Thus, the similarity between these two groups goes beyond wings. —SNV

Science, this issue p. 1197; see also p. 1124

IMMUNOLOGY

Blood DNases hack the NET

Neutrophil extracellular traps (NETs) are lattices of processed chromatin decorated with select secreted and cytoplasmic proteins that trap and neutralize microbes. However, their inappropriate release may do more harm than good by promoting inflammation and thrombosis. Jiménez-Alcázar *et al*. report that two deoxyribonucleases (DNases), DNASE1 and DNASE1L3, have partially redundant roles in degrading NETs in the circulation (see the Perspective by Gunzer). Knockout mice lacking these enzymes were unable to tolerate chronic neutrophilia, quickly dying after blood vessels were occluded by NET clots. Furthermore, the damage unleashed by clots during septicemia was enhanced when these DNases were absent. —STS

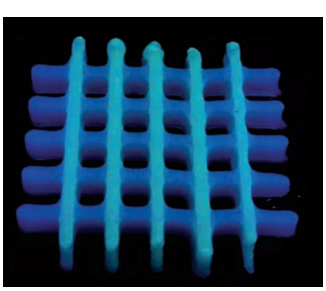
Science, this issue p. 1202; see also p. 1126

MATERIALS SCIENCE

3D printing with living inks

Intricate three-dimensional (3D)–printed structures teaming with bacterial life have been created using biocompatible hydrogel inks. Schaffner *et al.* blended the naturally occurring polymers κ-carrageenan, hyaluronic acid, and fumed silica in nearly equal parts in a salty, bacteria-rich broth. This yielded a nontoxic, functional living ink that could support free-standing objects written in submillimeter-scale printed filaments. Potential applications of such living materials range from degrading pollutants to producing synthetic skin scaffolds. —LAA

Sci. Adv. 10.1126/sciadv.aao6804 (2017).



Multimaterial 3D printing allows spatial segregation of two bacterial strains.

STRUCTURAL BIOLOGY

Holding a master regulator in check

A family of eukaryotic protein kinases, the phosphatidylinositol 3-kinase–related kinases (PIKKs), has key functions in DNA repair and nutrient sensing. In humans, ATR kinase locates DNA damage through its partner, ATRIP. Once activated, ATR initiates a cell-cycle cascade that culminates in cell-cycle arrest. Wang *et al*. determined the high-resolution structure of Mec1-Ddc2 (the yeast homolog of ATR-ATRIP) by electron microscopy. The structure shows the detailed architecture of the multidomain complex that overall forms a dimer of heterodimers. The detailed analysis of the structure reveals how an allosteric mechanism may activate the kinase. —VV

Science, this issue p. 1206

MUSCULAR DYSTROPHY

Making the cut

Mutations in the dystrophin gene cause Duchenne muscular dystrophy (DMD), a fatal childhood muscle disease. Amoasii *et al.* sought to optimize the correction of DMD mutations by CRISPR-Cas9 gene editing. They first generated mice in which exon 50, a common mutational hotspot region of the dystrophin gene in humans, was deleted. They then made a single cut in the dystrophin gene with CRISPR-Cas9, which resulted in up to 90% restoration of dystrophin expression in mouse skeletal and heart muscle. —OMS

Sci. Transl. Med. **9**, eaan8081 (2017).

IN OTHER JOURNALS

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

Invasive *Rudbeckia triloba* is less affected by climate warming than native European species.

ENZYMES

An enzymatic route to alkenes

Conversion of fatty acids to fully deoxygenated hydrocarbons is a challenging reaction for which few biological routes are known. Christenson *et al.* have characterized a bacterial enzyme, OleB, that catalyzes decarboxylation of fatty acid–derived β-lactones to form cis-olefins. OleB is a member of an enzyme family that typically uses a nucleophilic carboxylate in hydrolysis reactions. Sequence analysis and biochemical assays suggest that the conserved catalytic residues have been adapted to facilitate excision of the β-lactone. This group of enzymes may prove to be useful for biofuel production if their substrate range and efficiency can be tuned through engineering. —MAF

Biochemistry **56**, 5278 (2017).

