

EDITORIAL

- 1396 Mobilizing Scientific Societies
Bruce Alberts

NEWS OF THE WEEK

- 1400 A roundup of the week's top stories

NEWS & ANALYSIS

- 1404 Japan Stands Alone in Bid for \$10 Billion Collider
- 1405 NIH Offers to Help Universities Improve Training, Boost Diversity
- 1406 Turing Pattern Fingered for Digit Formation
>> Report p. 1476
- 1407 University of Texas Revamps Conflict Rules After Critical Review

NEWS FOCUS

- 1408 The Tale of the TALEs
Beyond TALENs
- 1412 How to Build a Smarter Rock
>> Science Podcast
- 1414 A Controversial Close-Up of Humanity's Health
- 1417 Experimental Landscapes Raise Stakes at Biosphere 2

LETTERS

- 1419 Cloudy Forecast for Weather Satellite Data
D. J. Baker
- Big Brains, Little Bodies
W. T. Wcislo
- Response
M. Balter
- Pushing the Planetary Boundaries
K.-H. Erb et al.
- Response
S. W. Running and W. K. Smith
- 1420 CORRECTIONS AND CLARIFICATIONS

BOOKS ET AL.

- 1421 Signals and Boundaries
J. H. Holland, reviewed by C. Adami
- 1422 Networked Life
M. Chiang, reviewed by L. A. Stein

POLICY FORUM

- 1424 The Greening of Insurance
E. Mills

PERSPECTIVES

- 1426 Is Science Mostly Driven by Ideas or by Tools?
F. J. Dyson
- 1427 The Revolution in the Life Sciences
S. Brenner
- 1428 Who Speaks with a Forked Tongue?
J. B. Losos et al.
- 1430 EZH2 Goes Solo
G. Cavalli
>> Report p. 1465
- 1431 A Genetic Intervention Stands a Skip Away from Clinical Tests
J. S. Chamberlain
- 1432 Relay Reactions That Trap Organometallic Intermediates
S. R. Gilbertson
>> Report p. 1455
- 1434 Sub-Nanosized Gold Catalysts
A. S. K. Hashmi
>> Report p. 1452

CONTENTS continued >>



page 1412



page 1428

Downloaded from <https://science.sciencemag.org/> on April 15, 2021



COVER

Arachnoscelis magnifica, a predaceous katydid (Orthoptera: Tettigoniidae), on a leaf in the San Lorenzo forest of Panama. This attractive insect is but one of the ~25,000 arthropod species likely to live in this 6000-hectare forest, confirming the formidable diversity of arthropods, which appears to be 300 times that of mammals in tropical rainforests. See page 1481.

Photo: Maurice Laponce, Royal Belgian Institute of Natural Sciences

DEPARTMENTS

- 1395 This Week in *Science*
- 1397 Editors' Choice
- 1399 *Science* Staff
- 1485 New Products
- 1486 *Science* Careers

REVIEW

- 1435** Epigenetic Regulation by Long Noncoding RNAs
J. T. Lee
>> Report p. 1469

RESEARCH ARTICLE

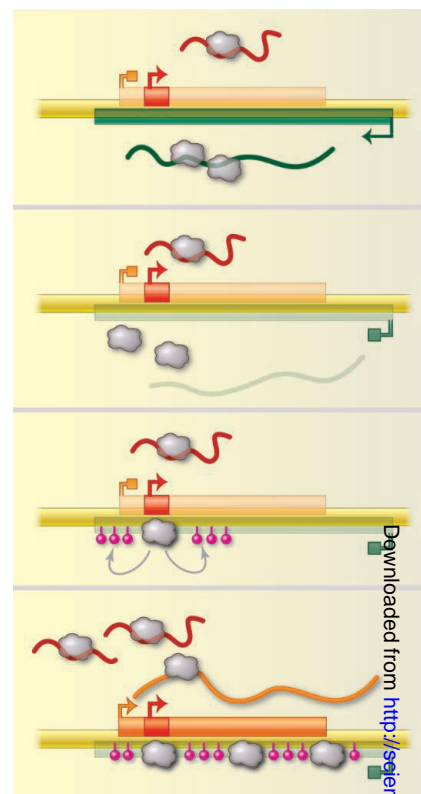
- 1440** Aggravating Genetic Interactions Allow a Solution to Redundancy in a Bacterial Pathogen
T. J. O'Connor et al.
Insertional mutagenesis and depletion dissects the interplay between intracellular *Legionella pneumophila* and its host.

