

## EDITORIAL

- 639 Indigenous Genomics  
*Vanessa Hayes*

## NEWS OF THE WEEK

- 646 A roundup of the week's top stories

## NEWS & ANALYSIS

- 650 China's Population Growing Slowly, Changing Fast  
651 NIH Wins in Appeals Court, But Legal Battle Continues  
652 EPA Proposal Would Exempt Some GMOs From Registry  
653 Anonymous Alcoholic Bankrolls Trial of Controversial Therapy

## NEWS FOCUS

- 654 Red in Tooth and Claw Among the Literati  
*>> Science Podcast*  
657 Car-Crash Epidemiologist Pushes Systemic Attack on Bad Driving  
658 Dating Duo Illuminates Modern Humans' Journey  
New Light on Ancient Samples

## LETTERS

- 662 An Unexpected Spotlight  
*A. Pollatsek*  
New University Plan Skips Crucial Steps  
*W. Zhong*  
Symmetrical Transparency in Science  
*K. Shrader-Frechette and N. Oreskes*  
Bringing Research into the Classroom  
*A. Krolik*

- 664 CORRECTIONS AND CLARIFICATIONS

## BOOKS ET AL.

- 665 Lab Coats in Hollywood  
*D. A. Kirby, reviewed by M. A. MacIver*  
666 Energy, People, and the Natural World

## POLICY FORUM

- 670 Transforming U.S. Agriculture  
*J. P. Reganold et al.*

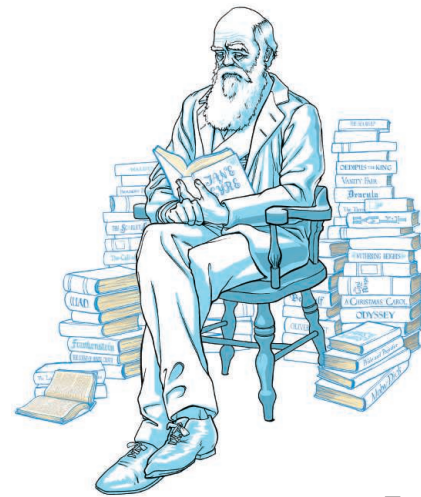
## PERSPECTIVES

- 672 Twisted Disks  
*H. Salo*  
*>> Reports pp. 708 and 711*  
673 Ancient Neurons Regulate Immunity  
*K. J. Tracey*  
*>> Report p. 729*  
674 Designing the Next Generation of Chemical Separation Membranes  
*D. L. Gin and R. D. Noble*  
676 Hot Electrons Cross Boundaries  
*M. Moskovits*  
*>> Report p. 702*  
677 Flow Cytometry, Amped Up  
*C. Benoist and N. Hacohen*  
*>> Research Article p. 687*  
679 Retrospective: Jürg Tschopp (1951–2011)  
*L. A. O'Neill*

## REVIEW

- 680 Scaffold Proteins: Hubs for Controlling the Flow of Cellular Information  
*M. C. Good et al.*

**CONTENTS** continued >>

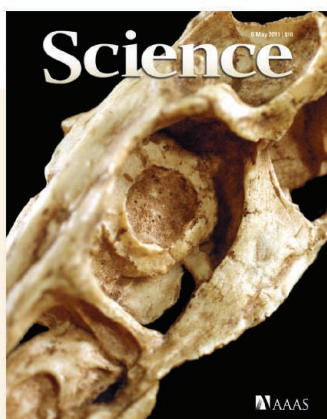


page 654



page 665

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## COVER

Skull of the theropod dinosaur *Velociraptor mongoliensis* (Mongolia) showing the eye socket (4 centimeters across). Analysis of the shape of the eye socket and scleral ring (a bone within the eye) of fossil and extant species suggests that Mesozoic archosaurs were active both day and night. See page 705.

*Photo: Lars Schmitz, University of California, Davis*

## DEPARTMENTS

- 635 This Week in *Science*  
641 Editors' Choice  
644 *Science* Staff  
739 New Products  
740 *Science* Careers

## RESEARCH ARTICLE

- 687 **Single-Cell Mass Cytometry of Differential Immune and Drug Responses Across a Human Hematopoietic Continuum**  
S. C. Bendall et al.  
Simultaneous measurement of more than 30 properties in individual human cells is used to characterize signaling in the immune system.  
>> *Perspective p. 677*

