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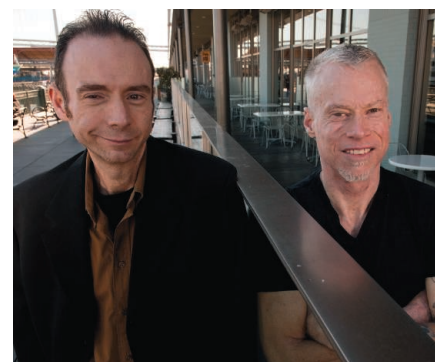
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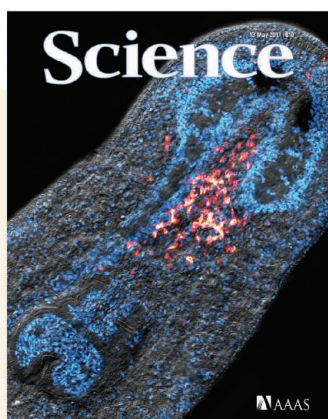
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**COVER**

Composite confocal image of an adult planarian (*Schmidtea mediterranea*) showing a growing colony of dividing cells (red) that initiated from a single, pluripotent stem cell called a clonogenic neoblast (cNeoblast). The ~1-millimeter-long animal is visualized with differential interference contrast microscopy and nuclear staining (blue). The colony is just posterior to the animal brain (nuclei-rich, bi-lobed structure) and eyes (two dark pigmented areas). See page 811.

*Credit: Daniel E. Wagner, Irving E. Wang, Peter W. Reddien/Department of Biology, Massachusetts Institute of Technology, Whitehead Institute for Biomedical Research*

