

An international journal devoted to basic research into the origins, development, and function of plants from the molecular to the whole organism and their interactions within the biotic and abiotic environment.

Editor-in-Chief

Michael R. Blatt
Glasgow, UK

Associate Editors

Julian Hibberd Cambridge, UK
Gerhard Thiel Darmstadt, Germany
Alice Cheung Amherst, MA, USA
Hong Ma Shanghai, China
Jiming Jiang Madison, WI, USA
Graham Farquhar Canberra, Australia
Anna Amtmann Glasgow, UK
Teun Munnik Amsterdam, The Netherlands
Yair Shachar-Hill East Lansing, MI, USA
Dr. Julia Bailey-Serres Riverside, CA, USA

Research Area and Sections

Biochemistry and Metabolism
 Breakthrough Technologies
 Cell Biology
 Genes, Development, and Evolution

Ecophysiology and Sustainability
 Membranes, Transport, and Biophysics
 Signaling and Response
 Systems and Synthetic Biology
 Reviews

International Board of Monitoring Editors

Lisa Ainsworth
Urbana-Champaign, IL, USA

Anja Geitmann
Montréal, Canada

Thomas Girke
Riverside, CA, USA

Zhizhong Gong
Beijing, China

Kim Hammond-Kosack
Rothamsted, UK

Matthew Hannah
Brussels, Belgium

Stacey Harmer
Davis, CA, USA

Klaus Harter
Tuebingen, Germany

Gregg A. Howe
East Lansing, MI, USA

Ning Jiang
East Lansing, MI, USA

Elizabeth Kellogg
St. Louis, MO, USA

Anthony Kinney
Wilmington, DE, USA

Leon Kochian
Ithaca, NY, USA

Joachim Kopka
Golm, Germany

Cris Kuhlemeier
Bern, Switzerland

Frans Maathuis
York, UK

Tony Miller
Norwich, UK

Ron Mittler
Denton, TX, USA

Ferenc Nagy
Szeged, Hungary

Jennifer Nemhauser
Seattle, WA, USA

Graham Noctor
Paris, France

Ralph Panstruga
Aachen, Germany

Eran Pichersky
Ann Arbor, MI, USA

Ronald Pierik
Utrecht, The Netherlands

Sue Rhee
Stanford, CA, USA

Silke Robatzek
Norwich, UK

Jocelyn K.C. Rose
Ithaca, NY, USA

Alexander Ruban
London, UK

Wataru Sakamoto
Okayama, Japan

Eric Schaller
Hanover, NH, USA

Ron R. Sederoff
Raleigh, NC, USA

Motoaki Seki
Yokohama, Japan

Shin-Han Shiu
East Lansing, MI, USA

Neelima Sinha
Davis, CA, USA

Alison Smith
Cambridge, UK

Laurie Smith
La Jolla, CA, USA

Julie M. Stone
Lincoln, NE, USA

Dan Szymanski
West Lafayette, IN, USA

Keiko U. Torii
Seattle, WA, USA

Yi-Fang Tsay
Taipei, Taiwan

Doris Wagner
Philadelphia, PA, USA

Elsbeth Walker
Amherst, MA, 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
Duesseldorf, 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; plochhart@aspb.org

PA to Editor-in-Chief

Claire Osborne; Claire.Osborne@glasgow.ac.uk

Science Writer

Peter V. Minorsky; peminorsky@aspb.org

Production Manager

Jon Munn; jmunn@aspb.org

Manuscript Manager

Ashton Wolf; awolf@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 \$40 each, plus \$10 shipping (U.S.) or \$12 (outside U.S.). Members of the American Society of Plant Biologists may subscribe to *Plant Physiology*® for \$265. Nonmember individuals may subscribe for \$525. Students may subscribe for \$190. 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.

© 2014 American Society of Plant Biologists. All rights reserved. Printed on acid-free paper. Printed in the USA.