CONTENTS

CONTENTS continued >>

www.sciencemag.org  SCIENCE  VOL 321  29 AUGUST 2008

Published by AAAS

NEWS OF THE WEEK

NSF Budget Ills Send Big Chill Through Antarctic Program
1142
Biologists Change One Cell Type Directly Into Another
1143
Fraud Charges Cast Doubt on Claims of DNA Damage From Cell Phone Fields
1144
Research Downturn
1144
SCIENCESCOPE
Can Fasting Blunt Chemotherapy’s Debilitating Side Effects?
1146
First Gene for Severe Dry Macular Degeneration
1146
NEWS FOCUS
Ancient Earthmovers of the Amazon
The Western Amazon’s “Garden Cities”
1148
Physiological Society Meeting
Learning Under Anesthesia
1153
Testing a Taste Test for Depression
Zeng Yi: A Controversial Bid to Thwart the “Cantonese Cancer”
1154
Mortality Survey Offers Mixed Message

LETTERS

China’s Energy Policy Comes at a Price Q. Wang
Response J. Pan et al.
From Darwinism to Evolutionary Biology U. Kutschera

CORRECTIONS AND CLARIFICATIONS

BOOKS ET AL.
Guesstimation Solving the World’s Problems on the Back of a Cocktail Napkin L. Weinstein and J. A. Adam, reviewed by S. Mertens

EDUCATION FORUM
Preschool Influences on Mathematics Achievement E. C. Melhuish et al.

PERSPECTIVES
The “Invisible Hand” of Floral Chemistry R. A. Raguso
Life After Death A. Celotti
When Seamounts Subduct R. von Huene
Opening the Molecular Floodgates C. S. Gandhi and D. C. Rees
A Catalytic Foothold for Fluorocarbon Reactions R. N. Perutz

EDITORIAL
1133 Academies Active in Education by Jorge E. Allende

DEPARTMENTS
1127 Science Online
1129 This Week in Science
1134 Editors’ Choice
1136 Contact Science
1139 Random Samples
1141 Newsmakers
1171 AAAS News & Notes
1225 New Products
1226 Science Careers

COVER
A black-chinned hummingbird (Archilochus alexandri) drinks nectar from a flower of wild tobacco (Nicotiana attenuata). Nicotine in the nectar moderates its consumption by the hummingbird and protects against predators; the flower lip produces benzyl acetone, which attracts pollinators. Together, the repellent and attractant maximize the plant’s reproductive fitness. See page 1200.

Photo: Danny Kessler
SCIENCE EXPRESS
www.sciencexpress.org

MEDICINE
Seeding and Propagation of Untransformed Mouse Mammary Cells in the Lung
K. Podsypanina et al.
In mice, normal mammary cells can colonize the lung, suggesting that metastases might arise from displaced normal cells acquiring genetic changes that confer malignancy.

APPLIED PHYSICS
Time Reversal and Negative Refraction
J. B. Pendry
Optically active materials with nonlinear optical properties are predicted to mimic negatively refractive materials but without losses associated with true negative refraction.

EVOLUTION
Natural Selection on a Major Armor Gene in Threespine Stickleback
R. D. H. Barrett, S. M. Rogers, D. Schluter
In stickleback fish transferred to fresh water, selection against the allele for the costly armor plating only partly explains the changes in allele frequencies over generations.

TECHNICAL COMMENT ABSTRACTS
GEOCHEMISTRY
Comment on "Determining Chondritic Impactor Size from the Marine Osmium Isotope Record"
J. V. Morgan
full text at www.sciencemag.org/cgi/content/full/321/5893/1158a
Response to Comment on "Determining Chondritic Impactor Size from the Marine Osmium Isotope Record"
full text at www.sciencemag.org/cgi/content/full/321/5893/1158b

REVIEW
APPLIED PHYSICS
Cavity Optomechanics: Back-Action at the Mesoscale
T. J. Kippenberg and K. J. Vahala

BREVIA
GEOCHEMISTRY
Bang! Month-Scale Eruption Triggering at Santorini Volcano
V. M. Martin et al.
Modeling the diffusion of iron in crystals shows that the 1925 eruption of Santorini was triggered by intrusion of hotter magma just a few months earlier.

