

AGEING

Less cancer protein, longer life

Mice live longer — and seem to age more slowly — if they express lower levels of a cancer-promoting protein called MYC.

High levels of MYC favour tumour growth, but some expression of the protein is required for survival. John Sedivy of Brown University in Providence, Rhode Island, and his colleagues studied the effects of low MYC expression in mice. Mice with only one copy of the *Myc* gene lived 15% longer than those with two copies of the gene, although development and reproduction in the two groups were the same.

Mice with a single copy of *Myc* had a faster metabolism, and less severe age-related conditions such as osteoporosis or the thickening of the heart tissue.

Cell <http://doi.org/znb> (2015)

BIOMECHANICS

Bird's flight captured in a box

Researchers have measured the aerodynamic forces of a bird flying inside a box.

Until now, the aerodynamic lift achieved by free-flying animals has only been estimated using models. David Lentink of Stanford University in California and his team built an enclosed device to directly measure forces generated by a bird's wings during flight. With each flap, moving air exerts a force on the walls of the box, which is captured by sensors. The signals were synchronized with those from a high-speed camera, which records a bird's flight from one side of the enclosure to the other.

The researchers confirmed previous findings that each



JORGE SAENZ/AP

HYDROLOGY

Dams reshape the world's rivers

Dams have altered 48% of all river flow worldwide. And if all dams planned for the next few decades are built, that proportion will nearly double.

Günther Grill of McGill University in Montreal, Canada, and his team developed two ways to analyse how dams break up and regulate river flow. They calculated how 6,374 existing dams and 3,377 proposed ones affected (or

would affect) river volume worldwide between 1930 and 2030. The team found significant changes to existing water flow in rivers such as the Parana River in South America (pictured). The biggest future effects would arise from dams being planned for the Amazon basin.

The models could help engineers to reduce the environmental effects of new dams.

Environ. Res. Lett. 10, 015001 (2015)

downstroke of a bird's wings generates enough force to lift twice the animal's body weight into the air. The device could be used with other animals and free-flying robots, says the team.

J. R. Soc. Interface 12, 20141283 (2015)

CHEMISTRY

Sodium explosion caught on camera

Chemists have scrutinized a classic piece of bench chemistry — the explosion that happens when sodium metal hits water — and revised the thinking of how it works. On contact with water,

the metal produces sodium hydroxide, hydrogen and heat, which was thought to ignite the hydrogen and cause the explosion. To delve into this, Pavel Jungwirth at the Czech Academy of Sciences in Prague and his team used high-speed cameras to capture the reaction of a drop of a liquid alloy of sodium and potassium with water at room temperature.

They found that spikes of the metal shoot out from the droplet just 0.4 milliseconds after it enters the water — too fast to have been expelled by heat. Computer simulations revealed that sodium atoms at the surface of a small cluster each lose an electron within picoseconds. The positively

charged ions rapidly repel each other, causing the explosion, while the protruding metal spikes generate new surface area that drives the reaction.

Nature Chem. <http://dx.doi.org/10.1038/nchem.2161> (2015)

CLIMATE SCIENCE

Big swings in weather to come

Weather extremes could become more common as the climate warms this century, because extreme cooling events in the Pacific Ocean are predicted to occur more often.

La Niña events occur when the equatorial Pacific cools, causing droughts and floods