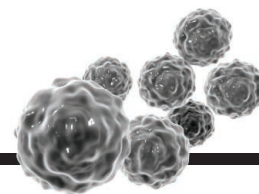


# CONTENTS



## 760 & 803

Personalized cancer vaccines

15 MAY 2015 • VOLUME 348 • ISSUE 6236

## NEWS

### IN BRIEF

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

### IN DEPTH

#### **740** NEWBORN SCREENING COLLIDES WITH PRIVACY FEARS

Informed consent requirement may change decades-old program

By *J. Couzin-Frankel*

#### **741** ENIGMATIC BIRD FLU STRAIN RACES ACROSS THE U.S. MIDWEST

Virologists baffled by the potent strain's continued spread as more than 30 million poultry hit

By *M. Hvistendahl*

#### **742** EBOLA SURVIVORS FIGHT BACK IN PLASMA STUDIES

Trials hope to show whether antibodies from recovered patients can save lives

By *M. Enserink*

#### **744** HOW BIRDS GOT THEIR BEAKS

Combining fossils and lab studies, researchers home in on genes that transformed a snout into a bill

By *E. Pennisi*



PHOTO (BOTTOM): © RIPEVANS/ALAMY

#### **745** RULES OF THE NAME

To avoid offense, WHO says no people, places, food, or animals in new disease names *By K. Kupferschmidt*

### FEATURES

#### **746** IN FROM THE COLD

After keeping science alive during decades of scarcity, Cuba's "guerrilla scientists" are ready to rejoin the world

By *R. Stone*

#### **748** Fidel Castro's first-born son fomented a nanotech revolution

By *R. Stone*

#### **750** Graying Cuba strains socialist safety net

By *R. Stone*

► EDITORIAL P. 735; PODCAST

#### **751** CUBA'S CORAL EDEN

Scientists rush to study what may be some of the last healthy corals in the Caribbean *By E. Pennisi*

## INSIGHTS

### PERSPECTIVES

#### **754** CHRONICLING MODERN HUMAN'S ARRIVAL IN EUROPE

Dental remains elucidate the demise of the Neandertals

By *N. J. Conard and M. Bolus*

► REPORT P. 793

#### **756** PHASED piRNAs TACKLE TRANSPOSONS

Tertiary piRNAs help silence dangerous DNA elements

By *H. Siomi and M. C. Siomi*

► REPORTS PP. 812 & 817

#### **758** PROBING THE UNDERBELLY OF A SUPERVOLCANO

Seismic imaging of Yellowstone provides a better understanding of large volcanic systems *By N. M. Shapiro and I. Koulakov*

► REPORT P. 773

#### **759** THE MISSING LINK IN OCEANIC PHOSPHORUS CYCLING?

Rapidly recycled reduced phosphorus compounds play a key role in phosphorus biogeochemistry

By *C. Benitez-Nelson*

► REPORT P. 783

#### **760** NEO APPROACHES TO CANCER VACCINES

A neoantigen-based vaccine elicits T cell responses in cancer patients

By *L. Delamarre et al.*

► REPORT P. 803

#### **762** LINKING FUNDS TO ACTIONS FOR GLOBAL HEALTH EMERGENCIES

The International Health Regulations could help align and trigger World Bank and World Health Organization efforts

