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## COVER

False-colored backscattered electron image of a small rocky particle, 150 micrometers in size, recovered from the surface of near-Earth asteroid 25143 Itokawa by the Japanese spacecraft Hayabusa. Mineralogy and chemistry of the particle indicate that the asteroid consists of very primitive solar system material and has had a complex formation history. See the series of Reports beginning on page 1113.

*Image: Japanese Aerospace Exploration Agency*

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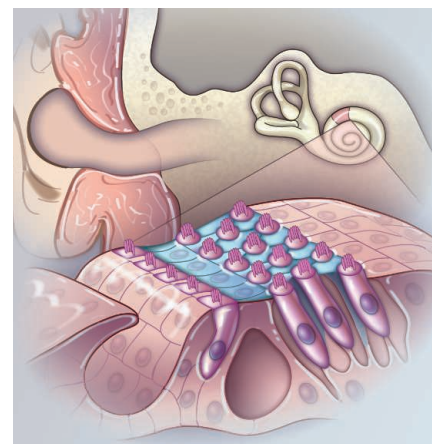
- 1109 Mitochondria and the Autophagy–Inflammation–Cell Death Axis in Organismal Aging  
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## REPORTS

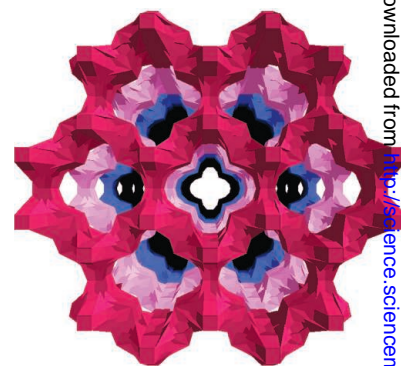
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- 1121 Incipient Space Weathering Observed on the Surface of Itokawa Dust Particles  
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A. Tsuchiyama et al.
- 1128 Irradiation History of Itokawa Regolith Material Deduced from Noble Gases in the Hayabusa Samples  
K. Nagao et al.  
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>> *Perspective p. 1098*
- 1131 Synthesis and Structure Determination of the Hierarchical Meso-Microporous Zeolite ITQ-43  
J. Jiang et al.  
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- 1134 Unraveling the Perplexing Structure of the Zeolite SSZ-57  
C. Baerlocher et al.  
X-ray analysis reveals a zeolite structure in which 10-sided channels are periodically disrupted by 12-sided channels.

- 1137 *optix* Drives the Repeated Convergent Evolution of Butterfly Wing Pattern Mimicry  
R. D. Reed et al.  
*Heliconius* butterfly wing pattern mimicry is driven by cis-regulatory variation of the *optix* gene.  
>> *Perspective p. 1100*
- 1141 Chaperonins Facilitate KNOTTED1 Cell-to-Cell Trafficking and Stem Cell Function  
X. M. Xu et al.  
Active transfer of a transcription factor between plant cells is required for stem cell maintenance.  
>> *Perspective p. 1103*
- 1144 Nectins Establish a Checkerboard-Like Cellular Pattern in the Auditory Epithelium  
H. Togashi et al.  
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>> *Perspective p. 1099*
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High harvest levels of low-trophic level fishes may have cascading marine ecosystem effects.
- 1151 Expanding the Genetic Code of *Escherichia coli* with Phosphoserine  
H.-S. Park et al.  
Engineered bacterial translation can be used to direct site-specific insertion of an amino acid into proteins.
- 1154 Exome Sequencing of Head and Neck Squamous Cell Carcinoma Reveals Inactivating Mutations in *NOTCH1*  
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- 1157 The Mutational Landscape of Head and Neck Squamous Cell Carcinoma  
N. Stransky et al.  
The mutational profile of head and neck cancer is complex and may pose challenges to the development of targeted therapies.  
>> *Perspective p. 1102*
- 1161 *MED23* Mutation Links Intellectual Disability to Dysregulation of Immediate Early Gene Expression  
S. Hashimoto et al.  
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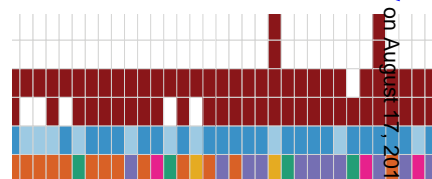
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## SCIENCEONLINE

## SCIENCEEXPRESS

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

**Promoting the Peace Process by Changing Beliefs About Group Malleability**

*E. Halperin et al.*

A belief that the beliefs of other groups are changeable rather than fixed is conducive to negotiation.

10.1126/science.1202925

**The Shaping of Modern Human Immune Systems by Multiregional Admixture with Archaic Humans**

*L. Abi-Rached et al.*

Viral defense and embryo implantation mechanisms have been shaped by contributions from Neandertal and Denisovan genes.

10.1126/science.1209202

>> *News story p. 1084*

**MED12, the Mediator Complex Subunit 12 Gene, Is Mutated at High Frequency in Uterine Leiomyomas**

*N. Mäkinen et al.*

Uterine fibroids frequently harbor mutations in a specific gene that has been implicated in transcriptional regulation.

10.1126/science.1208930

**Transformation of a Star into a Planet in a Millisecond Pulsar Binary**

*M. Bailes et al.*

Timing observations of a millisecond pulsar reveal a planet that is far denser than any known planet.

