

SPECIAL SECTION

## Changing Oceans

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An aggressive storm that battered the coastal town of Blackpool, United Kingdom, in January 2007. Among other important changes now occurring in the marine environment, rising sea levels will create the need for increased protection from such severe storms. See the special section on our changing oceans beginning on page 1497.

*Photo: Global Warming Images/Alamy*

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M. S. Brown et al.  
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## BREVIA

1529 **Reassortment of Pandemic H1N1/2009 Influenza A Virus in Swine**  
D. Vijaykrishna et al.  
Surveillance of pigs is important for tracking reassortment and emergence of influenza A viruses.  
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## RESEARCH ARTICLES

1530 **Tropical Ocean Temperatures Over the Past 3.5 Million Years**  
T. D. Herbert et al.  
Tropical sea surface temperatures were controlled more by atmospheric connections to glaciation cycles than by ocean circulation.  
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1534 **Target RNA-Directed Trimming and Tailing of Small Silencing RNAs**  
S. L. Ameres et al.  
Animal microRNAs have reduced complementarity to their targets to avoid their own degradation.  
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## REPORTS

1540 **Bose-Einstein Condensation in Microgravity**  
T. van Zoest et al.  
Studies of atomic quantum states in free-fall conditions may provide ways to test predictions of general relativity.  
>> *Perspective p. 1491*

1543 **Hot-Electron Transfer from Semiconductor Nanocrystals**  
W. A. Tisdale et al.  
Extraction of highly excited electrons formed in a light-absorbing material may make solar cells more efficient.

1547 **Crossover from Single-Step Tunneling to Multistep Hopping for Molecular Triplet Energy Transfer**  
J. Vura-Weis et al.  
Ultrafast absorption spectroscopy reveals a change in mechanism when sites for electron transfer become more distant.

1550 **Subpolar Link to the Emergence of the Modern Equatorial Pacific Cold Tongue**  
A. Martínez-García et al.  
The eastern Pacific Ocean cold tongue appeared as Earth's climate cooled and subpolar waters expanded in the Pleistocene.  
>> *Perspective p. 1488; Research Article p. 1530*

1554 **Radiocarbon-Based Chronology for Dynastic Egypt**  
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Many radiocarbon dates from short-lived plant remains provide a long and accurate chronology for ancient Egypt.  
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1558 **Evolutionary Novelty Is Concentrated at the Edge of Coral Species Distributions**  
A. F. Budd and J. M. Pandolfi  
Caribbean coral morphology documents that most coral evolution did not occur at the center of diversity of a species' range.

1561 **Identification of Germline Stem Cells in the Ovary of the Teleost Medaka**  
S. Nakamura et al.  
Ongoing follicle production is maintained by stem cells in an adult fish ovary.

1563 **Down-Regulation of a Host MicroRNA by a Herpesvirus saimiri Noncoding RNA**  
D. Cazalla et al.  
A viral noncoding RNA regulates the level of a complementary host-cell microRNA.  
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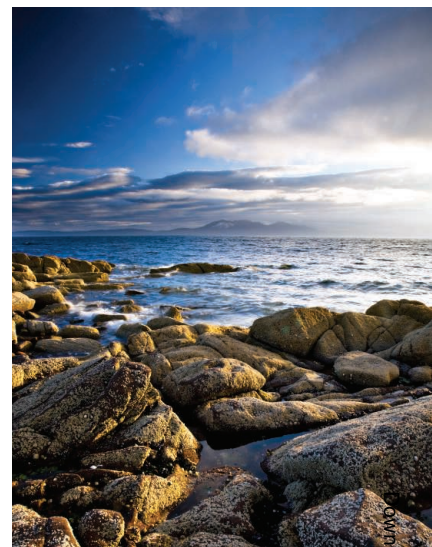
1566 **MicroRNA-33 and the SREBP Host Genes Cooperate to Control Cholesterol Homeostasis**  
S. H. Najafi-Shoushtari et al.

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K. J. Rayner et al.  
A small noncoding RNA helps regulate cholesterol levels in mice.  
>> *Perspective p. 1495*

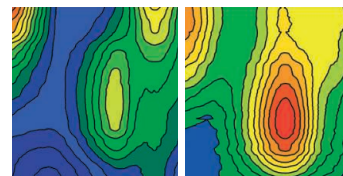
1573 **Development of the Hippocampal Cognitive Map in Prewanling Rats**  
T. J. Wills et al.  
Some aspects of spatial cognition develop very early and may be determined innately.

1576 **Development of the Spatial Representation System in the Rat**  
R. F. Langston et al.  
Space and direction are already represented in specific neurons when rat pups navigate a location for the first time.  
>> *Perspective p. 1487*

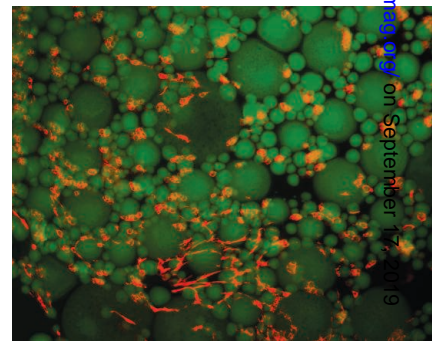
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## SCIENCEONLINE

## SCIENCEEXPRESS

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

**Biocatalytic Asymmetric Synthesis of Chiral Amines from Ketones Applied to Sitagliptin Manufacture**

C. K. Savile et al.

An engineered enzyme offers substantial efficiency advantages in the production-scale synthesis of a drug.

