

RESEARCH HIGHLIGHTS

Snakes face the heat

J. Exp. Biol. **213**, 242–248 (2010)

How animals will cope with changing global temperatures is a major question — especially for cold-blooded animals that rely on the environment to regulate their body temperature. Fabien Aubret at the French National Center for Scientific Research in Moulis and Richard Shine of the University of Sydney, Australia, investigated this by raising tiger snakes (*Notechis scutatus*, pictured) under different thermal conditions.

They found that animals exposed to high temperatures (19–37 °C) during the first 14 months of their lives exhibited the same body temperature, locomotor speed and predator responses as those raised in cold and intermediate environments.

However, regardless of the temperature they were raised in, none of the animals was later able to respond successfully to rapid change in ambient conditions. The authors suggest that the main impact of climate change may result from greater year-to-year variations than from an overall upward trend in temperature.



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NEUROSCIENCE

Brain cell gain and cocaine

J. Neurosci. **30**, 304–315 (2010)

Blocking the growth of new neurons in a key region of the adult rat brain may make the animal more vulnerable to cocaine addiction and relapse.

Amelia Eisch at the University of Texas Southwestern Medical Center in Dallas and her colleagues inhibited neurogenesis in the adult hippocampus by irradiating it. The rats were then trained to give themselves cocaine.

Animals whose hippocampus had been zapped self-administered more cocaine than those who had received a sham irradiation. When brain-cell generation was blocked after the rats had learned to give themselves cocaine, they worked harder than control rats to get the drug when it was no longer available.

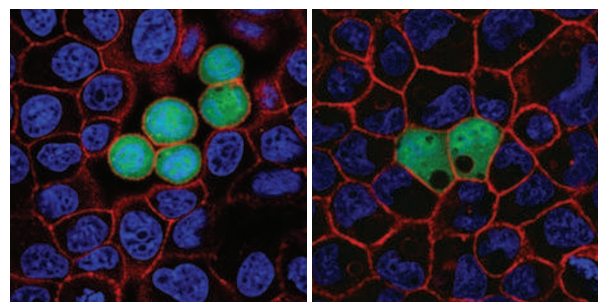
MATERIALS SCIENCE

Sequencing with carbon

Nano Lett. doi:10.1021/nl9029237 (2010)

A device that could rapidly sequence a single strand of DNA passing through a gap in a piece of graphene — a one-atom thick sheet of carbon — is outlined by Henk Postma of California State University, Northridge.

Postma's device would make use of graphene's conducting ability. The graphene would act as the electrodes to measure the conductance of DNA as it moved through the gap. Each of the four bases that make up DNA has a unique conductance, which would allow the DNA sequence to be read.



J. CELL SCI.

Other nanopores have been devised for DNA sequencing, but graphene's innate conductance and sturdiness makes it more attractive, says Postma.

CANCER BIOLOGY

Kicking out cancer cells

J. Cell Sci. **123**, 171–179 (2010)

It seems that when some cells turn cancerous, their healthy neighbours can detect the transformation and eject the cells. Yasuyuki Fujita of University College London and his colleagues have identified signalling pathways that may drive this process.

Cultured canine kidney cells bearing the mutated *Src* cancer gene are squeezed out in a specific direction from a layer of normal cells (pictured below left) but remain in place when surrounded by similar cancer cells (right). The authors pinpointed two proteins, myosin II and FAK, that are activated in the cancer cells when surrounded by normal cells and are involved in the cancer cells' ejection.

The authors say that the process prevents cancer cells from spreading around the body, because the cells are kicked out in the opposite direction to that required for such metastasis.

GEOSCIENCE

Extraterrestrial dust

Earth Planet. Sci. Lett. **289**, 287–297 (2010)

Studies of an ice core taken from East Antarctica's Dome Fuji reveal evidence of two meteoritic events that took place around 434,000 and 481,000 years ago. Keiji Misawa of Japan's National Institute of Polar Research in Tokyo and his colleagues report their discovery of silicate-rich dust layers. Analysis of the dust indicated an extraterrestrial source.

The dust layers, which are a few millimetres thick, are similar to those found in another core drilled about 2,000 kilometres to the east. The authors say that this massive spread of debris came from large impacts, evidence of which has not previously been found in the Southern Hemisphere.

BIOGEOCHEMISTRY

DDT in the ocean

Geophys. Res. Lett. doi:10.1029/2009GL041340 (2009)

Once hailed as an effective insecticide, but later loathed for its toxic environmental effects, DDT (dichlorodiphenyltrichloroethane)

was banned in many countries in the 1970s. Now, a modelling study suggests that, in parts of the ocean, it may have accumulated in large enough amounts to oversaturate the surface waters and be re-emitted into the atmosphere.

Irene Stemmler and Gerhard Lammel, both now at the Max Planck Institute for Chemistry in Mainz, Germany, used a three-dimensional