



page 684



page 696

EDITORIAL

- 670 Ensuring Success for J-NIH
Takashi Kadowaki

NEWS OF THE WEEK

- 676 A roundup of the week's top stories

NEWS & ANALYSIS

- 679 Israel's Silent Polio Epidemic Breaks All the Rules
- 680 California Moves Shake Up Prenatal Gene Testing Market
- 681 Orbiting MAVEN Mission Set to Trace a Planet's History in Thin Martian Air
- 682 Soldier-Scientists Join Counterinsurgency in Afghanistan
- 683 The Ears Have It: First Snakes Were Burrowers, Not Swimmers
- 683 Has Program to Rotate Scientists at NSF Spun Out of Control?

NEWS FOCUS

- 684 The Forgotten Malaria
Malaria as Lifesaving Therapy
>> Science Podcast
- 688 In the Hot Seat

LETTERS

- 691 In Defense of WHO's Blood Donation Policy
N. Dhingra
Response
N. Lacetera et al.
Returning to the Colombian Amazon
E. P. Anderson and J. A. Maldonado-Ocampo
- 693 CORRECTIONS AND CLARIFICATIONS

BOOKS ET AL.

- 694 Play, Playfulness, Creativity and Innovation
P. Bateson and P. Martin, reviewed by G. R. Brown
- 695 Europa Report
S. Cordero, director;
Gravity
A. Cuarón, director, reviewed by S. Hameed

POLICY FORUM

- 696 Hell and High Water:
Practice-Relevant Adaptation Science
R. H. Moss et al.
>> Science Podcast

PERSPECTIVES

- 699 Fusion for Moving
G. A. Clawson
- 700 A Stem Cell Perspective on Cellular Engineering
S. Doulatov and G. Q. Daley
- 702 Quantum Mechanics Tackles Mechanics
K. Hammerer
>> Report p. 710
- 703 Cold-Atom Thermoelectrics
T. T. Heikkilä
>> Report p. 713
- 705 Genetics Driving Epigenetics
T. S. Furey and P. Sethupathy
>> Reports pp. 744, 747, and 750
- 706 Have Your PIC!
S. Malik and R. G. Roeder
>> Research Article p. 709

ON THE WEB THIS WEEK

>> Science Podcast
Listen to stories on characterizing a meteorite, using science to adapt to climate change, the other malaria, and more.

>> Find More Online
Check out Science Express, our podcast, videos, daily news, our research journals, and Science Careers at www.sciencemag.org.



COVER

Raman mapping images of carbon isotope-labeled graphene domains (lateral dimensions: 50 to 120 micrometers) created by exposing a copper surface to normal and isotope-labeled methane at preselected intervals. The data provide information about the effect of growth parameters on the domain shape and size and also contribute to the growth of centimeter-size single crystals of graphene that could enable applications such as nanoelectronics, photonics, and ultrastrong materials. See page 720.

Image: Yufeng Hao

DEPARTMENTS

- 669 This Week in Science
- 671 Editors' Choice
- 674 Science Staff
- 753 New Products
- 754 Science Careers

REVIEW

- 708 Epithelial Plasticity: A Common Theme in Embryonic and Cancer Cells
M. A. Nieto

Review Summary; for full text:

<http://dx.doi.org/10.1126/science.1234850>

RESEARCH ARTICLE

- 709 Architecture of an RNA Polymerase II Transcription Pre-Initiation Complex
K. Murakami et al.

The yeast transcription pre-initiation complex has a bi-lobed structure that may reflect the assembly pathway of the complex.

Research Article Summary; for full text:

<http://dx.doi.org/10.1126/science.1238724>

>> Perspective p. 706

REPORTS

- 710 Entangling Mechanical Motion with Microwave Fields
T. A. Palomaki et al.

Quantum entanglement is demonstrated between a macroscopic mechanical oscillator and a microwave field.

>> Perspective p. 702

- 713 A Thermoelectric Heat Engine with Ultracold Atoms
J.-P. Brantut et al.

A flow of particles in response to a thermal gradient is observed in a channel connecting two reservoirs of ⁶Li atoms.

>> Perspective p. 703

- 716 Visualization and Quantification of Electrochemical and Mechanical Degradation in Li Ion Batteries
M. Ebner et al.

Synchrotron x-ray tomography can be used to study failure modes in an operating battery.

- 720 The Role of Surface Oxygen in the Growth of Large Single-Crystal Graphene on Copper
Y. Hao et al.

Oxygen treatment of a copper surface promoted the faster growth of compact, centimeter-scale graphene domains.

- 724 Asymmetric Distribution of Lunar Impact Basins Caused by Variations in Target Properties
K. Miljković et al.

Numerical simulations imply that lunar impact basins are not representative of the earliest inner solar system impact flux.

- 727 T_H17 Cell Differentiation Is Regulated by the Circadian Clock
X. Yu et al.

