

## Supplementary Materials for

### **Tryptophan Catabolism by Indoleamine 2,3-Dioxygenase 1 Alters the Balance of T<sub>H</sub>17 to Regulatory T Cells in HIV Disease**

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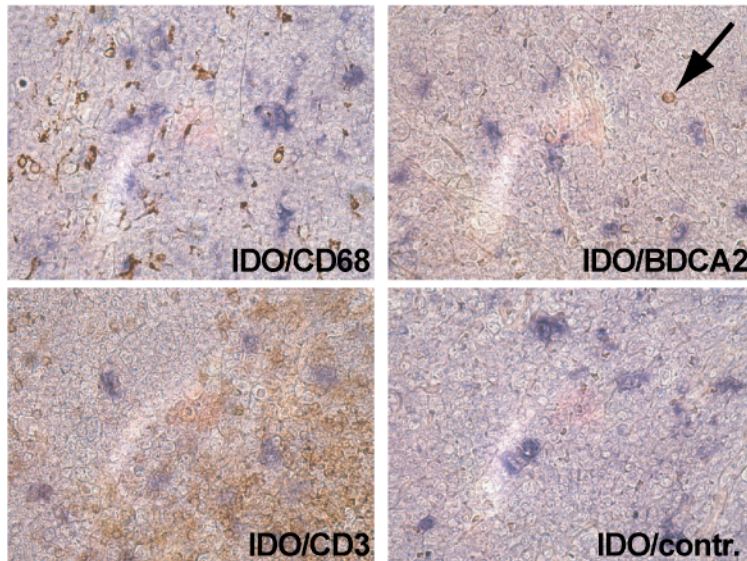
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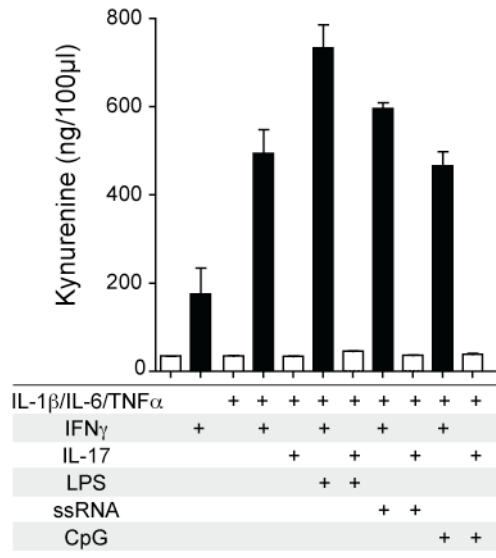
#### **The PDF file includes:**

- Fig. S1. Characterization of IDO up-regulation in mDCs from HIV<sup>+</sup> subjects.
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- Fig. S3. Characterization of T<sub>H</sub>17 memory phenotype in PBMCs and in rectosigmoid biopsies.
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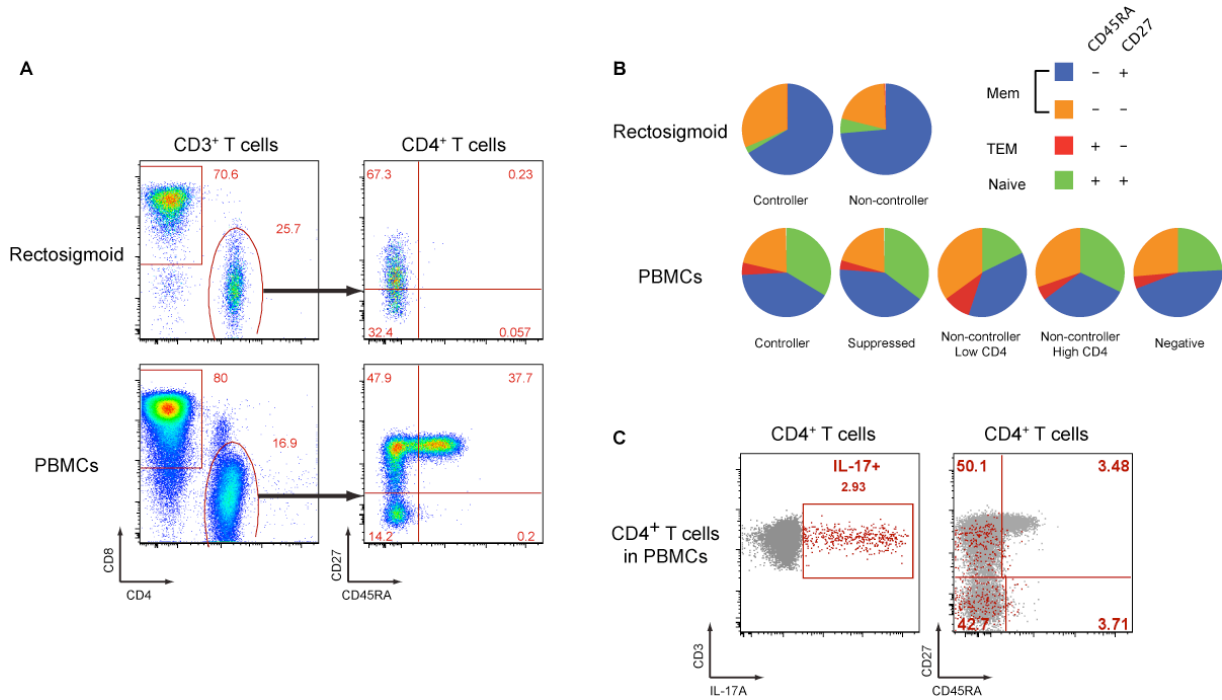
## Supplementary Figures and Tables



