

HIV

Human response in model mice

Mice that carry several key parts of the human immune system replicate the human immune response to HIV. The model could be used to test HIV vaccine candidates — an effort that has been hindered by the lack of a suitable small-animal model.

'BLT' mice are engrafted with human bone-marrow cells, liver and thymus tissue, and produce a functional human immune system, including a robust population of human CD4⁺ T cells, the target of HIV. Todd Allen of the Ragon Institute in Charlestown, Massachusetts, and his colleagues show that, during the acute phase of infection, these mice generate HIV-specific killer T cell responses that closely resemble those in humans. Importantly, the virus rapidly evolves to escape these responses, just as it does in humans. What's more, BLT mice that express HLA-B57, a human gene variant that protects against HIV, show better control of HIV replication — just as humans with this variant do.

Sci. Transl. Med. 4, 143ra98 (2012)

ANIMAL BEHAVIOUR

Squid 'fly' faster than they swim

Squid can exhibit brief periods of 'flight' above water, perhaps because this could be a more efficient form of

movement than swimming.

The animals propel themselves through the air (pictured) by forcing water out of their mantles. Ron O'Dor at Dalhousie University in Halifax, Canada, and his colleagues examined laboratory and field data on four species of squid in air and water. They found that velocities in the air could reach 37 body lengths per second, whereas the maximum seen in water was a mere 11 body lengths. Acceleration was also significantly higher in air than in water.

The team suggests that the advantages of squid 'flight' might mean that it is more common than currently thought, and that it may even reduce the cost of long-distance migrations.

Deep-Sea Res. Pt II <http://dx.doi.org/10.1016/j.dsr2.2012.07.002> (2012)

GEOLOGY

Greenland's ancient impact

A circular region more than 100 kilometres in diameter on the southwest coast of Greenland bears the footprint of a massive impact that occurred about 3 billion years ago.

Adam Garde of the Geological Survey of Denmark and Greenland in Copenhagen and his colleagues analysed evidence of intense crushing and heating in a formation whose features would have been buried about 25 kilometres below Earth's surface at the time of impact. In a central area 35–50 kilometres in diameter, all pre-existing rock structures were destroyed and partly melted. The authors also found evidence of fracturing, deformation and some melting within a diameter of 100–140 kilometres.

Large impacts were common early in Earth's history, but much of the evidence has been eroded by climate and tectonics. The authors suggest that the Maniitsoq structure, which

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ECOLOGY

Toxins for cane-toad control

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on rspb.royalsocietypublishing.org in June.

The invasive cane toad is wreaking havoc in Australian tropical ecosystems. But the toxin that this animal produces could be used to control its populations.

Cane toad (*Rhinella marina*; pictured) tadpoles seek out and consume newly laid eggs of their own species, to reduce competition for resources. To identify the chemical cues that drive this behaviour, Richard Shine of the University of Sydney in Australia and his colleagues analysed secretions from cane toad eggs and adults, and found that bufadienolide toxins dominate both. Using toxin samples as bait, the researchers set funnel traps in two floodplain ponds. Cane tadpoles made up more than 98% of the trapped animals. Laboratory trials with native species and cane tadpoles showed that the toxin repels native tadpoles.

Proc. R. Soc. B <http://dx.doi.org/10.1098/rspb.2012.0821> (2012)



P. NASKRECKI/MINDEN PICTURES/FLPA

they named after the nearest town, is the oldest and largest impact structure on record.

Earth Planet. Sci. Lett. <http://dx.doi.org/10.1016/j.epsl.2012.04.026> (2012)

CANCER

New target for melanoma fight

Melanoma, the most lethal form of skin cancer, is difficult to treat, but researchers have identified a potential drug target: a protein that blocks the effect of the tumour suppressor p53.

Jean-Christophe Marine at the Dutch-speaking Catholic University of Leuven in Belgium and his colleagues found that levels of the protein, MDM4, are elevated in about 65% of human melanomas. When they overexpressed MDM4 in melanoma-prone mice, the researchers found that nearly all the animals developed melanoma, compared with only about half of the control mice, and the animals did so

much more quickly. Treating human melanoma cells with a molecule that blocks the interaction between MDM4 and p53 restored p53 activity, with those cells undergoing apoptosis, or programmed cell death. This treatment also rendered melanoma cells more sensitive to two common chemotherapy drugs.

Inhibiting MDM4 could boost the effectiveness of other drugs, the authors suggest.

Nature Med. <http://dx.doi.org/10.1038/nm.2863> (2012)

CORRECTION

In the Research Highlight 'Hormone linked to depression' (*Nature* 487, 274; 2012), Xin-Yun Lu's affiliation should have been given as the University of Texas Health Science Center at San Antonio, not the University of Texas at San Antonio.

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