

# RESEARCH HIGHLIGHTS

Selections from the scientific literature

## OBESITY

### Heavy toll of stomach surgery

Weight-loss surgery improves the health of fat rats, but puts their offspring at risk of obesity and diabetes.

Randy Seeley and his team at the University of Cincinnati, Ohio, put female rats on a high-fat diet and then performed surgery to excise part of the rats' stomachs. After surgery, rats ate less food, lost weight and had fewer diabetes symptoms. Their offspring, however, were smaller and more susceptible to obesity and glucose intolerance compared with pups born to obese rats that had sham surgery.

For women, the authors say, weight loss alone may not stop them from passing on the effects of obesity to their children.

*Science Transl. Med.* 5, 199ra112 (2013)

## MATERIALS

### Electronic fabrics survive the wringer

Lightweight carbon sheets can be attached securely to nylon, cotton and polyester to create textiles that conduct electricity but don't fall apart in the wash.

Byung Hoon Kim at Incheon National University in South Korea and his colleagues smeared fibres with bovine serum albumin, a protein used in many biology labs. Albumin acted as a molecular glue; by



JONATHAN WOOD/GETTY

## CLIMATE SCIENCES

### Australia's record rains lowered sea level

Australia soaked up so much rain between early 2010 and late 2011 that global sea levels temporarily dropped.

John Fasullo of the US National Center for Atmospheric Research in Boulder, Colorado, and his colleagues used satellite measurements and tidal gauges to show that the mean global sea level — which had been rising by around 3 millimetres per year — fell by 7 mm. Using

measurements of Earth's gravity field, the team found a parallel increase in the mass of water on land, particularly in Australia, where topography prevents most water from flowing into the ocean.

Australia's record rainfall and flooding (pictured; in Queensland) probably came from a triad of regional climate patterns, including La Niña surface cooling in the tropical Pacific. *Geophys. Res. Lett.* <http://doi.org/ngx> (2013)

changing the charge on the fibres, it attracted sheets of graphene oxide (single-atom-thick layers of carbon atoms, topped with oxygen). The modified threads remained flexible (**pictured**) and could carry a current after being bent, washed and subjected to temperatures between  $-53^{\circ}\text{C}$  and  $52^{\circ}\text{C}$ .

*Adv. Mater.* <http://doi.org/njx> (2013)

## CANCER

### Revived genes give therapy a boost

A drug that inhibits DNA-modifying enzymes makes stubborn lymphoma cells sensitive to chemotherapy.

A team led by Leandro Cerchietti and Ari Melnick of Weill Cornell Medical College in New York studied drugs that prevent DNA methylation, a modification that 'silences' genes. Work in cell lines and mouse models for diffuse large B-cell lymphoma (DLBCL) showed that such a drug reactivated genes that made the anti-cancer agent doxorubicin more effective. Twelve patients with DLBCL were given an anti-methylation drug and standard chemotherapy; 11 responded. Biopsies showed decreased methylation and increased activity of a gene called *SMAD1*, which is often silenced in resistant DLBCL. The results suggest

that targeting excessive DNA methylation could reverse treatment resistance.

*Cancer Discov.* 3, 1–18 (2013)

## ENERGY STORAGE

### Power surge for flow batteries

Expensive membranes can be eliminated from flow batteries without compromising performance.

Flow batteries, used to store power in electricity grids, rely on fuels pumped through a power-generating region bounded by electrodes. Membranes typically stop fuels from reaching areas that would cause a short circuit. Some cheaper batteries are

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