

molecule called Sdf1 than seen in normal animals. This resulted in reduced recruitment of specific white blood cells that are involved in scar formation.

A compound that inhibits the signalling between Sdf1 and these white blood cells enhanced scar-free regrowth of ear tissue in normal mice. *Genes Dev.* 29, 2097–2107 (2015)

PHYSICS

Balloon-popping patterns probed

When balloons burst, they either split open along a single line or, if inflated to a high pressure, shred into many pieces.

Sébastien Moulinet and Mokhtar Adda-Bedia at the École Normale Supérieure in Paris punctured rubber balloons and used a high-speed camera to film the popping process, which lasts for less than 0.1 milliseconds. The stress within the membrane depends on the balloon's internal pressure and on the membrane's thickness and curvature. The authors found that as membrane stress increased, a single crack propagated at higher speeds. Above a threshold level, the crack branched out into as many as dozens of cracks to quickly dissipate the stress, leading to many balloon fragments.

The researchers say that similar principles might cause the tree-like propagation of cracks in processes ranging from the breakup of atomic nuclei to the collisions of asteroids.

Phys. Rev. Lett. 115, 184301 (2015)

MATERIALS

Ancient art spurs thin batteries

Ink on paper can act as an electrode in a thin, flexible battery.

Inspired by Chinese brush painting, a team led by Xin-Bo Zhang

at the Chinese Academy of Sciences' Changchun Institute of Applied Chemistry fabricated a flexible lithium-air battery using lithium foil and paper with a carbon-based ink (**pictured**). Electrons are stripped from the foil, creating lithium ions that flow to the inked paper electrode, where they combine with oxygen from the air. The resulting battery can hold a charge even after it has been bent 1,000 times. A foldable pack of four batteries, which weighs less than 2 grams, can supply current for 100 hours.

The technique paves the way for cheap and easily manufactured flexible batteries, the authors say. *Adv. Mater.* <http://doi.org/f3js75> (2015)

CANCER

Vitamin kills colon-cancer cells

High levels of vitamin C can slow the growth of colorectal tumours in mice.

Lewis Cantley at Weill Cornell Medical College in New York and his colleagues studied human colorectal cancer cells with mutations in either the *KRAS* or the *BRAF* genes, which are commonly mutated in people with this type of cancer. High levels of oxidized vitamin C killed the cells. The authors found that the cancer cells make unusually large amounts of a receptor that

takes up the oxidized vitamin C molecule. Once inside the cell, the compound kicked off a reaction that led to cell death by depleting a molecule called glutathione, which normally mops up damaging free radicals. High doses of vitamin C stunted colorectal tumour growth in *KRAS*-mutant mice.

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SOCIAL SELECTION

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Debate over microbiome initiatives

Researchers studying communities of microbes need to up their game. That was the argument made by two articles published on 28 October in *Science* and *Nature*, which called for national and international initiatives that would unite microbiome researchers and move the field forward. The initiatives would help researchers to develop better, standardized ways of studying microbial communities so that scientists can make meaningful comparisons of data sets across different studies. Some scientists were sceptical, however. Nick Loman, a bacterial geneticist at the University of Birmingham, UK, tweeted: "Just calling for standards and unified data sharing ain't going to make it happen."

But the proponents say that the two articles are just starting points for broader discussion in the field. Microbial ecologist Jack Gilbert at the University of Chicago in Illinois, a co-author of the *Science* article, hopes that the proposals — and the online back and forth — will stimulate further discussion and the creation of new research programmes. "No one is saying that we're going to fundamentally transform the way you do science. We're saying we're going to fundamentally transform the way science is funded and the

way multidisciplinary science can be implemented," he says. "This is starting a conversation."

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Science 350, 507–508 (2015); *Nature* 526, 631–634 (2015)



the vitamin could be used to treat some colon cancers, the authors suggest.

Science <http://doi.org/83w> (2015)

ANIMAL BEHAVIOUR

Fish bring death from above

Needlefish can leap from the sea and dive back down to attack small fish prey from above, the first time such behaviour has been seen in fish.

Ian Tibbetts at the University of Queensland in Australia and his colleagues observed *Tylosurus gavioloides* needlefish (**pictured**) pursuing prey that were in tightly packed shoals in two locations off the Queensland coast. Needlefish

normally strike at prey found within about 50 centimetres of their body, but aerial strikes extended their range to more than 2 metres. And such air strikes prevented fish prey from fleeing to the surface and leaping to escape, which they do when they are attacked from below the surface of the water.

The authors suggest that needlefish could be exploiting an optical effect called Snell's window — which limits vision through the water's surface — to mask their approach.

J. Fish Biol. <http://dx.doi.org/10.1111/jfb.12799> (2015)

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