Supporting information: Polymorphisms of large effect explain the majority of the host genetic contribution to variation of HIV-1 virus load

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Table S1: Summary of included samples and studies

Group	Origin	Primary Endpoint	N	VL	HIV control*		Disease progression*			λ**	Platform	Contributors***	Ref
			Total	spVL	Controllers	Progressors	LTNP	Normal	Rapid				
1	Europe/ Australia	spVL	1507	1304	277	988	62	628	231	1.01	Illumina 650	EuroCHAVI	(2)
2	USA	spVL	1476	1034	53	1400	60	1394	4	1.01	Affymetrix 6.0	ALIVE, DCG, HGDS, MHCS, SFCC	(12,13)
3	France	LTNP	962	581	46	570	266	661	126	1.02	Illumina 300	GRIV, PRIMO	(9,10)
4	USA	spVL	768	729	23	745	2	766	75	1.02	Illumina 1M	MACS	(12,13)
5	USA	Elite control	580	576	97	483	0	0	0	1.03	Illumina 1M	ACTG, IHCS	(8)
6	USA	Elite control	578	577	195	383	0	0	0	1.02	Illumina 1M	ACTG, IHCS	(8)
7	USA	Elite control	505	503	184	321	0	0	0	1.01	Illumina 650	ACTG, IHCS	(8)
8	USA	spVL	422	365	12	410	42	380	14	1.00	Illumina 550	MACS	(12,13)
9	Amsterdam	spVL	408	384	0	0	35	373	67	1.02	Illumina 300	ACS	(6)
10	USA	spVL	262	262	0	0	0	0	0	0.99	Illumina 650	UHS	NA

LTNP = Long-term non-progressors

* Criteria for meeting the control and progression endpoints are outlined in the respective original study

** λ was calculated over all genotyped SNPs using the main phenotype per group

*** Contributor abbreviations are defined in Note S1

Table S2: Association results for common class I HLA alleles ranked by p-value

Allele	Frequency	Beta	SE	P
HLA-B*57:01	0.05	-0.840	0.042	2.69E-86
HLA-C*06:02	0.10	-0.436	0.029	7.32E-50
HLA-B*27:05	0.04	-0.417	0.045	4.32E-20
HLA-C*07:01	0.14	0.195	0.025	1.86E-14
HLA-C*07:02	0.13	0.194	0.027	3.75E-13
HLA-B*07:02	0.12	0.200	0.028	5.17E-13
HLA-B*08:01	0.09	0.206	0.031	2.94E-11
HLA-C*08:02	0.04	-0.307	0.047	8.76E-11
HLA-C*04:01	0.11	0.183	0.028	9.07E-11
HLA-B*13:02	0.03	-0.346	0.055	3.70E-10
HLA-B*14:02	0.03	-0.318	0.053	2.10E-09
HLA-C*12:02	0.01	-0.478	0.087	4.02E-08
HLA-C*02:02	0.05	-0.223	0.041	5.45E-08
HLA-A*25:01	0.03	-0.301	0.056	6.80E-08
HLA-B*52:01	0.01	-0.435	0.084	2.60E-07
HLA-C*01:02	0.04	-0.231	0.049	2.22E-06
HLA-A*23:01	0.02	0.269	0.063	1.66E-05
HLA-B*55:01	0.02	0.302	0.071	2.32E-05
HLA-B*35:02	0.01	0.358	0.085	2.42E-05
HLA-A*31:01	0.03	-0.219	0.054	4.36E-05
HLA-B*35:01	0.06	0.156	0.038	4.82E-05
HLA-B*49:01	0.02	0.253	0.068	1.86E-04
HLA-B*35:03	0.02	0.215	0.064	7.13E-04
HLA-B*40:01	0.04	0.148	0.045	9.37E-04
HLA-B*18:01	0.05	0.136	0.041	9.48E-04
HLA-A*29:02	0.03	0.167	0.052	0.0014
HLA-C*14:02	0.02	-0.228	0.072	0.0015
HLA-A*11:01	0.07	-0.109	0.036	0.0027

HLA-A*24:02	0.09	0.094	0.032	0.0036
HLA-B*37:01	0.01	0.222	0.078	0.0045
HLA-B*44:03	0.05	0.119	0.042	0.0050
HLA-C*03:03	0.05	0.110	0.040	0.0065
HLA-B*58:01	0.01	-0.253	0.094	0.0071
HLA-A*32:01	0.04	-0.123	0.047	0.0083
HLA-C*16:01	0.03	0.137	0.052	0.0086
HLA-C*03:04	0.06	0.093	0.037	0.0125
HLA-B*38:01	0.02	-0.148	0.060	0.0135
HLA-A*33:01	0.01	-0.233	0.095	0.0145
HLA-A*30:01	0.02	-0.159	0.073	0.0289
HLA-C*12:03	0.06	-0.077	0.038	0.0459
HLA-A*01:01	0.14	0.051	0.026	0.0478
HLA-B*14:01	0.01	-0.187	0.097	0.0551
HLA-B*40:02	0.01	-0.130	0.079	0.1007
HLA-C*07:04	0.01	0.125	0.077	0.1025
HLA-C*05:01	0.08	0.043	0.033	0.1929
HLA-A*03:01	0.14	0.025	0.025	0.3289
HLA-B*51:01	0.06	-0.036	0.038	0.3522
HLA-A*68:01	0.03	0.046	0.052	0.3710
HLA-B*44:02	0.08	0.030	0.033	0.3726
HLA-B*39:01	0.01	0.073	0.084	0.3851
HLA-A*02:01	0.28	0.017	0.020	0.3938
HLA-C*15:02	0.03	-0.046	0.057	0.4198
HLA-B*50:01	0.01	0.066	0.092	0.4679
HLA-B*15:01	0.06	-0.021	0.037	0.5711
HLA-A*30:02	0.01	0.050	0.094	0.5923
HLA-A*26:01	0.03	-0.003	0.052	0.9566

Table S3: Results of test for non-additive effects per common HLA-B allele

Allele	P	Beta 1 allele	SE	Beta 2 alleles	SE
B*07:02	0.6941	0.1936	0.0375	0.4250	0.1028
B*08:01	0.6866	0.2049	0.0401	0.4734	0.1357
B*13:02	0.0055	-0.3300	0.0660	0.5605	0.4112
B*14:02	0.3130	-0.2850	0.0634	-0.0779	0.4554
B*15:01	0.3467	-0.0228	0.0459	0.1628	0.2018
B*18:01	0.6326	0.1604	0.0505	0.4500	0.2842
B*27:05	0.0197	-0.4295	0.0532	-0.1944	0.2753
B*35:01	0.8432	0.1411	0.0482	0.3235	0.2239
B*38:01	0.8217	-0.0588	0.0752	-0.1959	0.4206
B*40:01	0.6152	0.1163	0.0528	0.4720	0.4163
B*44:02	0.4142	0.0517	0.0422	0.2351	0.1494
B*44:03	0.1532	0.1663	0.0517	-0.0363	0.2240
B*51:01	0.0405	-0.0687	0.0471	0.3282	0.2185
B*57:01	0.1039	-0.8592	0.0492	-1.1136	0.3383

P-values and betas were calculated comparing standard additive linear regression models including covariates to one containing an additional non-additive term

Table S4: Association results for amino acid alleles at independently associated positions within HLA-B and HLA-A

Gene	Position	Allele	Frequency	Beta	SE	P
HLA-B	97	Val	0.051	-0.849	0.041	8.9E-92
		Asn	0.047	-0.422	0.043	7.9E-23
		Trp	0.041	-0.293	0.047	4.7E-10
		Thr	0.132	-0.089	0.027	1.0E-03
		Arg	0.495	0.167	0.018	6.6E-20
		Ser	0.235	0.205	0.021	4.1E-22
	67	Met	0.065	-0.677	0.037	3.8E-74
		Cys	0.135	-0.260	0.026	1.1E-22
		Ser	0.403	0.033	0.018	7.6E-02
		Phe	0.252	0.172	0.020	4.9E-17
		Tyr	0.145	0.221	0.025	3.0E-18
	45	Met	0.148	-0.383	0.025	1.3E-50
		Glu	0.374	0.060	0.019	1.3E-03
		Lys	0.233	0.084	0.021	8.4E-05
		Thr	0.245	0.096	0.021	4.8E-06
HLA-A	77	Ser	0.067	-0.203	0.036	2.4E-08
		Asp	0.609	-0.052	0.018	4.1E-03
		Asn	0.325	0.112	0.019	3.3E-09
	95	Iso	0.602	-0.058	0.018	1.7E-03
		Val	0.282	0.007	0.020	7.3E-01
		Lys	0.116	0.121	0.028	1.6E-05

