EDITORIAL
722  Speak Up for Science Funding
   Alan I. Leshner and Mary Woolley

NEWS OF THE WEEK
726  A roundup of the week’s top stories

NEWS & ANALYSIS
728  Scientists Assess Damage
   From Sandy’s Deadly Punch
730  Did Pulses of Climate Change
   Drive the Rise and Fall of the Maya?
   >> Report p. 788
731  Lung-on-a-Chip Breathes New Life
   Into Drug Discovery
   >> Sci. Transl. Med. Research Articles by
   D. Huh et al. and K. S. Thorneloe et al. and
   Perspective by D. M. Dambach and H. Uppal
732  As Drug Pilot Wraps Up, a Lively Debate
   About Its Future
733  Question of Martian Methane
     Is Still Up in the Air

NEWS FOCUS
734  Weather Forecasts Slowly Clearing Up
   One Sandy Forecast a Bigger Winner Than Others
   >> Science Podcast
738  Poor but Smart

LETTERS
740  Limits to Religious Conservation Efforts
   B. Gong et al.
   Credit Due to Peter Higgs
   J. Ellis
   Evolution’s Misleading Language
   A. N. Burdett
742  TECHNICAL COMMENT ABSTRACTS
742  CORRECTIONS AND CLARIFICATIONS

BOOKS ET AL.
743  Visible Empire
   D. Bleichmar, reviewed by P. H. Smith
744  Measurement
   P. Lockhart, reviewed by B. Finegold

POLICY FORUM
745  Law and Science Collide
   Over Human Gene Patents
   R. Cook-Deegan

PERSPECTIVES
748  A Decorated Virus Cannot Hide
   R. W. Herzog and D. A. Ostrov
   >> Report p. 795
749  Constraints on Sexual Selection
   M. J. Wade
   >> Report p. 802
750  Emerging Disease or Diagnosis?
   S. K. Gire et al.
752  Driving the Formation of Molecular Knots
   J. S. Siegel
   >> Report p. 783
754  A Single-Molecule Engine
   M. W. Bockrath
   >> Report p. 779
755  Constraining Cloud Feedbacks
   K. M. Shell
   >> Report p. 792
756  Epigenetic Islands in a Genetic Ocean
   D. Schübeler

ASSOCIATION AFFAIRS
758  Presidential Address: Transposable
   Elements, Epigenetics, and Genome
   Evolution
   N. V. Fedoroff

CONTENTS continued >>
**REVIEW**

768 Hepcidin and the Iron-Infection Axis
H. Drakesmith and A. M. Prentice

**REPORTS**

773 An Interacting Binary System Powers Precessing Outflows of an Evolved Star
H. M. J. Boffin et al.
Spectra of a planetary nebula’s central star reveal a companion star responsible for launching the system’s rotating jets.

775 Polarity-Switching Top Coats Enable Orientation of Sub–10-nm Block Copolymer Domains
C. M. Bates et al.
A chemical reaction in a thin polymer film imposes orientational ordering of lamellar domains in an underlying film.

779 Driving a Macroscopic Oscillator with the Stochastic Motion of a Hydrogen Molecule
C. Lotze et al.
The random motion of an activated hydrogen molecule produces forces that drive periodic motions of a scanning probe cantilever.

783 Discovery of an Organic Trefoil Knot
N. Ponnuswamy et al.
Hydrophobic interactions appear to steer three molecular fragments into a knot, rather than a simpler ring geometry.

785 Tissint Martian Meteorite: A Fresh Look at the Interior, Surface, and Atmosphere of Mars
H. Chennaoui Aoudjehane et al.
A meteorite that fell in Morocco in July 2011 provides a sample to study processes that operated on Mars 700,000 years ago.

788 Development and Disintegration of Maya Political Systems in Response to Climate Change
D. J. Kennett et al.
A record of rainfall from a stalagmite in southern Belize provides a context for better understanding Maya civilization.

792 A Less Cloudy Future: The Role of Subtropical Subsidence in Climate Sensitivity
J. T. Fasullo and K. E. Trenberth
Seasonal variations in tropospheric relative humidity may provide an observational constraint on climate sensitivity.

795 Coagulation Factor X Activates Innate Immunity to Human Species C Adenovirus
K. Doronin et al.
Tagging adenovirus with a serum protein prompts an immune response when the virus enters cells.

