RESEARCH HIGHLIGHTS

Selections from the scientific literature

GENE EDITING

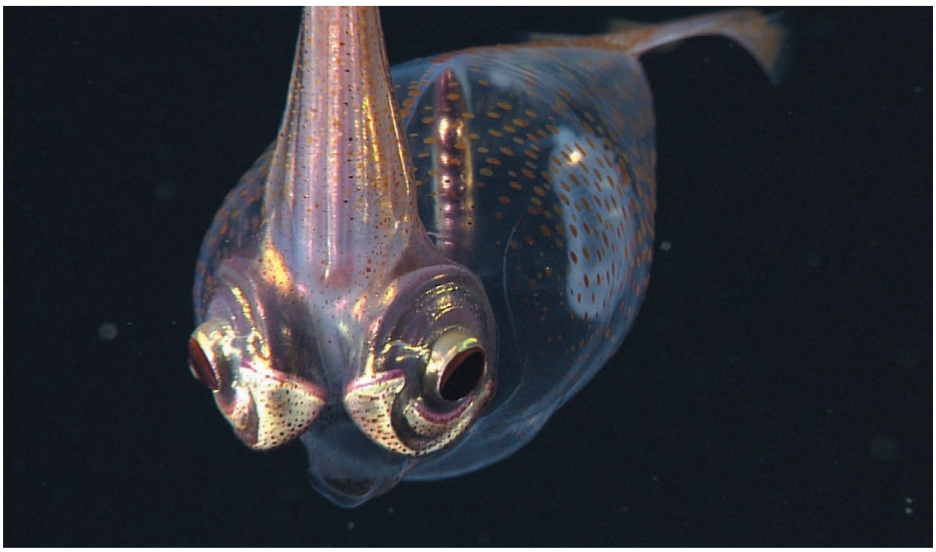
CRISPR blocks cancer growth

Knocking out genes in cancer genomes with the CRISPR–Cas9 technique decreases the ability of cancer cells to multiply.

William Hahn at the Dana Farber Cancer Institute in Boston, Aviad Tsherniak at the Broad Institute of Harvard and MIT in Cambridge — both in Massachusetts — and their colleagues silenced certain genes in 33 cancer-cell lines using CRISPR–Cas9, which can be programmed to snip DNA at specific locations. They found that in parts of the genome with multiple copies of a gene, the number of DNA breaks made by the CRISPR system was linked to a drop in cell proliferation, an outcome not seen with another gene-silencing tool called RNA interference. This effect could be the result of how CRISPR-made DNA cuts are repaired.

The results suggest that cancer cells are sensitive to site-specific DNA damage, and have implications for how experiments using CRISPR should be interpreted. Targeting genomic regions that have many repeated sequences could be a new therapeutic strategy, the authors suggest.

Cancer Discov. **http://doi.org/bjzn (2016)**



MBARI

BIOPHYSICS

How squid hide their eyes

A transparent squid may camouflage itself by activating specialized cells in its eyes.

Many marine creatures emit light to hide shadows that might be seen by predators below. To find out how animals control this bioluminescence, Amanda Holt and Alison Sweeney at the University of Pennsylvania in Philadelphia used transmission electron microscopy to study the eyes of the squid *Galiteuthis* (pictured). They found that the underside of the eye — one of the few parts of the creature that is not transparent — has fibre-like cells in a range of shapes that channel bioluminescence while leaking light at different rates.

The authors modelled how the light travels through the various cell shapes. They suggest that the squid could activate different populations of cells to vary the intensity and distribution of the light passing through them, allowing the animal to camouflage itself at any depth.

J. R. Soc. Interface 13, **20160230 (2016)**

ENERGY

Excess nitrogen spoils biofuels

Nitrogen fertilizer can boost the growth of crops for biofuel production, but applying too much can cut the climate benefits in half.

Ethanol fuel made from plant cellulose is a promising form of renewable energy. Philip Robertson at Michigan State University in Hickory Corners and his colleagues applied various amounts of nitrogen fertilizer to experimental plots of switchgrass (*Panicum virgatum*) for three years. They measured emissions of the greenhouse gas nitrous oxide (N_2O) and the leaching of nitrate, a water pollutant. The authors found that fertilizer boosted yields in the first year, but that the increase declined with subsequent applications. Levels of both emissions and leaching grew exponentially with increases in fertilizer.

The team suggests that minimizing fertilizer use will be crucial for maintaining the environmental benefits of cellulosic biofuel.

Environ. Res. Lett. 11, **064007 (2016)**

NANOSCIENCE

Tiny carbon rods blow off steam

Nanometre-sized rods of carbon can expel water in puffs of vapour when the air is already humid.

Materials such as carbon and silica gels typically pick up moisture as humidity increases. But Satish Nune and his colleagues at the Pacific Northwest National Laboratory in Richland, Washington, found that their carbon-based nanorods take up water at low humidity and then give off about half of it when the relative humidity exceeds 50–80%. The team thinks that water condenses between adjacent rods and then capillary forces draw the rods together until the water bursts from the ends of the