REPORTS

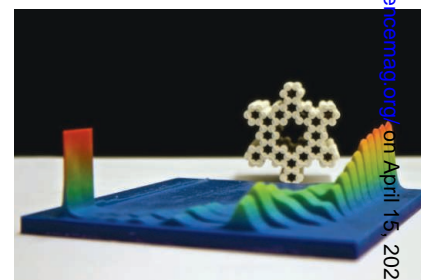
- 1445** A Universal Scaling for the Energetics of Relativistic Jets from Black Hole Systems
R. S. Nemmen et al.
Jets from black holes of differing masses show the same energy-dissipation efficiency, suggesting similar production mechanisms.
- 1448** Texture of Nanocrystalline Nickel: Probing the Lower Size Limit of Dislocation Activity
B. Chen et al.
A metal subjected to high pressures retains the activity of dislocations, even for very small grain sizes.
- 1452** Small Gold Clusters Formed in Solution Give Reaction Turnover Numbers of 10^7 at Room Temperature
J. Oliver-Meseguer et al.
Three- to ten-atom gold clusters formed from gold salts and complexes are highly active catalysts for organic reactions.
>> Perspective p. 1434
- 1455** Enantioselective Heck Arylations of Acyclic Alkenyl Alcohols Using a Redox-Relay Strategy
E. W. Werner et al.
A widely used coupling reaction is adapted by pairing formation of a carbon-carbon bond with oxidation of a nearby alcohol.
>> Perspective p. 1432

- 1458** Rapid Folding of DNA into Nanoscale Shapes at Constant Temperature
J.-P. J. Sobczak et al.
Complex DNA nanoscale objects may be assembled within minutes in high yields through a process resembling protein folding.
- 1462** Pheromonal Induction of Spatial Learning in Mice
S. A. Roberts et al.
A male sex pheromone rapidly stimulates learning of place preference that is remembered for about 2 weeks.
>> Science Podcast
- 1465** EZH2 Oncogenic Activity in Castration-Resistant Prostate Cancer Cells Is Polycomb-Independent
K. Xu et al.
An epigenetic regulator positively regulates gene expression in cell-based models of hormone-resistant prostate cancer.
>> Perspective p. 1430
- 1469** *Airn* Transcriptional Overlap, But Not Its lncRNA Products, Induces Imprinted *Igf2r* Silencing
P. A. Latos et al.
A very long noncoding RNA acts to silence its target gene cluster through transcriptional interference.
>> Review p. 1435
- 1472** A Steroid Receptor-MicroRNA Switch Regulates Life Span in Response to Signals from the Gonad
Y. Shen et al.
The mechanism by which removal of signals from the reproductive organs promotes longevity in nematodes is elucidated.
- 1476** *Hox* Genes Regulate Digit Patterning by Controlling the Wavelength of a Turing-Type Mechanism
R. Sheth et al.
Mouse genetics and computer modeling suggest that a reaction-diffusion mechanism defines digit pattern.
>> News story p. 1406
- 1481** Arthropod Diversity in a Tropical Forest
Y. Basset et al.
Total arthropod species richness in a tropical rainforest can be best predicted by plant diversity.
>> Science Podcast

CONTENTS continued >>



pages 1435 & 1469



page 1458

ONLINE HIGHLIGHTS

SCIENCEEXPRESS

www.scienceexpress.org

Publication Ahead of Print

Variable Clonal Repopulation Dynamics Influence Chemotherapy Response in Colorectal Cancer

A. Kreso et al.

10.1126/science.1227670

Actin, Spectrin, and Associated Proteins Form a Periodic Cytoskeletal Structure in Axons

K. Xu et al.

10.1126/science.1232251

EF-P Is Essential for Rapid Synthesis of Proteins Containing Consecutive Proline Residues

L. K. Doerfel et al.

10.1126/science.1229017

Translation Elongation Factor EF-P Alleviates Ribosome Stalling at Polyproline Stretches

S. Ude et al.

10.1126/science.1228985

A Stringent Limit on a Drifting Proton-to-Electron Mass Ratio from Alcohol in the Early Universe

J. Bagdonaitė et al.

10.1126/science.1224898

SCIENCE NOW

www.sciencenow.org

Highlights From Our Daily News Coverage

Diuretic Drug Offers Latest Hope for Autism Treatment

In a small trial, bumetanide improves social interactions in some children with this disorder.

