

NEUROSCIENCE

Sleep calms the emotions

A good night's sleep is restful for the amygdala, the brain's emotional centre. People who had recently awoken from sleep showed a decrease in reactivity in the amygdala after viewing emotional pictures, whereas those who had remained awake showed an increase.

Matthew Walker and his colleagues at the University of California, Berkeley, scanned the brains of volunteers as they looked at the pictures and rated the images' emotional intensity. The tests were repeated 12 hours later, after either a night of sleep or a wakeful daytime period. The most intense emotional ratings decreased among those who had slept, but not in those who had not slept. These decreases in amygdala reactivity and emotional ratings correlated with declines in electrical activity in the brain during rapid eye movement (REM) sleep.

The findings could explain why people with anxiety disorders, who often have abnormal REM sleep, are more emotionally reactive.

Curr. Biol. <http://dx.doi.org/10.1016/j.cub.2011.10.052> (2011)

PALAEOANTHROPOLOGY

Diet sculpts human jaws

Recent humans whose communities subsisted by farming, a relatively recent pursuit, tended to have shorter mandibles — lower jawbones — than hunter-gatherers.

Noreen von Cramon-Taubadel at the University of Kent in Canterbury, UK, compared hundreds of jaw and skull measurements from 11 populations around the world that practised varying degrees of hunting, fishing, foraging and farming. No matter what their home or their ancestry, the hunter-gatherers had longer, narrower mandibles than humans who subsisted on

crops, dairy or farm animals.

Agriculture and animal farming began emerging around 10,000 years ago in various regions of the world. As populations turned to farming, a diet of softer, more processed foods may have spurred the evolution of daintier jaws.

Proc. Natl Acad. Sci. USA <http://dx.doi.org/10.1073/pnas.1113050108> (2011)

ORGANIC CHEMISTRY

Random mix reveals reaction

Chemists in New Jersey have identified a new carbon-carbon bond-forming reaction by using an automated, high-throughput method to test more than 1,000 combinations of chemicals.

Many important discoveries in chemistry have been accidental, so David MacMillan and his colleagues at Princeton University decided to harness serendipity to look for new and unusual chemical reactions. They combined functional organic groups that they did not expect to react with one another and exposed them to light-activated catalysts.

The method paid off, revealing a reaction that activates a carbon atom bonded to nitrogen in an amine, and adds another carbon to it. The researchers used the reaction to generate, under mild conditions, a variety of benzylic amines, which are found in many pharmaceutical compounds. *Science* 334, 1114–1117 (2011)

MOLECULAR MEDICINE

Liver disease target

The extent of the damage caused by liver disease depends on the balance between the generation of scar tissue and the regeneration of liver cells. Hepatic stellate cells, which are activated during liver damage, shift the balance towards scarring.

Derek Mann at Newcastle University, UK, and his

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MATERIALS SCIENCE

Stretchy graphene transistors

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in October

A form of carbon called graphene could be a useful material in the production of stretchy, transparent electronic components.

To demonstrate its potential, Jong-Hyun Ahn at Sungkyunkwan University in Suwon and Jeong Ho Cho of Soongsil University in Seoul, both in South Korea, and their colleagues report transistors based on graphene, but printed on a stretchy rubber substrate. The team first laid down and patterned a graphene film on copper foil, then transferred it to rubber to form two electrodes — the 'source' and 'drain' — and the semiconducting channel region. Extra components can then be added using an aerosol jet to print polymers on top, forming the insulating layer and the third 'gate' electrode.

The method avoids the high-temperature, vacuum processes usually required for transistor manufacture and creates a transistor that works even when its rubber base is stretched.

Nano Lett. 11, 4642–4646 (2011)

colleagues found that, in mice, the neurotransmitter serotonin activates 5-HT_{2B} receptors on the surface of hepatic stellate cells. This sets off a molecular cascade that eventually suppresses the division of normal liver cells. A specific 5-HT_{2B}-receptor antagonist blocked this suppression, and mice lacking the receptor also showed increased regeneration of liver cells in response to damage. The team says that such receptor antagonists could be clinically useful for chronic liver disease.

Nature Med. <http://dx.doi.org/10.1038/nm.2490> (2011)

ZOOLOGY

Spiders' chemical deterrent

Ants are rarely seen foraging in the webs of orb-web spiders, even though creatures trapped there or the resident arachnid would make for an easy meal. Daiqin Li at the National University of Singapore and his colleagues report that the orb-web spider *Nephila antipodiana* (pictured) deposits an alkaloid compound on its silk strands that ants find repulsive.

Ants of three species were



happy to access food via spider silk that had been washed clean, but rarely crossed either untreated silk or silk that had been cleaned and then coated in the alkaloid. Worker ants contacting chemical-laced silk rapidly retreated.

In addition, the web silk threads of small, young spiders that were too thin to support the weight of ants did not contain the chemical. This indicates that it is a deliberate addition by larger spiders, and not a by-product of silk production, the authors write. *Proc. R. Soc. B* <http://dx.doi.org/10.1098/rspb.2011.2193> (2011)

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