

LAB METHODS

A strict diet for *Drosophila*

Lab fruitflies may soon all face the same limited menu.

Matthew Piper and his colleagues at University College London have developed a synthetic foodstuff for fruitflies (*Drosophila melanogaster*) that is made up of precise amounts of amino acids, vitamins and sugars that the insects need.

Feeding diverse foods to flies, as is common in labs, can drastically change their metabolism, but giving a standard food to all lab flies would ensure that it does not influence experimental results.

The researchers note that flies raised on the synthetic food grow more slowly and are less fertile than those fed a mix of sugar and yeast, suggesting that there are improvements to be made.

Nature Meth. <http://dx.doi.org/10.1038/nmeth.2731> (2013)

QUANTUM PHYSICS

A record-breaking quantum bit

Physicists have stored a quantum bit of information at room temperature for more than 39 minutes, smashing the previous record of just 2 seconds.

Mike Thewalt at Simon Fraser University in Burnaby, Canada, and his colleagues stored the bit in the nuclear spins of ionized phosphorus atoms embedded in a highly enriched silicon crystal, using optical and radio-frequency light to encode and read out the bit.

The next step is to find a reliable way to connect the nuclear spin state memory to the electronic spin states of atoms, which are more likely to be used in quantum computer



LITTLE RED RIDING HOOD BY GUSTAVE DORE/NATL. GALLERY OF VICTORIA, MELBOURNE, AUSTRALIA/BRIDGEMAN ART LIBRARY

CULTURAL ANTHROPOLOGY

Biology tool uncloaks folk-tale evolution

Phylogenetic analysis, a method that biologists use to infer evolutionary relationships between species, can be used to trace the ancestry of folk tales such as *Little Red Riding Hood*.

Anthropologists have struggled to find ways to group similar tales from different cultures. Jamshid Tehrani at Durham University, UK, approached the problem by creating an evolutionary 'tree' similar to those used to reveal common ancestors among biological species.

Tehrani treated each of 58 variations on *Little Red Riding Hood* as a separate species and analysed 72 varying plot elements from each tale to produce a tree displaying the tales' relationships. Notably, the analysis showed that African versions of the story are closely related to another fairy tale, *The Wolf and the Kids*, whereas East Asian versions probably evolved by combining the two with local tales.

PLoS ONE 8, e78871 (2013)

processing. Storing quantum bits at room temperature would boost efforts to create a practical quantum computer. *Science* 342, 830–833 (2013)

MARINE ECOSYSTEMS

Nutrient threat of seafood farms

Increased nutrients from aquaculture could cause harmful algal blooms in decades to come.

Lex Bouwman of the PBL Netherlands Environmental Assessment Agency in

Bilthoven and his team analysed the yearly production of farmed seafood species using data from the United Nations Food and Agriculture Organization. They estimated the amounts and types of nutrients, such as nitrogen and phosphorus, that aquaculture adds to coastal areas around the world today and predicted impacts for 2050 using scenarios from the Millennium Ecosystem Assessment.

Although most nutrient input to coastal seas comes from rivers that run through farmland, inputs from

aquaculture are growing. In some Chinese provinces, for instance, more than 20% of the dissolved nutrients in coastal waters derive from seafood farming.

Environ. Res. Lett. 8, 044026 (2013)

IMMUNOLOGY

Cells that hurt rather than heal

A type of cell that normally prevents a harmful autoinflammatory disease can, under certain inflammatory

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Wheat not to blame for coeliac rise

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The increase in cases of coeliac disease over the past 50 years or so cannot be pinned on the increasing gluten content of wheat, according to an analysis of varieties of the crop going back to the 1920s.

Some researchers have pegged the rise in the disease — an immune response to the wheat protein gluten — to modern varieties of wheat bred to contain more protein. Donald Kasarda of the Western Regional Research Center in Albany, California, compiled data on the amount of protein in US wheat crops over the past century.

Although Kasarda's analysis showed that the protein level in wheat remained largely unchanged, he did find that people now consume more wheat and foods containing gluten as an additive. This, he suggests, could account for the increase in coeliac disease since the mid-twentieth century.

J. Agric. Food Chem. 61, 1155–1159 (2013)

the toxic waters do not directly damage fish fertility. Instead, parents have fewer offspring as an inevitable trade-off of investing their energy in producing larger offspring, which can more easily detoxify hydrogen sulphide gas.

