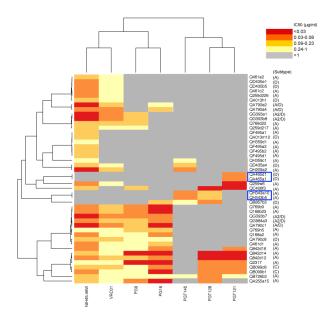
## Figure S1



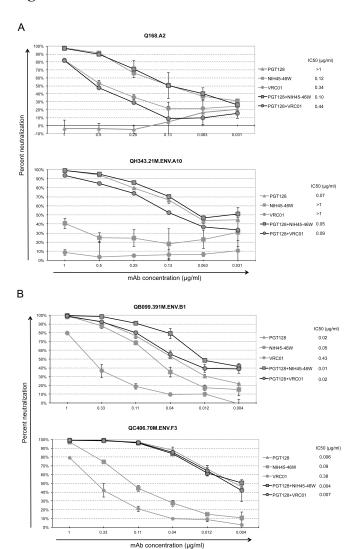
**Figure S1.** Hierarchical clustering of mAbs (bottom) and panel viruses (right). A heatmap of IC50 values for each virus-mAb combination is shown, with darker shading indicating increasing potency, as indicated by the key. The grey color indicates that 50% neutralization was not achieved at the highest concentration of mAb tested (1µg/ml). Blue boxes indicate viruses that are only neutralized by PGT121, PGT128, and/or PGT145.

## Figure S2

	V	1		V2	
HXB2CG	CASTRCADITY	NOTHINGS SGR MINENGE IN	SIBESTSTRAMOGENATERED	TIPIDMDTT	STRIÄSCHTSVITGACPRVSFEPIPIHYCAPAGI  DOMSHSR-R-INA  SUMSHSR-R-INA
Q769b9 Q769d22	T-N-SN	I-NIPHVNA-SIPHDv-E	NT-ELED-K-NV-SLR	-VV-LETSL	
076905					
0842d12	T-D-N	-V	NT-EL-D-RY-SL	-V0-SE	QGRESHW.R-ITA7
Q842d14	T-D-N	VN07SD	NT-EL-D-RV-SL	-VVQ-8D	
0842416					
g259d2.17	T-D	Y-Y-KDEITEDMQE	T-EL-D-EYHSLH	VV-MGG	
9259d2.26 9259v6	7-0	Y-VRHDWZKHHQE	T-EL-D-KVH5LR	V-Q-GG	
0461.02	and the control	tuv	D TO D X II OF	TEN COOK	
0461.02		-1-0OTTRATOPET OF		IFW-SPSM	esweswern_e_ruA
0461.e2	and Talkana MTM		and the File Date of the File of the same	ANYOUSERS.	SSNSSNFTO_B_TMA
Q168a2		7Y-SNT-NDGER	T-EL-D-RY-EL	VV0	NSS -R-INA7
Q168b23	T-NNVHN	2V-SN7-NDEER	VT-EL-D-RV-SL	VVQ	
Q2389V-17	T-HNVT	SVWT-GD	MT-EL-D-RV-SLR	-V8E	
QB726.70M.ENV.B3 QF495.23M.ENV.A1	T-D-88	Y-YTTSFTNEMPQ	MT-EL-D-KY-SLRS-	VV88	BSSSSQ-R-INAT
QF495.23H.ENV.A1	T-N-AYSVTIPS	T-GA-VTHSGTPTNIGTRHR	VA-ED-FX-Y-5LQ-	-VQ-SENGGSSEKSNSSIISAENSNTSS	NSSYSNSSSNSNSNSDE-I-INA
OP495 21W EWY B2	7-N-AV0971F0	2-01-VTWIP7970T0T0797W-079		_UV_NEWYCOCCUPANTOTTTCATHOUTO	SNSVSHSSSKRSNKDE-I-INA
OF495.23M.ENV.DI					
QQ984.21M.EMV.A3	ma Ta San M	AKGUTI KOTMOVTIN TTERRORE	man MT a FE a Da Yaa Ya Si amaa aa	STREET,	
QH209.14M.ENV.A2					
QH343.21M.ENV.A10					
Q8343.21M.ENV.R5 Q8359.21M.ENV.C1	T-NNVMGTEDMVT	RS-NTNATASPTVREDM		V2ER	
QB359.21M.EWV.C1	T-8-GHSVTIHSBVTIHSNYTI	H-S-AT-ATSPSIES-VH	VT-ED-7K-Y-SLR	PAG-8RNG	
08255.21R.ENV.DI	T-D-SYSTEM	ATS_TOTTI DINITY TOTON		_10_ND	CHOIN-D-THA
QA790.2041.ESV.A4	T-HNW	STEGR-CTENCTGGNFTIGGSDDLGM		VVGDNNSNN	GHHIM-R-INA
QA790.2041.ESV.C1					
QA790.2041.ESV.C8	T-H NWS	.STEGR-CTENCTGONFTIGGSDDLGS	T-E-ED-FEOLR	VVGDSSSSSS	
QA790.2041.ESV.E2		STEGR-CTENCTGGNTTIQGSDDLGN	T-E-ED-ENQLR	VVGDSNSSN	7
QG393.60H.ENV.A1 QG393.60H.ENV.B7	T-NEG	RSND-IEGEK	T-W-D-REGVH-LR	-VVAMRTH	-R-IHA
