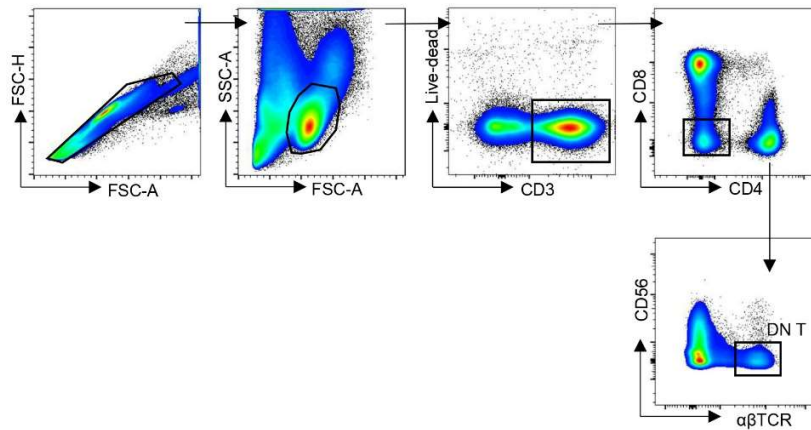


## Supplementary Material

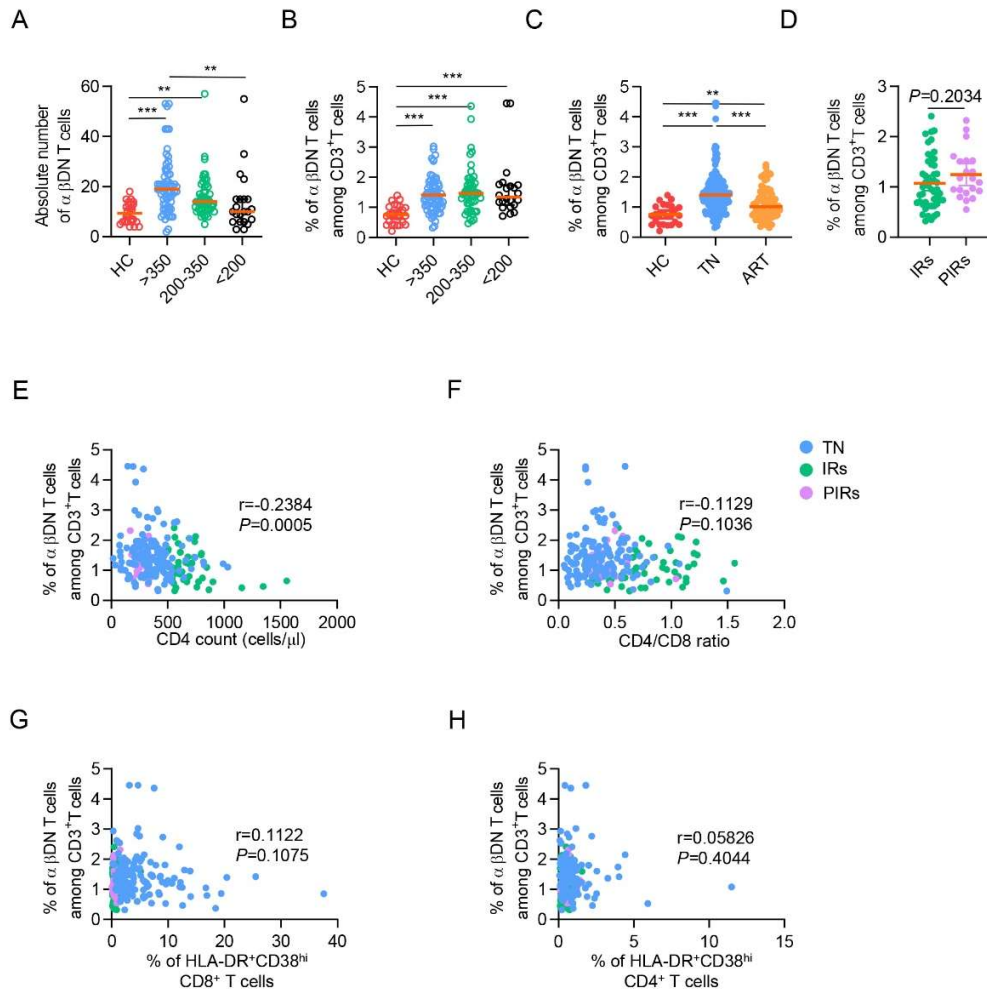
### Supplementary Figures



**Fig. S1 Identification of  $\alpha\beta$  DNT cells**

Representative gating strategy for flow cytometry analysis of  $\alpha\beta$  DNT cells in PLWH.

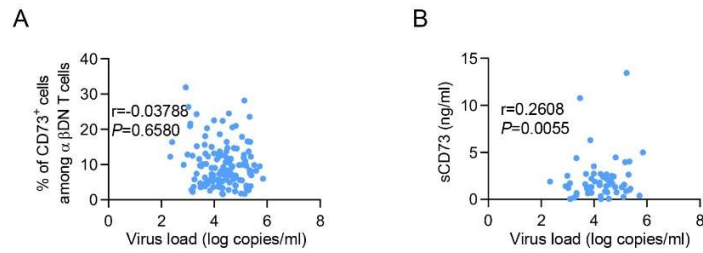
## Supplementary Material



**Fig. S2 Detection of absolute number and frequencies of DNT cells in HCs, TNs, IRs and PIRs**

(A) Scatter plots compared the absolute number of DNT cells from HCs and TNs ( $n=22-66$  each group).  $P$  values were obtained by the Kruskal-Wallis test followed by Dunn's multiple comparisons test. (B-D) Frequencies of DNT cells among CD3<sup>+</sup> T cells from HCs, TNs, IRs and PIRs ( $n=22-139$  each group).  $P$  values were obtained by Kruskal-Wallis test followed by Dunn's multiple comparisons test and unpaired t-test. (E-H) Correlation between frequency of DNT cells among CD3<sup>+</sup>T cells with CD4<sup>+</sup> T cell count (E), CD4/CD8 ratio (F), HLA-DR<sup>+</sup>CD38<sup>hi</sup> CD8<sup>+</sup> T cells (G), and HLA-DR<sup>+</sup>CD38<sup>hi</sup> CD4<sup>+</sup> T cells (H). Spearman's non-parametric test was used to test for correlations. \*\* $P<0.01$ , \*\*\* $P<0.001$ .

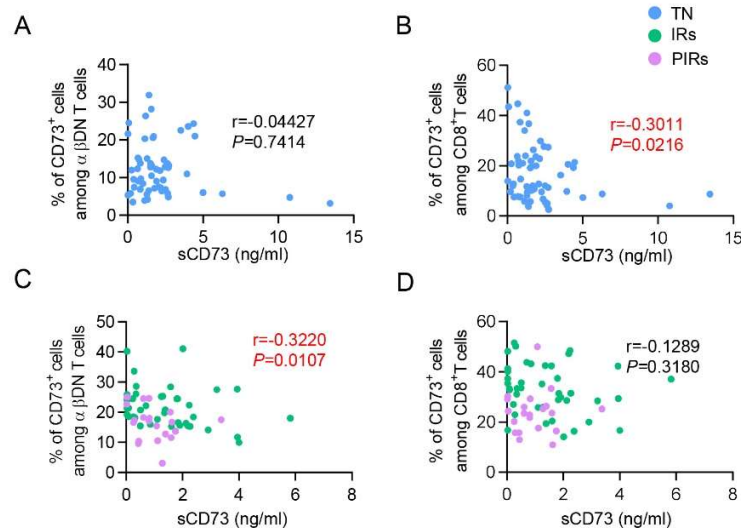
## Supplementary Material



**Fig. S3 Correlation of virus load with CD73<sup>+</sup> DNT frequency and sCD73 level**

Correlation of virus load with the frequency of CD73<sup>+</sup> DNT cells (A, n=139) and the concentration of sCD73 in baseline (B, n=58). Spearman's non-parametric test was used to test for correlations.

