COVER
Clusters of the pathogenic bacterium *Staphylococcus aureus* visualized by scanning electron microscopy. *Staphylococcus aureus* has been called a “superbug” because of its ability to resist numerous antibiotics and evade host antimicrobial mediators, including nitric oxide. See page 1672.

*Image: Annie Cavanagh/Wellcome Images*

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The sea squirt prevents self-fertilization by using a tightly linked genetic locus to encode a sperm-egg receptor-ligand pair, a system similar to that used by flowering plants.
10.1126/science.1152488

HIGH-TERMORELECTRIC PERFORMANCE OF NANOSTRUCTURED BISMUTH ANTIMONY TELLURIDE BULK ALLOYS
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Milling a thermoelectric alloy, which produces electricity from a thermal gradient, into a nanopowder, then pressing it into a bulk form, greatly improves its performance.
10.1126/science.1156446

ANCIENT ASTEROIDS ENRICHED IN REFRACTORY INCLUSIONS
Spectral data imply that some asteroids contain higher concentrations of early solar system grains and materials than are found in any sampled meteorite.
10.1126/science.1154340

METABOLIC DIVERSIFICATION—INDEPENDENT ASSEMBLY OF OPERON-LIKE GENE CLUSTERS IN PLANTS
B. Field and A. E. Osbourn
Through strong selection, similar clusters of genes for triterpene biosynthesis have arisen independently through gene duplication and neofunctionalization in several plant lines.
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COMMENT ON "PHYSICAL MODEL FOR THE DECAY AND PRESERVATION OF MARINE ORGANIC CARBON"
B. P. Boudreau et al.
full text at www.sciencemag.org/cgi/content/full/319/5870/1616b

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nanominerals, mineral nanoparticles, and Earth systems
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size-driven structural and thermodynamic complexity in iron oxides
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pattern separation in the human hippocampal CA3 and dentate gyrus
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High-resolution imaging of the human brain reveals that, as seen in rodents, recognition of small differences in similar memories requires a particular region of the hippocampus. >> Perspective p. 1623

The polarization of electrons in a complex iron oxide magnet can be manipulated using only a weak magnetic field, not a strong one as required in other systems.

Observations on the movements of silicon atoms in a thin film of aluminum show that dislocations can align and act like a channel or pipe to greatly accelerate diffusion.

An imbalance between the orbital and rotational periods of Saturn’s moon Titan implies that momentum is exchanged with its atmosphere and that it contains an internal ocean. >> Perspective p. 1629

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Chloride-Bearing Materials in the Southern Highlands of Mars  
M. M. Osterloo et al.

Spectral observations from Mars Odyssey detect chloride minerals, apparently forming from the evaporation of water, across some of the oldest regions on Mars.

**GEOCHEMISTRY**

Sulfur and Chlorine in Late Cretaceous Deccan Magmas and Eruptive Gas Release  
S. Self, S. Blake, K. Sharma, M. Widdowson, S. Septon

Measurements on rare glass inclusions and rims in India’s Deccan flood basalt imply that these end-Cretaceous eruptions injected huge amounts of sulfur into the atmosphere.  
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Atmospheric Hydroxyl Radical Production from Electronically Excited NO₂ and H₂O  
S. Li, J. Matthews, A. Sinha

The reaction of electronically excited nitrogen dioxide with water releases large amounts of OH radicals, an important oxidant, to the troposphere.  
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**Paleontology**

Synchronous Aggregate Growth in an Abundant New Ediacaran Tubular Organism  
M. L. Droser and J. G. Gehling

Tubular fossils up to 30 centimeters long dominate the fossil assemblage in the Late Precambrian of the Flinders Range, Australia, and show multiple modes of growth.

