to nutrient-transporting proteins, such as transferrin, which binds iron (see the Perspective by Armitage and Drakesmith). Without iron, invading pathogens cannot replicate, but iron is sequestered in transferrin, which stops pathogens using it. So pathogens have evolved a succession of transporters that can hijack transferrin's iron. Over time, the primate transferrin binding surface has coevolved to wrestle iron back from the grip of pathogens. — CA

Science, this issue p. 1362; see also p. 1299

POLITICAL SCIENCE

Dialogue opens the door to attitude change

Personal contact between in-group and out-group individuals of equivalent status can reduce perceived differences and thus improve intergroup relations. LaCour and Green demonstrate that simply a 20-minute conversation with a gay canvasser produced a large and sustained shift in attitudes toward same-sex marriage for Los Angeles County residents. Surveys showed persistent change up to 9 months after the initial conversation. Indeed, the magnitude of the shift for the person who answered the door was as large as the difference between attitudes in Georgia and Massachusetts. — GJC

Science, this issue p. 1366

NANOLITHOGRAPHY

Laser shock imprinting for patterning metals

High-fidelity, small-scale patterning is often a tradeoff between full-pattern methods that may have limited resolution or flexiblity, and serial methods that can create high-resolution patterns but only by slow processes. Furthermore, metals have limited formability at very small scales. Gao *et al.* developed a method to create very smooth three-dimensional crystalline metallic nanoscale structures using a laser to create shockwave impulses. The shockwave creates ultrahigh-strain-rate deformations that overcome the metal's normal strength and, thus, resistance to patterning. — MSL

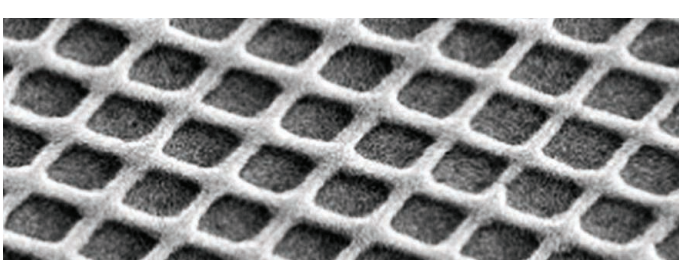
Science, this issue p. 1352

ONCOGENE REGULATION

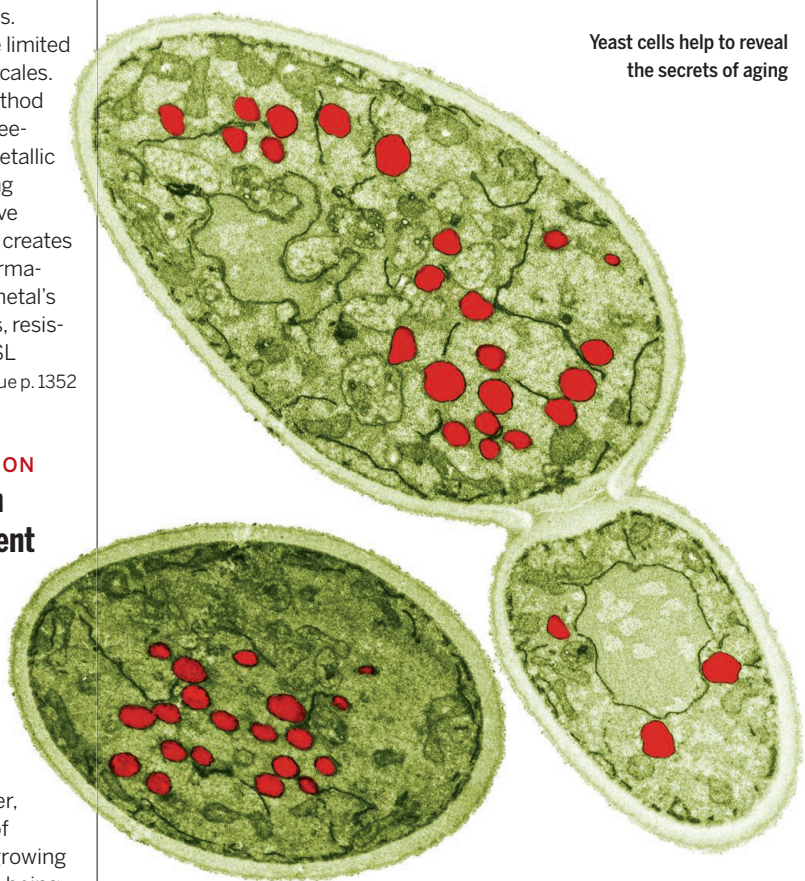
A super-enhancer in leukemia development