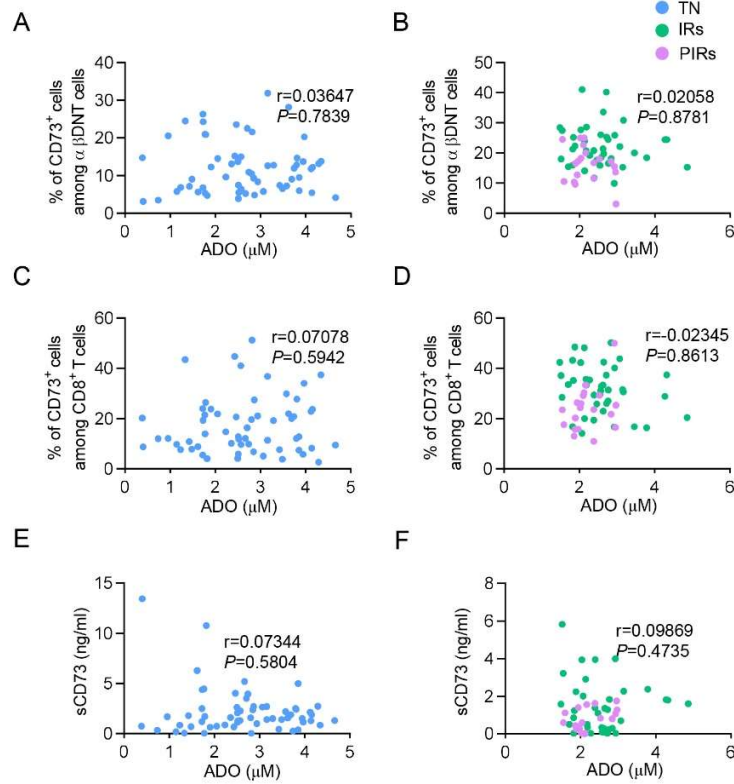
## Supplementary Material



**Fig. S4 Correlation of sCD73 level with frequencies of CD73<sup>+</sup> DNT cells and CD73<sup>+</sup> CD8<sup>+</sup> T cells**

(A-B) Correlation of sCD73 level with the frequency of CD73<sup>+</sup> DNT cells (A) and CD73<sup>+</sup> CD8<sup>+</sup> T cells (B) in TNs (n=58). (C-D) Correlation of sCD73 level with the frequency of CD73<sup>+</sup> DNT cells (C) and CD73<sup>+</sup> CD8<sup>+</sup> T cells (D) in IRs and PIRs (n=41 for IRs, n=21 for PIRs). Spearman's non-parametric test was used to test for correlations.

## Supplementary Material



**Fig. S5 Correlation of ADO level with frequencies of CD73<sup>+</sup> DNT cells, CD73<sup>+</sup> CD8<sup>+</sup> T cells, and sCD73**

(A-B) Correlation of ADO level with the frequency of CD73<sup>+</sup> DNT cells in TNs (n=59) and in IRs and PIRs (n=39 for IRs, n=19 for PIRs). (C-D) Correlation of ADO level with the frequency of CD73<sup>+</sup> CD8<sup>+</sup> T cells in TNs (n=59) and in IRs and PIRs (n=39 for IRs, n=19 for PIRs). (E-F) Correlation of ADO level with the sCD73 in TNs (n=59) and in IRs and PIRs (n=39 for IRs, n=19 for PIRs). Spearman's non-parametric test and Pearson correlation test was used to test for correlations.

