



Editor-in-Chief Marcia McNutt

Executive Editor Monica M. Bradford **News Editor** Tim Appenzeller

Managing Editor, Research Journals Katrina L. Kelner

Deputy Editors Barbara R. Jasny, Andrew M. Sugden(UK), Valda J. Vinson, Jake S. Yeston

Research and Insights

SR. EDITORS Caroline Ash(UK), Gilbert J. Chin, Lisa D. Chong, Julia Fahrenkamp-Uppenbrink(UK), Pamela J. Hines, Stella M. Hurlley(UK), Paula A. Kiberstis, Marc S. Lavine(Canada), Kristen L. Mueller, Ian S. Osborne(UK), Beverly A. Purnell, L. Bryan Ray, Guy Riddihough, H. Jesse Smith, Jelena Stajic, Peter Stern(UK), Phillip D. Szuromi, Brad Wible, Nicholas S. Wigginton, Laura M. Zahn **ASSOCIATE EDITORS** Brent Grocholski, Sacha Vignieri **ASSOCIATE BOOK REVIEW EDITOR** Valerie B. Thompson **ASSOCIATE LETTERS EDITOR** Jennifer Sills **CHIEF CONTENT PRODUCTION EDITOR** Cara Tate **SR. CONTENT PRODUCTION EDITORS** Harry Jach **CONTENT PRODUCTION EDITORS** Jeffrey E. Cook, Chris Filiatreau, Cynthia Howe, Lauren Krnec, Barbara P. Ordway **SR. EDITORIAL COORDINATORS** Carolyn Kyle, Beverly Shields **EDITORIAL COORDINATORS** Ramatoulaye Diop, Joi S. Granger, Lisa Johnson, Anita Wynn **PUBLICATIONS ASSISTANTS** Aneera Dobbins, Jeffrey Hearn, Dona Mathieu, Le-Toya Mayne Flood, Shannon McMahon, Scott Miller, Jerry Richardson, Rachel Roberts(UK), Alice Whaley(UK), Brian White **EXECUTIVE ASSISTANT** Anna Bashkirova **ADMINISTRATIVE SUPPORT** Janet Clements(UK), Monika Magon(UK, Intern), Lizanne Newton(UK), Maryrose Madrid, John Wood(UK)

News

NEWS MANAGING EDITOR John Travis **INTERNATIONAL EDITOR** Richard Stone **DEPUTY NEWS EDITORS** Daniel Clery(UK), Robert Coontz, Elizabeth Culotta, David Grimm, David Malakoff, Leslie Roberts **CONTRIBUTING EDITORS** Martin Enserink(Europe), Mara Hvistendahl **SR. CORRESPONDENTS** Jeffrey Mervis, Elizabeth Pennisi **NEWS WRITERS** Adrian Cho, Jon Cohen, Jennifer Couzin-Frankel, Carolyn Gramling, Eric Hand, Jocelyn Kaiser, Kelly Servick, Robert F. Service, Erik Stokstad(Cambridge, UK), Emily Underwood **INTERNS** Emily Conover, David Shultz, Jia You **CONTRIBUTING CORRESPONDENTS** Pallava Bagla(South Asia), Michael Balter(Paris), John Bohannon, Ann Gibbons, Sam Kean, Richard A. Kerr, Eli Kintisch, Kai Kupferschmidt(Berlin), Andrew Lawler, Christina Larson(Beijing), Mitch Leslie, Charles C. Mann, Eliot Marshall, Virginia Morell, Dennis Normide(Tokyo), Heather Pringle, Tania Rabesandratana(Brussels), Gretchen Vogel(Berlin), Lizzie Wade(Mexico City) **CAREERS** Jim Austin(Editor), Donisha Adams, Rachel Bernstein **COPY EDITORS** Kara Estelle, Nora Kelly, Jennifer Levin **ADMINISTRATIVE SUPPORT** Scherraine Mack