Table S5a: Amino acid haplotypes at independently associated positions for classical 4-digit HLA-A alleles

Pos77	Pos95	Frequency*	Classical allele(s)
S	I	0.067	25:01,32:01
D	I	0.318	03:01,11:01,30:01,31:01,68:01
D	V	0.282	02:01
N	I	0.217	01:01,26:01,29:02
N	L	0.170	23:01,24:02

*Reported frequency is for the amino acid haplotype

Table S5b: Amino acid haplotypes at independently associated positions for classical 4-digit HLA-B alleles

Pos45	Pos67	Pos97	Frequency*	Classical allele(s)
M	M	V	0.051	57:01
T	S	T	0.013	52:01
E	C	N	0.047	27:05
M	S	T	0.027	13:02
E	C	W	0.041	14:02
E	C	R	0.041	38:01,39:01
K	S	S	0.017	40:02
T	F	T	0.063	51:01
M	S	R	0.063	15:01
T	S	R	0.063	18:01,37:01
K	S	R	0.216	40:01,44:02,44:03,49:01,50:01
E	Y	S	0.122	07:02
E	F	S	0.092	08:01
E	Y	T	0.022	55:01
T	F	R	0.097	35:01,35:02,35:03

*Reported frequency is for the amino acid haplotype
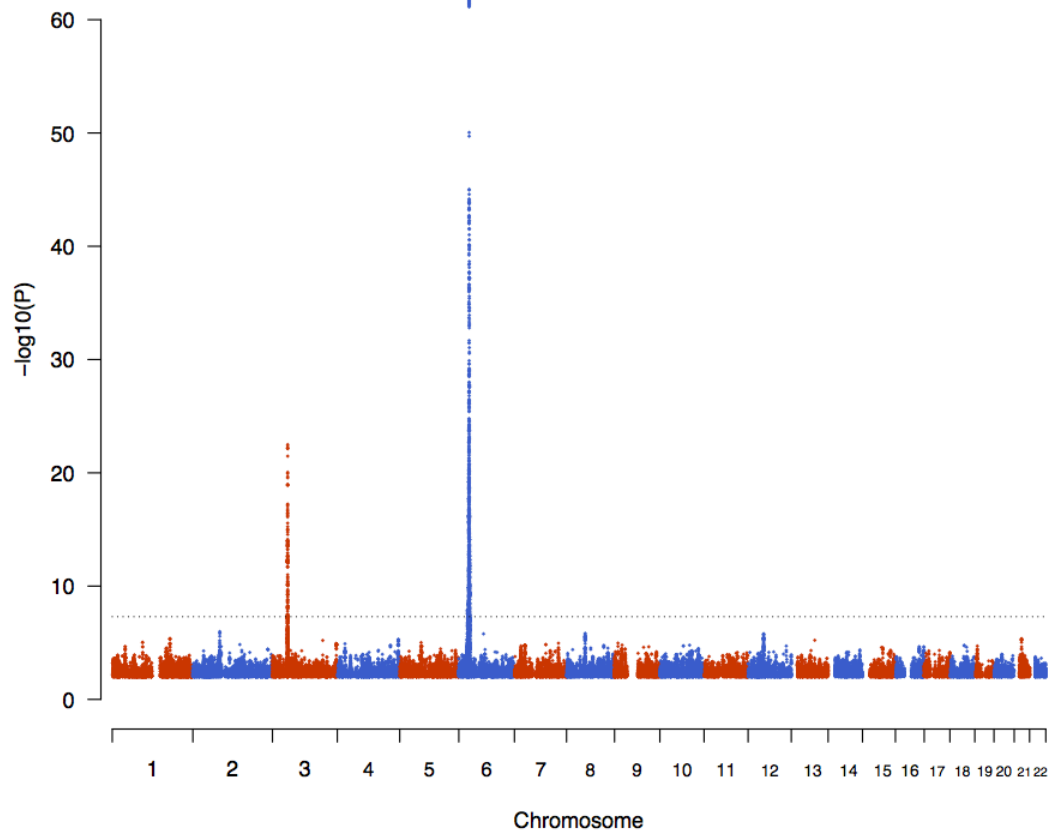
Figure S1: Genome-wide association results from meta-analysis of primary endpoints. Per-group we tested association between imputed SNPs and the main phenotype (see Appendix Table 1) using linear (spVL) or logistic (LTNP and HIV control) regression. Meta-analysis was performed by combining z-scores across all groups assuming that viral load decreasing alleles (spVL) acted as protective alleles against disease progression, i.e. have a higher frequency in LTNP and HIV controllers compared to rapid progressors and non-controllers.

