worse than the fundamental limit imposed by the Heisenberg uncertainty principle. — JS

Science, this issue p. 1486

VIRUS ENTRY

How Lassa virus breaks and enters

Lassa virus, which spreads from rodents to humans, infecting about half a million people every year, can lead to deadly hemorrhagic fever. Like many viruses, Lassa virus binds to cell surface receptors. Jae *et al.* now show that to enter a cell, the virus requires a second receptor, this one inside the infected cell. This requirement sheds light on the "enigmatic resistance" of bird cells to Lassa virus observed three decades ago. Although bird cells have the cell surface receptor, the intracellular receptor cannot bind the virus, stopping it in its tracks. — SMH

Science, this issue p. 1506

HUMAN COGNITION

Selecting the most successful strategy

The brain's prefrontal cortex helps us to make decisions in an uncertain and constantly changing environment. Donoso *et al.* present a model of human reasoning as an algorithm implemented in the prefrontal cortex (see the Perspective by Hare). Brain-imaging experiments supported this model. Depending on the prevailing circumstances, human reasoning can either adapt ongoing behavioral strategies or switch to previously learned strategies. Only when neither approach is appropriate will the brain create new strategies. — PRS

Science, this issue p. 1481, see also p. 1446

CANCER

Old drug learns new anticancer trick

Cancer researchers have been trying to develop drugs that inhibit angiogenesis, the formation of new blood vessels that nourish a tumor and allow it to grow. A few drugs that fight angiogenesis are now used for some cancers, but they are not always effective. Xu *et al.* report a potential addition to the anti-angiogenic armamentarium: nonsteroidal anti-inflammatory agents such as celecoxib, familiar remedies for arthritis. In mice, celecoxib inhibits blood vessel growth by a different mechanism than existing angiogenesis inhibitors. A combination of the two types of drugs was particularly effective in reducing tumor growth and spread. — YN

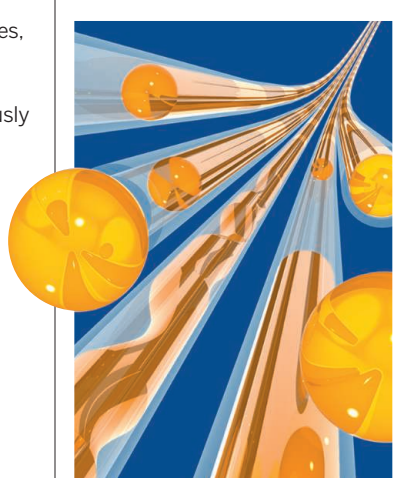
Sci. Transl. Med. **6**, 242ra84 (2014).

NANOFLUIDICS

Watching lead flow at the nanoscale

Microfluidic devices have recently become useful in commercial chemical synthesis. But what about fluid dynamics at the nanometer scale? Lorenz and Zewail used an electron microscope with nanosecond time resolution to capture images of molten lead flowing through a nanotube. They flash-melted the metal with a laser pulse to begin their flow measurements at a precise time point. The experiments offered insights into viscous friction as well as heat-transfer dynamics in a channel one-thousandth as wide as a strand of hair. — JSY

Science, this issue p. 1496



Conceptual view of molten lead flowing through zinc oxide nanotubes.

PHOTOS: (TOP TO BOTTOM) SHANNON KRINGEN/FLICKR; ULRICH J. LORENZ AND AHMED H. ZEWAIL/CALTECH

IN OTHER JOURNALS

Edited by **Kristen Mueller** *and* **Jesse Smith**

A rose petal's textured surface effectively repels water.

MATERIALS SCIENCE

Getting in shape to stay dry longer

Many textured surfaces commonly found in the natural world, such as a rose petal, repel liquids extremely well. Taking a clue from Mother Nature, designers have begun to routinely incorporate surface textures into products ranging from waterproof outdoor clothing to self-cleaning windows. However, under high humidity or pressure, liquid can infiltrate some textured surfaces and reduce their superhydrophobic properties. Checco *et al.* used x-rays to probe the interface region between liquid and a variety of textured silicon surfaces to show that the specific structure of a textured coating affects how the coating fails. This strategy could facilitate the rational design of better water-repellent coatings. — ISO

Phys. Rev. Lett. **112**, 216101 (2014).

CANCER

Long unwinding road to cancer treatment

Cancer chemotherapy is infamous for harming healthy cells. This collateral damage causes the side effects that range from unpleasant (such as hair loss) to life-threatening (such increased susceptibility to infection). They can be particularly devastating for elderly patients. Promising new data may one day lead to a safer treatment for a type of acute myeloid leukemia, which first strikes patients at age 66, on average. Mazurek *et al.* found that when they blocked mouse genes from expressing an enzyme called DDX5, the leukemia cells died, but healthy bone-marrow cells were unharmed. DDX5 made the cancer cells proliferate; inhibiting DDX5 made the cells accumulate toxic molecules called reactive oxygen species, which contributed to cancer cell death. — PAK

Cell Rep. **7**, 10.1016/j.celrep.2014.05.010 (2014).

AGING

Metformin's recipe for a long life

Metformin, a drug commonly prescribed to treat type 2 diabetes, has side effects, but some of these are beneficial, such as fighting certain cancers and increasing longevity. By studying the worm *Caenorhabditis elegans*,

The now-extinct woolly mammoth.