QUANTUM GASES

Putting an old law to the test

Most superfluids, liquids, and gases that flow without viscosity owe their exotic properties to Bose-Einstein condensation (BEC), the formation of a macroscopic wave function at low temperatures. However, not all particles in a superfluid condense; a fundamental limit is set by the interactions in the system. Lopes *et al.* studied the dependence of the superfluid fraction in a homogeneous BEC of potassium atoms on the (tunable) strength of interactions between them. The researchers used two laser beams to give a momentum "kick" only to the condensed atoms, causing them to physically separate from the uncondensed ones. The measured fraction closely followed the theoretical prediction made decades ago that had remained experimentally untested. —JS

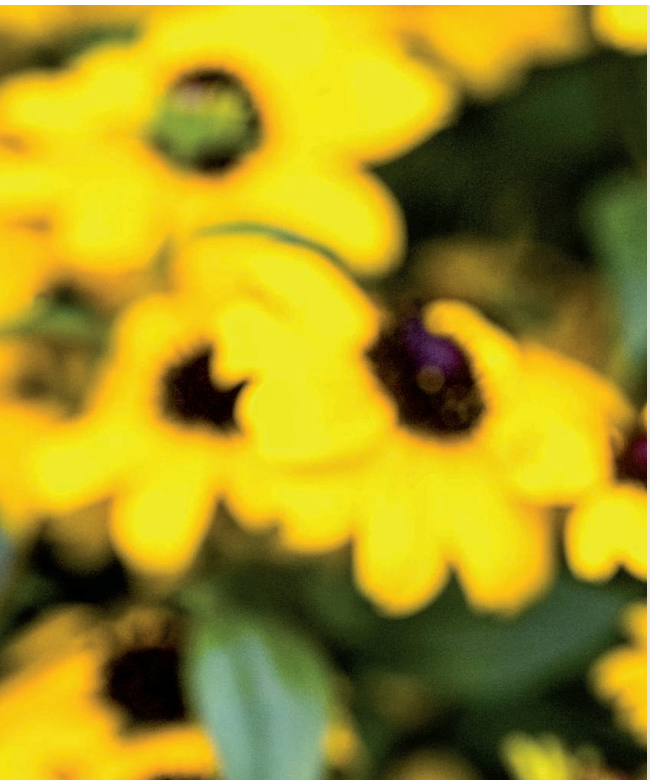
Phys. Rev. Lett. **119**, 190404 (2017).

PROTEIN DESIGN

Designed to stand the heat

Enzymes are valued as catalysts in the synthesis of pharmaceuticals, fine chemicals, and biofuels. A limitation is that most enzymes are unstable under

PHOTOS: (LEFT TO RIGHT) SCHAFFNER *ET AL*., *SCI. ADV.* 10.1126/SCIADV.AAO6804 (2017); CLARE GAINEY/ALAMY STOCK PHOTO



PLANT ECOLOGY

Coping with invasion and warming

Native plant communities worldwide face the challenges of anthropogenic changes, among them climate warming and invasion by introduced species. Haeuser *et al.* investigated the synergy between these two processes in a field experiment in native grassland in Germany. They sowed seeds of introduced ornamental plants together with those of the native grassland flora and compared the colonization and establishment of the two groups in artificially warmed plots and control plots. Although most species in both groups showed decreased performance under warming, the ornamentals were less severely affected. Hence, climate warming may increase the relative success of invasive species in such systems. —AMS

J. Ecol. **105**, 1698 (2017).

the reaction conditions used in chemical manufacturing. Moore *et al.* describe a strategy for stabilization based on designing covalent protein staples into an enzyme scaffold. They used Rosetta design software to identify optimal sites for introducing thioether bonds between a cysteine residue and a noncanonical amino acid. The design was implemented in an enzyme used in the biosynthesis of drugs containing cyclopropane. Several rounds of optimization yielded an enzyme containing two staples with enhanced thermal stability and resistance to chemical denaturation and organic solvents. The modified enzyme showed no reduction in activity or selectivity relative to the parent enzyme. —VV

