

NANOMATERIALS

Sunblock stays on skin surface

Using nanoparticles to encapsulate the ultraviolet (UV) filters found in sunscreen might prevent them from being absorbed by the skin — and could even improve their UV-blocking performance.

Some studies have shown that chemical UV filters have negative effects on cells when they penetrate skin. To stop this absorption, Mark Saltzman and his colleagues at Yale University in New Haven, Connecticut, coated a typical UV filter — padimate O — with nanoparticles that have sticky aldehyde groups on their surfaces. The coated UV filters stuck to the skin of mice and pigs even when exposed to water, and the nanoparticles prevented the filters from penetrating the skin.

Sunblock that used these nanoparticles and contained only 5% of the amount of UV filters found in conventional sunblock absorbed the same level of UV radiation.

Nature Mater. <http://dx.doi.org/10.1038/nmat4422> (2015)

ANIMAL BEHAVIOUR

Fish launches jaw to feed on land

A species of fish has an unusual way of eating — it thrusts its jaw out and downwards to nab prey on land.

Krijn Michel at the University of Antwerp in Belgium and his colleagues took high-speed video and made 3D reconstructions of the largescale four-eyed fish (*Anableps anableps*), which feeds from mudbanks. They found that the fish extends and rotates its upper jaw towards the ground while it turns its



NICOLE MILLER-STRUTTMANN

EVOLUTION

Bee tongues shrink as climate warms

Bees in some parts of the US Rocky Mountains have evolved shorter tongues, probably in response to a decline in flower populations caused by climate change.

Nicole Miller-Struttman at SUNY College in Old Westbury, New York, and her co-workers studied bees at three alpine sites in the Rocky Mountains. Similar to other mountainous habitats around the world, the Rockies have seen a drop in the number of flowers because

of warmer temperatures and drier soils. The researchers measured the tongues of 170 bees and found that they have got shorter by an average of about two millimetres since the 1970s in two dominant bee species in that area, *Bombus balteatus* and *Bombus sylvicola*.

Shorter tongues allow bees to feed on nectar from a greater variety of flowers, rather than from just long-tubed blooms.

Science 349, 1541–1544 (2015)

lower jaw downwards at a right angle, allowing it to clamp its mouth around its prey.

This mechanism differs from those of other land-feeding fish, which either curl their whole bodies downwards or pivot on their fins towards prey. *J. Exp. Biol.* 218, 2951–2960 (2015)

CLIMATE CHANGE

Clean air puts Arctic ice in peril

Cleaner air in the high north could reduce Arctic sea ice by an area of about one million square kilometres this century. Air pollution has a net

cooling effect on the climate, and has partially offset the decline of Arctic sea ice since the mid-1970s. John Fyfe and his colleagues at the Canadian Centre for Climate Modelling and Analysis in Victoria, Canada, used an Earth-system model to simulate sea-ice changes in the twenty-first century with and without projected reductions of global aerosol emissions. Cleaner air accounted for 15–40% of the Arctic ice melting simulated under a range of greenhouse-gas emission scenarios.

In a model with high greenhouse-gas emissions and large projected reductions in

air pollution, the Arctic Ocean became seasonally ice-free in 2045 — 12 years earlier than when aerosol emissions were held at 2000 levels.

Geophys. Res. Lett. <http://doi.org/7tt> (2015)

PLANT BIOLOGY

CRISPR cripples plant viruses

Plants that have been engineered to contain the CRISPR–Cas9 system are resistant to viral infections that reduce crop yields.

The CRISPR system, first discovered in bacteria, uses