

An international journal devoted to basic research into how plants function, ranging from the molecular to the cellular to the whole plant levels, and including the interactions of plants with their biotic and abiotic environments.

Editor-in-Chief

Donald R. Ort
USDA/ARS Urbana, IL, USA

Associate Editors

Bonnie Bartel Houston, TX, USA
Alan M. Jones Chapel Hill, NC, USA
Richard M. Amasino Madison, WI, USA
Julia Bailey-Serres Riverside, CA, USA
C. Robin Buell East Lansing, MI, USA
Sheila McCormick Berkeley, CA, USA
Andreas P.M. Weber Düsseldorf, Germany
Susanne von Caemmerer Canberra City, ACT, Australia
Corné M.J. Pieterse Utrecht, The Netherlands
Jiming Jiang Madison, WI, USA

Research Area and Sections

Signal Transduction and Hormone Action
 Cell Biology
 Development and Hormone Action
 Environmental Stress and Adaptation to Stress
 Bioinformatics, Breakthrough Technologies, and Genome Analysis
 Systems Biology, Molecular Biology, and Gene Regulation
 Genetics, Genomics, and Molecular Evolution
 Biochemical Processes and Macromolecular Structures
 Plants Interacting with Other Organisms
 Bioenergetics and Photosynthesis
 Whole Plant and Ecophysiology

International Board of Monitoring Editors

Lisa Ainsworth
Urbana-Champaign, IL, USA
Antony Bacic
Parkville, VIC, Australia
Neil R. Baker
Essex, UK
Malcolm J. Bennett
Nottingham, UK
Daniel R. Bush
Fort Collins, CO, USA
Joe Chappell
Lexington, KY, USA
Alice Y. Cheung
Amherst, MA, USA
Tzzy-Jen Chiou
Taipei, Taiwan
Vitaly Citovsky
Stony Brook, NY, USA
Hervé Cochard
Clermont-Ferrand, France
Allison DeLong
Providence, RI, USA
Karl-Josef Dietz
Bielefeld, Germany
Jeffrey J. Doyle
Ithaca, NY, USA
Robert Edwards
Durham, UK
John R. Evans
Canberra, ACT, Australia
Jennifer Fletcher
Albany, CA, USA
Peter Geigenberger
Munich, Germany
Thomas Girke
Riverside, CA, USA
Zhizhong Gong
Beijing, China
Stacey Harmer
Davis, CA, USA
Martha C. Hawes
Tucson, AZ, USA
Luis R. Herrera-Estrella
Irapuato, Mexico
Gregg A. Howe
East Lansing, MI, USA
Elizabeth Kellogg
St. Louis, MO, USA
Anthony Kinney
Wilmington, DE, USA
Leon Kochian
Ithaca, NY, USA
Joachim Kopka
Golm, Germany
Amane Makino
Sendai, Japan
Susan Martino-Catt
St. Louis, MO, USA
Maureen McCann
West Lafayette, IN, USA

Scott D. Michaels
Bloomington, IN, USA
Ron Mittler
Denton, TX, USA
Ferenc Nagy
Szeged, Hungary
Graham Noctor
Paris, France
Ralph Panstruga
Cologne, Germany
Marinus Pilon
Fort Collins, CO, USA
Anireddy S.N. Reddy
Fort Collins, CO, USA
Silke Robatzek
Norwich, UK
Jocelyn K.C. Rose
Ithaca, NY, USA
Wataru Sakamoto
Kurashiki, Japan
Eric Schaller
Hanover, NH, USA
Ron R. Sederoff
Raleigh, NC, USA
Motoaki Seki
Yokohama, Japan
Leslie E. Sieburth
Salt Lake City, UT, USA
Neelima Sinha
Davis, CA, USA

Nathan M. Springer
St. Paul, MN, USA
Dina A. St. Clair
Davis, CA, USA
Julie M. Stone
Lincoln, NE, USA
Lloyd W. Sumner
Ardmore, OK, USA
Dan Szymanski
West Lafayette, IN, USA
Keiko U. Torii
Seattle, WA, USA
Yi-Fang Tsay
Taipei, Taiwan
Carroll P. Vance
St. Paul, MN, USA
Guo-Liang Wang
Columbus, OH, USA
Astrid Wingler
London, UK
Eleanore T. Wurtzel
Bronx, NY, USA
Hong-Wei Xue
Shanghai, China
Shaul Yalovsky
Tel Aviv, Israel
Jürgen Zeier
Düsseldorf, Germany

Publisher

American Society of Plant Biologists,
Crispin Taylor, Executive Director; ctaylor@aspb.org

Publications Director

Nancy A. Winchester; nancyw@aspb.org

Managing Editor

Patti Lockhart; plockhart@aspb.org

Science Writer

Peter V. Minorsky; peminorsky@aspb.org

Production Manager

Jon Munn; jmunn@aspb.org

Manuscript Manager

Leslie Ash Csikos; lcsikos@aspb.org



Plant Physiology® (ISSN 0032-0889, online 1532-2548) is published monthly, in three volumes per year, by the American Society of Plant Biologists, 15501 Monona Drive, Rockville, MD 20855-2768, USA, and is produced by Dartmouth Journal Services, Waterbury, VT. The institutional price for the print and online versions is based on type of institution; contact institution@aspb.org. A subscription includes both *The Plant Cell* and *Plant Physiology*®; single copies may be purchased for \$95 each plus shipping. Members of the American Society of Plant Biologists receive free online access to the journal and may subscribe to the print version of *Plant Physiology*® for \$210. Nonmember individuals may subscribe for \$400. For matters regarding subscriptions, contact Suzanne Cholwek, 15501 Monona Drive, Rockville, MD 20855-2768; telephone 301-296-0926; fax 301-251-6740; e-mail scholwek@aspb.org. Notify ASPB within 3 months (domestic) or 6 months (foreign) of issue date, and defective copies or copies lost in the mail will be replaced. Send all inquiries regarding display advertising to: FASEB AdNet, 9650 Rockville Pike, Bethesda, MD 20814-3998; telephone 301-634-7791; fax 301-634-7153; e-mail adnet@faseb.org. Periodicals postage paid at Rockville, MD 20850, and at additional mailing offices. **Postmaster:** Send address changes to *Plant Physiology*®, American Society of Plant Biologists, 15501 Monona Drive, Rockville, MD 20855-2768. The online version of *Plant Physiology*® is available at www.plantphysiol.org. **Permission to Reprint:** Permission to make digital or hard copies of part or all of a work published in *Plant Physiology*® is granted without fee for personal or classroom use provided that copies are not made or distributed for profit or commercial advantage and that copies bear the full citation and the following notice on the first page: "Copyright American Society of Plant Biologists." For all other kinds of copying, request permission in writing from Nancy A. Winchester, Publications Director, ASPB headquarters.

© 2011 American Society of Plant Biologists. All rights reserved. Printed on acid-free paper. Printed in the USA.