10.1126/science.1188934

**Probing the Superfluid-to-Mott-Insulator Transition at the Single-Atom Level**

W. S. Bakr et al.

Imaging of atoms that were optically trapped in lattice sites reveals local dynamics of a quantum phase transition.

10.1126/science.1192368

**A Septin Diffusion Barrier at the Base of the Primary Cilium Maintains Ciliary Membrane Protein Distribution**

Q. Hu et al.

Signaling proteins are retained in the cilium by a diffusion barrier created by a member of the septin family.

10.1126/science.1191054

**Sfrp5 Is an Anti-Inflammatory Adipokine That Modulates Metabolic Dysfunction in Obesity**

N. Ouchi et al.

Fat cells secrete an anti-inflammatory factor that has beneficial effects on metabolic health.

10.1126/science.1188280

**Integrative Modeling Defines the Nova Splicing-Regulatory Network and Its Combinatorial Controls**

C. Zhang et al.

Network modeling reveals an RNA splicing network in the brain and uncovers complex mechanisms of regulation.

10.1126/science.1191150

## TECHNICALCOMMENTS

**Comment on "Deep-Sea Temperature and Ice Volume Changes Across the Pliocene-Pleistocene Climate Transitions"**

J. Yu and W. S. Broecker

Full text at [www.sciencemag.org/cgi/content/full/328/5985/1480-c](http://www.sciencemag.org/cgi/content/full/328/5985/1480-c)

**Response to Comment on "Deep-Sea Temperature and Ice Volume Changes Across the Pliocene-Pleistocene Climate Transitions"**

S. Sosdian and Y. Rosenthal

Full text at [www.sciencemag.org/cgi/content/full/328/5985/1480-d](http://www.sciencemag.org/cgi/content/full/328/5985/1480-d)

## SCIENCENOW

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

Highlights From Our Daily News Coverage

**Was the New World Settled Twice?**

Analysis of ancient skulls suggests a wave of migration before the ancestors of today's Native Americans.

**Did a Deep Sea Once Cover Mars?**

River deltas suggest a large, ancient ocean, but not all experts are convinced.

**Better Rice Through Fungi**

A bit of fungal cultivation helps rice plants grow up to five times as fast.

## SCIENCE SIGNALING

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

The Signal Transduction Knowledge Environment

**RESEARCH ARTICLE: Ablation of the Kinase NDR1 Predisposes Mice to the Development of T Cell Lymphoma**

H. Cornils et al.

The kinase NDR1 functions as a haploinsufficient tumor suppressor by ensuring proper apoptotic responses.

**PROTOCOL: Analysis of Matrix-Dependent Cell Migration with a Barrier Migration Assay**

S. Kroening and M. Goppelt-Struebe

Removable plastic barriers allow quantification of cell migration without damaging either the surface proteins or the cells.

## FUNDING SOURCES

Find opportunities to fund research and training in cell signaling.

## GLOSSARY

Find out what ADPKD, CICR, and DHPR mean in the world of cell signaling.

## SCIENCE CAREERS

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

Free Career Resources for Scientists

**Changing Oceans: Viewing Coral Reefs Through a Cultural Lens**

H. Fields

Human geographer Josh Cinner studies how people and coral reefs interact.

>> *Changing Oceans* section p. 1497

**Tooling Up: Be the Candidate**

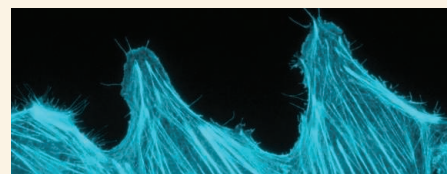
D. Jensen

Your chances of finding a job improve if you are considered a candidate and not just an applicant.

**Psychologist Bridges Clinic and Lab to Untangle Schizophrenia's Roots**

B. Vastag

Deanna Barch is developing neuroimaging tools to speed the development of schizophrenia treatments.



## SCIENCE SIGNALING

Measuring cell migration.

## SCIENCE TRANSLATIONAL MEDICINE

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

Integrating Medicine and Science

**RESEARCH ARTICLE: RNA-Based Gene Therapy for HIV with Lentiviral Vector-Modified CD34+ Cells in Patients Undergoing Transplantation for AIDS-Related Lymphoma**

D. L. DiGiusto et al.

Therapeutic RNAs are stably expressed in blood cells of HIV-positive patients.

**PERSPECTIVE: Gene Therapy Takes a Cue from HAART—Combinatorial Antiviral Therapeutics Reach the Clinic**

P. S. Shah and D. V. Schaffer

Therapeutic RNAs are stably expressed in blood cells of HIV-positive patients.

**PERSPECTIVE: Stopping Sepsis by Targeting Sphingosine Kinase 1**

L. A. J. O'Neill

A recent study suggests that inhibiting the enzyme sphingosine kinase 1 might have great potential as a therapy for sepsis.

## SCIENCE PODCAST

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

Free Weekly Show

Download the 18 June *Science* Podcast to hear about reassortment of the H1N1/2009 influenza virus in swine, ocean noise, the physics of old violins, and more.

## SCIENCE INSIDER

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

Science Policy News and Analysis

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