**Fig. S1. Characterization of IDO up-regulation in myeloid dendritic cells (mDCs) from HIV<sup>+</sup> subjects.** Detection of IDO expression by immunohistochemistry on paraffin-embedded section of lymph node from HIV-infected subjects, as described in Material and Methods, with co-staining of IDO (blue) and markers (brown) of macrophages (CD68), plasmacytoid DCs (BDCA2), and T cells (CD3). Anti-IDO rabbit polyclonal antibodies were detected using an anti-rabbit alkaline phosphatase antibody (Biocare Medical) and the substrate (nitro-blue tetrazolium chloride/5-bromo-4-chloro-3'-indolyphosphate p-toluidine, NBT/BCIP) (DAKO). Murine monoclonal antibodies (anti-CD68, clone KP-1; anti-BDCA2, clone 124b3.13; and anti-CD3, clone F7.2.38) were detected with a secondary anti-mouse antibody-horseradish peroxidase (HRP) (Biocare Medical) and the substrate, diaminobenzidine. IDO/control shows IDO staining and the secondary anti-mouse antibody-HRP reagent alone.

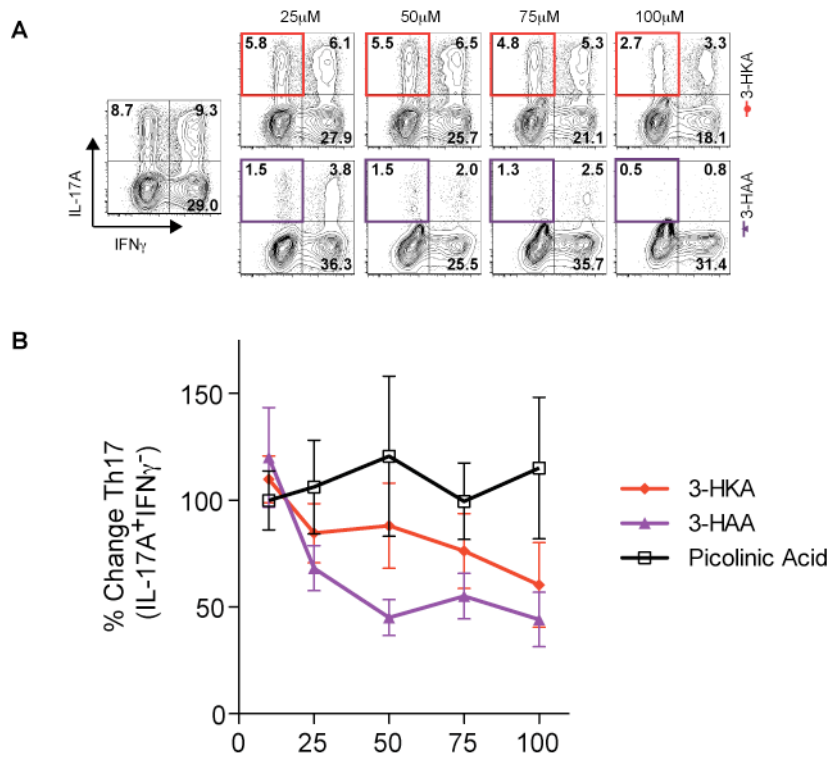


**Fig. S2. IDO activity on mDCs in vitro with combined IL-17 and/or IL-1β–IL-6–TNFα.** As described in Fig. 2C, IDO activity was measured in terms of kynurenine concentration described in the supernatant of monocyte-derived DCs after exposure to IFN<sub>γ</sub> and IL-1β, IL-6, and TNFα in combination with LPS or other TLR ligands (e.g., ssRNA and CpG). Data are representative of two donors.