10.1126/science.1208890

**A Reservoir of Ionized Gas in the Galactic Halo to Sustain Star Formation in the Milky Way**

*N. Lehner and J. C. Hawk*

Clouds of ionized gas located inside our galaxy provide a major supply of matter for fueling ongoing star formation.

10.1126/science.1209069

## TECHNICALCOMMENTS

**Comment on "Drought-Induced Reduction in Global Terrestrial Net Primary Production from 2000 Through 2009"**

*A. Samanta et al.*

Full text at [www.sciencemag.org/cgi/content/ful/333/6046/1093-c](http://www.sciencemag.org/cgi/content/ful/333/6046/1093-c)

**Comment on "Drought-Induced Reduction in Global Terrestrial Net Primary Production from 2000 Through 2009"**

*B. E. Medlyn*

Full text at [www.sciencemag.org/cgi/content/ful/333/6046/1093-d](http://www.sciencemag.org/cgi/content/ful/333/6046/1093-d)

**Response to Comments on "Drought-Induced Reduction in Global Terrestrial Net Primary Production from 2000 Through 2009"**

*M. Zhao and S. W. Running*

Full text at [www.sciencemag.org/cgi/content/ful/333/6046/1093-e](http://www.sciencemag.org/cgi/content/ful/333/6046/1093-e)

## SCIENCENOW

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

Highlights From Our Daily News Coverage

**'Eco-Friendly' Chilean Sea Bass May Not Be So Green**

A genetic study finds the first evidence of mislabeling in fish certified as sustainable.

<http://scim.ag/ecoseabass>

**Immune System Protects Female Bedbugs From Traumatic Sex**

Insects anticipate infections from violent male insemination.

<http://scim.ag/bedbugbacteria>

**Lager Beer's Mystery Yeast**

Scientists identify a microbe that is key to the brewing process.

<http://scim.ag/lageryeast>

## SCIENCE SIGNALING

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

The Signal Transduction Knowledge Environment

**23 August issue: <http://scim.ag/ss082311>**

**RESEARCH ARTICLE: Tumor Progression Locus 2 Mediates Signal-Induced Increases in Cytoplasmic Calcium and Cell Migration**

*M. Hatzia Apostolou et al.*

The kinase Tpl2 triggers calcium signaling and cell migration downstream of various receptors implicated in cancer and inflammation.

**PERSPECTIVE: TBK1 Mediates Crosstalk Between the Innate Immune Response and Autophagy**

*H. Weidberg and Z. Elazar*

Phosphorylation of an autophagy adaptor by a kinase involved in innate immune responses limits pathogenic bacterial growth.

## PODCAST

*H. D. Mansvelder and A. M. VanHook*

$\beta$ 2 subunit-containing nicotinic acetylcholine receptors in the prefrontal cortex are sufficient for acetylcholine-mediated enhancement of attentional focus.

## SCIENCE CAREERS

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

Free Career Resources for Scientists

**Experimental Error: This Is Only a Test**

*A. Rubin*

As we are training to become fully fledged scientists, we ourselves are the test subjects.

[http://scim.ag/EE\\_Testing](http://scim.ag/EE_Testing)

**Creating Your Own Job: From Engineer to Entrepreneur**

*S. A. Holgate*

A layoff set engineer Diana Hodgins on a new career path, leading eventually to managing her own company.

[http://scim.ag/Diana\\_Hodgins](http://scim.ag/Diana_Hodgins)

**In Person: A Sabbatical in Namibia**

*L. A. Levin and D. M. Checkley*

On the heels of our feature on doing science in Namibia, two scientists describe their sabbatical experiences there.

[http://scim.ag/Namibia\\_Sabbatical](http://scim.ag/Namibia_Sabbatical)

## SCIENCE TRANSLATIONAL MEDICINE

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

Integrating Medicine and Science

**24 August issue: <http://scim.ag/stm082411>**

**COMMENTARY: Herding CATS**

*G. A. Petsko*

The National Center for Advancing Translational Sciences seems primed to polarize scientists while possibly failing to drive biomedical research and development forward.

**RESEARCH ARTICLE: Long-Term Persistence of a Polyclonal T Cell Repertoire After Gene Therapy for X-Linked Severe Combined Immunodeficiency**

*H. B. Gaspar et al.*

**RESEARCH ARTICLE: Hematopoietic Stem Cell Gene Therapy for Adenosine Deaminase-Deficient Severe Combined Immunodeficiency Leads to Long-Term Immunological Recovery and Metabolic Correction**

*H. B. Gaspar et al.*

**PERSPECTIVE: A Tale of Two SCIDS**

*K. L. Shaw and D. B. Kohn*

Gene therapy can restore immune and metabolic function in immunodeficient patients.

**RESEARCH ARTICLE: Potent Kinetic Stabilizers That Prevent Transthyretin-Mediated Cardiomyocyte Proteotoxicity**

*M. M. Alhamadshah et al.*

A screen for transthyretin ligands that inhibit protein aggregation identifies agents that prevent amyloid toxicity in cardiomyocytes.

## SCIENCEPODCAST

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

Free Weekly Show

On the 26 August Science Podcast: dust particles from asteroid Itokawa, new insights into the Denisovans, drawing to learn in science, and more.

## SCIENCEINSIDER

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

Science Policy News and Analysis

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