

# MULTIOMICS OF DETECTABLE VS. UNDETECTABLE MONOCYTE CELL-ASSOCIATED HIV RNA DURING AHI

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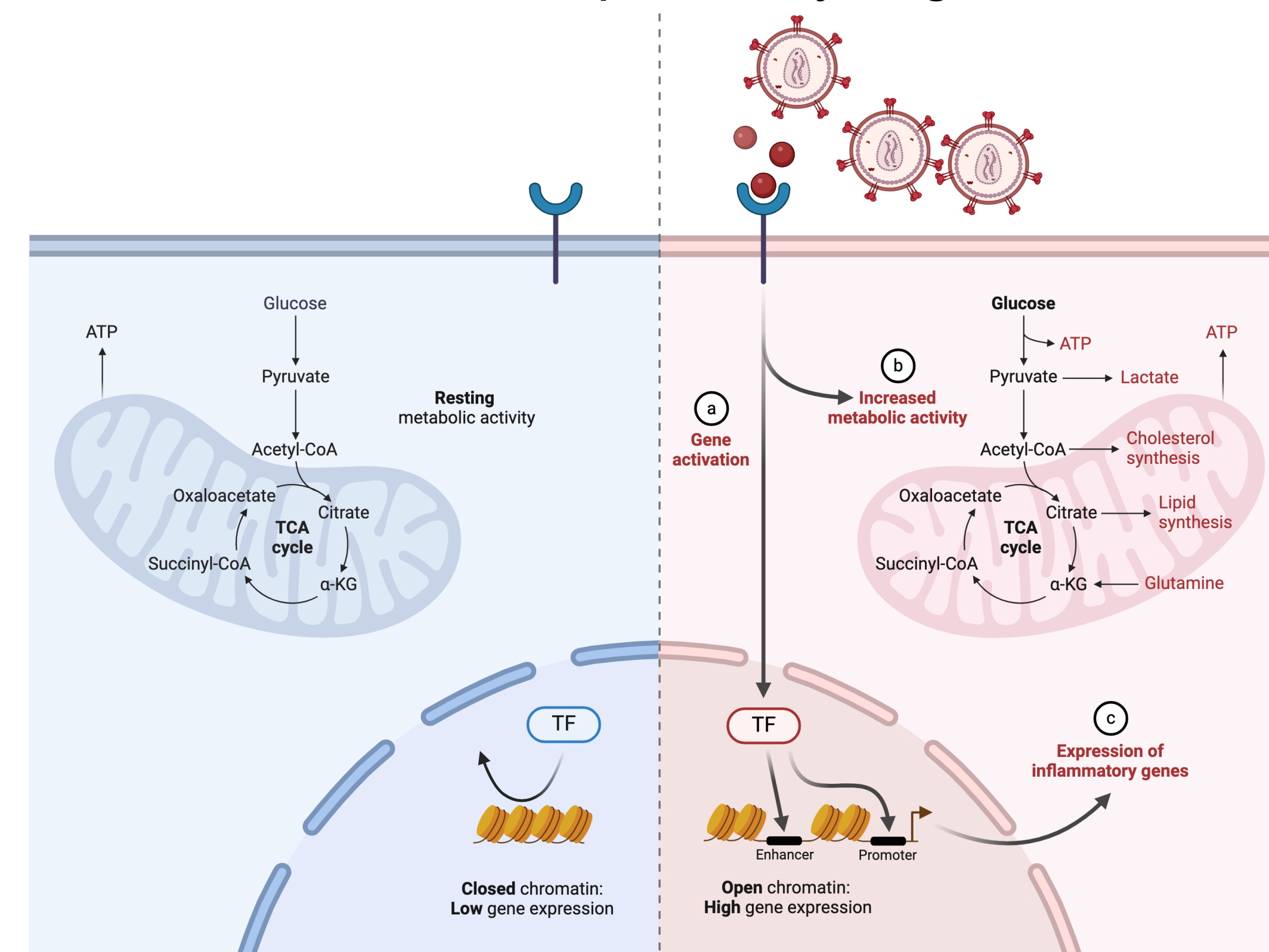
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## BACKGROUND

