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## COVER

A row of 5000-year-old stone tombs lines a ridge in Al-Ayn, near the village of Bat in the foothills of the Hajar Mountains, Oman. During the third millennium B.C.E., a surprisingly sophisticated culture developed in this region and ultimately linked the early civilizations of the Indus, Iran, and Mesopotamia. See the special News Focus section beginning on page 1092.

Photo: *Wikimedia Commons*

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- 1128 Horizontal Gene Transfer by the Parasitic Plant *Striga hermonthica*  
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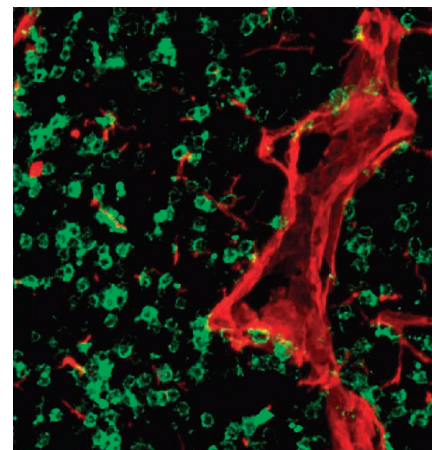
- 1129 Neural Crest–Derived Pericytes Promote Egress of Mature Thymocytes at the Corticomedullary Junction  
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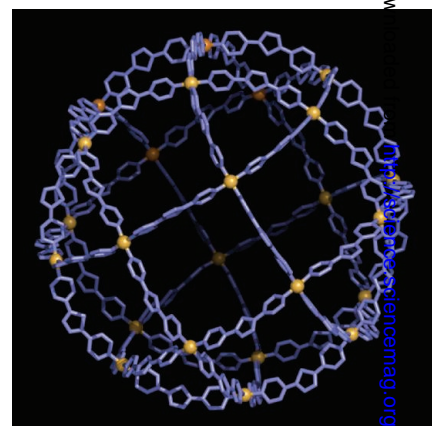
- 1135 Self-Assembled Plasmonic Nanoparticle Clusters  
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A hierarchy of nanoscale optical structures is created from nanoparticles that have metal shells and dielectric cores.
- 1138 How Grain Growth Stops: A Mechanism for Grain-Growth Stagnation in Pure Materials  
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Smooth, low-mobility grain boundaries limit crystallite growth when a pure metal is heated.
- 1141 Interface-Confined Ferrous Centers for Catalytic Oxidation  
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The interface between ferrous oxide islands and a platinum support contains sites that activate dioxygen for catalytic reactions.
- 1144 Self-Assembled  $M_{24}L_{48}$  Polyhedra and Their Sharp Structural Switch upon Subtle Ligand Variation  
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- 1147 Ventilation of the Deep Southern Ocean and Deglacial  $CO_2$  Rise  
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- 1151 Mirid Bug Outbreaks in Multiple Crops Correlated with Wide-Scale Adoption of Bt Cotton in China  
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The use of more specific pesticides results in the resurgence of nontargeted insect populations.
- 1154 Prion Strain Mutation Determined by Prion Protein Conformational Compatibility and Primary Structure  
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In mice, the development of energy-burning brown fat is regulated by an enzyme that is critical for prostaglandin synthesis.  
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- 1161 Genome-Wide Kinetics of Nucleosome Turnover Determined by Metabolic Labeling of Histones  
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- 1164 Global Biodiversity: Indicators of Recent Declines  
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An analysis of 30 indicators shows that the Convention on Biological Diversity's 2010 targets have not been met.
- 1168 Plectasin, a Fungal Defense, Targets the Bacterial Cell Wall Precursor Lipid II  
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Some metazoan and fungal host defense peptides are specific inhibitors of bacterial peptidoglycan biosynthesis.
- 1172 mTORC1-Mediated Cell Proliferation, But Not Cell Growth, Controlled by the 4E-BPs  
*R. J. O. Dowling et al.*  
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- 1176 Fairness and the Development of Inequality Acceptance  
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## SCIENCEONLINE

## SCIENCEEXPRESS

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

**Structure of the Human BK Channel Ca<sup>2+</sup>-Activation Apparatus at 3.0 Å Resolution**  
*P. Yuan et al.*

A tetramer of two regulatory domains forms a gating ring that regulates calcium ion activation.  
10.1126/science.1190414

**Control of Membrane Protein Topology by a Single C-Terminal Residue**  
*S. Seppälä et al.*

The orientation of a multispinning inner membrane protein can be engineered by a single positively charged residue.  
10.1126/science.1188950

**c-di-AMP Secreted by Intracellular *Listeria monocytogenes* Activates a Host Type I Interferon Response**  
*J. J. Woodward et al.*

