

## IN BRIEF

## COVID-19

## Human antibodies can neutralize SARS-CoV-2

In this preprint, Ju et al. demonstrate the existence of virus-specific memory B cells recognizing the receptor-binding domain (RBD) of the SARS-CoV-2 spike protein in patients infected with SARS-CoV-2. They observed crossreactivity of antibodies from patients infected with SARS-CoV-2 against spike proteins, but not against the RBD, of SARS-CoV-1 and MERS-CoV. Through single-cell sorting and BCR sequencing, they generated 206 SARS-CoV-2 RBD-specific monoclonal antibodies. Antibodies were from diverse families of immunoglobulin genes, without any apparent enrichment for specific families. Only two clones showed 98–99% blocking of viral entry, which correlated with high competing capacity against ACE2 receptor. These results indicate that the humoral response is virus specific and diverse and can produce potent neutralizing antibodies.

**ORIGINAL ARTICLE** Ju, B. et al. Potent human neutralizing antibodies elicited by SARS-CoV-2 infection. Preprint at [bioRxiv](https://doi.org/10.1101/2020.03.21.990770) <https://doi.org/10.1101/2020.03.21.990770> (2020)

## COVID-19

## Coronaviruses hijack the complement system

Complement activation occurs in patients infected with MERS-CoV, SARS-CoV-1 and SARS-CoV-2, which might be involved in the pathogenesis of acute lung injury and acute respiratory distress syndrome (ARDS). In this preprint, Gao et al. identify the host complement activator MASP2 as a target of the N protein of all three viruses. In mice, lung injury induced by SARS-CoV-1 or MERS-CoV N protein was attenuated when its MASP2-binding motif was altered, when MASP2 was genetically knocked out or when the MASP2–N protein interaction was pharmacologically blocked. Preliminary data from patients treated with a blocking antibody to complement component C5a suggest a potential benefit of targeting complement in patients with COVID-19 with severe lung injury.

**ORIGINAL ARTICLE** Gao, T. et al. Highly pathogenic coronavirus N protein aggravates lung injury by MASP-2-mediated complement over-activation. Preprint at [medRxiv](https://doi.org/10.1101/2020.03.29.20041962) <https://doi.org/10.1101/2020.03.29.20041962> (2020)

## COVID-19

## Hydroxychloroquine: small effects in mild disease

This preprint reports a double-blind, randomized clinical trial of 62 patients to assess the efficacy of hydroxychloroquine (HCQ) in mild COVID-19. Patients in the treatment arm received 400 mg HCQ per day for 5 days. Fever and cough resolved on average 1 day earlier with HCQ, although the distribution of symptomatic patients at day 0 was not even between groups. No patients receiving HCQ progressed to severe disease, whereas 4 of 31 patients in the control arm progressed. Few clinical data and no viral load measurements were reported, limiting the conclusions that can be drawn from this trial. This study suggests relative efficacy for patients with mild disease and warrants larger clinical trials, but the effects of HCQ on patients with more severe COVID-19 remain unknown.

**ORIGINAL ARTICLE** Chen, Z. et al. Efficacy of hydroxychloroquine in patients with COVID-19: results of a randomized clinical trial. Preprint at [medRxiv](https://doi.org/10.1101/2020.03.22.20040758) <https://doi.org/10.1101/2020.03.22.20040758> (2020)

Jovani Catalan-Dibene, C. Matthias Wilk,  
Rachel Levantovsky and Nicolas Vabret  
Sinai Immunology Review Project,  
Icahn School of Medicine at Mount Sinai, New York, NY, USA  
e-mail: [sinai.immunology@gmail.com](mailto:sinai.immunology@gmail.com)

The authors declare no competing interests.

## MUCOSAL IMMUNOLOGY

## Ironing out the details of intestinal repair

Intestinal inflammation, such as occurs in inflammatory bowel disease (IBD), infections and colorectal cancers, often results in intestinal bleeding and hence anaemia. Given the function of liver-derived hepcidin as a master regulator of systemic iron homeostasis, Bessman et al. looked at the role of hepcidin in iron regulation in the gut. They describe a new pathway by which dendritic cell (DC)-derived hepcidin promotes intestinal repair.

Hepcidin-deficient (*Hamp*<sup>-/-</sup>) and wild-type (*Hamp*<sup>+/+</sup>) mice had similar levels of intestinal tissue damage after dextran sodium sulfate (DSS) administration, but the *Hamp*<sup>-/-</sup> mice had persistent weight loss, disruption of intestinal architecture and reduced colon lengths compared with *Hamp*<sup>+/+</sup> mice after DSS withdrawal. By contrast, the recovery of *Hamp*<sup>Aliver</sup> mice, which lack hepatocyte-derived

hepcidin, from DSS exposure was comparable with that of wild-type mice. Therefore, a non-hepatocyte source of hepcidin is required for mucosal repair.

Bessman et al. showed that type 2 conventional DCs (cDC2s) are the main myeloid source of hepcidin in the mouse colon after DSS administration and that intestinal cDCs are important producers of hepcidin also in patients with IBD. Furthermore, cDCs were shown to produce hepcidin in vitro in response to microbial stimulation. *Hamp*<sup>ACD11C</sup> mice, which lack hepcidin expression in cDCs, had a similarly impaired recovery phenotype to *Hamp*<sup>-/-</sup> mice after DSS withdrawal, which shows that cDC-derived hepcidin is required for intestinal repair.

As liver-derived hepcidin promotes degradation of the cellular iron efflux transporter ferroportin

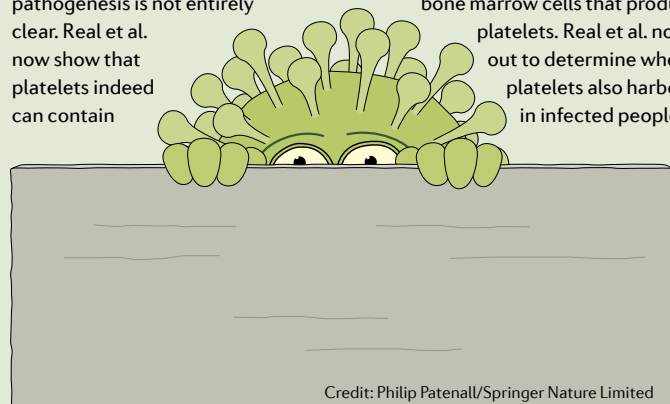
## VIRAL INFECTION

## HIV hides in platelets

The main target cells of HIV are CD4<sup>+</sup> T cells and other immune cells, such as macrophages and dendritic cells. In addition, the virus has been found in other cell types, including haematopoietic progenitor cells, astrocytes and even platelets. However, the relevance of these findings for infection and pathogenesis is not entirely clear. Real et al. now show that platelets indeed can contain

replication-competent HIV that can propagate infection to macrophages.

Early studies from the 1990s already found HIV RNA in platelets but it was unclear whether this RNA came from intact, infectious virions. Later in vitro work showed that virions interact with platelets and megakaryocytes, the bone marrow cells that produce platelets. Real et al. now set out to determine whether platelets also harbour HIV in infected people.



Credit: Philip Patenall/Springer Nature Limited