Executive Publisher Rush D. Holt

Publisher Kent R. Anderson **Chief Digital Media Officer** Rob Covey

BUSINESS OPERATIONS AND ADMINISTRATION DIRECTOR Deborah Rivera-Wienhold **BUSINESS SYSTEMS AND FINANCIAL ANALYSIS DIRECTOR** Randy Yi **MANAGER OF FULFILLMENT SYSTEMS** Neal Hawkins **SYSTEMS ANALYST** Nicole Mehmedovich **ASSISTANT DIRECTOR, BUSINESS OPERATIONS** Eric Knott **MANAGER, BUSINESS OPERATIONS** Jessica Tierney **BUSINESS ANALYSTS** Cory Lipman, Cooper Tilton, Celeste Troxler **FINANCIAL ANALYST** Jeremy Clay **RIGHTS AND PERMISSIONS ASSISTANT DIRECTOR** Emilie David **PERMISSIONS ASSOCIATE** Elizabeth Sandler **RIGHTS, CONTRACTS, AND LICENSING ASSOCIATE** Lili Kiser

MARKETING DIRECTOR Ian King **MARKETING MANAGER** Julianne Wielga **MARKETING ASSOCIATE** Elizabeth Sattler **SR. MARKETING EXECUTIVE** Jennifer Reeves **SR. ART ASSOCIATE, PROJECT MANAGER** Tzeitel Sorrosa **ART ASSOCIATE** Seil Lee **ASSISTANT COMMERCIAL EDITOR** Selby Framme **MARKETING PROJECT MANAGER** Angelissa McArthur **SR. WRITER** Bill Zimmer **PROGRAM DIRECTOR, AAAS MEMBER CENTRAL** Peggy Mihelich **FULFILLMENT SYSTEMS AND OPERATIONS** membership@aaas.org **MANAGER, MEMBER SERVICES** Pat Butler **SPECIALISTS** LaToya Castejo, Javia Flemmings, Latasha Russell **MANAGER, DATA ENTRY** Mickie Napoleoni **DATA ENTRY SPECIALISTS** JJ Regan, Jaimee Wise, Fiona Giblin

DIRECTOR, SITE LICENSING Tom Ryan **DIRECTOR, CORPORATE RELATIONS** Eileen Bernadette Moran **SR. PUBLISHER RELATIONS SPECIALIST** Kiki Forsythe **PUBLISHER RELATIONS MANAGER** Catherine Holland **PUBLISHER RELATIONS, EASTERN REGION** Keith Layson **PUBLISHER RELATIONS, WESTERN REGION** Ryan Rexroth **MANAGER, SITE LICENSE OPERATIONS** Iqo Edim **FULFILLMENT ANALYST** Lana Guo **ASSOCIATE DIRECTOR, MARKETING** Christina Schlecht **MARKETING ASSOCIATES** Thomas Landreth, Minah Kim

DIRECTOR OF WEB TECHNOLOGIES Ahmed Khadr **SR. DEVELOPER** Chris Coleman **DEVELOPERS** Dan Berger, Jimmy Marks **SR. PROJECT MANAGER** Trista Smith **SYSTEMS ENGINEER** Luke Johnson **PRODUCT MANAGER** Walter Jones

CREATIVE DIRECTOR, MULTIMEDIA Martyn Green **DIRECTOR OF ANALYTICS** Enrique Gonzales **SR. WEB PRODUCER** Sarah Crespi **WEB PRODUCER** Alison Crawford **VIDEO PRODUCER** Nguyen Nguyen **SOCIAL MEDIA PRODUCER** Meghna Sachdev

DIRECTOR OF OPERATIONS PRINT AND ONLINE Elizabeth Harman **DIGITAL/PRINT STRATEGY MANAGER** Jason Hillman **QUALITY TECHNICAL MANAGER** Marcus Spiegel **DIGITAL PRODUCTION MANAGER** Lisa Stanford **ASSISTANT MANAGER DIGITAL/PRINT** Rebecca Doshi **DIGITAL MEDIA SPECIALIST** Tara Kelly **SENIOR CONTENT SPECIALISTS** Steve Forrester, Antoinette Hodal, Lori Murphy, Anthony Rosen **CONTENT SPECIALISTS** Jacob Hedrick, Kimberley Oster

