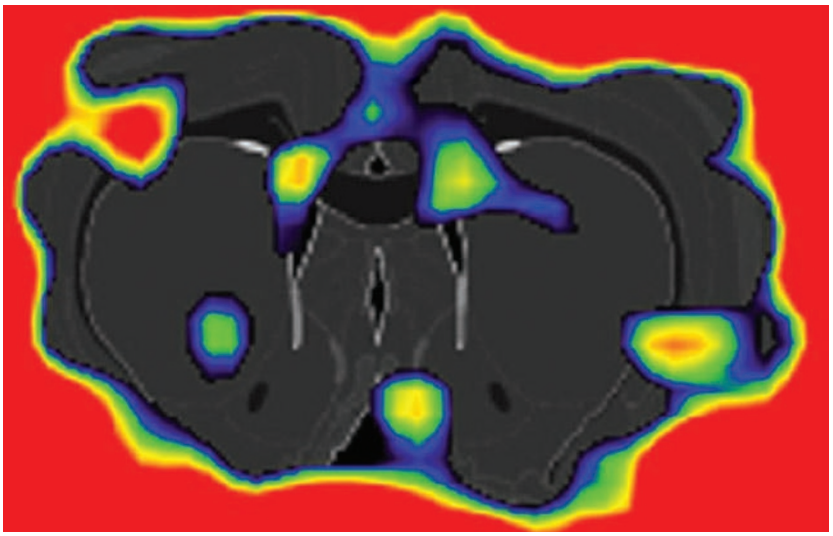
RESEARCH HIGHLIGHTS

Stem cells on screen

J. Neurosci. **30,** 6454–6460 (2010)
Certain drugs stimulate the generation of stem cells in particular regions of the brain, raising hopes that such compounds could help the brain to repair itself after damage. So far, however, it has been possible to assess the effects of these drugs only after use, by staining brain slices from dead animals.

To develop a way of monitoring stem cells *in vivo*, Michael Schroeter at the University Hospital of Cologne in Germany and his colleagues injected rats with a radiolabelled marker of cell proliferation. Using the imaging technique positron emission tomography, the researchers observed and measured the growth of the neural stem-cell population in live rats with normal (pictured) and diseased brains. They also quantified the expansion of certain stem-cell populations in response to drugs or surgically induced brain damage. **L.O.-S.**



M. A. RUEGER *ET AL.*

SYNTHETIC BIOLOGY

Search and destroy

Nature Chem. Biol. doi:10.1038/nchembio.369 (2010)
Researchers have engineered a strain of the bacterium *Escherichia coli* to migrate towards and degrade atrazine, a common herbicide and environmental contaminant.

Justin Gallivan and his colleagues at Emory University in Atlanta, Georgia, have developed an atrazine-sensitive synthetic riboswitch — an RNA molecule that regulates gene expression. They inserted the riboswitch into *E. coli*, where it controls a motility protein, causing the bacteria to move towards atrazine.

The researchers next added a gene for an enzyme that breaks down atrazine. They show that in a Petri dish containing atrazine, engineered cells move outwards, destroying atrazine in their path. As herbicide levels drop, cells eventually slow down and stop. The team suggests that a similar approach could be used to reprogram bacteria for other tasks. **C.L.**

NEUROSCIENCE

Ageing on the brain

Science **328,** 753–756 (2010)
Why do learning and memory deteriorate with age? Scientists have speculated that changes in gene expression are involved, but little is known about the mechanism.

André Fischer at the European Neuroscience Institute in Göttingen, Germany, and his colleagues have identified more than 1,500 genes that are upregulated in hippocampal cells in response to learning in three-month-old mice. However, they found that the expression of these 'learning-regulated' genes remained at baseline levels in 16-month-old animals that had performed the same memory tasks. The authors traced this difference to errors in a chemical modification, called acetylation, of the DNA-packaging proteins bound to just these genes.

The team shows that drugs that reverse this modification improve learning and memory in older mice, suggesting that this could be a strategy for treating dementia. **A.K.**

ANIMAL BEHAVIOUR

Honeybee harmony

J. Exp. Biol. doi:10.1242/jeb.035626 (2010)
When kept in the same hives, two related species of honeybee can cooperate to build a comb, despite producing different wax chemicals and comb-cell sizes.

Sarah Radloff at Rhodes University in Grahamstown, South Africa, and her team filmed comb-building in pure and artificially mixed colonies of *Apis cerana* and *Apis mellifera* (pictured). They found that *A. mellifera* workers were more tolerant of differences in wax and cell size than *A. cerana* bees, and that the former seem to stimulate comb construction by the latter.

M.-X. YANG *ET AL.*/COMPANY OF BIOLOGISTS

The two species share certain aspects of comb-building behaviour, suggesting that these evolved before the species split. **J.F.**

GENETICS

An eye for colour

PLoS Genet. **6,** e1000934 (2010)
Previous studies of the genetics of human eye colour used only broad categories — such as blue, brown and intermediate — without quantifying the subtle variations in between. So far, this has led to the identification of seven genes associated with the trait.

Manfred Kayser at Erasmus University Medical Center in Rotterdam, the Netherlands, and his colleagues adopted a more detailed approach. They digitally encoded eye colour using hue and saturation values obtained from high-resolution photographs of 5,951 Dutch Europeans.

Analysis of the participants' genomes revealed three new regions associated with continuous variations in eye colour. These new regions, together with the seven genes identified previously, underlie about 50% of eye-colour variation, according to a model the researchers developed to predict eye colour. **J.F.**

QUANTUM INFORMATION

Leak-proof chips

Phys. Rev. Lett. doi:10.1103/PhysRevLett.104.180501 (2010)
Semiconducting chips are fast approaching classical limits. Electrical circuits have become atomically thin, causing errors in