

# Biological Psychiatry

*A Journal of Psychiatric Neuroscience and Therapeutics*

## Editor

John H. Krystal, M.D.  
Yale University School of Medicine  
VA Connecticut Healthcare System  
West Haven, Connecticut

## Deputy Editors

Cameron S. Carter, M.D.  
Sacramento, California

Daniel Geschwind, M.D., Ph.D.  
Los Angeles, California

Hussein K. Manji, M.D., FRCP(C)  
Bethesda, Maryland

John S. March, M.D.  
Durham, North Carolina

Eric J. Nestler, M.D., Ph.D.  
Dallas, Texas

Jon-Kar Zubieta, M.D., Ph.D.  
Ann Arbor, Michigan

## Editorial Committee

Dennis S. Charney, M.D.  
New York, New York

David Goldman, M.D.  
Rockville, Maryland

René Hen, Ph.D.  
New York, New York

K. Ranga Rama Krishnan, M.D.  
Durham, North Carolina

## Ex Officio

Raquel E. Gur, M.D., Ph.D.

Jeffrey A. Lieberman, M.D.

Peter Roy-Byrne, M.D.

David R. Rubinow, M.D.

## Editorial Board

Stewart A. Anderson, M.D. New York, NY	Stephen V. Faraone, Ph.D. Syracuse, NY	George F. Koo, Ph.D. La Jolla, CA	Herbert Y. Meltzer, M.D. Nashville, TN	Peter Roy-Byrne, M.D. Seattle, WA
Nicholas Barden, Ph.D. Quebec, Canada	Robert Freedman, M.D. Denver, CO	K. Ranga Krishnan, M.D. Durham, NC	Kathleen R. Merikangas, Ph.D. Bethesda, MD	David R. Rubinow, M.D. Chapel Hill, NC
Samuel Barondes, M.D. San Francisco, CA	Karl J. Friston, M.B.B.S., M.A., MRCPsych London, United Kingdom	Andrew D. Krystal, M.D., M.S. Durham, NC	Andreas Meyer-Lindenberg, M.D., Ph.D. Mannheim, Germany	A. John Rush, M.D. Dallas, TX
Karen F. Berman, M.D. Bethesda, MD	John D. E. Gabrieli, Ph.D. Cambridge, MA	Ellen Leibenluft, M.D. Bethesda, MD	Emmanuel Mignot, M.D., Ph.D. Stanford, CA	Harold A. Sackeim, Ph.D. New York, NY
James Blair, Ph.D. Bethesda, MD	Joel Gelemtner, M.D. West Haven, CT	Douglas F. Levinson, M.D. Palo Alto, CA	Károly Mímics, M.D. Nashville, TN	Gerard Sanacora, M.D., Ph.D. New Haven, CT
David L. Braff, M.D. La Jolla, CA	Barbara Geller, M.D. St. Louis, MO	Pat R. Levitt, Ph.D. Nashville, TN	Lisa M. Monteggia, Ph.D. Dallas, TX	Alan F. Schatzberg, M.D. Stanford, CA
E. Sherwood Brown, M.D., Ph.D. Dallas, TX	Michael Gill, M.D., MRCPsych Dublin, Republic of Ireland	David A. Lewis, M.D. Pittsburgh, PA	Alexander Neumeister, M.D. West Haven, CT	Edward M. Scolnick, M.D. Cambridge, MA
Joseph R. Calabrese, M.D. Cleveland, OH	David Goldman, M.D. Rockville, MD	Israel Liberzon, M.D. Ann Arbor, MI	Charles P. O'Brien, M.D., Ph.D. Philadelphia, PA	Yavin Shaham, Ph.D. Baltimore, MD
William A. Carlezon, Jr., Ph.D. Belmont, MA	Elizabeth Gould, Ph.D. Princeton, NJ	Jeffrey A. Lieberman, M.D. New York, NY	Michael C. O'Donovan, Ph.D. Cardiff, United Kingdom	Larry J. Siever, M.D. Bronx, NY
Jonathan D. Cohen, M.D., Ph.D. Princeton, NJ	Anthony A. Grace, Ph.D. Pittsburgh, PA	Barbara K. Lipska, Ph.D. Bethesda, MD	Michael J. Owen, M.D., Ph.D. Cardiff, United Kingdom	Richard E. Straub, Ph.D. Bethesda, MD
Edwin H. Cook, Jr., M.D. Chicago, IL	Christian Grillon, Ph.D. Bethesda, MD	Robert C. Malenka, M.D., Ph.D. Palo Alto, CA	Daniel S. Pine, M.D. Bethesda, MD	Trey Sunderland, M.D. Bethesda, MD
Nick Craddock, M.D. Cardiff Wales, United Kingdom	Ralitz Gueorguieva, Ph.D. New Haven, CT	Stephen R. Marder, M.D. Los Angeles, CA	Judith L. Rapoport, M.D. Bethesda, MD	Laurence H. Tecott, M.D., Ph.D. San Francisco, CA
Richard J. Davidson, Ph.D. Madison, WI	Ahmad R. Hariri, Ph.D. Pittsburgh, PA	Athina Markou, Ph.D. La Jolla, CA	Scott L. Rauch, M.D. Charlestown, MA	Michael E. Thase, M.D. Philadelphia, PA
Michael Davis, Ph.D. Atlanta, GA	René Hen, Ph.D. New York, NY	Graeme F. Mason, Ph.D. New Haven, CT	Charles F. Reynolds, III, M.D. Pittsburgh, PA	Richard D. Todd, Ph.D., M.D. St. Louis, MO
Robert Desimone, M.D. Cambridge, MA	Robert B. Innis, M.D., Ph.D. Bethesda, MD	Christopher J. McDougale, M.D. Indianapolis, IN	Trevor W. Robbins, Ph.D. Cambridge, United Kingdom	Myma M. Weissman, Ph.D. New York, NY
Wayne C. Drevets, M.D. Bethesda, MD	Edward G. Jones, M.D., Ph.D. Davis, CA	Bruce S. McEwen, Ph.D. New York, NY	Jerrold F. Rosenbaum, M.D. Boston, MA	Rachel Yehuda, Ph.D. Bronx, NY
Ronald S. Duman, Ph.D. New Haven, CT	John R. Kelsoe, M.D. La Jolla, CA	Francis J. McMahon, M.D. Bethesda, MD	David R. Rosenberg, M.D. Detroit, MI	Takeo Yoshikawa, M.D., Ph.D. Saitama, Japan
Susan M. Essock, Ph.D. New York, NY	Joel E. Kleinman, M.D., Ph.D. Bethesda, MD	Michael J. Meaney, Ph.D. Montreal, Canada	Christopher A. Ross, M.D., Ph.D. Baltimore, MD	Elizabeth A. Young, M.D. Ann Arbor, MI

