

## NEWS

### IN BRIEF

**696** Roundup of the week's news

### IN DEPTH

#### **699 AGRICULTURAL RESEARCHERS RATTLED BY DEMANDS FOR DOCUMENTS**

Group opposed to GM foods asks a dozen scientists to hand over letters, e-mails in probe of academic-industry ties

By K. Kloor

#### **700 CAPTIVE PANDAS SUCCUMB TO KILLER VIRUS**

Deaths at breeding center in China have put scientists on edge

By M. Hvistendahl

#### **701 EBOLA DRUG TRIALS LURCH AHEAD**

Changing epidemiology and hints of success alter studies of experimental treatments

By K. Kupferschmidt and J. Cohen

#### **702 SUSTAINABLE GOALS FROM U.N. UNDER FIRE**

Scientific review labels development targets as vague, weak, or meaningless

By E. Stokstad

#### **704 CHINA'S LAKES OF PIG MANURE SPAWN ANTIBIOTIC RESISTANCE**

Researchers begin to size up a public health threat from burgeoning pork production

By C. Larson

#### **705 FUND CLIMATE INTERVENTION RESEARCH, STUDY SAYS**

U.S. needs more science to understand sun-blocking, carbon-removal technologies

By E. Kintisch

#### **707 MODELS PREDICT LONGER, DEEPER U.S. DROUGHTS**

Future western "megadroughts" could be worse than ever

By E. Underwood

► SCIENCE ADVANCES RESEARCH ARTICLE

BY COOK ET AL.

### FEATURE

#### **708 WHO ARE THE TIBETANS?**

China and some scientists say they are Chinese. But others see a richer picture

By J. Qiu



## INSIGHTS

### PERSPECTIVES

#### **712 BUILT FOR TOUGH CONDITIONS**

High-resolution structural data help to explain the mechanical properties of rodent teeth

By Y. Politi and J. C. Weaver

► REPORT P. 746

#### **713 TYING UP A TRANSCRIPTION FACTOR**

A bivalent small molecule inhibits the activity of a rogue transcription factor in leukemia

By A. Chen and A. N. Koehler

► REPORT P. 779

#### **715 KICKSTARTING A VIRAL RNA POLYMERASE**

Hepatitis C virus RNA-dependent RNA polymerase primes synthesis of its RNA genome with an inbuilt proteinaceous primer

By S. Bressanelli

► REPORT P. 771

#### **716 BREAKING THE INTESTINAL BARRIER TO DELIVER DRUGS**

The structure of a tight junction protein bound to a disruptive toxin may guide drug delivery strategies

By P. Artursson and S. D. Knight

► REPORT P. 775

#### **718 JUST ADD WATER DIMERS**

Fast reaction with water dimers may limit the impact of the simplest Criegee intermediate on atmospheric chemistry

By M. Okumura

► REPORT P. 751

#### **719 HARNESSING WEAK INTERACTIONS FOR ENANTIOSELECTIVE CATALYSIS**

The traditional tools of physical organic chemistry benefit from modern data analysis techniques

By T. Lu and S. E. Wheeler

► RESEARCH ARTICLE P. 737

#### **720 RANDOMIZE EVALUATIONS TO IMPROVE HEALTH CARE DELIVERY**

Administrative data and experimental designs lead the way

By A. Finkelstein and S. Taubman

### BOOKS ET AL.

#### **724 PLANT BEHAVIOUR AND INTELLIGENCE**

By A. Trewavas, reviewed by A. G. Zink and Z.-H. He

#### **725 THE MAN WHO TOUCHED HIS OWN HEART**

By R. Dunn, reviewed by Y. Nusinovich

### LETTERS

#### **727 CANCER RISK: ROLE OF ENVIRONMENT**

By N. A. Ashford et al.

#### **727 CANCER RISK: TUMORS EXCLUDED**

By J. D. Potter and R. L. Prentice

#### **728 CANCER RISK: ROLE OF CHANCE OVERSTATED**

By C. Wild et al.

#### **728 CANCER RISK: PREVENTION IS CRUCIAL**

By C. Gotay et al.