A)
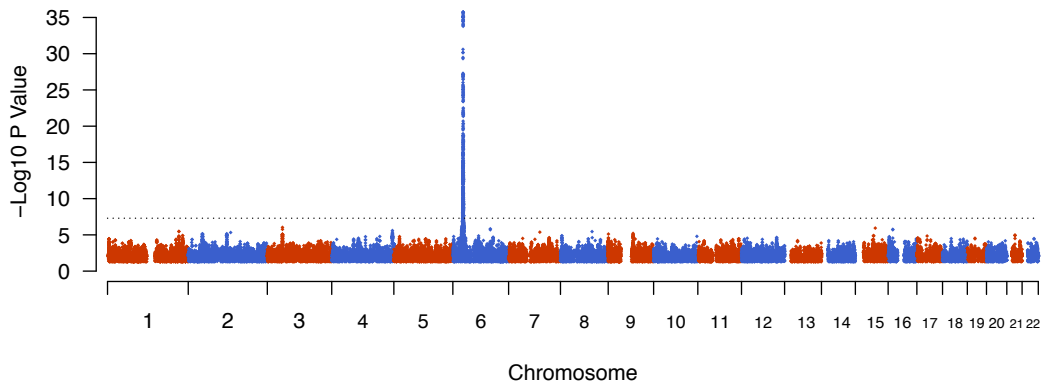
B)
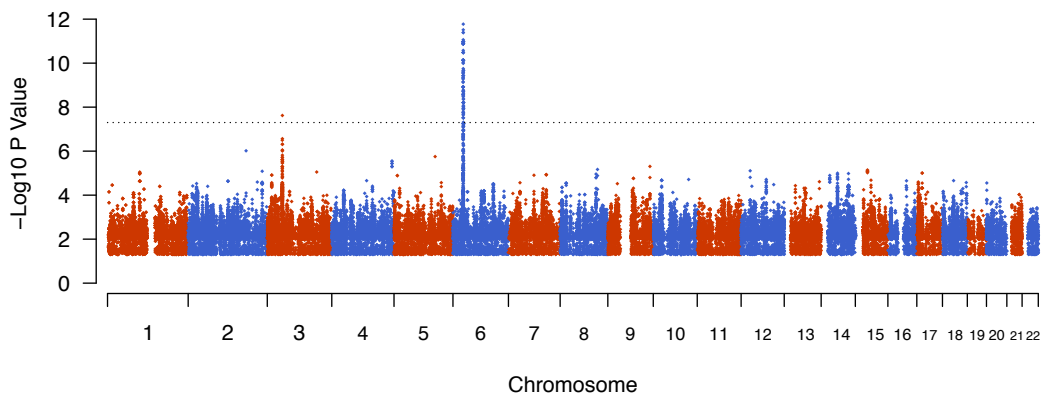
Figure S2: Genome-wide association results from meta-analysis of extreme phenotypes. Association testing was performed comparing A) Elite controllers (n=887) to non-controllers (n=2745) and B) rapid progressors (n=517) to long-term non-progressors (n=467) using logistic regression. To avoid the influence of genotype batch on the association statistics only groups with a case/control ratio of < 1:10 were included. Association signlas on chromosome 6 and chromosome 3 are consistent with observations using the quantitative spVL phenotype.
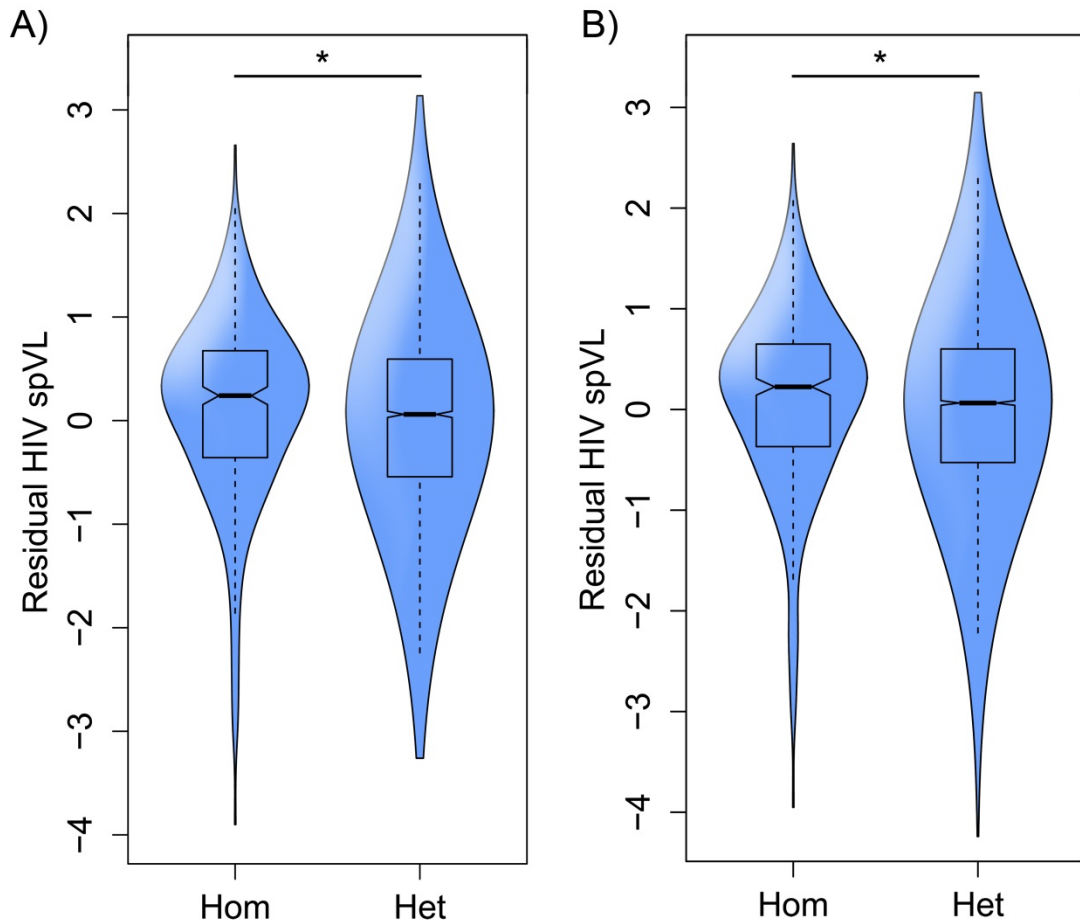
Figure S3: HLA heterozygote advantage in HIV spVL. Standard boxplots show median and interquartile range of spVL levels for individuals homozygote (Hom) and heterozygote (Het) at the HLA-B locus considering A) only common alleles or B) all observed alleles. SpVL levels are controlled for population stratification and additive effects of classical HLA-B alleles. Blue areas show the density distribution of individual data. Model-based significance levels are given: * $p < 0.05$.
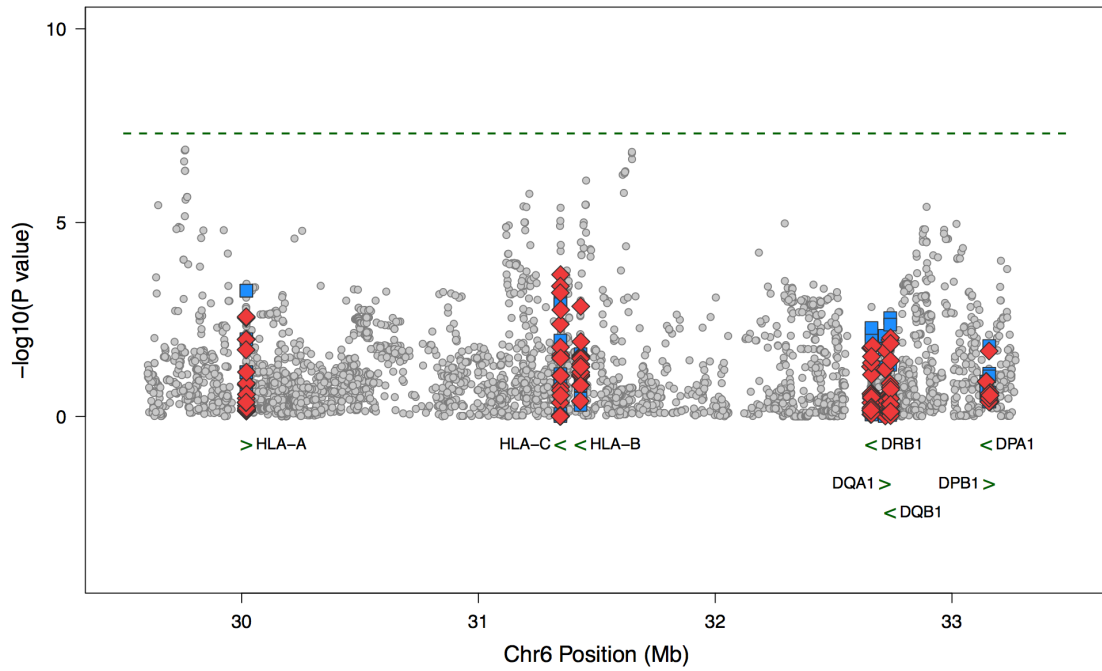
Figure S4: Regional association plot of the MHC conditional on independently associated amino acids. Association results (-log10 P value) in the MHC region. SNPs (grey circles), classical HLA alleles (blue boxes) and amino acids within HLA genes (red diamonds) were tested for association with spVL controlling for positions HLA-B^{97}, B^{67}, B^{45}, A^{95} and A^{77}. Dashed line indicates genome-wide significance ($p=5 \times 10^{-8}$).
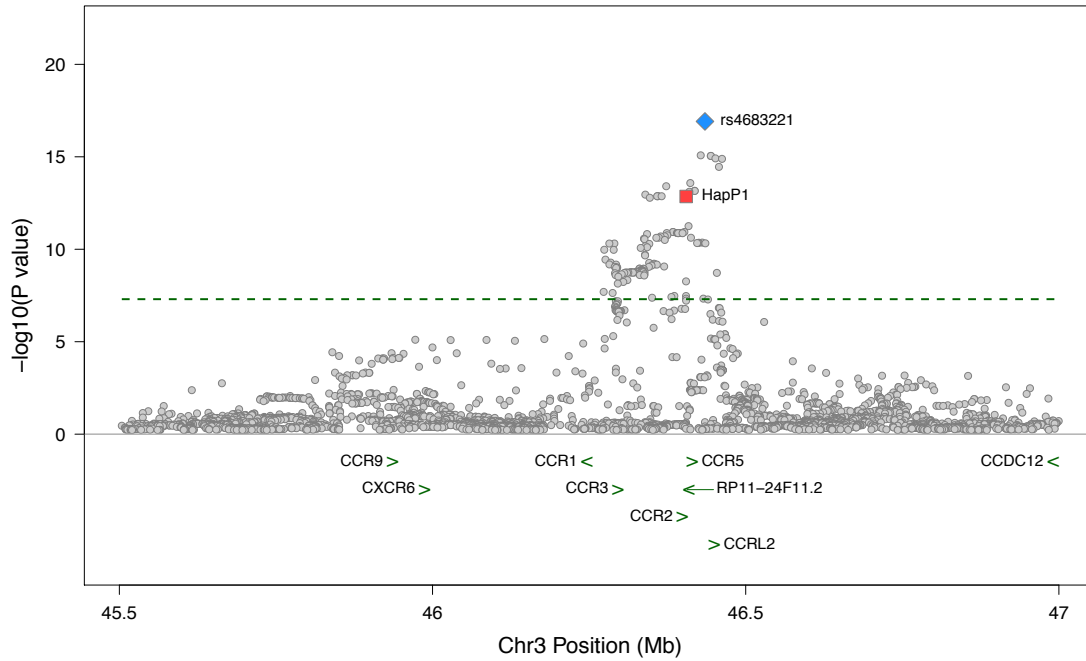
Figure S5: Association results in the CCR5 region conditional on CCR5Δ32. Association was calculated between spVL and SNPs in the CCR5 regions in a subset of 5,559 individuals by linear regression including CCR5Δ32 as a covariate. Several SNPs remain strongly associated, indicating a role for additional variation in this region in determining spVL. The blue diamond indicates the top SNP in the conditional analysis (rs4683221, $p=1.2 \times 10^{-17}$). The association strength of the P1 haplotype (previously reported to associate with AIDS progression) is indicated by the red square.
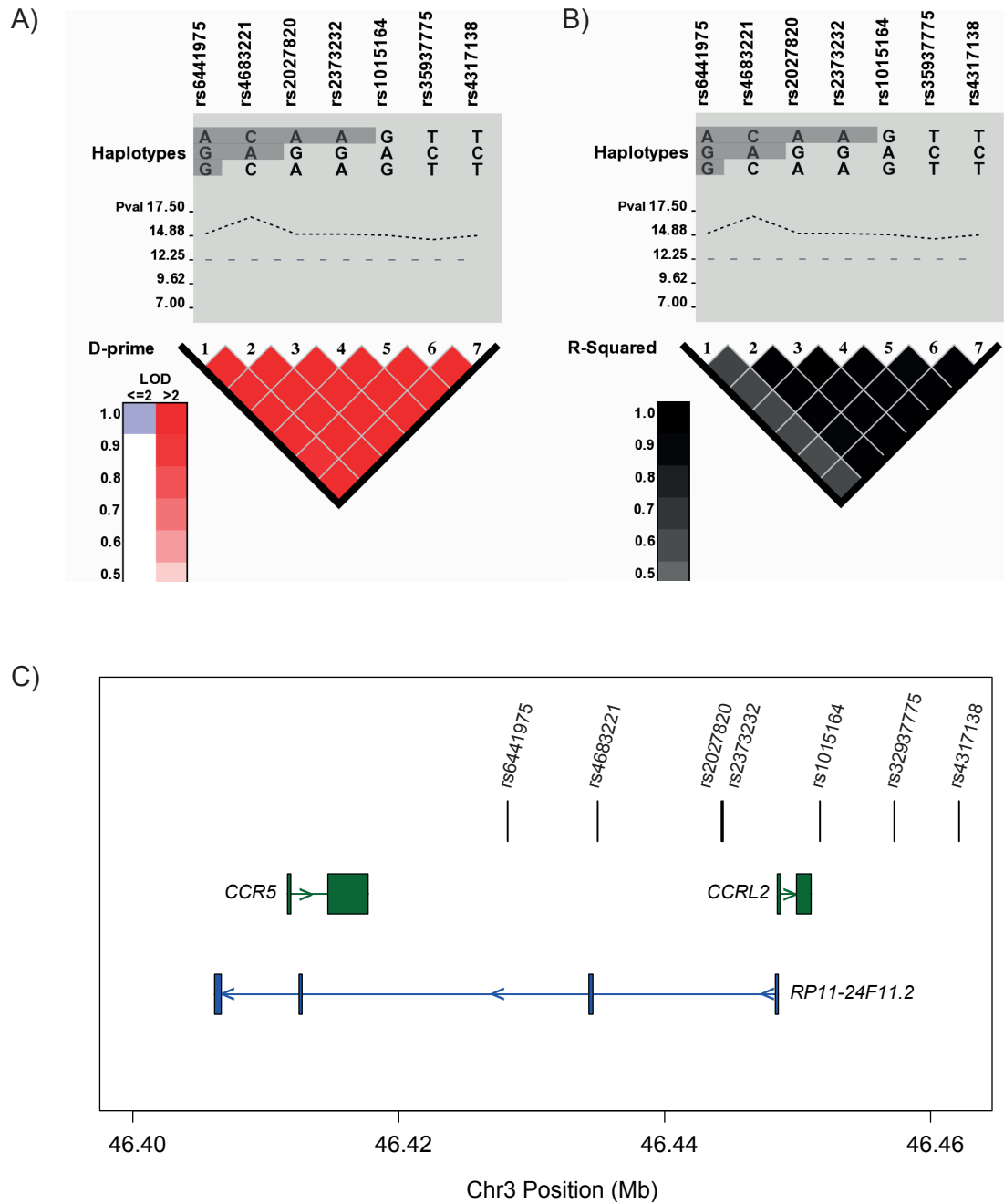
Figure S6: Linkage disequilibrium and genetic location of top associated SNPs in the chromosome 3 region conditioned on CCR5Δ32. LD plots (D' panel A, r2 panel B) of a cluster of SNPs strongly associated with spVL after conditioning on CCR5Δ32. SNPs are ordered by genomic position and the dotted line indicates the –log10(P-value) after correction for CCR5Δ32. D' and r2 were calculated using genotypes from European individuals from the 1000 genomes project. LD plots were generated using LD-Plus (https://chgr.mc.vanderbilt.edu/ldplus). C) Location of SNPs (black lines) relative to the *CCR5* gene (coordinates based on Hg19). The haplotype carrying the associated SNPs includes an anti-sense transcribed sequence (RP11-24F11.2) that overlaps *CCR5*. Arrows indicate the direction of transcription.
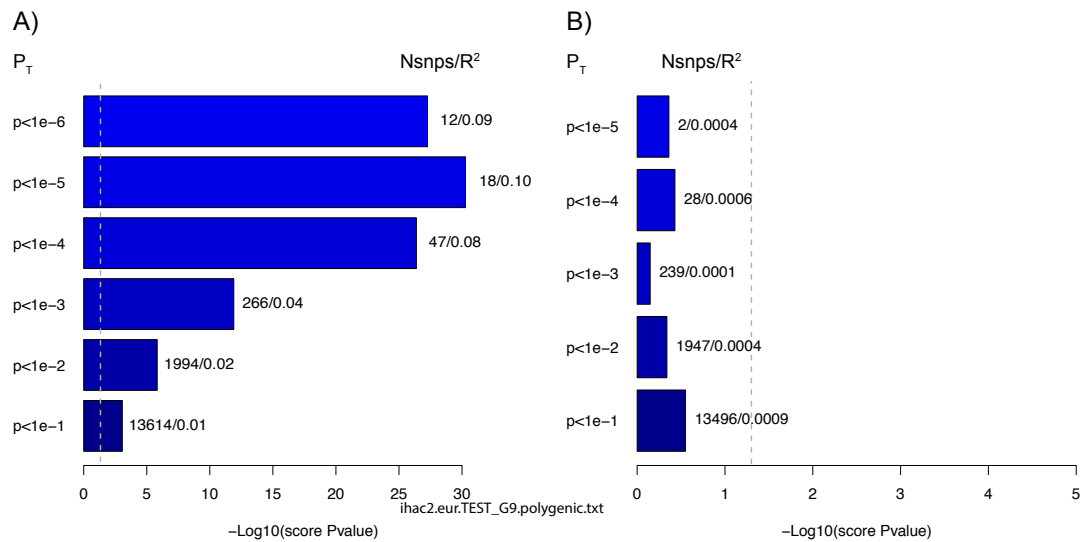
Figure S7: Multi-SNP score test for association with spVL. Per individual polygenic scores were calculated for a subset of individuals (n=1,304, test set) based on association results from a non-overlapping training set excluding cohorts enriched for HIV controllers (n=3,355). Polygenic scores including either all SNPs (A) or only non-MHC, non-CCR5 SNPs (B) falling below various p-value thresholds (P_T) after LD pruning were tested for association with spVL. Numbers above each bar indicate the number of SNPs included in the score calculation and the variance explained (R2) by the regression model. The dashed line indicates p=0.05

