RESEARCH HIGHLIGHTS

Selections from the scientific literature

NEUROSCIENCE

How migraines begin

Researchers have pinpointed a brain stress signal that may spark migraine pain.

Migraines are thought to be caused by a wave of cellular depolarization that travels through the brain's cortex. Turgay Dalkara and his colleagues at the Hacettepe University in Ankara induced depolarizing waves in the exposed brains of mice by pricking the cortex with a pin or by applying potassium chloride to it.

The authors then used molecular and pharmacological tools to document the cascade of molecular events that led to activation of the trigeminal nerves, which innervate the face and are implicated in migraines.

Science 339, **1092–1095 (2013)**

JAKOB BRODERSEN

ECOLOGY

Fish migration reduces predation

Fish in Danish lakes substantially reduce their risk of being eaten by making annual migrations. Thus, predation — alongside food and weather — may drive such movements.

Christian Skov at the Technical University of Denmark in Silkeborg and his team implanted 2,219 roach (*Rutilus rutilus*, pictured) with tags during a 4-year period, and monitored individuals' migratory behaviour. Most of the tags recovered from a nearby colony of cormorants (*Phalacrocorax carbo*) were from fish that were last recorded as being in lakes. Roach that spent most time in the lakes during winter were substantially more likely to be eaten by cormorants than those that moved to streams.

This study provides direct evidence that animals can benefit from migration by reducing their risk from predators.

Biol. Lett. 9, **20121178 (2013)**

PALAEONTOLOGY

Fine anatomy of earliest animals

Internal structures of embryonic jellyfish-like organisms have been found in limestone that formed more than 530 million years ago.

Basic animal body plans were established over half a billion years ago, and their origins are often murky. Differing hypotheses have tied one relatively common specimen, *Olivooides*, to three disparate phyla, of which penis worms, sea stars and jellyfish are modern examples. A team led by Philip Donoghue at the University of Bristol, UK, found three specimens in which the internal anatomy (**pictured**) of late-stage *Olivooides* embryos had been preserved, revealing details that place it with Cnidaria, which includes jellyfish.

JOHN CUNNINGHAM

The authors argue that assigning ancient organisms to the correct group is crucial to our understanding of how changes in embryonic development led to the formation of current animal phyla.

Proc. R. Soc. B 280, **20130071 (2013)**

INFECTIOUS DISEASE

Worm signal for river blindness

A newly identified chemical could help to monitor the treatment of a tropical disease that afflicts tens of millions of people.

Onchocerciasis, commonly known as river blindness, is caused by the parasitic worm *Onchocerca volvulus*. The worm can persist in the body in nodules, even after treatment.

Kim Janda at the Scripps Research Institute in La Jolla, California, and his colleagues studied urine from people with the disease, aiming to find a marker of active infection. The team found a previously unknown molecule called *N*-acetyltyramine-*O*,β-glucuronide by using liquid chromatography–mass spectrometry. The molecule — which is derived from one of the worm's neurotransmitters — was present at high levels in the urine of infected people, but at much lower levels in healthy people and patients who were receiving antibiotic treatment.

The authors suggest that a similar approach could be used to find biomarkers for other tropical diseases.

Proc. Natl Acad. Sci. USA **http://dx.doi.org/10.1073/pnas.1221969110 (2013)**