Env-pseudotyped viruses

Clade A ¹	Country of origin	Fiebig Stage	Mode of trans.	Source ²	Accession number	ARRRP cat #	ID50 (µg/ml) in TZM-bl cells ³						Ref
							sCD4	IgG1b12	2G12	2F5	4E10	TriMab	
Q23.17*	Kenya	VI	M-F		AF004885	10455	11.1	>50	>50	2.9	1.3	4.6	6
Q461.e2*	Kenya	Acute/early	M-F		AF407156	10460	15.0	>50	>50	4.1	2.0	13.0	6
Q769.d22*	Kenya	Acute/early	M-F		AF407158	10458	0.6	>50	>50	0.5	0.4	2.1	6
Q259.d2.17*	Kenya	Acute/early	M-F		AF407152	10459	9.7	>50	>50	7.1	8.5	20.1	6
Q842.d12*	Kenya	Acute/early	M-F		AF407160	10457	13.5	>50	>50	5.2	2.0	10.5	6

CRF02_AG gp160 clones for use as Tier 2 Env-pseudotyped viruses

CRF02_AG ¹	Country of origin	Fiebig Stage	Mode of trans.	Source ²	Accession number	ARRRP cat #	ID50 (µg/ml) in TZM-bl cells ³						Ref
							sCD4	IgG1b12	2G12	2F5	4E10	TriMab	
T257-31*	Cameroon	Acute/early		ccPBMC			23.6	>50	>50	1.0	1.2	10.1	7
928-28*	Cote d'Ivoire	Acute/early		ccPBMC			2.2	>50	>50	1.0	0.5	3.9	7
271-11*	Cameroon	Acute/early		ccPBMC			<0.02	38.7	>50	7.0	2.1	22.8	7
T33-7*	Cameroon	VI		ccPBMC			16.7	>50	>50	5.0	11.8	11.0	7
263-8*	Cameroon	VI		ccPBMC			3.2	>50	15.0	>50	1.4	21.4	7
T250-4*	Cameroon	VI		ccPBMC			6.8	>50	12.8	2.4	3.1	4.5	7
T251-18*	Cameroon	VI		ccPBMC			9.3	>50	9.3	13.0	2.6	16.8	7
T278-50*	Cameroon	VI		ccPBMC			0.8	3.6	>50	2.8	1.3	5.3	7
T255-34*	Cameroon	VI		ccPBMC			3.0	>50	>50	>50	0.6	>25	7
211-9*	Cameroon	VI		ccPBMC			8.7	>50	38.3	4.7	5.9	8.4	7
235-47*	Cameroon	VI		ccPBMC			39.0	>50	0.7	>50	1.0	2.0	7
242-14*	Cameroon	VI		ccPBMC			3.6	>50	>50	0.9	20.7	1.5	7
T266-60	Cameroon	VI		ccPBMC			6.8	7.6	>50	1.2	1.7	2.5	7
T253-11	Cameroon	VI		ccPBMC			>50	>50	>50	<0.02	5.9	12.7	7
T280-5	Cameroon	VI		ccPBMC			21.0	>50	37.2	8.4	8.1	23.9	7
269-12	Cameroon	VI		ccPBMC			17.1	>50	>50	>50	0.9	>25	7

Clade G gp160 clones for use as Tier 2 Env-pseudotyped viruses

Clade G ¹	Country of origin	Fiebig Stage	Mode of trans.	Source ²	Accession number	ARRRP cat #	ID50 (µg/ml) in TZM-bl cells ³						Ref
							sCD4	IgG1b12	2G12	2F5	4E10	TriMab	
252-7	W. Afr.	VI					>50	>50	>50	11.4	9.6	19.8	7

CRF A/D gp160 clones for use as Tier 2 Env-pseudotyped viruses

CRF A/D ¹	Country of origin	Fiebig Stage	Mode of trans.	Source ²	Accession number	ARRRP cat #	ID50 (µg/ml) in TZM-bl cells ³						Ref
							sCD4	IgG1b12	2G12	2F5	4E10	TriMab	
Q168.a2*	Kenya	Acute/early	M-F		AF407148	10456	5.6	>50	>50	3.2	2.3	6.3	6

Candidate Tier 1 gp160 clones for use as Env-pseudotyped viruses

Tier 1	Clade	Country of origin	Fiebig Stage	Mode of trans.	Source ²	Access. number	ARRRP cat #	ID50 (µg/ml) in TZM-bl cells ³						Ref
								sCD4	IgG1b12	2G12	2F5	4E10	TriMab	
MN	B	USA	VI											
SF162.LS	B	USA	VI			EU123924	10463	0.4	0.1	0.7	0.9	1.6	0.2	8
Bal.26	B	USA	VI					0.2	0.2	0.9	0.8	0.7	0.3	
SS1196.1	B	USA	V-VI	M-M	ccPBMC	AY835442		1.8	2.4	10.8	21.8	0.4	4.5	1
Bx08.16	B	France	VI					0.5	4.2	5.4	2.6	2.4	2.5	
BZ167.12	B		VI											
TV1.21	C	S. Africa	VI					0.3	>25	1.7	12.9	1.5	3.8	
92BR025.9	C	Brazil	VI			HIV1U15121		0.5	>25	1.2	>25	2.8	5.4	
MW965.26	C	Malawi	VI					0.4	0.2	>25	>25	0.01	3.4	
DJ263.8	A	Djibouti	VI			AF063223		0.2	>25	1.9	>25	0.2	5.8	
MS208.A1	A	Montserrat	VI					9.3	1.0	>25	0.8	0.7	1.1	
92RW020.2	A	Rwanda	VI			DQ187010		10.4	19.0	>25	5.5	4.8	9.0	