Note S1: Contributing centers

Cohorts and individuals contributing to the International Collaboration for the Genomics of HIV

The AIDS Clinical Trials Group (ACTG)

DESCRIPTION:
The AIDS Clinical Trials Group (ACTG) was initially established in 1987 to broaden the scope of the AIDS research effort of the US National Institute of Allergy and Infectious Diseases (NIAID). The ACTG established and supports the largest Network of expert clinical and translational investigators and therapeutic clinical trials units in the world, including sites in resource-limited countries. These investigators and units serve as the major resource for HIV/AIDS research, treatment, care, and training/education in their communities.

MEMBERS:
Eric S. Daar, Roy M. Gulick, David W. Haas, Richard Haubrich, Daniel R. Kuritzkes, Heather J. Ribaudo, Sharon Riddler, Gregory K. Robbins, Paul E. Sax, Robert W. Shafer, Cecilia M. Shikuma

The AIDS Linked to the IntraVenous Experience (ALIVE) Cohort

DESCRIPTION:
The *AIDS Linked to the IntraVenous Experience* (ALIVE) study is a natural history study following the incidence and progression of HIV infection among intravenous drug users (IDUs) in Baltimore, MD.

MEMBERS:
Gregory D. Kirk, Shruti H. Mehta, Kenrad Nelson, Steffanie Strathdee, David Vlahov

The Amsterdam Cohort Studies on HIV infection and AIDS (ACS)

DESCRIPTION:

The Amsterdam Cohort Studies (ACS) on HIV infection and AIDS were started shortly after the first cases of AIDS were diagnosed in the Netherlands. Since October 1984, men who have sex with men (MSM) have been enrolled in a prospective cohort study. A second cohort involving drug users (DU) was initiated in 1985.

MEMBERS:
Neeltje A. Kootstra, Daniëlle van Manen, Brigitte Boeser-Nunnink, Angélique B. van 't Wout, Hanneke Schuitemaker

The ANRS CO18

DESCRIPTION:
The ANRS CO18 cohort prospectively enrolls HIV controllers, defined as patients infected by HIV-1 for ≥ 5 years who have never received antiretroviral treatment and whose last 5 consecutive plasma HIV RNA values are < 400 copies/mL.