By *C. J. Standley et al.*

### BOOKS ET AL.

#### **764** WE COULD NOT FAIL

By *R. Paul and S. Moss*,

reviewed by *C. Alexander*

#### **765** NATURALISTS IN PARADISE

By *J. Hemming*, reviewed by *S. Knapp*



### LETTERS

#### **766** RETHINKING MIGRATION

By *C. G. Willis and C. C. Davis*

#### **766** THE NOBEL PULSAR

By *N. Christensen*

#### **766** PREPARING FOR DISASTERS

By *A. Miller and L. Birnbaum*

#### **767** TECHNICAL COMMENT ABSTRACTS

### DEPARTMENTS

#### **735** EDITORIAL

Science in U.S.-Cuba relations

By *Sergio Jorge Pastrana*

► NEWS STORY P. 746

#### **830** WORKING LIFE

Accounting for career breaks

By *Emily Nicholson*

Science Staff.....	734
New Products.....	822
Science Careers.....	823

# CONTENTS

15 MAY 2015 • VOLUME 348 • ISSUE 6236



## 754 & 793

Southern European prehistory



## 796

## RESEARCH

### IN BRIEF

**768** From *Science* and other journals

### REVIEW

#### 771 CELL BIOLOGY

On being the right (cell) size  
*M. B. Ginzberg et al.*

REVIEW SUMMARY; FOR FULL TEXT:  
[dx.doi.org/10.1126/science.1245075](http://dx.doi.org/10.1126/science.1245075)

### RESEARCH ARTICLE

#### 772 DEVELOPMENT ECONOMICS

A multifaceted program causes lasting progress for the very poor: Evidence from six countries  
*A. Banerjee et al.*

RESEARCH ARTICLE SUMMARY; FOR FULL TEXT:  
[dx.doi.org/10.1126/science.1260799](http://dx.doi.org/10.1126/science.1260799)

### REPORTS

#### 773 VOLCANOLOGY

The Yellowstone magmatic system from the mantle plume to the upper crust  
*H.-H. Huang et al.*

► PERSPECTIVE P. 758

#### 776 QUANTUM OPTICS

Quantum dynamics of an electromagnetic mode that cannot contain  $N$  photons  
*L. Bretheau et al.*

#### 779 GALAXY EVOLUTION

Quasar quartet embedded in giant nebula reveals rare massive structure in distant universe  
*J. F. Hennawi et al.*

#### 783 PHOSPHORUS CYCLING

Major role of planktonic phosphate reduction in the marine phosphorus redox cycle  
*B. A. S. Van Mooy et al.*

► PERSPECTIVE P. 759

#### 786 ANIMAL PHYSIOLOGY

Whole-body endothermy in a mesopelagic fish, the opah, *Lampris guttatus*  
*N. C. Wegner et al.*

#### 789 NEURODEVELOPMENT

Live imaging of adult neural stem cell behavior in the intact and injured zebrafish brain  
*J. S. Barbosa et al.*

#### 793 ARCHAEOLOGY

The makers of the Protoaurignacian and implications for Neandertal extinction  
*S. Benazzi et al.*

► PERSPECTIVE P. 754

#### 796 HUMAN BEHAVIOR

Sex equality can explain the unique social structure of hunter-gatherer bands  
*M. Dyble et al.*

#### 799 MITOSIS

Microtubule detyrosination guides chromosomes during mitosis  
*M. Barisic et al.*

#### 803 CANCER IMMUNOTHERAPY

A dendritic cell vaccine increases the breadth and diversity of melanoma neoantigen-specific T cells  
*B. M. Carreno et al.*

► PERSPECTIVE P. 760

#### 808 CENTROSOMES

Regulated assembly of a supramolecular centrosome scaffold in vitro  
*J. B. Woodruff et al.*

#### NONCODING RNA

**812** piRNA-guided slicing specifies transcripts for Zucchini-dependent, phased piRNA biogenesis  
*F. Mohn et al.*

**817** piRNA-guided transposon cleavage initiates Zucchini-dependent, phased piRNA production  
*B. W. Han et al.*

► PERSPECTIVE P. 756

#### ON THE COVER



A young woman in Havana checks her smartphone last month. Warmer ties between Cuba and the United States are expected to better integrate Cuban scientists into the global community and boost joint research on topics as diverse as the island's stunning coral reefs and the mosquito-borne chikungunya disease. See pages 735 and 746. Photo: REUTERS/Enrique de la Osa

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, air mail, 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, 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 \$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

**348 (6236)**

*Science* **348** (6236), 735-830.

**ARTICLE TOOLS**

<http://science.sciencemag.org/content/348/6236>

**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.