## Supplementary Material

### Supplementary Tables

#### Supplementary Table 1 Demographic and clinical characteristics of participants in the retrospective cohort study

Characteristics	All patients (n=171)
Sex (M/F)	169/2
Age (mean, years)	36±10
Baseline CD4 <sup>+</sup> T cell count (cells/mm <sup>3</sup> ), median (IQR)	171(43-262)
Baseline CD8 <sup>+</sup> T cell count (cells/mm <sup>3</sup> ), median (IQR)	834(620-1101)
Baseline CD4/CD8 ratio at baseline, median (IQR)	0.18(0.06-0.30)
Baseline HIV RNA viral load (copies/mL), median (IQR)	67747(26842-180500)

Abbreviations: PLWH, people living with HIV; M, male; F, female.

Supplementary Material

**Supplementary Table 2 Incidence of poor immune reconstitution in groups of high and low sCD73 at different time-points post ART**

	High-sCD73 (n=70)	Low-sCD73 (n=101)	<i>P</i>
1-year <sup>a</sup>	48/69 (69.6%)	53/101 (52.5%)	<b>0.026</b>
2-year <sup>b</sup>	41/70 (58.6%)	43/100(43.0%)	<b>0.046</b>
3-year <sup>c</sup>	34/68 (50.0%)	30/101 (29.7%)	<b>0.008</b>
4-year <sup>d</sup>	35/69 (50.7%)	28/101 (27.7%)	<b>0.002</b>
5-year <sup>e</sup>	37/60 (61.7%)	24/93 (25.8%)	<b>&lt;0.0001</b>

<sup>a</sup>One patient of high-sCD73 lost the result of CD4<sup>+</sup> T cell count.

<sup>b</sup>One patient of low-sCD73 lost the result of CD4<sup>+</sup> T cell count.

<sup>c</sup>Two patients of high-sCD73 lost the results of CD4<sup>+</sup> T cell count.

<sup>d</sup>One patient of high-sCD73 lost the result of CD4<sup>+</sup> T cell count.

<sup>e</sup>Ten patients of high-sCD73 lost the results of CD4<sup>+</sup> T cell count and eight patients of low-sCD73 lost the results of CD4<sup>+</sup> T cell count.

*P* values were obtained by Chi-square test. Bold numbers represent *P*<0.05

Abbreviations: ART, antiretroviral therapy; sCD73, soluble cluster of differentiation 73.

Supplementary Material

**Supplementary table 3 Univariable and multivariable proportional hazards models of soluble plasma factors**

Baseline factors	univariable		multivariable	
	HR (95%CI)	<i>P</i>	HR (95%CI)	<i>P</i>
<b>IL-1<math>\beta</math></b>	<b>1.578 (1.084-2.296)</b>	<b>0.017</b>		
IL-2	1.045 (0.707-1.543)	0.825		
IL-7	1.702 (0.986-2.938)	0.056		
IL-15	1.053 (0.719-1.542)	0.792		
<b>IL-18</b>	<b>1.736 (1.145-2.634)</b>	<b>0.009</b>		
IFN- $\alpha$	1.395 (0.959-2.029)	0.081		
<b>IFN-<math>\gamma</math></b>	<b>1.750 (1.164-2.632)</b>	<b>0.007</b>		
IP-10	1.320 (0.873-1.995)	0.188		
MIP-1 $\beta$	1.238 (0.840-1.824)	0.281		
RANTES	0.925 (0.581-1.474)	0.743		
<b>sCD73</b>	<b>2.069 (1.397-3.063)</b>	<b>&lt;0.0001</b>	<b>2.057 (1.356-3.121)</b>	<b>0.001</b>
<b>TNF-<math>\alpha</math></b>	<b>2.176 (1.433-3.304)</b>	<b>&lt;0.0001</b>	<b>1.913 (1.241-2.950)</b>	<b>0.003</b>

Multivariate analysis is adjusted for all variables with  $P < 0.05$  in univariate analysis. Bold numbers represent  $P < 0.05$

Abbreviations: HR=hazard ratio