COVER
Mammalian fatty acid synthase, a multienzyme that catalyzes all steps of fatty acid biosynthesis. A blueprint of its atomic structure is shown in three views, and the extent of its functional domains is indicated by colored bars. The versatile segmental construction is also used in other members of this large family of multienzymes, which synthesize natural products such as antibiotics. See page 1315.

Image: Marc Leibundgut and Timm Maier/ETH Zurich

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**NEUROSCIENCE**

Internally Generated Reactivation of Single Neurons in Human Hippocampus During Free Recall

H. Gelbard-Sagiv, R. Mukamel, M. Harel, R. Malach, J. Fried

The firing patterns of brain neurons recorded from people watching a video episode were the same as those recorded during later recall of the same show.

>> News story p. 1280; Research Article p. 1322

10.1126/science.1164685

**CHEMISTRY**

Merging Photoredox Catalysis with Organocatalysis: The Direct Asymmetric Alkylation of Aldehydes

D. A. Nicewicz and D. W. C. MacMillan

When irradiated by light, a ruthenium-organic catalyst creates intermediates with unpaired electrons that undergo otherwise intractable asymmetric reactions.

10.1126/science.1161976

**CELL BIOLOGY**

TMEM16A, A Membrane Protein Associated with Calcium-Dependent Chloride Channel Activity

A. Caputo et al.

A transmembrane protein induced in cytokine-treated bronchial epithelial cells seems to be a long-sought primary carrier of a voltage- and calcium-dependent chloride current.

10.1126/science.1163518

**MEDICINE**

An Integrated Genomic Analysis of Human Glioblastoma Multiforme

D. W. Parsons et al.

Comprehensive analysis of mutations in a brain cancer identifies previously unrecognized cancer genes and a frequently mutated protein that may serve as a therapeutic marker.

>> News story p. 1280; Science Express Research Article by S. Jones et al.

10.1126/science.1164382

Core Signaling Pathways in Human Pancreatic Cancers Revealed by Global Genomic Analyses

S. Jones et al.

Analysis of genome alterations shows that the same 12 signaling pathways are disrupted in most pancreatic tumors, suggesting these as key to tumor development.

>> News story p. 1280; Science Express Research Article by D. W. Parsons et al.

10.1126/science.1164368

**ECOLOGY**

Comment on “Fire-Derived Charcoal Causes Loss of Forest Humus”

J. Lehmann and S. Sohi

full text at www.sciencemag.org/cgi/content/full/321/5894/1295c

Response to Comment on “Fire-Derived Charcoal Causes Loss of Forest Humus”

D. A. Wardle, M.-C. Nilsson, O. Zackrisson

full text at www.sciencemag.org/cgi/content/full/321/5894/1295d

**ATMOSPHERIC SCIENCE**

Flood or Drought: How Do Aerosols Affect Precipitation?

D. Rosenfeld et al.

10.1126/science.1163569

**DEVELOPMENTAL BIOLOGY**

Shadow Enhancers as a Source of Evolutionary Novelty

J.-W. Hong, D. A. Hendrix, M. S. Levine

Some developmentally important genes can be regulated via two enhancers, one located nearby and the other, a “shadow” enhancer, 10 to 20 kilobases away.

>> Perspective p. 1300; Report p. 1346

10.1126/science.1163572

**STRUCTURAL BIOLOGY**

The Crystal Structure of a Mammalian Fatty Acid Synthase

T. Maier, M. Leibundgut, N. Ban

A high-resolution structure of mammalian fatty acid synthase reveals that this enzyme is derived from an iterative polyketide synthase and has five active catalytic domains.

>> Perspective p. 1304

10.1126/science.1163585

**NEUROSCIENCE**

Internally Generated Cell Assembly Sequences in the Rat Hippocampus

E. Pastalkova, V. Itskov, A. Amarasingham, G. Buzsáki

As rats perform a memory task, cells in their hippocampus fire in self-generated sequences that correspond to and presage the animals’ subsequent choices.

>> News story p. 1280; Science Express Report by H. Gelbard-Sagiv et al.; Science Podcast

10.1126/science.1163592

**GEOCHEMISTRY**

Experimental Test of Self-Shielding in Vacuum Ultraviolet Photodissociation of CO

S. Chakraborty, M. Ahmed, T. L. Jackson, M. H. Thiemens

The anomalous variation of oxygen isotopes in early meteorites is produced by excited states during photodissociation of carbon monoxide, not by self-shielding, as was thought.

10.1126/science.1163597

10.1126/science.1164387
Identification of Active Gold Nanoclusters on Iron Oxide Supports for CO Oxidation
A. A. Herzing et al.
High-resolution microscopy showed that the most effective catalytic gold species on an iron oxide support were those forming bilayer clusters of just 10 atoms.

A chimeric messenger RNA generated in a tumor by a DNA rearrangement is also, unexpectedly, expressed in healthy cells, a result of splicing together two separate messenger RNAs.

A resistance factor known to protect mice from retroviral infection is unexpectedly identified as Apobec3, a deoxycytidine deaminase that controls somatic hypermutation.

A protein responsible for the final separation of daughter cells or budding viruses forms heteromeric complexes on the inside of the membrane to regulate the abscission step.

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