QG393.6GM.ENV.B7	T-8	POMO_TP COM		VVG.SHNST	
09099.391H.20V.B1					
GB099.391H.ENV.CB		HISTORICONSTANCE Martinities		-ValueOf	NOTE-D-THTD
QC406.TGM.ENV.F3					
QA013.701.ENV.E1		NGSVTDQDIGH	T-EV-D-KHQVQ-L	VVQ8	T-R-IN-A777
QN013.701.ENV.H12	T-NEW	SGSVTDQDIGH	T-EV-D-FEQVQ-L	VVQ8	
QA465.59H.ENV.AL	T-NEY	-S-KI-SSTS-DTGHR	T-EV-D03XEVL	VVQ-8D585TN	TR-INA7
ORGST 1101 PRV B1		COCCURATE CONTRACTOR	D D D NICOTI I	TENN OFF H	
00435,100H,89V,84	T-N PSP	-7MPXM UPSPTOM	TP-FY-08Y-09H-1	I/U_MENNEOPPINE	VTN-R-INA7
00435 - 100H - PNV - BS	T-NFMF	THE MIS VTN- KT CH-D-	TT-EV-DRX-CON-L-	AND MINISTERS	
QD435.100m.ENV.E1	T-NEWE	THRSHVTN-EIGH	TT-EV-DRE-GVH-L	VV-MSDSSSTDIN	YTN-R-INA7
HIRZOS				V3	SRAKWINTLEGIASKLERGFONHKTIIFKGGSGGDPEIVTHSFNC
076909	ACHBETPHOTOPURVSTVQC180	TRPVVSTQLLINGSLAE. SEVV I SVNPTUNA	NATI ARTHUS ASTROCT SHARK IN	KKIKIUMIPORAFVITO.KIUMIMMAKE	ISKARWINTLEDIASKLERDJYONRKTILPEDJORGOPELVINGPEC
0769422					
076905		E	-Name Valley Orac Tay Green	Salt	VS-QQKA-QDV-TQTH-RKMS-LLT
Q76955 0842d12	D-EL-K	-KGK-MVE-I-N	-8F-NQIG	-S-HLKV-YAT.NIDI-K	WS-QQKA-QDV-TQTH-RRSS-LLT
Q842d12 Q842d14	D-E1-E	-K	-NF-NQIG VNP-E		NS-QQ-KA-QDV-TQ-TH-RRNS-LLT
Q842d12 Q842d14 Q842d16	D-EI-KKDEEI-KKDEEI-K	- K	-NF-N-QI-G VNP-K	-5-HLKV-YAT.NI-DI-K -5-HQ-YAT-DI-DI -8-PQ-YAT-DI-DI	VS-QQ-KA-QSV-TQ-7H-RR3H-LL-7
0842d12 0842d14 0842d16 0259d2,17	D-EL-K	- K - K - K - K - K - K - K - K - K - K	-NY-NQIG	-5-HL,KV-YAT.NI-DI-K -8-HQ-YAT-DI-DI- -8-PQ-YAT-DI-DI- -8-BQ-Y-T-DI-DI-	NS-QQ-KA-QDV-TQTR-R-, R38-L-, L7
Q842d12 Q842d14 Q842d16 Q259d2.17 Q259d2.26	D-EL-K		-SF-H-QI-G	-5-HLKV-YAT.BIDI-K	NS-QO-EA-QV-TQ-TS-R-R-SS-L-L-T
Q842d12 Q842d14 Q842d16 Q259d2.17 Q259d2.26 Q259u6		K	-SF-N-QI-G	-5-HLKV-YAT.NI-DI-K	
Q842d12 Q842d14 Q842d16 Q259d2.17 Q259d2.26 Q259w6 Q461.02	-D-E L-EEXGE- I - EEXGE- KEXGE- KD-E-5 K5 -D-E-5 K5 -D-E-8 K8 -DSV KDSV K	K GF-WY-E-1-N- K Z K C-CB-1-N- K Z K C-CB-1-N- K K K K C-CB-1-N- K K K K K C-CB-1-N- K K K K K K K K K K K K K K K K K K K	-8	-5-HL KV-YAT, SI DI - K5-H Q-YAT-DI DI -5-H Q-YAT-DI Y5-Y Q-YAT-DI Y5 Q-YAT-DI Y5-Y Q-YAT-DI DI Y5-Y Q-YAT-DI DI Y5-Y Q-YAT-DI DI DI Y5-Y Q-YAT-DI DI DI Y5-Y Q-YAT-DI DI DI DI Z5-Y Q-YAT-DI DI DI Z5-Y Q-YAT-DI DI DI DI Z5-Y Q-YAT-DI DI DI Z Q-YAT-DI DI DI DI DI Z Q-YAT-DI DI -	NV QQ - NV - QQ - V Q V Q - V Q
