RESEARCH HIGHLIGHTS

Selections from the scientific literature

NEUROBIOLOGY

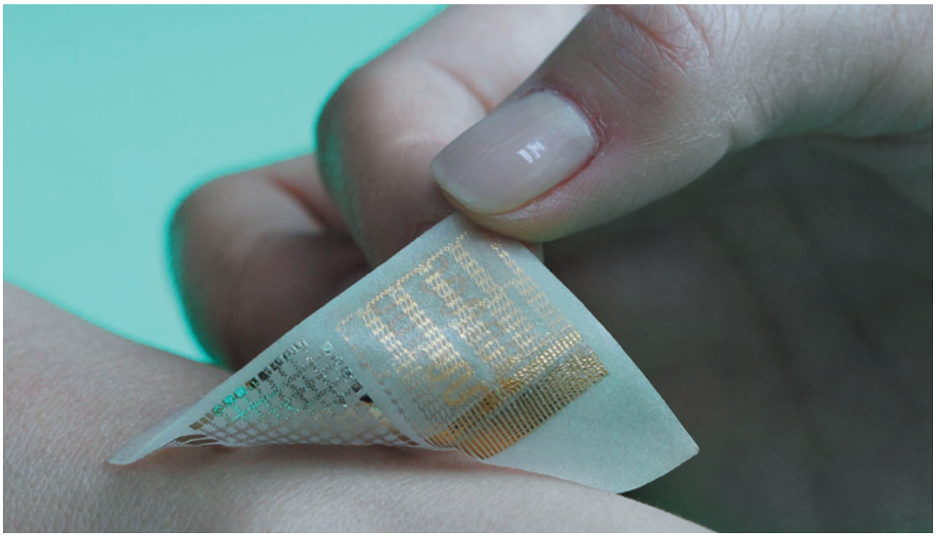
Brain map reveals behaviour links

An "atlas" of the fruit-fly brain is the largest yet to map regions that encode specific behaviours, such as walking backwards.

Carey Priebe of Johns Hopkins University in Baltimore, Maryland, and Marta Zlatic of the Howard Hughes Medical Institute's Janelia Farm Research Campus in Ashburn, Virginia, and their colleagues engineered fruit-fly larvae so that the insects' neurons fired when hit with a beam of light. The researchers stimulated more than 1,000 different neuronal pathways in nearly 38,000 *Drosophila* flies, and recorded how the flies responded.

They were able to determine 29 different behaviours, such as turning to avoid an obstacle, and mapped which neurons seemed to control each behaviour.

Science **http://doi.org/r4t (2014)**



DONGHEE SON/JONGHA LEE

ELECTRONICS

Stick-on skin sensor measures motion

A wearable device as thin as a temporary tattoo can measure, store and transmit data on muscle activity, and release embedded drugs into the wearer's skin.

Dae-Hyeong Kim at Seoul National University in South Korea and his colleagues built their device (pictured) by placing stretchable layers of nanomaterials onto an elastomeric polymer material designed to mimic the softness and flexibility of skin. The nanomaterials acted as strain and temperature sensors, memory modules, microheaters and drug carriers. The authors showed that when the device was applied to human skin, it remained in place and deformed with the skin. It measured simulated hand tremors, and delivered drugs through the skin when the tiny heaters generated enough heat.

The device used a wired connection for power supply and data transfer, but the team aims to develop a wireless version for use by patients with movement disorders.

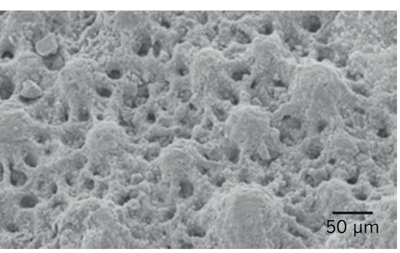
Nature Nanotechnol. **http://dx.doi.org/10.1038/nnano.2014.38 (2014)**

PALAEONTOLOGY

Ancient starfish spotted predators

Sea stars and some other echinoderms might have had complex visual systems for roughly the past 80 million years.

Some existing echinoderms, such as brittle stars, are covered in crystal calcite microlenses that are sensitive to light. To determine the evolutionary history of these structures, Przemysław Gorzelak at the Polish Academy of Sciences in Warsaw and his team analysed 75-million-year-old brittle-star and starfish fossils using a scanning electron microscope. Both kinds of fossil contained structures (**pictured**) that matched modern echinoderms' microlenses in size and shape.



PRZEMYSŁAW GORZELAK/POLISH ACADEMY OF SCIENCES

After an explosion in the diversity of fish and crustacean predators began around 80 million years ago, echinoderms may have developed visual systems to avoid such predators, the researchers say.

Nature Commun. 5, **3576 (2014)**

NEUROSCIENCE

Why babies live hand to mouth

The reason that newborns put their hands into their mouths is probably because this action is hard-wired into the brain as a basic unit of movement.

Angela Sirigu at the French National Centre for Scientific Research in Bron and her colleagues used electrodes to stimulate nearly 150 sites in the precentral gyrus — the brain region that controls voluntary movement — in 26 people undergoing brain surgery. When the researchers stimulated ten specific sites in nine of the participants, including two three-year-olds, the volunteers each moved their closing hand towards their opening mouth.

The authors speculate that the hard-wiring of these movements in the brain means that they are an evolutionarily important behaviour that