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

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
Tzyy-Jen Chiu
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 Geisenberger
Münich, 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. Howie
East Lansing, MI, USA
Georg Jander
Ithaca, NY, USA
Jiming Jiang
Madison, WI, USA
Elizabeth Kellogg
St. Louis, MO, USA
Anthony Kinney
Wilmingtom, 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
Graham Noctor
Paris, France
Ralph Panstruga
Cologne, Germany
Marinus Pilou
Fort Collins, CO, USA
Anreddy S.N. Reddy
Fort Collins, CO, USA
Silke Robatzek
Norwich, UK
Jocelyn K.C. Rose
Ithaca, NY, USA
Wataru Sakamoto
Kurashiki, Japan
David E. Salt
West Lafayette, IN, 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
Lloyd W. Sumner
Ardmore, OK, USA
Dan Szymanski
West Lafayette, IN, USA
Keiko U. Torii
Seattle, WA, USA
Carroll P. Vance
St. Paul, MN, USA
Guo-Liang Wang
Columbus, OH, USA
Astrid Wingler
London, UK
Eleanor T. Wurtzel
Brons, NY, USA
Shaú Yalovsky
Tel Aviv, Israel

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

PLANT PHYSIOLOGY®
January 2011 • Volume 155 • Number 1

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. Nonmembers 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 adnet@faseb.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. Copyright American Society of Plant Biologists. Permission to make digital or hard copies of part or all of any 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, permission request in writing is 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.