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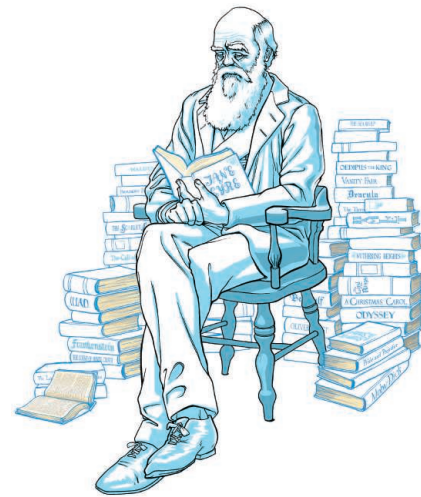
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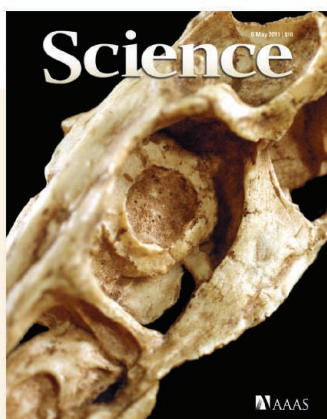


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COVER

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

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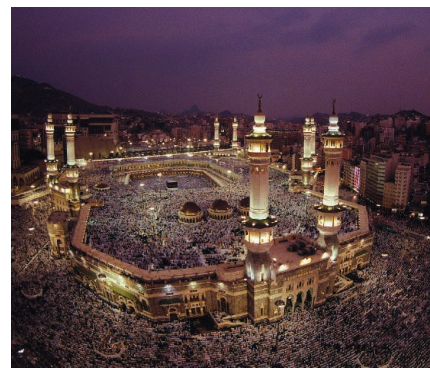
- 687 **Single-Cell Mass Cytometry of Differential Immune and Drug Responses Across a Human Hematopoietic Continuum**
S. C. Bendall et al.
Simultaneous measurement of more than 30 properties in individual human cells is used to characterize signaling in the immune system.
>> *Perspective p. 677*

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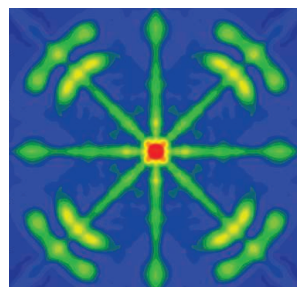
- 696 **Observation of Orbital Currents in CuO**
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Y. Sakurai et al.
Inelastic x-ray scattering probed the doping dependence of the electronic environment within a cuprate superconductor.
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M. W. Knight 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- γ -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.
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- 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.
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- 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.

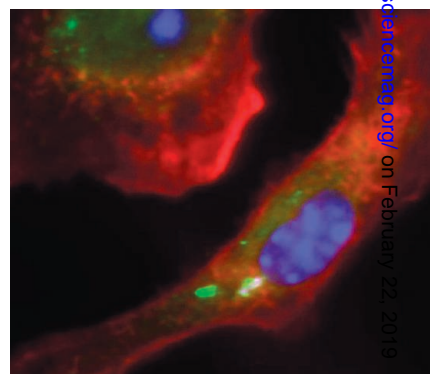
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The Compact Selaginella Genome Identifies Changes in Gene Content Associated with the Evolution of Vascular Plants

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*

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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

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The Signal Transduction Knowledge Environment

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

RESEARCH ARTICLE: Male Fertility Depends on Ca²⁺ Absorption by TRPV6 in Epididymal Epithelia

P. Weissgerber et al.

Production of functional spermatozoa requires regulation of the Ca²⁺ 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

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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

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

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Integrating Medicine and Science

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

PERSPECTIVE: The Inflammasome in Atherosclerosis and Type 2 Diabetes

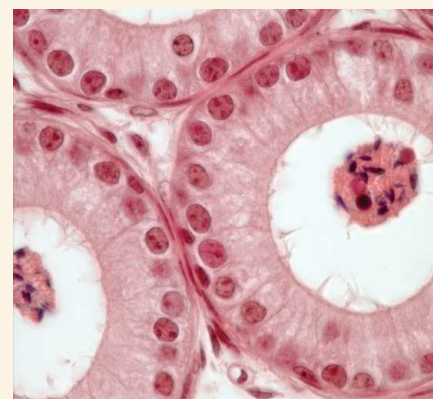
S. L. Masters et al.

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

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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 (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 © 2011 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): \$149 (\$74 allocated to subscription). Domestic institutional subscription (51 issues): \$990; 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.**

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Science

332 (6030)

Science **332** (6030), 635-739.

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