**Fig. S3. Characterization of  $T_H17$  memory phenotype in PBMCs and in rectosigmoid biopsies.**

(A) Representative FACS plot showing the distribution of naïve ( $CD45RA^+CD27^+$ ), memory (Mem) ( $CD45RA^-CD27^{+/-}$ ), and terminally differentiated effector memory (TEM) ( $CD45RA^+CD27^-$ ) subpopulations among  $CD4^+$  T cells in a rectosigmoid biopsy (upper) and in PBMCs (lower) from a HIV controller. (B) Pie-chart representations of the average mean frequencies of each of these subpopulations in rectosigmoid biopsies (upper) and in PBMCs (lower) in patients from Study D and B, respectively (for further details, see Materials and Methods, Patient populations, Study B and D, Table S1). (C) Overlay representation of  $IL-17^+$   $CD4^+$  T cells in  $CD4^+$  T cells. The frequency of  $Th17$  cells in total  $CD4$  T cells is indicated on the left panel. The right panel shows the overlay of  $Th17$  cells (red dot) on subset  $CD4^+$  T cells with the frequency of  $Th17$  cells indicated for each  $CD45$  and/or  $CD27$ .



**Fig. S4. IDO catabolites affect  $T_H17$  cells in PBMCs from healthy donors and HIV-infected subjects.**

PBMCs from healthy subjects and untreated HIV-infected viral controllers were cultured *in vitro* for six days in the presence of different IDO catabolites, including 3-hydroxykynurenic acid (3-HKA), 3-hydroxyanthranilic acid (3-HAA), and picolinic acid (PA), as described in Fig. 5. **(A)** Frequency of  $IL-17A^+IFN\gamma^- CD4^+$  T cells from another healthy individual. **(B)** Change of Th17 over control, from three experiments from untreated HIV-infected controllers ( $N=4$ ), as described in Fig. 5.

**Table S1. Individual characteristic of subjects.** Median and [25%-75%] interquartile ranges are indicated on the top of each group. "Years of self-reported diagnosis" refers to the time between sampling of the specimens and the date of self-reported first positive antibody test. ARV: antiretroviral treatment.

