

Study is first to identify potential therapeutic targets for COVID-19

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Dr. Douglas Fraser led a research team that identified a unique pattern of six molecules that could be used as therapeutic targets to treat the COVID-19 virus. Credit: Lawson Health Research Institute

A team from Lawson Health Research Institute and Western University

are the first in the world to profile the body's immune response to COVID-19. By studying blood samples from critically ill patients at London Health Sciences Centre (LHSC), the research team identified a unique pattern of six molecules that could be used as therapeutic targets to treat the virus. The study is published this week in *Critical Care Explorations*.

Since the pandemic's start there have been reports that the [immune system](#) can overreact to the virus and cause a cytokine storm—elevated levels of inflammatory molecules that damage [healthy cells](#).

"Clinicians have been trying to address this hyperinflammation but without evidence of what to target," explains Dr. Douglas Fraser, lead researcher from Lawson and Western's Schulich School of Medicine & Dentistry and Critical Care Physician at LHSC. "Our study takes away the guessing by identifying potential therapeutic targets for the first time."

The study included 30 participants: 10 COVID-19 patients and 10 patients with other infections admitted to LHSC's intensive care unit (ICU), as well as 10 healthy control participants. Blood was drawn daily for the first seven days of ICU admission, processed in a lab and then analyzed using statistical methods and artificial intelligence (AI).

The research team studied 57 inflammatory molecules. They found that six molecules were uniquely elevated in COVID-19 ICU patients ([tumor necrosis factor](#), granzyme B, heat shock protein 70, interleukin-18, interferon-gamma-inducible protein 10 and elastase 2).



Blood samples from critically ill COVID-19 patients. Credit: Lawson Health Research Institute

The team also used AI to validate their results. They found that inflammation profiling was able to predict the presence of COVID-19 in critically ill patients with 98 percent accuracy. They also found that one of the molecules ([heat shock protein](#) 70) was strongly associated with an increased risk of death when measured in the blood early during the illness.

"Understanding the [immune response](#) is paramount to finding the best treatments," says Dr. Fraser "Our next step is to test drugs that block the harmful effects of several of these molecules while still allowing the immune system to fight the virus."

More information: Douglas D. Fraser et al, Inflammation Profiling of Critically Ill Coronavirus Disease 2019 Patients, *Critical Care Explorations* (2020). [DOI: 10.1097/CCE.0000000000000144](https://doi.org/10.1097/CCE.0000000000000144)

Provided by Lawson Health Research Institute

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