Signaling triggered by macrophages is associated with exhaustion of T cells in COVID-19

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Video Byte

Keywords: Cell Communication and Signaling, COVID-19, SARS-CoV-2, single cell RNA-sequencing, macrophage, T cell, retrospective, cytokines, immunopathology, prognostic indicators, risk factors, CD4+ T cells, CD8+ T cells

Posted Date: October 13th, 2021

DOI: <https://doi.org/10.21203/rs.3.rs-966256/v1>

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Abstract

The COVID-19 outbreak is a devastating ongoing pandemic. Most patients experience mild symptoms, but some develop severe disease. An even smaller subset of patients develop acute respiratory distress syndrome, which has high mortality. To unravel the molecular mechanisms at play, researchers retroactively examined clinical records from patients with confirmed COVID-19. They found that severe cases had increased levels of inflammatory damage markers and lower T cell numbers – including total T cells, CD4+, and CD8+ T cells – than moderate cases. Analysis of public single-cell RNA-seq data revealed severe cases had increased clonal expansion of macrophages and highlighted that high-TREM2-expressing macrophages were dramatically enriched in moderate cases of COVID-19. Cell communication analysis suggested that high-TREM2 macrophages drive ligand-receptor cross talk, which may contribute to the exhaustion of CD8+ cells. Another potential contributor was the concomitant rise in inflammatory cytokines from these macrophages. While laboratory confirmation of the interaction between macrophages and T cells is required, this study provides key insights into the immunopathology of COVID-19 and new targets for prognosis and therapy.