**Anthropology**

Orrorin tugenensis Femoral Morphology and the Evolution of Hominin Bipedalism  
B. G. Richmond and W. L. Jungers

Comparison of femora from an early, ostensibly human fossil to those from apes, humans, and hominins confirms that *Orrorin tugenensis* was a basal bipedal hominin.  
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**Cell Biology**

Activation of FOXO1 by Cdk1 in Cycling Cells and Postmitotic Neurons  
Z. Yuan et al.

A cell cycle–associated kinase phosphorylates the transcription factor FOXO1, which activates transcription of a regulator of mitosis.

**Medicine**

TPD-43 Mutations in Familial and Sporadic Amyotrophic Lateral Sclerosis  
J. Sreedharan et al.

Mutations in a gene that encodes a protein that aggregates in several neurodegenerative disorders are linked to atrophorphic lateral sclerosis (Lou Gehrig’s disease).

**Microbiology**

A Nitric Oxide–Inducible Lactate Dehydrogenase Enables *Staphylococcus aureus* to Resist Innate Immunity  
A. R. Richardson, S. J. Libby, F. C. Fang

*Staphylococcus aureus* is a particularly successful pathogen because it responds to antimicrobial defenses of its host by producing more lactate to maintain its redox balance.

**Neuroscience**

Drosophila Egg-Laying Site Selection as a System to Study Simple Decision-Making Processes  
C. Yang, P. Belawat, E. Hafen, L. Y. Jan, Y.-N. Jan

Experiments show how flies make complex decisions when laying eggs, choosing surfaces containing sucrose only when other options are not available.

**Neuroscience**

Protein Synthesis and Neurotrophin-Dependent Structural Plasticity of Single Dendritic Spines  
J. Tanaka et al.

Pairing of stimuli in hippocampal cells induces secretion of the growth factor BDNF, causing enlargement of individual spines and strengthening of synapses.  
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**Psychology**

Spending Money on Others Promotes Happiness  
E. W. Dunn, L. B. Akinin, M. I. Norton

A survey, a study of windfall spending, and a lab experiment all indicate that spending money on others results in more happiness than does spending money on oneself.
Opportunities for scientists in public health.

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S. Webb  
Scientists are needed with experience and expertise to address global health challenges.

Tooling Up: Breaking Free of Academia  
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The cultural shift from academia to nonacademic workplaces requires careful self-assessment.

Ahead of Her Time  
E. Pain  
At age 24, Katerina Aifantis received a grant from the European Research Council to start an independent lab.

From the Archives: Thanks for the Great Postdoc Bargain  
R. Freeman  
The Harvard economist thanks postdocs for their skilled and diligent servitude.

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Diminutive hominid may have ties to human ancestors.

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A special muscle may give alligators a deadly edge in the water.

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Signaling researchers met in Weimar, Germany.

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EDITORIAL GUIDE: Hear It, Watch It, Read It  
N. R. Gough  
Four new sections of Science Signaling bring new resources to the cell signaling community.

MEETING REPORT: Watching Molecules Talking to Each Other  
K. Friedrich, O. Janssen, R. Hass  
The 2007 meeting of the Signal Transduction Society focused on results obtained using state-of-the-art imaging methodologies.

PRESENTATION: Matrix Metalloproteinase-7 and the 20S Proteasome Contribute to Cellular Senescence  
C. Bertram and R. Hass  
Two cultured cell systems provide insight into intracellular and extracellular events involved in cellular differentiation and senescence.

PRESENTATION: In Vivo Imaging of T Cell Priming  
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History of prior antigenic experience controls T cell activation.

PRESENTATION: Geranylgeranylation but Not GTP-Loading of Rho GTPases Determines T Cell Function  
S. Waiczies, I. Bendix, F. Zipp  
Posttranslational lipid modification of RhoA is necessary for T cell migration into the central nervous system during neuroinflammation.

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**SCIENCE ONLINE FEATURE**

**THE GONZO SCIENTIST:**  
Play It Again, Robot  
The fifth installment in this series, with accompanying video, investigates the state of the art of robot music.
Science 319 (5870), 1585-1696.