

EDITORIAL

- 673 Social Science, Spared Again
Kenneth Prewitt

NEWS OF THE WEEK

- 680 A roundup of the week's top stories

NEWS & ANALYSIS

- 683 NIH Wins Suit Challenging Legality of Research
- 684 Fukushima Begins 30-Year Odyssey in Radiation Health
Japan's Electricity Woes Have Researchers Sweating
- 686 Marine Census Scrambles to Fund a Second Phase With Expanded Focus
- 687 Scourge of Snake Oil Salesmen Bids an Early Farewell

NEWS FOCUS

- 688 Climate Change Sparks Battles in Classroom
>> Science Podcast
- 690 Furtive Approach Rolls Back the Limits of Quantum Uncertainty
- 694 Wayne Clough Wants Smithsonian Science to Escape Its Shadow
>> Extended Online Interview

LETTERS

- 696 Fukushima Research Needs World's Support
A. Akabayashi
- Science-Policy Interface: Scientific Input Limited
S. V. Briggs and A. T. Knight
- Science-Policy Interface: Beyond Assessments
M. Hulme et al.

- 698 CORRECTIONS AND CLARIFICATIONS

BOOKS ET AL.

- 699 G. Evelyn Hutchinson and the Invention of Modern Ecology
N. G. Slack, reviewed by M. L. Rosenzweig
- 700 Metaphors for Environmental Sustainability
B. Larson, reviewed by N. Golubiewski
- 700 BROWSEINGS

POLICY FORUM

- 702 Changing Incentives to Publish
C. Franzoni et al.

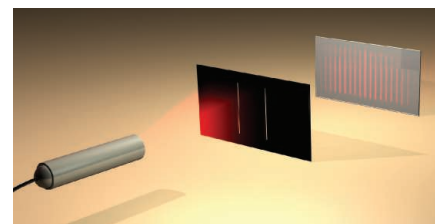
PERSPECTIVES

- 704 Seeing a Molecular Motor at Work
W. Junge and D. J. Müller
>> Report p. 755
- 705 Exploiting Malaria Drug Resistance to Our Advantage
N. Cammack
>> Research Article p. 724
- 706 Glacial Cycles and Indian Monsoon—A Southern Push
Z. Liu
>> Research Article p. 719
- 708 Is Bigger Always Better?
C. Rowe and S. D. Healy
>> Report p. 751
- 709 Spotlight on Plasmon Lasers
V. J. Sorger and X. Zhang
- 711 Retrospective: Lennart Philipson (1929–2011)
K. Simons and I. W. Mattaj

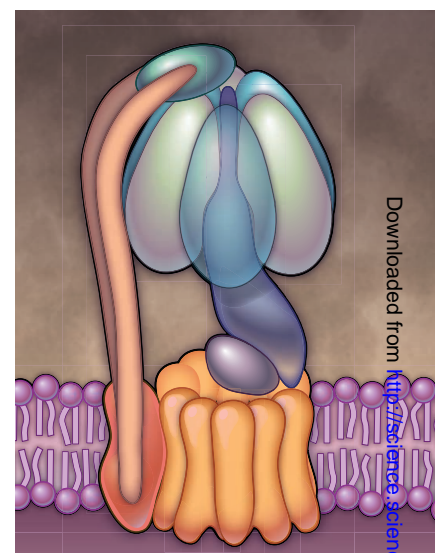
REVIEW

- 712 The Future of Seawater Desalination: Energy, Technology, and the Environment
M. Elimelech and W. A. Phillip

CONTENTS continued >>

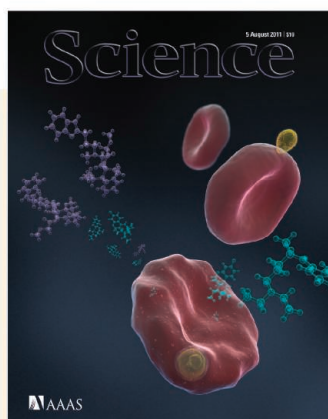


page 690



pages 704 & 755

Downloaded from ml.aps.org on September 20, 2018



COVER

A pair of chemical compounds (light blue and purple) target wild-type and mutant forms of the *Plasmodium falciparum* chloroquine resistance transporter, which mediates the parasite's (yellow) resistance to the widely used antimalarial drug. Using high-throughput chemical and genetic analyses, Yuan *et al.* identify potential new antimalarial drugs that could be used in combination to suppress the development of drug resistance. See page 724.

