

COGNITIVE NEUROSCIENCE

Vicious cycle of overeating

Obese people are known to have a less sensitive reward centre in the brain, which drives them to overeat. This may, in turn, further dampen their reward circuitry for food.

Eric Stice at the University of Texas at Austin and his co-workers used functional magnetic resonance imaging to scan the brains of 20 overweight female volunteers of similar body mass index (BMI) as they sipped either a chocolate milkshake or a tasteless solution. The researchers repeated the tests six months later. They found that women who had a greater than 2.5% increase in their BMI over the interim period showed a reduced response in the brain's striatum to the milkshake relative to their baseline response, as well as to women whose weight had remained steady over the six-month period.

J. Neurosci. 30, 13105–13109 (2010)

NEUROSCIENCE

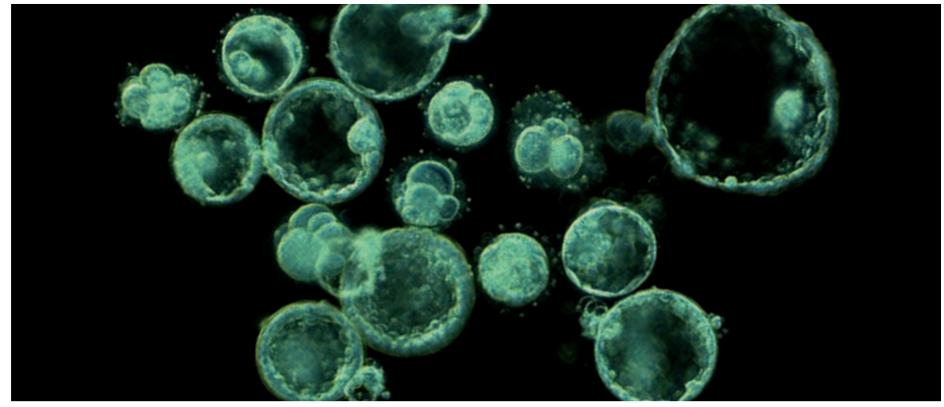
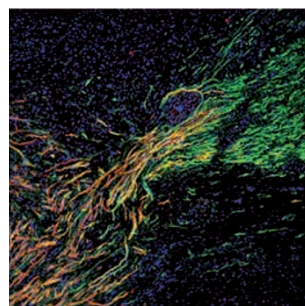
Guide the way to nerve repair

If severed, nerves outside the brain and spinal cord can reconnect and resume functioning. Unexpectedly, the molecular mechanism behind this remarkable ability turns out to involve fibroblasts — a type of cell that helps with wound repair.

Alison Lloyd at University College London and her colleagues used fluorescence microscopy to observe how cut nerves mend themselves in rats. They observed fibroblasts at the site of injury make contact with Schwann cells, which surround and protect

neurons. Signalling between the two cell types prompted the Schwann cells to clump into tiny cords that guide the regrowth of neurons across the wound (pictured). This response, the authors found, is mediated by a protein called SOX2, which is also involved in reprogramming cells to a stem-cell-like state.

Cell 143, 145–155 (2010)



BIOTECHNOLOGY

Pictures predict embryos' fate

The likelihood that a human embryo cultured during *in vitro* fertilization (IVF) will develop successfully to the five-day mark can be predicted with about 93% sensitivity and specificity from three early developmental events.

In IVF, 50–70% of embryos never make it to the blastocyst stage, which begins five or six days after fertilization. Renee Reijo Pera at Stanford University in California and her group analysed images of 242 IVF embryos (pictured) taken

with microscopic time-lapse photography.

They found that those that would go on to form blastocysts showed specific developmental patterns, such as the first cytokinesis — cleavage that results in two separate cells — lasting less than 33 minutes. The team devised an algorithm to automatically screen embryos for this and two other parameters, and found that it could predict which embryos would reach the blastocyst stage. *Nature Biotechnol.* doi:10.1038/nbt.1686 (2010)

HYDROLOGY

Groundwater stores running dry

Groundwater supplies are shrinking at an increasing rate — according to new estimates, annual depletion more than doubled from 126 cubic kilometres in 1960 to 283 cubic kilometres in 2000.

About one-third of the world's inhabitants have limited access to fresh water, and many must draw from underground aquifers — often more rapidly than natural processes can refill them. Marc Bierkens at Utrecht University in the Netherlands and his colleagues combined a groundwater database with a global hydrological model. They found depletion rates

to be highest in some of the world's major agricultural regions, including northwest India, northeast China, and the central United States.

The authors also found that a significant amount of the extracted groundwater evaporates and precipitates over the ocean, accounting for about 25% of the annual rise in sea level.

Geophys. Res. Lett. doi:10.1029/2010GL044571 (2010)

CANCER BIOLOGY

Tumours pave their own path

For tumour cells to infiltrate new tissues, they must first clear an escape route from their