Q842d12 Q842d14 Q842d16 Q259d2.17 Q259d2.26 Q259w6		GF-WV-E-I-W   GF-WV-E-I-W   FR-WV-E-I-W   GF-WV-E-I-W   GF-WV-E-I-W 	-S- F-N-Q- I - G	-5-H. KV-YAN-SI-DI-X5-B-Q-YAN-DI-DI -5-B-Q-YAN-DI-DI -5-B-Q-YAN-DI-DI -5-B-Q-YAN-DI-DI -5-B-Q-YAN-DI-DI -5-C-Q-YAN-DI-DI -5-Q-YAN-DI-DI -5-C-Q-YAN-DI-DI-3-V-Y -5-C-Q-YAN-DI-DI-3-V-Y -5-C-Q-YAN-DI-DI-3-V-Y -5-C-Q-YAN-DI-DI-3-V-Y	N1 QQ - N2 - QQ - V Q V Q - V Q
0842d12 0842d14 0842d16 0842d16 0259d2,17 0259d2,26 0259d6 0461.02 0461.01 0461.02 0461.02	-D-E - L-K 	-E. GC-WV-E-I-N  E. H-E-CEI-W-  E. R-E-CEDI-W-  E. R-E-CEDI-W-  -E-WCEI-W-  -E-WCEI-W-  -E-WCEI-W-  E-WCEI-W-  E-W	-S- T-N-Q- I - G -VNP-K -VNP-K -VNP-KL -S- S-P-N-S -S- N-P-N-S -S- P-N-S -	-5-HLKV-YAT.SIDI-K6-HQ-YAT-DI-DI -5-HQ-YAT-DI-DI -5-HQ-YAT-DI-DI -5-HQ-YAT-DI-DI -5-HQ-YAT-DI-DI -5-HQ-YAT-DI-DI -5-HQ-YAT-DI-I -	NI QQ - NI QQ
Q842d12 Q842d14 Q842d16 Q829d2.17 Q259d2.27 Q259d2.26 Q259d6 Q461.02 Q461.01 Q461.02 Q168b2 Q168b2	-D-1 - 1 - K  KORE	GH   V - E   I M   C   C   C   C   C   C   C   C   C	-S. T.NQ. IGVRP-KVRP-KVRP-KS. K.P-N-5S. K.P-N-5S. K.P-N-5S. K.P-N-6S. FTKP-N-T-IGS. TTKN-N-T-IGS. TTKN-N-T-IGS. L.PEEP-KD. S. L.PEEP-K.	-5-HL VVAI.SI.OI.5 -8-H Q VAI.SI.OI.5 -9-H Q VAI.SI	NI QQ - LEQOV 1Q - 713 - 3
QB42x12 QB42x14 QB42x14 Q259x12.17 Q259x12.26 Q259x6 Q461.02 Q461.02 Q461.02 Q168x2 Q168x2 Q168x2 Q168x2	-0-1 -1-1KEED -1KEED -1KEED -10-1-5 -1-	CR-W   -1-1-W	-S 7-N - Q - 11 - G - 17-N - X	-5-III V-VAT.II 01-X5-III 02-XT-01-015-III 02-XT-01-015-III 02-XT-01-015-III 02-XT-01-015-III 02-XT-01-15-III 02-XT-01-15-III 02-XT-01-15-III 02-XT-01-15-III 02-XT-01-15-III 02-XT-01-15-III 02-XT-01-15-III 02-XT-01-15-III 02-XT-01-15-III 02-XT-01-1-15-III 02-XT-01-1-15-III 02-XT-01-1-1-15-III 02-XT-01-1-1-1-1-15-III 02-XT-01-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1	18. C2 - 18.
QB42x12 QB42x14 QB42x14 Q259x22.17 Q259x2.26 Q259x6 Q461.02 Q461.01 Q461.02 Q168x23 Q218xv.17 QB726.70%.EMF.83	-0-1 -1-1KEED -1KEED -1KEED -10-1-5 -1-	CR-W   -1-1-W	-S 7-N - Q - 11 - G - 17-N - X	-5-III V-VAT.II 01-X5-III 02-XT-01-015-III 02-XT-01-015-III 02-XT-01-015-III 02-XT-01-015-III 02-XT-01-15-III 02-XT-01-15-III 02-XT-01-15-III 02-XT-01-15-III 02-XT-01-15-III 02-XT-01-15-III 02-XT-01-15-III 02-XT-01-15-III 02-XT-01-15-III 02-XT-01-1-15-III 02-XT-01-1-15-III 02-XT-01-1-1-15-III 02-XT-01-1-1-1-1-15-III 02-XT-01-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1	18. C2 - 18.