DESIGN DIRECTOR Beth Rakouskas **DESIGN EDITOR** Marcy Atarod **SENIOR SCIENTIFIC ILLUSTRATORS** Chris Bickel, Katharine Sutliff **SCIENTIFIC ILLUSTRATOR** Valerie Altounian **SENIOR ART ASSOCIATES** Holly Bishop, Preston Huey **SENIOR DESIGNER** Garvin Grullón **DESIGNER** Chrystal Smith **SENIOR PHOTO EDITOR** William William Douthitt **PHOTO EDITOR** Leslie Liezard

DIRECTOR, GLOBAL COLLABORATION, CUSTOM PUBLICATIONS, ADVERTISING Bill Moran **EDITOR, CUSTOM PUBLISHING** Sean Sanders: 202-326-6430 **ASSISTANT EDITOR, CUSTOM PUBLISHING** Tianna Hicklin: 202-326-6463 **ADVERTISING MARKETING MANAGER** Justin Sawyers: 202-326-7061 **science_advertising@aaas.org** **ADVERTISING MARKETING ASSOCIATE** Javia Flemmings **ADVERTISING SUPPORT MANAGER** Karen Foote: 202-326-6740 **ADVERTISING PRODUCTION OPERATIONS MANAGER** Deborah Tompkins **SR. PRODUCTION SPECIALIST/GRAPHIC DESIGNER** Amy Hardcastle **PRODUCTION SPECIALIST** Yuse Lajimimuhup **SR. TRAFFIC ASSOCIATE** Christine Hall **SALES COORDINATOR** Shirley Young **ASSOCIATE DIRECTOR, COLLABORATION, CUSTOM PUBLICATIONS/CHINA/TAIWAN/KOREA/SINGAPORE** Ruolei Wu: +86-186 0822 9345, rww@aaas.org **COLLABORATION/CUSTOM PUBLICATIONS/JAPAN** Adarsh Sandhu + 81532-81-5142 asandhu@aaas.org **EAST COAST/E. CANADA** Laurie Faraday: 508-747-9395, FAX 617-507-8189 **WEST COAST/W. CANADA** Lynne Stickrod: 415-931-9782, FAX 415-520-6940 **MIDWEST** Jeffrey Dembski: 847-498-4520 x3005, Steven Loerch: 847-498-4520 x3006 **UK EUROPE/ASIA** Roger Goncalves: TEL/FAX +41 243 1358 **JAPAN** Katsuyoshi Fukamizu(Tokyo): +81-3-3219-5777 fukamizu@aaas.org **CHINA/TAIWAN** Ruolei Wu: +86-0082-9345

WORLDWIDE ASSOCIATE DIRECTOR OF SCIENCE CAREERS Tracy Holmes: +44 (0) 1223 326525, FAX +44 (0) 1223 326532 tholmes@science-int.co.uk **CLASSIFIED** advertise@sciencecareers.org **US SALES** Tina Burks: 202-326-6577, Nancy Toerna: 202-326-6578 **SALES ADMINISTRATOR** Marci Gallun **EUROPE/ROW SALES** Axel Gesatzki, Sarah LeLange **SALES ASSISTANT** Kelly Grace **JAPAN** Hirokyuki Mashiki(Kyoto): +81-75-823-1109 hmashiki@aaas.org **CHINA/TAIWAN** Ruolei Wu: +86-186 0082 9345 rww@aaas.org **MARKETING MANAGER** Allison Pritchard **MARKETING ASSOCIATE** Aimee Aponte

