

(see the Perspective by Teijaro and Burton). A combination of mutants was assembled to construct a virus that triggered transient IFN responses in mice but that was unable to replicate effectively. The transient IFN responses led to robust antibody and memory responses that protected against subsequent challenge with different influenza viruses. This approach could be adapted to improve other RNA virus vaccines. —CA

Science, this issue p. 290;
see also p. 277

QUANTUM FLUIDS

Making dilute quantum droplets

In recent years, quantum fluids have been studied largely in gaseous form, such as the Bose-Einstein condensates (BECs) of alkali atoms and related species. Quantum liquids, other than liquid helium, have been comparatively more difficult to come by. Cabrera *et al.* combined two BECs and manipulated the atomic interactions to create droplets of a quantum liquid (see the Perspective by Ferrier-Barbut and Pfau). Because the interactions were not directional, the droplets had a roughly round shape. The simplicity of this dilute system makes it amenable to theoretical modeling, enabling a better understanding of quantum fluids. —JS

Science, this issue p. 301;
see also p. 274

STRUCTURAL BIOLOGY

Recognizing centromere by kinetochore

The kinetochore proteins CENP-N and CENP-C recognize the histone H3 variant CENP-A in the centromeric nucleosome. This ensures proper kinetochore assembly and accurate segregation of chromosomes. Chittori *et al.* describe the cryo-electron microscopy structure of the human CENP-A nucleosome–CENP-N complex. The interaction of CENP-N with CENP-A and the nucleosomal DNA together

ensure specific and stable centromeric nucleosome recognition. Mutational analyses using both human and *Xenopus* CENP-A and CENP-N proteins suggest that the proteins have coevolved to preserve the interacting surfaces. —SYM

Science, this issue p. 339

INDUCED SEISMICITY

Seismicity curbed by lowering volume

Determining why hydraulic fracturing (also known as fracking) triggered earthquakes in the Duvernay Formation in Canada is important for future hazard mitigation. Schultz *et al.* found that injection volume was the key operational parameter correlated with induced earthquakes in the Duvernay. However, geological factors also played a considerable role in determining whether a large injection volume would trigger earthquakes. These findings provide a framework that may lead to better forecasting of induced seismicity. —BG

Science, this issue p. 304

RESEARCH METHODS

Algorithms fail to improve predictions

In the United States, algorithms are commonly used to predict the likelihood that a criminal defendant will commit a crime, and these predictions influence pretrial, parole, and sentencing decisions. Commercial software, such as the widely used COMPAS system, promises to make these predictions more accurate than human judgments. Dressel and Farid show that COMPAS's impressive-sounding 137-feature black box is nearly equivalent to a trivial linear classifier using two features, and both approaches are no more accurate or fair than predictions made by people with little or no criminal justice expertise. —AC

Sci. Adv. 10.1126/sciadv.aao5580 (2018).

IN OTHER JOURNALS

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



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GEOPHYSICS

Going dry in the Pacific Northwest

Volcanic belts such as the Andes result from deep melting as water dragged down during subduction fluxes into the crust. Canales *et al.* show that the Juan de Fuca slab, which is subducting below the Pacific Northwest in North America, is much drier than other subducting slabs. The distribution of water in the slab may help determine the origins of seismic tremor and episodic slip that occur in this region. It also confirms a hypothesis that volcanism in the region is not the result of the influence of water, but rather is due to the decompression trigger melting more commonly seen along mid-ocean ridges. —BG

Nat. Geosci. 10, 864–870 (2017).

MOLECULAR BIOLOGY

Time-out for mRNAs in the nucleus

Cell cycle events are precisely orchestrated to ensure accurate

cell division. Yang *et al.* have discovered that sequestering mature mRNAs in the nucleus modulates cell cycle players. In dividing *Arabidopsis* cells, nuclear retention of CDC20 and CCS52B mRNAs prevents them from being released into the cytoplasm until the nuclear envelope breaks down at pro-metaphase. Released mRNAs are rapidly translated into proteins, ensuring their regulatory functions at the proper cell cycle stage. Similar nuclear sequestration strategies may be used for other mRNAs in different cellular contexts. —SYM

Mol. Cell. 10.1016/j.molcel.2017.11.008 (2017).

NEUROSCIENCE

Serious damage by soluble tau

Alterations in the metabolism of the neuronal microtubule-associated protein tau are central to several neurodegenerative diseases. In these diseases, tau usually loses solubility and forms aggregates that impair cell

PHOTO: ONDREJ PROSICKY/SHUTTERSTOCK.COM



CONSERVATION

How hunting affects brown bear populations

In many parts of the world, regulated hunting is used to control the size of predator populations such as wolves and brown bears. Bischof *et al.* explore how such regulated hunting affects the life history and demography of a brown bear population in Sweden that has been monitored continuously since 1985. The study shows that hunting was the leading cause of death for bears aged more than 3 years, resulting in reduced life expectancy; this contrasts with natural conditions, where mortality is reduced once bears reach adulthood. Hunting also substantially reduces the reproductive value—that is, the number of future offspring that female bears of a given age are expected to have. Thus, even if a carnivore population recovers numerically, regulated hunting transforms its makeup in multiple ways that need to be taken into account in management. —JFU

Nat. Ecol. Evol. **2**, 116 (2018).

