RESEARCH HIGHLIGHTS

Selections from the scientific literature

CANCER

Switching p53 back on

Mutations in the gene encoding the tumour-suppressor protein p53 often underlie cancer, but a compound can reverse the effects of a common p53 mutation in mice.

Darren Carpizo and his team at the University of Medicine and Dentistry of New Jersey in New Brunswick identified the compound in a cancer drug database. The authors found that it induced programmed cell death in cancer cells carrying the R175 mutant form of the p53 protein, while leaving non-tumour cell lines relatively intact. The compound slowed down the growth of human tumours bearing this mutation that were implanted in mice, but had little to no effect on tumours carrying other p53 mutations or a non-mutant form of p53. The chemical seems to restore the conformation of the mutated protein, enabling it to function normally.

The compound could be a candidate for drug development, the authors say.
Cancer Cell 21, **614–625 (2012)**

CHEMICAL SENSING

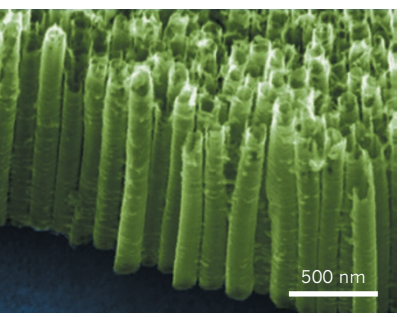
A nose for explosives

Explosives such as trinitrotoluene (TNT) are difficult to detect because of their low volatilities under everyday conditions. Denis Spitzer of the French–German Institute of Saint-Louis, France, and his colleagues have created a device that they estimate can sniff out less than one part per trillion of TNT.

The team coated a tiny, vibrating cantilever with vertically aligned titanium dioxide (TiO_2) nanotubes (**pictured**). TNT binds to the nanotubes, altering the frequency of the vibration. The device's sensitivity is due to the nanotubes' structure and large surface area, and to the strong affinity of TiO_2 for TNT. The detector is much less sensitive to other compounds, which reduces the likelihood of false positives.

The researchers are now adapting their sensor to detect additional chemicals, including other types of explosive.
Angew. Chem. Int. Ed. **http://dx.doi.org/10.1002/anie.201108251 (2012)**

F. SCHNELL/NS3E



G. GIRIBET

PHYLOGENETICS

Arachnids crossed the Pacific

A family of harvestmen that inhabits tropical forests on both sides of the Pacific Ocean originated in Mesoamerica roughly 82 million years ago. The arachnids' migration is a rare example of a trans-Pacific dispersal.

Prashant Sharma and Gonzalo Giribet at Harvard University in Cambridge, Massachusetts, sequenced and analysed DNA from 147 specimens from the sister superfamilies of Zalmoxoidea (a member pictured) and Samooidea. The authors conclude that the species spread from the Amazon Basin across the Pacific and settled on islands of the Indo-Pacific.

The creatures probably did not disperse through the break-up of the supercontinent Gondwana, so the authors speculate that they made their way across the Pacific on floating vegetation carried by ocean currents.
Proc. R. Soc. B **http://dx.doi.org/10.1098/rspb.2012.0675 (2012)**

CANCER DETECTION

Sequencing spots tumour cells

Patients with cancer can relapse if a few malignant cells survive treatment. Researchers show that high-throughput gene sequencing can detect this minimal residual disease (MRD) with greater sensitivity than conventional methods.

Harlan Robins of the Fred Hutchinson Cancer Research Center in Seattle, Washington, studied 43 children with T-lineage acute lymphoblastic leukaemia/lymphoma, which affects white blood cells called T cells. The team sequenced a region of two genes encoding T-cell receptors before treatment and then looked for the cancer-specific sequences in cells sampled after chemotherapy. When the researchers compared sequencing with the conventional method, which looks for cells with particular surface molecules, they found that both techniques detected cancer cells in 12 patients after treatment. However, only