AAAS BOARD OF DIRECTORS **RETIRING PRESIDENT, CHAIR** Gerald R. Fink **PRESIDENT** Geraldine (Ger) Richmond **PRESIDENT-ELECT** Barbara A. Schaaf **TREASURER** David Evans **SHAW CHIEF EXECUTIVE OFFICER** Rush D. Holt **BOARD** Bonnie L. Bassler, May R. Berenbaum, Carlos J. Bustamante, Stephen P.A. Fodor, Claire M. Fraser, Michael S. Gazzaniga, Laura H. Greene, Elizabeth Loftus, Mercedes Pascual

SUBSCRIPTION SERVICES For change of address, missing issues, new orders and renewals, and payment questions: 866-434-AAAS (2227) or 202-326-6417, FAX 202-842-1065. Mailing addresses: AAAS, P.O. Box 96178, Washington, DC 20090-6178 or AAAS Member Services, 1200 New York Avenue, NW, Washington, DC 20005

INSTITUTIONAL SITE LICENSES 202-326-6755 **REPRINTS:** Author Inquiries 800-635-7181 **COMMERCIAL INQUIRIES** 803-359-4578 **PERMISSIONS** 202-326-6765, permissions@aaas.org **AAAS Member Services** 202-326-6417 or http://membercentral.aaas.org/discourts

Science serves as a forum for discussion of important issues related to the advancement of science by publishing material on which a consensus has been reached as well as including the presentation of minority or conflicting points of view. Accordingly, all articles published in Science—including editorials, news and comment, and books reviews—are signed and reflect the individual views of the authors and not official points of view adopted by AAAS or the institutions with which the authors are affiliated.

INFORMATION FOR AUTHORS See pages 678 and 679 of the 6 February 2015 issue or access www.sciencemag.org/about/authors

SENIOR EDITORIAL BOARD

Gary King, Harvard University
Susan M. Rosenberg, Baylor College of Medicine, Ali Shilatifard, Northwestern University
Feinberg School of Medicine, Michael S. Turner, U. of Chicago

BOARD OF REVIEWING EDITORS (Statistics board members indicated with \$)

