

## RESEARCH HIGHLIGHTS

**Deeper still and deeper**

*Proc. R. Soc. B* doi:10.1098/rspb.2009.0102 (2009)

Darwin suggested that particularly long-tongued pollinators and long-tubed flowers are dancers in a sort of coevolutionary tango, each acting as selection pressure on the other. When faced with a flower that keeps its nectar at the end of a long tube, a nectar bat (*Anoura fistulata*, pictured) with a longer-than-average tongue has an advantage over its shorter-tongued conspecifics. Now, Nathan Muchhala and James Thomson of the University of Toronto, Canada, have shown that pressures run the other way as well.

The duo experimentally manipulated the length of the flower *Centropogon nigricans* and found that longer tubes delivered more pollen to bats in male flowers, and took more pollen from bats in female flowers. The exact mechanism, however, remains unknown.



N. MUCHHALA & J.D. THOMSON

**MARINE BIOLOGY****Snotty sampling**

*Mar. Mamm. Sci.* doi:10.1111/j.1748-7692.2008.00277.x (2009)

Water ejected from whale blow holes can be used for research into the animals' hormonal state, and possibly gender.

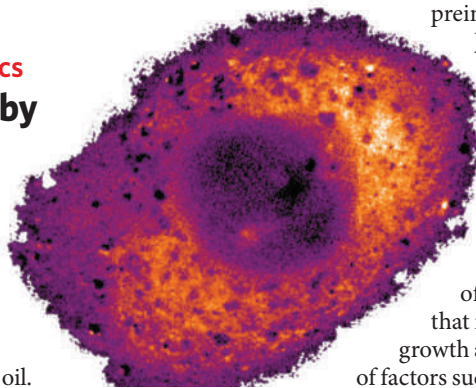
Researchers studying terrestrial mammals can measure hormone levels in faeces and urine; with aquatic mammals, such non-invasive monitoring is difficult. Using nylon stockings mounted on 13-metre carbon-fibre poles, Carolyn Hogg of the University of New South Wales in Sydney, Australia, and her colleagues sampled the exhalations of humpback and northern right whales they were following to see whether these might provide a source of hormonal data.

The team discovered progesterone and testosterone in some of the blows. Testosterone collected from single whales escorting female-calf pods supports theories that escorts are males waiting to breed. However, further testosterone/oestradiol tests are needed to definitively determine the whales' sex.

**MOLECULAR DIAGNOSTICS****Like a record, baby**

*Nature Chem.* doi:10.1038/nchem.120 (2009)

The fluids in the different compartments inside cells vary in viscosity, with those in some parts as thin as water, and those in others more glutinous than olive oil.



Marina Kuimova of Imperial College London and her colleagues have now watched as a dying cell's fluids thicken. Their tool, and weapon, was a molecular rotor that gives off a fluorescent signal that varies according to its rotation rate and can be triggered with light to release reactive oxygen species, which harm the cell.

When the lights went on and the harmful oxygen species were released, the spin rates of the molecules slowed. The team thinks that the cell's internal fluids became drastically more viscous (shown as orange in picture, below) because the chemical assault increased crosslinking between molecules. Over time, the thickening slowed the rate at which further harmful reactions took place.

**GEOSCIENCES****Reefless madness**

*Geophys. Res. Lett.* doi:10.1029/2008GL036282 (2009)

Say sayonara to coral reefs if carbon dioxide levels in the atmosphere reach 560 parts per million, roughly double their preindustrial level.

Jacob Silverman of the Carnegie Institution in Stanford, California, and his colleagues reached this conclusion on the basis of field studies that measured coral growth as a function of factors such as ocean

acidity and water temperature.

Those relationships suggest that at 560 parts per million of carbon dioxide the world's coral reefs cease to grow and start to dissolve. Unlike past studies, this one relied on measurements from actual coral reefs, rather than rates derived from studies in the lab or in large aquaria.

**NEUROSCIENCE****Spinal zap**

*Science* 323, 1578-1582 (2009)

Electrical stimulation of the spinal cord can allow rodents with symptoms of Parkinson's disease to move normally.

This discovery suggests that spinal stimulation could eventually substitute for the risky 'deep-brain stimulation' (DBS) procedure offered to some patients with severe Parkinson's disease, according to Romulo Fuentes and his colleagues at Duke University in Durham, North Carolina, who carried out the studies. DBS is an effective therapy, but highly invasive, because stimulating electrodes must be implanted deep in the brain.

The scientists say the spinal stimulation probably works through nerves that link the spinal cord to the motor cortex, where intentions to move are processed.

For a News story on this research see <http://tinyurl.com/dl2zrl>

**CONDENSED MATTER****Trolling for poles**

*Nature Phys.* doi:10.1038/nphys1227 (2009)

Might it be possible to have a north magnetic pole without a corresponding south? Despite three-quarters of a century of theoretical