Diurnal regulation of an immune cell lineage in the intestine protects against inflammatory disease in mice.

- 731 High-Resolution Mapping of the Spatial Organization of a Bacterial Chromosome
T. B. K. Le et al.

A bacterial chromosome is organized into self-interacting regions delimited by highly expressed genes.

- 734 Mitochondrial Fusion Directs Cardiomyocyte Differentiation via Calcineurin and Notch Signaling
A. Kasahara et al.

Interrupting mitochondrial fusion inhibits cardiac differentiation by dysregulating a specific cell signaling pathway.

- 737 The Hippo Signaling Pathway Interactome
Y. Kwon et al.

A proteomics approach for protein-protein interactions reveals new components of a conserved cell signaling pathway.

- 741 High-Speed Force Spectroscopy Unfolds Titin at the Velocity of Molecular Dynamics Simulations
F. Rico et al.

Experimental time scales previously accessible only to simulations provide insight into forced protein unfolding.

- 744 Coordinated Effects of Sequence Variation on DNA Binding, Chromatin Structure, and Transcription
H. Kilpinen et al.

Human genetic variation results in coordinated allelic variation across molecular phenotypes.

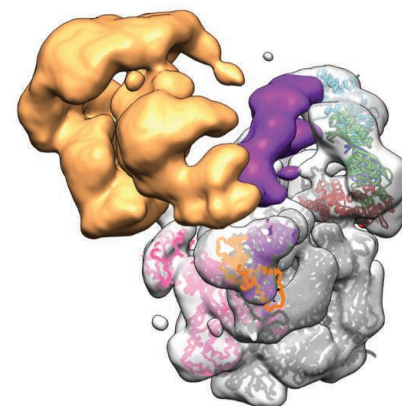
- 747 Identification of Genetic Variants That Affect Histone Modifications in Human Cells
G. McVicker et al.

Human genetic variation affects transcription factor binding, leading to histone modifications.

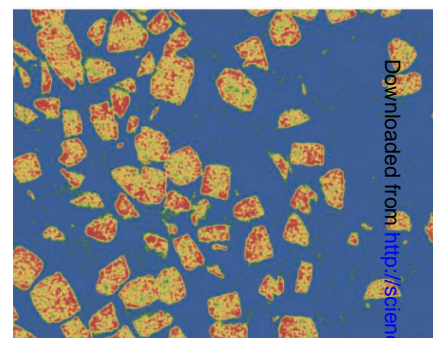
- 750 Extensive Variation in Chromatin States Across Humans
M. Kasowski et al.

Variability among humans with different ancestry affects chromatin states and gene expression.

>> Perspective p. 705



pages 706 & 709



page 716

Downloaded from <http://science.sciencemag.org> on May 27, 2019

SCIENCE (ISSN 0036-8075) is published weekly on Friday, except the last week in December, by the American Association for the Advancement of Science, 1200 New York Avenue, NW, Washington, DC 20005. Periodicals Mail postage (publication No. 484460) paid at Washington, DC, and additional mailing offices. Copyright © 2013 by the American Association for the Advancement of Science. The title SCIENCE is a registered trademark of the AAAS. Domestic individual membership and subscription (51 issues): \$149 (\$74 allocated to subscription). Domestic institutional subscription (51 issues): \$990; Foreign postage extra: Mexico, Caribbean (surface mail) \$55; other countries (air assist delivery) \$85. First class, airmail, student, and emeritus rates on request. Canadian rates with GST available upon request, GST #1254 88122. Publications Mail Agreement Number 1069624. Printed in the U.S.A.

Change of address: Allow 4 weeks, giving old and new addresses and 8-digit account number. Postmaster: Send change of address to AAAS, P.O. Box 96178, Washington, DC 20090-6178. Single-copy sales: \$10.00 current issue, \$15.00 back issue prepaid includes surface postage; bulk rates on request. Authorization to photocopy material for internal or personal use under circumstances not falling within the fair use provisions of the Copyright Act is granted by AAAS to libraries and other users registered with the Copyright Clearance Center (CCC) Transactional Reporting Service, provided that \$30.00 per article is paid directly to CCC, 222 Rosewood Drive, Danvers, MA 01923. The identification code for Science is 0036-8075. Science is indexed in the Reader's Guide to Periodical Literature and in several specialized indexes.

Science

342 (6159)

Science **342** (6159), 669-753.

ARTICLE TOOLS

<http://science.sciencemag.org/content/342/6159>

PERMISSIONS

<http://www.sciencemag.org/help/reprints-and-permissions>

Use of this article is subject to the [Terms of Service](#)

Science (print ISSN 0036-8075; online ISSN 1095-9203) is published by the American Association for the Advancement of Science, 1200 New York Avenue NW, Washington, DC 20005. 2017 © The Authors, some rights reserved; exclusive licensee American Association for the Advancement of Science. No claim to original U.S. Government Works. The title *Science* is a registered trademark of AAAS.