SHIV and SIV gp160 clones for use as Env-pseudotyped viruses

SHIV and SIV	Country of origin	Fiebig Stage	Mode of trans.	Source ²	Accession number	ARRRP cat #	ID50 (µg/ml) in TZM-bl cells ³						Ref
							sCD4	IgG1b12	2G12	2F5	4E10	TriMab	
SHIV-89.6P.18	USA	VI					0.8	>25	1.3	1.5	1.8	1.9	
SHIV-SF162P3.5	USA	VI					4.2	0.6	4.1	0.5	0.5	0.9	
SIVmac239CS.23	--	--						--	--	--	--		

References

1. Li, M., F. Gao, J.R. Mascola, L. Stamatatos, V.R. Polonis, M. Koutsoukos, G. Voss, P. Goepfert, P. Gilbert, K.M. Greene, M. Bilaska, D.L. Kothe, J.F. Salazar-Gonzalez, X. Wei, J.M. Decker, B.H. Hahn, and D.C. Montefiori. (2005) Human immunodeficiency virus type 1 *env* clones from acute and early subtype B infections for standardized assessments of vaccine-elicited neutralizing antibodies. *J. Virol.*, 79:10108-10125.
2. Li, M., J.F. Salazar-Gonzalez, C.A. Derdeyn, L. Morris, C. Williamson, J.E. Robinson, J.M. Decker, Y. Li, M.G. Salazar, V.R. Polonis, K. Mlisana, S.A. Karim, K. Hong, K.M. Greene, M. Bilaska, J.T. Zhou, S. Allen, E. Chomba, J. Mulenga, C. Vwalika, F. Gao, M. Zhang, B.T.M. Korber, E. Hunter, B.H. Hahn, and D.C. Montefiori. (2006) Genetic and neutralization properties of subtype C human immunodeficiency virus type 1 molecular *env* clones from acute and early heterosexually acquired infections in southern Africa. *J. Virol.*, 80:11776-11790.
3. These clade B clones from Lima, Peru were created in collaboration with Rosario Zuniga, Aldo Lucchetti, Patricia Galvan, Shyla Sanchez, Jesus Peinado (Asociación Civil IMPACTA Salud y Educación, Lima, Peru); Christian Brander, Todd Allen, Marcus Altfeld and Bruce Walker (Partners AIDS Research Center, Boston, MA); Ming Li, Haili Tang and David Montefiori (Duke University Medical Center, Durham, NC).
4. These CRF07_BC clones from China were created in collaboration with Yiming Shao and Kunxue Hong (Chinese Center for Disease Control and Prevention, Beijing, China); Haili Tang and David Montefiori (Duke University Medical Center, Durham, NC).
5. These clade C clones from India were created in collaboration with Ramesh Paranjape, Jayanta Bhattacharya, Smita Kulkarni (National AIDS Research Institute, Pune, India); Robert Bollinger (Johns Hopkins School of Medicine, Baltimore, MD); Haili Tang, Ming Li and David Montefiori (Duke University Medical Center, Durham, NC). Manuscript in preparation.
6. Blish, C.A, R. Nedellec, K. Mandaliya, D.E. Mosier, and J. Overbaugh. (2007) HIV-1 subtype A envelope variants from early in infection have variable sensitivity to neutralization and to inhibitors of viral entry. *AIDS* 21:693-702.
7. These CRF02_AG clones from West Africa were created by investigators at the Center for Disease Control & Prevention in Atlanta, GA (Dennis Ellenberger, Sal Butera, et al).
8. Cheng-Mayer, C., R. Liu, N.R. Landau, and L. Stamatatos. (1997) Macrophage tropism of human immunodeficiency virus type 1 and utilization of the CC-CKR5 coreceptor. *J. Virol.* 71:1657-1661.
9. Keele, B., E. Giorgi, J. Salazar-Gonzalez, J. Decker, K. Pham, M. Salazar, C. Sun, T. Grayson, S. Wang, H. Li, X. Wei, C. Jiang, J. Kirchherr, F. Gao, J. Anderson, L. Ping, R. Swansrom, G. Tomaras, B. Blattner, P. Goepfert, E. Delwart, M. Busch, M. Cohen, D. Montefiori, B. Haynes, B. Gashen, G. Athreya, H. Lee, N. Wood, C. Seoighe, A. Perelson, T. Battacharya, B. Korber, B. Hahn, and G. Shaw. (2008) Identification of the transmitted HIV-1 envelope. Submitted.