MEMBERS:
Olivier Lambotte, Laurence Meyer, Faroudy Boufassa, Christine Rouzioux, Asier Saez-Cirion, Gianfranco Pancino, Alain Venet, Camille Lecuroux, Ioannis Theodorou, Lisa Chakrabarti

The ANRS PRIMO Cohort

DESCRIPTION:
The ANRS CO06 PRIMO is an ongoing multicenter cohort that enrolls patients with demonstrated primary HIV-1 infection in France since November 1996.

MEMBERS:
Région Sud–Est : André-Pierre BLANC, Thierry ALLEGRE, Claudine LAFON, Isabelle ROUBAUD, Jean-Louis TOURAINE, Jean-Michel LIVROZET, François JEANBLANC, Pierre CHIARELLO, Djamila MAKHLOUFI, Dominique PEYRAMOND, Christian TREPO, Patrick MIAILHES, Joseph KOFFI, Thomas BAUDRY, Sylvie PAILHES, Valérie THOIRAIN, Corinne BROCHIER, Alain LAFEUILLADE, Antoine CHERET, Julie ALLEMAND, Thomas HULEUX, Gilles HITTINGER, Alain RIEU, Gisèle PHILIP, Assi ASSI, Edith DANIELLI, Véronique LAMBRY, Pierre DELLAMONICA, Jacques DURANT, Eric CUA, Anne LEPLATOIS, Pascal PUBLIESE, Alissa NAQVI, Véronique MONDAIN –MITON, Matteo VASSALLO, Marie-Ange SERINI, Jean-Gabriel FUZIBET, Jill-Patrice CASSUTO, Michèle QUARANTA, Claudine SOHN, Eric ROSENTHAL, Isabelle POIZOT MARTIN, Marie-Pierre DROGOUL, Jean-Albert

GASTAUT, Geneviève FABRE, Caroline DEBREUX, Andréas STEIN, Isabelle RAVAUX, Hervé GALLAIS, Annette VALON, Gilles PICHANCOURT, Denis QUINSAT, Serge TEMPESTA, Sylvie ANDREO, Patrick PHILIBERT, Christine CHAPUS, Robert RIOU, Hélène CHAMPAGNE

Région Sud-Ouest : Philippe MORLAT, Fabrice BONNET, Isabelle LOUIS, Caroline ASLAN, Denis MALVY, Denis LACOSTE, Noëlle BERNARD, François PACCALIN, Mojgan BONAREK, Marie-Anne VANDENHENDE, Jean DELAUNE, Sabrina CALTADO, Jean-Marie RAGNAUD, Michel DUPON, Hervé DUTRONC, Frédéric DAUCHY, Charles CAZENAVE, Didier NEAU, Laetitia LACAZE-BUZY, Thierry PISTONE, Elodie BLANCHARD, Audrey MERLET, Jean-Luc PELLEGRIN, Isabelle RAYMOND, Jean-François VIALLARD, Estibaliz LAZARO, Carine GREIB, Gaetane WIRTH, Severin CHAIGNE DE LALANDE, Jacques REYNES, Vincent BAILLAT, Corinne MERLE de BOEVER, Vincent LEMOING, Nadine ATOUI, Alain MAKINSON, Jean Marc JACQUET, Christina PSOMAS, Antoine VILLADERO, Christine TRAMONI, Michèle VIDAL, Bruno MARCHOU, Martine OBADIA, Marie CHAUVEAU, Florence BALZARIN, Francis SAINT-DIZIER, Daniel GARIPUY, Roland VIRABEN, François PREVOTEAU du CLARY, Hugues AUMAITRE, Mathieu SAADA, Marie MEDUS, Orélia EDEN, Ségolène NEUVILLE, Milagros FERREYRA, Martine MALET

Antilles : André CABIE, Sylvie ABEL, Sandrine PIERRE-FRANCOIS, Guillaume HURTREL, Patrick HOCHEDEZ, Guillaume AVENIN, Nicolas VIGNIER, Bernard LIAUTAUD, Christelle BARINGTHON, Véronique BEAUJOLAIS, Gilles BEAUCAIRE, Isabelle LAMAURY

Région Est : Bernard DRENOU, Geneviève BECK-WIRTH, Catherine MICHEL, Jean-Michel PETER, Charles BECK, Jean-Michel HALNA, Meryem BENOMAR, Bruno HOEN, Christine DROBACHEFF-THIEBAUT, Jean-François FAUCHER, Adeline FOLTZER, François PARCELIER, Catherine BOURDEAUX, Jean-Marie ESTAVOYER, Lionel PIROTH, Marielle BUISSON, Sandrine TREUVELOT, Thierry MAY, Laurence BOYER, Simone WASSOUMBOU, Bruno AUDHUY, Masha MOHSENI ZADEH, Martin MARTINOT, Nathalie PLAISANCE, Anaïs MOTHES, Anne PACHART, Elisabeth SALLE, Benoît MARTHA, Marguerite FLORENCE, David REY, Maria PARTISANI, Christine CHENEAU, Michèle PRIESTER, Claudine BERNARD-HENRY, Erick de MAUTORT, Patricia FISCHER, Roland JAUSSAUD, Christine ROUGER, Jean-Luc BERGER

Région Nord : Eric SENNEVILLE, Antoine CHERET, Thomas HULEUX, Faïza AJANA, Isabelle ALCARAZ, Christophe ALLIENNE, Véronique BACLET, Xavier de la TRIBONNIERE, Hugues MELLIEZ, Agnès MEYBECK, Bertrand RIFF, Michel VALETTE, Nathalie VIGET, Emmanuelle AISSI, Yves DOMART, Dominique MERRIEN, Jean-Luc SCHMIT, Youssef EL SAMAD, Nathalie DECAUX, Georges DIAB, Jean GRIHON

Région Ouest: François RAFFI, Bénédicte BONNET, Clotilde ALLAVENA, Jean-Philippe TALARMIN, Olivier MOUNOURY, Véronique RELIQUET, Eric BILLAUD, Cécile BRUNET, Sabelline BOUCHEZ, Nicolas FEUILLEBOIS, David BOUTOILLE, Hervé HUE, Delphine BROSSEAU, Myriam SICOT, Christian MICHELET, Faouzi SOUALA, Pierre TATTEVIN, Cédric ARVIEUX, Matthieu REVEST, Hélène LEROY, Jean-Marc CHAPPLAIN, Matthieu DUPONT, Fabien FILY, Maja RASJTAJACK, Louis BERNARD, Frédéric BASTIDES, Pascale NAU, Vanessa LAPLANTINE, Renaud VERDON, Arnaud de la BLANCHARDIERE, Vincent NOYON, Anne MARTIN, Mathilde SIX, Philippe FERET, Claude BEUSCART, Corinne DANIEL, Sylvie Le MOAL, Elizabeth DUHAMEL, Anne GATEL, Elisabeth PAPE, Eric PICHARD, Pascale FIALAIRE, Jean Marie CHENNEBAULT, Jocelyne LOISON, Valérie RABIER, Pierre ABGUEGUEN, Sami REHAIEM, Philippe MOREAU, Odile VAILLANT, Mathilde NIAULT, Yves POINSIGNON, Anabèle DOS SANTOS, Virginie MOUTON- RIOUX,

Bernadette Le MABEC, Dominique HOULBERT, Philippe PERRE, Sophie LEANTEZ-NAINVILLE, Jean-Luc ESNAULT, Thomas GUIMARD, Isabelle SUAUD, Jean-Jacques GIRARD, Véronique SIMONET, Loïk GEFFRAY, François CARON, Yasmine DEBAB

Région Centre : Jean BEYTOUT, Christine JACOMET, Florence GOURDON, Hacène TAS, Pierre WEINBRECK, Claire GENET, Grégoire LAMBERT de CURSAY, Bruno ABRAHAM, Claire PERINO, Pauline PINET, Alain REGNIER, Odile ANTONIOTTI