## Editorial Office

Department of Psychiatry  
The University of Texas  
Southwestern Medical Center  
6363 Forest Park Road, Suite 651  
Dallas, Texas 75235-5435 USA

Telephone: (214) 648-0880

Fax: (214) 648-0881

e-mail: [biol.psych@UTSouthwestern.edu](mailto:biol.psych@UTSouthwestern.edu)

[www.sobp.org/journal](http://www.sobp.org/journal)

**Managing Editor** Rhiannon M. Bugno  
**Publication Coordinator** Rosa Garces  
**Technical Editor** Rosemary McCandless

## Aims and Scope

This international rapid-publication journal is the official journal of the Society of Biological Psychiatry. It covers a broad range of topics in psychiatric neuroscience and therapeutics. Both basic and clinical contributions are encouraged from all disciplines and research areas relevant to the pathophysiology and treatment of major neuropsychiatric disorders. Novel results of original research, available in three formats of Archival, Research and Brief Reports, Commentaries and Correspondence judged to be of high impact to the field are published, particularly those addressing genetic and environmental risk factors, neural circuitry and neurochemistry, and important new therapeutic approaches. Concise Reviews and Editorials that focus on topics of current research and interest are also published rapidly.

## Founding Editor

Joseph Wortis, M.D., 1969-1992

## Editor Emeriti

Wagner H. Bridger, M.D., 1992-1997

Richard C. Josiassen, Ph.D., 1997

Dennis S. Charney, M.D., 1998-2006