

# Are we treating long COVID wrong? Immune-boosting treatment takes new approach



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Long COVID could be causing an abnormally suppressed immune system in some patients, according to research. Gustavo Minas/Getty Images



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targeted treatments for this condition.

- A small pilot study reports that a monoclonal antibody, leronlimab, can improve symptoms in some individuals with long COVID.
- The study's findings suggest that leronlimab could improve long COVID symptoms by boosting immunity, contrary to the




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A monoclonal antibody treatment called [leronlimab](#)  could reduce [long COVID](#) symptoms in some patients, according to a recent pilot study published in the journal [Clinical Infectious Disease](#).

The study's results suggest that leronlimab can alleviate long COVID symptoms by boosting the immune system in individuals who previously had a suppressed immune system.

Scientists have considered persistent [inflammation](#) as one of the causes underlying long COVID. In contrast, the study's findings suggest that the downregulation of the immune system could be responsible for long COVID in some individuals.

## Long COVID and inflammation

A majority of individuals with COVID-19 recover fully within the initial 3-4 weeks after contracting the illness. However, around 10-[30](#) % of individuals experience lingering symptoms weeks and months after the



Since the symptoms of long COVID vary from person to person, the mechanisms underlying long COVID are not well understood. This has also hindered the development of treatments targeting the factors responsible for causing long COVID.

Severe illness during the acute phase of a [SARS](#)-CoV-2 infection is characterized by excessive inflammation and a dysregulated immune response. Scientists have hypothesized that these atypical immune responses during the acute infection phase could lead to persistent inflammation. This chronic inflammation could be potentially [responsible](#) ✓ for long COVID symptoms.

Indeed, studies have reported that individuals with long COVID show elevated levels of inflammatory [cytokines](#), which are a class of proteins involved in mediating the body's immune response.

**Thus, scientists have been turning to treatments that normalize the immune system to help alleviate symptoms of long COVID. One such candidate is the monoclonal antibody leronlimab which blocks the cytokine receptor CCR5.**

The CCR5 receptor is expressed by immune cells and is involved in mediating an immune response against an infection. Previous [studies](#) ✓ have shown that leronlimab can reduce the levels of inflammatory cytokines in individuals hospitalized with severe COVID-19.

Hence, the study's authors decided to assess the ability of leronlimab in reducing long COVID symptoms.

## Effects on long COVID symptoms

The present study involved 55 individuals with long COVID who received a weekly injection of either leronlimab or saline [placebo](#) over an 8-week period.

To evaluate the effectiveness of leronlimab, the researchers tracked changes in 24 symptoms commonly associated with long COVID over the



**They found that a higher percentage of individuals in the leronlimab-treated group showed improvements in several long COVID symptoms than in the placebo group.**

However, not all individuals receiving leronlimab showed an improvement in their symptoms.

## Measuring immune response

The researchers then examined the impact of leronlimab on CCR5 expression in long COVID.

Individuals treated with leronlimab showed an increase in the percentage of immune cells expressing CCR5 after 8 weeks. The control group did not show an increase in their CCR5 expression.

In addition, the researchers found differences in CCR5 expression among individuals within the leronlimab-treated group. Individuals who responded to leronlimab showed lower levels of CCR5 expression at the beginning of the study than those who did not respond to the treatment.

Significantly, only individuals in the leronlimab-treated group who responded to the treatment showed an increase in CCR5 expression during the 8-week period. Such an increase in CCR5 expression was absent in non-responders.



“Patients who improved were those who started with low CCR5 on their T cells, suggesting their immune system was less active than normal, and levels of CCR5 actually increased in people who improved.”

Dr. Yang indicates that this could change approaches to long COVID treatments.

**“This leads to the new hypothesis that long COVID in some persons is related to the immune system being suppressed and not hyperactive and that while blocking its activity, the antibody can stabilize CCR5 expression on the cell surface leading to upregulation of other immune receptors or functions,” he says.**

The researchers also found that treatment with leronlimab increased the number of specific immune cell populations, such as T cells. This further suggests that blocking CCR5 with leronlimab boosted the immune system in some individuals with long COVID.

## A possible long COVID treatment?

[Dr. Rajeev Mehlotra](#), a research associate at Case Western Reserve University, who was not involved in the study, told *Medical News Today* that the findings add another perspective to efforts to understand long COVID.

“As the studies targeting CCR5 for COVID-19 treatment are performed, and such treatments start becoming increasingly available, this study adds another view to the mechanism associated with leronlimab treatment,” Dr. Mehlotra said.

**“Considering this ‘unexpected’ mechanism together with existing knowledge may lead to a more comprehensive understanding of the pathogenesis and treatment outcomes in COVID-19 patients,” he added.**

Previous studies have shown that individuals who are genetically  
 associated to possess lower levels of CCR5  and also increased levels of



expression could influence whether individuals with long COVID respond to leronlimab treatment.

[Dr. Saurabh Mehandru](#), a professor of gastroenterology at the Icahn School of Medicine at Mount Sinai, told *MNT* that the study's findings could help reveal some of the yet-unknown mechanisms behind long COVID.

**"It is encouraging to note that there are interesting cellular and receptor expression differences between treatment responders and non-responders. This could suggest an underlying biological mechanism that could be further explored in pre-clinical or clinical studies on patients with long COVID," he said.**

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