Image: Ethan Tyler and Alan Hoofring, Division of Medical Arts, National Institutes of Health

DEPARTMENTS

- 699 This Week in Science
675 Editors' Choice
678 Science Staff
779 New Products
780 Science Careers

BREVIA

- 718 Effects of Working-Memory Training on Striatal Dopamine Release
L. Bäckman et al.
A cognitive training program that improves working memory is associated with increased dopamine release during task performance.

RESEARCH ARTICLES

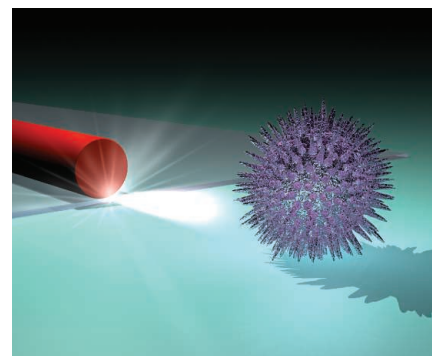
- 719 Glacial-Interglacial Indian Summer Monsoon Dynamics
Z. An et al.
Indian summer monsoon changes during the Pleistocene were influenced by dynamic effects originating in both hemispheres.
>> *Perspective p. 706*
- 724 Chemical Genomic Profiling for Antimalarial Therapies, Response Signatures, and Molecular Targets
J. Yuan et al.
There are a limited number of ways that the malaria parasite can develop drug resistance.
>> *Perspective p. 705*

REPORTS

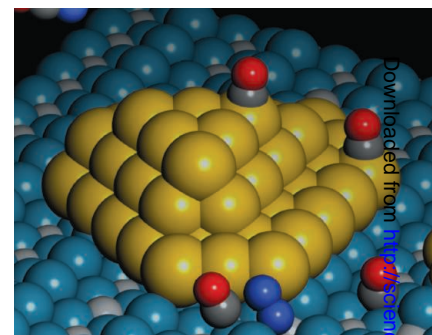
- 729 Nonreciprocal Light Propagation in a Silicon Photonic Circuit
L. Feng et al.
An engineered metallic-silicon waveguide allows for direction-dependent light propagation.
- 733 A Synthetic Model of the Mn₃Ca Subsite of the Oxygen-Evolving Complex in Photosystem II
J. S. Kanady et al.
A model compound sheds light on the puzzling role of calcium in the metal cluster that oxidizes water during photosynthesis.
- 736 Spectroscopic Observation of Dual Catalytic Sites During Oxidation of CO on a Au/TiO₂ Catalyst
I. X. Green et al.
The low-temperature oxidation of carbon monoxide proceeds initially with oxygen molecules that bridge titanium and gold sites.
- 740 Seasonal Flows on Warm Martian Slopes
A. S. McEwen et al.
Rare meter-scale slope features on Mars might be explained by the transient flow of liquid salty water.
>> *Science Podcast*
- 743 Reduced Interannual Rainfall Variability in East Africa During the Last Ice Age
C. Wolff et al.
Extreme rainfall was weaker and less frequent in East Africa during the last ice age.
- 747 A 10,000-Year Record of Arctic Ocean Sea-Ice Variability—View from the Beach
S. Funder et al.
Sea-ice coverage near northern Greenland and in the western Arctic Ocean varied in opposition over much of the Holocene.

