

these services by law enforcement to identify suspects in criminal cases. Testing models of relatedness, Erlich *et al.* show that many individuals of European ancestry in the United States—even those that have not undergone genetic testing—can be identified on the basis of available genetic information. These results indicate a need for procedures to help maintain genetic privacy for individuals. —LMZ

Science, this issue p. 690

BATTERIES

Oil when not in use

For primary or nonrechargeable batteries, the overall energy density will be limited by any discharge or open-circuit corrosion that occurs during storage. For batteries based on aluminum and air, this long-standing problem has prevented their widespread use and has been challenging to overcome. Hopkins *et al.* used commercially available components to construct aluminum-air batteries. During standby periods, the electrolyte in the batteries was replaced with oil to protect the electrodes from corrosion, thus preventing energy loss. —MSL

Science, this issue p. 658



Photo of aluminum-air prototype battery

OSTEOPOROSIS

Building and rebuilding bone

WNT signaling is important for proper embryonic development, shaping cell fate and migration, stem cell renewal, and organ and tissue formation. Luther *et al.* investigated the role of WNT1 in osteoporosis.

Patients with early-onset osteoporosis and mutations in the *WNT1* gene had low bone turnover and high fracture rates, and loss of WNT1 activity caused fracture and osteoporosis in mice. Inducing WNT1 in bone-forming cells increased bone mass in aged mice, and this process did not require LRP5, a co-receptor involved in WNT signaling. Thus, WNT1 acts as an anabolic (bone building) factor and might represent a therapeutic target for osteoporosis. —CC

Sci. Transl. Med. **10**, eaau7137 (2018).

SKIN BIOLOGY

A basic way to tan

Darker-skinned individuals have more melanin in their skin and a lower risk for skin cancers. The production of melanin in organelles called melanosomes is pH sensitive. Zhou *et al.* found that the enzymatic activity of soluble adenylyl cyclase (sAC) resulted in decreases in both melanosome pH and melanin synthesis. sAC deficiency or inhibitors increased melanosome pH and pigmentation in mice. This mechanism for rapidly regulating melanin synthesis could potentially be exploited to reduce skin cancer risk for fair-skinned individuals. —WW

Sci. Signal. **11**, eaau7987 (2018).

PREDATION

No longer a safe haven

Many biological patterns have a latitudinal component. One long-recognized pattern is that predation rates are higher at lower latitudes. This may explain why many migratory birds travel thousands of miles from the tropics to the poles to breed. Looking across thousands of records, Kubelka *et al.* found that climate change seems to have altered this fundamental pattern. In shorebirds, at least, predation rates on nests are now higher in the Arctic than in the tropics. —SNV

Science, this issue p. 680

IN OTHER JOURNALS

Edited by **Caroline Ash**
and **Jesse Smith**

A handheld device should greatly expand the application of adaptive optics scanning laser ophthalmoscopy.

NEUROSCIENCE

Decisions and their future implications

We constantly make choices. It is often important to consider not only the short-term but also the longer-term implications of a choice, also known as its prospective value. In a combined decision-making and brain-scanning study, Kolling *et al.* found that when humans make sequential decisions, they do not only consider their immediately available options. Instead, they incorporate the average value of future options, their variability, and the time frame or search horizon, as well as search costs. Furthermore, humans even consider individual capacities and preferences for making decisions in the future. Brain activity in the dorsal anterior cingulate cortex represents prospective value, but when there is an increased need to overcome costs, activity in the ventral striatum and perigenual anterior cingulate cortex is more strongly coupled. —PRS

Neuron **99**, 1069 (2018).

CELL BIOLOGY

The intraflagellar transport train

Assembly of the cilium requires bidirectional intraflagellar transport (IFT) of building blocks along microtubules to and from the site of assembly at its tip. Dynein-1b motors are required to power retrograde transport and are believed to reach the ciliary tip by kinesin-2–driven anterograde IFT. It is unclear which mechanism prevents a tug-of-war between these oppositely directed microtubule motors. Jordan *et al.* used cryo-electron tomography to examine the architecture of IFT trains in *Chlamydomonas* cilia in situ. Their findings revealed the relative positions of IFT motors on anterograde versus retrograde trains. Dynein-1b in its autoinhibited form was an integral part of anterograde trains but is positioned to prevent premature engagement with the microtubules. Once at the cilia tip, the dynein converted into its activated form, engaged the microtubules, and then powered retrograde transport. —SMH

Nat. Cell Biol. **20**, 1250 (2018).