## REPORTS

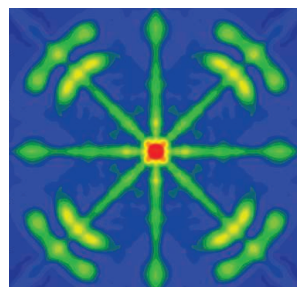
- 696 **Observation of Orbital Currents in CuO**  
V. Scagnoli et al.  
Resonant x-ray scattering is used to detect microscopic loop currents within the plane of cupric oxide.
- 698 **Imaging Doped Holes in a Cuprate Superconductor with High-Resolution Compton Scattering**  
Y. Sakurai et al.  
Inelastic x-ray scattering probed the doping dependence of the electronic environment within a cuprate superconductor.
- 702 **Photodetection with Active Optical Antennas**  
M. W. Knight et al.  
An active optical antenna-diode combines the functions of light-harvesting and excited-electron injection.  
>> *Perspective p. 676*
- 705 **Nocturnality in Dinosaurs Inferred from Scleral Ring and Orbit Morphology**  
L. Schmitz and R. Motani  
Comparison of eye structures between fossils and modern species suggests that Mesozoic archosaurs were active day and night.
- 708 **Saturn's Curiously Corrugated C Ring**  
M. M. Hedman et al.
- 711 **The Impact of Comet Shoemaker-Levy 9 Sends Ripples Through the Rings of Jupiter**  
M. R. Showalter et al.  
Spacecraft observations show that Saturn's and Jupiter's rings preserve records of recent interplanetary debris collisions.  
>> *Perspective p. 672*

- 714 **Single-Cell Genomics Reveals Organismal Interactions in Uncultivated Marine Protists**  
H. S. Yoon et al.  
Marine protist cells from the wild environment contain DNA from several viruses and bacteria, but apparently lack plastids.
- 717 **A Family of IFN- $\gamma$ -Inducible 65-kD GTPases Protects Against Bacterial Infection**  
B.-H. Kim et al.  
Guanylate-binding proteins coordinately regulate oxidative and autophagic responses to intracellular bacteria.
- 721 **Normalization for Sparse Encoding of Odors by a Wide-Field Interneuron**  
M. Papadopoulos et al.  
A single neuron is responsible for adaptive normalization in an olfactory circuit generating sparse odor representations.
- 726 **Relationship Between Clinical Signs and Transmission of an Infectious Disease and the Implications for Control**  
B. Charleston et al.  
Livestock experiments provide precise parameters for incubation and infectious periods for foot-and-mouth disease virus.  
>> *Science Podcast*
- 729 **Neuronal GPCR Controls Innate Immunity by Regulating Noncanonical Unfolded Protein Response Genes**  
J. Sun et al.  
Two nematode worm neurons "smell" disease and promote resistance to pathogens.  
>> *Perspective p. 673*
- 732 **Transient Activation of the HOG MAPK Pathway Regulates Bimodal Gene Expression**  
S. Pelet et al.  
Bimodal expression of genes is activated in response to osmotic stress.

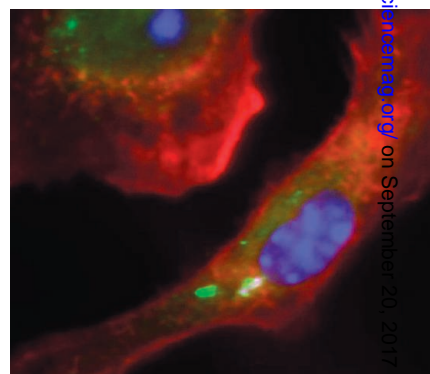
**CONTENTS** continued >>



page 666



pages 696 & 698



page 717

## SCIENCEONLINE

## SCIENCEEXPRESS

[www.sciencexpress.org](http://www.sciencexpress.org)

**The Compact Selaginella Genome Identifies Changes in Gene Content Associated with the Evolution of Vascular Plants**

*J. A. Banks et al.*

The genome sequence of a lycophyte hints at ancient evolutionary transitions.

10.1126/science.1203810

**Deciphering the Rhizosphere Microbiome for Disease-Suppressive Bacteria**

*R. Mendes et al.*

A common plant pathogen induces the growth of disease-suppressive microbes in local soil communities.

10.1126/science.1203980

**Realizing All-Spin-Based Logic Operations Atom by Atom**

*A. A. Khajetoorians et al.*

Scanning tunneling microscopy is used to assemble and read out signals from a device based on atomic spins.

10.1126/science.1201725

**Climate Trends and Global Crop Production Since 1980**

*D. B. Lobell et al.*

Climate change has decreased global maize and wheat production, while soybean and rice production have remained stable.