0442612 0442614 0442616 043962.17 023962.26 025966 0461.02 0461.02 046182 024682 024682 024682 024682 024682 024682 024682 024682	-0-1 -1-7KEGE -1-7KEGE -1-7KEGE -1-75-1-5-75-1-5-75-1-5-75-1-5-75-1-5-75-1-5-75-1-5-75-1-5-75-1-5-75-1-5-75-1-5-75-1-5-75-1-5-7.		-S. 7-N-Q-II-G-  VIRT-X  VIRT-X  VIRT-X  -VIRT-X  -VIRT-X	-5-Hi. NV-YAT, 81-011-75-Hi. Q-V-YAT, 81-011-75-Hi. Q-V-YAT-51-0115-Hi. Q-V-YAT-51-0115-Hi. Q-V-YAT-51-0115-Hi. Q-V-YAT-51-0115-Hi. Q-V-YAT-51-0115-Hi. Q-V-YAT-51-0115-Hi. Q-V-YAT-51-011-15-Hi. Q-V-YAT-51-01-15-Hi. Q-V-YAT-51-01-15-Hi. Q-V-YAT-51-01-17-Hi. Q-V-YAT-51-01-17-F-C-V-YAT-51-01-1-17-F-C-V-YAT-51-01-1-17-F-C-V-YAT-51-01-1-17-F-C-V-YAT-51-01-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1	18. Co. 1. Co. 1
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0842612 0842614 0842615 025962.17 025962.17 025962.26 0461.02 0461.01 0461.02 046822 02389.17 02726.108.007.83 07495.218.007.83 07495.218.007.83 07495.218.007.83 07495.218.007.83 07495.218.007.83		Gr-W-2-1-1	-30 - 7 - 1 - 0 - 7 - 1 - 0 - 7 - 1 - 0 - 7 - 1 - 1 - 7 - 7 - 7 - 7 - 7 - 7 - 7	-5-HI. NV-YAT, SI -011 76-HI. Q-V-YAT, SI -01	10 (2) 1.0 (2)
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0842612 0842614 0842615 075962.177 033962.126 0461.02 0461.02 0461.02 0461.02 0468023 023887.198.1887.83 07495.238.1887.83 07495.238.1887.83 07495.238.1887.83 07495.238.1887.83	-0-11-7	Cartin   C	-30 - 7 - 1 - 0 - 7 - 1 - 0 - 7 - 1 - 0 - 7 - 1 - 0 - 7 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1	-5-Bill NF-VR, II - 0.7 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	
049-2014 049-2014 049-2014 049-2014 049-2014 049-2014 049-2014 049-2015 049-2017 049-2018 049	-0-11-7		-37-1-0-1-1-0-1 -707-7	-5-III. 87-97. III0.7-75-III. 97-97. III0.7-75-III. 97-97. III. 97-975-III. 97-97. III.	10 Garden 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
0842011 0842014 0842084014 0842014 0842014 0842014 0842014 0842014 0842014 0842014 084	-0-1- 1-7	Company   Comp	-31-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1	5-Bit St. 10 - 24 - 25 - 25 - 25 - 25 - 25 - 25 - 25	18 G.
049-2012 049-2014 049	-0-1	5. Gen - 1:14  - 1. Gen	-8- 1-1-0-1-1-5 -700-1700-	5-Bit 10-10-10-10-10-10-10-10-10-10-10-10-10-1	
0842011 084201				-5-Bit	
0842011 0842014 08420842014 0842014 0842014 0842014 0842014 0842014 0842014 0842014 08	-0-1 - J0-25 - J			5-Bit Street Str	
0842012 0842014 084	-3-1 - J3-1 -				