Adriano Aguzzi, U. Hospital Zürich
Takuzo Aida, U. of Tokyo
Leslie Aiello, Wenner-Gren Foundation
Judith Allen, U. of Edinburgh
Sonia Altizer, U. of Georgia
Sebastian Amigorena, Institut Curie
Kathryn Anderson, Memorial Sloan-Kettering Cancer Center
Meinrat O. Andreae, Max-Planck Inst. Mainz
Paola Arlotta, Harvard U.
Johan Auwerx, EPFL
David Awschalom, U. of Chicago
Jordi Bascompte, Estación Biológica de Doñana CSIC
Facundo Batista, London Research Inst.
Ray H. Baughman, U. of Texas, Dallas
David Baum, U. of Wisconsin
Carlo Beenakker, Leiden U.
Kamran Behnia, ESPCI-ParisTech
Yasmine Belkaid, NIAID, NIH
Philip Benfey, Duke U.
Stephen J. Benkovic, Penn State U.
May Berenbaum, U. of Illinois
Gabriele Bergers, U. of California, San Francisco
Bradley Bernstein, Massachusetts General Hospital
Peer Bork, EMBL
Bernard Bourdon, Ecole Normale Supérieure de Lyon
Chris Bowler, Ecole Normale Supérieure
Ian Boyd, U. of St. Andrews
Emily Brodsky, U. of California, Santa Cruz
Ron Brookmeyer, U. of California Los Angeles (\$) **\$**
Christian Büchel, U. Hamburg-Eppendorf
Joseph A. Burns, Cornell U.
György Buzsáki, New York U. School of Medicine
Blanche Capel, Duke U.
Mats Carlsson, U. of Oslo
David Clapham, Children's Hospital Boston
David Clary, U. of Oxford
Joel Cohen, Rockefeller U., Columbia U.
Jonathan D. Cohen, Princeton U.
James Collins, Boston U.
Robert Cook-Deegan, Duke U.
Alan Cowman, Walter & Eliza Hall Inst.
Robert H. Crabtree, Yale U.
Roberta Croce, Vrije Universiteit
Janet Currie, Princeton U.
Jeff L. Dangl, U. of North Carolina
Tom Daniel, U. of Washington
Frans de Waal, Emory U.
Stanislas Dehaene, Collège de France
Robert Desimone, MIT
Claude Desplais, New York U.
Ap Dijksterhuis, Radboud U. of Nijmegen
Dennis Discher, U. of Pennsylvania
Gerald W. Dorn II, Washington U. School of Medicine
Jennifer A. Doudna, U. of California, Berkeley
Bruce Dunn, U. of California, Los Angeles
Christopher Dye, WHO
Todd Ehlers, U. of Tuebingen
David Ehrhardt, Carnegie Inst. of Washington
Tim Elston, U. of North Carolina at Chapel Hill
Gerhard Ertl, Fritz-Haber-Institut, Berlin
Barry Everitt, U. of Cambridge
Ernst Fehr, U. of Zurich
Anne C. Ferguson-Smith, U. of Cambridge
Michael Feuer, The George Washington U.
Kate Fitzgerald, U. of Massachusetts
Peter Fratzl, Max-Planck Inst.
Elaïne Fuchs, Rockefeller U.
Daniel Geschwind, UCLA
Andrew Gewirth, U. of Illinois
Karl-Heinz Glassmeier, TU Braunschweig
Ramon Gonzalez, Rice U.
Julia R. Greer, Caltech
Elizabeth Grove, U. of Chicago
Nicolas Gruber, ETH Zurich
Kip Guy, St. Jude's Children's Research Hospital
Taekjip Ha, U. of Illinois at Urbana-Champaign
Christian Haass, Ludwig Maximilians U.
Steven Hahn, Fred Hutchinson Cancer Research Center
Michael Hasselmo, Boston U.
Martin Heimann, Max-Planck Inst. Jena
Yka Helariutta, U. of Cambridge
James A. Hendler, Rensselaer Polytechnic Inst.
Janet G. Hering, Swiss Fed. Inst. of Aquatic Science & Technology
Kai-Uwe Hinrichs, U. of Bremen
Kei Hirose, Tokyo Inst. of Technology
David Hodell, U. of Cambridge
David Holden, Imperial College
Lora Hooper, UT Southwestern Medical Ctr. at Dallas
Raymond Huey, U. of Washington
Steven Jacobsen, U. of California, Los Angeles
Kai Johnson, EPFL Lausanne
Peter Jonas, Inst. of Science & Technology (IST) Austria
Matt Kaerberlein, U. of Washington
William Kaelin Jr., Dana-Farber Cancer Inst.
Daniel Kahne, Harvard U.
Daniel Kammen, U. of California, Berkeley
Masashi Kawasaki, U. of Tokyo
Joel Kingsolver, U. of North Carolina at Chapel Hill
Robert Kingston, Harvard Medical School
Etienne Kochkin, Ecole Normale Supérieure
Alexander Kolodkin, Johns Hopkins U.
Alberto R. Kornblitt, U. of Buenos Aires
