Ardipithecus ramidus, a possible human ancestor, inhabited then-wooded regions of Ethiopia 4.4 million years ago. This year, studies of the fossilized skeleton of a member of the species raised surprising questions about how key human traits evolved. See the Breakthrough of the Year special section beginning on page 1598 and at www.sciencemag.org/btoy2009/.

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Enabling New Missions for Robotic Aircraft
J. W. Langelaan and N. Roy

Mining Our Reality
T. M. Mitchell

Reflections On: Our Planet and Its Life, Origins, and Futures
J. J. McCarthy

Regiodivergent Ring Opening of Chiral Aziridines
B. Wu et al.
A bimetallic catalyst selects different ring-opening sites, depending on the chiral configuration of the substrate.

Stepwise Modification of a Modular Enhancer Underlies Adaptation in a Drosophila Population
M. Rebeiz et al.
A combination of new and previously existing mutations in gene regulatory sequences can drive morphological evolution.

Crystal Structure of the Eukaryotic Strong Inward-Rectifier K\(^+\) Channel Kir2.2 at 3.1 Å Resolution
X. Tao et al.
A structure reveals the basis of diode-like conduction properties and toxin insensitivity of these channels.

Formation and Survival of Water Vapor in the Terrestrial Planet–Forming Region
T. Bethell and E. Bergin
Water in protoplanetary disks shields water molecules in deeper layers of the disk from destructive ultraviolet radiation.

Spatial Organization of Hominin Activities at Gesher Benot Ya’aqov, Israel
N. Alperson-Afil et al.
The spatial distribution of artifacts implies that living space was organized by use as early as 800,000 years ago.

Mozambican Grass Seed Consumption During the Middle Stone Age
J. Mercader
Residues on stone tools imply that early humans were processing grass seeds by 100,000 years ago.

Universality in Three- and Four-Body Bound States of Ultracold Atoms
S. E. Pollack et al.
The interactions involved in the formation of few-body bound states can be probed in a cloud of ultracold atoms.

Experimental Observations of Stress-Driven Grain Boundary Migration
T. J. Rupert et al.
Shear stresses drive grain boundaries to move in a manner consistent with predictions of coupled grain boundary migration.

Real-Time Observation of Carbonic Acid Formation in Aqueous Solution
K. Adamczyk et al.
The use of a photoacid enables the long-sought characterization of the conjugate acid of bicarbonate.

Bacterial Community Variation in Human Body Habitats Across Space and Time
E. K. Costello et al.
The composition of microbial communities on the human body is primarily determined by their location.

The Fanconi Anemia Pathway Promotes Replication-Dependent DNA Interstrand Cross-Link Repair
P. Knipscheer et al.
Insertion of a nucleotide during the repair of a complex lesion in DNA requires tagging of a lysine residue.

Indirect Punishment and Generosity Toward Strangers
A. Ule et al.
Frequent rewards spiced with occasional punishment are a recipe for the evolution of cooperation.

On the Origin of Species by Natural and Sexual Selection
G. S. van Doorn et al.
Modeling demonstrates how speciation occurs due to sexual selection.

Structure of the LKB1-STRAD-MO25 Complex Reveals an Allosteric Mechanism of Kinase Activation
E. Zeqiraj et al.
A “pseudokinase” activates the LKB1 tumor suppressor protein without catalyzing phosphorylation.

The Subtle Transmission of Race Bias via Televised Nonverbal Behavior
M. Weisbuch et al.
Nonverbal behaviors can contribute to implicit bias in intergroup attitudes.
The guanine nucleotide exchange activity of \textit{Vav1} in T cells.

A. Saveliev

\textbf{Exchange Activity of \textit{Vav1} in T Cell Development}

\textbf{RESEARCH ARTICLE: Function of the Nucleotide}

\textbf{SIGNALING}

\textbf{Structure of \textit{Vav1}}

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