



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, Keith T. Smith, Sacha Vignier **ASSOCIATE BOOK REVIEW EDITOR** Valerie B. Thompson **ASSOCIATE LETTERS EDITOR** Jennifer Sills **CHIEF CONTENT PRODUCTION EDITOR** Cara Tate **SR. CONTENT PRODUCTION EDITORS** Harry Jack, Lauren Kmec **CONTENT PRODUCTION EDITORS** Jeffrey E. Cook, Chris Filiatreau, Cynthia Howe, Barbara P. Ordway, Catherine Wolner **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-Touya Maye Flood, Shannon McMahon, Scott Miller, Jerry Richardson, Rachel Roberts(UK), Alice Whaley(UK), Brian White **EXECUTIVE ASSISTANT** Anna Bashkurova **ADMINISTRATIVE SUPPORT** Janet Clements(UK), Lizanne Newton(UK), Maryrose Madrid, Laura-Nadine Schuhmacher (UK, Intern), Alix Welch (Intern), 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 EDITOR** Martin Enserink(Europe) **SR. CORRESPONDENTS** Jeffrey Mervis, Elizabeth Pennisi **NEWS WRITERS** Adrian Cho, Jon Cohen, Jennifer Couzin-Frankel, Carolyn Gramling, Eric Hand, Jocelyn Kaiser, Catherine Maticic, Kelly Servick, Robert F. Service, Erik Stokstad(Cambridge, UK), Emily Underwood **INTERNS** Hanae Armitage, Nala Rogers **CONTRIBUTING CORRESPONDENTS** Michael Balter(Paris), John Bohannon, Ann Gibbons, Mara Hivendahl, Sam Kean, Eli Kintisch, Kai Kupferschmidt(Berlin), Andrew Lawler, Christina Larson(Beijing), Mitch Leslie, Charles C. Mann, Eliot Marshall, Virginia Morell, Dennis Normile(Shanghai), Heather Pringle, Tania Rabesandratana(London), Gretchen Vogel(Berlin), Lizzie Wade(Mexico City) **CAREERS** Donisha Adams, Rachel Bernstein(Editor) **COPY EDITORS** Julia Cole, Dorie Chevlen, Jennifer Levin (Chief) **ADMINISTRATIVE SUPPORT** Jessica Williams

Executive Publisher Rush D. Holt

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

BUSINESS OPERATIONS AND PORTFOLIO MANAGEMENT DIRECTOR Sarah Whalen **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 **FINANCIAL ANALYST** Robert Clark **RIGHTS AND PERMISSIONS ASSISTANT DIRECTOR** Emilie Dade **PERMISSIONS ASSOCIATE** Elizabeth Sandler **RIGHTS, CONTRACTS, AND LICENSING ASSOCIATE** Lili Kiser

MARKETING DIRECTOR Elise Swinehart **ASSOCIATE DIRECTOR OF ACQUISITION AND RETENTION** Julianne Wielga **MARKETING ASSOCIATE** Elizabeth Sattler **SR. MARKETING EXECUTIVE** Jennifer Reeves **ASSOCIATE DIRECTOR, CREATIVE SERVICES** Tzeitel Sorrosa **ART ASSOCIATE** Seil Lee **JR. ART ASSOCIATE** Kim Huynh **ASSISTANT COMMERCIAL EDITOR** Selby Frame **MARKETING PROJECT MANAGER** Angelissa McArthur **PROGRAM DIRECTOR, AAAS MEMBER CENTRAL** Peggy Mihelich **FULFILLMENT SYSTEMS AND OPERATIONS** membership@aaas.org **MANAGER, MEMBER SERVICES** Pat Butler **SPECIALISTS** Terrance Morrison, Latasha Russell **MANAGER, DATA ENTRY** Mickie Napoleoni **DATA ENTRY SPECIALISTS** Brenden Aquilino, Fiona Giblin

DIRECTOR, SITE LICENSING Tom Ryan **DIRECTOR, CORPORATE RELATIONS** Eileen Bernadette Moran **SR. PUBLISHER RELATIONS SPECIALIST** Kiki Forsyth **PUBLISHER RELATIONS MANAGER** Catherine Holland **PUBLISHER RELATIONS, EASTERN REGION** Keith Layson **PUBLISHER RELATIONS, WESTERN REGION** Ryan Rexroth **SALES RESEARCH COORDINATOR** Aiesha Marshall **MANAGER, SITE LICENSE OPERATIONS** Iqoo Edim **SENIOR PRODUCTION SPECIALIST** Robert Koepke **SENIOR OPERATIONS ANALYST** Lana Guz **FULFILLMENT ANALYST** Judy Lillibridge **ASSOCIATE DIRECTOR, MARKETING** Christina Schlecht **MARKETING ASSOCIATES** Thomas Landreth, Isa Sesay-Bah

