ASTHMA
Defiant ILC2s resist steroids

Group 2 innate lymphoid cells (ILC2s) contribute to the inflammation associated with human allergic airway diseases, including asthma and chronic rhinosinusitis. Corticosteroid drugs are used to manage type 2 respiratory diseases, but steroid resistance may arise in the course of therapy. By comparing ILC2s from inflamed nasal polyps with blood ILC2s from healthy controls, van der Ploeg et al. observed that enhanced cytokine expression by nasal poly ILC2s and loss of steroid responsiveness were both associated with surface expression of the receptor isoform CD45RO rather than CD45RA, which is found on most resting ILC2s. Expression of the CD45RO isoform by inflammatory ILC2s in blood was increased in patients with asthma and correlated with more severe airway disease. CD45RO is a candidate biomarker for human inflammatory ILC2s that correlates with the acquisition of steroid resistance. —IRW

Science, this issue p. 614; see also p. 576

CLIMATE CHANGE
Microhabitat matters

Understanding how our warming climate affects vulnerable species is of paramount importance. However, predicting responses is complicated because species are complex and may adapt or respond in distinct ways. Riddell et al. compared a century-old dataset on species richness in the Mojave against modern surveys to measure climate-related changes in bird and small mammal communities. They found little change in mammal richness or occupancy but large declines across birds. They attribute these differences to differences in microclimate opportunities; specifically, mammals can mitigate temperature impacts through burrowing, whereas birds are generally more exposed. —SNV

Science, this issue p. 633

IN OTHER JOURNALS
Edited by Caroline Ash and Jesse Smith

ICE SHEETS
Too hot for our own good

Climate is warming faster in the Arctic than in any other large region, and the Greenland Ice Sheet is melting faster as a result. Noël et al. project that the rate of summertime surface melting will surpass that of winter snow accumulation in Greenland when the average air temperature there rises to 4.5°C above preindustrial values, which corresponds to a global warming threshold of 2.7°C. Without strong CO₂ emission mitigation measures, net surface mass loss could occur as soon as the middle of the 21st century. —HJS


SIGNAL TRANSDUCTION
How adiponectin fights diabetes

Adiponectin, a hormone produced in adipose tissue, may provide a useful therapeutic lead for type 2 diabetes because it improves glucose homeostasis and tissue sensitivity to insulin. But how it does so is unclear. Li et al. show that in mice with insulin resistance caused by a high-fat diet, treatment with adiponectin reduced the amount of triglyceride in the liver and in skeletal muscle. It did so by increasing lipoprotein lipase.

Science, this issue p. 661

QUANTUM SYSTEMS
Quantum gating at a distance

The processing of quantum information is reliant on the encoding and manipulation of quantum states of a qubit. Superconducting circuits are the most advanced platform at present, but there is an issue with cross-talk between the qubits and the challenge of error correction as the systems are scaled up. Another approach being pursued is a modular platform in which the qubits are spatially separated. Daiss et al. demonstrate the operation of a quantum gate in which one qubit conditionally controls the state of another qubit spatially separated by 60 meters (see the Perspective by Hunger). Because the approach is platform independent, it could be extended from the demonstrated neutral atoms to ions, impurity vacancy centers, or even a combination of these qubits. —ISO

Science, this issue p. 624; see also p. 576

Surface melting in Greenland may soon outpace snow accumulation there.


**REGULATORY FUNCTIONS REQUIRE PROTEINS, RNAs ALSO REGULATE**

Activity and triglyceride uptake into epididymal white adipose tissue and increasing fatty acid oxidation in muscle. These effects decreased the amount of diacylglycerol in the plasma membrane of liver and muscle cells, thus decreasing the activity of protein kinase C family members that impair signaling by the insulin receptor. —LBR


**RNA BIOLOGY**

**RNA FOLD INTO LIFE**

In addition to their well-known roles serving as messengers of genetic material from DNA to proteins, RNAs also regulate a myriad of cellular processes. Regulatory functions require proper folding of RNA by processes that remain challenging to understand. In a recent study, Yu *et al.* tackled this problem by developing a method that combined experimental RNA structure data with computational structural prediction. They focused on a bacterial noncoding RNA called SRP RNA and found that internal structural fluctuation was required to lead this newly synthesized RNA through a folding pathway called toehold-mediated strand displacement. Their results corroborated a prior study by Fukuda *et al.*, which used optical tweezers to follow in real time the cotranscriptional folding of SRP RNA. —DJ

*Mol. Cell* **81**, 1 (2021);

**GENETICS**

**NOT SUCH IDENTICAL TWINS**

Monozygotic twins that originate in the fertilization of one egg that splits into two are classically considered genetically identical. As a result, twin studies are an important aspect of research to unpick questions of nature versus nurture. To verify this assumption, Eriksson *et al.* sequenced the genomes of 381 monozygotic twin pairs and two sets of triplets and mapped mutations. The authors found that some twin pairs showed no differences, whereas 15% showed substantial differences in the number of mutations. In some twin pairs, the mutated lineages occurred in most cell lineages sampled, suggesting that they had occurred early in development. Phenotypic differences between twins are usually attributed to environmental effects, but this study suggests that this might not always be the case. —GKA


Some identical twin pairs, such as the former cricketers Eric Bedser (left) and Sir Alec Bedser, who were born on 4 July 1918, may have substantial mutational differences.

**MATERIALS DISCOVERY**

**FIRST Mo–Bi INTERMETALLIC MATERIAL**

Despite ordered structure and well-defined stoichiometry, stable intermetallic compounds are challenging to predict even in binary systems because of the numbers of structures that depend on chemical composition and need to be considered. Incorporation of Bi is of particular interest because of the potentially distinctive properties that it could introduce into intermetallic materials. Using a density functional theory–based random structure searching approach, Altman *et al.* explored the high-pressure phase space of the Mo–Bi system and predicted stability of the stoichiometric compound MoBi₂, of the CuAl₁₂ structure type, the first group 6-Bi binary intermetallic structure confirmed experimentally. Additional electronic structure calculations revealed important correlations that could be useful in directing the synthesis of analogous intermetallic compounds of transition metals with Bi. —YS


**COOLING TECHNOLOGY**

**A COOLER PAINT**

Passive radiative cooling relies on materials that emit infrared radiation through an atmospheric window of low energy absorption, thereby using outer space as a cold sink. Li *et al.* found a paint-like material that allowed for daytime, subambient daytime cooling. Calcium carbonate particles with a wide size distribution were mixed with acrylic and the resulting paint was field tested to demonstrate the cooling capabilities. Passively providing cooling may help mitigate the need for air conditioning and easy application is a key incentive for adopting the technology. —BG


**CANCER GENOMICS**

**LINEAGE TRAJECTORIES DIFFER BY MUTATION**

Mutations in the essential RUNX1 gene are associated with several diseases of the blood, including leukemias, familial platelet disorder, and other malignancies. How these mutations underly each phenotype is unknown. Using embryonic stem cells, Kellaway *et al.* examined the genomic effects of four different mutant RUNX1 transcription factor proteins. The mutations affect binding of RUNX1 to DNA or its transactivation domains in differentiated hematopoietic stem cells. Each mutation altered RUNX1 function by a different mechanism, leading to divergent trajectories for stem cell development for each disease phenotype. Thus, each malignancy will need a different therapeutic approach. —LMZ