

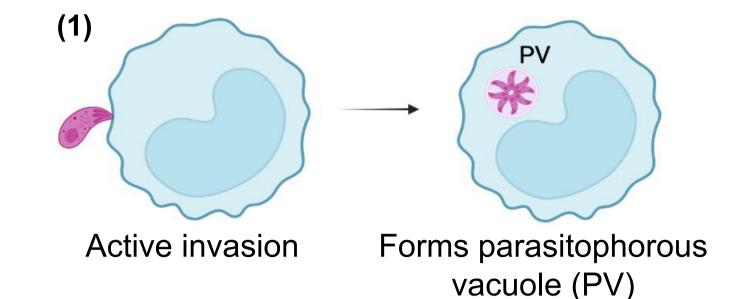


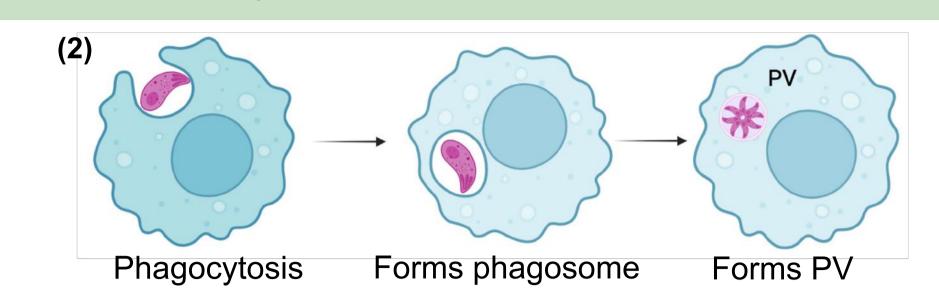
Differential transcriptional responses between heterogenous host-Toxoplasma interactions

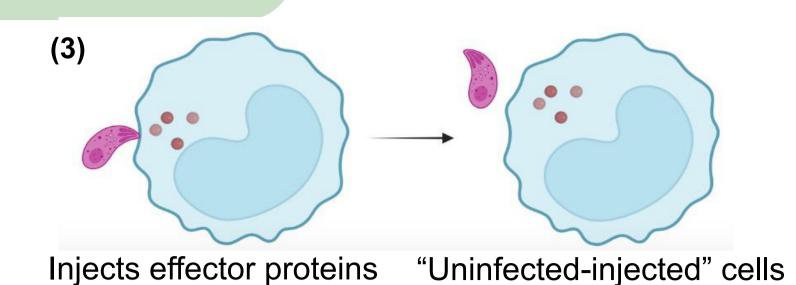
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INTRODUCTION

- Pathogen interaction with host immune cells can simultaneously produce different outcomes.
- Hence, it is important to understand host-pathogen interaction at a single cell level.
- *Toxoplasma gondii* can simultaneously produce distinct infection outcomes in the same host¹⁻².

