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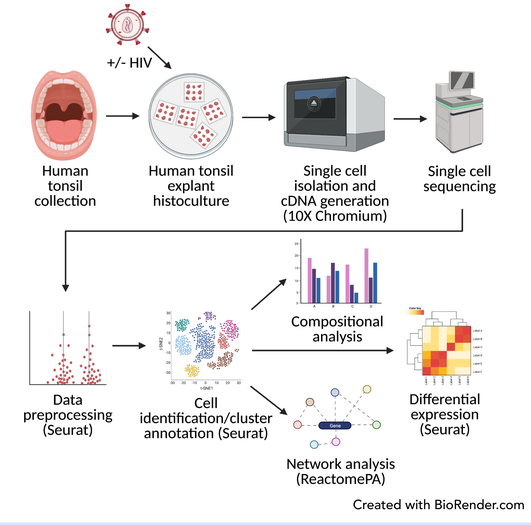
Single-Cell Analysis of a Human Tonsil Explant Histoculture Model of HIV-1 infection

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BACKGROUND

- HIV-1 infection is associated with age-associated noncommunicable comorbidities related to **chronic, dysfunctional, hyperactive inflammation**
- **Human tonsil explant tissue histoculture** preserves native architecture, cellular repertoire, milieu, interactions and functions
- **Objective:** Use single-cell analysis to investigate the effects of HIV-1 infection on human tonsil explant tissue histoculture cells

METHODS



- **Single-cell analysis of a tonsil explant model allows for characterization of key immune cell subsets involved in HIV-1 replication and associated inflammatory responses, typically not accessible via bulk RNA analysis.**
- **HIV-treated tonsil explants contain distinct subgroups of cells with no, low, or high levels of HIV expression. These subgroups are characterized by distinct cell type compositions and gene expression patterns.**

FIGURE 1. Cell types identified in Control and HIV-treated tonsil explants.

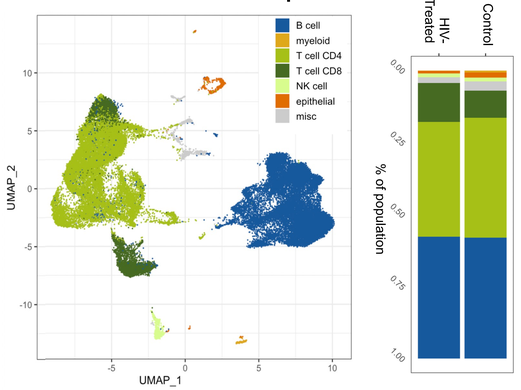


FIGURE 2. HIV-treated cell populations consist of a mixture of cells with no, low, and high levels of HIV expression.

