

# Physiological Genomics®

**Editor-in-Chief:** BINA JOE

---

**Associate Editors:**

HILARY COLLER  
MICHAEL R. GARRETT  
JUSTIN GROBE  
LAUREN GERARD KOCH

MARTIN McBRIDE  
PATRICIA MUNROE  
SANDOSH PADMANABHAN  
LEAH SOLBERG WOODS

TIM WILTSHIRE  
COLIN YOUNG

---

**Consulting Editors:**

ANDREW S. GREENE  
MINGYU LIANG

---

**Editorial Board:**

AMY C. ARNOLD  
EUAN ASHLEY  
RADHA AYYAGARI  
MARCAS M. BAMMAN  
JATIN BURNISTON  
SAMANTHA BUTLER  
MICHAEL BUTTERWORTH  
JONATHAN CAVANAUGH  
FADI CHARCHAR  
QIN M. CHEN  
DAN CRONA  
PANOS DELOUKAS  
MARCEL DEN HOED  
MICHELLE DIGMAN  
PETER DORIS  
YUMEI FENG  
PATRICK FUEGER  
ERIC GEORGE  
DYLAN GLUBB  
PERCIO GULKO  
VICTOR GURYEV

DAN HERTZ  
PAAVO HONKAKOSKI  
MICHAEL HULTSTRÖM  
MAJA JAGODIC  
YALDA JAMSHIDI  
ANDREW D. JOHNSON  
MARTIN KENNEDY  
TUOMAS OSKARI KILPELÄINEN  
DAVID KISOR  
RON KORSTANJE  
ERIC G. KRAUSE  
ALISON KRIEDEL  
KATE LAWRENSEN  
HEATHER LAWSON  
ERIC LAZARTIGUES  
JOHN McCARTHY  
JOHN D. McCLURE  
CRISTINA MENNI  
BORBALA MIFSUD  
MANI MUDALIAR  
SWAPAN NATH  
MIKKO NIEMI

KAILASH N. PANDEY  
FRANK PARK  
BRIAN PARKS  
BOGDAN PASANIUC  
MINOLI PERRERA  
TUOMO RANKINEN  
R. SCOTT RECTOR  
RICHARD ROMAN  
UTE I. SCHOLL  
ANDREW J. P. SMITH  
PERNILLA STRIDH  
YASUHARU TABARA  
JOHN THYFAULT  
ANDREW TINKER  
GEORGE TRACHTÉ  
ANA M. VALDES  
RICHARD D. WAINFORD  
ULRIK WISLØFF  
ROY WOLLMAN  
ALEXANDER ZAMBON  
JUDITH ZAUGG  
JASENKA ZUBCEVIC

---

**Publications Committee**

C. D. SIGMUND, *Chair*  
C. E. CARR  
D. ELLISON  
A. S. GREENE  
P. A. INSEL  
L. K. ROGERS  
L. WOLD

**Ex officio**

D. BROWN, *President*  
J. M. SANDS, *President-Elect*  
J. F. RECKELHOFF, *Past President*  
M. FRANK, *Executive Director*  
R. SCHEMAN,  
*Director of Publications  
and Executive Editor*

A. E. COX  
*Editorial Manager*  
P. CHOE  
*Journal Copy Editor*

---

*Physiological Genomics* (ISSN-1094-8341) is published by the American Physiological Society, 9650 Rockville Pike, Bethesda, MD 20814-3991. *Physiological Genomics* is published online at <http://physiolgenomics.physiology.org> (ISSN-1531-2267). *Subscription Prices:* Institutions (online only): see [http://bit.ly/aps\\_institution\\_pricing](http://bit.ly/aps_institution_pricing). Nonmember individuals (online only): \$285. APS members: online is free. Subscriptions from outside the United States are payable in US currency or full equivalent. Subscriptions are accepted on a calendar-year basis only. *Print back issues* through 10/2010: Subscriber, \$65 each; Nonsubscriber, \$130 each. Periodicals postage paid at Bethesda, MD, and at additional mailing offices. POSTMAS-

TER: Send address changes to Physiological Genomics, 9650 Rockville Pike, Bethesda, MD 20814-3991.

*Physiological Genomics*® is a registered trademark of the American Physiological Society.

Copyright © 2017 by the American Physiological Society. Printed in the United States of America by Cadmus Communications—Lancaster Division, Lancaster, PA 17601. The code at the bottom of the first page of an article indicates the copyright owner's consent that copies of that article may be made beyond that permitted by sections 107 and 108 of the US Copyright Law—unless the copies are for general distribution, for advertising, for creating new works, or for resale—provided the

per-copy fee is paid through the Copyright Clearance Center, Inc., 222 Rosewood Dr., Danvers, MA 01923.

*Editorial and Business Correspondence:* Physiological Genomics, 9650 Rockville Pike, Bethesda, MD 20814-3991.

**Disclaimer:** The statements and opinions contained in the articles of *Physiological Genomics* are solely those of the individual authors and contributors and not of the American Physiological Society. The appearance of advertisements in the journal is not a warranty, endorsement, or approval of the products or their safety. The American Physiological Society disclaims responsibility for any injury to persons or property resulting from any ideas or products referred to in any article or advertisement.