



Molecular & Cellular **PROTEOMICS**

PUBLISHED BY THE AMERICAN SOCIETY FOR BIOCHEMISTRY AND MOLECULAR BIOLOGY, INC.

Editor

Ralph A. Bradshaw
University of California, Irvine

Deputy Editor

Alma L. Burlingame
University of California, San Francisco

Associate Editors

Ruedi Aebersold, Systems Biology Institute, Seattle and Swiss Federal Institute of Technology, Zürich
Patricia C. Babbitt, University of California, San Francisco
Steven A. Carr, Broad Institute, Cambridge
Julio E. Celis, Institute of Cancer Biology and DCTB, Copenhagen
Raymond J. Deshaies, HHMI, California Institute of Technology, Pasadena
Kevan Shokat, University of California, San Francisco

Editorial Board Members

Ruben Abagyan
Natalie G. Ahn
Leigh Anderson
Philip Andrews
Roland S. Annan
Adam Arkin
Terri Attwood
Michael A. Baldwin
Bonnie L. Bassler
John J. M. Bergeron
Michael Blaber
Matthew Bogyo
Dolores Cahill
Brian Chait
Jyoti Choudhary
Fred E. Cohen
Benjamin F. Cravatt
Craig M. Crews
James De Voss
Michel Desjardins
Norman J. Dovichi
Stanley Fields
Minoru Fukuda
Bruce Futcher
James I. Garrels

Jeffrey J. Gorman
Gerald W. Hart
Preston Hensley
Denis F. Hochstrasser
Hubert Hondermarck
Ian J. Jacobs
Karl-Anders Karlsson
Randall Wharton King
Elizabeth A. Komives
John W. Kozarich
Rick Lathrop
Kong-Joo Lee
Hakon Leffler
Lance Liotta
Terry P. Lybrand
Matthias Mann
Katalin F. Medzihradzsky
Jeremy Minshull
Gaetano Montelione
Judith Murray-Rust
Takemichi Nakamura
Torben Ørntoft
Young-Ki Paik
Peter J. Parker
Rainer Pepperkok

Francine B. Perler
Eric M. Phizicky
Thierry Rabilloud
Carol V. Robinson
Peter Roepstorff
Andrej Sali
Ben Shen
Andrej Shevchenko
Kai Simons
A. Ian Smith
Michael Snyder
Kenneth G. Standing
John Stults
Shankar Subramaniam
Marc E. Surette
Pierre Thibault
Mike Tyers
Mathias Uhlen
Alain Van Dorsselaer
Marvin Vestal
Marc Vidal
Kenneth W. Walker
Michael Waterfield
Julian P. Whitelegge
Michael B. Yaffe

Editorial Consultant

David Eisenberg

Editorial Office

Barbara A. Gordon, *Director of Publications*
American Society for Biochemistry and
Molecular Biology
9650 Rockville Pike
Bethesda, MD 20814-3996
Phone: 301-634-7145
Fax: 301-634-7126
E-mail: mcp@asbmb.org

Office of the Editor

Erin A. Schalles, *Manager*
University of California, Irvine
Department of Physiology and Biophysics
346-D Medical Science I
Irvine, CA 92697-4560
Phone: 949-824-7173 Fax: 949-824-8036
E-mail: eschalles@asbmb.org

Office of the Deputy Editor

Candy Stoner, *Manager*
University of California, San Francisco
Department of Pharmaceutical Chemistry
San Francisco, CA 94143-0446
Phone: 415-476-5641
Fax: 415-476-0688
E-mail: cstoner@asbmb.org

Data Set Advisory Committee

Patricia C. Babbitt (Chair)
University of California, San Francisco
babbitt@cgl.ucsf.edu
Kenneth H. Buetow
NCI Center for Bioinformatics, NIH, Rockville
Karl Clauser
Millennium Pharmaceuticals, Cambridge
David J. Erle
University of California, San Francisco
Christine Hoogland
Swiss Institute of Bioinformatics, Geneva
Christopher Hogue
Samuel Lunenfeld Research Institute, Toronto
Kenneth C. Parker
Applied BioSystems, Framingham

