Antibody responses in COVID-19 patients could guide vaccine design

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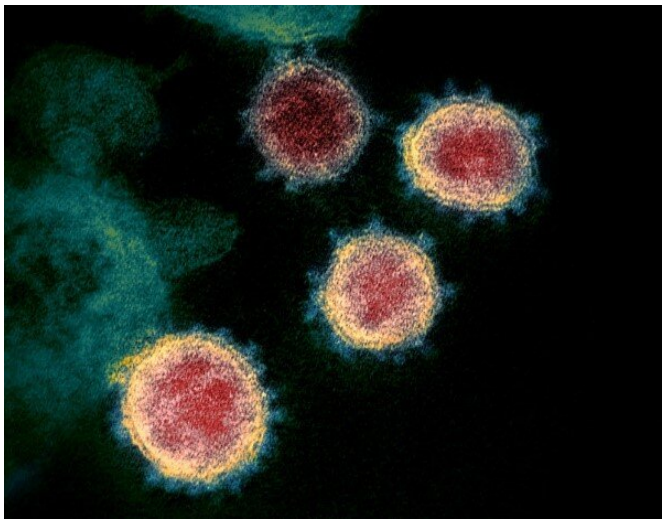

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The world is facing an unprecedented challenge with communities and economies affected by the growing COVID-19 pandemic. Currently, there is no vaccine or effective drugs approved to treat or prevent the disease. A better understanding of antibody responses against SARS-CoV-2—the virus that causes COVID-19—will provide fundamental information for developing effective treatments and a preventive vaccine. In the new study, researchers continuously monitored SARS-CoV-2-specific antibody responses in 19 non-severe and seven severe COVID-19 patients for seven weeks from disease onset.

Most patients generated antibody responses against SARS-CoV-2, including the viral nucleoprotein and three parts of the spike protein: the receptor-binding domain, S1 protein, and ectodomain. Although 80.7% of recovered COVID-19 patients had varying levels of antibody neutralization activity against SARS-CoV-2, only a small portion of patients elicited a potent level of neutralization activity. This result highlights the importance of carefully selecting blood samples from recovered patients using antibody neutralization assays prior to transfusion into other COVID-19 patients. Three to four weeks after hospital discharge, the neutralizing activity of antibodies from recovered patients declined significantly, suggesting that recovered COVID-19 patients might be susceptible to reinfection with SARS-CoV-2. In addition, severe COVID-19 patients had a large amount of non-neutralizing antibodies, which may contribute to antibody-dependent enhancement of infection. According to the authors, the study provides important insights for serological testing, antibody-based intervention, and vaccine design.

More information: Chen Y, Tong X, Li Y, Gu B, Yan J, Liu Y, et al. (2020) A comprehensive, longitudinal analysis of humoral responses specific to four recombinant antigens of SARS-CoV-2 in severe and non-severe COVID-19 patients. *PLoS Pathog* 16(9): e1008796. doi.org/10.1371/journal.ppat.1008796

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