

adaptations to life in the gut for ones that allow them to thrive in the urethra and bladder. A team led by Jeffrey Gordon at Washington University in St. Louis, Missouri, compared the genomes of dozens of *E. coli* strains from the faeces and urine of four women with recurrent infections.

In two of the women, new but matching *E. coli* strains emerged in both the gut and the urinary tract. Follow-up experiments in mice showed that the same strain could survive at both sites without the expected loss of fitness. Strategies to fight recurrent infections might need to be reconsidered, the authors say. *Sci. Transl. Med.* 5, 184ra60 (2013)

ANIMAL BEHAVIOUR

Tree-loving lemur digs hole in winter

Lemurs normally live in trees, but researchers have discovered that at least two species hibernate underground.

Marina Blanco at the Duke Lemur Center in Durham, North Carolina, and her colleagues unearthed two species of eastern dwarf lemur (*Cheirogaleus sibreei* and *C. crossleyi*, pictured) in Tsinjoarivo, a high-altitude rainforest in central-eastern Madagascar.

By tagging 12 animals with radiotransmitters, the team found that the lemurs dig underground burrows in which they hibernate for several months between April and September. By contrast, the fat-tailed dwarf lemur (*C. medius*,

the only other primate species known to hibernate annually, sleeps in holes in tree trunks. Being buried beneath an insulating layer of leaves and roots might help the eastern dwarf lemurs to maintain stable body temperatures amid large daily swings in air temperature, which often dip to 5°C in the cold season.

Sci. Rep. 3, 1768 (2013)

PALAEOLOGY

Flow sorting for fossil pollen

Unconventional use of a sorting technology could help palaeontologists to date lake sediments. This could enable better reconstruction of past environments and climates.

Pollen grains, which can be used in carbon dating, are often the only organic matter found in abundance in lake sediments. However, isolating the grains is difficult, often making their use in carbon-dating impractical. Richard Jones at the University of Exeter, UK, and his colleagues adapted a biomedical technique known as flow cytometry, which sorts labelled cells on the basis of how they fluoresce and scatter light. Pollen grains are naturally fluorescent, so could be separated from contaminants by size and shape.

In just four hours, the technique collected 2.75 million fossil grains — an amount large enough to date a sample.

J. Quart. Sci. 28, 229–236 (2013)

CELL BIOLOGY

Sperm control DNA breaks

When dividing to produce mammalian sex cells, cells coordinate how DNA breaks occur.

The cell-division process that forms these sex cells, which contain one set of chromosomes instead of the normal two, involves the swapping of bits of genetic material between matching

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MATERIALS SCIENCE

Holes help supercapacitor

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A graphene-based material can store energy at seven times the density of commercial carbon-based products.

Supercapacitors — which could be used to power electric vehicles — recharge and release energy faster than batteries, but their energy density is lower. Theoretically, graphene — an unusual material made of atomically thick layers of carbon — is a good candidate for a supercapacitor, but its carbon layers tend to stack together, degrading its performance. Pei Kang Shen and his colleagues at Sun Yat-sen University in Guangzhou, China, created a porous graphene-based structure using an acrylic resin as a template. The researchers rinsed the resin with a nickel acetate solution followed by acid to produce a network of graphene layers with interconnected pores. When the material was filled with an electrolyte solution, it showed stable performance and had an energy density comparable to that of a lead-acid battery.

Adv. Mater. 25, 2474–2480 (2013)

pairs of chromosomes. This process can involve hundreds of breaks in the double-stranded DNA. A team led by Maria Jasin and Scott Keeney at the Memorial Sloan-Kettering Cancer Center in New York found that in male mice engineered to have reduced double-stranded breaks, chromosome pairs failed to exchange DNA properly. The resulting ‘chromosome tangles’ continued to accumulate breaks as cell division progressed, suggesting that a feedback mechanism stalls breaks as chromosomes successfully intermingle. The cells of the engineered mice eventually halted division, and the mice were left sterile.

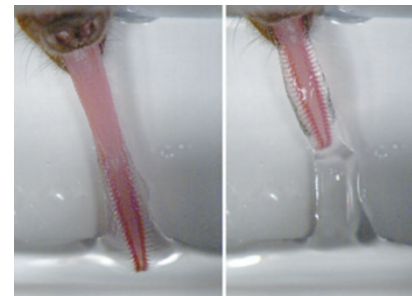
Genes Dev. 27, 873–886 (2013)

ZOOLOGY

Tongue spikes snare nectar

Hovering bats use barbed tongues to snare nectar from flowers.

Cally Harper and her colleagues at Brown University in Providence, Rhode Island, used a high-speed video camera and post-mortem



analyses to understand the mechanics of the eponymous organ of the Pallas's long-tongued bat (*Glossophaga soricina*). The tongue (pictured) can extend up to 4 centimetres, about twice the length of the bat's head. The researchers found that as bats thrust out their tongues, muscles force blood into rows of tiny bristles that usually lie flat along the tip of the tongue. The bristles become erect in 0.04 seconds, trapping nectar between them as the bat retracts its tongue.

Proc. Natl Acad. Sci. USA
<http://dx.doi.org/10.1073/pnas.1222726110> (2013)

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