Study and Group	Specimen Date	Gender	Ethnicity	MSM	HIV Ab	Years of self-reported HIV Diagnosis (SCOPE)	Age (year at visit date)	Viral load (HIV RNA copies/ml)	CD4+ T cell count (cells/mm <sup>3</sup> )	ARV Treatment
<b>Study A (n=86, SCOPE cohort)</b>										
						Years				
<b>Controllers CD4&gt;500 (except 2 subjects CD4&gt;430 at specimen date) (n=20)</b>						15 [11-17]	44 [43-51]	104 [75-607]	669 [550-766]	
SC-1	2004	Male	Asian	Yes	Positive	20	57	325	663	None
SC-2	2004	M to F Transgender	African American	No	Positive	12	44	<75	1 248	None
SC-3	2004	Male	African American	No	Positive	18	41	279	675	None
SC-4	2004	Female	African American	Yes	Positive	16	48	<75	1150	None
SC-5	2004	Female	White	Yes	Positive	15	49	<75	939	None
SC-6	2003	Male	Hispanic/Latino	Yes	Positive	12	51	<75	1 074	None
SC-7	2005	Male	White	Yes	Positive	19	52	<75	688	None
SC-8	2001	Male	White	Yes	Positive	15	44	1 523	532	None
SC-9	2005	Male	African American	No	Positive	15	51	<75	556	None
SC-10	2005	Male	African American	Yes	Positive	16	44	888	708	None
SC-11	2005	Male	African American	Yes	Positive	-	58	1 356	699	None
SC-12	2005	Male	White	Yes	Positive	13	42	307	480	None
SC-13	2004	Male	White	Yes	Positive	13	35	<75	1 548	None
SC-14	2005	Female	African American	No	Positive	19	44	<75	590	None
SC-15	2005	Male	African American	Yes	Positive	18	50	<75	649	None
SC-16	2004	Female	African American	Yes	Positive	4	36		561	None
SC-17	2003	Male	African American	No	Positive	7	44	1 843	512	None
SC-18	2002	Male	White	Yes	Positive	6	53	104	507	None
SC-19	2002	M to F Transgender	African American	Yes	Positive	6	43	191	680	None
SC-20	2001	Male	White	Yes	Positive	9	43	1 277	434	None
<b>Noncontrollers CD4&gt;350 (n=33)</b>						11 [5-16]	44 [41-51]	17462 [7179-31913]	516 [440-636]	
SC-21	2005	Male	White	Yes	Positive	18	55	2 808	1 137	None
SC-22	2003	Male	African American	Yes	Positive	18	53	4 001	678	None
SC-23	2003	Female	African American	Yes	Positive	17	51	6 547	648	None
SC-24	2002	Male	White	Yes	Positive	14	41	3 513	663	None
SC-25	2001	Male	African American	Yes	Positive	11	33	6 132	511	None
SC-26	2004	Male	White	Yes	Positive	5	41	7 179	642	None
SC-27	2004	Male	African American	No	Positive	10	45	5 152	434	None
SC-28	2004	Male	African American	No	Positive	18	58	2 557	471	None
SC-29	2004	Male	Asian	Yes	Positive	18	44	9 207	396	None
SC-30	2005	Male	African American	Yes	Positive	13	38	3 284	363	None
SC-31	2005	Male	White	Yes	Positive	18	60	17 462	636	None
SC-32	2005	Male	African American	Yes	Positive	14	50	>100 000	778	None
SC-33	2003	Female	White	Yes	Positive	6	42	18 397	543	None
SC-34	2002	Male	Asian	Yes	Positive	4	37	32 077	555	None
SC-35	2003	Female	White	Yes	Positive	16	46	75 267	559	None
SC-36	2002	Male	White	Yes	Positive	11	36	16 006	500	None
SC-37	2002	Male	White	Yes	Positive	10	46	>500 000	514	None
SC-38	2002	Male	White	Yes	Positive	13	31	63 932	585	None
SC-39	2002	Male	Hispanic/Latino	Yes	Positive	2	51	31 527	501	None
SC-40	2001	Male	White	Yes	Positive	10	51	111 838	528	None
SC-41	2001	Male	White	No	Positive	5	44	14 249	771	None
SC-42	2002	M to F Transgender	White	Yes	Positive	11	31	37 216	536	None
SC-43	2001	Male	White	Yes	Positive	14	51	30 181	715	None
SC-44	2005	Male	African American	No	Positive	16	54	12 305	542	None
SC-45	2005	Male	White	No	Positive	4	46	22 012	516	None
SC-46	2004	Male	White	Yes	Positive	4	38	14 067	489	None
SC-47	2004	Female	African American	Yes	Positive	3	42	17 784	356	None
SC-48	2004	Female	White	Yes	Positive	12	44	31 913	423	None
SC-49	2003	Male	White	Yes	Positive	14	44	13 640	440	None
SC-50	2001	Male	African American	No	Positive	2	36	44 773	395	None
SC-51	2001	Male	Mixed Race	Yes	Positive	10	41	25 941	432	None
SC-52	2001	Female	African American	No	Positive	3	43	27 890	395	None
SC-53	2005	Male	White	Yes	Positive	19	41	13 430	477	None
<b>Noncontrollers CD4&lt;350 (n=33)</b>						13 [9-17]	43 [39-49]	27505 [16928-55059]	163 [128-258]	
SC-141	2004	Female	White	Yes	Positive	18	52	3 265	276	None
SC-54	2004	Male	African American	Yes	Positive	17	49	5 655	305	None
SC-55	2004	M to F Transgender	African American	Yes	Positive	12	39	4 358	346	None
SC-56	2004	M to F Transgender	African American	Yes	Positive	10	32	6 418	163	None
SC-57	2004	Male	White	No	Positive	18	52	9 127	192	None
SC-58	2004	Male	African American	No	Positive	20	48	17 330	282	None
SC-59	2004	Male	White	Yes	Positive	4	36	17 320	246	None
SC-60	2004	Male	African American	No	Positive	9	39	381 594	219	None
SC-61	2002	Male	White	Yes	Positive	13	46	13 011	268	None
SC-62	2001	Female	Hispanic/Latino	No	Positive	11	49	23 075	318	None
SC-63	2001	Male	Mixed Race	Yes	Positive	16	40	57 103	251	None
SC-64	2001	Male	Mixed Race	Yes	Positive	10	37	24 631	258	None
SC-65	2001	Male	White	Yes	Positive	12	47	24 026	293	None
SC-66	2005	Female	African American	Yes	Positive	9	43	34 864	239	None
SC-67	2005	Male	White	No	Positive	10	43	15 750	291	None
SC-68	2004	Female	African American	Yes	Positive	7	45	26 584	161	None
SC-69	2004	Male	White	Yes	Positive	13	44	54 377	83	None
SC-70	2004	Female	White	No	Positive	9	56	119 817	163	None
SC-71	2004	Female	African American	No	Positive	10	55	13 188	93	None
SC-72	2004	Female	African American	Yes	Positive	13	38	34 951	31	None
SC-73	2003	Female	White	Yes	Positive	18	51	400 865	184	None
SC-74	2003	Male	Mixed Race	No	Positive	4	42	347 559	65	None
SC-75	2002	Female	African American	Yes	Positive	4	33	28 425	128	None
SC-76	2001	Male	African American	Yes	Positive	14	39	24 201	83	None
SC-77	2001	Male	White	Yes	Positive	8	43	>500 000	120	None
SC-78	2002	Male	Mixed Race	Yes	Positive	16	52	28 998	86	None
SC-79	2002	Male	White	Yes	Positive	18	42	277 359	153	None
SC-80	2001	Female	African American	No	Positive	13	51	36 667	134	None
SC-81	2001	Male	White	Yes	Positive	13	48	51 252	152	None
SC-82	2001	Male	White	No	Positive	17	34	21 526	163	None
SC-83	2001	Male	White	Yes	Positive	9	43	87 283	57	None
SC-84	2005	Male	White	Yes	Positive	17	39		156	None
SC-85	2005	Male	Native American	No	Positive	19	45	32 665	191	None

