Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Neutralising SARS-CoV-2
Researchers have found that SARS-CoV-2 is prevented from docking and invading the body’s cells only when people are able to form specific antibodies against the folded receptor-binding domain (RBD) of the spike protein, and this docking site does not change with significant virus mutations. The researchers used microarray or chip technology, in which a large number of viral antigens were applied to a microscopic chip by a robotic spotting machine. Antibodies were exclusively formed against the intact, three-dimensionally folded spike protein and not against parts of it. About 20% of those who have recovered from COVID-19 do not develop these antibodies, and an antigen-based vaccine targeting RBD might help more people, the researchers said.

T-cell analysis crucial
A combination of COVID-19 vaccines activates the best immune response in solid organ-transplant recipients, and they need T-cell analysis—not just antibody tests—to determine their response to vaccination, according to results from an ongoing study. The study found that the Pfizer-BioNTech BNT162b2 vaccine was more effective in generating antibodies than the Oxford-AstraZeneca ChAdOx1 vaccine. However, this association was reversed when studying T cells, which were present in greater numbers after ChAdOx1. Among organ-transplant recipients, antibodies were detected in about 5% of patients who had received their first dose, whereas the corresponding figure was 80% in controls. When levels of T cells were examined, T cells were detected in around 25% of organ-transplant recipients after the first dose and in more than 80% of controls.

Anticoagulants in COVID-19
According to an international study in 2200 patients at 121 sites, therapeutic-dose anticoagulation with unfractionated or low-molecular-weight heparin increased survival until discharge without need for organ support in moderately ill patients hospitalised with COVID-19 compared with usual-care thromboprophylaxis. Patients who received therapeutic-dose anticoagulation were also 27% less likely to need cardiovascular or respiratory organ support than those who received usual care. A parallel study found that therapeutic-dose anticoagulation did not help severely ill patients. Moderately ill patients were defined as those who did not need intensive care unit support. The increase in survival to discharge represented a clinically meaningful improvement in these patients, said an author of the study.

Pan-coronavirus antibodies
Survivors of the 2003 SARS-CoV outbreak who were vaccinated with BNT162b2 not only produced functional antibodies capable of neutralising all known SARS-CoV-2 variants of concern but also other animal coronaviruses, a study found. Researchers compared the immune response before and after receipt of BNT162b2 in eight people who had recovered from SARS-CoV, ten healthy people, and ten COVID-19 survivors. After receiving two doses of the mRNA vaccine, all participants displayed high levels of neutralising antibodies against both SARS-CoV and SARS-CoV-2.

In addition, SARS-CoV survivors were the only group to have a broad spectrum of neutralising antibodies against ten sarbecoviruses with the potential to jump from animals to humans.

HIV drug delivery to the brain
HIV reservoirs in the brain that contribute to neurological problems can be reduced with a nanoparticle drug-delivery system, according to a new study. Current drugs help to manage HIV as a chronic condition but cannot cross the blood-brain barrier. The ability of nanoparticles to deliver antiretroviral drugs to the brain is a breakthrough that could be used to treat neurocognitive disorders such as HIV dementia and improve treatment of a wide range of brain diseases. The researchers used biodegradable brain-targeted polymeric nanoparticles to reduce the HIV burden.

Manganese uptake by bacteria
Researchers have discovered a way in which the bacterium Streptococcus pneumoniae obtains manganese (Mn) from the human body to survive. They described a gateway that sits within the bacterium’s membrane that selectively opens and closes to import Mn. A disturbance of this gateway would starve the bacterium of Mn and prevent it from causing disease. New pneumococcal strategies are needed considering current vaccines provide limited protection against circulating strains, antibiotic resistance rates are rising, and pneumococcus is a major cause of meningitis, sepsis, and bacterial pneumonia.

mAb prevents malaria
A small clinical trial has shown for the first time that one dose of a monoclonal antibody (mAb) prevented malaria for up to 9 months in people who were exposed to the malaria parasite. Further research is needed to confirm the trial, which tested whether the neutralising mAb CIS43LS could safely provide a high level of protection against circulating strains, antibiotic resistance rates are rising, and pneumococcus is a major cause of meningitis, sepsis, and bacterial pneumonia.

For more on neutralising SARS-CoV-2 see Allergy 2021; published online Aug 28. https://doi.org/10.1111/all.15066
For more on T-cell analysis see Am/Transplant 2021; published online Aug 18. https://doi.org/10.1056/ NEJMoa2108453
For more on anticoagulants in COVID-19 see N Engl J Med 2021; 385: 790–802
For more on pan-coronavirus antibodies see N Engl J Med 2021; published online Aug 18. https://doi.org/10.1056/NEJMoa2108453
For more on HIV drug delivery to the brain see ACS Nano 2021; published online Aug 6. https://doi.org/10.1021/acsnano.0c05553
For more on manganese uptake see Sci Adv 2021; 7: eabg3580
For more on a monoclonal antibody that prevents malaria see Editorial page 1333 and N Engl J Med 2021; 385: 803–14

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