

RESEARCH HIGHLIGHTS

Vampire genes

Naturwissenschaften doi:10.1007/s00114-008-0446-0 (2008)

The evolution of the common vampire bat, *Desmodus rotundus*, included three rounds of duplication of a gene that encodes a salivary enzyme involved in breaking down blood clots. *Desmodus* laps the blood of mammals. The other vampire bats — *Diaemus youngi*, which also feeds from mammals but prefers bird blood, and *Diphylla ecaudata* (pictured), which sticks to birds — have only one copy of a plasminogen activator gene, find David Liberles of the University of Wyoming in Laramie and his colleagues.

Their genetic analysis corroborates established species relationships. DNA sequencing revealed three alternative versions of the gene in *Diaemus* and four in *Diphylla*. The four gene copies that *Desmodus* expresses lack a section called Kringle 2. Its deletion may have aided a dietary switch to mammalian blood.



N. GORDON/OSF/PHOTOLIBRARY

GEOSCIENCES

Carbon crunch

Proc. Natl Acad. Sci. USA doi:10.1073/pnas.0805382105 (2008)

India's smashing into Asia around 50 million years ago brought changes far beyond the creation of the world's highest mountain range: the continental collision is widely thought to have altered global climate.

Dennis Kent of Rutgers University in Piscataway, New Jersey, and Giovanni Muttoni at the University of Milan in Italy offer particular mechanisms for this. The researchers' model predicts that the carbon-rich sediments on the former ocean floor stopped being subducted and producing carbon dioxide when the landmasses touched.

Meanwhile, India's drift into more humid equatorial climes increased the uptake of the greenhouse gas through greater weathering of silicates in the Deccan traps (pictured below). This could have lowered atmospheric

carbon dioxide enough to prompt the cooling trend in the Middle to Late Eocene.

ECOLOGY

Diatoms downsize

Proc. R. Soc. B doi:10.1098/rspb.2008.1200 (2008)

Global warming is predicted to be bad for diatoms. Hungry and heavy as plankton go, they are expected to find themselves with fewer nutrients and sink more quickly as temperature gradients, and thus density gradients, grow, increasing the energy needed for mixing.

However, the total volume of diatoms in Lake Tahoe, on the California–Nevada border, did not change between 1982 and 2006, despite a warming in average air temperatures in the Tahoe Basin, report Monika Winder and her co-workers at the University of California, Davis. Instead, average diatom sizes fell from 67 micrometres to 35 micrometres, stemming the mean sinking speed and altering energy transfer through the food web.

CANCER BIOLOGY

Ensuring a welcome

Nature Cell Biol. doi:10.1038/ncb1794 (2008)

Before travelling to new organs — or metastasizing — some cancers send chemical signals to prepare the target organ for their arrival.

Yoshiro Maru and his colleagues at the Tokyo Women's Medical University in Japan had previously found that primary tumours in mice secrete growth factors that stimulate lung cells to produce chemoattractant proteins. These recruit white blood cells into the lungs, and the resulting inflammation recruits cancer cells to the site.

The team now reports that the chemoattractants involved induce the synthesis of serum amyloid A3 in lung cells. This protein attracts and activates white blood cells, setting up a state of chronic inflammation that facilitates tumour cell invasion. Antibodies against serum amyloid A3 blocked metastasis.

GEOLOGY

Primitive petrous

Science 321, 1828–1831 (2008)

A beige outcrop in northern Quebec may be Earth's oldest known crustal rock. Jonathan O'Neil of McGill University in Montreal, Canada, and his colleagues have dated parts of the stone using ratios of neodymium and samarium isotopes, and calculated the oldest section to be 4.28 billion years old. This is 250 million years older than the previous record-holder.

The rocks in question are from the Nuvvuagittuq greenstone belt. This belt had been estimated to be 3.8 billion years old, based on an analysis of zircon crystals. But the stone that O'Neil and his team probed contained no zircons, forcing them to use an alternative method. The outcrop's low levels of neodymium suggest that it formed before Earth's neodymium levels became fixed 4.1 billion years ago.

MECHANICS

Slippery when clean

Phys. Rev. Lett. 101, 125505 (2008)

Friction is a familiar force in everyday life, but its nanometre-scale details are obscure. This is because the fundamental mechanisms are subtle and sensitive to contamination,