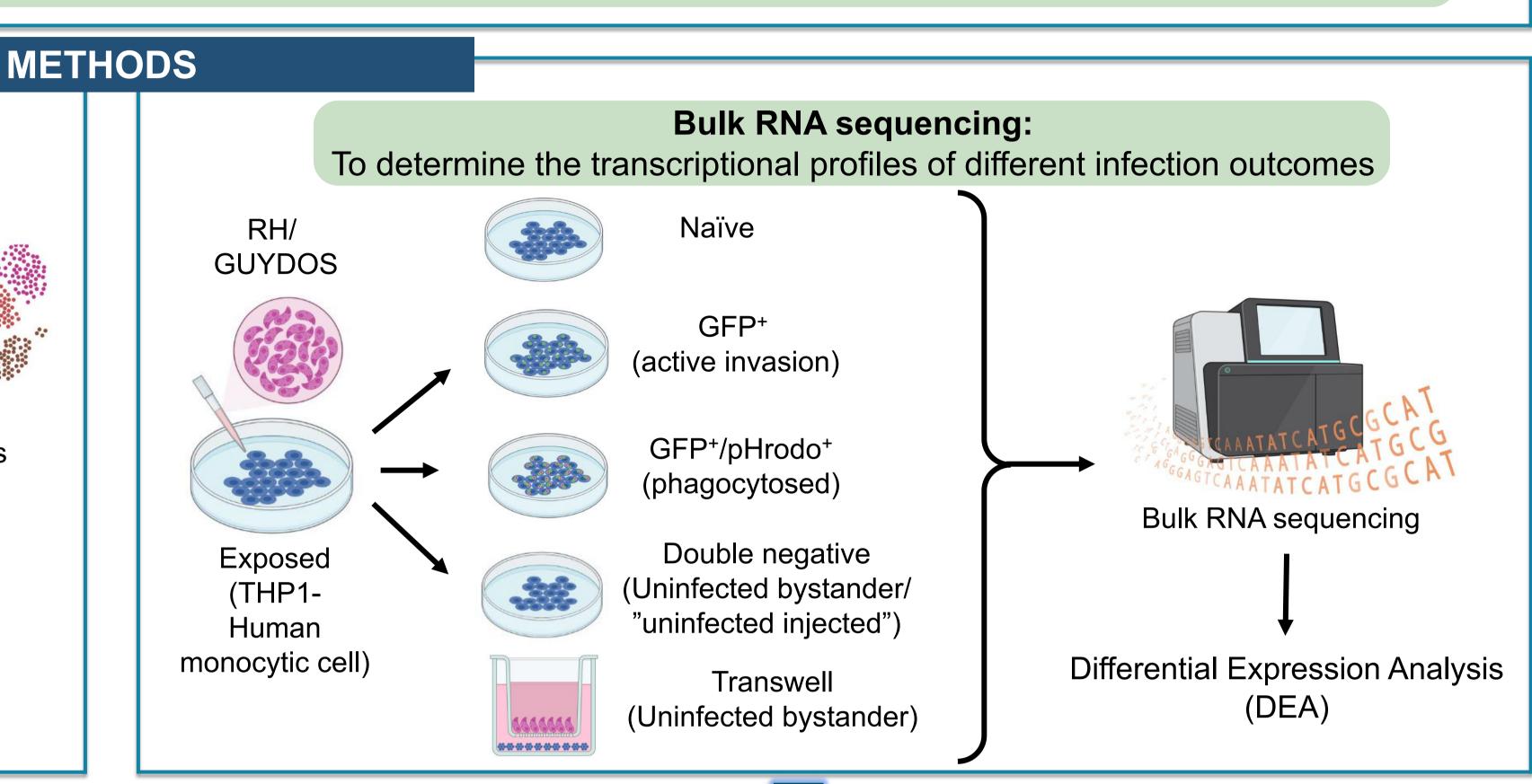


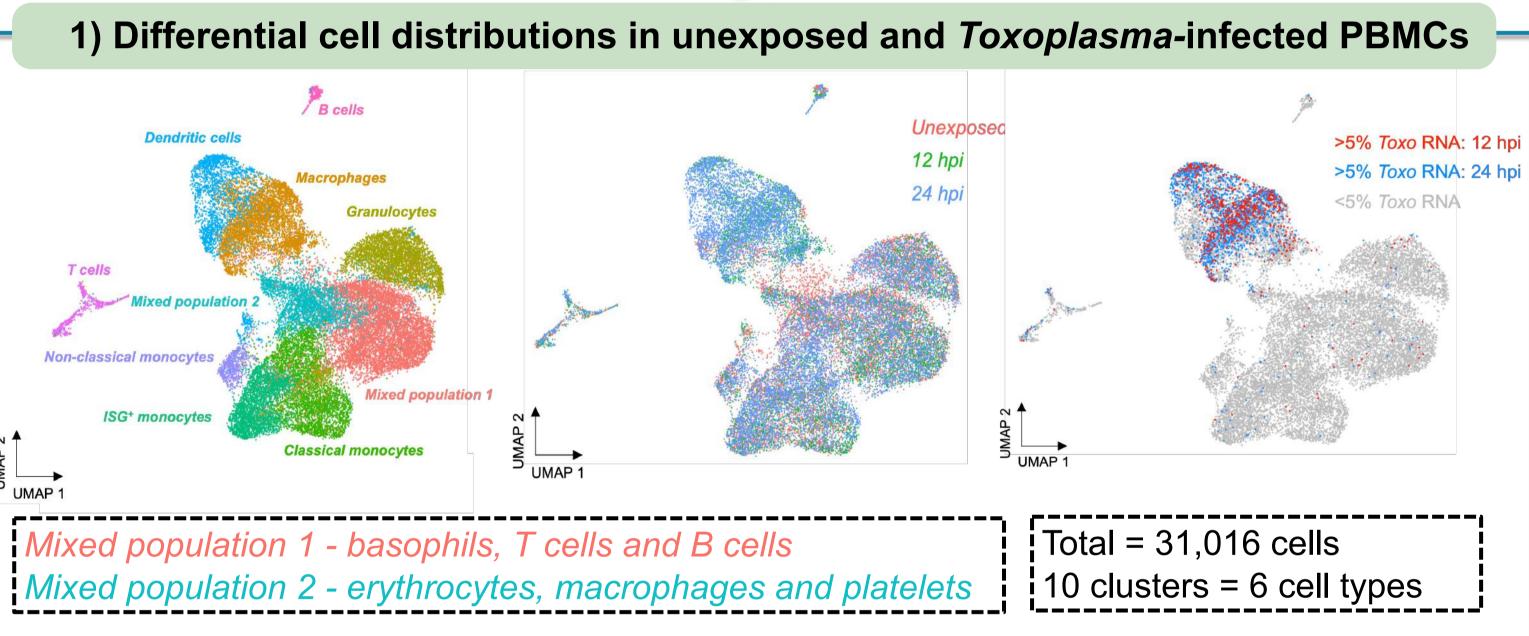


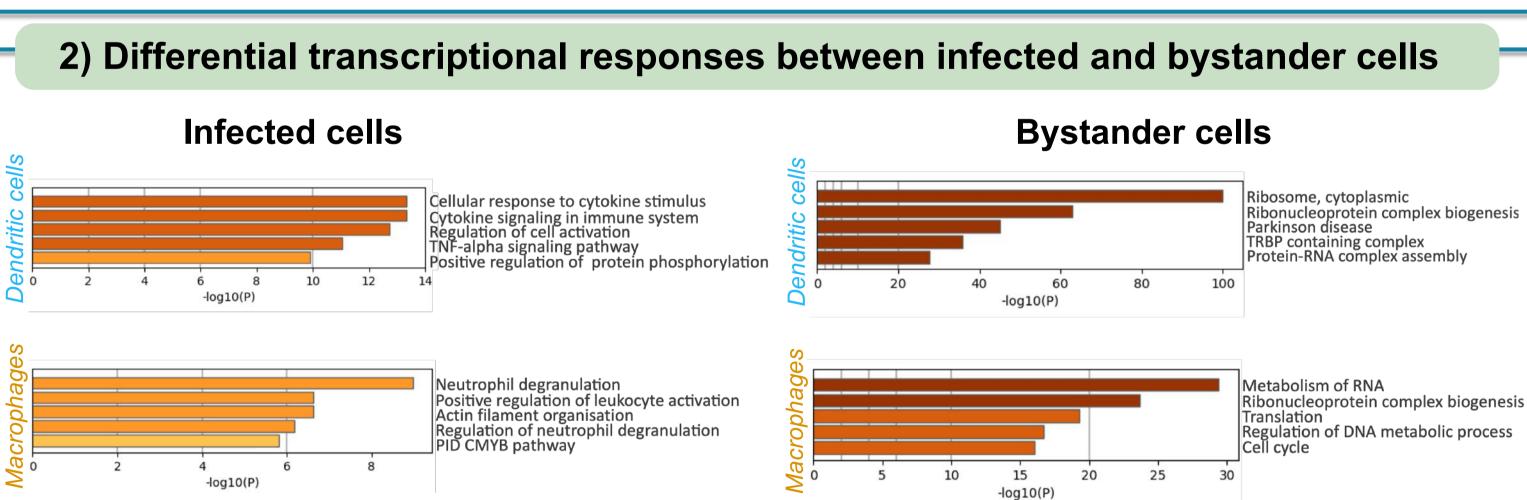


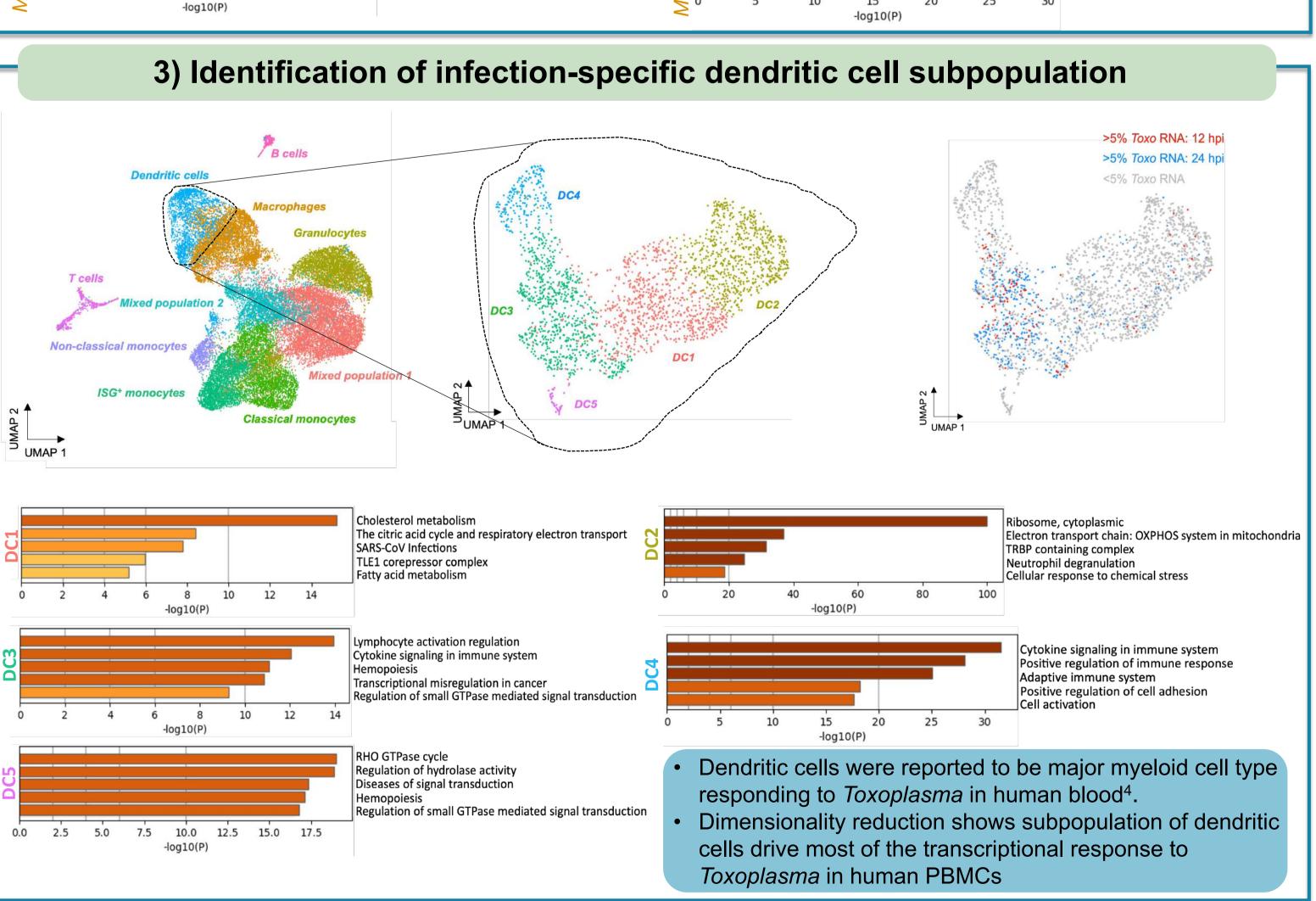
Aim: To investigate the transcriptional programs that underpin heterogenous *Toxoplasma*-human peripheral blood mononuclear cells (PBMCs) interactions using a combination of dual single cell and bulk RNA sequencing

Single cell RNA sequencing: To investigate transcriptional profile of PBMCs during infection PBMC (n = 3)Data Analysis **D1 D2 D3** 10x Chromium Unexposed 12 hpi 24 hpi