798 Germ Cell Migration Across Sertoli Cell Tight Junctions
B. E. Smith and R. E. Brown
Syncytial germ cell chains span a network of transient compartments to cross the blood-testis barrier in adult mice.

802 Bateman in Nature: Predation on Offspring Reduces the Potential for Sexual Selection
J. Byers and S. Dunn
The relationship between mate number and offspring output in male pronghorn confirms Bateman’s findings.

804 Corals Chemically Cue Mutualistic Fishes to Remove Competing Seaweeds
D. L. Dixson and M. E. Hay
Goby fish remove toxic algae from their coral habitat, becoming more distasteful to predators in the process.

807 A Core Metabolic Enzyme Mediates Resistance to Phosphine Gas
D. I. Schlipalius et al.
Mutations in a lipoic acid metabolism enzyme confer resistance to phosphine but also result in sensitivity to arsenite.

810 Optical Control of Protein Activity by Fluorescent Protein Domains
X. X. Zhou et al.
Shining light onto an engineered fluorescent protein controls the activity of domains fused to the protein.

815 Intramitochondrial Transport of Phosphatidic Acid in Yeast by a Lipid Transfer Protein
M. Connerth et al.
A lipid transfer protein, Ups1, controls the accumulation of cardiolipin in mitochondrial outer and inner membranes.

818 IRE1α Cleaves Select microRNAs During ER Stress to Derepress Translation of Proapoptotic Caspase-2
J.-P. Upton et al.
Protein misfolding stimulates the destruction of microRNAs and the synthesis of an enzyme that promotes cell death.

822 Mitochondrial Network Size Scaling in Budding Yeast
S. M. Rafelski et al.
Yeast cells produce buds with uniform mitochondrial content, even as the aging mother cell loses out.
SCIENCEONLINE

SCIENCEEXPRESS
www.scienceexpress.org
Publication Ahead of Print

Kinetic Responses of β-Catenin Specify the Sites of Wnt Control
A. R. Hernandez et al.
10.1126/science.1228734

Acute Inflammation Initiates the Regenerative Response in the Adult Zebrafish Brain
N. Kyrtsis et al.
10.1126/science.1228773

Cytoplasmic ATP Hydrolysis Powers Transport of Lipopolysaccharide Across the Periplasm in E. coli
S. Okuda et al.
10.1126/science.1228984

Robust Photogeneration of H 2 in Water Using Semiconductor Nanocrystals and a Nickel Catalyst
Z. Han et al.
10.1126/science.1227775

TECHNICAL COMMENTS
Comment and Response on “Glacial Survival of Boreal Trees in Northern Scandinavia”
Comment: H. H. Birk et al.
http://dx.doi.org/10.1126/science.1225345
Response: L. Parducci et al.
10.1126/science.1225476

SCIENCENOW
www.sciencenow.org
Highlights From Our Daily News Coverage

The Innovative Cockato: Figaro Invents, Makes, and Uses a Tool
Even among birds, necessity is the mother of invention.
http://scim.ag/Innovative-Cockatoo

The Eternal Youth of Asteroid Vesta
The Dawn spacecraft shows how Vesta’s blemishes are removed, but why isn’t space aging it?
http://scim.ag/Eternal-Youth

Many-Eyed Monsters Prove the Eyes Have It
People seek out others’ eyes, even when they are not centered on the face.
http://scim.ag/Seek_Eyes

SCIENCEONLINE
www.sciencesignaling.org
The Signal Transduction Knowledge Environment

RESEARCH ARTICLE: Key Roles for the Lipid Signaling Enzyme Phospholipase D1 in the Tumor Microenvironment During Tumor Angiogenesis and Metastasis
Q. Chen et al.
10.1126/science.1228437

PODCAST
M. A. Frohman and A. M. VanHook
Tumor growth and metastasis are attenuated in mice lacking a lipid signaling enzyme.

RESEARCH ARTICLE: Proliferative and Antia apoptotic Signaling Stimulated by Nuclear-Localized PDK1 Results in Oncogenesis
C. K. Kitani et al.
PDK1 in the nucleus drives oncogenesis in mice and correlates with human prostate tumor grade.

PER SPECTIVE: Sexy DEG/ENaC Channels Involved in Gustatory Detection of Fruit Fly Pheromones
A. A. Belov and M. Mohammadi
DEG/ENaC channels allow male fruit flies to “taste” their mates.