10.1126/science.1204531

>> [Science Podcast](#)

## SCIENCENOW

[www.sciencenow.org](http://www.sciencenow.org)

Highlights From Our Daily News Coverage

**First Buildings May Have Been Community Centers**

Large structures found in 12,000-year-old farming village were probably not homes.

<http://scim.ag/first-buildings>

**Computer Algorithm May Speed Drug Discovery**

A computational approach could simplify the quest for new HIV and cancer therapies.

<http://scim.ag/drug-discovery>

**Scattering Microscope Peers Into the Nanoscale**

A new frosted lens sees finer details than ever before.

<http://scim.ag/nano-scale>

## SCIENCE SIGNALING

[www.sciencesignaling.org](http://www.sciencesignaling.org)

The Signal Transduction Knowledge Environment

**3 May issue:** <http://scim.ag/ss050311>

**RESEARCH ARTICLE: Male Fertility Depends on Ca<sup>2+</sup> Absorption by TRPV6 in Epididymal Epithelia**

*P. Weissgerber et al.*

Production of functional spermatozoa requires regulation of the Ca<sup>2+</sup> concentration in epididymal fluid by TRPV6.

**RESEARCH ARTICLE: Mechanism of Impaired NLRP3 Inflammasome Priming by Monophosphoryl Lipid A**

*C. A. Embry et al.*

## PODCAST

*T. C. Mitchell and A. M. VanHook*

Biased signaling by an immune receptor ligand underlies its inability to induce inflammatory responses.

**PERSPECTIVE: New Roles for Lysosomal Trafficking in Morphogen Gradient Sensing**

*E. Rainero and J. C. Norman*

The rate at which morphogen receptors move into lysosomes dictates the extent of downstream signaling during differentiation.

## SCIENCE CAREERS

[www.sciencereers.org/career\\_magazine](http://www.sciencereers.org/career_magazine)

Free Career Resources for Scientists

**Focus on Aging: Unlocking the Genome's Secrets to Long Life**

*M. Leslie*

Liz Cirulli is seeking gene variants in centenarians that account for their longevity.

[http://scim.ag/long\\_life\\_genome](http://scim.ag/long_life_genome)

**Taken for Granted: When Will They Learn?**

*B. L. Benderly*

Another needless death at a university research facility points up the scandal of lax safety standards in academe.

[http://scim.ag/tfg\\_safety](http://scim.ag/tfg_safety)

## SCIENCE TRANSLATIONAL MEDICINE

[www.sciencetranslationalmedicine.org](http://www.sciencetranslationalmedicine.org)

Integrating Medicine and Science

**4 May issue:** <http://scim.ag/ss050411>

**PERSPECTIVE: The Inflammasome in Atherosclerosis and Type 2 Diabetes**

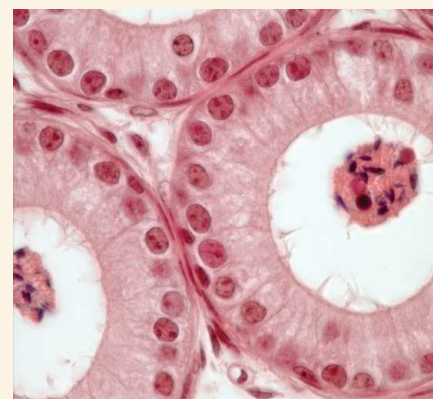
*S. L. Masters et al.*

Type 2 diabetes and atherosclerosis might be linked through the inflammasome via obesity-related triggers.

**RESEARCH ARTICLE: A Phosphorus-Based Dendrimer Targets Inflammation and Osteoclastogenesis in Experimental Arthritis**

*M. Hayder et al.*

A phosphorus-based dendrimer suppresses inflammation and reduces bone erosion in mouse models of rheumatoid arthritis.



## SCIENCE SIGNALING

Epididymus, a site of calcium regulation.

**RESEARCH ARTICLE: Immune and Genetic Correlates of Vaccine Protection Against Mucosal Infection by SIV in Monkeys**

*N. L. Letvin et al.*

A vaccine protecting monkeys against mucosal infection by simian immunodeficiency virus sheds light on immune and genetic correlates of protection.

## SCIENCE PODCAST

[www.sciencemag.org/multimedia/podcast](http://www.sciencemag.org/multimedia/podcast)

Free Weekly Show

On the 6 May *Science* Podcast: the effects of climate on crop production, detecting infectious disease, Darwinian literary criticism, and more.

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Science Policy News and Analysis

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