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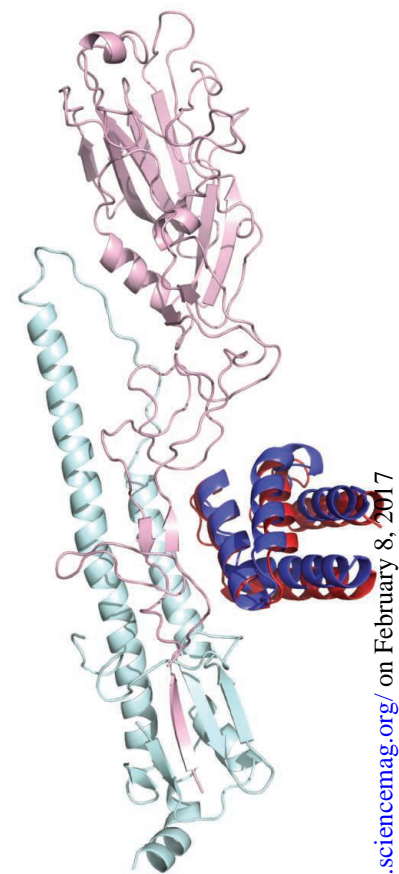
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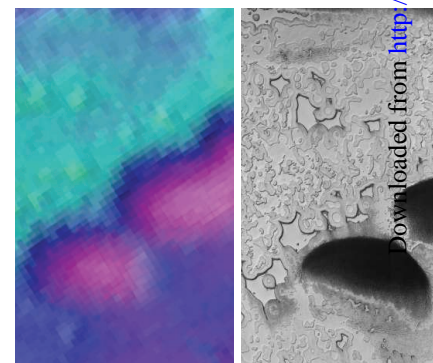
- 811 **Clonogenic Neoblasts Are Pluripotent Adult Stem Cells That Underlie Planarian Regeneration**  
*D. E. Wagner et al.*  
A pluripotent adult stem cell underlies flatworms' amazing regenerative ability.  
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- 816 **Computational Design of Proteins Targeting the Conserved Stem Region of Influenza Hemagglutinin**  
*S. J. Fleishman et al.*  
Proteins can be designed that bind to specific patches on target proteins to alter their subsequent interactions.  
>> *Perspective p. 801; Science Podcast*
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- 821 **Interplay of Rotational, Relaxational, and Shear Dynamics in Solid  $^4\text{He}$**   
*E. J. Pratt et al.*  
Comprehensive measurements argue against the existence of the exotic supersolid quantum state of frozen helium.
- 825 **Very Large Capacitance Enhancement in a Two-Dimensional Electron System**  
*L. Li et al.*  
Electron correlation effects at the interface of two metal oxides lead to a lower chemical potential and enhance capacitance.
- 828 **Beating Crystallization in Glass-Forming Metals by Millisecond Heating and Processing**  
*W. L. Johnson et al.*  
Resistive heating can be used to rapidly heat a bulk metallic glass without inducing crystallization.
- 833 **Three-Dimensional Orientation Mapping in the Transmission Electron Microscope**  
*H. H. Liu et al.*  
Electron microscopy is used to nondestructively map the three-dimensional grain orientations in nanocrystalline aluminum.
- 835 **Silver-Catalyzed C-C Bond Formation Between Methane and Ethyl Diazoacetate in Supercritical  $\text{CO}_2$**   
*A. Caballero et al.*  
Supercritical carbon dioxide solvent facilitates transformation of the generally inert carbon-hydrogen bonds in methane.
- 838 **Massive  $\text{CO}_2$  Ice Deposits Sequestered in the South Polar Layered Deposits of Mars**  
*R. J. Phillips et al.*  
Radar measurements reveal a substantial buried deposit of carbon dioxide in the south pole of Mars.  
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- 841 **Late Mousterian Persistence near the Arctic Circle**  
*L. Slimak et al.*  
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>> *Perspective p. 798*
- 848 **Role for piRNAs and Noncoding RNA in de Novo DNA Methylation of the Imprinted Mouse *Rasgrf1* Locus**  
*T. Watanabe et al.*  
Small, noncoding PIWI-interacting RNAs regulate the imprinting of a mouse gene.
- 852 **Polarized *notum* Activation at Wounds Inhibits Wnt Function to Promote Planarian Head Regeneration**  
*C. P. Petersen and P. W. Reddien*  
Local detection of tissue polarity results in selective feedback inhibition of signaling at posterior-facing wounds.  
>> *Perspective p. 799; Research Article p. 811*
- 855 **Natural Microbe-Mediated Refractoriness to *Plasmodium* Infection in *Anopheles gambiae***  
*C. M. Cirimotich et al.*  
Insect midgut-dwelling bacteria generate reactive oxygen species that inhibit malaria parasite development.
- 858 **Preserved Feedforward But Impaired Top-Down Processes in the Vegetative State**  
*M. Boly et al.*  
Discerning the neural correlates of (un)consciousness sheds light on the mechanisms underlying vegetative states.  
>> *News & Analysis story p. 779*
- 862 **Improved Learning in a Large-Enrollment Physics Class**  
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Encouraging active engagement results in enhanced learning.

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## SCIENCEONLINE

## SCIENCEEXPRESS

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

**Evidence of a Global Magma Ocean in Io's Interior**

*K. K. Khurana et al.*

Magnetic field measurements made near Jupiter's moon Io strengthen the evidence for a magma ocean in its interior.

10.1126/science.1201425

**Carbon-Based Supercapacitors Produced by Activation of Graphene**

*Y. Zhu et al.*

Activated microwave-exfoliated graphite oxide combined with an ionic liquid can be used to make an enhanced capacitor.

10.1126/science.1200770

**Disorder-Enhanced Transport in Photonic Quasicrystals**

*L. Levi et al.*

Optical interference in a photorefractive crystal is used to study light propagation in a controlled disordered system.

10.1126/science.1202977

**Local Macrophage Proliferation, Rather than Recruitment from the Blood, Is a Signature of T<sub>H</sub>2 Inflammation**

*S. J. Jenkins et al.*

Proliferation in situ, rather than immune cell recruitment, drives macrophage expansion in response to parasitic infection.

10.1126/science.1204351

**Crystal Structure of the Maltose Transporter in a Pretranslocation Intermediate State**

*M. L. Oldham and J. Chen*

An intermediate structure provides insight into how a transport substrate allosterically activates adenosine triphosphatase activity.

