

SPECIAL SECTION

# Ardipithecus ramidus

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*Ardipithecus ramidus* and the Paleobiology of Early Hominids

Tim D. White et al.

Authors' Summary p. 64, Full Text p. 75

The Geological, Isotopic, Botanical, Invertebrate, and Lower Vertebrate Surroundings of *Ardipithecus ramidus*

Giday WoldeGabriel et al.

Authors' Summary p. 65, Full Text Online\*

Taphonomic, Avian, and Small-Vertebrate Indicators of *Ardipithecus ramidus* Habitat

Antoine Louchart et al.

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Macrovertebrate Paleontology and the Pliocene Habitat of *Ardipithecus ramidus*

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The *Ardipithecus ramidus* Skull and Its Implications for Hominid Origins

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Careful Climbing in the Miocene: The Forelimbs of *Ardipithecus ramidus* and Humans Are Primitive

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The Pelvis and Femur of *Ardipithecus ramidus*: The Emergence of Upright Walking

C. Owen Lovejoy et al.

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The Great Divides: *Ardipithecus ramidus* Reveals the Postcrania of Our Last Common Ancestors with African Apes

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Reexamining Human Origins in Light of *Ardipithecus ramidus*

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\*Full text and related online content at

[www.sciencemag.org/ardipithecus/](http://www.sciencemag.org/ardipithecus/)



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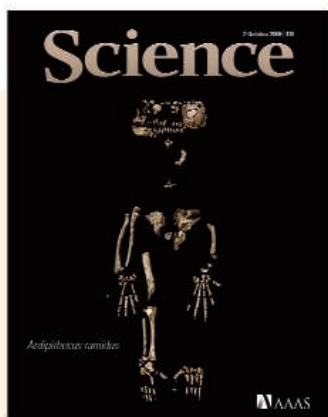
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**COVER**

Partial skeleton of *Ardipithecus ramidus*, a hominid species living about 4.4 million years ago in Ethiopia. This female stood about 1.2 meters high. Eleven papers from an international team of authors published in print and online in this special issue describe the anatomy of this species and its habitat and discuss the implications for understanding human evolution. One result is that extant great apes are poor models for our last common ancestor with chimpanzees. See page 60 for an introduction.

Image: © T. White, 2008

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Long-period surface waves from oceanic or atmospheric disturbances can be used for seismic mapping of the upper mantle.

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*V. E. Manucharyan et al.*  
Circuit engineering was used to mitigate the effects of quantum noise in superconducting quantum circuits.
- 116 Preferential Growth of Single-Walled Carbon Nanotubes with Metallic Conductivity  
*A. R. Harutyunyan et al.*  
Reaction conditions that alter catalyst particles can bias the chirality and electronic properties of nanotube products.

- 120 Chiral Organic Ion Pair Catalysts Assembled Through a Hydrogen-Bonding Network  
*D. Uraguchi et al.*

A small cluster of hydrogen-bonded molecules acts as a highly selective asymmetric catalyst.

- 123 Nitrous Oxide (N<sub>2</sub>O): The Dominant Ozone-Depleting Substance Emitted in the 21st Century  
*A. R. Ravishankara et al.*

Nitrous oxide causes more stratospheric ozone destruction than any other ozone-depleting substance.

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- 126 Enhanced Sulfur and Coking Tolerance of a Mixed Ion Conductor for SOFCs: BaZr<sub>0.1</sub>Ce<sub>0.7</sub>Y<sub>0.2-x</sub>Yb<sub>x</sub>O<sub>3-δ</sub>  
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A barium zirconate-cerate doped with yttrium and ytterbium can transport both protons and oxygen ions at high temperatures.

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- 129 Rapid Resurgence of Marine Productivity After the Cretaceous-Paleogene Mass Extinction  
*J. Sepúlveda et al.*

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- 132 Identification of Carboniferous (320 Million Years Old) Class Ic Amber  
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- 137 Genetic Discontinuity Between Local Hunter-Gatherers and Central Europe's First Farmers  
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A nuclear-encoded protein is responsible for the uptake of calcium and the export of protons across the mitochondrial membrane.

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- 147 Dissecting the Genetic Basis of Resistance to Malaria Parasites in *Anopheles gambiae*  
*S. A. Blandin et al.*

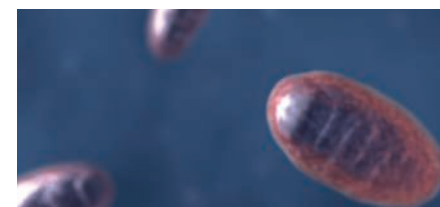
Genome-wide mapping reveals the molecular basis of phenotypic variation in resistance to *Plasmodium* in mosquitoes.

- 150 Coat Variation in the Domestic Dog Is Governed by Variants in Three Genes  
*E. Cadieu et al.*

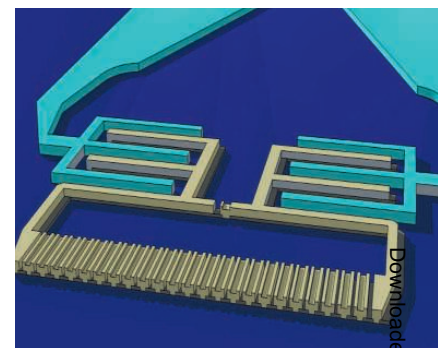
Huge variations in the coats of purebred dogs can be explained by the combinatorial effects of only three genes.