Human cancer genome projects have provided a wealth of information about mutations that reside within the coding regions of genes and drive tumor growth by functionally altering protein products. However, this mutational portrait of cancer is incomplete: A growing number of mutations are being found within gene regulatory regions. Mansour *et al.* present an intriguing example of this in a study of a childhood cancer, T-cell acute lymphoblastic leukemia (see the Perspective by Vähärautio and Taipale). An oncogene known to drive the growth of this cancer is expressed at high levels in the leukemic cells because the cells harbor mutations that create a powerful super-enhancer (a DNA sequence that activates transcription) upstream of the oncogene. — PAK

Science, this issue p. 1373; see also p. 1291



Silver fishnet structure from laser shock imprinting



Yeast cells help to reveal the secrets of aging

AGING IN YEAST

DNA circles involved in an aging SAGA

Budding yeast cells provide a powerful model system to study the mechanisms of aging. As they grow older, yeast cells accumulate extra-chromosomal ribosomal DNA circles, a by-product of DNA repair processes. Somehow, during cell division, these circles are retained in the mother cell where they replicate and limit mother cell viability. Denoth-Lippuner *et al.* report that the yeast acetyl-transferase complex SAGA plays a role in this process. Cells lacking SAGA are long-lived. SAGA promotes the retention of DNA circles within the nucleus of yeast mother cells by anchoring them to nuclear pores. The nuclear pores and DNA circles accumulate in a sort of cap inside the nuclear envelope, which is preferentially retained in the mother cell. — SMH

eLife **3**, e03790 (2014).

SOCIOLOGY

Networking doesn't always mean cooperating

The relationship between network structure and cooperation has been hard to define. Rand *et al.* arranged sets of volunteers in fixed networks, where they could only interact with specific players, in a Prisoner's dilemma game. In this game, "defectors" earned points and "cooperators" paid a cost so that each of their neighbors benefited. After each round, players learned what their neighbors had done. Not all network conformations

A coffee plant pathogen is leaving a trail through South America

PLANT PATHOLOGY

Morning brew at risk

Coffee leaf scorch has affected yields of coffee in Brazil, the supplier of much of the world's coffee, since the 1990s. The disease is caused by *Xylella fastidiosa*, a bacterium that clogs xylem vessels and impedes transport of water and nutrients for the plant, resulting in a degradation of the quality and yield of the coffee beans and the eventual death of the plant. Nunney *et al.* genotyped bacterial samples from infected plants in Costa Rica to reconstruct the pathogen's progress as it slithers from Brazil and through the Americas. Citrus groves are also at risk because substrains of this pathogen hopscotch into new domains, perhaps using homologous recombination with strains already present. — PJH

PLOS One **9**, e112463 (2014).

increased cooperation—the rewards relative to costs had to be greater than the number of linked players in order for cooperation to increase and clusters of cooperators to form. — BJ

Proc. Natl. Acad. Sci. U.S.A. 10.1073/pnas.1400406111 (2014).

