

# RESEARCH HIGHLIGHTS

## Claudin-3, a fire-proof tight junction protein in dragons?

**S. Milatz (2010)**  
Dragons in various Fantasy novels regularly spout fire to increase suspense in the readership. So far, mechanisms underlying the secretion of flames from the snout epithelium are unknown. The present work might well prove to revolutionize the field of epithelial physiology.

In a milestone experimental approach it was possible to demonstrate that the tight junction protein claudin-3 is the major sealing junctional component within this epithelium, preventing back-leakage of the flames and thus severe tissue injury during the dragon's defensive behaviour.

Indeed, claudin-3 knock-out proved to be lethal within the first 5 hours after hatching.

Thus, claudin-3 is a promising target for anti-dragon fighters, should other weapons fail to accomplish a timely removal of the dragon towards the final chapters of the novel, in order to attain a happy ending.



R. THORPE

### NEUROSCIENCE

## What makes masculinity?

*Neuron* 66, 260–272 (2010)

In many vertebrates, male sexual and territorial behaviours are regulated by testosterone and oestrogen in the brain. Nirao Shah at the University of California, San Francisco, and his colleagues have found that, in male mice, testosterone controls the extent of these behaviours, but not their programming during development. The authors confirm previous findings that this programming is mediated by oestrogen, which in the male brain is derived from testosterone.

The authors discovered that the androgen receptor, which binds testosterone, is not abundant in the brains of developing male mice, but that oestrogen results in greater expression of this receptor later on in males than in females. Mice in which the gene for this receptor was deleted in the nervous system still displayed typical sexual and territorial behaviours, but to a lesser extent.

### OCEANOGRAPHY

## Deep-sea biomass boom

*Proc. R. Soc. B* doi:10.1098/rspb.2010.0462 (2010)

Submarine canyons are widespread in the deep ocean, but little is known about the life that they support. Fabio De Leo at the University of Hawaii in Honolulu and his team report that the floor of the Kaikoura Canyon off the coast of New Zealand sustains a huge population of invertebrates (a sampling pictured).

The biomass that the authors collected in grab samples and trawls was 100 times greater than any reported previously for habitats more than 500 metres below the sea surface that are

not fed by hydrothermal vents. The team also detected large numbers of rattail fish, which are probably feeding on these invertebrates.

Deep-sea canyons are potential hot spots for bottom-dwelling organisms, and thus could provide fish with feeding grounds.

For a longer story on this research, see [go.nature.com/YXhXL5](http://go.nature.com/YXhXL5)

### ATMOSPHERIC SCIENCE

## Ozone high and low

*Geophys. Res. Lett.* doi:10.1029/2010GL042812 (2010)

A combination of climate change and repair of the hole in the stratospheric ozone layer could, by 2100, lead to increased ozone concentrations in the lower atmosphere (troposphere), particularly in the Southern Hemisphere. Higher levels of ozone could adversely affect air quality and human health.

Guang Zeng of the National Institute of Water and Atmospheric Research in Lauder, New Zealand, and her colleagues used a tropospheric chemistry climate model to

separate the effects of two factors on the global ozone budget: changes in atmospheric circulation due to climate change, and the expected recovery of stratospheric ozone.

When ozone recovery was included, predicted increases in ozone at Earth's surface almost doubled in southern extra-tropical regions during winter months, relative to increases caused by climate change alone.

### MICROSCOPY

## See through tissue

*Opt. Lett.* 35, 1245–1247 (2010)

Fluorescence microscopy has become an indispensable tool for cell biologists. But the light beams used to penetrate a sample are scattered by tissues, complicating efforts to image below a tissue's surface.

Now, Ivo Vellekoop and Christof Aegerter of the University of Zurich in Switzerland have developed a type of fluorescence microscopy that can see what lies beneath. They adjusted the properties of the incoming light so that it constructively interfered with light scattered by the intervening material. The result was a sharply focused beam that could detect fluorescent beads below a light-scattering zinc-oxide layer, with the same resolution as a conventional fluorescent microscope.

### GENOMICS

## Rat sequencing redux

*Genome Res.* doi:10.1101/gr.103499.109 (2010)

Using rapid DNA sequencing methods, Timothy Aitman of Imperial College London and his colleagues have sequenced the genome of a rat strain widely used to study high blood pressure. They compared the



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