

News in brief



INCREASED CONTACT FUELLED GAMMA VARIANT'S RISE

The coronavirus variant behind Brazil's ferocious second wave of COVID-19 emerged, in part, because of relaxed social distancing, according to an analysis of viral sequences from the outbreak's epicentre. In late 2020, researchers first spotted the P.1 variant – also called Gamma – in people who returned to Japan from Manaus in Brazil's Amazonas state.

To chart the rise of P.1, researchers sequenced the genomes of 250 SARS-CoV-2 samples collected from across Amazonas between March 2020 and January 2021, and conducted more-limited genetic testing on hundreds of samples.

They found that the prevalence of P.1 rose with breathtaking swiftness in Amazonas. There was no sign of the variant in samples from November 2020, but it accounted for nearly three-quarters of samples by mid-January 2021 (F. G. Naveca *et al. Nature Med.* <https://doi.org/gj6w6j>; 2021). The rise of P.1 coincided with reduced social distancing in Amazonas. This might have been linked to Christmas and New Year's holidays, as well as to municipal elections in November. The researchers think that these events, combined with the variant's heightened transmissibility, helped P.1 to flourish.

ANTIBODY NASAL SPRAY COULD PROTECT AGAINST COVID

A nasal spritz of a designer antibody offers strong protection against variants of the coronavirus SARS-CoV-2 in mice (Z. Ku *et al. Nature* <https://doi.org/gkctjj>; 2021).

Since the early days of the pandemic, scientists have been developing antibodies as COVID-19 treatments. Today, several are in late-stage clinical trials, and a handful have been approved for emergency use.

Among doctors, however, antibody treatments have not been popular, says Zhiqiang An, an antibody engineer at the University of Texas Health Science Center at Houston. Those available are delivered intravenously rather than directly to the respiratory tract, where the virus is mainly found – so must be given in high doses.

An and his colleagues engineered an antibody for delivery directly into the nose. They scanned an antibody library for those that could recognize a protein that SARS-CoV-2 uses to enter cells. Among the promising candidates were IgG antibodies.

The team stitched these IgG fragments to IgM antibodies, which act as first responders to many infections. The engineered IgMs had a much stronger 'neutralizing' effect on more than 20 variants of SARS-CoV-2 than did the IgGs alone. Squirted into the noses of mice six hours before or six hours after infection, the engineered IgMs sharply reduced the amount of virus in the rodents' lungs two days after infection.

This work is a "big feat of engineering", says Guy Gorochov, an immunologist at Sorbonne University in Paris. But he says there are open questions, such as how long the antibodies will linger in humans.

The most detailed 3D map of the Universe ever made

A survey of the southern sky has reconstructed how mass is spread across space and time in the biggest study of its kind.

The Dark Energy Survey (DES) collaboration observed the sky between 2013 and 2019 using a 570-megapixel camera at the Víctor M. Blanco telescope at the Cerro Tololo Inter-American Observatory in Chile. The survey covered one-quarter of the southern sky, and its exposures included 300 million galaxies (N. Jeffrey *et al. Mon. Not. R. Astron. Soc.* <https://doi.org/10.1093/mnras/stab1495>; 2021).

The resulting 3D cosmic map provides a record of the Universe's history. By tracking how galaxies spread out over time, researchers can measure the forces at play. These include the gravitational pull of dark matter – the invisible stuff that constitutes some 80% of the Universe's mass – and dark energy, the mysterious force that seems to be pushing the Universe to accelerate its expansion.

The data provide striking evidence that dark energy has been constant throughout cosmic history. The DES team also found the Universe to be slightly smoother than expected – confirming findings that the collaboration first reported in 2017.

DARK-MATTER MAP

The Dark Energy Survey (DES) collaboration's detailed map of dark matter covers a large, tank-shaped area in the Southern Hemisphere sky.

