

352

## NEWS

### IN BRIEF

350 Roundup of the week's news

### IN DEPTH

#### 352 SCIENTISTS PONDER AN IMPROBABLY ACTIVE PLUTO

New Horizons delights researchers with stark vistas and perplexing puzzles  
*By E. Hand*

#### 354 NEW MYSTERY FOR NATIVE AMERICAN ORIGINS

Rival papers compete to explain surprising link to Australia and Melanesia  
*By M. Balter*

► RESEARCH ARTICLE BY M. RAGHAVAN ET AL. 10.1126/science.aab3884

#### 355 CHILD FIGHTS HIV TO A DRAW

After 12 years off treatment, a young woman has had remarkable—and unexplained—control of her infection  
*By J. Cohen*

#### 356 IRAN NUCLEAR DEAL HOLDS 'GOODIES' FOR SCIENTISTS

Researchers to collaborate at repurposed nuclear facilities  
*By R. Stone*

#### 357 WEB BILLIONAIRE JOINS SEARCH FOR ALIEN SIGNALS

Yuri Milner hopes that \$100 million can answer one of humanity's most enduring questions  
*By D. Clery*

### FEATURES

#### 358 NEW LIFE FOR OLD BONES

After a stormy adolescence, the field of ancient DNA enters its golden era  
*By E. Culotta*

► PODCAST

#### 362 REVOLUTION IN HUMAN EVOLUTION

As it smashes disciplinary boundaries, ancient DNA is rewriting much of human prehistory  
*By A. Gibbons*

#### 367 LOST WORLDS FOUND

Sugar cubes of buried soil reveal how ecosystems warmed after the last ice age  
*By E. Pennisi*

#### 369 Prospecting for genetic gold

*By E. Pennisi*

► BOOKS ET AL. P. 388; VIDEO

► RESEARCH ARTICLE BY A. COOPER ET AL. 10.1126/science.aac4315

#### 370 BREAKING A TROPICAL TABOO

Most ancient DNA comes from frigid environs. Can new methods sample hot and humid locales?  
*By L. Wade*

#### 372 PROTEIN POWER

Paleoproteomics hustles to catch up with its more developed cousin  
*By R. F. Service*



## INSIGHTS

### PERSPECTIVES

#### 374 FOUR LEGS TOO MANY?

A long-bodied fossil snake retains fore- and hindlimbs  
*By S. Evans*  
► REPORT P. 416

#### 376 MAKING METHANE DOWN DEEP

Scientists find active life 2.5 km beneath the sea floor  
*By J. A. Huber*  
► REPORT P. 420

#### 377 MOVING CTLA-4 FROM THE TRASH TO RECYCLING

Individuals lacking a protein expressed in T cells have low CTLA-4 and develop autoimmunity  
*By D. M. Sansom*  
► REPORT P. 436

#### 379 CATALYSTS BY PLATONIC DESIGN

Sophisticated shape-controlled design is yielding ever more active nanocatalysts  
*By P. Strasser*  
► REPORT P. 412

#### 380 BREAKERS AND BLOCKERS—miRNAs AT WORK

MicroRNAs mediate silencing through messenger RNA degradation and translation repression  
*By E. Izaurralde*

#### 382 STRETCH, WRAP, AND RELAX TO SMARTNESS

Carbon nanotubes wrapped around rubber cores create resilient conducting fibers  
*By T. Ghosh*  
► REPORT P. 400

#### 384 YELLOW LIGHTS FOR EMERGING TECHNOLOGIES

All-or-none regulatory systems are not adequate for revolutionary innovations  
*By R. A. Charo*

#### 386 TOWARD AN HIV VACCINE: A SCIENTIFIC JOURNEY

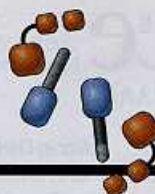
Different strategies are coming together to provide insights for an effective HIV vaccine  
*By A. S. Fauci and H. D. Marston*





## 374 & 416

A Cretaceous snake with limbs



## 377 & 436

An autoimmunity mechanism

### BOOKS ET AL.

#### 388 HOW TO CLONE A MAMMOTH

By B. Shapiro, reviewed

by A. R. Hoelzel

► NEWS STORY P. 369

#### 389 THE LOCK AND KEY OF MEDICINE

By L. V. Marks, reviewed by S. Prabhakaran

### LETTERS

#### 390 PRECISION MEDICINE: LOOK TO THE MICE

By K. C. K. Lloyd et al.