Study and Group	Specimen Date	Gender	Ethnicity	MSM	HIV Ab	Years of self-reported HIV Diagnosis (SCOPE)	Age (year at visit date)	Viral load (HIV RNA copies/ml)	CD4+ T cell count (cells/mm <sup>3</sup> )	ARV Treatment
<b>Study B (n=70, SCOPE cohort)</b>										
<b>Controllers CD4&gt;500 (n=14)</b>						15 [14-18]	49 [44-51]	75 [75-75]	814 [713-1156]	
SC-86	2005	Female	Hispanic/Latino	No	Positive	16	45	<75	1482	None
SC-87	2006	Female	African American	No	Positive	10	54	<75	821	None
SC-11	2006	Male	African American	Yes	Positive	15	59	122	671	None
SC-88	2006	M to F Transgender	African American	Yes	Positive	17	51	1 288	1181	None
SC-89	2006	Male	African American	Yes	Positive	18	47	<75	806	None
SC-90	2006	Male	African American	Yes	Positive	13	50	940	788	None
SC-3	2004	Male	African American	No	Positive	17	40	<75	893	None
SC-91	2004	Male	White	Yes	Positive	23	44	<75	682	None
SC-92	2004	Female	African American	No	Positive	14	51	<75	1081	None
SC-13	2004	Male	White	Yes	Positive	13	35	<75	1548	None
SC-14	2005	Female	African American	No	Positive	19	44	<75	590	None
SC-9	2005	Male	African American	No	Positive	15	50	<75	805	None
SC-7	2005	Male	White	No	Positive	19	52	<75	688	None
SC-2	2006	M to F Transgender	African American	Yes	Positive	15	46	<75	1224	None
<b>Suppressed (n=14)</b>						16 [11-21]	51 [42-55]	75 [75-75]	720 [658-830]	
SC-93	2003	Male	Pacific Islander	Yes	Positive	14	46	<75	906	AZT/3TC,EFV,LPV/r
SC-94	2004	Male	White	Yes	Positive	11	53	<75	1052	ABC,TDF,EFV
SC-95	2004	Male	African American	Yes	Positive	22	40	<75	742	D4T,3TC,NVP,NFV
SC-96	2004	Male	Asian	No	Positive	15	51	<75	539	3TC,TDF,NFV
SC-97	2004	Male	White	Yes	Positive	11	40	<75	1109	AZT/3TC,ABC,EFV
SC-98	2005	Male	White	Yes	Positive	18	60	<75	742	AZT/3TC,NVP,IDV,RTV
SC-99	2005	Male	White	Yes	Positive	22	56	<75	675	ABC,3TC,NVP,LPV/r
SC-100	2005	Female	White	No	Positive	12	42	<75	653	ABC,NVP,LPV/r
SC-101	2005	Male	Mixed	Yes	Positive	8	40	<75	859	3TC,TDF,NVP,LPV/r
SC-102	2005	Male	White	Yes	Positive	23	51	<75	723	DDI,TDF,EFV,LPV/r
SC-103	2005	Male	White	Yes	Positive	19	57	<75	717	AZT,TDF,ABC/3TC
SC-104	2005	Male	White	Yes	Positive	17	43	<75	672	ABC,3TC,NVP,LPV/r
SC-105	2006	Male	White	Yes	Positive	28	51	<75	460	ABC/3TC,ATV,RTV
SC-106	2006	Male	White	Yes	Positive	11	56	<75	424	3TC,TDF,IDV
<b>Noncontrollers CD4&gt;350 (n=14)</b>						8 [3-15]	43 [37-47]	33921 [26527-52955]	504 [473-541]	
SC-50	2001	Male	African American	No	Positive	2	35	260 744	506	None
SC-42	2002	M to F Transgender	White	No	Positive	11	31	37 216	536	None
SC-34	2002	Male	Asian	Yes	Positive	3	36	148 248	572	None
SC-38	2002	Male	White	Yes	Positive	13	30	54 819	938	None
SC-23	2002	Female	African American	No	Positive	16	49	12 136	585	None
SC-107	2002	Male	African American	Yes	Positive	9	53	323 995	391	None
SC-26	2004	Male	White	Yes	Positive	5	40	23 739	499	None
SC-35	2003	Female	White	No	Positive	16	46	36 563	543	None
SC-29	2003	Male	Asian	Yes	Positive	18	43	26 924	418	None
SC-47	2004	Female	African American	Yes	Positive	3	41	27 976	490	None
SC-45	2004	Male	White	No	Positive	3	44	26 394	501	None
SC-39	2003	Male	Hispanic/Latino	Yes	Positive	3	52	25 655	438	None
SC-33	2004	Female	White	Yes	Positive	7	42	47 363	510	None
SC-8	2005	Male	White	Yes	Positive	19	47	31 279	467	None
<b>Noncontrollers CD4&lt;350 (n=14)</b>						13 [10-16]	41 [38-44]	45369 [17423-139048]	218 [179-260]	
SC-108	2000	Male	White	Yes	Positive	10	44	50 169	264	None
SC-81	2000	Male	White	Yes	Positive	13	47	22 762	268	None
SC-109	2001	Male	African American	No	Positive	10	60	11 137	222	None
SC-64	2001	Male	Mixed	Yes	Positive	9	37	24 631	258	None
SC-82	2001	Male	White	Yes	Positive	17	33	12 585	184	None
SC-110	2001	Male	African American	Yes	Positive	14	44	265 548	201	None
SC-77	2001	Male	White	Yes	Positive	8	42	347 127	147	None
SC-61	2001	Male	White	Yes	Positive	12	44	15 643	239	None
SC-36	2003	Male	White	Yes	Positive	13	37	40 569	325	None
SC-111	2003	Male	White	Yes	Positive	19	40	53 585	214	None
SC-43	2004	Male	White	Yes	Positive	17	53	402 295	177	None
SC-60	2004	Male	African American	No	Positive	9	39	151 896	163	None
SC-56	2005	M to F Transgender	African American	Yes	Positive	11	32	13 283	261	None
SC-84	2005	Male	White	Yes	Positive	17	39	100 502	176	None
<b>Neg (n=14)</b>							35 [30-44]			
SC-112	2003	Male	White	Yes	Negative	-	33	-	ND	-
SC-113	2003	Male	White	Yes	Negative	-	29	-	ND	-
SC-114	2003	Male	Mixed	Yes	Negative	-	23	-	ND	-
SC-115	2003	Male	White	Yes	Negative	-	49	-	ND	-
SC-116	2003	Male	White	Yes	Negative	-	41	-	ND	-
SC-117	2003	Male	White	Yes	Negative	-	45	-	ND	-
SC-118	2003	Male	White	Yes	Negative	-	45	-	ND	-
SC-119	2003	Male	White	Yes	Negative	-	57	-	ND	-
SC-120	2003	Male	White	Yes	Negative	-	27	-	ND	-
SC-121	2003	Male	White	Yes	Negative	-	37	-	ND	-
SC-122	2003	Male	White	Yes	Negative	-	32	-	ND	-
SC-123	2003	Male	Hispanic/Latino	Yes	Negative	-	31	-	ND	-
SC-124	2003	Male	White	Yes	Negative	-	42	-	ND	-
SC-125	2003	Male	White	Yes	Negative	-	24	-	ND	-