<http://scim.ag/Autism-Treatment>

Tree Rings for Lobsters

Newly discovered growth bands reveal crustacean ages for the first time.

http://scim.ag/Crustacean_Ages

Turning Pull Into Push?

One physicist puts a curious twist on the interactions of charge and surface.

http://scim.ag/Charge_Surface

SCIENCE SIGNALING

www.sciencesignaling.org

The Signal Transduction Knowledge Environment

11 December issue: <http://scim.ag/ss121112>

RESEARCH ARTICLE: TIM Family Proteins Promote the Lysosomal Degradation of the Nuclear Receptor NUR77

S. Balasubramanian et al.

The TIM family of receptors attenuates cell death in kidney cells after injury.

RESEARCH ARTICLE: Mechanism of Stretch-Induced Activation of the Mechanotransducer Zyxin in Vascular Cells

S. S. Babu et al.

Multiple steps drive the stretch-induced nuclear translocation of the mechanotransducer zyxin.

MEETING REPORT: Celebrating 30 Years of Wnt Signaling

F. Verkaar et al.

Researchers gathered to share the latest findings on Wnt signaling in development and disease.

LETTER: Comment on "Epidermal Growth Factor Receptor Is Essential for Toll-Like Receptor 3 Signaling"

B. Burtress et al.

Targeted inhibitors used in cancer treatments may have adverse effects on immune responses.

SCIENCE TRANSLATIONAL MEDICINE

www.sciencetranslationalmedicine.org

Integrating Medicine and Science

12 December issue: <http://scim.ag/stm121212>

FOCUS: T_{reg} Cells in Cancer—A Case of Multiple Personality Disorder

P. D. Bos and A. Y. Rudensky

RESEARCH ARTICLE: Expression of ROR γ t Marks a Pathogenic Regulatory T Cell Subset in Human Colon Cancer

N. R. Blatner et al.

T_{regs} that expand in human colon cancer have proinflammatory properties and contribute to tumor progression.

PERSPECTIVE: Pluripotent Stem Cells—Immune to the Immune System?

J. I. Pearl et al.

The immunogenicity of pluripotent stem cells will dictate the type of immunosuppression needed for cell therapy.

RESEARCH ARTICLE: Dantrolene Enhances Antisense-Mediated Exon Skipping in Human and Mouse Models of Duchenne Muscular Dystrophy

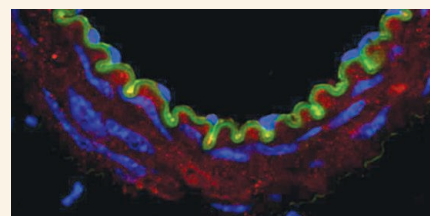
G. C. Kendall et al.

A ryanodine receptor antagonist facilitates exon skipping for treatment of Duchenne muscular dystrophy.

RESEARCH ARTICLE: Ser¹²⁹² Autophosphorylation Is an Indicator of LRRK2 Kinase Activity and Contributes to the Cellular Effects of PD Mutations

Z. Sheng et al.

LRRK2 Ser¹²⁹² autophosphorylation may be useful for screening candidate LRRK2 inhibitors.



SCIENCE SIGNALING
Signaling arterial stretch.

SCIENCE CAREERS

www.sciencecareers.org/career_magazine

Free Career Resources for Scientists

14 December 2012 <http://scim.ag/SciCareers14December2012>

Big Hopes, Small Changes for Biomedical Workforce Training

M. Price

In implementing the recommendations of its workforce working group, NIH decides to play it safe.

Experimental Error: The Myth of the Well-Rounded Scientist

A. Ruben

Despite what grad school admissions committees seem to believe, outside interests are good.

Administrative Hurdles Delay Ph.D. Scholarships in Spain

E. Pain

Many Spanish students have been forced to start their doctorates without financial help.

SCIENCE PODCAST

www.sciencemag.org/multimedia/podcast

Free Weekly Show for 14 December 2012

Listen to stories on smells and learning, counting up bugs, smarter rocks, and more.

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 © 2012 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.



ADVANCING SCIENCE. SERVING SOCIETY

Science

338 (6113)

Science **338** (6113), 1395-1485.

ARTICLE TOOLS

<http://science.sciencemag.org/content/338/6113>

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. The title *Science* is a registered trademark of AAAS.

Copyright © 2012 The Authors, some rights reserved; exclusive licensee American Association for the Advancement of Science. No claim to original U.S. Government Works.