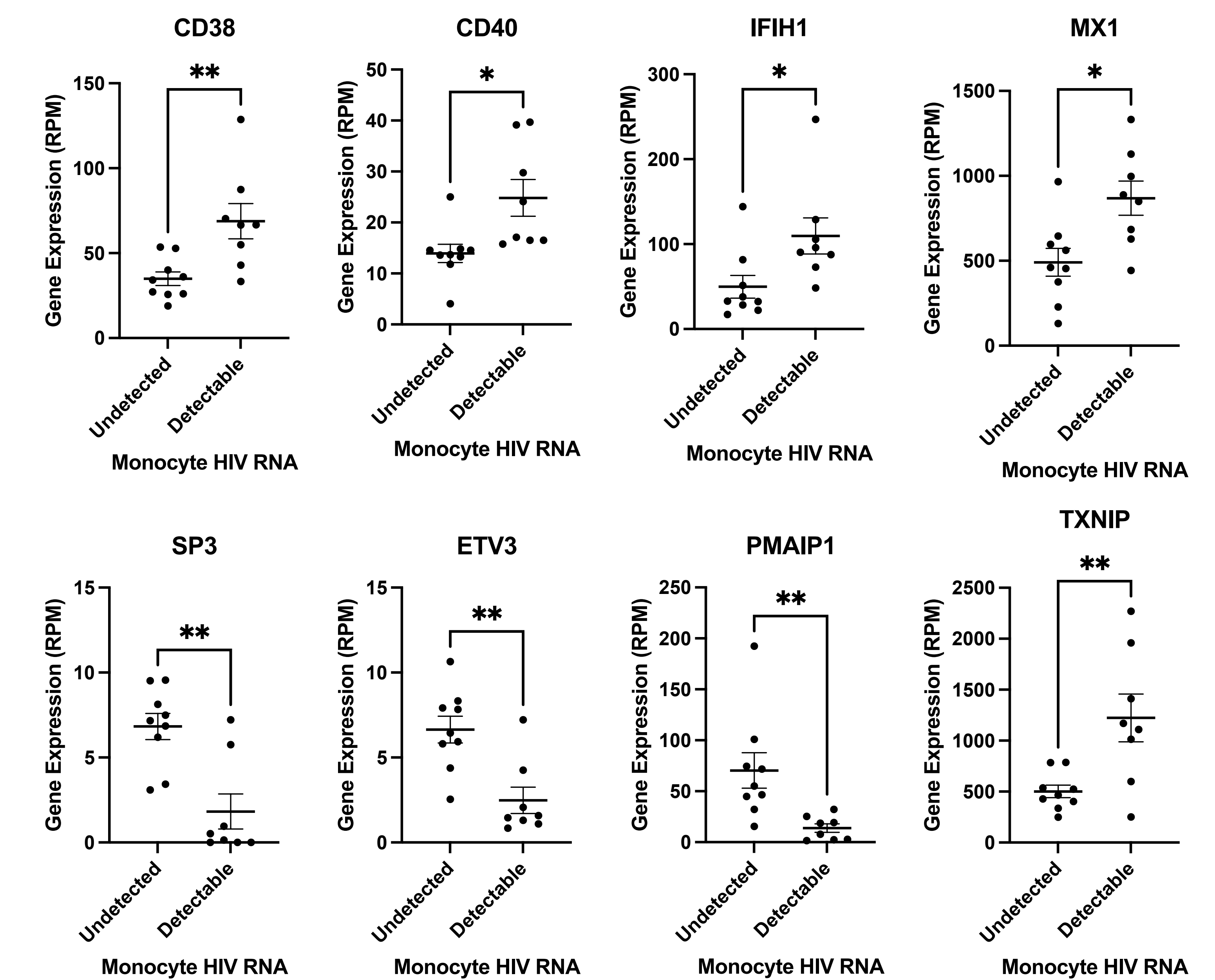
- Monocytes play a significant role in the early immune response during acute HIV infection (AHI) and the extent of dysregulation of myeloid cells has implications for long-term central nervous system (CNS) outcomes.
- We hypothesized that monocytes carrying HIV RNA would show increased transcriptional dysregulation during AHI.