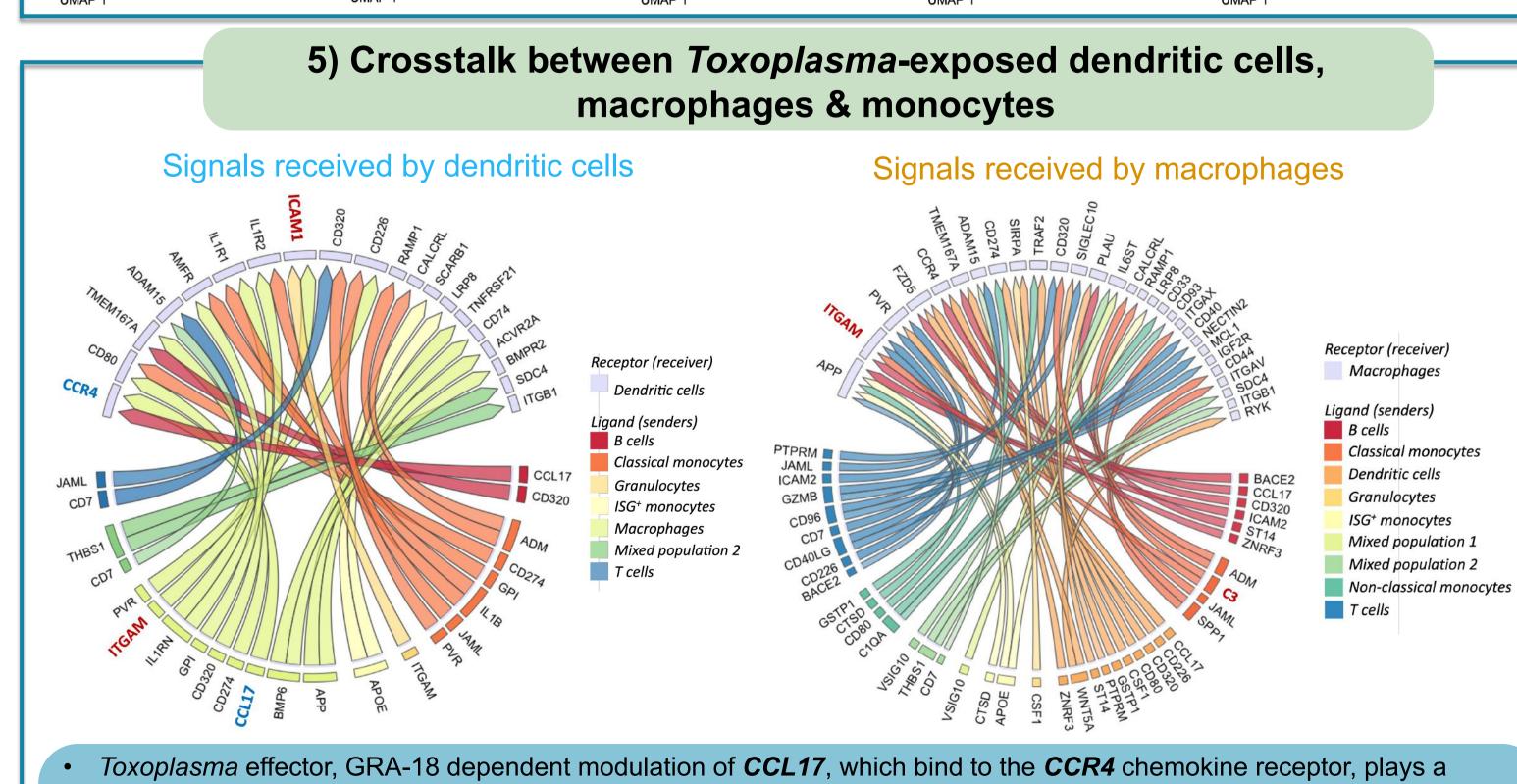








4) Transcriptional heterogeneity in *Toxoplasma*-exposed monocytes Log₂ fold change > 2 Non significant Adjusted P-value < 0.05 & Log₂ fold change > 2 GFP⁺ vs. other infection outcomes GFP⁻ pHrodo⁻ vs. other infection outcomes 12.5 -10.0 RNU2-58P TCAM1P 5.0 Investigated the expression of the differentially RAET1K EGR2 expressed genes from RNAseg in scRNA clusters. Log₂ fold change Log₂ fold change total = 62649 variables Further validations required to determine if the Transwell vs. other infection outcomes GFP⁺ pHrodo⁺ vs. other infection outcomes differentially expressed genes can serve as reference for the heterogenous infection outcomes. Log₂ fold change **ULBP1** CCL22 EGR2 EGR3



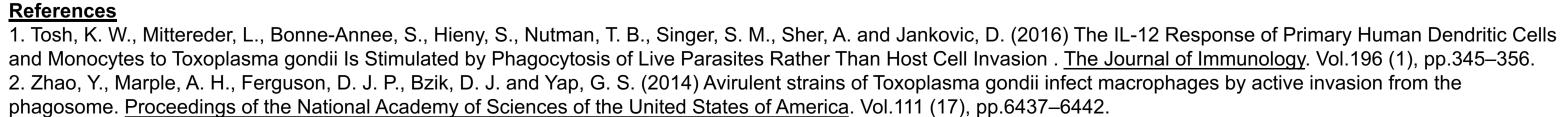
- crucial role in *Toxoplasma* virulence and its ability to influence the immune response⁵⁻⁷. C3 regulate the clearance of Toxoplasma by macrophages via the non-canonical IFN γ dependent autophagy pathway⁸.
- It is possible that classical monocytes release C3 in response to Toxoplasma, opsonising the pathogen in infected cells.
- Macrophages, expressing ITGAM, recognise and bind to the opsonised parasites, clearing them through phagocytosis. ITGAM-ICAM1 interactions are involved in coordinating immune responses, such as antigen presentation, and modulating the activities of other immune cells to promote cell adhesion.

CONCLUSION

- Dendritic cells and macrophages are the key players during acute infection, with distinct subpopulations within dendritic cells exhibiting different responses.
- Ligand-receptor interactions provided insights into complex cell-cell communication and host molecular responses.
- Our study emphasizes the importance of studying the host immune responses with diverse immune cells.







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