Clinical Proteomics Advisory Committee

Julio E. Celis (Chair)
Institute of Cancer Biology and DCTB, Copenhagen
jec@cancer.dk
John A. Kessler
Northwestern University, Chicago
Murray Korc
University of California, Irvine
Jeffrey S. Ross
Millennium Pharmaceuticals, Cambridge
Richard J. Havel
University of California, San Francisco
Nils Br nner
Royal Veterinary and Agriculture University, Frederiksberg

GENERAL INFORMATION

This publication is available on-line at <http://www.mcponline.org>. Inquire about availability through your subscription agent or contact: MOLECULAR & CELLULAR PROTEOMICS, P.O. Box 830399, Birmingham, AL 35283-0399, U.S.A., Phone: 800-633-4931 or 205-995-1567, Fax: 205-995-1588.

Submit all manuscripts via the web to: www.mcponline.org/submit. All correspondence should be addressed to:

Editor, Molecular & Cellular Proteomics
9650 Rockville Pike
Bethesda, MD 20814, U.S.A.

Accepted manuscripts will be published with the implicit understanding that the author(s) will pay a charge per page. Current page charges may be obtained by contacting the MCP office. Under exceptional circumstances, when no source of grant or other support exists, the author(s) may apply, at the time of submission, for a grant-in-aid to Chairman, Publications Committee, American Society for Biochemistry and Molecular Biology, Inc., 9650 Rockville Pike, Bethesda, MD 20814. All such applications must be countersigned by an appropriate institutional official stating that no funds are available for page charges.

Queries on matters of general editorial policy should be directed to the Journal Editorial Office in Bethesda, telephone 301-634-7150; fax 301-634-7126; E-mail mcp@asbmb.org. *Molecular & Cellular Proteomics* publishes papers on a broad range of topics of interest to scientists working in the field of proteomics. The views expressed are those of the author(s) and not of *Molecular & Cellular Proteomics* or the American Society for Biochemistry and Molecular Biology.

Molecular & Cellular Proteomics is copyrighted by the American Society for Biochemistry and Molecular Biology, Inc. Reprographic copying beyond that permitted by Sections 107 or 108 of the U.S. Copyright Law is allowed, provided that the \$10.00 per-copy fee is paid through the Copyright Clearance Center, 222 Rosewood Drive, Dan-

vers, MA 01923. For those organizations that have been granted photocopy license by CCC, a separate system of payment has been arranged. The fee code for users of the Transactional Reporting Service is: 1535-9476/01 \$10.00. Reproduction of any portion of an article for subsequent republication requires permission of the copyright owner. Requests should be made in writing to the American Society for Biochemistry and Molecular Biology, Inc. Attn: Editorial Office, 9650 Rockville Pike, Bethesda, MD 20814, or mcp@asbmb.org and should include a statement of intended use as well as explicit specifications of the material to be reproduced. Non-profit educational institutions may photocopy multiple copies of articles for classroom use without payment of fees. All reproduction must utilize institutionally owned equipment for this purpose.

Address all correspondence and orders relative to subscriptions and back copies to: *Molecular & Cellular Proteomics*, P.O. Box 830399, Birmingham, AL 35283-0399, U.S.A., telephone 800-633-4931 or 205-995-1567. Subscriptions are entered on a calendar year basis only. Allow at least six weeks for address changes. Claims for replacement copies must be received within three months of the issue date.

Molecular & Cellular Proteomics (ISSN 1535-9476) is published monthly by the American Society for Biochemistry and Molecular Biology, Inc., 9650 Rockville Pike, Bethesda, MD 20814. Volume 3 for 2004: Institutions: United States, \$360.00; Foreign, \$400.00. Single copies of the Journal are \$30.00 plus shipping. (Note: Maryland and Canada add applicable taxes, unless a tax-exempt certificate number is shown.) The GST number for Canadian subscribers is 13037 0018 RT. C.P.C Int'l Pub Mail # 0060119. Periodicals postage pending at Bethesda, MD 20814, U.S.A. and at additional mailing offices. Printed in the U.S.A. Subscription rates for MCP Online are available at <http://www.mcponline.org>. POSTMASTER: Send address changes to *Molecular & Cellular Proteomics* at P.O. Box 830399, Birmingham, AL 35288-0399, U.S.A.