RESEARCH HIGHLIGHTS

Selections from the scientific literature

CLIMATE

Worst drought in centuries

The 15-year drought that ended in 2012 in parts of the Middle East was probably the worst dry spell in the region for 900 years.

Benjamin Cook at the NASA Goddard Institute for Space Studies in New York and his colleagues analysed tree-ring patterns from 1100 to 2012 to estimate drought variability in the Mediterranean. Summer droughts of similar magnitude to those that have hit the western Mediterranean and Greece in recent decades did previously occur. But the researchers found an 89% likelihood that the 1998–2012 drought in the part of the eastern Mediterranean called the Levant was the driest since 1100.

Climate change will probably increase the risk of drought in the region, potentially aggravating sociopolitical and economic disruption in crisis regions such as Syria, the authors say.

J. Geophys. Res.-Atmos. **http://doi.org/bcz2 (2016)**

JUNGBAE PARK

BEHAVIOURAL ECOLOGY

Fungus makes tree frogs sing

A fungal disease that is devastating many amphibian populations around the world causes some infected tree frogs to sing more, even though they don't show other symptoms.

Amphibians are threatened by a global pandemic of chytridiomycosis, which is caused by the chytrid fungus *Batrachochytrium dendrobatidis*. Deuknam An and Bruce Waldman from Seoul National University recorded the mating calls of male Japanese tree frogs (*Hyla japonica;* pictured), before testing them for the fungus. They found that infected males tended to call more rapidly, and produce longer calls, than non-infected frogs.

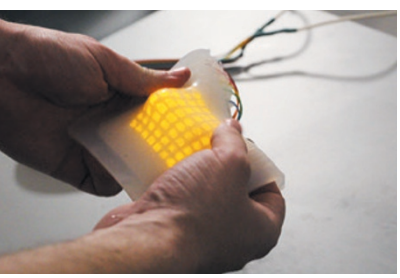
This could be a sign that the fungus is manipulating the frogs' behaviour — longer calls attract more frogs, potentially spreading the disease. Alternatively, the frogs could be mating earlier because of a shortened lifespan.

Biol. Lett. 12, **20160018 (2016)**

ELECTRONICS

Stretchy artificial skin that glows

Inspired by the octopus, researchers have developed an artificial skin that responds to pressure and emits light when stretched.



ROB KURCOBA/CORNELL

Rob Shepherd at Cornell University in Ithaca, New York, and his colleagues made the skin (**pictured**) by combining layers of transparent electrode-containing hydrogels with stretchy silicone sheets embedded with various zinc sulfides. They added light-emitting metal compounds to the zinc sulfides, causing them to emit different colours in response to electrical excitement. The team rolled, folded and stretched the material by nearly 500% without disrupting light emission. And the more the material was stretched, the brighter the light.

The authors incorporated panels of their material into a crawling soft robot, allowing it to luminesce as the robot undulated and the skin stretched. Pressing on the material altered its capacitance — its stored electric charge — so the researchers say that the skin could have applications in touch-sensitive robotics.

Science 351, **1071–1074 (2016)**

GENOMICS

Disabling a gene may not be harmful

People who have non-functioning genes may not always have health problems.

David van Heel of Queen Mary University of London, Richard Durbin of the Wellcome Trust Sanger Institute in Hinxton, UK, and their colleagues sequenced the part of the genome that encodes proteins from more than 3,000 healthy adults whose parents were closely related (often first cousins). The team found that 821 individuals carried rare genetic variants that would be expected to cause the loss of function of certain genes. When the researchers examined the participants' health records, they found no links between the loss-of-function genes and clinical

effects. One pregnant mother lacked a functional *PRDM9* gene, which is required for fertility in mice, but the non-functioning gene had no impact on her health.

Non-functioning genes in adults may not be as clinically important as previously thought, the authors say.
Science **http://doi.org/bc3x (2016)**

CLIMATE CHANGE

Climate shift for African farming

Many farmers in Africa may have to change the crops they are growing by the end of this century because of climate change, but for most plants only small areas will be impacted.

Julian Ramirez-Villegas at the University of Leeds, UK, and his colleagues modelled the suitability of sub-Saharan Africa for growing 9 major crops under climate scenarios that would see relatively large increases, exceeding 2 °C, in global temperatures by 2100. For maize (corn) and banana, around 30% of the region will become unsuitable, and for beans, 60% of the land will be unavailable. But for the other six crops — including cassava and yam — the affected area is limited to small pockets that total less than 15%.

