

sequencing, which can find one cancerous cell in 100,000, identified MRD in a further 10 patients.

The test could potentially be adapted to monitor other blood cancers.

*Sci. Transl. Med.* 4, 134ra63 (2012)

## INFLUENZA

## Towards a single flu vaccine

Vaccines against the pandemic H1N1 influenza strain of 2009 also generated immunity to other diverse flu viruses.

A team including Rafi Ahmed at Emory University in Atlanta, Georgia, and Patrick Wilson at the University of Chicago in Illinois previously showed that people infected with pandemic H1N1 flu made antibodies that neutralized both H1N1 and other flu strains. Now the researchers have analysed immune cells from 24 people who received an H1N1 vaccine, and found that these cells also produce these broadly neutralizing antibodies. The antibodies recognize conserved molecular features of both seasonal and pandemic flu strains — including the strain responsible for the 1918 pandemic.

The findings could aid the design of flu vaccines that recognize all flu viruses.

*Proc. Natl Acad. Sci. USA* <http://dx.doi.org/10.1073/pnas.1118979109> (2012)

## PALAEOLOGY

## Dating with rare earth elements

The discovery of human remains in the same layer as fossil mammals, including mammoths and mastodons, at a site in Florida has generated debate about whether the species were contemporaneous. An analysis of rare earth elements suggests that they were.

Carbon dating of the fossils, found at Vero Beach, has not yielded conclusive answers, so Bruce MacFadden

at the University of Florida in Gainesville and his team analysed levels of rare earth elements such as cerium to date the remains. The authors show that the levels of these elements are similar in both sets of remains, but are different from those in modern mammals. Assuming that the uptake of rare earth elements by fossils from surrounding groundwater is time-dependent, then the two sets of remains must have been laid down at the same time, probably around 12,000 years ago.

*J. Vertebr. Paleontol.* 32, 708–716 (2012)

## IMMUNOLOGY

## Partners for the sunshine vitamin

Whether vitamin D protects the body from infection is controversial. Researchers in California provide a possible explanation for why some studies have failed to link vitamin D to immune response: the vitamin does not work alone to boost immunity.

Richard Gallo at the University of California, San Diego, in La Jolla, and his colleagues found that, in human skin cells, one of two hormones — parathyroid hormone (PTH) and a related peptide, PTHrP — needs to team up with vitamin D's active form to increase the production of the antimicrobial peptide, cathelicidin. Mice injected with PTH fended off a *Streptococcus* infection more successfully than control animals, but only if they could produce the active form of vitamin D. The hormones can compensate for insufficient vitamin D and may participate in a positive feedback system with vitamin D and cathelicidin.

*Sci. Transl. Med.* 4, 135ra66 (2012)

## MOLECULAR BIOLOGY

## Cancer gene shifts chromatin

A cancer gene alters the three-dimensional structure of chromosomes, which could

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## GEOLOGY

## Explosions created big sandpit

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At the start of the most recent ice age, pressurized sand exploded through cracks in the sea floor at the bottom of the North Sea, producing a body of sand large enough to bury Manhattan under 160-metre-high dunes.

Helge Løseth at the Statoil Research Centre in Trondheim, Norway, and his colleagues created a seismic map of the sand in Norwegian waters, which they combined with data from wells drilled into the sea bed. The authors conclude that after the sand erupted from sea bed cracks, water currents spread it over several kilometres. At 10 cubic kilometres, the sand body is the largest created in this way to be found so far.

The sand sits on top of an oil field and could harbour oil, which can emerge from fractures in the sea floor and seep through porous sand, the authors say.

*Geology* 40, 467–470 (2012)

in turn affect the expression of other genes in ways that promote cancer development.

Mark Rubin at Weill Cornell Medical College in New York and his team mapped chromosomal interactions and changes in gene expression in healthy prostate cells that overexpress a cancer gene called *ERG*. The researchers found that *ERG* overexpression correlated with remodelling of the structure of chromatin — the protein–DNA package that constitutes chromosomes. *ERG* overexpression was linked with an exchange of material between chromosomes 13 and 15. This suggests that *ERG* overactivation might lead to secondary changes in genomic structure.

*Proc. Natl Acad. Sci. USA* <http://dx.doi.org/10.1073/pnas.1112570109> (2012)

## GLACIOLOGY

## Lost photos reveal glacier shifts

Aerial photographs of Greenland from the 1930s — rediscovered in a castle outside Copenhagen — could provide a deeper understanding of the impact of climate change on the island's glaciers than the use of



satellite data alone.

Most studies of Greenland's glaciers have used satellite imagery collected since the 1960s. Anders Björk at the University of Copenhagen and his colleagues found the historical images of 132 Greenlandic glaciers (pictured) and compared them with more recent satellite data. The comparison shows that, overall, glacier retreat over the past decade has been as vigorous as in a similar period of warming in the 1930s. However, glaciers with edges that reach the ocean tended to retreat more rapidly in the 2000s than in the 1930s, whereas those terminating on land regressed faster 80 years ago than in the 2000s.

*Nature Geosci.* <http://dx.doi.org/10.1038/ngeo1481> (2012)

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