

# New insights into the immune system's role in severe COVID-19

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By conducting advanced analyses of immune system activation in patients with severe COVID-19, researchers at Karolinska Institutet have managed to identify several cell types that play a key part in the immune response to the new coronavirus and the hyperinflammation seen in severe cases of the disease. The results are published in the scientific journal *Cell Reports Medicine*.

"These findings are valuable in improving the clinical evaluation of patients and in the development of new treatments that modulate and mitigate the over-reaction of the immune system in patients with severe COVID-19," says principal investigator Petter Brodin, pediatrician and researcher in immunology at the Department of Women's and Children's Health, Karolinska Institutet.

The analyses were conducted at the Science for Life Laboratory (SciLifeLab) in Solna, Sweden, on samples taken from patients with severe COVID-19 treated in Helsinki, Finland. The researchers employed a combination of advanced techniques to analyze the entire composition and function of the immune system in up to 14 repeated [blood samples](#) from each patient.

"This has enabled us to make an unusually detailed analysis of immune system activation during severe COVID-19, and we have described several new details of immune system response to the virus and its hyperresponsiveness in severely ill patients," says Dr. Brodin.

Their results show, among other things, that a kind of white blood cells called eosinophils, which are well-documented in asthma but whose function is less understood in respiratory infections in the lungs, play an important role in severe COVID-19. These cells expand in the blood shortly before the patients suffer a deterioration due to pulmonary hyperinflammation, and ARDS (acute respiratory distress syndrome), requiring intensive care. Other [white blood cells](#) called basophils are found in this study to be involved in the development of strong antibody responses during the infection. The researchers have also identified how the immune system recovers in the patients who recovered from severe COVID-19.

**More information:** Lucie Rodriguez et al. Systems-level immunomonitoring from acute to recovery phase of severe COVID-19,

*Cell Reports Medicine* (2020). [DOI: 10.1016/j.xcrm.2020.100078](https://doi.org/10.1016/j.xcrm.2020.100078)

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