Hunting is the leading cause of death for brown bears older than 3 years in Sweden.

cortex. And, like the external scaffolds on a building under construction, some glutamatergic neurons migrate tangentially, instruct organization, then disappear. The developing chick brain, although it has tangentially migrating interneurons, lacks the tangentially migrating transient neurons. —PJH

Cell Rep. **22**, 96 (2018).

SCIENCE CAREERS

Social skills to pay the bills

Employment requiring high math skills but low social skills, including many science and engineering jobs, has decreased in the United States as high social skills have become increasingly powerful predictors of employment and wage growth. Using surveys of occupations, skills, and wages, Deming shows that socially skilled people self-select into less structured jobs requiring a wide range of tasks, leading to wage gains. Increasing computerization may be a driver, replacing routine work and prioritizing social collaboration, but employment and wages have been especially strong in jobs demanding both high math and high social skills. —BW

Quart. J. Econ. **132**, 1593 (2017).

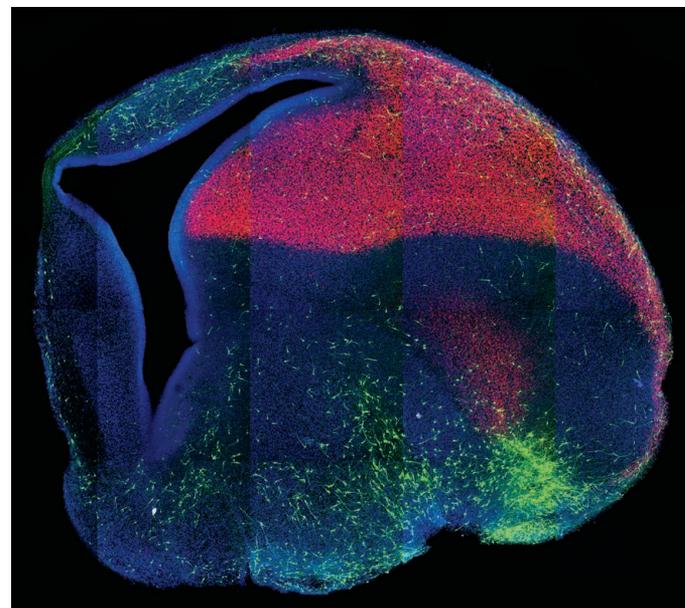
function to trigger neuronal cell death and neurodegeneration. However, the *in vivo* neurotoxic potential of soluble tau is not yet fully understood. Bolós *et al.* stereotactically injected human soluble tau into the dentate gyrus of mice. Hippocampal granule neurons showed markedly reduced synapse numbers in the molecular layer. In addition, newborn granule cells showed reduced numbers of dendritic spines. Behaviorally, these animals exhibited an impaired capacity to perform pattern separation. Soluble tau thus causes long-term damage to the morphology and connectivity of newborn granule cells. —PRS

Transl. Psych. 10.1038/s41398-017-0013-6 (2017).

This approach revealed folding in the thiamine pyrophosphate (TPP) riboswitch that regulates translation of genes involved in the synthesis of thiamine, an essential vitamin. The riboswitch folds into the “off” conformation, in which translation is inhibited, even in the absence of the TPP ligand. If TPP is not bound to this off conformation, it can switch to the “on” conformation when transcription pauses near the translation start codon, and this allows translation to start. TPP binding stabilizes the off conformation and prevents the switch. The assay will allow investigation of other cases in which transcriptional speed and pausing affect RNA folding. —VV

Proc. Natl. Acad. Sci. U.S.A. 10.1073/pnas.1712983115 (2017).

the development of the chick brain to understand what makes the mammalian brain distinctive. In mammals, excitatory glutamatergic neurons born deep in the brain migrate radially to the cortex, whereas inhibitory GABAergic interneurons born elsewhere migrate tangentially across the



Neurons migrate to form surface layers of the chick brain.

RNA FOLDING

Lighting up riboswitching

RNAs fold as they are synthesized, and this folding is required for function. Uhm *et al.* describe a single-molecule fluorescence energy transfer assay to monitor cotranscriptional RNA folding.

BRAIN DEVELOPMENT

The value of scaffolds

The brain is built by groups of neurons that migrate and interdigitate to form layers and circuits. This process varies in different phyla of animals. García-Moreno *et al.* draw lessons from

PHOTO: F. GARCÍA-MORENO ET AL. CELL REF. 22, 96 (2018)

Downloaded from <http://science.sciencemag.org/> on April 25, 2019

Science

Social skills to pay the bills

Brad Wible

Science **359** (6373), 286-287.
DOI: 10.1126/science.359.6373.286-g

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