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049-0412 049-0414 049-049-0414 049-0414 049-0414 049-0414 049-0414 049-0414	-5-1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1		3- 1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1		18 G. J. L. C.
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049-0412 049-0414 049-049-049 049			5- 8-18-5-1-5		18
0892612 089261	-5-1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1		S 1 1 1 1 1 1 1		
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049-0412   049-0412	-5-1 - 5-1 -		8- 17-18-18-18-18-18-18-18-18-18-18-18-18-18-		18
0.0452021 (1972)			S. J. F. J. C. J.		
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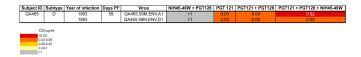
**Figure S2.** Amino acid alignment of the V1-V3 envelope region of all panel viruses. HXB2 sequence is shown at the top as reference. Symbols: dashes, consensus amino acid sequences; dots, deletions; boxes, PNGS at residues 156 and 160 in V1/V2, and at residues 301 and 332 in V3 important for PG9/16 and PGT121/128 neutralization, respectively; circles, positively charged residues in positions 168, 169, and 171 of V2 important for PG9/16 and PGT145 neutralization.

## Figure S3



**Figure S3.** Viruses were tested against PGT128 alone, NIH45-46W alone, VRC01 alone, or a 1:1 combination of PGT128, NIH45-46W, and VRC01 at a starting concentration of 1μg/ml each mAb. Percent neutralization against mAb concentration is plotted. IC50 values are shown in the key and are based on averages from 2 independent experiments, only one of which is shown. (A) Neutralization curves of viruses sensitive to NIH45-46W and VRC01, but not PGT128 (top panel), or vice versa (bottom panel). (B) Neutralization curves of viruses sensitive to NIH45-46W, VRC01, and PGT128.

Figure S4



**Figure S4.** Viruses not neutralized in by a combination of NIH45-46W and PGT128 were tested against PGT121 alone and in combination with either PGT128 or PGT128 and NIH45-46W. Asterisk, estimated days post infection at which envelope clone was obtained. Darker shading indicates increasing mAb potency, as indicated by the key. Grey color indicates that 50% neutralization was not achieved at the highest concentration of mAb tested ( $1\mu g/ml$ ). IC50 values shown are averages from at least 2 independent experiments performed in duplicate.