- 751 Signal Perception in Frogs and Bats and the Evolution of Mating Signals
K. L. Akre et al.
Receiver perception limits the evolution of increasingly elaborate calls in túngara frogs.
>> *Perspective p. 708; Science Podcast*
- 753 Extending the Carbon Chain: Hydrocarbon Formation Catalyzed by Vanadium/Molybdenum Nitrogenases
Y. Hu et al.
The molybdenum nitrogenase enzyme can reduce carbon monoxide, albeit inefficiently, in addition to its native substrate, nitrogen.
- 755 High-Speed Atomic Force Microscopy Reveals Rotary Catalysis of Rotorless F₁-ATPase
T. Uchihashi et al.
Intrinsic cooperativity drives cyclic propagation of conformational states in the stator ring of an adenosine triphosphate-driven rotary motor.
>> *Perspective p. 704*
- 758 Structural Basis for Tail-Anchored Membrane Protein Biogenesis by the Get3-Receptor Complex
S. Stejfer et al.
Docking of cytoplasmic and membrane receptors facilitates conformational changes that drive protein insertion.
- 762 The Plant Cell Wall—Decomposing Machinery Underlies the Functional Diversity of Forest Fungi
D. C. Eastwood et al.
Comparative genomic analysis of “dry rot” fungus shows both convergent evolution and divergence among fungal decomposers.
- 765 The Leukemogenicity of AML1-ETO Is Dependent on Site-Specific Lysine Acetylation
L. Wang et al.
A protein that drives the growth of leukemia does so only when it carries a specific posttranslational modification.
- 769 Cartilage Acidic Protein-1B (LOTUS), an Endogenous Nogo Receptor Antagonist for Axon Tract Formation
Y. Sato et al.
A molecule that functions in normal olfactory tract development could provide clues to failed neuronal regeneration in adults.
- 773 Integrating What and When Across the Primate Medial Temporal Lobe
Y. Naya and W. A. Suzuki
Structures of the medial temporal lobe provide distinct but complementary signals to encode temporal-order information.
- 776 Google Effects on Memory: Cognitive Consequences of Having Information at Our Fingertips
B. Sparrow et al.
Owing to Internet search, we are more likely to encode “where” aspects of memory rather than “what.”

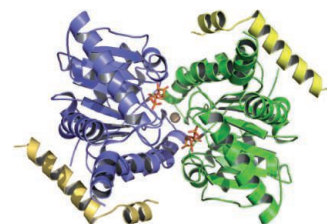
CONTENTS continued >>



page 709



page 736



page 758

SCIENCEONLINE

SCIENCEEXPRESS

www.scienceexpress.org

Vacuum-Induced Transparency

H. Tanji-Suzuki et al.

The transmission of light through an atomic gas can be controlled by manipulating the confining cavity.

10.1126/science.1208066

Single-Shot Correlations and Two-Qubit Gate of Solid-State Spins

K. C. Nowack et al.

Independent readout of two single-spin qubits in quantum dots is achieved in an all-electrical setup.

10.1126/science.1209524

Control of Local Protein Synthesis and Initial Events in Myelination by Action Potentials

H. Wake et al.

Axons signal through both glutamate and adenosine triphosphate release to regulate their insulating wraps.

10.1126/science.1206998

Tet-Mediated Formation of 5-Carboxylcytosine and Its Excision by TDG in Mammalian DNA

Y.-F. He et al.

Evidence for a possible route for DNA demethylation in animals is suggested.

10.1126/science.1210944

Mutations in *CIC* and *FUBP1* Contribute to Human Oligodendroglioma

C. Bettegowda et al.

A gene originally studied for its role in fruit fly embryogenesis is implicated in the growth of a common human brain tumor.

10.1126/science.1210557

SCIENCE NOW

www.sciencenow.org

Highlights From Our Daily News Coverage

Lab-Grown Disks May Cure

That Aching Back

'Living disks' could replace painkillers and spinal fusion surgery.

<http://scim.ag/backdisks>

Shrimp Hurt the Sponges That Shelter Them

Seemingly parasitic crustacean species living deep inside sponges pig out on their hosts.

<http://scim.ag/shrimp-sponge>

Gene May Explain 'Elephant Man' Disorder

A rare mutation leads to deformed hands and feet.

<http://scim.ag/elephant-man>

SCIENCE SIGNALING

www.sciencesignaling.org

The Signal Transduction Knowledge Environment

2 August issue: <http://scim.ag/ss080211>

RESEARCH ARTICLE: Structure of a Light-Activated LOV Protein Dimer That Regulates Transcription

A. T. Vaidya et al.

Light-induced conformational changes in a blue-light sensor facilitate its dimerization.