#### **728 CANCER RISK: MANY FACTORS CONTRIBUTE**

By M. Song and E. L. Giovannucci

#### **729 CANCER RISK: ACCURACY OF LITERATURE**

By M. O'Callaghan

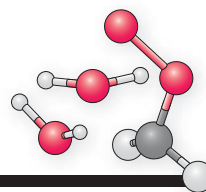
#### **729 RESPONSE**

By C. Tomasetti and B. Vogelstein

#### **731 TECHNICAL COMMENT ABSTRACTS**

Science Staff .....	694
New Products .....	791
Science Careers .....	792

# CONTENTS



## 718 & 751

Water molecules act fast in pairs

13 FEBRUARY 2015 • VOLUME 347 • ISSUE 6223



## RESEARCH

### IN BRIEF

**732** From *Science* and other journals

### REVIEW

#### 735 ENVIRONMENTAL SCIENCE

Rethinking the marine carbon cycle: Factoring in the multifarious lifestyles of microbes *A. Z. Worden et al.*

REVIEW SUMMARY; FOR FULL TEXT:  
[dx.doi.org/10.1126/science.1257594](http://dx.doi.org/10.1126/science.1257594)

### RESEARCH ARTICLES

#### 736 SUSTAINABILITY

Planetary boundaries: Guiding human development on a changing planet *W. Steffen et al.*

RESEARCH ARTICLE SUMMARY; FOR FULL TEXT:  
[dx.doi.org/10.1126/science.1259855](http://dx.doi.org/10.1126/science.1259855)

► PODCAST

#### 737 ORGANIC CHEMISTRY

A data-intensive approach to mechanistic elucidation applied to chiral anion catalysis *A. Milo et al.*

► PERSPECTIVE P. 719

### REPORTS

#### 743 SUPERCONDUCTIVITY

Light-induced superconductivity using a photoactive electric double layer *M. Suda et al.*

#### 746 DENTAL MATERIALS

Amorphous intergranular phases control the properties of rodent tooth enamel *L. M. Gordon et al.*

► PERSPECTIVE P. 712

#### 751 ATMOSPHERIC CHEMISTRY

Direct kinetic measurement of the reaction of the simplest Criegee intermediate with water vapor *W. Chao et al.*

► PERSPECTIVE P. 718

#### 755 NEURAL CIRCUITS

Labeling of active neural circuits in vivo with designed calcium integrators *B. F. Fosque et al.*

### MAMMALIAN EVOLUTION

**760** Evolutionary development in basal mammaliaforms as revealed by a docodontan *Z.-X. Luo et al.*

**764** An arboreal docodont from the Jurassic and mammaliaform ecological diversification *Q.-J. Meng et al.*

#### 768 MARINE POLLUTION

Plastic waste inputs from land into the ocean *J. R. Jambeck et al.*

► PODCAST

#### 771 VIRAL REPLICATION

Structural basis for RNA replication by the hepatitis C virus polymerase *T. C. Appleby et al.*

► PERSPECTIVE P. 715

#### 775 TIGHT JUNCTIONS

Structural insight into tight junction disassembly by *Clostridium perfringens* enterotoxin *Y. Saitoh et al.*

► PERSPECTIVE P. 716

### 779 CHEMICAL BIOLOGY

A small-molecule inhibitor of the aberrant transcription factor CBF $\beta$ -SMMHC delays leukemia in mice *A. Illendula et al.*

► PERSPECTIVE P. 713

### 784 HUMORAL IMMUNITY

Apoptosis and antigen affinity limit effector cell differentiation of a single naïve B cell *J. J. Taylor et al.*

### DEPARTMENTS

#### 695 EDITORIAL

Give soils their due

By *Diana H. Wall and Johan Six*

#### 798 WORKING LIFE

The science of schmoozing

By *Eli Kintisch*



### ON THE COVER



Who are the Tibetans? New findings from disparate fields are revising notions about how people settled the cold, high, and dry Tibetan Plateau, one of the most forbidding environments that

humans call home. Like many questions of geography and migration, the prehistoric conquest of the “roof of the world” has political overtones. See page 708.

Photo: © *Blaine Harrington III/Corbis*

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 © 2015 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): \$153 (\$74 allocated to subscription). Domestic institutional subscription (51 issues): \$1282; 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 #R1254 88122. Publications Mail Agreement Number 1069624. Printed in the U.S.A. Change of address: Allow 4 weeks 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 \$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

**347 (6223)**

*Science* **347** (6223), 695-798.

ARTICLE TOOLS

<http://science.sciencemag.org/content/347/6223>

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.