Study and Group	Specimen Date	Gender	Ethnicity	MSM	HIV Ab	Months from estimated infection date (EID)	Age (year at visit date)	Viral load (HIV RNA copies/ml)	CD4+ T cell count (cells/mm <sup>3</sup> )	ARV Treatment
<b>Study C (n=27, Options cohort)</b>										
<b>ACUTE</b>						3 [2.4-3.6]	36 [34-42.5]	14147 [2824-56377]	552 [494-728]	
<b>Group-1 (Early, n=9)</b>						3.4 [2.6-4.2]	36 [35-40]	3269 [1351-8856]	675 [534-756]	None
OP-1	1998	Male	AfricanAmerican	Yes	Positive	5.2	43	1 351		None
OP-2	2000	Male	Mixed Race	Yes	Positive	2.6	38	1 770		None
OP-3	2000	Male	White	Yes	Positive	2.4	35	3 634	504	None
OP-4	2000	Male	Mixed Race	Yes	Positive	2.4	36	3 269	675	None
OP-5	2000	Male	White	Yes	Positive	3.7	40	50	527	None
OP-6	2000	Male	White	Yes	Positive	3.4	31	14 147	784	None
OP-7	2001	Male	White	Yes	Positive	3.1	28	8 856	966	None
OP-8	2001	Male	White	Yes	Positive	4.2	35	13 898	728	None
OP-9	2001	Male	White	Yes	Positive	4.8	48	350	540	None
<b>Group-2 (Early, n=9)</b>						3.1 [2.4-3.3]	35 [34-43]	45289 [21494-62155]	528 [416-592]	
OP-10	1999	Male	White	Yes	Positive	3.2	29	45 289	552	None
OP-11	1999	Male	White	Yes	Positive	3.8	45	64 626	528	None
OP-12	1999	Male	White	Yes	Positive	2.4	38	572	592	None
OP-13	1999	Male	White	Yes	Positive	3.6	25	2 083	1 260	None
OP-14	1999	Male	White	Yes	Positive	2.4	43	63 321	416	None
OP-15	1999	Male	White	Yes	Positive	-	45	24 877	312	None
OP-16	2000	Male	Latino / Hispanic	Yes	Positive	3.2	34	50 600	300	None
OP-17	2000	Male	White	Yes	Positive	2.0	34	62 155	690	None
OP-18	2001	Male	Mixed Race	Yes	Positive	3.0	35	21 494	513	None
<b>Group-3 (Early, n=9)</b>						2.8 [2.4-3.3]	38 [34-42]	47050 [9884-75452]	592 [480-837]	
OP-19	1998	Male	White	Yes	Positive	2.4	53	47 050	595	None
OP-20	2000	Male	Latino / Hispanic	Yes	Positive	2.8	29	73 698	475	None
OP-21	2000	Male	White	Yes	Negative	0.8	49	9 884	837	None
OP-22	2001	Female	White	No	Positive	-	34	33 837	592	None
OP-23	2001	Male	White	Yes	Positive	2.9	34	2 380	930	None
OP-24	2001	Male	White	Yes	Positive	2.4	36	6 363	1 404	None
OP-25	2001	Male	White	Yes	Positive	-	39	200 538	330	None
OP-26	2001	Male	White	Yes	Positive	3.6	38	75 452	480	None
OP-27	2002	Male	White	Yes	Positive	7.1	42	87 864	494	None
<b>CHRONIC</b>						11.6 [9.1-14.3]	37 [35-43.5]	37657 [2496-81922]	444 [359-743]	
<b>Group-1 (Late, n=9)</b>						14.1 [9.5-14.3]	37 [35-41]	1536 [883-2386]	702 [481-805]	
OP-1	1999	Male	AfricanAmerican	Yes	Positive	16.0	44	1 536	481	None
OP-2	2001	Male	Mixed Race	Yes	Positive	14.3	39	93	966	None
OP-3	2001	Male	White	Yes	Positive	14.3	36	883	693	None
OP-4	2001	Male	Mixed Race	Yes	Positive	14.1	37	1 168	805	None
OP-5	2001	Male	White	Yes	Positive	9.1	41	127	480	None
OP-6	2001	Male	White	Yes	Positive	8.8	31	2 606	760	None
OP-7	2002	Male	White	Yes	Positive	14.7	29	3 363	882	None
OP-8	2001	Male	White	Yes	Positive	9.5	35	2 212	702	None
