

MAURICIO DE PAIVA

lower levels of microbes with antimicrobial activity than did their healthy counterparts.

The team identified several *Staphylococcus* species, and the peptides they make, that specifically kill *S. aureus*. Only the strains with antimicrobial activity were able to lower *S. aureus* levels when applied to people's skin.

*Sci. Transl. Med.* 9, eaah4680 (2017)

## BIOMATERIALS

## A super-strong underwater glue

A synthetic adhesive inspired by the sticky proteins made by mussels can bind to wet surfaces more tightly than even live mussels can.

Previous mussel-mimicking adhesives were strong when dry, but less effective underwater. Jonathan Wilker and his colleagues at Purdue University in West Lafayette, Indiana, created a polymer with some of the same structural elements as the sticky protein threads that mussels make to attach themselves to rocks and other surfaces.

Previous adhesives had catechol chemical groups attached to a synthetic polystyrene backbone, but the new material incorporates these groups into the backbone, as mussels' adhesive proteins do. This may explain the polymer's high degree of stickiness underwater, the authors say.

*ACS Appl. Mater. Interfaces* <http://doi.org/bz8n> (2017)

## EVOLUTION

## How humans adapt to arsenic

People living in Chile's Atacama Desert have different versions of a gene that allow them to cope with the region's naturally high levels of arsenic.

Arsenic from rocks seeps into the desert's scarce water sources, exposing people in the Camarones Valley to levels 100 times higher than the safe

limit of 10 micrograms per litre set by the World Health Organization. Mauricio Moraga at the University of Chile in Santiago and his colleagues compared the DNA of 50 people from this region with that of 92 individuals from other areas of the country that have lower levels of arsenic. They identified mutations that increased the efficiency with which the arsenic methyltransferase enzyme processes the element, and found these to be more common in the people of the Camarones Valley.

Nearly 70% of the Camarones people carried the most protective variant, considerably more than in other populations. These people have evolved over just 7,000 years under natural selection to tolerate arsenic, the authors say.

*Am. J. Phys. Anthropol.* <http://doi.org/bz4s> (2017)

## NEUROSCIENCE

## Predicting smell from structure

Algorithms can predict a molecule's odour on the basis of its chemical structure.

Pablo Meyer at IBM's Computational Biology Center in Yorktown Heights, New York, and his colleagues, asked 49 people to smell hundreds of molecules (**pictured**) and rate them on intensity, pleasantness and 19 other descriptors, such as 'fruit', 'musky' and 'bakery'.

The researchers gave these ratings, along with information on the substances' chemical structures, to 22 teams of computational scientists, who competed to

build the best predictive, machine-learning algorithms. After initially developing and training their algorithms on a partial data set, the teams tested their algorithms' abilities to predict people's perception of the remaining molecules.

Across all models, 'garlic' and 'fish' were the best-predicted attributes, at about 70% accuracy. Such tools could be used by the flavour and fragrance industry to formulate products, the authors say.

*Science* 355, 820–826 (2017)

## ANTHROPOLOGY

## Skulls show migration history

A study of skulls of early people in South America suggests that there were multiple waves of migration into the New World more than 10,000 years ago.

Wide variation in the skull shape of modern South American people has triggered debate over whether this results from rapid changes after the arrival of people in the region, or from successive migrations that introduced diversity. Noreen von Cramon-Taubadel at the University at Buffalo in New York and her colleagues compared the shape of Palaeoamerican crania (**pictured**) from the Lagoa Santa site in Brazil with those from modern populations. The team used the data to develop a model of ancestry, and found that the most recent common ancestor of the Palaeoamericans and contemporary Native American groups lived outside the Americas.



This adds weight to the theory that people moved into the Americas at many different times from northeast Asia across the Bering land bridge. *Sci. Adv.* 3, e1602289 (2017)

## ECOLOGY

## Alien species on the rise

The number of new instances of non-native species documented is increasing around the globe — growth that shows no sign of slowing.

The introduction of alien species can disrupt ecosystems and even cause local extinctions. Hanno Seebens at the Senckenberg Biodiversity and Climate Research Centre in Frankfurt, Germany, Franz Essl at the University of Vienna and their colleagues assembled a data set of 45,813 records, dating back to the 1500s, detailing the first arrival of an alien species. They show that such 'first records' have increased in the past 200 years, from an average of 7.7 per year between 1500 and 1800 to a record 585 in 1996. The rise in these records in the past 200 years was found in all taxa, with the exception of mammals and fishes, in which rates have declined in recent decades.

Alien numbers will probably continue to rise for years to come, despite efforts to curb them.

*Nature Commun.* <http://doi.org/bzw2> (2017)

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