NEUROSCIENCE

## Protein seed as Alzheimer's test

A test that exploits the abnormal stickiness of misfolded proteins could one day be used to diagnose Alzheimer's disease, reports a team led by Claudio Soto at the University of Texas Medical School in Houston.

The team adapted an amplification assay, originally developed for prion diseases. The new test used certain proteins as seeds that trigger clumping of malformed amyloid-β proteins, creating aggregates that are typical of the disease. When tested on patient samples from three centres, the assay distinguished the cerebrospinal fluid of patients with Alzheimer's from that of people with other neurological diseases, with 90% sensitivity and 92% specificity. The researchers are investigating why the test did not work on samples from a fourth centre.

***Cell Rep.*** **http://doi.org/r3b (2014)**

NANOTECHNOLOGY

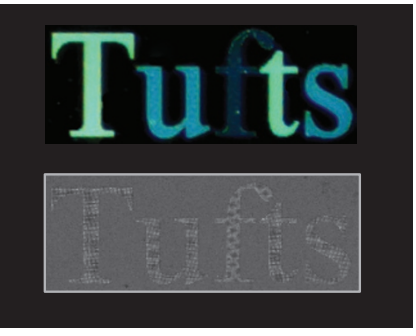
## Writing with water and silk

Electron beams can create very fine nano-structured patterns on thin films of silk, with only water required to complete the etching process.

Fiorenzo Omenetto from Tufts University in Massachusetts and his team say that their silk-and-water system avoids the toxic chemicals and complex processing steps needed in other forms of lithography. The authors created photonic lattices (**pictured**), which manipulate light, with resolution as high as 30 nanometres. They also etched patterns out of silk films to which active materials, such as enzymes, proteins or quantum dots had been added.

***Nature Nanotechnol.*** **http://doi.org/r3c (2014)**

SILKLAB/TUFTS UNIV.




ZOOLOGY

## Chickens' Pacific voyaging detailed

Suggestions that ancient Polynesians had contact with South America could have been biased by contaminated samples of ancient-chicken DNA, say Alan Cooper and Jeremy Austin at the University of Adelaide, Australia, and their colleagues.

The authors sequenced genetic information from 37 ancient chicken bones and 124 modern samples, all from Polynesia and the islands of southeast Asia. They found a unique and distinctive set of DNA variations in all of the ancient and many of the modern specimens. This 'Polynesian motif' is not found in early South American chickens, suggesting that humans transported chickens from Micronesia across the Pacific Ocean, but only as far as Easter Island (Rapa Nui). Contamination of some ancient samples with modern-chicken DNA probably explains previous suggestions that the migration continued all the way to South America, the authors say.

***Proc. Natl Acad. Sci. USA*** **http://doi.org/rx6 (2014)**

ASTROPHYSICS

## Early quasars ate like the rest

The giant black hole in the most distant-known quasar, which formed just 750 million years after the Big Bang, engulfed matter at the same rate as much younger quasars.

Alberto Moretti of the Brera Astronomical Observatory in Milan, Italy, and his colleagues used the European Space Agency's XMM-Newton observatory to study ULAS J1120+0641, a galactic centre that produces huge amounts of radiation powered by a supermassive black hole. They found that its X-ray spectrum, an indication of the rate at which the black hole sucks in matter, was indistinguishable from those of quasars seen later in the life of the Universe. The authors had expected that ULAS J1120+0641 would collect matter at a much higher rate because its mass is 2 billion times that of the Sun. The slow growth rate of the galactic centre raises questions about how it could have reached its huge size so early in the Universe's life.

***Astron. Astrophys.*** **563, A46 (2014)**

IMMUNOLOGY

## HIV vaccine success secrets

The production of certain antibodies could explain the partial success of an HIV-vaccine trial and the failure of another.

In 2009, researchers reported that an experimental HIV vaccine had reduced infection risk by 31%, the only HIV vaccine ever shown to be effective. Two teams have now compared the immune responses of people in that trial, known as RV144, with those of participants in a different trial, VAX003, in which a vaccine did not prevent infection. Georgia Tomaras at Duke University in Durham, North Carolina, and her colleagues found that volunteers in the RV144 trial produced a greater response, in terms of IgG3 antibodies, which recognize a portion of HIV's outer shell, than people in the unsuccessful trial.

Another team, led by Galit Alter at Massachusetts General Hospital, Boston, also found that the differences between the two vaccines may be explained by higher levels of IgG3, and by another antibody called IgG1, in the successful trial. These antibodies might have spurred other immune cells to vanquish cells infected with HIV, both teams conclude.

***Sci. Transl. Med.*** **6, 228ra38; 228ra39 (2014)**

## COMMUNITY CHOICE

*The most viewed papers in science*

CLIMATE SCIENCE

## Climate change endangers culture

HIGHLY READ on www.IOP.org in March

Many of the world's most important cultural sites could find themselves below sea level owing to climate change.

Using high-resolution topography and predictions of sea-level rise as a result of global warming, Ben Marzeion at the University of Innsbruck, Austria, and Anders Levermann of Potsdam University, Germany, calculated the temperature at which each cultural site on the World Heritage List would be affected by swelling oceans. The authors found that if current global mean temperatures were sustained for two millennia, around 40 sites, 6% of the total, would be damaged if left unprotected. If global temperatures warmed by 3 kelvins the number of sites would rise to 136, or 19% of the total.

***Environ. Res. Lett.*** **9, 034001 (2014)**

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