

# RESEARCH HIGHLIGHTS

Selections from the scientific literature

## GENOME EDITING

### A fix for faulty mitochondria

Using genome editing to target faulty DNA in mitochondria — the cell's powerhouses — could prevent the inheritance of mitochondrial defects that cause disease.

Juan Carlos Izpisua Belmonte at the Salk Institute for Biological Studies in La Jolla, California, and his colleagues injected RNA into mouse embryos and eggs containing a mix of mitochondria from two different mouse strains. The RNA was programmed to produce an engineered enzyme that targets and cuts DNA from only one mouse strain. Around 60% of the targeted mitochondrial DNA was destroyed.

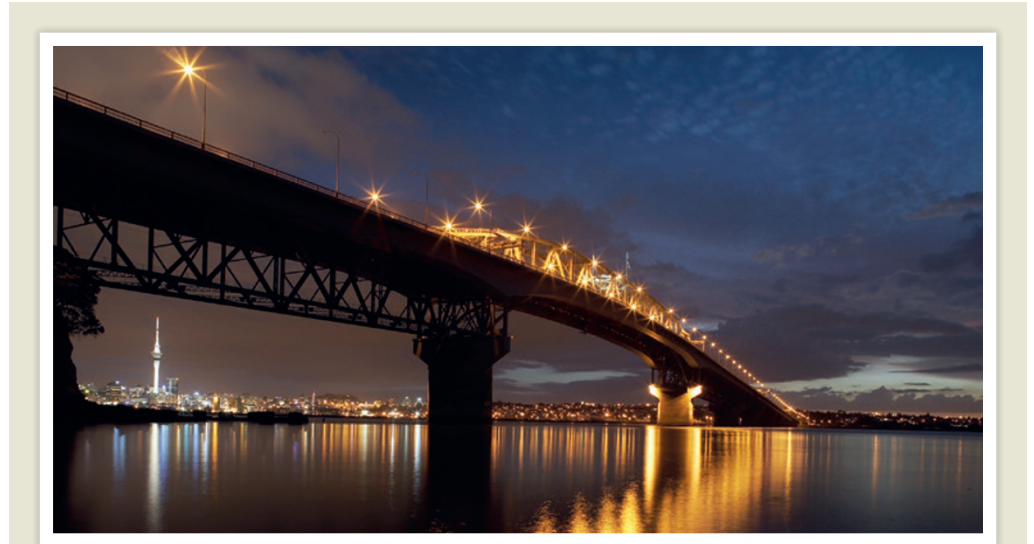
The researchers also reduced the levels of faulty DNA in mouse eggs that contained mitochondria from humans with a mitochondrial disorder. Eventually, similar techniques might be used to prevent the transmission of such diseases while avoiding a controversial method that makes eggs containing mitochondrial DNA from two women. *Cell* 161, 459–469 (2015)

## CANCER

### Targeting multiple myeloma

A new way of blocking enzymes that destroy faulty proteins could fight the blood cancer multiple myeloma.

Proteasomes are enzyme complexes that degrade misfolded proteins, and disrupting them can stop some cancers from proliferating. But cancer cells quickly become resistant to such inhibition, so Thomas Kodadek of the



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## ECOLOGY

### Night lights bring a sea change

Light pollution may be driving changes in marine ecosystems, attracting some species and discouraging others.

Thomas Davies at the University of Exeter, UK, and his colleagues placed plastic panels in the sea off north Wales and illuminated some with white light-emitting diodes (LEDs) at night while leaving others in the dark. After 12 weeks, the lit and unlit panels had been colonized by markedly different animals. Those influenced by light included both

mobile and fixed species. Illumination reduced the numbers of hydroid *Plumularia setacea*, while the tube-building worm *Spirobranchus lamarcki* and the mobile crustacean *Metis ignea* seemed to be attracted by light. A rise in the use of LED lights, which emit a broader range of wavelengths than older lighting technologies, could increase the rate of marine ecological changes driven by light pollution.

*Biol. Lett.* <http://doi.org/36n> (2015)

Scripps Research Institute in Jupiter, Florida, and his colleagues targeted a different part of this system to try to avoid resistance. They showed an anti-cancer effect from blocking a receptor called Rpn13, which is present in elevated amounts in cancer cells but is not targeted by traditional proteasome inhibitors. The blocking molecule binds selectively to Rpn13 and is toxic to multiple-myeloma cells.

Their work confirms an earlier report that it is possible to bind a drug-like compound specifically to the Rpn13 receptor.

*J. Am. Chem. Soc.* <http://doi.org/372> (2015)

## ANTHROPOLOGY

### Mummies' stature reveals inbreeding

The heights of the mummified pharaohs who ruled ancient Egypt support the belief that they married their siblings.

Historical records say that many Egyptian pharaohs married their sisters, but it is hard to prove through genetic testing because of ethical objections to destroying mummies' tissues (pictured is Rameses III, who was Pharaoh in 1186–1155 BC). Frank Rühli at the University of

Zurich in Switzerland and his colleagues used body height, which is heavily dependent on genetics, to look for evidence of inbreeding in 259 mummies of both commoners and royals. Pharaohs varied less in height than men in the general population, which suggests that royal Egyptians may have been more inbred than commoners, the authors say. Pharaohs also tended to be taller than non-royal men from the same time period. Royal and non-royal women were equally variable in height.

*Am. J. Phys. Anthropol.* <http://doi.org/37x> (2015)



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