PERSPECTIVE: Grb2, A Double-Edged Sword of Receptor Tyrosine Kinase Signaling
A. R. Hernandez
The adaptor Grb2 plays both positive and negative roles in FGF receptor signaling.

SCIENTRANSLATIONAL MEDICINE
www.sciencetranslationalmedicine.org
Integrating Medicine and Science

RESEARCH ARTICLE: A Human Disease Model of Drug Toxicity–Induced Pulmonary Edema in a Lung-on-a-Chip Microdevice
D. Huh et al.
A human lung-on-a-chip model of human pulmonary edema predicts the efficacy of a new drug being tested in animals.

RESEARCH ARTICLE: An Orally Active TRPV4 Channel Blocker Prevents and Resolves Pulmonary Edema Induced by Heart Failure
K. S. Tornerlo et al.
Blocking TRPV4 ion channels expressed in the lung in vivo and in vitro resolves pulmonary edema induced by heart failure.

PERSPECTIVE: Improving Risk Assessment
D. M. Dambach and H. Uppal
A collaborative effort to build human organs-on-a-chip may strengthen drug-related adverse-event prediction.
>> News story p. 731

RESEARCH ARTICLE: Human Melanoma Metastasis in NSG Mice Correlates with Clinical Outcome in Patients
E. Quintana et al.
The ability of melanomas to produce circulating tumor cells and metastasize in immunocompromised mice correlates with their ability to form distant metastases in patients.

COMMENTARY: Research Results—Preserving Newborn Blood Samples
M. H. Lewis et al.
The debate about retention of dried blood samples from newborns should include their value to biomedical research.

SCIENCECAREERS
www.sciencemag.org/career_magazine
Free Career Resources for Scientists
http://scim.ag/SciCareers9November2012

Alternative Research Metrics
L. Laursen
Researchers are seeking faster, better ways to measure research output and impact.

Content Collection: Talking to the Public
E. Pain
The benefits of public engagement justify the effort required to develop the necessary skills.

SCIENCEPODCAST
www.sciencemag.org/multimedia/podcast
Free Weekly Show for 9 November 2012
Listen to stories on coral symbiosis, climate change and the Maya, the challenges of weather forecasting, and more.

SCIENCE (ISSN 0036-8075) is published weekly on Friday, except the last week in December, by the American Association for the Advancement of Science, 1200 New York Avenue, NW, Washington, DC 20005. Periodicals Mail postage (publication No. 484460) paid at Washington, DC, and additional mailing offices. Copyright © 2012 by the American Association for the Advancement of Science. The title SCIENCE is a registered trademark of the AAAS. Domestic individual membership and subscription (51 issues): $1149 (1574 allocated to subscription); Domestic institutional subscription (51 issues): $2990; Foreign postage extra: Mexico, Caribbean (surface mail) $35; other countries (air assisted delivery) $45. First class, airmail, student, and emeritus rates on request. Canadian rates with GST available upon request. GST #1254 88122. Publications Mail Agreement Number 1069624. Printed in the U.S.A.

Change of address: Allow 4 weeks, giving old and new addresses and 8-digit account number. Postmaster: Send change of address to AAAS, P.O. Box 96176, Washington, DC 20090-6176. Single-copy sales: $10.00 current issue, $25.00 back issue prepaid includes surface postage; bulk rates on request. Authorization to photocopy material for internal or personal use or for the internal use of others who pay the per-copy fee is granted by AAAS to libraries and other users registered with the Copyright Clearance Center (CCC) Transactional Reporting Service, provided that $30.00 per article is paid directly to CCC, 222 Rosewood Drive, Danvers, MA 01923. The identification code for Science is 0036-8075. Science is indexed in the Reader’s Guide to Periodical Literature and in several specialized indexes.
Science 338 (6108), 720-825.

http://science.sciencemag.org/content/338/6108

http://www.sciencemag.org/help/reprints-and-permissions

Use of this article is subject to the Terms of Service

Science (print ISSN 0036-8075; online ISSN 1095-9203) is published by the American Association for the Advancement of Science, 1200 New York Avenue NW, Washington, DC 20005. 2017 © The Authors, some rights reserved; exclusive licensee American Association for the Advancement of Science. No claim to original U.S. Government Works. The title Science is a registered trademark of AAAS.