



## NEWS

### IN BRIEF

**1272** Roundup of the week's news

### IN DEPTH

#### **1275 BIRD BIOLOGY TAKES FLIGHT WITH AVIAN GENOMES**

Avian family tree clearer, and song genetics elucidated *By E. Pennisi*

▶ A FLOCK OF GENOMES SECTION P. 1308

#### **1276 THE GENES BEHIND RESISTANT MALARIA**

Studies confirm changes that underlie resistance to artemisinin *By G. Vogel*

▶ STRAIMER ET AL. 10.1126/science.1260867;  
MOK ET AL. 10.1126/science.1260403

#### **1278 THE TROUBLE WITH TRITIUM**

Japan seeks a way to cleanse Fukushima water *By D. Normile*

#### **1279 FROM HELL ON EARTH, LIFE'S BUILDING BLOCKS**

Simulated meteorite impact forges RNA components *By S. Perkins*

#### **1280 E.U. TO LET MEMBERS BAN CROPS**

Revived proposal allows countries to ignore scientific assessments of GM crops *By T. Rabesandratana*



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#### **1281 BACK FROM THE DEAD**

The once-moribund idea that volcanism helped kill off the dinosaurs gains new credibility *By R. Stone*

▶ SCHOENE ET AL. 10.1126/science.aaa0118

#### **1284 LIVE WIRE**

Do cells use electricity to repair DNA? Jacqueline Barton aims to find out *By R. F. Service*

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Are the right chemical ingredients enough to make a habitable planet? *By P. G. Conrad*

#### **1290 EXPANDING THE BREADTH OF AN HIV-1 VACCINE**

Immunogens are designed to elicit the production of highly coveted broadly neutralizing antibodies that protect against HIV-1 *By G. Ofek and R. Diskin*

▶ REPORT P. 1380

#### **1291 CANCER BY SUPER-ENHANCER**

Tiny changes in our genomes can enhance oncogene expression and contribute to tumorigenesis

*By A. Vähärautio and J. Taipale*

▶ REPORT P. 1373

#### **1293 ELECTRONS TAKE THE FAST TRACK THROUGH SILICON**

Quantum-mechanical tunneling of valence-band electrons excited by intense, ultrafast laser pulses is verified with time-resolved x-ray spectroscopy

*By C. Spielmann*

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#### **1294 MATHEMATICAL MODELS FOR EMERGING DISEASE**

How can models provide better insights into pathogen emergence and epidemic prediction? *By A. Dobson*

#### **1296 ONE HEALTH APPROACH TO USE OF VETERINARY PHARMACEUTICALS**

Weak environmental assessments undermine regulations

*By A. Margalida et al.*

#### **1298 TOSSED OUT TO SAVE THE MASSES**

Dead stem cells are expelled from the vertebrate brain *By F. Calegari*

#### **1299 THE BATTLE FOR IRON**

Evolutionary analysis shows how a mammalian iron transport protein evolves to avoid capture by bacteria

*By A. E. Armitage and H. Drakesmith*

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*By R. C. Fox, reviewed by K. Chen*

#### **1305 ANIMAL WEAPONS**

*By D. J. Emlen, reviewed V. Callier*

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Zero infection

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Making science a desirable career

*By Jessica K. Polka and Kristin A. Krukenberg*

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**1338** From *Science* and other journals

### REVIEW

#### **1341 AVIAN EVOLUTION**

An integrative approach to understanding bird origins X. Xu et al.

REVIEW SUMMARY; FOR FULL TEXT:

dx.doi.org/10.1126/science.1253293

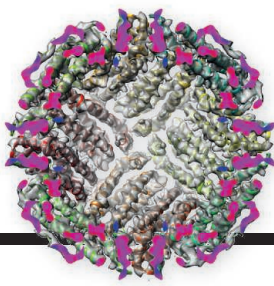
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#### **1342 ROCK MECHANICS**

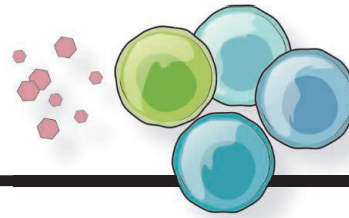
Superplastic nanofibrous slip zones control seismogenic fault friction

*By B. A. Verberne et al.*



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A challenging structure solved by electron microscopy



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Better immunogens for HIV vaccine development



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1308 A flock of genomes

### OPINION

1310 Valuing collections  
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1320 Whole-genome analyses resolve early branches in the tree of life of modern birds *E. D. Jarvis et al.*

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1333 Convergent transcriptional specializations in the brains of humans and song-learning birds *A. R. Pfenning et al.*

1334 Core and region-enriched networks of behaviorally regulated genes and the singing genome *O. Whitney et al.*

1335 Three crocodylian genomes reveal ancestral patterns of evolution among archosaurs *R. E. Green et al.*

1336 Evidence for a single loss of mineralized teeth in the common avian ancestor *R. W. Meredith et al.*

1337 Statistical binning enables an accurate coalescent-based estimation of the avian tree *S. Mirarab et al.*

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### ON THE COVER



The evolutionary history of birds such as the hoatzin (*Opisthocomus hoazin*; pictured) has been difficult to resolve.

This special issue focuses on the avian phylogenomics project, which sequenced 45 bird species from all major avian clades. Using this data, studies analyzed the phylogenetic relationship of birds and explored aspects of avian biology. See page 1308.

Photo: © *Flip De Nooyer/Foto Natura/Minden Pictures/Corbis*

### 1348 ULTRAFAST DYNAMICS

Attosecond band-gap dynamics in silicon *M. Schultze et al.*

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Escape from bacterial iron piracy through rapid evolution of transferrin *M. F. Barber and N. C. Elde*  
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### 1366 POLITICAL SCIENCE

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### 1370 SYSTEMS BIOLOGY

Accurate information transmission through dynamic biochemical signaling networks *J. Selimkhanov et al.*

### 1373 ONCOGENE REGULATION

An oncogenic super-enhancer formed through somatic mutation of a noncoding intergenic element *M. R. Mansour et al.*  
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### 1377 ELECTRON MICROSCOPY

Ultrastable gold substrates for electron cryomicroscopy *C. J. Russo and L. A. Passmore*

### 1380 HIV ANTIBODIES

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