

RESEARCH HIGHLIGHTS

Selections from the scientific literature

GENETICS

Prenatal test for Down's syndrome

Fetuses can be screened for Down's syndrome using amniocentesis and other invasive methods, which all carry a risk of inducing miscarriage. A non-invasive test that analyses fetal DNA extracted from the mother's blood might one day replace current methods.

Philippos Patsalis at the Cyprus Institute of Neurology and Genetics in Nicosia and his colleagues used an antibody-based method to examine patterns of fetal DNA methylation on chromosome 21, of which Down's patients have an extra copy.

The researchers chose eight regions in which methylation levels differed most between people with and without Down's. They calculated a score for each case and used this to classify samples as unaffected or as Down's syndrome. The researchers accurately identified all 14 cases of Down's out of a pool of 40 samples. *Nature Med.* doi:10.1038/nm.2312 (2011)

ZOOLOGY

Fish that feed through their skin

Hagfish can absorb nutrients through their skin, a trait previously unknown in vertebrates.

The animals often feed by boring into carcasses and

eating their way out of this nutrient-rich environment. Chris Glover at the University of Canterbury in Christchurch, New Zealand, and his colleagues found that samples of skin and gills from Pacific hagfish (*Eptatretus stoutii*; pictured) can absorb the amino acids glycine and alanine *in vitro*.

The authors propose that the phylogenetic position of hagfish — which have many primitive traits — suggests that nutrient absorption through the skin may have been widespread in early vertebrates, as it is still among aquatic invertebrates. *Proc. R. Soc. B* doi:10.1098/rspb.2010.2784 (2011)



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R. E. BELL/LAMONT-DOHERTY EARTH OBS.

GLACIOLOGY

Glacier grows from below

A large fraction of the thick ice sheet that covers East Antarctica's high interior is formed by liquid water freezing on to the bottom of the ice.

Ice sheets were thought to thicken at the top as accumulating snow is transformed into ice. But a radar survey of the structure of the ice sheet around Antarctica's remote Dome A (pictured), conducted between 2007 and 2009, reveals that up to half of the 2,400–3,000-metre-thick ice

package found above valleys in the subglacial Gamburtsev mountain range has been added from below, curving the overlying ice.

The discovery, by Robin Bell at Lamont-Doherty Earth Observatory in Palisades, New York, and her colleagues, could help researchers who hope to find and analyse ancient ice for clues to past climate change.

Science doi:10.1126/science.1200109 (2011)

CHEMISTRY

Where did the xenon go?

Only 10% of all the xenon that was present as a gas in Earth's primordial atmosphere is estimated to exist in that form today, leaving researchers wondering where the rest went. David Brock and Gary Schrobilgen at McMaster University in Hamilton, Canada, provide a possible solution to the mystery.

They report the synthesis of an elusive Xe compound, xenon dioxide (XeO₂). Obtained as a yellow crystal by reacting XeF₄ with water at near-ambient conditions,

XeO₂ shows the spectroscopic features of a square-planar solid. This geometry would let Xe atoms replace some silicon atoms in the lattice of SiO₂, one of the most abundant minerals in the Earth's crust.

J. Am. Chem. Soc. doi:10.1021/ja110618g (2011)

ANIMAL BEHAVIOUR

Sharks swim with direction

Some shark species swim towards quite distant targets, at least some of the time, whereas others seemingly move randomly within a small home range.

By feeding tracking data