

RESEARCH HIGHLIGHTS

Aloha Mohoidae

Curr. Biol. doi:10.1016/j.cub.2008.10.051 (2008)
Since their discovery by explorer James Cook, five species of Hawaiian bird have been lumped in with Australasian honeyeaters, of the family Meliphagidae, by classifiers. Robert Fleischer and his team at the Smithsonian Institution in Washington DC report that none of the five now-extinct Hawaiian honeyeaters belongs there.

Using DNA sequences from museum specimens, the researchers report that the birds are actually members of the Passerida, the group of well-known songbirds that includes birds such as sparrows, warblers,



wrens and waxwings. Analysis of nuclear DNA indicated that these birds may have diverged from their nearest living mainland ancestor at about the same

time bird-pollinated plants took root on the islands 14 million–17 million years ago. They propose reclassifying them as a unique family, the Mohoidae.

ENVIRONMENTAL SCIENCE

It's in the water

Environ. Sci. Technol. doi: 10.1021/es801845a (2008)
US drinking water is drugged. Shane Snyder and his colleagues at the Southern Nevada Water Authority in Las Vegas tested the water at 19 treatment facilities across the nation for a selection of compounds that disrupt body function, including pharmaceuticals.

Of the 51 compounds the team tested for, 34 were detected in at least one sample, although none at levels deemed unsafe. The herbicide atrazine and the drugs meprobamate and phenytoin were present in more than half of the samples collected from tap water distributed to homes and businesses.

CANCER

Interfering with cancer

N. Engl. J. Med. 359, 2641–2650 (2008)
RNA interference, in which cells use short stretches of RNA to block the translation of genetic recipes into proteins, has been linked to survival in the largest study yet to examine the effect of this phenomenon on human cancers.

A team led by Anil Sood of the University of Texas M. D. Anderson Cancer Center in Houston measured gene expression levels of

Dicer and Drosha, proteins involved in the interference pathway, in 111 invasive ovarian tumours. Women with high levels of both proteins survived for a median of more than 11 years — more than four times longer than those with low levels.

The findings were verified using a second set of 132 ovarian cancer samples. For lung cancer and breast cancer, only Dicer levels affected survival. The findings could lead to the development of better prognostic tests and therapies.

NEUROBIOLOGY

Crossing the barrier

Nature Biotechnol. doi:10.1038/nbt1515 (2008)
A virus has been found that can shuttle genes across the blood–brain barrier. The discovery raises hopes that gene therapy could one day be used to treat neurodegenerative diseases.

Although a variety of viruses have been harnessed as vectors to carry genes into cells, none has been able to enter the brain from the bloodstream. Brian Kaspar of Nationwide Children's Hospital in Columbus, Ohio, and his co-workers have found that adeno-associated-virus 9 (AAV9) carrying a fluorescent 'reporter' gene enters neurons in the brain and spinal cord when injected intravenously into newborn mouse pups, in

which the blood–brain barrier is not fully formed.

AAV9 also entered the central nervous system of adult mice, but primarily targeted support cells called astrocytes.

MATHEMATICAL BIOLOGY

Sensible swarming

Curr. Biol. doi: 10.1016/j.cub.2008.10.070
Locusts live two lives. Usually solitary, something in them stirs when the density of their fellows reaches a certain threshold. They then change their markings and exhibit an intense desire to swarm together.

Using a mathematical model called percolation theory, Andy Reynolds of Rothamsted Research in Harpenden, UK, and three colleagues explain why this behaviour might have evolved. If a landscape is divided into patches — clumps of plants, say — then each patch has a density of locusts below which it is not worth a predator expending the effort to look for them. So at low densities, locusts are relatively safe. With increasing density, they would become worth hunting, a smorgasbord of crunchy treats allowing well-fed predators to move around the landscape. Before this happens, locusts flip into a highly bunched distribution in which most patches are locust-free and only a few patches are full, so fewer predators are on hand to menace the entire swarm.

BIOMECHANICS

Wobble mystery solved

Proc. R. Soc. A doi:10.1098/rspa.2008.0367 (2008)
It's the way people balance themselves rather than the timing of their steps that makes certain bridges wobble, John Macdonald of the University of Bristol, UK, has found.

The Millennium Bridge (pictured below), a footbridge straddling the Thames in London, closed just days after it opened in June 2000 because it was wobbling sideways. It looked as if pedestrians were synchronizing their steps in time with the wobble, and that this was exacerbating the movement.



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