## RESULTS

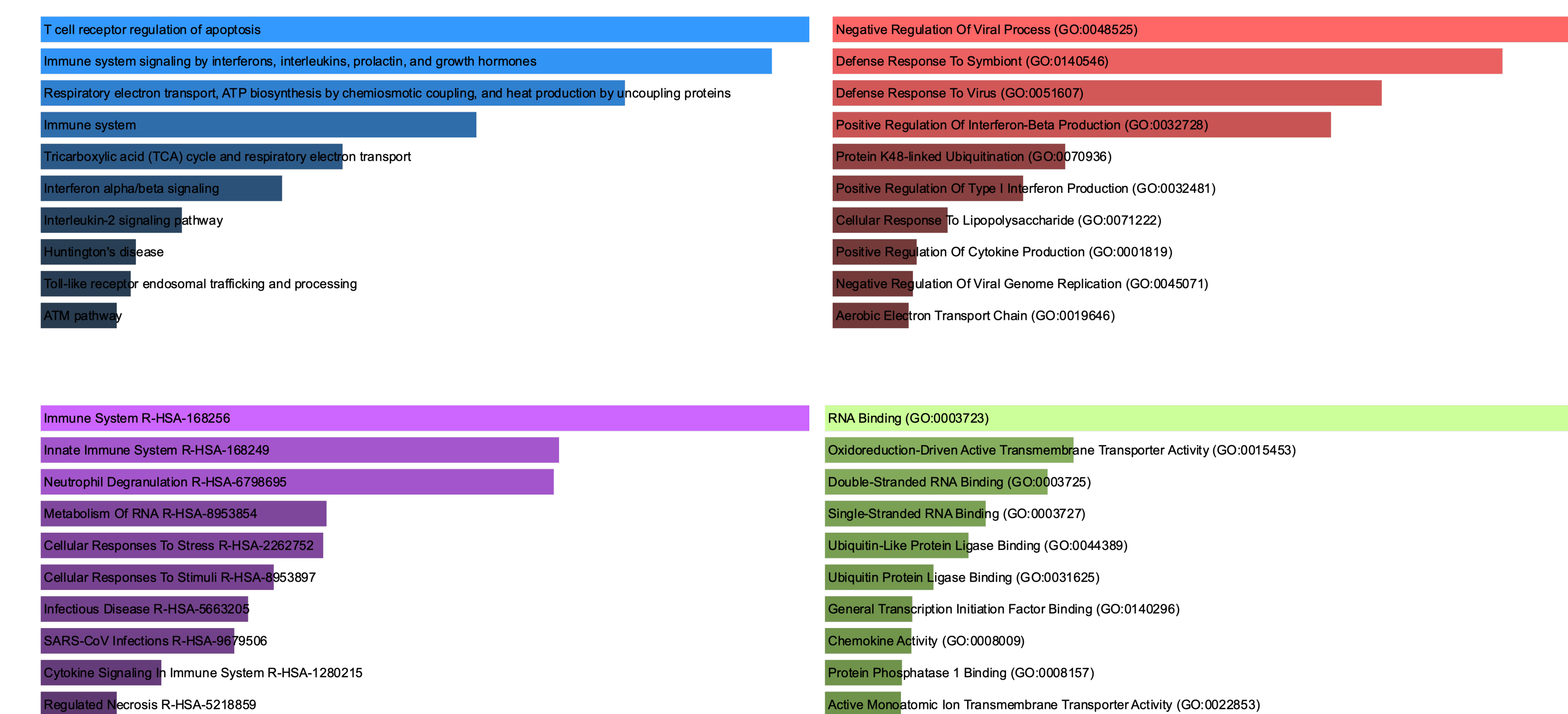
**Detectable monocyte HIV RNA during AHI is linked to notable transcriptional dysregulation, potentially impacting long-term myeloid cell programming and CNS outcomes.**



	Detectable (n=8)	Undetectable (n=9)	P-value
Age (years)	23.5 (19-42)	27 (20-44)	0.79
Male (n, %)	8 (100%)	9 (100%)	1.0
Fiebig stage	2 Fiebig I-II 6 Fiebig III-V	5 Fiebig I-II 4 Fiebig III-V	1.0
CRF01_AE	8 (100%)	9 (100%)	1.0
Plasma HIV RNA (log <sub>10</sub> copies/mL)	6.1 (5.0-7.43)	5.2 (3.9-6.86)	0.06
CD4+ T cell count (cells/uL)	431 (165-576)	476 (234-773)	0.25
CD4/CD8 Ratio	0.45 (0.17-1.16)	0.74 (0.36-1.5)	0.06
NPZ-4	-0.07 (-3.09-0.57)	-0.11 (-1.46-0.68)	0.76



**Figure 3.** Host gene expression of immunomodulatory inflammatory gene CD38, cell surface receptor gene CD40, interferon-induced gene MX1, and viral RNA sensor IFIH1 were significantly higher in participants with detectable versus undetectable monocyte cell-associated HIV RNA. Additionally, we identified that expression of pro-apoptotic BCL-2 protein family gene PMAIP1 and transcription factors SP3 and ETV3 were significantly decreased in participants with detectable versus undetectable monocyte CA-HIV RNA.



**Figure 2.** Enrichr analyses of differentially expressed genes related to detectable monocyte HIV RNA. Pathways enrichments and GO biological process and molecular function enrichments. Adjusted P value < 0.05 and Odds ratio > 1.