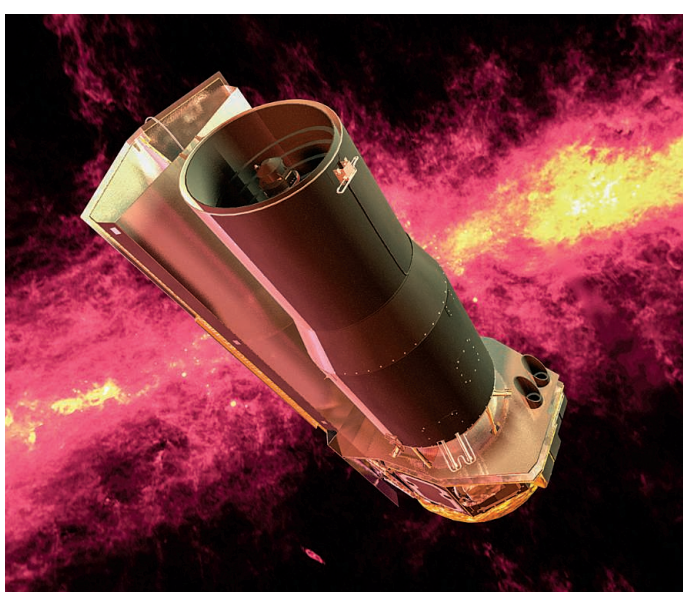
Proc. Natl. Acad. Sci. U.S.A. 10.1073/pnas.1708907114 (2017).

GRAVITATIONAL LENSING

Seeing microlensing from multiple angles

General relativity shows that massive objects deflect light. If a background star and a moving foreground object line up with Earth, the system acts as a lens that appears to temporarily increase the brightness of the star, an effect known as gravitational microlensing. Zhu *et al.* observed a microlensing event simultaneously with the Kepler and Spitzer space telescopes, as well as from Earth. Because the two spacecraft and Earth have widely separated orbits, the same event was effectively viewed from three different angles. This allowed the determination of key physical parameters that would otherwise have multiple solutions, which showed that this event was caused by a brown dwarf in the bulge of our Milky Way Galaxy. —KTS

Astrophys. J. **849**, L31 (2017).



The Spitzer Space Telescope helped characterize gravitational microlensing of a brown dwarf star.

ILLUSTRATION: NASA/JPL-CALTECH/R. HURT (SSC)

THERAPY

Surviving heart attack inflammation

Heart attack (myocardial infarction) causes cell death and inflammation of cardiac tissue. It is not yet clear what mechanisms specifically cause fatality. King *et al.* show that ischemia (restricted blood flow to the heart muscles) caused by infarction results in cell death. Debris from the dead cells is taken up by macrophages (a type of immune cell). This results in an interferon regulatory factor 3 (IRF3) and type I interferon (IFN) inflammatory response, which activates a distinct population of cardiac macrophages. Mice deficient in IRF3 and type I IFN signaling showed improved survival after myocardial infarction. Moreover, treatment of mice with neutralizing antibodies to the type I IFN receptor after myocardial infarction improved their survival, indicating that this might be an avenue for treatment. —GKA

Nat. Med. 10.1038/nm.4428 (2017).

AGING

Signaling an extended health span

Research on aging increasingly emphasizes the importance of health span rather than life span itself. Yin *et al.* found that in the nematode worm *Caenorhabditis elegans*, genetic variation in some (but not all) measures of health span was influenced by variation in genes encoding a neuropeptide and its corresponding receptor. The peptide is made in glial cells and activates a receptor on neurons that is similar to the somatostatin and nociceptin receptors of mammals. Loss of signaling in this pathway extended virility and digestive tract function. Understanding such mechanisms might allow therapies that promote health span—a very welcome possibility in a world faced with an expanding population of elderly individuals. —LBR

Nature 10.1038/nature24463 (2017).