

File Name: Supplementary Data 1

Description: Differential expression analysis results (adjusted for age, sex, center, and storage time) comparing 147 viral controllers (VC) and 36 elite controllers (EC) from the discovery cohort.

File Name: Supplementary Data 2

Description: Differential expression analysis results (adjusted for age and sex) comparing 5 VC and 14 EC from the validation cohort.

File Name: Supplementary Data 3

Description: Linear mixed-model analysis results (adjusted for age, sex, center, and storage time) for paired samples from 57 persistent VC before and after ART initiation in the discovery cohort.

File Name: Supplementary Data 4

Description: Pathway enrichment analysis of downregulated proteins in persistent VC after ART initiation.

File Name: Supplementary Data 5

Description: Linear mixed-model analysis results (adjusted for age, sex, center, and storage time) for paired samples from 36 transient VC before and after ART initiation in the discovery cohort.

File Name: Supplementary Data 6

Description: Linear mixed-model analysis results (adjusted for age, sex, center, and storage time) for paired samples from 9 persistent EC before and after ART initiation in the discovery cohort.

File Name: Supplementary Data 7

Description: Cox regression analysis results (adjusted for age, sex, center, and storage time) associating proteins with time to virological loss (VL >10,000 copies/mL) in 125 persistent and 56 transient HIV controllers from the discovery cohort.

File Name: Supplementary Data 8

Description: Cox regression analysis results (adjusted for age, sex, center, and storage time) associating proteins with time to substantial viral increase (>1,000 copies/mL increase in moving median or VL >10,000 copies/mL) in 181 HIV controllers from the discovery cohort.

File Name: Supplementary Data 9

Description: Spearman correlations between seven proteins (CRTAM, LY9, CD6, ICAM3, SH2D1A, C1QL2, and CNGB3) and the absolute number of HLA-DR⁺CD38⁺ T-cell subsets.

File Name: Supplementary Data 10

Description: Detailed participant characteristics for plasma viral sequencing.

File Name: Supplementary Data 11

Description: Primers used for half-genome amplification.