ARTIFICIAL SKIN SWEATS THE SMALL STUFF

A synthetic coating can 'sweat' droplets of fluid containing ibuprofen or other compounds when stimulated by radio waves. Coatings that can secrete fluids on demand could keep themselves clean or administer medicines to a wound. Danqing Liu at the Eindhoven University of Technology in the Netherlands and her colleagues created such a coating from liquid-crystal molecules. These can move like a liquid but, when exposed to an electric field, align themselves neatly like a crystal's atoms.

The fluid that serves as sweat is stored in numerous micrometre-sized pores surrounded by the long liquid-crystal molecules, which stand vertically on their ends. The coating rests on a layer of glass embedded with metallic electrodes that generate radio waves similar to those produced by a Wi-Fi router.

When the radio waves are turned on, the long liquid-crystal molecules twist to orient with the waves' direction of travel. This twisting motion wrings liquid out of the coating's pores. The coating sweats more as the radio waves become stronger.

After the radio waves are switched off, the coating reabsorbs any sweat left on its surface in seconds.

Matter. http://doi.org/dzr7 (2020)

THE RED PLANET GIVES OFF A GREEN GLOW

Mars's atmosphere has a green glow, much like the Northern and Southern lights on Earth. Researchers predicted four decades ago that Mars's atmosphere should emit green light, but it has proved elusive. Jean-Claude Gérard at the University of Liège in Belgium and his colleagues finally spotted the glow by using the European Space Agency's Trace Gas Orbiter spacecraft to scan the planet's edge against the dark background of space.

The green glow is given off by oxygen, which forms when the Sun's radiation breaks apart carbon dioxide in Mars's atmosphere. The team's measurements suggest that much of the glow comes from oxygen produced in two regions, 80 and 120 kilometres above the Martian surface.

The spacecraft measured the glow's intensity in visible and ultraviolet wavelengths, allowing the researchers to calculate the ratio between the two. This should be the same for other planets. As a result, researchers studying other planets' glows will be able to confirm that their instruments are working correctly by comparing the intensity ratio in their own measurements with that in the European team's measurements of Mars.

Nature Astron. http://doi.org/dzr6 (2020)

LATE-BLOOMING NEURONS BUILD MORE CONNECTIONS

The hippocampus, a brain region involved in learning and memory, is known to include cells that arise during both infancy and adulthood. Now, experiments on rats have revealed key differences between the two classes that could endow the late-blooming cells with important capabilities.

To study the hippocampal cells that arise during maturity, Jason Snyder at the University of British Columbia in Vancouver, Canada, and his colleagues injected the hippocampi of infant and adult rats with viruses that mark newly created neurons. The team estimated that half of the neurons in hippocampal tissue (pictured) are formed in adulthood.

Compared with neurons born in the hippocampi of baby rats, those that grew in the brains of adult animals had more thorny protrusions crowning the part of the cell that receives information from other neurons. Adult-born neurons also had more finger-like structures connecting them with neurons that send inhibitory signals to the brain.

The differences could give adult-born neurons advanced functions, including the ability to stimulate other cells involved in cognition, the researchers say.

J. Neurosci. https://doi.org/10.1523/JNEUROSCI.1665-19.2020 (2020)

WHY THE PANDEMIC SPURRED A RUN ON TOILET PAPER

People who felt seriously threatened by the COVID-19 pandemic are more likely to have stockpiled toilet paper early on than are those who were less worried about the disease.

As the new coronavirus began to spread across the Western Hemisphere this year, sales of toilet paper skyrocketed by up to 700% from February to March, prompting psychologists to argue about the reason for the buying spree.

Theo Toppe at the Max Planck Institute for Evolutionary Anthropology in Leipzig, Germany, and his colleagues surveyed 996 people in 22 countries across North America and Europe about how they purchased and stored toilet paper. Participants also ranked the threat of COVID-19 on a ten-point scale and took a test that rated them on personality traits.

Those who placed COVID-19 high on the risk scale were the most likely to bulk-buy toilet paper. Emotional people tended to worry most about the disease and thus tended to stockpile. Conscientiousness was also linked to stockpiling.

However, the variables studied accounted for only 12% of the variability in hoarding, so other factors must also influence people's purchasing, the researchers say.

PLoS ONE http://doi.org/ggz7zh (2020)