OP-9	2002	Male	White	Yes	Positive	10.6	49	2 386	385	None
<b>Group-2 (Late, n=9)</b>						13.4 [10.6-14.3]	35 [35-44]	82641 [53486-181901]	308 [253-437]	
OP-10	1999	Male	White	Yes	Positive	11.2	29	181 901	253	None
OP-11	2000	Male	White	Yes	Positive	8.3	45	82 641	304	None
OP-12	2000	Male	White	Yes	Positive	14.1	39	206 621	308	None
OP-13	2000	Male	White	Yes	Positive	14.8	26	97 084	756	None
OP-14	2000	Male	White	Yes	Positive	12.9	44	478 000	338	None
OP-15	2000	Male	White	Yes	Positive	-	46	39 482	242	None
OP-16	2001	Male	Latino / Hispanic	Yes	Positive	14.0	35	53 486	225	None
OP-17	2002	Male	White	Yes	Positive	18.3	35	25 922	437	None
OP-18	2002	Male	Mixed Race	Yes	Positive	8.8	35	63 482	450	None
<b>Group-3 (Late, n=9)</b>						9.6 [8.4-10.9]	38 [36-43]	40735 [34823-81203]	426 [404-707]	
OP-19	1998	Male	White	Yes	Positive	5.5	53	40 735	408	None
OP-20	2001	Male	Latino / Hispanic	Yes	Positive	9.0	29	37 657	350	None
OP-21	2001	Male	White	Yes	Negative	7.9	50	34 823	780	None
OP-22	2002	Female	White	No	Positive	-	36	81 203	420	None
OP-23	2002	Male	White	Yes	Positive	19.7	35	33 367	928	None
OP-24	2002	Male	White	Yes	Positive	9.8	37	41 401		None
OP-25	2002	Male	White	Yes	Positive	-	39	122 891	432	None
OP-26	2002	Male	White	Yes	Positive	9.6	38	150 715	682	None
OP-27	2002	Male	White	Yes	Positive	12.0	43	21 500	390	None
<b>Study D (n=20, SCOPE cohort)</b>										
						<b>Years</b>				
<b>Controllers CD4&gt;500 (n=9)</b>						19 [18-21]	47 [46-48]	40 [40-250]	701 [625-1000]	
SC-126	2007	Male	White	Yes	Positive	11	45	1 795	597	None
SC-127	2007	Male	Hispanic/Latino	Yes	Positive	19	42	250	701	None
SC-10	2007	Male	African American	Yes	Positive	18	46	774	633	None
SC-128	2007	Male	White	Yes	Positive	20	54	<40	823	None
SC-129	2007	Male	Native American	No	Positive	22	47	<40	518	None
SC-130	2007	Male	White	Yes	Positive	21	52	<40	1 311	None
SC-131	2007	Male	White	Yes	Positive	22	47	<40	1 000	None
SC-89	2007	Male	African American	Yes	Positive	19	48	182	625	None
SC-2	2007	M to F Transgender	African American	No	Positive	16	47	<40	1 507	None
<b>Noncontrollers (n=11)</b>						11 [6-14]	42 [40-48]	24734 [21257-44622]	253 [210-402]	
SC-30	2007	Male	African American	Yes	Positive	15	41	17 600	196	None
SC-132	2007	Male	White	Yes	Positive	1	59	32 944	221	None
SC-133	2007	M to F Transgender	African American	Yes	Positive	11	46	140 000	211	None
SC-134	2007	Male	African American	Yes	Positive	0	42	56 299	206	None
SC-135	2007	Intersex	Mixed Race	Yes	Positive	18	46	20 420	643	None
SC-46	2007	Male	White	Yes	Positive	7	41	24 734	253	None
SC-136	2007	Male	White	Yes	Positive	21	49	21 523	415	None
SC-137	2007	Male	African American	Yes	Positive	11	36	20 991	354	None
SC-138	2007	Male	Hispanic/Latino	Yes	Positive	6	38	24 729	389	None
SC-139	2007	Male	White	Yes	Positive	5	39	25 725	673	None
SC-140	2007	Male	White	Yes	Positive	12	50	91 199	208	None



