RESEARCH HIGHLIGHTS

Night vision

Cell **137,** 356–368 (2009)

In most mammalian cells, densely packed DNA is situated near the perimeter of the nucleus, whereas looser regions containing more active genes cluster towards the centre. Jochen Guck of the University of Cambridge, UK, Boris Joffe at Ludwig-Maximilian University in Munich, Germany, and their colleagues found that in mouse rod cells — light-receptor cells of the eye — this arrangement is reversed.

An analysis of 38 other mammalian species, including the colugo *Galeopterus variegatus* (pictured), revealed that the inverted arrangement is associated with a nocturnal lifestyle. In mouse rod cells, the arrangement seems to reduce light scattering.

T. LAMAN/NATIONAL GEOGRAPHIC/GETTY

BIOCHEMISTRY

Hushing the flush

J. Clin. Invest. doi:10.1172/JCI36806 (2009)

Niacin lowers disease-causing triglycerides and boosts 'good' high-density lipoproteins. But it also triggers a burning 'flush' sensation in humans. Robert Lefkowitz and his colleagues at Duke University Medical Center in Durham, North Carolina, now report that niacin's benefits and side effects may occur through different pathways mediated by the same G-protein-coupled receptor, GPR109A.

When the team exposed human cells expressing GPR109A to niacin, a protein called β-arrestin 1 flocked to the receptor, triggering a downstream flood of the molecule arachidonate, which causes the flushing response. In mice lacking β-arrestin 1, niacin improved fatty acid levels with minimal flushing. Lefkowitz, founder of a company seeking drugs targeting G-protein-coupled receptors, suggests the results could help scientists to find treatments with niacin's benefits but no flush.

CLIMATE CHANGE

Network effects

Ecol. Lett. **12,** 420–431 (2009)

Networks of protected areas have become a key conservation tool, but little is known about how climate change will affect them.

A team led by Stephen Willis of Durham University, UK, modelled the distribution of all of sub-Saharan Africa's breeding birds with respect to the Important Bird Areas network. The researchers calculated species' climate envelopes under the predictions of the 2001 third assessment report of the Intergovernmental Panel on Climate Change.

They found that species distributions will change drastically in the network's areas, which make up 7% of the continent and cover 42 countries. However, most of the 815 birds considered 'priority species' will still find a home somewhere within the network. Only seven or eight such species are predicted to lose all suitable climate from the network.

POPULATION STUDIES

China needs women

Br. Med. J. **338,** b1211 (2009)

Analysis of a 2005 census suggests that, in China's under-20 age group, there are almost 33 million more males than there are females.

Therese Hesketh of University College London and her colleagues pin the heightened sex ratio (the number of boys in each age group for every 100 girls) on sex-selected abortions starting with the introduction of low-cost ultrasound in the late 1980s.

The study extrapolates from a survey of nearly 4.8 million people in the under-20 set — covering 1% of this population across all of China's provinces. The authors show the nationwide sex ratio rising from 108 in the late 1980s to 124 in the 2000–2004 period. Male-biased births were highest for rural families who were allowed a second child after having a girl.

J. XU/REUTERS

NEUROSCIENCE

Connecting dementias

Neuron **62,** 42–52 (2009)

Neurodegenerative diseases do not sow destruction randomly in the brain, but progress along defined and predictable neuronal networks, according to new imaging work.

William Seeley of the University of California, San Francisco, and his colleagues imaged the brains of patients with five different clinical dementias — including Alzheimer's disease — which can arise from different molecular pathologies.

The researchers traced intrinsic connectivity networks — such as that involved in episodic memory — in the brains of healthy controls, and compared them with data from each patient group. They found that each type of dementia targets a different neural network.

CIRCADIAN RHYTHMS

Magnetic clocks

PLoS Biol. **7,** e1000086 (2009)

Earth's magnetic field can influence animals' circadian clocks, surprisingly enough through the photoreceptor cryptochrome, which is activated by blue light.