PERSPECTIVE: K2P Potassium Channels, Mysterious and Paradoxically Exciting

S. A. N. Goldstein

K2P potassium channels become permeable to Na⁺ with low extracellular K⁺ concentrations and may thereby increase the risk for cardiac arrhythmias.

JOURNAL CLUB: MicroRNAs Add an Additional Layer to the Complexity of Cell Signaling

J. I. Herschkowitz and X. Fu

Down-regulation of microRNAs associated with EGF signaling may contribute to tumor progression.

GLOSSARY

Find out what KDAC, NF2, and TANK mean in the world of cell signaling.

SCIENCE TRANSLATIONAL MEDICINE

www.sciencetranslationalmedicine.org

Integrating Medicine and Science

3 August issue: <http://scim.ag/stm080311>

COMMENTARY: Defining Success for Translational Research Organizations

R. Pozen and H. Kline

To promote translational research foundations requires a flexible framework for performance assessment.

RESEARCH ARTICLE: Targeting GLUT1 and the Warburg Effect in Renal Cell Carcinoma by Chemical Synthetic Lethality

D. A. Chan et al.

A screen identifies a drug that specifically kills glycolysis-dependent cancer cells by inhibiting glucose uptake.

RESEARCH ARTICLE: A Prime-Boost Strategy Using Virus-Like Particles Pseudotyped for HCV Proteins Triggers Broadly Neutralizing Antibodies in Macaques

P. Garrone et al.

PERSPECTIVE: Progress Toward Development of a Hepatitis C Vaccine with Broad Shoulders

R. Ray

Rational mechanism-based design of vaccine immunogens elicits broadly neutralizing antibodies against HCV.

PODCAST

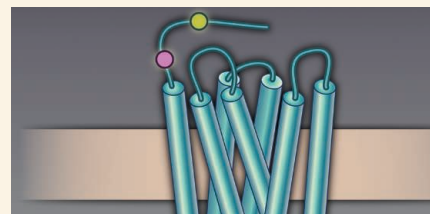
D. Klatzmann and A. Colmone

A new vaccine strategy induces broadly neutralizing antibodies to hepatitis C virus.

RESEARCH ARTICLE: Urine TMPRSS2:ERG Fusion Transcript Stratifies Prostate Cancer Risk in Men with Elevated Serum PSA

S. A. Tomlins et al.

Urine TMPRSS2:ERG gene fusion could be used for stratification of patients at higher risk for prostate cancer.



SCIENCE SIGNALING

Light-regulated gene expression.

SCIENCE CAREERS

www.sciencecareers.org/career_magazine

Free Career Resources for Scientists

From Mycology to Oncology

R. Kaufman

Wilma Lingle started out studying mushrooms but transformed herself into a Mayo Clinic breast cancer researcher and the manager of two core facilities.

<http://scim.ag/WilmaLingle>

Taken for Granted: Everything Money Can Buy

B. L. Benderly

The vast wealth of the oil-rich Arab states is creating opportunities for scientists who can stand the heat.

http://scim.ag/TFG_Qatar

SCIENCE PODCAST

www.sciencemag.org/multimedia/podcast

Free Weekly Show

On the 5 August *Science* Podcast: evidence of briny flows on Mars, signal perception in frogs and bats, teaching climate change in the classroom, and more.

SCIENCE INSIDER

news.sciencemag.org/scienceinsider

Science Policy News and Analysis

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 © 2011 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): \$149 (\$74 allocated to subscription). Domestic institutional subscription (51 issues): \$990; Foreign postage extra: Mexico, Caribbean (surface mail) \$55; other countries (air assist delivery) \$85. 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 96178, Washington, DC 20090-6178. Single-copy sales: \$10.00 current issue, \$15.00 back issue prepaid includes surface postage; bulk rates on request. Authorization to photocopy material for internal or personal use under circumstances not falling within the fair use provisions of the Copyright Act is granted by AAAS to libraries and other users registered with the Copyright Clearance Center (CCC) Transactional Reporting Service, provided that \$25.00 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.



ADVANCING SCIENCE. SERVING SOCIETY

Science

333 (6043)

Science **333** (6043), 669-779.

ARTICLE TOOLS

<http://science.sciencemag.org/content/333/6043>

PERMISSIONS

<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.