**Table S2. Antibody panels for multiparameter flow cytometry.**

Fluorescence dye	Panel 1: Activation/Subpop T cells				Panel 2: T regs			
	Antigen	Clone	Manufact.	Dilution	Antigen	Clone	Manufact.	Dilution
Pacific Blue	CD3	SP34-2	BD	100	CD3	SP34-2	BD	100
qDot655	CD4	19Thy-5D7	NIH	100	CD4	19Thy-5D7	NIH	100
FITC	Ki67	B56	BD	25	Ki67	B56	BD	25
PE	Tim3 or MHC-I	344823/W632	R&D/Dako	50\100	CD127	hIL-7R-M21	BD	25
PE-Texas Red (ECD)	CD45RA	2H4	Coulter	50	CD45RA	2H4	Coulter	50
Amcyan (AQUA)	Live/Dead		Invitrogen	300	Live/Dead		Invitrogen	300
APC/Alexa647	CD38	HIT2	BD	25	FoxP3	PCH101	eBioscience	20
PE-Cy5.5	CD8	3b5	Invitroeqn	200	CD8	3b5	Invitroeqn	200
PE-Cy7	HLA-DR	L243	BD	100	HLA-DR	L243	BD	100
APC-Cy7/APC-Alexa750	CD27	O323	eBioscience	100	CD27	O323	eBioscience	100
Alexa700	CD25	BC96	Biologend	100	CD25	BC96	Biologend	100

Fluorescence dye	Panel CFC/Th17 (Study D)				Panel CFC/Th17 (Studies B and C)			
	Antigen	Clone	Manufact.	Dilution	Antigen	Clone	Manufact.	Dilution
Pacific Blue	IFN $\gamma$	4S.B3	eBioscience	50	CD3	SP34-2	BD	100
qDot655					CD4	19Thy-5D7	NIH	100
FITC/Alexa488	MIP1 $\beta$	25.3	R&D	50	MIP1 $\beta$	25.3	R&D	50
PE	IL-17	eBio64CAP17	eBioscience	50	IL-17	eBio64CAP17	eBioscience	50
PE-Texas Red (ECD)	CD4	SFC112T4011	Coulter	75	CD45RA	2H4	Coulter	50
Amcyan	Live/Dead		Invitrogen	300	Live/Dead		Invitrogen	300
APC/Alexa647	IL-22 or IL-21	142928/3A3-N2	R&D/eBiosc.	50	IL-22	142928	R&	50
PE-Cy5.5	CD8	3b5	Invitrogen	200	CD8	3b5	Invitrogen	200
PE-Cy7	TNF $\alpha$	B27	BD	100	IFN $\gamma$	B27	BD	100
APC-Cy7/APC-Alexa750	CD3	SP34-2	BD	100	CD27	O323	eBioscience	100
Alexa700	IL-2	MQ1-17H12	Biologend	100	IL-2	MQ1-17H12	Biologend	100