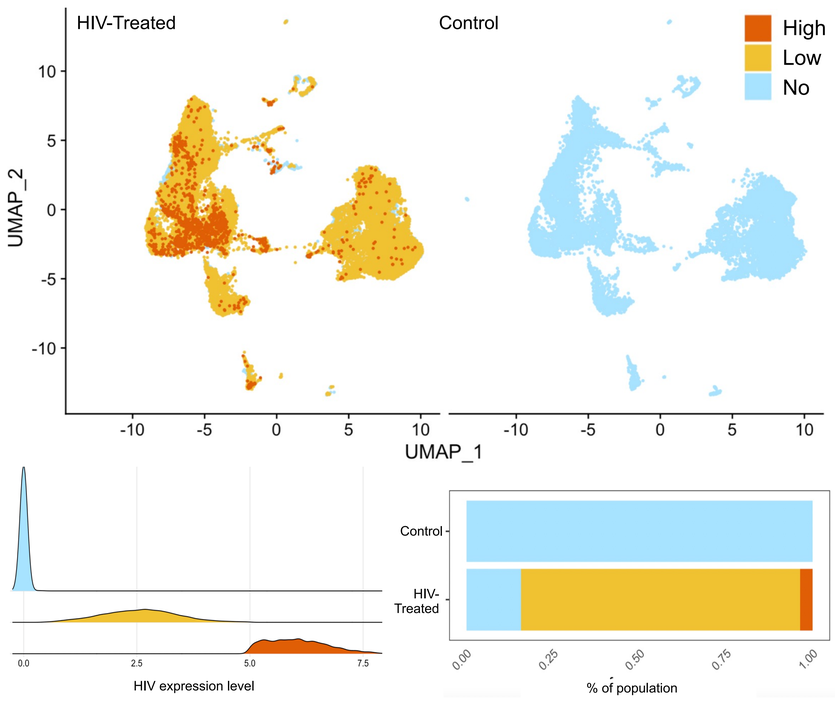


FIGURE 3. No, low, and high HIV-expressing cells demonstrate distinct cell type compositions.

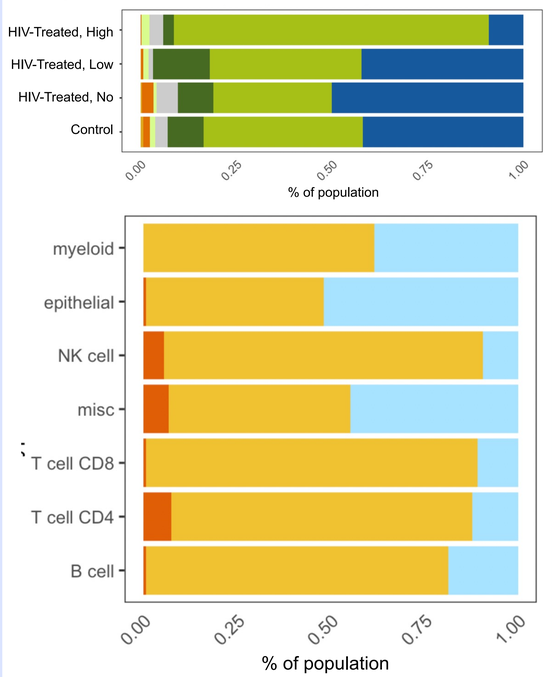
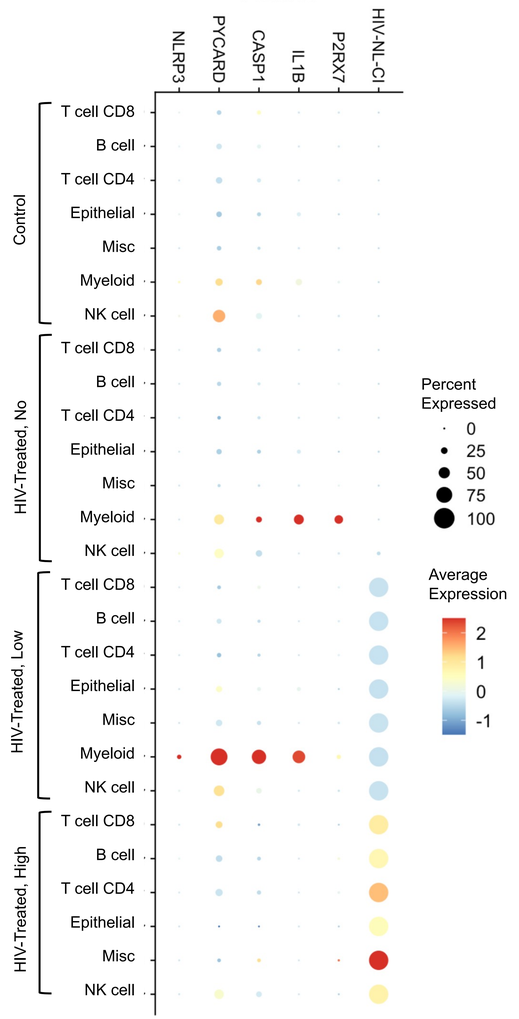


FIGURE 4. High and low HIV-expressing cells demonstrate differential expression of key genes in the purinergic receptor/NLRP3 inflammasome pathway compared to uninfected cells (Control and HIV-treated).



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