WEB TECHNOLOGIES SR. DEVELOPER Chris Coleman **DEVELOPERS** Dan Berger, Jimmy Marks, Ryan Jensen **SR. PROJECT MANAGER** Trista Smith

MULTIMEDIA DIRECTOR OF SOCIAL MEDIA Enrique Gonzales **SR. WEB PRODUCER** Sarah Crespi **WEB PRODUCER** Alison Crawford **VIDEO PRODUCER** Nguyen Nguyen **ANALYTICS PRODUCER** Brice Russ

DIRECTOR OF OPERATIONS PRINT AND ONLINE Elizabeth Harman **DESIGN/PRINT STRATEGY MANAGER** Jason Hillman **QUALITY TECHNICAL MANAGER** Marcus Spiegel **PROJECT ACCOUNT MANAGER** Tara Kelly **DIGITAL PRODUCTION MANAGER** Lisa Stanford **ASSISTANT MANAGER DIGITAL/PRINT** Rebecca Doshi **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 DESIGNER** Garvin Grullón **DESIGNER** Chrystal Smith **GRAPHICS MANAGING EDITOR** Alberto Cuadra **SENIOR SCIENTIFIC ILLUSTRATORS** Chris Bickel, Katharine Sutliff **SCIENTIFIC ILLUSTRATOR** Valerie Altounian **SENIOR ART ASSOCIATES** Holly Bishop, Nathalie Cary, Preston Huey **SENIOR PHOTO EDITOR** William Douthitt **PHOTO EDITORS** Leslie Blizard, Christy Steele

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 Sawyer: 202-326-7061 **science_advertising@aaas.org** **ADVERTISING MARKETING ASSOCIATE** Javia Flemings **ADVERTISING SUPPORT MANAGER** Karen Foote: 202-326-6740 **ADVERTISING PRODUCTION OPERATIONS MANAGER** Deborah Tompkins **SR. PRODUCTION SPECIALIST/GRAPHIC DESIGNER** Amy Hardcastle **SR. TRAFFIC ASSOCIATE** Christine Hall **SALES COORDINATOR** Shirley Young **ASSOCIATE DIRECTOR, COLLABORATION, CUSTOM PUBLICATIONS/CHINA/TAIWAN/KOREA/SINGAPORE** Ruelie Wu: +86-186 0082 9345, rwu@aaas.org **COLLABORATION/CUSTOM PUBLICATIONS/JAPAN** Adarsh Sandhu + 81532-81-5142 asandhu@aaas.org **EAST COAST/E. CANADA** Laurie Faraday: 508-747-9395, FAX 507-8189 **WEST COAST/W. CANADA** Lynne Stickrod: 415-931-9782, FAX 415-520-6940 **MIDWEST** Jeffrey Dembksi: 847-498-4520 x3005, Steven Loerch: 847-498-4520 x3006 **UK EUROPE/ASIA** Roger Goncalves: TEL/FAX +41 43 243 1358 **JAPAN** Katsuyoshi Fukamizu(Tokyo): +81-3-3219-5777 kfukamizu@aaas.org **CHINA/TAIWAN** Ruelie Wu: +86-186 0082 9345, rwu@aaas.org

WORLDWIDE ASSOCIATE DIRECTOR OF SCIENCE CAREERS Tracy Holmes: +44 (0) 1223 326525, FAX +44 (0) 1223 326532 tholmes@science-int.co.uk **CLASSIFIED** advertises@sciencecareers.org **U.S. SALES** Tina Burks: 202-326-6577 **Nancy Toema**: 202-326-6578 **EUROPE/ROW SALES** Sarah Lelarge **SALES ASSISTANT** Kelly Grace **Japan** Hirayuki Mashiki(Kyoto): +81-75-823-1109 hmashiki@aaas.org **CHINA/TAIWAN** Ruelie Wu: +86-186 0082 9345 rwu@aaas.org **MARKETING MANAGER** Allison Pritchard **MARKETING ASSOCIATE** Aimee Aponte

AAAS BOARD OF DIRECTORS **RETIRING PRESIDENT, CHAIR** Gerald R. Fink **PRESIDENT** Geraldine (Geri) Richmond **PRESIDENT-ELECT** Barbara A. Schaal **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 202-326-6730 **REPRINTS:** Author Inquiries 800-635-7181 **COMMERCIAL INQUIRIES** 803-359-4578 **PERMISSIONS** 202-326-6276-6765, permissions@aaas.org **AAAS Member Services** 202-326-6417 or http://membercentral.aaas.org/discouints