10.1126/science.1200767

## SCIENCENOW

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

Highlights From Our Daily News Coverage

**Study: High-Tech Gas Drilling Is Fouling Drinking Water**

Fracking for deep stores of methane may be contaminating nearby wells.

<http://scim.ag/deep-drilling>

**Titan's Atmosphere Spawned by Impacts?**

Ancient bombardments may have transformed ammonia-rich ices into gaseous nitrogen.

<http://scim.ag/titan-impacts>

**Earliest American Dogs May Have Been Dinner**

A bone found in 9000-year-old human excrement may be the first definitive evidence of dogs in the New World and of dogs being eaten by people.

<http://scim.ag/dog-dinner>

## SCIENCE SIGNALING

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

The Signal Transduction Knowledge Environment

**10 May issue:** <http://scim.ag/ss051011>

**RESEARCH ARTICLE: Methylation of a Phosphatase Specifies Dephosphorylation and Degradation of Activated Brassinosteroid Receptors**

*G. Wu et al.*

**PERSPECTIVE: PP2A Phosphatases—The “On-Off” Regulatory Switches of Brassinosteroid Signaling**

*S. Di Rubbo et al.*

The abundance of brassinosteroid receptors and thus the intensity of brassinosteroid signaling are set by methylation of a protein phosphatase.

**RESEARCH ARTICLE: A Peptide-Based Target Screen Implicates the Protein Kinase CK2 in the Global Regulation of Caspase Signaling**

*J. S. Duncan et al.*

**PERSPECTIVE: Protein Kinases Curb Cell Death**

*O. Filhol and C. Cochet*

Phosphorylation of caspase substrates by the protein kinase CK2 may underlie its role in tumorigenesis.

## GLOSSARY

Find out what AAM, BFA, and cSMAC 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

**An Interdisciplinary Approach to Successful Aging**

*E. Pain*

Social and behavioral scientist Nardi Steverink studies the psychological well-being of older people to help them stay well and happy longer.

<http://scim.ag/steverink>

**On Kidney Stones and Qualifying Exams**

*A. Marnett*

Both can be painful and hard to pass, but proper preparation can make it easier—for the qualifying exam, at least.

[http://scim.ag/qualifying\\_exam](http://scim.ag/qualifying_exam)

## SCIENCE TRANSLATIONAL MEDICINE

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

Integrating Medicine and Science

**11 May issue:** <http://scim.ag/stm051111>

**COMMENTARY: Universal Design of Research—Inclusion of Persons with Disabilities in Mainstream Biomedical Studies**

*A. S. Williams and S. M. Moore*

Simple changes in clinical study design allow individuals with disabilities to participate in and contribute to research.

**PERSPECTIVE: Diagnosing the Individual to Control the Epidemic**

*G. F. Medley*

Infection experiments help to elucidate how epidemics propagate through individuals.

**RESEARCH ARTICLE: Losartan Restores Skeletal Muscle Remodeling and Protects Against Disuse Atrophy in Sarcopenia**

*T. N. Burks et al.*

## PODCAST

*R. D. Cohn and A. Colmone*

Losartan improves muscle remodeling and protects against immobilization atrophy by mediating pathways critical for muscle homeostasis.

**RESEARCH ARTICLE: Cytosolic DNA Triggers Inflammasome Activation in Keratinocytes in Psoriatic Lesions**

*Y. Dombrowski et al.*

In psoriasis, cytosolic DNA in keratinocytes triggers maturation of the cytokine IL-1 $\beta$  via the AIM2 inflammasome.

**RESEARCH ARTICLE: In Vivo Liver Regeneration Potential of Human Induced Pluripotent Stem Cells from Diverse Origins**

*H. Liu et al.*

Hepatic cells derived from human induced pluripotent stem cells of various origins contribute to liver regeneration in vivo.

## SCIENCEPODCAST

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Science Policy News and Analysis

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Editor's Summary

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