

RESEARCH HIGHLIGHTS

Selections from the
scientific literature

BIOPHYSICS

DNA is as elastic as nylon

To perform its functions in the cell, a DNA molecule needs to fold, coil and unzip — processes that depend on its mechanical properties. Lambert van Eijck at Delft University of Technology in the Netherlands and his colleagues have measured the elasticity of DNA and found that, at 83 newtons per metre, it is similar to that of nylon.

The team shot a neutron beam through aligned fibres of DNA and measured the scattering of neutrons as a way to gauge the speed of sound waves vibrating along the DNA helices. The authors also used a computer model of the DNA's vibrations to explain the large variation in previously reported elasticities, which ranged from 0.3 to 133 newtons per metre.

Phys. Rev. Lett. 107, 088102 (2011)

CANCER

Tumours light up in surgery

A tumour-specific fluorescent label has allowed surgeons to remove ovarian cancer tissue that would have appeared normal to the naked eye.

About 85–95% of ovarian

cancers express large numbers of receptors for the molecule folate. So Gooitzen van Dam at the University of Groningen in the Netherlands, Vasilis Ntziachristos at the Technical University Munich in Germany and their colleagues tested a probe made up of folate bound to a fluorescent molecule. They injected ten patients with this label and used a special camera and light source (pictured) to 'light up' the cancer cells during surgery. Fluorescence appeared in patients with malignant tumours, but not in those with benign growths. Furthermore, five surgeons asked to identify tumour deposits in colour images detected more when

aided by fluorescence.

Nature Med. <http://dx.doi.org/10.1038/nm.2472> (2011)

NEUROIMMUNOLOGY

T cell makes nerve molecule

In times of stress, signals from the brain quell potentially damaging inflammation in other parts of the body. The process involves release of the neurotransmitter acetylcholine in the spleen, but the source of this chemical in the organ has been unclear, as the nerves that link the spleen to the brain cannot make it. So Kevin Tracey at the Feinstein Institute

for Medical Research in Manhasset, New York, and his team looked for other sources. They homed in on a specific group of immune cells, called 'memory' T cells, in the spleens of mice that make acetylcholine when the vagus nerve, which connects the brain to many internal organs, is stimulated.

Stimulating the vagus nerve lowered the production of the inflammatory protein called TNF- α in the spleens of normal mice, but had no effect on mice lacking T cells. This was resolved by implanting the acetylcholine-synthesizing T cells into these mice.

Science <http://dx.doi.org/10.1126/science.1209985> (2011)



C. R. TRACY

ZOOLOGY

Frogs fog up to absorb water

Green tree frogs remain active in northern Australia during winter, despite a seasonal lack of rain and surface water. It seems that the frogs (*Litoria caerulea*) get around this by absorbing water that condenses on their skin — increasing their body mass by up to 0.93%.

Christopher Tracy and his colleagues at Charles Darwin University in Darwin, Australia, used ice water to cool frogs to 7–16°C. They then moved the chilled animals

into humid, warm (up to 30°C) natural and artificial tree hollows, where they observed droplets of condensation on the creatures' dorsal skin, especially on their heads (pictured).

The authors suggest that when the frogs leave their warm shelters on cool nights, they gain more water on their return than they lose through evaporation while they are outside.

Am. Nat. <http://dx.doi.org/10.1086/661908> (2011)

