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
RESEARCH ARTICLES

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.
>> Perspective p. 799; Report p. 852

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

REPORTS

821 Interplay of Rotational, Relaxational, and Shear Dynamics in Solid 4He
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 CO2
A. Caballero et al.
Supercritical carbon dioxide solvent facilitates transformation of the generally inert carbon-hydrogen bonds in methane.

838 Massive CO2 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.
>> Perspective p. 797

841 Late Mousterian Persistence near the Arctic Circle
L. Slimak et al.
Artefacts at a site in the northern Urals dating to about 33,000 years ago suggest a last northern refuge of Neandertals.
>> News & Analysis story p. 778

845 Experimental Evidence Supports a Sex-Specific Selective Sieve in Mitochondrial Genome Evolution
P. Innocenti et al.
Polymorphisms in the organelle genome have little effect in female flies but do alter gene expression in males.
>> 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
L. Deslauriers et al.
Encouraging active engagement results in enhanced learning.

CONTENTS continued >>