Région Parisienne : Jean-François DELFRAISSY, Cécile GOUJARD, Jade GHOSN, Yann QUERTAINMONT, Martin DURACINSKY, Olivier SEGERAL, Arnaud BLANC, Delphine PERETTI, Valérie SEGUIN, Erwan FOURN, Marie-Thérèse RANNOU, Marie Josée DULUCQ, Philippe BROET, Cyril DALMASSO, Daniel VITTECOQ, Lelia ESCAUT, Claudine BOLLIOT, Yves LEVY, Anne-Sophie LASCAUX, Jean-Daniel LELIEVRE, Stéphanie DOMINGUEZ, Corinne JUNG, Cécile DUMONT, François BOUE, Renato FIOR, Véronique CHAMBRIN, Agnès LEVY, Valérie MARTINEZ, Christian PERRONNE, Pierre de TRUCHIS, Huguette BERTHE, Pierre CHEVOJON, Alain DEVIDAS, Isabelle TURPAULT, Fabrice CHAIX, Isabelle TURPAULT, Olivier BOUCHAUD, François ROUGES, Sophie ABGRALL, Régine BARRUET, Frédéric MECHAI, Patricia HONORE, Elisabeth ROUVEIX, Evelyne REIMANN, Alix GREDER BELAN, Audrey THERBY, Claire GODIN COLLET, Maria RUQUET, Isabelle MAHE, Anne-Marie SIMONPOLI, Emmanuel MORTIER, Martine BLOCH, Véronique MANCERON, Isabelle CAHITTE, Ai-feng ZENG, Bénédicte MONTOYA, David ZUCMAN, Catherine MAJERHOLC, Dominique BORNAREL, Bruno FANTIN, Agnès ULUDAG, Justine GELLEN-DAUTREMER, Agnès. LEFORT, Ali.TADLAOUI, Michel RUEL, Vincent DANELUZZI, Juliette GERBE, Olivier FEIN, Jérôme STIRNEMANN, Virginie PRENDKI, Sylvie TASSI, Mélissa COUPARD, Olivier PATEY, Jonas BANTSIMBA, Sophie DELLION, Pauline CARAUX PAZ, Benoit CAZENAVE, Laurent RICHIER, Isabelle de LACROIX SZMANIA, Valérie GARRAIT, Brigitte ELHARRAR, Laurent RICHIER, Annie LEPRETRE, Marie-Agnès KOZA, Laurent SUTTON, Philippe GENET, Juliette GERBE, Françoise GRANIER, Véronique PERRONE, Jean-Luc BOUSSARD, Patricia CHARDON, Eric FROGUEL, Philippe SIMON, Sylvie TASSI, Jean-Michel MOLINA, Samuel FERRET, Matthieu LAFAURIE, Nathalie COLIN de VERDIERE, Diane PONSCARME, Nathalie de CASTRO, Alexandre ASLAN, Willy ROZENBAUM, Jerôme GOGUEL, Suna BALKAN, Sébastien GALLIEN, François CLAVEL, Caroline GATEY, Valérie GARRAIT, Bénédicte LOZE, Caroline LASCOUX-COMBE, Olivier TAULERA, Claire PINTADO, Jeannine DELGADO, Daniel SERENI, Patrice MOREL, Julie TIMSIT, Françoise LAMBERT, Eric OKSENHENDLER, Laurence GERARD, Pierre-Marie GIRARD, Odile PICARD, Jürgen TREDUP, Diane BOLLENS, Nadia VALIN, Pauline CAMPA, Nelly DESPLANQUE, Yazdan YAZDANPANAH, Patrick YENI, Elisabeth BOUVET, Isabelle FOURNIER, Bao PHUNG, Bilguissa DIALLO, Frédérique GUIROY, Nadia EL ALAMI TALBI, Golriz PAHALAVAN, Françoise LOUNI, Catherine LEPORT, Corinne JADAND, Ugo COLASANTE, Jean-Jacques LAURICHESSE, Christine JESTIN, Gilles PIALOUX, Laurence SLAMA, Thomas LYAVANC, Valérie BERREBI, Firouze BANI SADR, Jean-François BERGMAN, Myriam DIEMER, Aurélie DUREL, Agathe RAMI, Maguy PARRINELLO, Loïc GUILLEVIN, Dominique SALMON, Tassadit TAHI, Catherine CHAKVETADZE, Linda BELARBI, Odile LAUNAY, Benjamin SILBERMANN, Marie-Pierre PIETRI, François BRICAIRE, Christine KATLAMA, Marc-Antoine VALANTIN, Roland TUBIANA, Fabienne CABY, Luminita SCHNEIDER, Sophie SEANG, Hind STITOU, Saadia BEN ABDALLAH, Serge HERSON, Anne SIMON, Manuela BONMARCHAND, Naouel AMIRAT, François PICHON, Jean-Luc VOURCH, Michèle PAUCHARD, Nadia ADEB, Laurence WEISS, Martin BUISSON, Maria MANEA, Jean-Paul VIARD, Jacques GILQUIN, Alain SOBEL, Blanka HADACEK, Nugyen THU-HUYN, Olivier ZAK-DIT-ZBAR, Agnès CROS, Paul Henri CONSIGNY, Claudine DUVIVIER, Fatima

TOUAM, Loïc BODARD, Isabelle SAURET, Sylvie GIBERT, Anne MEUDEC, Gérard HUCHON, Alejandra COMPAGNUCCI, Christian MIODOVSKI

The Center for Cancer Research, National Cancer Institute

DESCRIPTION:
The Center for Cancer Research (CCR) is home to more than 250 scientists and clinicians working in intramural research at NCI. CCR's investigators are basic, clinical, and translational scientists who work together to advance knowledge of cancer and AIDS and to develop new therapies against these diseases.

MEMBERS:
Ping An, Sher Hendrickson, Randall Johnson, Bailey Kessing, James Lautenberger, Carl McIntosh, George Nelson, Stephen O'Brien, Efe Szegin, Jennifer Troyer, and Cheryl Winkler

The Center for HIV/AIDS Vaccine Immunology (CHAVI)

DESCRIPTION:
The Center for HIV/AIDS Vaccine Immunology (CHAVI) is a consortium of universities and academic medical centers that was established by the National Institute of Allergy and Infectious Diseases (NIAID) from 2005-2012. CHAVI's goal was to solve the major problems in HIV vaccine development and design.

MEMBERS:
CHAVI is led by Barton Haynes (Duke University, Durham, NC, USA). Its Host Genetics Core is led by David Goldstein (Duke University, Durham, NC, USA).

The Danish HIV Cohort Study

DESCRIPTION:
The Danish HIV Cohort Study (DHCS) includes all HIV-infected individuals, aged 16 years or older at time of HIV diagnosis, seen in one of the eight Danish HIV centres after 31 December 1994. The aims of DHCS are (i) to create a population-based nationwide database of HIV patients for scientific projects, (ii) to monitor the spread and demographics of the HIV epidemic in Denmark, (iii) to monitor and compare the effects of treatment strategies in Danish HIV treatment centres and (iv) to monitor the effect of HAART on a national level.

MEMBERS:
Neils Obel, Jan Gerstoft, Gitte Kronborg, Court Pedersen

FUNDING:

The Genetic and Immunological Studies of European and African HIV-1+ Long Term Non-Progressors (GISHEAL) Study

DESCRIPTION:
GISHEAL is a collaborative European consortium focusing on long-term nonprogressors (LTNP), with particular regard to the host genetic background and gene expression profiling and to the adaptive and innate immunological responses to the infection.

MEMBERS:
Guido Poli (Coordinator); steering committee: Brigitte Autran (Vice-Coordinator), Dominique Costagliola, Patrice Debré, Massimo Galli, Frances Gotch, Pontiano Kaleebu, Federico Martini, Agostino Riva, Ioannis Theodorou, Elisa Vicenzi,

FUNDING:

The GRIV Cohort

DESCRIPTION:
The GRIV cohort, started in 1995 in France, includes both fast and slow/non-progressors. It aims at understanding basic features of the yet unknown HIV pathogenesis mechanisms.

MEMBERS:
Cédric Coulonges, Olivier Delaneau, Lieng Taing, Pierre Rucart, Sigrid Le Clerc, Sophie Limou, Jean-François Zagury.

FUNDING:

The Hemophilia Growth and Development Study (HGDS)

DESCRIPTION:
The HGDS is a multicenter study of hemophilia and its complications that was established in 1988. Data were prospectively collected in 14 U.S. hemophilia treatment centers through 1996/97. A total of 333 children and adolescents were enrolled. The HGDS has investigated the effects of hemophilia and HIV on physical growth and maturation; immunological, neurological, and neuropsychological functioning; and the pathophysiology of HIV and hepatitis C.

The Hospital Clinic-IDIBAPS Acute/Recent HIV-1 Infection cohort

DESCRIPTION:
The Hospital Clinic PHI Cohort was created in 1997 and it has a biobank of biological and tissue samples since 2004. It focuses on studies of transmitted drug resistance and in clinical trials with new antiretroviral drugs and/or immune modulators trying to change the natural history of HIV-infection.

MEMBERS:
J. M. Miro (Chair), C. Manzardo, F. Agüero, J. A. Arnaiz, T. Pumarola, M. Plana, M. Tuset, M. C. Ligero, VM Sanchez, T. Gallart, and J. M. Gatell.

