chimpanzees exhibited approximately one extra mutation. This finding will inform future studies of primate evolution. — LMZ

**CANCER IMAGING**

**Taking a broader view of cancer imaging**

Many people think the best way to visualize tumors is to target imaging agents to specific cancers at the molecular level. Kuo et al. feel differently: They developed aging agents to specific cancers to visualize tumors is to target people think the best way of cancer imaging taking a broader view.

**QUANTUM GASES**

**Tilting just right makes atoms tunnel**

One of the most fascinating phenomena in the quantum world is the ability of particles to go through an energy barrier — a process called quantum tunneling. Meinert et al. studied the dynamics of quantum tunneling in an optical lattice of strongly interacting atoms. When the lattice was suddenly tilted, the atoms, originally each in their own lattice site, tunneled to non-neighboring sites. — JS

**EARTH’S INTERIOR**

**Cycling water through the transition zone**

The water cycle involves more than just the water that circulates between the atmosphere, oceans, and surface waters. It extends deep into Earth’s interior as the oceanic crust subducts, or slides, under adjoining plates of crust and sinks into the mantle, carrying water with it. Schmandt et al. combined seismological observations beneath North America with geodynamical modeling and high-pressure and -temperature melting experiments. They conclude that the mantle transition zone—410 to 660 km below Earth’s surface—acts as a large reservoir of water. — NW

Science, this issue p. 1259

**CANCER METASTASIS**

**Copper for breast cancer metastasis**

Many patients with breast cancer die from metastases, when cancer cells spread from the primary tumor to other sites. Some of the intracellular proteins that help cells move from one location to another can be activated by a chemical modification called oxidation. MacDonald et al. found that the enzyme Memo binds copper, enhancing the oxidation of proteins involved in cell movement. Mice with tumors formed from breast cancer cells that lacked Memo had fewer lung metastases, and human patients with breast cancers that had high levels of Memo were more likely to develop metastases. — WW


**NEUROLOGICAL DISEASE**

**Skin may hold the key for Parkinson’s**

In Parkinson’s disease, a degenerative movement disorder of the central nervous system, a protein called phosphorylated alpha-synuclein builds up in neurons, damaging the brain. The disease is hard to diagnose early or monitor over time because the protein builds up so slowly and so deep inside the brain. Doppler et al. now report that patient skin samples hold key insights. The authors detected phosphorylated alpha-synuclein in autonomic and sensory nerves found in the skin samples in 16 out of 31 people diagnosed with Parkinson’s disease and in 0 out of 35 healthy volunteers. Because skin is far more accessible than brain tissue, these observations could lead to diagnostic tests to identify and follow the progression of Parkinson’s disease. — PJH

Acta Neuropathol. 10.1007/s00401-014-1284-0 (2014).

**EDUCATION**

**Active learning: The twilight of Chem 101?**

Should professors continue to use traditional lectures in
Image of slime growing on a heart valve, along with text about how slime can be eradicated by blocking stress responses in biofilm-producing bacteria. This is an example of a broad-spectrum bug biofilm buster.

**BIOFILMS**

*Broad-spectrum bug biofilm buster*

Imagine slime growing on your heart valves. Such infections, which happen all too often and are often deadly, can be eradicated by blocking stress responses in biofilm-producing bacteria—that is, fighting the bacteria’s defenses. Unfortunately, however, there are no approved biofilm-busting drugs yet. So Fuente-Núñez et al. went looking for one. They knew that small positively charged synthetic peptides can stop biofilm formation in many antibiotic-resistant bacterial pathogens, such as Staphylococcus aureus, Escherichia coli, and Salmonella. When they performed a screening assay of small peptides, they found a candidate that acts on an important stress pathway. Bacteria use the pathway to synthesize the signaling nucleotide ppGpp. Without ppGpp, the bacteria have trouble forming biofilms and even staying alive. The candidate, peptide 1018, binds directly to ppGpp and degrades it, stopping deadly pathogens in their tracks. —CA


*The deadly pathogen Staphylococcus aureus.*

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**CELL METABOLISM**

*“Tricking” the body to burn calories*

Activating immune cells in fat can convert tissue from white fat, which stores energy, to something resembling brown fat, which burns it. Until now, the only way known to “brown” white fat was with exposure to cold. In one of two new studies in mice, Qiu et al. found that activating macrophages, a type of immune cell, helps brown white fat. Meanwhile, Rao et al. found that boosting levels of a hormone induced in muscle or after cold exposure helps activate the macrophages, brown fat, and improve glucose tolerance. The research opens up potential new strategies for tackling obesity and diabetes, because it could lead to ways of increasing energy expenditure. —MM


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**RARE GENETIC DISEASES**

*A role for Mom’s genes in Prader-Willi syndrome*

Prader-Willi syndrome, a genetic disorder characterized by intellectual impairment, behavioral and learning disabilities, and other features, occurs in about 1 in 15,000 to 25,000 births. In most cases, the syndrome results when cells fail to express a part of chromosome 15 inherited from the father, but Steltzer et al. now show a maternal contribution as well. Cells taken from patients, they found, expressed higher amounts of genes from a specific section of chromosome 14, but only those genes inherited from the mother. The cells turned on those maternal genes by suppressing a long non-coding RNA and by modifying histones—proteins that regulate gene expression. Understanding what makes genes turn on and off appropriately in individuals with Prader-Willi syndrome may help illuminate the causes of this disease and point the way toward treatments. —BAP

Nat Genet. 10.1038/ng.2968 (2014).

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**ECONOMICS**

*Expertise: Sometimes blinding and costly*

Experts trying to solve global challenges often call for new technologies and access to information, but they might do better to take a harder look at what they’ve been doing all along, to see whether they’ve missed some simple solution that could make a dramatic difference. Building on literature in economics and learning sciences, Hanna et al. studied Indonesian seaweed farmers and found that, despite years of experience that showed the importance of factors such as the spacing of pods during planting, the farmers hadn’t noticed that adjusting pod size might be useful as well. This work may help improve the way technologies and training are deployed, in agriculture and beyond. —BW

J. Econ. 10.1093/jje/qju015 (2014).

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**ASTROPHYSICS**

*One shot for stardom and a clean sweep*

In galactic regions experiencing lively bouts of star formation, we sometimes find tidy spheres of massive stars without residual gas. These young star associations offer astronomers an enhanced, dense environment in which to study star formation, quite unlike our own more sedate solar neighborhood. How these clusters formed has been a longstanding puzzle. Previous observational evidence suggested that a parent gas cloud could fragment into many cores, forming stars that energize and sweep away the remaining gas. Banerjee and Kroupa have now reproduced the central young cluster in NGC 3603 with a simulation involving just one episode of star birth, supporting that hypothesis. According to the authors, this scenario can explain the formation of clusters such as the Pleiades and Orion as well. —MMM