

waste-management system. Raghu Kalluri at the University of Texas MD Anderson Cancer Center in Houston and his colleagues found that exosomes from cancer cells contain the building blocks for short RNA fragments that can shut off gene expression. Healthy cells that were exposed to cancer exosomes in culture caused tumours when the cells were later injected into mice, whereas cells exposed to normal exosomes did not.

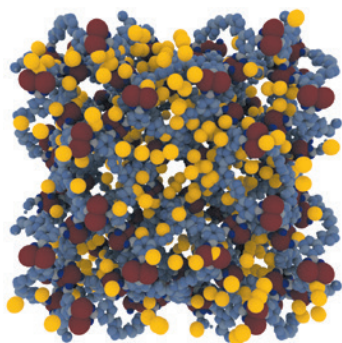
Samples of exosomes from people with breast cancer also caused tumours in 5 out of 11 mice treated. This finding could aid the discovery of markers for disease progression, or even represent a route to new cancer therapies. *Cancer Cell* <http://doi.org/wkg> (2014)

CHEMISTRY

Molecular sponges store oxygen

An oxygen cylinder could hold even more gas if it were filled with sponge-like powders, chemists report.

The powders are a type of metal-organic framework (MOF): sponge-like materials in which metal atoms are connected by organic groups, creating a porous network with many promising applications including gas storage. Omar Farha of Northwestern University in Evanston, Illinois, and his colleagues simulated oxygen adsorption (pictured, yellow spheres) on 10,000 MOFs and selected two to test. They experimentally showed that the MOFs could store and release oxygen over 50 cycles and outperformed



zeolites, another kind of chemical sponge.

The structures could allow soldiers or medical teams to carry oxygen using smaller, lighter containers that operate at lower pressures than cylinders, the team says.

Angew. Chem. Int. Edn <http://doi.org/f2vn85> (2014)

GLACIOLOGY

Channels hint at glacier hardness

Ancient channels preserved beneath the West Antarctic Ice Sheet suggest that part of the glacier prevailed during warm periods more than two million years ago.

By combining radio-echo soundings of the landscape underneath the glacier with satellite images of the ice surface, Kathryn Rose of the Bristol Glaciology Centre, UK, Martin Siegert at Imperial College London and their colleagues discovered a series of ancient wide, shallow channels. These suggest that, historically, there was a large flow of meltwater from the ice surface. The most recent period that was warm enough to generate such melting was during the Pliocene, 5.3 million to 2.6 million years ago.

Parts of this ice sheet, which some studies have predicted will destabilize in a warmer climate, may have existed at intervals during a period that was 2 °C warmer than now, the authors say.

Geology <http://doi.org/wkt> (2014)

BIOTECHNOLOGY

Paper-based gene tools

Functional biological circuits can be printed on paper, reports a team led by James Collins at Boston University in Massachusetts.

The team synthesized cell-free gene networks from off-the-shelf parts and freeze-dried them on to paper. When later rehydrated, the networks worked as programmable

SOCIAL SELECTION

Popular articles on social media

Rules for reproducibility win support

Nearly a decade after writing a scathing critique of biomedical research, 'Why Most Published Research Findings Are False', Stanford University scientist John Ioannidis has published a follow-up. The health-policy researcher suggests a blueprint for making scientific results more reliable, including increasing the statistical certainty of discoveries, giving more weight to negative results and changing how researchers earn kudos.

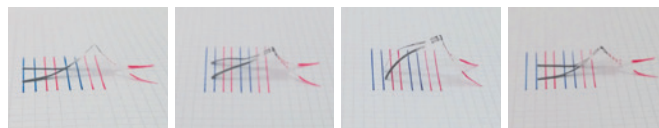
Many commenters chimed in with support for his paper, even if they did not believe that change could come easily. Simon Wheeler, a public-health nutritionist at the University of Cambridge, UK, endorsed Ioannidis's suggestions, tweeting that scientists should be "creating a culture where these are norms and expectations, not just lofty ideals". Mick Watson, a computational biologist at the University of Edinburgh's Roslin Institute, UK, tweeted, "I'm totally with John Ioannidis when he says the scientific reward system needs to change."

PLoS Med. 11, e1001747 (2014)



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in vitro diagnostics with a colorimetric output. The team demonstrated the technology by using the circuits to detect glucose and to distinguish between RNA fragments from two related virus species of the Ebolavirus genus, called Sudan and Zaire.

The paper technology should allow the easy and low-cost use of synthetic biology outside the lab, the team predicts.

Cell <http://doi.org/wkr> (2014)

MATERIALS

Sunshine drives graphene machines

Machines that move by bending in response to moisture can be made by exposing thin sheets of graphene oxide to sunlight.

A team led by Hong-Bo Sun at Jilin University in

Changchun, China, focused sunlight on one side of graphene oxide paper. The ultraviolet radiation induced a reaction that negatively charged the surface so that it repelled water more strongly than the layer below, causing the paper to curl in seconds on contact with moisture.

The team fashioned a claw from the paper that closes when approached by a sweaty finger, and a paper robot (pictured) that crawls when the humidity in its environment is raised and lowered. The authors say that the material could be used in devices including sensors and smart textiles.

Adv. Mater. <http://doi.org/wjj> (2014)

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