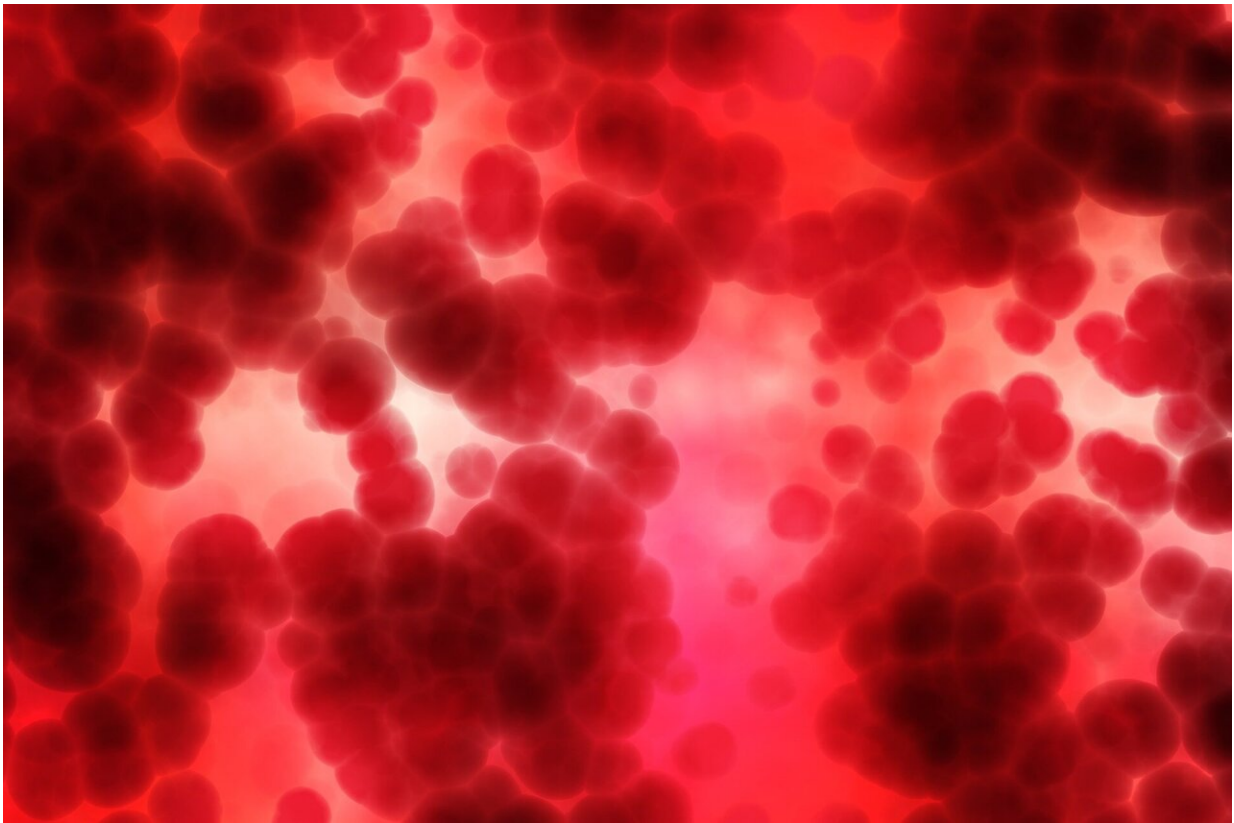


COVID-19 antibodies in donated plasma decline within first months after symptom onset

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Although there is still uncertainty about the clinical benefits and role of convalescent plasma to treat COVID-19, new research suggests that the

earlier plasma is collected after the donor's recovery from COVID-19, the better, as antibodies start to disappear after three months of symptom onset. The results, which authors say may also have implications for vaccine design and for prevalence studies in communities trying to gauge how many people have recovered from the virus, are published today in the journal *Blood*.

When someone is infected with a virus, their body makes antibodies to fight the infection. After recovery, antibodies may remain in a person's blood [plasma](#) for months or even years. In convalescent plasma treatment, people who are newly ill—in this case with the coronavirus—receive plasma from a recovered person in the hopes that it will bolster their own ability to fight off the virus and limit its severity.

"While many [clinical trials](#) are underway to better understand whether convalescent plasma is clinically beneficial for treating COVID-19, a key question is at what time point is it most effective to collect donor plasma based on the presence of antibodies that help fight the virus," said Renée Bazin, Ph.D., of the Héma-Québec blood center (Canada) and author of the study. "Based on our findings, antibodies against the new [coronavirus](#) are not eternal."

This small study, which drew from 282 COVID-19 plasma donors in Quebec, Canada, followed 15 adults (11 males and 4 females) who were diagnosed with and subsequently recovered from COVID-19. While symptoms ranged from mild to severe, none of these donors were hospitalized for their COVID-19 infection. Participants each donated their plasma between four and nine times with the first donation occurring between 33 and 77 days after symptom onset and the last donation between 66 and 114 days.

Dr. Bazin said the present study is one of the first longitudinal analyses to show that people who were seropositive—that is, they had produced

antibodies against the virus that causes COVID-19—become seronegative, which means there were no detectable antibodies after a certain point. The decline in antibodies over time appears unrelated to the number of times someone donated blood plasma and is, instead, due to the elapsed time since the infection and a natural waning of the immune response. All 15 donors showed decreases in antibodies at the same time, around 88 days, and half of the detectable antibodies decreased within 21 days afterward.

"The antibodies disappear rapidly, so people recovering from COVID-19 who want to donate blood plasma should not wait too long once they become eligible to donate," said Dr. Bazin.

For this analysis, the research team focused on antibodies to one target for the virus called the receptor binding domain (RBD). RBD is a protein on the surface of the virus that acts like a key. It binds to the ACE-2 receptor on the surface of cell, in turn, unlocking a door through which the virus enters and infects the cell. But the [immune system](#) can develop RBD antibodies that inhibit the protein's ability to fit into and open the door through the ACE-2 receptor, thereby preventing the virus from entering the cells.

"Based on our findings, clinicians should ideally use plasma that is collected early on after a donor's onset of symptoms and check for the presence of antibodies before giving [donor](#) plasma to a patient," said Dr. Bazin.

She noted that nearly 7% of the original 282 donors did not have detectable antibodies at their first donation and this proportion doubled when considering donors who waited more than 11 to 12 weeks after symptom onset before donating.

Of course, understanding the drop-off of antibodies following natural

infection with COVID-19 has practical applications not only to help inform policies for when convalescent plasma is most effective (i.e. before immune response starts to decline), but it may also have implications for seroprevalence studies that gauge how many people in a community have antibodies against the [virus](#). "Based on our findings, if [antibodies](#) wane three to four months after a peak of infection, we could underestimate the prevalence of the infection in communities or populations," said Dr. Bazin.

Researchers plan to follow plasma blood donors over time and while they did not select for specific plasma (for example, those with only high antibody titers) for this analysis, future studies will try to determine if certain plasma is more beneficial.

More information: Josée Perreault et al. Waning of SARS-CoV-2 RBD antibodies in longitudinal convalescent plasma samples within four months after symptom onset. *Blood*. (2020)
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