

# RESEARCH HIGHLIGHTS

## CANCER BIOLOGY

### Stem cell-cancer link

*Nature Genet.* doi:10.1038/ng.465 (2009)

The *SOX2* gene, famous for its role in helping to reprogram adult cells into stem cells, is also a cancer driver.

Matthew Meyerson of the Dana-Farber Cancer Institute in Boston, Massachusetts, and his colleagues searched genome-wide for tumour-promoting genes in human samples of lung and oesophageal squamous-cell carcinomas. They found that a region around *SOX2* was frequently replicated in both diseases. *SOX2* expression is necessary for the growth of lung and oesophageal squamous-cell cancer lines. Overactivating *SOX2* also turned normal cells cancerous with help from a couple of other genes.

## ECOLOGY

### Wildebeest chain reaction

*PLoS Biol.* 7, e1000210 (2009)

One change in an ecosystem can have far-reaching effects. This is evident in the Serengeti in East Africa, where tree density has increased since the 1960s, when the rinderpest virus, which attacks wildebeest, was eradicated. To figure out what the connection between these events might be, Ricardo Holdo of the University of Florida in Gainesville and his colleagues compared ten models of tree and fire dynamics on the famous savannah.

The researchers conclude that after the disease was wiped out, wildebeest grew in number and ate more grasses. With less grass to burn, fires decreased in frequency and more seedlings were able to grow to maturity. Other factors such as climate change and browsing by elephants seemed to have less of a role. The team adds that this shift means that the Serengeti may have become a carbon sink.

J. VAN GRUISEN/ARDEA.COM




### Boys against girls

*Science* doi:10.1126/science.1174705 (2009)

Male cichlid fishes in East Africa's Lake Malawi have evolved striking coloration (top right) to compete for females. The objects of their affections, meanwhile, tend to sport inconspicuous brown scales (top left).

An exception is the

'orange-blotch' trait, which is found almost exclusively in females (bottom left) and provides them with camouflage. When it does occur in males, it disrupts their patterning (bottom right), reducing their fitness.

Thomas Kocher and his colleagues at the University of Maryland in College Park have found that this trait is caused by a mutation in the

*Pax7* gene, which is tightly linked to a new female-sex-determining gene. The close linkage between the mutated gene and the female sex determiner ensures that orange-blotch is expressed mainly in females. Such sexual conflicts can lead to the evolution of new sex-determining systems and many other traits, the team suggests.

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## GEOSCIENCE

### Earth's magnetic personality

*Geochem. Geophys. Geosys.*

doi:10.1029/2009GC002496 (2009)

When did our planet develop the roiling convection pattern that churns its metallic core and gives rise to its magnetic field?

Ancient rocks from South Africa's Barberton greenstone belt reveal that such currents in the core must have started by 3.45 billion years ago, significantly earlier than had been established from previous rock evidence, report John Tarduno of the University of Rochester in New York and his colleagues. The rocks sport a magnetic signature indicating that the planet had developed a substantial magnetic field by that time.

Past work by Tarduno and his co-workers had provided evidence that a significant magnetic field was present by 3.2 billion years ago.

## ANALYTICAL CHEMISTRY

### Gloop monitor

*Angew. Chem. Int. Edn* doi:10.1002/anie.200902360 (2009)

Mass spectrometry is an invaluable tool for analysing substances' molecular compositions. But using it on

viscous liquids such as toothpaste has required the time-consuming step of taking selective extracts from the liquids. Now these sticky complex mixtures can be monitored directly in a flask.

Renato Zenobi at the Swiss Federal Institute of Technology in Zurich and Huanwen Chen at the East China Institute of Technology in Fuzhou and their colleagues blew nitrogen gas through samples of toothpaste, honey and olive oil to create bubbles that carry molecules up to the sample's surface. There, the bubbles burst, creating aerosols that can be analysed in a standard mass spectrometer.

The team used the technique to track the progress of chemical reactions in viscous ionic liquids, which are increasingly popular solvents.

## AGEING

### Live longer, but how?

*Science* 326, 140-144 (2009)

Caloric restriction extends the lifespan of many model organisms, a finding that has prompted some people to drastically reduce their food intake in the hope of upping their longevity. But how exactly caloric restriction staves off death remains unknown.

Dominic Withers of University College London and his colleagues found that mice in which the gene *S6k1* was deleted lived