EXTINCTION

Miss mammoths? Blame your ancestors

Imagine saber-toothed tigers, giant ground sloths, and car-sized glyptodonts—an armadillo relative—ranging across the entire planet. Only a few tens of thousands of years ago, such charismatic megafauna ruled the earth. What killed them—climate change or human activity? In the first global analysis of extinctions during the Pleistocene geological epoch, Sandom *et al.* found that the expansion of humans out of Africa most likely caused the extinctions over the past 100,000 years. The animals were easy targets: They lacked the fear of humans that comes with years and years of co-evolution. — SNV

Proc. R. Soc. London Ser. B **281**, 20133254 (2014).

a model of aging, De Haes *et al*. discovered the molecular basis for how metformin may prolong lives. In treated worms, metformin promoted mitochondrial respiration, a process that converts nutrients into energy for the cell. Mitochondrial respiration also produces byproducts called reactive oxygen species (ROS), which can react with proteins, harming them. When the worms produced limited amounts of ROS, however, the life span of worms increased. The increase in life span required a protein called peroxiredoxin-2, which is oxidized by ROS and may then activate other enzymes to produce effects that promote longevity. — LBR

Proc. Natl. Acad. Sci. U.S.A. 10.1073/pnas.1321776111 (2014).

CHEMISTRY

Knotty questions in molecular assembly

How would you tie a knot if you couldn't touch either end of the rope? In the past few years, chemists have solved that problem at the molecular scale by precisely designing strand fragments, then luring them into mutually overlapping arrangements around metal ions. Ayme *et al.* now have tested the limits of that approach, exploring how subtle changes to the strands affect the distribution of knots produced in the reaction. Specifically, the authors mixed two types of strands that differed only by the presence or absence of two oxygen atoms. They found that the types sorted themselves remarkably well in combination with iron ions: The longer strands assembled into cross-shaped groups of four, the shorter strands into star-shaped groups of five. — JSY

Angew. Chem. Int. Ed. **53**, 10.1002 anie.201404270 (2014).

COSMOLOGY

Universe inflation or dust emissions?

Doubt enshrouds what was supposedly the biggest discovery in cosmology in a decade. In March, researchers working with BICEP2, a telescope at the South Pole, reported that the pinwheel swirls they saw in the polarization of the cosmic microwave background—the Big Bang's afterglow—came from gravitational waves rippling through the infant universe. That, they said, was the first direct evidence of an exponential growth spurt called inflation in the early universe. But others noted that the signal might emanate instead from dust in our galaxy. Now, in the published paper, Ade *et al*. write that their models of galactic dust "are not sufficiently constrained ... to exclude the possibility of dust emission bright enough to explain the entire excess signal." — AC

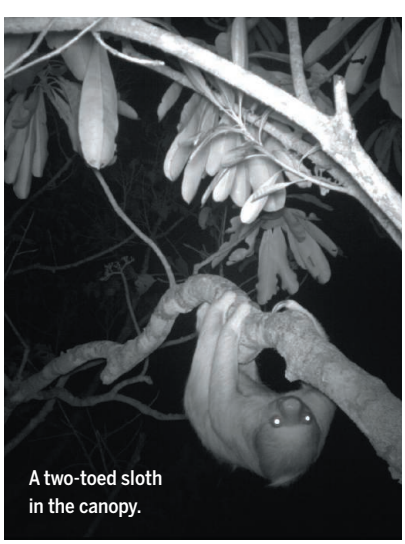
Phys. Rev. Lett. **112**, 241101 (2014).

ANIMAL ECOLOGY

The secrets of canopy dwellers revealed

Many mammals in tropical forests spend much of their life in the canopy, which makes their behavior difficult to document. Treetop cameras can help, Gregory *et al*. report. The authors attached motion-triggered cameras high in the branches of a Peruvian tropical forest. In more than 1500 photographs taken over 6 months, they recorded 20 mammal species at crossing points between trees. The animals seemed unfazed by the cameras (though fluttering leaves did tend to trigger the cameras unnecessarily). Like the more familiar camera traps at ground level, arboreal camera traps may become an important tool for recording hitherto hidden behaviors. — AMS

Methods Ecol. Evol. **5**, 443 (2014).



A two-toed sloth in the canopy.

MATERIALS SCIENCE

Tubular friction at the nanoscale

When large-scale objects slide by each other, the amount of friction depends on their surface roughness and the contact area between them. At the nanoscale, though, different factors and forces can affect resistance to motion. Niguès *et al.* examine the response of multiwalled carbon nanotubes (CNTs) and boron nitride nanotubes (BNNTs) as their concentric cylindrical layers are pulled past each other. Whereas the semiconducting CNTs show almost no resistance to sliding motion, the BNNTs show viscous-like dissipation that is proportional to the contact area. The authors attribute this difference to bond character: Boron nitride forms ionic bonds, whereas the bonds in CNTs are purely covalent. Because they slide so much less slickly when they touch, the BNNTs could make highly efficient nanoscale shock absorbers. — MSL

Nat. Mater. 10.1038/nmat3985 (2014).

PHOTOS: (TOP TO BOTTOM) DANIEL ESKRIDGE/STOCKTREK IMAGES/GETTY IMAGES; SMITHSONIAN CONSERVATION BIOLOGY INSTITUTE