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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Mechanism of Self-Sterility in a Hermaphroditic Chordate
Y. Harada et al.
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

MATERIALS SCIENCE
High-Thermoelectric Performance of Nanostructured Bismuth Antimony Telluride Bulk Alloys
B. Poudel et al.
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

PLANETARY SCIENCE
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

EVOLUTION
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.
10.1126/science.1154990

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TECHNICAL COMMENT ABSTRACTS
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full text at www.sciencemag.org/cgi/content/full/319/5870/1616b
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Low-Magnetic-Field Control of Electric Polarization Vector in a Helimagnet
S. Ishiwata, Y. Taguchi, H. Murakawa, Y. Onose, Y. Tokura
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.
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Observation of Giant Diffusivity Along Dislocation Cores
M. Legros, G. Dehm, E. Arzt, T. J. Balk
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.
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Titan’s Rotation Reveals an Internal Ocean and Changing Zonal Winds
R. D. Lorenz et al.
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.
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Preparing and Motivating Behavior Outside of Awareness
H. Aarts, R. Custers, H. Marien
Encouraging words flashed on a screen so briefly that they are only perceived unconsciously can, nevertheless, increase the effort put into a subsequent test of strength.
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Pattern Separation in the Human Hippocampal CA3 and Dentate Gyrus
A. Bakker, C. B. Kirwan, M. Miller, C. E. L. Stark
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.
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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. Sephton
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. >> Perspective p. 1628

ATMOSPHERIC SCIENCE

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. >> Perspective p. 1624

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. >> News story p. 1599

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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

TDP-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 amyotrophic 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 Neuregulin-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. >> Perspective p. 1627

PSYCHOLOGY

Spending Money on Others Promotes Happiness
E. W. Dunn, L. B. Aknin, 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.
SCIENCE SIGNALING

www.stke.org  THE SIGNAL TRANSDUCTION KNOWLEDGE ENVIRONMENT

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
S. E. Henrickson et al.
History of prior antigenic experience controls T cell activation.

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

SCIENCE CAREERS

www.sciencemag.org  CAREER RESOURCES FOR SCIENTISTS

Public Health Goes Global
S. Webb
Scientists are needed with experience and expertise to address global health challenges.

Tooling Up: Breaking Free of Academia
D. Jensen
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.

SCIENCEPODCAST

Download the 14 March Science Podcast to hear about the evolution of human bipedalism, subliminal influence on behavior, and for farewell thoughts from senior news correspondent Jean Marx.

www.sciencemag.org/about/podcast.dtl

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