The authors suggest that some farmers will initially adapt to climate change through improvements to farming techniques, but will then need to transition to substitute crops or relocate.
Nature Clim. Change **http://dx.doi.org/10.1038/nclimate2947 (2016)**

VIROLOGY

Zika virus infects brain cells

Laboratory-grown human cells that are similar to those in the brains of developing fetuses are rapidly infected and killed by Zika virus.

With the disease now spreading across Latin America and the Caribbean, researchers are racing to understand Zika virus and its potential link to microcephaly in fetuses. Hongjun Song and Guo-li Ming at Johns Hopkins University in Baltimore, Maryland, along with Hengli Tang at Florida State University in Tallahassee and their team, caused reprogrammed human stem cells to develop into neural progenitor cells, then infected them with Zika virus, which replicated rapidly. After three days, the virus had killed one-third of the cells. Immature neurons were also susceptible to Zika, but to a lesser extent.

Neural progenitor cells could be used to study the virus in the lab and identify treatments, the researchers say.
Cell Stem Cell **http://doi.org/bc3w (2016)**

GENETICS

Genetic link for a monobrow

Researchers have identified ten genetic variants linked to hair traits, including the rate at which hair goes grey and whether a person will have a 'monobrow'.

Previous studies looking at European and East Asian populations have identified genes associated with male-pattern baldness, hair colour and curliness. Kaustubh Adhikari at University College London and his colleagues studied the genomes of more than 6,000 people living in Brazil, Colombia, Chile, Mexico and Peru, categorizing volunteers according to the colour, shape and pattern of hair on their scalp and faces.

They found, for example, that the variant associated with the rate of hair-greying is in a gene called *IRF4*, which regulates the production and storage of melanin — the pigment that determines hair, skin and eye colour. A variant of *FOXL2* is linked to eyebrow thickness, and a *PAX3* variant is associated with the growth of a monobrow.
Nature Commun. **7, 10815 (2016)**

SOCIAL SELECTION

Popular topics on social media

'Creator' paper sparks concern

A paper that attributed the architecture of the human hand to "the proper design by the Creator" has triggered a debate over the quality of editing and peer review at high-volume journals.

The paper by Cai-Hua Xiong at the Huazhong University of Science and Technology in Wuhan, China, and his co-authors appeared in *PLoS ONE* on 5 January. But it came to prominence last week after its apparently creationist slant was flagged on Twitter, spawning the hashtags #Creatorgate and #HandofGod. James McInerney, who works on computational molecular evolution at the University of Manchester, UK, started the ball rolling with a tweet, saying the paper reveals *PLoS ONE* to be an "absolute joke of a journal". When contacted by *Nature*, Xiong said he was sorry, adding, "We are not native speakers of English, and entirely lost the connotations of some words such as 'Creator'." The journal later posted an online statement saying that it had decided to retract the paper. "Our internal review and the advice we have received have confirmed the concerns about the article and revealed that the peer review process did not adequately evaluate several aspects of the work."
PLoS ONE **http://doi.org/bc4c (2016)**

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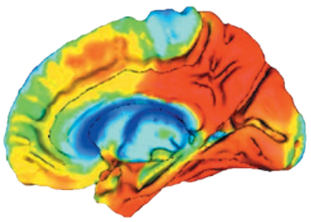

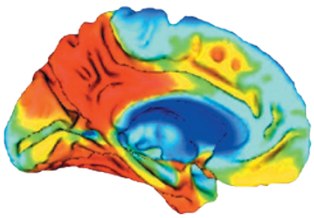

CELL PRESS

NEURODEGENERATION

Ageing protein imaged in brain

A protein that accumulates in the brain with normal ageing as well as with Alzheimer's disease can be tracked using human brain imaging for the first time.

Scientists could previously map the insoluble form of the protein tau in human brain tissue only after death. To follow changes in tau levels and distribution over time, William Jagust at the University of California, Berkeley, and his colleagues used a previously developed molecule that labels tau for positron emission tomography (PET) imaging (**pictured**) in living people. Compared with young people, healthy older people had increased tau in the medial temporal lobe, an area involved in memory. Higher levels of the protein predicted a poorer performance on certain memory tasks. Older adults with suspected Alzheimer's disease had the highest levels of tau. Across all older participants, the spread of tau to other brain areas correlated with higher levels of amyloid-β protein, which is also associated with Alzheimer's disease.

The technique could be used to monitor brain health and test drug candidates, the authors suggest.
Neuron **89, 971–982 (2016)**

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