rods and evaporates.
Nature Nanotechnol. **http://dx.doi.org/10.1038/nnano.2016.91 (2016)**

EVOLUTION

Fish keep coming out of water

Fish have evolved to live on land multiple times, suggesting that the crucial transition from water to land during the evolution of terrestrial life may not have been unusual.

Terry Ord and Georgina Cooke at the University of New South Wales in Kensington, Australia, looked at data on the behaviour and ecology of living fish and identified 33 different families that include amphibious species, some of which seldom leave the land. In one family, the blenny fish (Blenniidae), amphibious lifestyles evolved 3–7 times. The duo observed one primarily aquatic species of blenny (*Praealticus labrovittas*) emerging onto land on warm days on the western Pacific island of Guam.

The ability to survive on land could help fish to cope with the low oxygen levels of warm seawater, and prevent them getting stuck in tidal pools, the authors propose.
Evolution **http://doi.org/bjzq (2016)**

MICROBIOLOGY

A wealth of anti-CRISPR proteins

Proteins that inhibit the activity of the CRISPR–Cas bacterial defence system could be widespread.

Viruses and other microbes often successfully transfer genes to bacteria, despite the presence of the bacterial CRISPR–Cas system, which recognizes and attacks foreign DNA or RNA. Karen Maxwell and Alan Davidson at the University of Toronto in Canada and their colleagues had previously described nine families of anti-CRISPR protein that help certain viruses to infect *Pseudomonas* bacteria. Now, using bioinformatics, the team has identified five more anti-CRISPR protein families in a range of microorganisms that inhibit CRISPR–Cas systems in *Pseudomonas aeruginosa* and *Pectobacterium atrosepticum*.

Anti-CRISPR proteins could have an important role in gene transfer between bacteria, including the spread of genes involved in antibiotic resistance, the authors say.
Nature Microbiol. **http://dx.doi.org/10.1038/nmicrobiol.2016.85 (2016)**

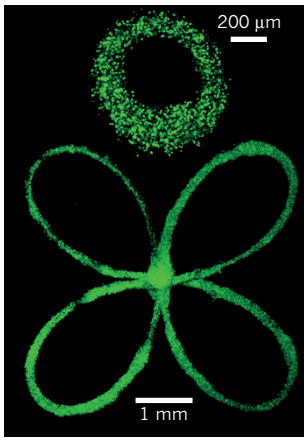
BIOMATERIALS

Liquid-like solid lets cells grow

A scaffold made of tightly packed hydrogel particles allows cultured cells to grow in custom 3D configurations.

Developed by Thomas Angelini and his colleagues at the University of Florida in Gainesville, the scaffold is made of a liquid-like solid material that temporarily becomes fluid when force is applied, and rapidly solidifies after the force is removed. Angelini's team 3D-printed clusters of various types of cell inside the liquid-like solid, creating multicellular structures in the shape of a sphere, a loop and a simple flower (**pictured**).

In contrast to other, stiffer scaffolds used for 3D cell culture, this one is not easily damaged when cells are injected into it, and does not need to be broken down by enzymes to allow cells to grow and migrate.
ACS Biomater. Sci. Eng. **http://doi.org/bjzp (2016)**



T. BHATTACHARJEE *ET AL.*/AM. CHEM. SOC.

NEUROSCIENCE

Myelin clogs up immune cells

The insulating layer around nerve fibres breaks down as mice age, and this could lead to immune dysfunction.

The myelin layer coats nerves to speed up signal transmission. Mikael Simons at the Max Planck Institute for Experimental Medicine in Göttingen, Germany, and his colleagues used electron microscopy to study the brains of mice. They found that the amount of myelin fragments increased with age and that the pieces were taken up by immune cells in the brain called microglia, which engulf debris and foreign materials. During this process, insoluble fatty aggregates accumulated in the microglia and the ability of the cells to take up material declined.

The authors suggest that microglia become overwhelmed with the growing amount of myelin debris, making them less able to function in the ageing brain.
Nature Neurosci. **http://dx.doi.org/10.1038/nn.4325 (2016)**

ARTHUR GEORGES

DEVELOPMENTAL BIOLOGY

Dragon lizard gets sex change

A shift in egg-incubation temperature can result in a genetically male lizard having a mix of male and female traits.

The sex of some reptile species is determined by genetics, but in others it depends on egg-incubation temperature. Richard Shine at the University of Sydney in Australia and his colleagues studied hatchlings and juveniles of the central bearded dragon (*Pogona vitticeps*; male **pictured**). In this species, sex is normally controlled genetically, but incubation temperatures of 32 °C and above can produce sex-reversed females from male embryos. The team incubated eggs at constant temperatures between 26 °C and 34 °C, and found that although sex-reversed females are capable of laying eggs — and even produce more eggs than genetic females — they are similar to males in their morphology and behaviour.

This mix of traits could enhance fitness under certain conditions, which could cause a rapid elimination of sex-determination genes, the authors say.
Proc. R. Soc. B 283, **20160217 (2016)**

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