Within the host cell, a small secondary signaling molecule from a pathogen triggers a pathway of innate immunity.  
10.1126/science.1189801

**Stochastic Community Assembly Causes Higher Biodiversity in More Productive Environments**  
*J. M. Chase*

A long-term experiment in ponds addresses the influence of primary productivity on broad-scale patterns of biodiversity.  
10.1126/science.1187820

**Explaining the Structure of the Archean Mass-Independent Sulfur Isotope Record**  
*I. Halevy et al.*

Modeling suggests that volcanic output and microorganisms created a distinctive profile of sulfur isotopes on early Earth.  
10.1126/science.1190298

**The Climate Change Debates**  
*P. Kitcher*

10.1126/science.1189312

>> [Join the discussion at http://tiny.cc/clichng](http://tiny.cc/clichng)

## TECHNICALCOMMENTS

**Comment on the Paleobiology and Classification of *Ardipithecus ramidus***  
*E. E. Sarmiento*

Full text at [www.sciencemag.org/cgi/content/full/328/5982/1105-b](http://www.sciencemag.org/cgi/content/full/328/5982/1105-b)

**Response to Comment on the Paleobiology and Classification of *Ardipithecus ramidus***  
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**Response to Comment on the Paleoenvironment of *Ardipithecus ramidus***  
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## SCIENCENOW

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

Highlights From Our Daily News Coverage

**Animal Reserves Can Be Good for People, Too**

Detailed analysis of Thailand and Costa Rica shows less poverty near protected areas.

**Body Temperature Time Machine**

New technique allows scientists to determine extinct animals' body temperatures.

**Genetic Discovery Promises to Boost Rice Yields**

Two groups find gene variant that boosts test plot yields by 10%.

## SCIENCE SIGNALING

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

The Signal Transduction Knowledge Environment

**RESEARCH ARTICLE: The Balance of WNT and FGF Signaling Influences Mesenchymal Stem Cell Fate During Skeletal Development**  
*T. Maruyama et al.*

## PODCAST

*W. Hsu and A. M. VanHook*

Imbalance of WNT and FGF signaling promotes premature closure of skull bones by inducing bone formation.

**RESEARCH ARTICLE: Negative Feedback in Noncanonical NF-κB Signaling Modulates NIK Stability Through IKKα-Mediated Phosphorylation**  
*B. Razani et al.*

**PERSPECTIVE: Controlling the Fate of NIK—A Central Stage in Noncanonical NF-κB Signaling**  
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Feedback inhibition of the central regulator of noncanonical NF-κB signaling is mediated by its target kinase.

**RESEARCH ARTICLE: TRAF6 and A20 Regulate Lysine 63–Linked Ubiquitination of Beclin-1 to Control TLR4-Induced Autophagy**  
*C.-S. Shi and J. H. Kehrl*

Regulation of the ubiquitination of Beclin-1 may be a general mechanism that controls autophagy.

## SCIENCE CAREERS

[www.sciencereers.org/career\\_magazine](http://www.sciencereers.org/career_magazine)  
Free Career Resources for Scientists

**The Successful Physician-Scientist in the 21st Century**

*A. Schafer*

Physician-scientists must learn to thrive, despite a divided culture and rigid institutional structures.

**Ten Years of Bologna: Threats and Opportunities for Students**

*E. Pain*

Reforms in Europe may offer students opportunities to shape higher education around their needs.

**Science Careers Communities**

*Science Careers Staff*

MySciNet and CTSciNet offer opportunities to connect with like-minded scientists.

## SCIENCE TRANSLATIONAL MEDICINE

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

Integrating Medicine and Science

**PERSPECTIVE: Achalasia and Viral Infection—New Insights from Veterinary Medicine**

*D. Ganem et al.*

A viral disease in parrots mimics features of achalasia, a human disorder of esophageal motility.

**PERSPECTIVE: Rong's Numbers—Accelerating Progress in HCV Therapeutic Research**

*D. L. Wyles and R. T. Schooley*

Mathematical modeling and other modern translational research tools can expedite the development of drugs that target hepatitis C virus.

**RESEARCH ARTICLE: Metabolic Signatures of Exercise in Human Plasma**

*G. D. Lewis et al.*

Profiles of plasma metabolites show that people who are more fit respond more effectively to exercise.

**RESEARCH ARTICLE: Proteins Required for Centrosome Clustering in Cancer Cells**

*B. Leber et al.*

Proteins that prevent spindle multipolarity in human cancer cells may prove to be promising drug targets.

## SCIENCE PODCAST

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[news.sciencemag.org/scienceinsider](http://news.sciencemag.org/scienceinsider)  
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