

## RESEARCH HIGHLIGHTS



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**Weird worms***BMC Biol.* 7, 74 (2009)

Feeding off whale bones at the bottom of the ocean, the *Osedax* genus of marine worms was first described by scientists in 2004.

In these creatures, harems of tiny males are wholly encased in the tubes that surround the females. Now Robert Vrijenhoek of the Monterey Bay Aquarium Research Institute in Moss Landing,

California, and his colleagues say there are at least another 12 putative species (*Osedax* orange-collar, pictured) in addition to the five previously described.

The team examined DNA

sequences and physical traits of *Osedax* from whale remains and conclude that these newly discovered species have been evolutionarily separate for millions of years.

**GEOLOGY****Impact ironed out***Geology* 37, 1011-1014 (2009)

A huge meteorite or comet that smashed into North America 1.85 billion years ago was responsible for the abrupt end of certain iron deposits in the rocks around Lake Superior, say John Slack and William Cannon from the US Geological Survey in Reston, Virginia. They propose that the collision, dubbed the Sudbury impact, caused dramatic changes in the oxygen levels of the deep oceans.

The impact probably caused a giant tsunami and other mixing processes that brought small amounts of dissolved oxygen to the previously oxygen-free deep ocean. Oxygen would have lowered the solubility of iron from hydrothermal vents, hindering its journey to the continental margin, an area where ocean crust and continental crust meet. This stopped the deposition of banded iron formations in the rocks of this region, say the authors.

**CANCER BIOLOGY****Gene highs and lows***PLoS Genet.* 5, e1000719 (2009)

A large-scale survey of gene loss or gain in cervical cancer has flagged more than 50 potential genetic drivers of the disease.

Heidi Lyng and her colleagues at the Norwegian Radium Hospital in Oslo screened tumours from 102 patients with cervical cancer to look for changes in gene-copy numbers and expression profiles. They found 57 candidate genes that were frequently gained or lost and which were linked to various well-known tumour-promoting processes, such

as carbohydrate metabolism and avoiding cell suicide. They also discovered some novel genes tied to resistance to chemoradiotherapy.

**MICROSCOPY****Cell close-up***Phys. Rev. Lett.* 103, 198101; 198102 (2009)

Researchers have taken the first X-ray diffraction images of intact, hydrated cells.

Because of their short wavelengths, X-rays can penetrate deep into specimens and generate high-resolution images, yet it has been difficult to use X-ray diffraction microscopy on intact cells because the radiation damages them. Freeze-drying the cells makes them more stable but they are still damaged after multiple exposures.

Chris Jacobsen at Stony Brook University in New York and his colleagues protected yeast cells (X-ray diffraction micrograph, pictured) from radiation damage by freezing them to below  $-170^{\circ}\text{C}$ . Because the cells were hydrated

when frozen, their structures were similar to those of living cells.

Enju Lima and her colleagues at the European Synchrotron Radiation Facility in Grenoble, France, used a similar technique to image bacteria. Both groups were able to image the cells' internal structures at resolutions of less than 50 nanometres.

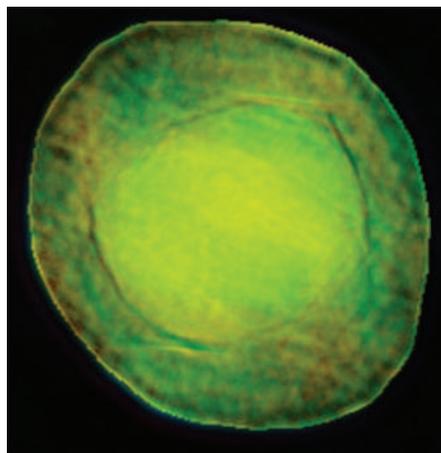
**AGRICULTURE****Mixed manure message***Proc. R. Soc. B* doi:10.1098/rspb.2009.16311 (2009)

Some organic-farming advocates have suggested that the nitrogen spike released from synthetic fertilizers attracts more insect pests to conventionally farmed crops. Joanna Staley at Imperial College London and her collaborators compared the abundance of insect pests on two sets of cabbage plots treated with either synthetic or organic fertilizer, including manure, over two seasons.

Different insects showed different preferences: one aphid species visited the organic cabbages more often in one year, but not in the other, while another aphid preferred synthetically fertilized plots, but only in one season. Such mixed results show that the impact of fertilization type on crop pests cannot be oversimplified.

**PALAEONTOLOGY****Hot-blooded dinosaurs***PLoS ONE* 4, e7783 (2009)

Two methods for estimating animal metabolic rates have been applied to extinct dinosaurs to show which of the bipedal species may have been warm- or cold-blooded. Herman Pontzer of Washington



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