

STEM CELLS

Stem cells tackle diabetes

Stem cells may be useful for treating type 2 diabetes, according to a study in mice.

Insulin-producing cells derived from human embryonic stem cells reduce blood sugar levels in mice with type 1 diabetes, but it was unclear whether the approach would work for type 2 diabetes, which is much more common in humans. To model the disease, Timothy Kieffer of the University of British Columbia in Vancouver, Canada, and his colleagues fed mice a high-fat diet. After five days, the mice had high blood glucose levels, and by seven weeks they exhibited other symptoms of type 2 diabetes.

Transplanting pancreatic cells grown from human embryonic stem cells into these mice increased their sensitivity to insulin. When combined with diabetes drugs, the transplants also reduced obesity and blood sugar levels. *Stem Cell Rep.* <http://dx.doi.org/10.1016/j.stemcr.2015.02.011> (2015)

CANCER

Leukaemia cells made normal

Cancerous white blood cells from people with a form of leukaemia have been reprogrammed into immune cells that do not cause the disease in animals.

Immature immune cells called B cells cannot develop fully in people with precursor B-cell acute lymphoblastic leukaemia (B-ALL). Ravindra Majeti and his colleagues at Stanford University in California isolated diseased cells with specific mutations from 12 patients with B-ALL.



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ZOOLOGY

Fish slurps up prey with watery 'tongue'

Mudskipper fish (*Periophthalmus barbarus*; pictured) use water bubbles as a 'tongue' to feed on land. The finding hints at how other animals might have evolved tongues as they made the transition from aquatic to terrestrial life.

Krijn Michel at the University of Antwerp in Belgium and his colleagues used high-speed video and X-ray imaging to study the feeding behaviour of various animals. They found that when the mudskipper eats on land, a bubble of water held in its mouth protrudes out and

touches food before its jaws close. The fish sucks some of this water back into its mouth as it engulfs the food. The movement of a bone involved in mudskipper feeding resembles that of some animals that feed with tongues on land, the authors say.

This pseudo-tongue allows mudskippers to catch and swallow food items on land, unlike some other aquatic species that must return to water to consume what they capture ashore.

Proc. R. Soc. B <http://doi.org/2wr> (2015)

CHEMISTRY

Imaging of excited electron orbitals

A technique could pave the way for imaging electron behaviour as chemical reactions happen.

Many reactions are governed by the behaviour of electrons in excited orbital states, but these states are difficult to capture because they last only a few picoseconds (10^{-12} seconds). Now, Masahiko Takahashi at Tohoku University in Sendai, Japan, and his colleagues have measured the excited states of

molecules of acetone gas by probing them with ultrashort pulses of electrons.

Electrons in the pulse knocked excited electrons out of the atoms comprising the acetone. By simultaneously measuring the energy of the ejected electrons and those from the pulse, the team determined the energy and momentum of the molecule's excited state, which lasted for just 13.5 picoseconds.

Although the data quality is currently low, the results show that such measurements are feasible, say the authors. *Phys. Rev. Lett.* 114, 103005 (2015)