

# RESEARCH HIGHLIGHTS

Selections from the scientific literature

## METABOLISM

### Gastric surgery alters sweet tooth

Some weight-loss surgeries can diminish cravings for sweets by altering the brain's response to the neurotransmitter dopamine.

Ivan de Araujo of Yale University in New Haven, Connecticut, and his colleagues studied the effects of a duodenal-jejunal bypass, which reroutes food from the stomach directly into the middle part of the small intestine. They found that well-fed mice that did not have the surgery consumed more sugar after previous repeated exposure to sweets. Mice that had the surgery did not develop the same sweet tooth.

Sugar consumption led to the release of dopamine, which is involved in reward responses, particularly when the sugar was administered to the upper region of the intestines (the area bypassed in the surgery). Activating dopamine-sensing neurons restored the sweet cravings in mice that had undergone the surgery.

*Cell Metab.* <http://doi.org/9dm> (2015)

## ECOLOGY

### Toads saved from killer fungus

Biologists have rid a wild toad species of a lethal fungal disease that threatens



amphibians around the world.

The chytrid fungus *Batrachochytrium dendrobatidis* has wiped out many species of frogs and toads. Jaime Bosch at Spain's National Museum of Natural History in Madrid and his team removed tadpoles of the midwife toad (*Alytes muletensis*; pictured) from ponds on the Spanish island of Mallorca and treated them in the lab with a drug that kills the fungus. They also drained the ponds and sprayed them with a disinfectant before returning the tadpoles. The fungus disappeared in four out of five treated

ponds for two years.

The method may work only in some habitats, the authors say.

*Biol. Lett.* 11, 20150874 (2015)

## HYDROLOGY

### Snow-fed water supply threatened

The southwestern United States, the Iberian Peninsula and parts of the Middle East and other regions are at risk of seasonal water shortages resulting from decreasing snowfall in a warming climate.

Justin Mankin at Columbia

University in New York and his colleagues looked at projections from various climate models to determine how warming might affect snowfall and river run-off in more than 400 large basins in the Northern Hemisphere. The team identified a dozen or so snow-sensitive basins that, across all climate models, face an 80–100% risk of declining water supply in the coming decades. Each of the sensitive basins has a current population of more than 1 million people — including the Rio Grande basin spanning Texas and Mexico, the Ebro-Duero



## ZOOLOGY

### Mollusc sees with its shell

A marine mollusc has hundreds of eyes in its armour that can see images.

Christine Ortiz at the Massachusetts Institute of Technology in Cambridge and her colleagues studied the structural, optical and mechanical properties of the eyes of *Acanthopleura granulata* (pictured) using various experimental and computational techniques. Unlike in most animals, the microscopic lenses are not organic, but are made of the mineral aragonite. These

minimize light scattering because they are made of large and aligned crystals. Projecting images through the lenses showed that they could resolve an image of a potential predator of around 20 centimetres in size from about 2 metres away.

The shells are much weaker at these points than elsewhere, but the organism has evolved ways to compensate for the structural weakness, the team found.

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