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Protein Structure Initiative: Phase 3 or Phase Out Researchers Hone Their Homology Tools 1610
GENETICS
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

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

TECHNICAL COMMENT ABSTRACTS
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
Response to Comment on "Physical Model for the Decay and Preservation of Marine Organic Carbon"
D. H. Rothman and D. C. Forney
full text at www.sciencemag.org/cgi/content/full/319/5870/1616c

REVIEWS
GEOCHEMISTRY
Nanominerals, Mineral Nanoparticles, and Earth Systems
M. F. Hochella Jr. et al.
GEOCHEMISTRY
Size-Driven Structural and Thermodynamic Complexity in Iron Oxides
A. Novotny, L. Mazeina, J. Majzlan

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PSYCHOLOGY
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.

RESEARCH ARTICLE
NEUROSCIENCE
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. >> Perspective p. 1623

REPORTS
APPLIED PHYSICS
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.

MATERIALS SCIENCE
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.

PLANETARY SCIENCE
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. >> Perspective p. 1629
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PLANETARY SCIENCE
Chloride-Bearing Materials in the Southern Highlands of Mars 1651
M. M. Oosterloo 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 1654
S. Self, S. Blake, K. Sharma, M. Widdowson, S. Sephton
Measurements on rare glass inclusions and rims in India’s Deccan flood basals 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 1657
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 1660
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 1662
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

CELL BIOLOGY
Activation of FOXO1 by Cdk1 in Cycling Cells and Postmitotic Neurons 1665
Z. Yuan et al.
A cell cycle–associated kinase phosphorylates the transcription factor FOXO1, which activates transcription of a regulator of mitosis.

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TPD-43 Mutations in Familial and Sporadic Amyotrophic Lateral Sclerosis 1668
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 1672
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.

MEDICINE
Oncogenic CARD11 Mutations in Human Diffuse Large B Cell Lymphoma 1676
G. Lenz et al.
One type of non-Hodgkin’s lymphoma is caused by mutations in a scaffolding protein that inappropriately activate an inflammatory signaling pathway.

NEUROSCIENCE
Drosophila Egg-Laying Site Selection as a System to Study Simple Decision-Making Processes 1679
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 1683
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 1687
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.
One Tail, Many Feats
Fifth appendage keeps geckos upright and agile and even helps them glide.

Hobbit Skull Suggests a Separate Species
Diminutive hominid may have ties to human ancestors.

Gators Dive With Flexible Air Tanks
A special muscle may give alligators a deadly edge in the water.

Opportunities for scientists in public health.

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.

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