## CONCLUSIONS

- 8/17 participants (47%) enrolled during AHI had detectable monocyte HIV CA-RNA, which may relate to host control of myeloid cell viral transcription dynamics.
- In AHI, detectable monocyte HIV RNA is linked to immunomodulatory transcriptional dysregulation, potentially impacting long-term myeloid cell programming and CNS outcomes.

## ACKNOWLEDGEMENTS

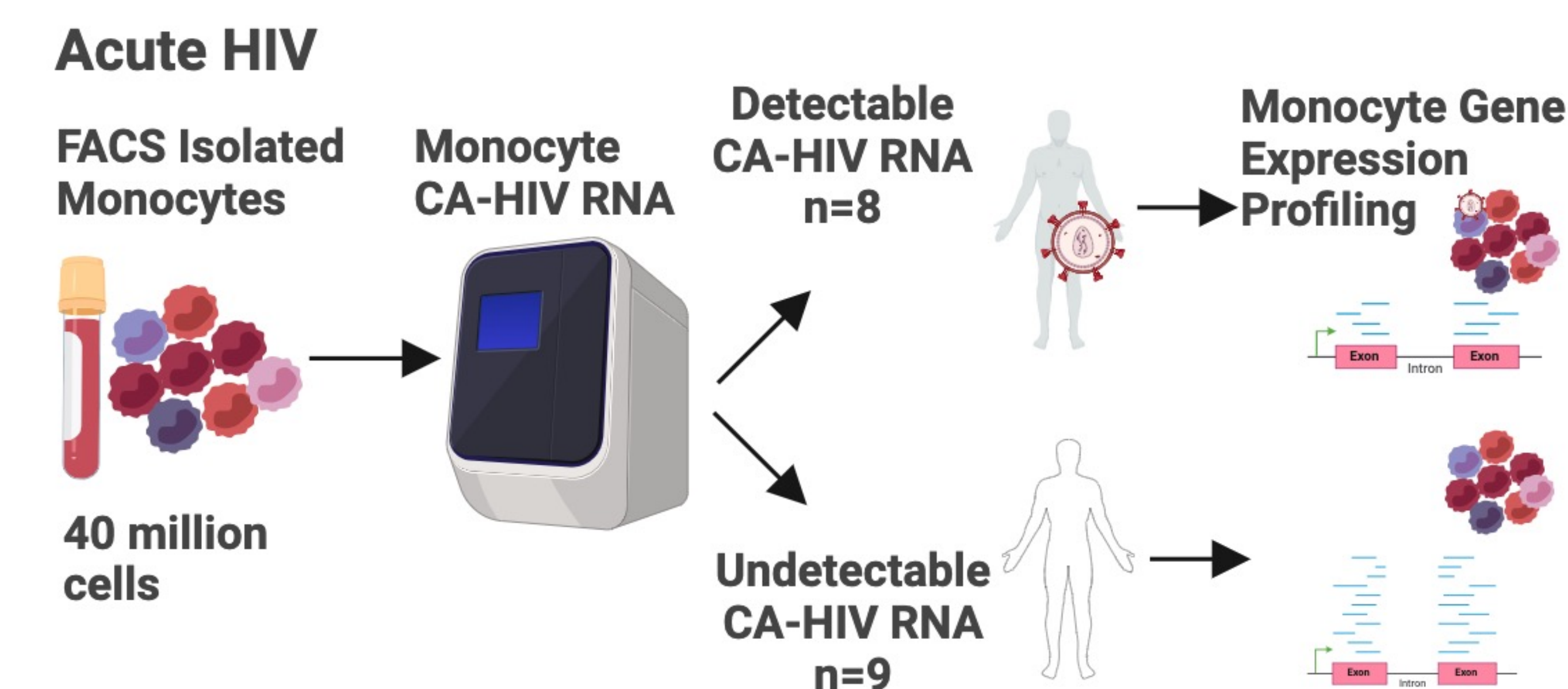
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## METHODS

### Ultra-high purity monocyte isolation by fluorescence activated cell sorting



**Figure 1.** We isolated ultra-high purity monocytes from 25-40 million PBMC aliquots of 17 participants in the Thai RV254/SEARCH010 AHI cohort obtained prior to ART, in AHI (Fiebig I-V) to measure genome-wide transcriptome expression profiles and assess the detection of cell-associated (CA-) HIV RNA. Mann Whitney and T tests examined demographic differences between those with detectable and undetectable monocyte CA-HIV RNA. Differential expression analyses compared participants with detectable versus undetectable HIV RNA using an FDR adjusted P value.