WATER STRUCTURE

Getting all wet 9 or 10 at a time

H_2O seems like such a simple molecule. Why, then, haven't chemists definitively resolved the details of liquid water structure? The trouble is that hydrogen bonding—the attraction between an H on one molecule and an O on another—creates a cooperative net, where the orientation of each individual H_2O depends sensitively on the orientations of all its neighbors. Pérez *et al.* take a close look at water clusters built up from 9 or 10 molecules, to help tease out the subtleties of hydrogen bonding behavior in a more manageable size regime. Using rotational spectroscopy in the microwave region, they observe several different arrangements at slightly varying energies, which accord with a straightforward cooperativity model. — JSY

Angew. Chem. Int. Ed. **53**, 10.1002/anie.201407447 (2014).

ECONOMICS

Working from home can work well

In the U.S., telecommuting is most commonly observed for employees in the highest and lowest income deciles, yet there is little evidence about its benefits. Bloom *et al.* carried out the first randomized control trial of this management practice and report that performance of at-home workers increased by 13%. They found that Ctrip, a large, China-based travel agency, experienced lower turnover among its call-center workers, who also reported greater job satisfaction. When this program was rolled out to the entire company, some of the at-home employees elected to return to the office, whereas others switched to working from home; this reassortment improved the overall performance gain to 22%. — GJC

Quart. J. Econ. 10.1093/qje/qju032 (2014)

ICE SHEETS

Bottom-up effects on Northern glaciation

How much did the solid Earth contribute to the development of Northern Hemispheric glaciation around 3 million years ago? Much attention has been paid to the roles of solar insolation, distal orogeny, and the ocean, and now Steinberger *et al.* suggest that regional geodynamic processes also had a profound influence on the growth of major ice sheets. They argue that the mantle plume beneath Iceland thinned the lithosphere and caused regional uplift in Greenland, while Greenland was drifting northward due to plate tectonics and true polar wander. These factors could help explain the reappearance of major Northern Hemispheric ice sheets after an absence of more than 500 million years. — HJS

Terra Nova 10.1111/ter.12133 (2014)

ENVIRONMENTAL SCIENCE

A simple, efficient way to purify water

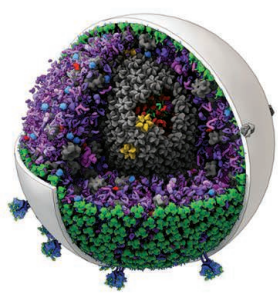
Unsafe drinking water is a serious public health issue that affects many millions of people worldwide. Improved methods for purifying water have the potential to save many lives in the developing world, but they have to be affordable. Ehdaie *et al.* have developed a prototype ceramic tablet that, when added to a container, can purify 10 liters of water each day for more than 154 days. The tablet works by releasing silver ions, which effectively destroy bacteria, viruses, and protozoa, but are safe for humans at the levels released. These devices are comparatively cheap and easy to produce from sawdust, clay, and silver nitrate. Differences in clay composition can affect the tablet properties, so the approach still must be tested under real-world conditions. — JFU

Environ. Sci. Technol. 10.1021/es503534c (2014).

STRUCTURAL BIOLOGY

HIV in 3D: Modeling the mesoscale

Structural biologists have one set of tools to visualize atomic-level details of large structures and another that reveals the nuances of small ones. But detailed models of medium-sized viruses, synaptic vessels, plasma, and the like—objects at the so-called mesoscale, ranging from 10 to 100 nanometers—have largely remained in the dark. Now, Johnson *et al.* have developed cellPACK, freely available software that produces 3D images of biological systems at the mesoscale. As a demonstration of cellPACK's utility, the tool purports to resolve a longstanding debate about whether HIV surface proteins are randomly distributed on the virus's surface (spoiler alert: they are not). — JC



cellPACK's HIV model shows protein distribution on the virus's surface.

CREDITS: (TOP TO BOTTOM) GERSON SOBREIRA/TERRASTOCK; GRAHAM JOHNSON AND LUDOVIC AUTIN/THE SCRIPPS RESEARCH INSTITUTE

Nat. Methods, 10.1038/nmeth.3204 (2014)

HIV in 3D: Modeling the mesoscale

Jon Cohen

Science **346** (6215), 1339-1340.
DOI: 10.1126/science.346.6215.1339-h