The Icona Foundation Study

DESCRIPTION:
The Italian cohort of patients naive from antiretrovirals (ICONA) was set up in April 1997. ICONA is a multicentre, observational study. By September 2006 a total of 6,205 naive patients had been enrolled. The main focus of ICONA is the outcome of antiretroviral therapy.

MEMBERS:
GOVERNING BODY: M. Moroni (Chair), G Angarano, A Antinori, F Castelli, R Cauda, A d'Arminio Monforte, G Di Perri, M Galli, R Iardino, G Ippolito, A Lazzarin, CF Perno, O Armignacco, PL Viale, F Von Schlosser.
SCIENTIFIC SECRETARY:
A d'Arminio Monforte

STEERING COMMITTEE: A Ammassari, M Andreoni, A Antinori, C Balotta, P Bonfanti, S Bonora, M Borderi, MR Capobianchi, A Castagna, F Ceccherini-Silberstein, P Cinque, A Cozzi-Lepri, A d'Arminio Monforte, A De Luca, M Gargiulo, C Gervasoni, E Girardi, A Gori, G Guaraldi, M Lichtner, S Lo Caputo, G Madeddu, F Maggiolo, G Marchetti, S Marcotullio, L Monno, R Murri, C Mussini, M Puoti, C Torti
STATISTICAL AND MONITORING TEAM
A Cozzi-Lepri, P Cicconi, I Fanti, T Formenti, L Galli, P Lorenzini

PARTICIPATING PHYSICIANS AND CENTERS: Italy A. Giacometti, A Costantini, A. Riva (Ancona); G. Angarano, L Monno, C Carrisa, (Bari); F. Maggiolo, G Lazzari (Bergamo); PL.

Viale, M Borderi, G. Verucchi (Bologna); F Castelli, C. Torti, C. Minardi, (Brescia); T. Quirino, C Abeli (Busto Arsizio); P.E. Manconi, P. Piano (Cagliari); J Vecchiet, K Falasca (Chieti); L. Sighinolfi, D. Segala (Ferrara); F. Mazzotta, S. Lo Caputo (Firenze); G. Cassola, G Viscoli, A. Alessandrini, R. Piscopo, G Mazzarello (Genova); C. Mastroianni, V. Belvisi (Latina); P. Bonfanti, I. Caramma (Lecco); A. Chiodera, P. Castelli (Macerata); M Galli, A. Lazzarin, G. Rizzardini, M. Puoti, A. d'Arminio Monforte, AL Ridolfo, R Piolini, A Castagna, S Salpietro, A Galli, A Bigoloni, V Spagnuolo, L Carenzi, P Zucchi, M.C. Moioli, R Rossotti, P Cicconi, T Formenti (Milano); C. Mussini, L Bisio (Modena); A Gori, G Lapadula (Monza), N. Abrescia, A. Chirianni, MG Guida, M Gargiulo (Napoli); F Baldelli, B Belfiori (Perugia); G. Parruti, T Ursini (Pescara); G. Magnani, M.A. Ursitti (Reggio Emilia); R. Cauda, M Andreoni, A. Antinori, V Tozzi, V. Vullo, A. De Luca, A. d'Avino, M. Zaccarelli, L Gallo, E. Nicastro, R. Acinapura, M Capozzi, R Libertone, M. Lichtner, G Tebano, (Roma); M.S. Mura, G Madeddu (Sassari); P. Caramello, G. Di Perri, G.C. Orofino, M Sciandra (Torino); G. Pellizzer, V. Manfrin (Vicenza).

The International HIV Controllers Study

DESCRIPTION:
The International HIV Controllers Study is a collaborative effort among scientists, healthcare professionals and the community to study HIV infected people who have been able to maintain low viral loads without the use of medications.

MEMBERS:
HIV controllers recruitment and sample management: Florencia Pereyra, Alicja Piechocka-Trocha, Emily Cutrell, Rachel Rosenberg, Kristin L. Moss, Ildiko Toth, Brian Block, Brett Baker, Alissa Rothchild, Jeffrey Lian, Jacqueline Proudfoot, Marylyn M. Addo, Bruce D. Walker

HIV controllers referral team: Brian Agan, Shanu Agarwal, Richard L. Ahern, Brady L. Allen, Sherly Altidor, Eric L. Altschuler, Sujata Ambardar, Kathryn Anastos, Val Anderson, Ushan Andrady, Diana Antoniskis, David Bangsberg, Daniel Barbaro, William Barrie, J. Bartczak, Simon Barton, Patricia Basden, Nesli Basgoz, Nicholaos C. Bellos, Judith Berger, Nicole F. Bernard, Annette M. Bernard, Stanley J. Bodner, Robert K. Bolan, Emilie T. Boudreaux, James F. Braun, Jon E. Brndjar, J. Brown, Sheldon T. Brown, Jedidiah Burack, Larry M. Bush, Virginia Cafaro, John Campbell, Robert H. Carlson, J. Kevin Carmichael, Kathleen K. Casey, Chris Cavacuiti, Gregory Celestin, Steven T. Chambers, Nancy Chez, Lisa M. Chirch, Paul J. Cimoch, Daniel Cohen, Lillian E. Cohn, Brian Conway, David A. Cooper, Brian Cornelson, David T. Cox, Michael V. Cristofano, George Cuchural Jr., Julie L. Czartoski, Joseph M. Dahman, Jennifer S. Daly, Benjamin T. Davis, Kristine Davis, Sheila M. Davod, Steven G. Deeks, Edwin DeJesus, Craig A. Dietz, Eleanor Dunham, Michael E. Dunn, Todd B. Ellerin, Joseph J. Eron, John J.W. Fangman, Helen Ferlazzo, Sarah Fidler, Anita Fleenor-Ford, Renee Frankel, Kenneth A. Freedberg, Neel K. French, Jonathan D. Fuchs, Jon D. Fuller, Jonna Gaberman, Joel E. Gallant, Rajesh T. Gandhi, Efrain Garcia, Donald Garmon, Joseph C. Gathe Jr, Cyril R. Gaultier, Wondwoosen Gebre, Frank D. Gilman, Ian Gilson, Paul A. Goepfert, Michael S. Gottlieb, Claudia Goulston, Richard K. Groger, T. Douglas Gurley, Stuart Haber, Robin Hardwicke, W. David Hardy, P. Richard Harrigan, Trevor N. Hawkins, Sonya Heath, Frederick M. Hecht, W. Keith Henry, Melissa Hladek, Robert P. Hoffman, James M. Horton, Ricky K. Hsu, Gregory D. Huhn, Peter Hunt, Mark L. Illeman, Hans Jaeger, Robert M. Jellinger, Mina John, Jennifer A. Johnson, Kristin L. Johnson, Heather Johnson, Kay Johnson, Jennifer Joly, Wilbert C. Jordan, Carol A. Kauffman, Homayoon Khanlou, Arthur Y. Kim, David D. Kim, Clifford A. Kinder, Laura Kogelman, Erna Milunka Kojic, P. Todd Korthuis, Wayne Kurisu, Douglas S. Kwon, Melissa LaMar, Harry Lampiris, Michael M.

Lederman, David M. Lee, Marah J. Lee, Edward T.Y. Lee, Janice Lemoine, Jay A. Levy, Josep M. Llibre, Michael A. Liguori, Susan J. Little, Anne Y. Liu, Alvaro J. Lopez, Mono R. Loutfy, Dawn Loy, Debbie Y. Mohammed, Alan Man, Michael K. Mansour, Vincent C. Marconi, Martin Markowitz, Jeffrey N. Martin, Harold L. Martin Jr., Kenneth Hugh Mayer, M. Juliana McElrath, Theresa A. McGhee, Barbara H. McGovern, Katherine McGowan, Dawn McIntyre, Gavin X. McLeod, Prema Menezes, Greg Mesa, Craig E. Metroka, Dirk Meyer-Olson, Andy O. Miller, Kate Montgomery, Karam C. Mounzer, Iris Nagin, Ronald G. Nahass, Craig Nielsen, David L. Norene, David H. O'Connor, Jason Okulicz, Edward C. Oldfield III, Susan A. Olender, Mario Ostrowski, William F. Owen Jr., Jeffrey Parsonnet, Andrew M. Pavlatos, Aaron M. Perlmutter, Jonathan M. Pincus, Leandro Pisani, Lawrence Jay Price, Laurie Proia, Richard C. Prokesch, Heather Calderon Pujet, Moti Ramgopal, Michael Rausch, J. Ravishankar, Frank S. Rhame, Constance Shamuyarira Richards, Douglas D. Richman, Gregory K. Robbins, Berta Rodes, Milagros Rodriguez, Richard C. Rose III, Eric S. Rosenberg, Daniel Rosenthal, Polly E. Ross, David S. Rubin, Elease Rumbaugh, Luis Saenz, Michelle R. Salvaggio, William C. Sanchez, Veeraf M. Sanjana, Steven Santiago, Wolfgang Schmidt, Hanneke Schuitemaker, Philip M. Sestak, Peter Shalit, William Shay, Vivian N. Shirvani, Vanessa I. Silebi, James M. Sizemore Jr., Paul R. Skolnik, Marcia Sokol-Anderson, James M. Sosman, Paul Stabile, Jack T. Stapleton, Francine Stein, Hans-Jurgen Stellbrink, F. Lisa Sterman, Valerie E. Stone, David R. Stone, Giuseppe Tambussi, Randy A. Taplitz, Ellen M. Tedaldi, Amalio Telenti, Richard Torres, Lorraine Tosiello, Cecile Tremblay, Marc A. Tribble, Phuong D. Trinh, Anthony Vaccaro, Emilia Valadas, Thanes J. Vanig, Isabel Vecino, Wenoah Veikley, Barbara H. Wade, Charles Walworth, Chingchai Wanidworanun, Douglas J. Ward, Robert D. Weber, Duncan Webster, Steve Weis, David A. Wheeler, David J. White, Ed Wilkins, Alan Winston, Clifford G. Wlodaver, Angelique van 't Wout, David P. Wright, Otto O. Yang, David L. Yurdin, Brandon W. Zabukovic, Kimon C. Zachary, Beth Zeeman, Meng Zhao