OPHTHALMIC IMAGING

Making vision clearer

Adaptive optics scanning laser ophthalmoscopy (AOSLO) is now a routine tool used by eye care professionals to aid the detection and diagnosis of retinal disease. These machines, however, are large and not portable, so the patient needs to travel to where they are located. By combining computational algorithms with developments in miniaturized deformable mirrors and microelectromechanical technology, DuBose *et al.* have developed a handheld AOSLO device that weighs less than 200 grams. Such a technological development opens up the possibility of examination to a broader range of patient populations, such as children and the physically incapacitated. The light weight of the device also offers the opportunity to provide examinations to people in geographically remote areas. —ISO

Optica **9**, 1027 (2018).

mainly in liver mitochondria. This pathway provides energy to vital organs when access to glucose is limited for prolonged periods, such as during fasting. Lipolysis-derived fatty acids normally initiate this process via the transcription factor PPAR- α . Misto *et al.* found that fasting stimulates mast cells to release histamine, which stimulates the biosynthesis of the high-affinity PPAR- α agonist oleylethanolamide via G protein-coupled H₁ receptors. Thus, mast cells, recognized for their role in allergy and anaphylaxis, unexpectedly take part in the regulation of a major metabolic pathway. Future studies will be needed to uncover the underlying mechanisms of this process and understand how it may contribute to metabolic dysfunction. —STS

Cell Metab. 10.1016/j.cmet.2018.09.014 (2018).

transport in the pseudogap phase were locked in step. This indicates that the ground state of the nonsuperconducting pseudogap phase has the character of a conventional metal. Comparison to the data at zero field further suggests that applying magnetic fields does not affect some of the signatures of the pseudogap phase. —JS

Phys. Rev. X **8**, 041010 (2018).

MOLECULAR IMAGING

Revealing chromosome features

Cryo-electron tomography (cryo-ET) is used to visualize cellular structures in the native environment without chemical fixation and dye labeling. Cai *et al.* used cryo-ET on both interphase and mitotic fission yeast cells to explore some interesting features of chromosome organization. Nucleosomes in situ do not appear to resemble the canonical conformation obtained by crystallography in vitro. In vivo, it appears that nucleosomes are partially unwrapped. Moreover, nucleosomes cluster irregularly, with the clusters being more condensed and less dynamic in mitotic cells. Yet, the condensation in mitotic chromosomes is uneven, and there are loosely packed regions where, possibly, mitotic transcription occurs. —SYM

Proc. Natl. Acad. Sci. U.S.A. **115**, 10977 (2018).

SUPERCONDUCTIVITY

Thermal transport to the rescue

The pseudogap phase in cuprate superconductors remains one of the most puzzling aspects of these materials. To shed light on the nature of the pseudogap, Michon *et al.* studied thermal transport in the cuprate La_{1.6-x}Nd_{0.4}Sr_xCuO₄. By applying magnetic fields high enough to destroy superconductivity and approaching absolute zero temperature, the researchers found that the thermal and charge

CLIMATE CHANGE

Uneven results

What are likely to be the specific results of anthropogenic activities on climate, beyond higher temperatures? One may be change in the way rainfall is distributed in time. Rainfall is an uneven phenomenon: There are wet days and dry days, floods and droughts, and hard rains and gentle rains. Pendergrass and Knutti use observations and models to show that climate change should only exacerbate that unevenness. Whereas

today it takes an average of 12 days each year for half of the rain to fall, by 2100, in a scenario with high greenhouse gas emissions, the same fraction should fall in the wettest 6 days each year. —HJS

Geophys. Res. Lett. 10.1029/2018GL080298 (2018).

IMMUNOMETABOLISM

A role for mastocytes in ketosis

Ketogenesis is a fundamental biochemical process occurring



Climate change will exacerbate the unevenness of precipitation.

PHOTO: NITICHUYSAKUL PHOTOGRAPHY/GETTY IMAGES