RESEARCH ARTICLE
STRUCTURAL BIOLOGY
The Structure of an Open Form of an E. coli Mechanosensitive Channel at 3.45 Å Resolution
W. Wang et al.
Circularly arrayed transmembrane helices in the bacterial mechanosensitive ion channel, MscS, expand like the iris of a camera to open the channel and allow ion efflux.
>> Perspective p. 1166; Report p. 1210

REPORTS
ASTRONOMY
Polarized Gamma-Ray Emission from the Crab
A. J. Dean et al.
Detection of polarized gamma rays from the Crab Pulsar implies that electrons must be accelerated to extreme energies to emit radiation near the rapidly rotating star.
>> Perspective p. 1164

ASTRONOMY
The Metamorphosis of Supernova SN 2008D/XRF 080109: A Link Between Supernovae and GRBs/Hypernovae
P. A. Mazzali et al.
The spectra of a recent supernova evolved from that of a more energetic event to that of a less energetic one, providing a link between previous observations.
Dynamics Correlate with Neurological Disease

A channel that allows diffusion of metabolites across the mitochondrial outer membrane forms an unusual 19-stranded α-helix of transmembrane helices facilitating the opening of a bacterial mechanosensitive channel in a lipid bilayer. >> Perspective p. 1166; Research Article p. 1179

Weak Interplate Coupling by Seamounts and Repeating M ~ 7 Earthquakes

More earthquakes occur in front of a subducting seamount east of Japan than over and behind it, implying that the subducting and overriding plates are weakly coupled. >> Perspective p. 1165

Field Experiments with Transformed Plants Reveal the Sense of Floral Scents

Genetic manipulation of wild tobacco plants balances the use of scent to attract pollinators and toxin to limit nectar consumption in order to optimize reproduction. >> Perspective p. 1163; Science Podcast

Redox-Active Antibiotics Control Gene Expression and Community Behavior in Divergent Bacteria

In addition to an antiseptic function, phenazines—pigmented antibiotics made by bacteria—organize colony structure by activating a superoxide-stress regulator.

Solution Structure of the Integral Human Membrane Protein VDAC-1 in Detergent Micelles

A channel that allows diffusion of metabolites across the mitochondrial outer membrane forms an unusual 19-stranded β barrel with a pore size of about 25 angstroms.

A Structural Mechanism for MscS Gating in Lipid Bilayers

Electron paramagnetic resonance measurements reveal that tilting of transmembrane helices facilitates the opening of a bacterial mechanosensitive channel in a lipid bilayer. >> Perspective p. 1166

Promoted Electron Emission from a Metal Surface

Vibrationally excited nitric oxide molecules unexpectedly ionize a surface more efficiently at slower approach velocities, apparently because there is more time for charge transfer.

Redox-Active Antibiotics Control Gene Expression and Community Behavior in Divergent Bacteria

In addition to an antiseptic function, phenazines—pigmented antibiotics made by bacteria—organize colony structure by activating a superoxide-stress regulator.

Solution Structure of the Integral Human Membrane Protein VDAC-1 in Detergent Micelles

A channel that allows diffusion of metabolites across the mitochondrial outer membrane forms an unusual 19-stranded β barrel with a pore size of about 25 angstroms.
Foul wind.

SCIENCE NOW
www.sciencenow.org
HIGHLIGHTS FROM OUR DAILY NEWS COVERAGE

Bats: Gone With the Wind
How are wind turbines killing thousands of bats? It’s not the blades.

How to Disown a Body Part
Rubber-hand illusion makes people forget about a real appendage.

Did Rumbling Give Rise to Rome?
Ancient civilizations preferred to settle along the edges of earthquake-prone regions.

The SDB Meeting, Philadelphia.

SCIENCE SIGNALING
www.sciencesignaling.org
THE SIGNAL TRANSDUCTION KNOWLEDGE ENVIRONMENT

FORUM: Open Forum on Cell Signaling
A. M. VanHook
Read highlights from the 67th Annual Meeting of the Society for Developmental Biology (SDB).

ST NETWATCH: Kinase.com
Kinase.com explores the functions, evolution, and diversity of protein kinases; in Protein Databases.

PRIMARY RESEARCH
Watch out for the publication of the first primary research articles in the next issue of Science Signaling.

Veterans studying combat-related brain injuries.

SCIENCE CAREERS
www.sciencerecareers.org/career_development
FREE CAREER RESOURCES FOR SCIENTISTS

Making a Scientific Impact
S. Gaidos
A team of military veterans at Harvard is investigating mechanical forces involved in traumatic brain injury.

University of California Postdoc Union Wins Official Recognition
B. Benderly
California’s employment board officially confirms unionizing the nation’s largest group of postdocs.

After Success Abroad, a Polish Scientist Returns Home
C. Wald
Agnieszka Dobrzyń has reaped the rewards of efforts to keep top young scientists in Poland.

From the Archives: The Postbac—One or Two Years That Make Careers
S. Webb
A break from education after the bachelor’s degree allows students to gain perspective and learn new skills before starting grad school.

SCIENCE PODCAST
www.sciencemag.org/multimedia/podcast
FREE WEEKLY SHOW

Download the 29 August Science Podcast to hear about a molecular marker of neurological status, how scents aid floral success, early Amazonian urbanism, and more.

Separate individual or institutional subscriptions to these products may be required for full-text access.