FUNDING:

The IrsiCaixa Foundation Acute/Recent HIV-1 Infection Cohort

DESCRIPTION:
The IrsiCaixa Institute for AIDS Research aims at improving understanding of the disease, its prevention and treatments of HIV and AIDS with the ultimate goal of eradicating the epidemic.

MEMBERS:
Judith Dalmau, Javier Martinez-Picado, Bonaventura Clotet, Eulàlia Grau, Rafaela Ayen, Jordi Puig, Cristina Miranda, José Ramón Santos, Ingrid Martínez, Pere Domingo, David Dalmau, José Moltó, Robert Muga, Guilem Sirera, Maria del Mar Gutiérrez, Maria Gràcia Mateo

FUNDING:

The Modena Cohort

DESCRIPTION:
The Modena HIV Surveillance Cohort collects data concerning new cases of HIV infected adults since 1985.

MEMBERS:
Andrea Cossarizza

The Multicenter AIDS Cohort Study (MACS)

DESCRIPTION:
The Multicenter AIDS Cohort Study (MACS) is an ongoing prospective study of the natural and treated histories of HIV-1 infection in homosexual and bisexual men conducted by sites located in Baltimore, Chicago, Pittsburgh and Los Angeles. A total of 6,972 men have been enrolled.

MEMBERS:
Baltimore: The Johns Hopkins University Bloomberg School of Public Health: Joseph B. Margolick (Principal Investigator), Barbara Crain, Adrian Dobs, Homayoon Farzadegan, Joel Gallant, Lisette Johnson, Shenghan Lai, Ned Sacktor, Ola Selnes, James Shepherd, Chloe Thio.
Chicago: Howard Brown Health Center, Feinberg School of Medicine, Northwestern University, and Cook County Bureau of Health Services: John P. Phair and Steven Wolinsky (Multiple Principal Investigators), Sheila Badri, Bruce Cohen, Craig Conover, Maurice O'Gorman, David Ostrow, Frank Palella.
Los Angeles: University of California, UCLA Schools of Public Health and Medicine: Roger Detels (Principal Investigator), Barbara R. Visscher (Co-Principal Investigator), Aaron Aronow, Robert Bolan, Elizabeth Breen, Anthony Butch, Thomas Coates, Rita Effros, John Fahey, Beth Jamieson, Otoniel Martínez-Maza, Eric N. Miller, John Oishi, Paul Satz, Harry Vinters, Dorothy Wiley, Mallory Witt, Otto Yang, Stephen Young, Zuo Feng Zhang.
Pittsburgh: University of Pittsburgh, Graduate School of Public Health: Charles R. Rinaldo (Principal Investigator), Lawrence Kingsley (Co-Principal Investigator), James T. Becker, Robert W. Evans, John Mellors, Sharon Riddler, Anthony Silvestre.
Data Coordinating Center: The Johns Hopkins University Bloomberg School of Public Health: Lisa P. Jacobson (Principal Investigator), Alvaro Muñoz (Co-Principal Investigator), Keri Althoff, Christopher Cox, Gypsyamber D'Souza, Stephen J. Gange, Elizabeth Golub, Janet Schollenberger, Eric C. Seaberg, Sol Su.

The Multicenter Hemophilia Cohort Studies (MHCS)

DESCRIPTION:
The first Multicenter Hemophilia Cohort Study (MHCS-I) evaluated and prospectively followed patients with hemophilia or a related coagulation disorder. Initiated in 1982, this study particularly sought to understand the cause and natural history of HIV infection and AIDS in this population, which was at high risk for development of AIDS.

MEMBER:
James J. Goedert.

The San Francisco City Clinic Cohort (SFCCC)

DESCRIPTION:
The San Francisco City Clinic Cohort (SFCCC) consists of approximately 6700 homosexual men recruited between 1978 and 1980 from a clinic for sexually transmitted diseases.

MEMBERS:
Susan Buchbinder

The Swiss HIV Cohort Study (SHCS)

DESCRIPTION:
The Swiss HIV Cohort Study (SHCS) is an ongoing multi-center research project dealing with HIV infected adults aged 16 years or older. Since it was established in 1988, the SHCS recruited and followed more than 17'000 patients in seven centers.

MEMBERS:
Aubert V, Barth J, Battegay M, Bernasconi E, Böni J, Bucher HC, Burton-Jeangros C, Calmy A, Cavassini M, Egger M, Elzi L, Fehr J, Fellay J, Francioli P, Furrer H (Chairman of the Clinical and Laboratory Committee), Fux CA, Gorgievski M, Günthard H (President of the SHCS), Haerry D (deputy of "Positive Council"), Hasse B, Hirsch HH, Hirschel B, Hösli I, Kahlert C, Kaiser L, Keiser O, Kind C, Klimkait T, Kovari H, Ledergerber B, Martinetti G, Martinez de Tejada B, Metzner K, Müller N, Nadal D, Pantaleo G, Rauch A (Chairman of the Scientific Board), Regenass S, Rickenbach M (Head of Data Center), Rudin C (Chairman of the Mother & Child Substudy), Schmid P, Schultze D, Schöni-Affolter F, Schüpbach J, Speck R, Taffé P, Tarr P, Telenti A, Trkola A, Vernazza P, Weber R, Yerly S.

Urban Health Study: Genetics Cohort (UHSGC)

DESCRIPTION:
The Urban Health Study was a serial, cross-sectional sero-epidemiological study. Data were collected every 6 months in communities with a high prevalence of injection drug use: 35 semi-annual "waves" across 19 years of data collection in the San Francisco Bay Area CA U.S. (1986-2005). From the UHS we have banked biospecimens from about 15,000 people who injected drugs (PWIDs). From these UHS participants we developed the UHSGC, genotyping selected HIV+ cases and exposure-matched HIV- controls (total N = 3,136).

MEMBERS:
Laura J. Bierut, Nathan C. Gaddis, Cristie Glasheen, Dana B. Hancock, Eric O. Johnson (PI: UHSGC), Alex H. Kral (PI: UHS), Joshua L. Levy, Scott P. Novak, Grier Page, Nancy L. Saccone

The US military HIV Natural History Study (NHS)

DESCRIPTION:
The US military HIV Natural History Study is a longitudinal epidemiological, observational, open cohort study collecting retrospective and prospective data in the U.S. Military active duty and Department of Defense (DoD) health care beneficiary HIV infected population.

MEMBERS:
Brian Agan, Mary Bavaro, Helen Chun, Nancy Crum-Cianflone, Cathy Decker, Connor Eggleston, Tomas Ferguson, Susan Fraser, Anuradha Ganesan, Joshua Hartzell, Joshua Hawley, Gunther Hsue, Arthur Johnson, Mark Kortepeter, Tahaniyat Lalani, Grace Macalino, Scott Merritt, Robert O'Connell, Jason Okulicz, Sheila Peel, Michael Polis, John Powers, Rose Ressner, Edmund Tramont, Tyler Warkentien, Amy Weintrob, Timothy Whitman, Michael Zapor

The Western Australian HIV cohort Study

DESCRIPTION:
The Western Australian (WA) HIV Cohort Study is a population-based, observational cohort study of HIV-infected patients in Perth, Australia.

MEMBERS:
Simon Mallal, David Nolan, Mina John, Olga Martinez, Martyn French, Elizabeth Phillips, Lloyd D'orsogna, Peter Hollingsworth, Lisa Boogerd