The discovery illustrates a widespread pattern of predictable evolution, they say. *Ecol. Lett.* <http://doi.org/p5h> (2013)

ZOOLOGY

Sex messes with a sea slug's head

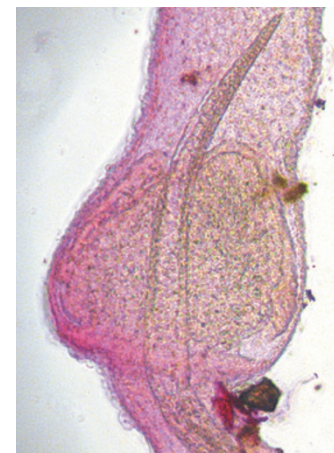
A tiny sea slug found on Australia's Great Barrier Reef stabs its sexual partners through the head with a specialized probe, apparently to inject secretions that influence its partners' behaviour after mating.

Rolanda Lange of Monash University in Melbourne, Australia, and her colleagues observed 16 matings between 20 individuals of a newly discovered sea slug (*Siphopteron* sp.) that has a two-part penis. In all cases, seconds after the animal had inserted its penile bulb into a sexual partner to transfer

sperm, it stabbed the other part — a specialized needle-like structure (pictured) — into the head of its mate.

Related sea-slug species are known to inject prostate secretions in a similar manner, but not to the head. The authors suggest that this species is targeting the neural ganglia near the injection site, and that the secretions manipulate the behaviour of the sperm receiver.

Proc. R. Soc. B <http://doi.org/p33> (2013)



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ANIMAL BEHAVIOUR

Phantom road frightens birds

Why did the bird not cross the road? Noise, it seems, forms at least part of the explanation.

Christopher McClure, Jesse Barber and their colleagues at Boise State University in Idaho created a 'phantom road' to test the effects of traffic noise without any actual cars or disruptions in the visual landscape.

The authors played continuous traffic sounds through speakers spaced evenly along a 0.5-kilometre ridge for four days, followed by four days of silence. They monitored multiple sites along the fake road and in a control area every morning for 7.5 weeks.

When recordings played, the number of birds along the road declined by more than one-quarter. Two species, the cedar waxwing (*Bombycilla cedrorum*; pictured) and yellow warbler (*Setophaga petechia*), avoided the noisy road almost completely.

Proc. R. Soc. B 280, 20132290 (2013)

EVOLUTION

Fish babies bigger in toxic waters

Live-bearing fish in sulphur-rich springs give birth to fewer, larger young than counterparts in non-toxic waters.

Rüdiger Riesch at the University of Sheffield, UK, and his colleagues studied nine species of fish, including the guppy (*Poecilia reticulata*), which have independently flourished in sulphur springs in the United States, the Caribbean and South America.

The researchers show that

conditions, cause the disease in a mouse model.

A team led by Jeffrey Bluestone of the University of California, San Francisco, studied regulatory T (T_{reg}) cells in a mouse model of an autoimmune disease in which the body attacks its own nerve tissue.

T_{reg} cells expressing the *Foxp3* gene normally act to suppress these harmful immune attacks. However, during the inflammatory response, a subset of the T_{reg} cells expressed lower levels of *Foxp3* and higher levels of proteins called cytokines.

These unstable T_{reg} cells were predominantly present in the antigen-specific T_{reg} compartment and induced anti-self immune reactions when transplanted into other mice. However, treating the T_{reg} cells with the anti-inflammatory cytokine interleukin 2 restored the cells' protective abilities.

Immunity 39, 949–962 (2013)

ARCHAEOLOGY

Teeth nibble away at invasion theory

Human remains from a fifth-century cemetery in Oxfordshire, UK, contradict the standard view of the Anglo-Saxon conquest of Britain.

Historical accounts suggest that Germanic invaders wiped out and replaced local populations at around that time. A team led by Susan Hughes of the Naval Facilities and Engineering Command Northwest in Silverdale, Washington, studied strontium and oxygen isotopes in teeth from the remains of 19 people. This can reveal whether a person ate and drank local foodstuffs.

Just one of the 19 samples contained isotopes indicating that the person came from continental Europe. The others were longtime locals, supporting the idea that Anglo-Saxons merged gradually into the region. *J. Arch. Sci.* <http://doi.org/p4j> (2013)