Research highlights

**MUTATION SEEN IN AFRICA THREATENS MALARIA DRUG**

Resistance to the gold-standard malaria treatment, the drug artemisinin, has been rising in southeast Asia for a decade — and there is evidence that artemisinin-based therapies might start to fail in Rwanda, too.

In Asia, artemisinin drug resistance has been linked to various mutations in the ‘K13’ section of the genome of the most deadly malaria parasite, *Plasmodium falciparum*. Aline Uwimana at the Rwanda Biomedical Centre in Kigali, Didier Menard at the Pasteur Institute in Paris and their colleagues detected K13 mutations in *P. falciparum* parasites collected from people with malaria in Rwanda.

The team genetically modified parasites to harbour the changes conferred by the mutations. These bioengineered parasites were resistant to artemisinin in the laboratory.

However, malaria therapies consisting of artemisinin combined with other drugs successfully treated people in Rwanda infected with *P. falciparum* — including *P. falciparum* that has the K13 mutations. The researchers suggest that the other drugs helped the infected people to recover.

A genetic analysis suggests that parasites with the mutation didn’t arrive from Asia, but arose independently in Africa. By contrast, mutations that rendered *P. falciparum* resistant to a former malaria treatment, chloroquine, seem to have spread to Africa from Asia — resulting in millions of childhood deaths.

*Nature Med.* http://doi.org/d55q (2020)

**AURORAS LURE SEISMIC SENSORS TO REACH FOR THE SKY**

Seismometers in Alaska that normally measure trembling in the ground also pick up signals from the Northern Lights shimmering overhead.

The Northern and Southern lights form when charged particles from the Sun slam into Earth’s protective magnetic shield, which funnels the particles towards the poles. There, the particles energize atmospheric atoms and molecules, which emit light when they relax. Geophysicists use cameras and magnetic instruments to record the polar light shows — also known as auroras — and to monitor the influx of solar particles.

Carl Tape at the University of Alaska Fairbanks and his colleagues found that on three winter nights from 2017 to 2019, the seismometer at Poker Flat, Alaska, detected seismic signals caused by magnetic fluctuations in the sky. Photographs showed the Northern Lights glowing dramatically on those nights, confirming that the seismometer was picking up fluctuations in Earth’s magnetic field that were linked to the aurora.

The network of more than 200 seismometers in Alaska could be used to study the effects of auroras across the state, the authors say.

*Seismol. Res. Lett.* http://doi.org/d55p (2020)

**HOW DISTANCING MAKES FOR DAZZLING DYES**

Scientists have combined new fluorescent dyes with plastic to create some of the most brightly glowing objects ever made.

Most fluorescent molecules lose their glow if they are packed closely together, whether in a concentrated solution or a solid light-emitting display. This limits their brightness.

Bo Laursen at the University of Copenhagen, Amar Flood at Indiana University in Bloomington and their colleagues used flat, star-shaped molecules to address this flaw. The team’s method applies to tens of thousands of dyes that have a large fluorescent component and a small non-fluorescent component.

The star-shaped molecules trap the non-fluorescent component inside molecular ‘sandwiches’, forming discs that are similar to the fluorescent component in shape and size. These discs and the fluorescent components stack themselves alternately into a crystalline 3D lattice, isolating the fluorescent components from each other.

The researchers transformed representatives of five major classes of fluorescent dye into crystals. They blended these into plastic materials, producing films and 3D-printed shapes that glowed red, blue or green.

*Chem* 6, 1978–1997 (2020)

**BIRTH PATTERNS DRIVEN BY DESIRE FOR A GIRL AND A BOY**

In the second half of the twentieth century, a growing proportion of parents kept having children until they had at least one boy and one girl, according to an analysis of British birth patterns.

Studies have suggested that genetic factors in parents can raise their chances of producing more boys than girls. (*Nature* recognizes that sex and gender are not binary, and are not necessarily aligned.) To explore this possibility, Erping Long and Jianzhi Zhang at the University of Michigan in Ann Arbor analysed data for more than 300,000 people in the United Kingdom, most of them born between 1940 and 1970. The data included the number of male and female siblings of each study participant.

The researchers found that a higher proportion of families than expected had had one or more girls and only one boy, or vice versa. They also found that since the mid-twentieth century, there has been a rise in the proportion of families in which all children are of the same sex, except for the last-born.

The authors attribute this to a growing preference for having at least one boy and one girl, driven by improvements in gender equality and appreciation of gender diversity.

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