RESEARCH HIGHLIGHTS

Selections from the scientific literature

NEUROSCIENCE

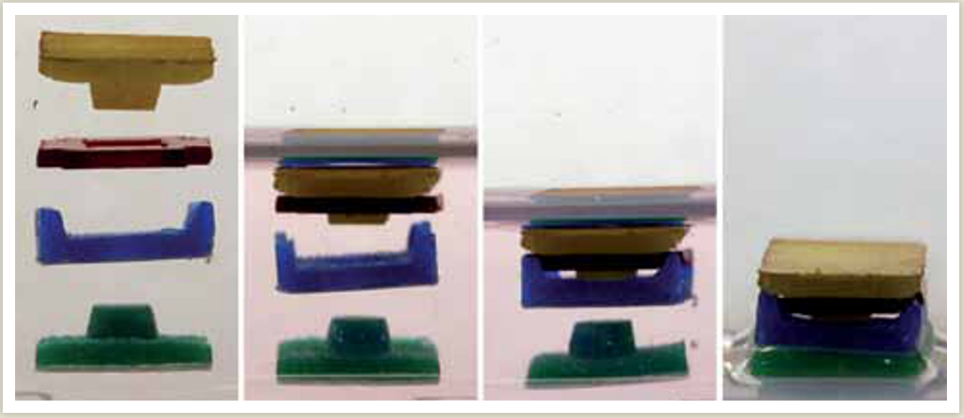
A cancer–memory connection

A protein whose overexpression is associated with many forms of cancer also controls the formation of connections between brain cells.

Cyclin E drives cell proliferation and is found mostly in dividing cells, but is also present in the adult brain. Jarrod Marto and Piotr Sicinski at the Dana-Farber Cancer Institute in Boston, Massachusetts, and their colleagues reveal that, in non-dividing neurons in the mouse brain, the protein is involved in memory formation. Neurons from mice in which the cyclin E gene was knocked out formed fewer synapses, or connections, and showed reduced synaptic transmission compared with normal mice. The knockout mice also exhibited memory impairments.

The authors show that cyclin E normally inhibits the enzyme Cdk5, which regulates neuronal development.

Dev. Cell **http://dx.doi.org/10.1016/j.devcel.2011.08.009 (2011)**



K. MIRICA

MATERIALS

A maglev construction kit

By exploiting a magnetic levitational effect, researchers have come up with a way to assemble small parts in three dimensions.

The system devised by George Whitesides at Harvard University in Cambridge, Massachusetts, and his colleagues consists of neodymium iron boride magnets placed above and below a container filled with a fluid that is weakly magnetic when in a magnetic field. Suspended in the liquid are millimetre-sized objects. The average density of an object determines the height at which it levitates and the variation of density within it affects its tilt. Changing the magnetic field alters the objects' position and orientation. Draining the fluid allows gravity to pull the pieces together.

The authors used their method to build multilayered structures out of chunks of polymer (pictured). They say that the technique could be used to assemble soft or fragile pieces, minimizing mechanical contact and friction.

Adv. Mater. 23, **4134–4140 (2011)**

PALAEOANTHROPOLOGY

Adding bite to hominin history

Fossils of the ancient human ancestor *Homo erectus* have been found in two locations in East Asia — near Beijing and in central Java, Indonesia — but whether this indicates one or more hominin migrations from Africa remains unclear. Now Yahdi Zaim at the Institute of Technology Bandung in Java and his colleagues report a 1.5-million-year-old *H. erectus* jaw fragment (**pictured**) that supports the occurrence of two waves of eastward migration at different times and with different endpoints.

The fossil more closely resembles the jaws of *H. erectus* in Africa and Western Eurasia than those from China. The researchers suggest that an earlier population of *H. erectus* took a southern route to equatorial Asia, and a second group took a more northerly passage to northeast China.

J. Hum. Evol. 61, **363–376 (2011)**

R. L. CIOCHON/UNIV. IOWA

CELL BIOLOGY

When fat droplets fatten

As the metabolic needs of an organism shift, cellular lipid-storing droplets can grow and shrink rapidly in size and number — but what is the mechanism behind this? Tobias Walther at Yale University in New Haven, Connecticut, and his colleagues have found that an enzyme, CCT, regulates the formation of phosphatidylcholine (PC) during the expansion of lipid droplets. PC acts as a surfactant at the surface of the lipid droplets, preventing them from coalescing.

The authors fluorescently tagged CCT in fruitfly cells and loaded the cells with lipid. They show that CCT binds to the expanding lipid droplets as PC levels run short. This activates the enzyme to stimulate the production of PC. The researchers found a similar mechanism in mouse cells.

Cell Metab. **http://dx.doi.org/10.1016/j.cmet.2011.07.013 (2011)**