

cardiolipin levels overwhelm ATP8b1 transporters during infection, allowing the lipid to accumulate.

Nature Med. doi:10.1038/nm.2213 (2010)

IMMUNOLOGY

Vessels block inflammation

Increased growth of vessels that shuttle immune cells involved in inflammation actually prevents chronic skin inflammation.

Michael Detmar at the Swiss Federal Institute of Technology in Zurich and his colleagues engineered a mouse model of psoriasis — an autoimmune skin condition — to overexpress in the skin a protein called VEGF-C, which promotes the generation of lymphatic vessels. The mice made more lymphatic vessels than normal psoriatic mice, but showed fewer signs of skin inflammation, with symptoms disappearing after four weeks. Treating the skin of the normal psoriatic mice with a recombinant form of VEGF-C had similar effects.

J. Exp. Med. doi:10.1084/jem.20100559 (2010)

MOLECULAR BIOLOGY

Proteins actin' differently

Two forms of a common protein called actin behave differently in cells, despite having almost identical amino-acid sequences. Anna Kashina at the University of Pennsylvania in Philadelphia and her colleagues have uncovered the reason why: one is synthesized, or translated, by the cell from RNA more slowly than the other.

β -actin often has an extra copy of the amino-acid arginine added after translation. However, γ -actin is not found in an arginylated form. By monitoring the metabolic fates of the two forms in various cellular tests, the team showed that γ -actin is translated, and therefore

folded, more slowly. The delay reveals a normally hidden residue of another amino acid, lysine. If γ -actin is arginylated, the combination of this and the exposure of the lysine ultimately marks γ -actin for degradation. The two forms of actin are encoded by different genes, which explains the difference in translation rate. *Science* 329, 1534–1537 (2010)

NEUROSCIENCE

No brain pain control

Pain is inhibited by the binding of cannabinoid compounds with their receptor molecules. Now scientists have identified the endogenous cannabinoid responsible — anandamide. Unexpectedly, they have also shown that its full analgesic effect can be achieved when the cannabinoid receptor CB₁ is activated solely in tissues outside the brain.

Daniele Piomelli at the Italian Institute of Technology in Genoa and his colleagues developed a small molecule, URB937, that blocks the breakdown of anandamide but cannot access the brain. Rats injected with URB937 displayed reduced responses to several different types of pain.

The discovery may offer a new approach to pain therapy that avoids the risk of a 'cannabis high', the authors say.

Nature Neurosci. doi:10.1038/nn.2632 (2010)

ZOOLOGY

Cooperative flatworms

Parasitic Trematode flatworms form cooperative colonies in their molluscan hosts, with some individuals reproducing while others defend the colony. Although known to occur in a few groups — ants, for example — such complex social organization and altruistic behaviour is unusual.

Ryan Hechinger and his

COMMUNITY CHOICE

The most read papers in science

REGENERATIVE BIOLOGY

Rat pancreas for mice

HIGHLY READ
on www.cell.com
up until 13
September 2010

A pancreas has been generated from rat stem cells inside a developing mouse that lacks the ability to produce a functioning pancreas of its own.

Hiromitsu Nakauchi at the University of Tokyo and his colleagues 'disguised' donor rat or mouse stem cells so that they could be introduced into an embryo of the other species, by culturing the cells under specific conditions.

The team used the technique to inject reprogrammed rat stem cells, capable of forming any tissue, into mouse embryos in which a key gene regulating pancreatic development had been deleted. Only a small percentage of the mice born survived into adulthood, but the pancreases of these mice were functional and derived almost completely from the rat cells. The authors say that the method takes us a step closer to whole-organ regeneration and transplantation.

Cell 142, 787–799 (2010)

colleagues at the University of California, Santa Barbara, found two distinct forms of the flatworm. 'Soldiers'

were around 2% of the body size of those that reproduced, precluding them from breeding but allowing them greater mobility to defend their colonies. Only the reproductive forms had embryos in their body cavities, whereas soldiers were more frequently observed attacking worms of other species or colonies (pictured).

The researchers say that the finding provides a new avenue by which to study the evolution of social behaviour. *Proc. R. Soc. B* doi:10.1098/rspb.2010.1753 (2010)

EPIGENETICS

Mapping methylation

DNA can undergo changes not only in sequence, but also by the addition or

removal of chemical groups. Such 'epigenetic' changes affect gene regulation and are thought to be involved in many diseases. Daniele Fallin and Andrew Feinberg at Johns Hopkins University in Baltimore, Maryland, and their colleagues have identified four genomic regions in which methyl-group abundance correlates with body mass index (BMI), which can indicate obesity.

The authors studied blood samples taken from 74 Icelanders on two occasions, roughly 11 years apart. They teased out 227 genomic regions in which methylation varied greatly across the volunteers. Of these, 119 remained unchanged within individuals during the 11-year period. These included the four regions linked to BMI, which were in or near genes implicated in obesity or diabetes. The authors suggest that stable epigenetic 'signatures' could provide personalized indicators of disease risk. *Sci. Transl. Med.* 2, 49ra67 (2010)