- 153 JAK-STAT Signal Inhibition Regulates Competition in the *Drosophila* Testis Stem Cell Niche  
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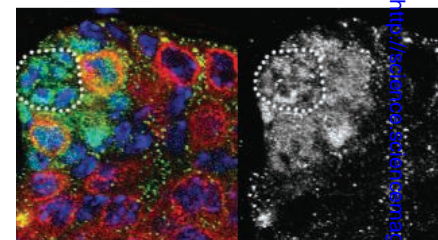
Suppression of transcription signaling in somatic stem cells prevents them from out-competing neighboring germline stem cells.



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## SCIENCEXPRESS

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

### Sexual Conflict Resolved by Invasion of a Novel Sex Determiner in Lake Malawi Cichlid Fishes

R. B. Roberts et al.

A color phenotype that is advantageous to females is linked to a sex-determining gene locus in cichlids.  
10.1126/science.1174705

### CD4<sup>+</sup> Regulatory T Cells Control T<sub>H</sub>17 Responses in a Stat3-Dependent Manner

A. Chaudhry et al.

Suppressor T cells regulate different classes of immune responses through induction of specific transcription factors.  
10.1126/science.1172702

### Two Chemoreceptors Mediate Developmental Effects of Dauer Pheromone in *C. elegans*

K. Kim et al.

Chemical signals that determine alternative nematode developmental programs act via two G protein-coupled receptors.  
10.1126/science.1176331

### Probing the Magnetic Field of Light at Optical Frequencies

M. Burresi et al.

A split-ring resonator coupled to a scanning probe is used to measure the weak magnetic component of light.  
10.1126/science.1177096

### A Population of Compact Elliptical Galaxies Detected with the Virtual Observatory

I. Chilingarian et al.

A sample of elliptical systems provides evidence that disruption of galaxies plays an important role in their evolution.  
10.1126/science.1175930

## SCIENCENOW

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

Highlights From Our Daily News Coverage

### The Upside of Recessions

Economic downturns are linked to better health.

### Cells Mind the Gaps

Researchers propose surprising strategy for how cells detect chemicals in their environment.

### Dylan to Darwin: Don't Look Back

A study of ancient proteins shows that evolution doesn't go in reverse.

## SCIENCESIGNALING

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

The Signal Transduction Knowledge Environment

### EDITORIAL GUIDE: Focus Issue: The Long and Short of Redox Signaling

N. R. Gough

Reactive oxygen species mediate local and long-distance signals.

### RESEARCH ARTICLE: *Leishmania* GP63 Alters Host Signaling Through Cleavage-Activated Protein Tyrosine Phosphatases

M. A. Gomez et al.

The parasite protein GP63 triggers cleavage and activation of host protein tyrosine phosphatases to promote infection.

### RESEARCH ARTICLE: Hippo Pathway-Dependent and -Independent Roles of RASSF6

M. Ikeda et al.

RASSF6 is both an inhibitor and a promoter of apoptosis, and its proapoptotic activity is regulated by the mammalian kinase MST2, a Hippo homolog.

### PERSPECTIVE: Sending ROS on a Bullet Train

H. L. Wong and K. Shimamoto

Hydrogen peroxide is an auto-propagating, rapid systemic stress signal generated by RBOHD in *Arabidopsis*.

### PERSPECTIVE: STAT3 Revs Up the Powerhouse

N. C. Reich

The transcription factor STAT3 stimulates mitochondria to augment Ras-dependent oncogenic transformation.

### REVIEW: Transduction of Redox Signaling by Electrophile-Protein Reactions

T. K. Rudolph and B. A. Freeman

Attachment of electrophilic products of redox reactions to proteins links cell function to changes in metabolic and inflammatory status.

## SCIENCECAREERS

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

Free Career Resources for Scientists

### Flying High

S. Gaidos

Cecilia Aragon lacked the confidence to be a scientist—and then she learned to fly.

### Destigmatizing Depression

K. Hede

Physician-scientist trainees are often reluctant to admit to suffering from depression.

### Taken for Granted: Is a New Model Needed for Breakthrough Science?

B. L. Bendorly

Traditional PI-centered research cannot solve the big problems, a lab leader asserts.

## SCIENCEPODCAST

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Free Weekly Show

Download the 2 October *Science* Podcast to hear about the most detailed snapshot of early hominid life, the origin of community structure, and your letters to *Science*.



## SCIENCESIGNALING

Responding to redox signals.



## SCIENCECAREERS

Owning up to depression.

SPECIALFEATURE: *Ardipithecus ramidus*

The entire contents of this week's special section, online—plus special video and podcast features. Find it all at [www.sciencemag.org/ardipithecus/](http://www.sciencemag.org/ardipithecus/).

## ORIGINSBLOG

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A History of Beginnings

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Science Policy News and Analysis

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