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

Robert H. Grubbs, California Institute of Technology, Gary King, Harvard University
Susan M. Rosenberg, Baylor College of Medicine, Ali Shihatifard, Northwestern University
Feinberg School of Medicine, Michael S. Turner, U. of Chicago

BOARD OF REVIEWING EDITORS (Statistics board members indicated with S)

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
Clare Avesalom, U. of Chicago
David Baker, University of Cambridge
Jordi Bascompte, University of Zurich
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.
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 (S)
Christian Büchel, U. Hamburg-Eppendorf
Joseph A. Burns, Cornell U.
Carter Tribley Butts, U. of California, Irvine
Gyorgy Buzsáki, New York U. School of Medicine
Bianche Capel, Duke U.
Mats Carlsson, U. of Oslo
Ib Chorkendorff, U. of Denmark
David Clapham, Children's Hospital Boston
Joel Cohen, Rockefeller U., Columbia U.
James J. Collins, MIT
Robert Cook-Deegan, Duke U.
Lisa Coussens, Oregon Health & Science 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 Desplan, New York U.
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
William Dunphy, Caltech
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.
Toren Finkel, NHLBI, NIH
Kate Fitzgerald, U. of Massachusetts
Peter Fratzl, Max-Planck Inst.
Elaine Fuchs, Rockefeller U.
Daniel Geschwind, UCLA
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.
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
David Hodell, U. of Cambridge
David Holden, Imperial College
Lora Hooper, UT Southwestern Medical Ctr. at Dallas
Tamas Horvath, Yale University
Raymond Huey, U. of Washington
Auke Ijspeert, EPFL Lausanne
Steven Jacobsen, U. of California, Los Angeles
Stephen Jackson, U. of Arizona
Kai Jonsson, EPFL Lausanne
Peter Jonas, Inst. of Science & Technology (IST) Austria
Matt Kaeblerlein, 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
V. Naray Kim, Seoul National U.
Joel Kingsolver, U. of North Carolina at Chapel Hill
Robert Kingston, Harvard Medical School
Etienne Kochkin, Ecole Normale Supérieure
Alexander Kolodkin, Johns Hopkins U.

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.
Wendell Lim, U.C. San Francisco
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 Bealson Inst. for Cancer Research
Anne 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
Tom Misteli, NCI
Yasushi Miyashita, U. of Tokyo
Mary Ann Moran, U. of Georgia
Richard Morris, U. of Edinburgh
Alison Murray-Reif, NC State U. (S)
Thomas Murray, The Hastings Center
Daniel Neumar, U. of California, Berkeley
Kitty Nijmeijer, U. of Twente
Pär Nordlund, Karolinska Inst.
Hela Nowotny, European Research Advisory Board
Ben Olsen, MIT
Joe Orenstein, 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. (S)
John H. J. Petrini, Memorial Sloan-Kettering Cancer Center
Samuel Pfaff, Saik Institute for Biological Studies
Joshua Plotkin, U. of Pennsylvania
Albert Polman, FOM Institute AMOLF
Philippe Poulin, CNRS
Jonathan Pritchard, Stanford U.
David Randall, Colorado State U.
Felix Rey, Institut Pasteur
Trevor Robbins, U. of Cambridge
Jim Roberts, Fred Hutchinson Cancer Research Ctr.
Barbara A. Romanowich, U. of California, Berkeley
Amy Rosenzweig, Northwestern University
Mike Ryan, U. of Texas, Austin
Mitsunori Sakata, Kyoto U.
Shimon Sakauchi, Kyoto U.
Miquel Salmeron, Lawrence Berkeley National Lab
Jürgen Sandkühner, Medical U. of Vienna
Alexander Schier, Harvard U.
Vladimir Shalaev, Purdue U.
Robert Siliciano, Johns Hopkins School of Medicine
Denis Simon, Arizona State U.
Uri Simonsohn, U. of Pennsylvania
Alison Smith, John Innes Centre
Richard Smith, U. of North Carolina (S)
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 Inst.
Herbert Virgin, Washington U.
Bert Vogelstein, Johns Hopkins U.
Cynthia Volkert, U. of Göttingen
Douglas Wallace, Dalhousie U.
David Wallace, Weizmann Inst. of Science
Ivan Walmsey, U. of Oxford
Jane-Ling Wang, U. of California, Davis
David A. Wardle, Swedish U. of Agric. Sciences
David Waxman, Fudan U.
Jonathan Weissman, U. of California, San Francisco
Chris Wikle, U. of Missouri (S)
Ian A. Wilson, The Scripps Res. Inst. (S)
Timothy D. Wilson, U. of Virginia
Rosemary Wyse, Johns Hopkins U.
Jan Zaenen, Leiden U.
Kenneth Zaret, U. of Pennsylvania School of Medicine
Jonathan Zehr, U. of California, Santa Cruz
Len Zou, 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