Leonid Kruglyak, UCLA
Thomas Langer, U. of Cologne
Mitchell A. Lazar, U. of Pennsylvania
David Lazer, Harvard U.
Thomas Lecuit, IBM
Virginia Lee, U. of Pennsylvania
Stanley Lemon, U. of North Carolina at Chapel Hill
Ottoline Leyser, Cambridge U.
Marcia C. Linn, U. of California, Berkeley
Jianguo Liu, Michigan State U.
Luis Liz-Marzan, CIC bioMaGUNE
Jonathan Losos, Harvard U.
Ke Lu, Chinese Acad. of Sciences
Christian Lüscher, U. of Geneva
Laura Machesky, CRUK Beatson Inst. for Cancer Research
Aime Magurran, U. of St. Andrews
Oscar Marin, CSIC & U. Miguel Hernández
Charles Marshall, U. of California, Berkeley
C. Robertson McClung, Dartmouth College
Graham Medley, U. of Warwick
Yasushi Miyashita, U. of Tokyo
Mary Ann Moran, U. of Edinburgh
Richard Morris, U. of Edinburgh
Alison Møntsgaard-Reif, NC State U. (\$) **\$**
Sean Munro, MRC U. of Molecular Biology
Thomas Murray, The Hastings Center
James Nelson, Stanford U. School of Med.
Daniel Neumar, U. of California, Berkeley
Timothy W. Nilsen, Case Western Reserve U.
Pär Nordlund, Karolinska Inst.
Heiga Novotny, European Research Advisory Board
Ben Oken, MIT
Jose Olsenstein, U. of California Berkeley & Lawrence Berkeley National Lab
Harry Orr, U. of Minnesota
Andrew Oswald, U. of Warwick
Steve Palumbi, Stanford U.
Jane Parker, Max-Planck Inst. of Plant Breeding Research
Giovanni Parmigiani, Dana-Farber Cancer Inst. (\$) **\$**
Donald R. Paul, U. of Texas, Austin
John H. J. Petrini, Memorial Sloan-Kettering Cancer Center
Joshua Plotkin, U. of Pennsylvania
Alfred Polman, FOM Institute AMOLF
Philippe Poulin, CNRS
Jonathan Pritchard, Stanford U.
David Randall, Colorado State U.
Colin Renfrew, U. of Cambridge
Felix Rey, Institut Pasteur
Trevor Robbins, U. of Cambridge
Jim Roberts, Fred Hutchinson Cancer Research Ctr.
Barbara A. Romanowicz, U. of California, Berkeley
Jens Rostrup-Nielsen, Haldor Topsøe
Mike Ryan, U. of Texas, Austin
Mitsunori Saitou, Kyoto U.
Shimon Sakaguchi, Kyoto U.
Miquel Salmeron, Lawrence Berkeley National Lab
Jürgen Sandkühler, Medical U. of Vienna
Alexander Schier, Harvard U.
Randy Seeley, U. of Cincinnati
Vladimir Shalaev, Purdue U.
Robert Siliciano, Johns Hopkins School of Medicine
Joseph Silk, Institut d'Astrophysique de Paris
Dennis Simon, Arizona State U.
Alison Smith, John Innes Centre
Richard Smith, U. of North Carolina (\$) **\$**
John Speakman, U. of Aberdeen
Allan C. Spradling, Carnegie Institution of Washington
Jonathan Sprent, Garvan Inst. of Medical Research
Eric Steig, U. of Washington
Paula Stephan, Georgia State U. and National Bureau of Economic Research
Molly Stevens, Imperial College London
V. S. Subrahmanian, U. of Maryland
Ira Tabas, Columbia U.
Sarah Teichmann, Cambridge U.
John Thomas, North Carolina State U.
Shubha Tole, Tata Institute of Fundamental Research
Christopher Tyler-Smith, The Wellcome Trust Sanger Institute
Herbert Virgin, Washington U.
BERT Vogelstein, Johns Hopkins U.
Cynthia Volkert, U. of Göttingen
Douglas Wallace, Dalhousie U.
David Wallace, Weizmann Inst. of Science
Ian Walsmsley, U. of Oxford
David A. Warde, Swedish U. of Agric. Sciences
David Waxman, Fudan U.
Jonathan Weissman, U. of California, San Francisco
Chris Wikle, U. of Missouri (\$) **\$**
Ian A. Wilson, The Scripps Res. Inst. (\$) **\$**
Timothy D. Wilson, U. of Virginia
Rosemary Wyse, Johns Hopkins U.
Jan Zaenen, Leiden U.
Kenneth Zarek, U. of Pennsylvania School of Medicine
Jonathan Zehr, U. of California, Santa Cruz
Len Zon, Children's Hospital Boston
Maria Zuber, MIT

BOOK REVIEW BOARD

David Bloom, Harvard U. Samuel Bowring, MIT, Angela Creager, Princeton U., Richard Swedner, U. of Chicago, Ed Wasserman, DuPont