#### 390 SEXISM DISCUSSION MISSES THE POINT

By H. S. Young

#### 391 CHIMPANZEES DESERVE THEIR FREEDOM

By S. M. Wise

#### 391 TECHNICAL COMMENT ABSTRACTS

## RESEARCH

### IN BRIEF

392 From *Science* and other journals

### REVIEW

#### 395 HUMAN MICROBIOTA

Small molecules from the human microbiota M. S. Donia and M. A. Fischbach

REVIEW SUMMARY; FOR FULL TEXT: dx.doi.org/10.1126/science.1254766

### REPORTS

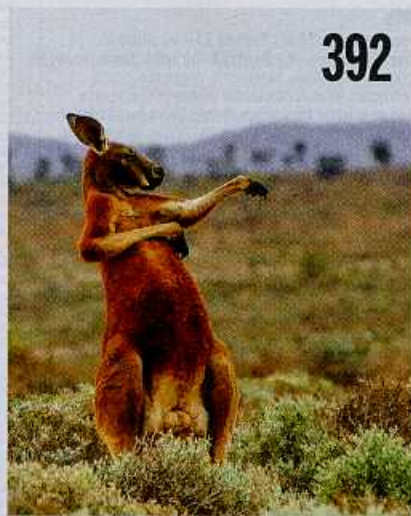
#### 396 APPLIED ORIGAMI

Origami of thick panels Y. Chen et al.

#### 400 STRETCHY ELECTRONICS

Hierarchically buckled sheath-core fibers for superelastic electronics, sensors, and muscles Z. F. Liu et al.

► PERSPECTIVE P. 382



## 392

### QUANTUM INFORMATION

405 Coherent coupling between a ferromagnetic magnon and a superconducting qubit Y. Tabuchi et al.

408 Coherent coupling of a single spin to microwave cavity photons J. J. Viennot et al.

### 412 NANOCATALYSTS

Platinum-based nanocages with subnanometer-thick walls and well-defined, controllable facets L. Zhang et al.

► PERSPECTIVE P. 379

### 416 EVOLUTION

A four-legged snake from the Early Cretaceous of Gondwana D. M. Martill et al.

► PERSPECTIVE P. 374

### 420 DEEP BIOSPHERE

Exploring deep microbial life in coal-bearing sediment down to ~2.5 km below the ocean floor F. Inagaki et al.

► PERSPECTIVE P. 376

### 424 NEURODEVELOPMENT

Adult cortical plasticity depends on an early postnatal critical period S. D. Greenhill et al.

### INTRACELLULAR TRANSPORT

428 PI4P/phosphatidylserine countertransport at ORP5- and ORP8-mediated ER-plasma membrane contacts J. Chung et al.

432 Phosphatidylserine transport by ORP/Osh proteins is driven by phosphatidylinositol 4-phosphate J. Moser von Filseck et al.

### 436 AUTOIMMUNE DISEASE

Patients with LRBA deficiency show CTLA4 loss and immune dysregulation responsive to abatacept therapy B. Lo et al.

► PERSPECTIVE P. 377

### DEPARTMENTS

#### 349 EDITORIAL

Rethinking graduate education By Alan I. Leshner

#### 446 WORKING LIFE

Songwriting and science By C. Neal Stewart Jr.

### ON THE COVER



A researcher drills into ancient bone to extract material for DNA analysis at the Max Planck Institute for Evolutionary Anthropology in Leipzig, Germany. As the newest sequencing

methods are applied to ancient samples and spread to many laboratories, ancient DNA is poised to enter its golden age, delivering stunning results ranging from the evolution of humans to that of microbes. See page 358. Photo: © Jörg Singer

Science Staff .....	348
New Products .....	441
Science Careers .....	442

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 #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 \$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.