

CANCER PREVENTION RESEARCH

The Forefront of Prevention Science

AN OFFICIAL JOURNAL OF THE **AACR** American Association
for Cancer Research



Editor-in-Chief

Raymond N. DuBois



Editor-in-Chief

Michael N. Pollak

Special Advisors to the Editors-in-Chief

Elizabeth H. Blackburn
Ronald M. Evans
William N. Hait

Deputy Editors

Marcia R. Cruz-Correa
Ernest T. Hawk
Avrum Spira
Eva Szabo
Timothy C. Wang

Senior Editors

Adriana Albini
Powel H. Brown
Jack Cuzick
Andrew J. Dannenberg
Zigang Dong
Marc Gunter
Mark Hull
Daehee Kang
Thomas W. Kensler
Lawrence J. Marnett
David Sidransky
Ignacio I. Wistuba

Statistical Editor

J. Jack Lee

Editorial Staff

Associate Editor

Jing Peng

Associate Managing Editor

Jen Zimmerman

Special Content Manager

Chris Vesci

Editorial Associate

Brittany Rubio

Editorial Board

James L. Abbruzzese
Lucile L. Adams-Campbell
Rajesh Agarwal
David S. Alberts
Garnet L. Anderson
Karen Anderson
Michael A. Andrykowski

Leonard H. Augenlicht
Mariano Barbacid
John A. Baron
Steven A. Belinsky
Raymond C. Bergan
Diane F. Birt
Maarten Bosland
G. Timothy Bowden
Deborah J. Bowen
Norman F. Boyd
Douglas E. Brash
Otis W. Brawley
Dean E. Brenner
John Burn
Joseph A. Califano
Ya Cao
Andrew T. Chan
Rowan T. Chlebowski
Margie L. Clapper
James A. Crowell
Mary B. Daly
Roderick H. Dashwood
Nancy E. Davidson
Andrea De Censi
Silvio De Flora
Angelo M. De Marzo
Wendy Demark-Wahnefried
Phillip A. Dennis
John DiGiovanni

(continued on next page)

Editorial Office: *Cancer Prevention Research* [ISSN: 1940-6207 (Print); ISSN: 1940-6215 (Online)] is published monthly one volume per year, by the American Association for Cancer Research, Inc.; 615 Chestnut Street, 17th Floor, Philadelphia, PA 19106-4404. Postage paid at Philadelphia, PA, and additional mailing offices. Send address changes to *Cancer Prevention Research*, Member Services, AACR, 615 Chestnut Street, 17th Floor, Philadelphia, PA 19106-4404 or E-mail: membership@aacr.org. Copyright 2020 by the American Association for Cancer Research, Inc. © The paper used in this publication meets the requirements of ANSI/NISO Z39.48-1992 (Permanence of Paper).

CANCER PREVENTION RESEARCH

Editorial Board (Continued)

Ethan Dmitrovsky
Mitchell Dowsett
Steven M. Dubinett
Adel El-Naggar
Craig A. Elmets
Isam-Eldin Eltoum
Carol J. Fabian
Olivera J. Finn
Leslie G. Ford
Wilbur A. Franklin
Stephen J. Freedland
Patricia A. Ganz
Judy E. Garber
Andreas J. Gescher
Maura L. Gillison
Karen Glanz
Jeffrey E. Green
Peter Greenwald
Clinton J. Grubbs
Lorraine J. Gudas
J. Silvio Gutkind
Heather Hampel
Samir M. Hanash
Lynn C. Hartmann
Stephen S. Hecht
James G. Herman
Fred R. Hirsch
Anthony Howell
Chanita Hughes-Halbert
Stephen D. Hursting
Peter A. Jones
V. Craig Jordan
Humam N. Kadara
Robert L. Keith
Fadlo R. Khuri
Eric A. Klein

Ah-ng Tony Kong
Ernst Kuipers
Stephen Lam
Ho-Young Lee
Scott J. Leischow
Christopher I. Li
Karen T. Liby
Paul J. Limburg
Mark W. Lingen
Steven M. Lipkin
Karen H. Lu
Carlo C. Maley
Sharon L. Manne
Li Mao
Sanford D. Markowitz
James R. Marshall
Rajendra G. Mehta
Frank L. Meyskens
Stefan Michiels
John D. Minna
James L. Mulshine
Kenneth Offit
Olufunmilayo Olopade
Frank G. Ondrey
Vali Papadimitrako-poulou
Howard L. Parnes
Electra D. Paskett
Richard Peek
John Pepper
Gloria M. Petersen
Chinthalapally Rao
Rebecca R. Richards-Kortum
Daniel W. Rosenberg
Miriam P. Rosin
Charles M. Rudin

Carmen Sapienza
Dong Moon Shin
Imad Shureiqi
Yu Shyr
Shivendra V. Singh
Michael B. Sporn
Sudhir Srivastava
Silvia D. Stan
William P. Steward
Gary D. Stoner
Kotha Subbaramaiah
Nanjoo Suh
Saraswati Sukumar
Shi-Yong Sun
Young-Joon Surh
Catherine M. Tangen
Craig B. Thompson
Henry J. Thompson
Ian Thompson
David Threadgill
Thea D. Tlsty
Asad Umar
Toshikazu Ushijima
Jaye L. Viner
Kala Visvanathan
Victor G. Vogel
Cheryl Lyn Walker
Thomas Wang
Robyn Ward
Dennis A. Wigle
Benjamin C.Y. Wong
Kwok-Kin Wong
Chung S. Yang
Ming You
Harald zur Hausen

CANCER PREVENTION RESEARCH

Publishing Information

AN OFFICIAL JOURNAL OF THE **AACR** American Association for Cancer Research

AACR Officers

Elaine R. Mardis, President
Antoni Ribas, President-Elect
Elizabeth M. Jaffee, Past President
William N. Hait, Treasurer
Margaret Foti, Chief Executive Officer

Publications Committee

Victor E. Velculescu, Chairperson
Mary Helen Barcellos-Hoff
Alberto Bardelli
Dafna Bar-Sagi
Michael E. Berens
René Bernards
John D. Carpten
Frederic J. de Sauvage
Sanjiv Sam Gambhir
Maura L. Gillison
Rakesh K. Jain
Pasi A. Jänne
Gerrit A. Meijer
Gordon B. Mills
Steffi Oesterreich
William Pao
Gloria M. Petersen
Helen M. Piwnica-Worms
Charles W.M. Roberts
Alice T. Shaw
Lillian L. Siu
David B. Solit
Saraswati V. Sukumar
Toshikazu Ushijima

Publishing Staff

Publisher

Christine Battle

Director, Journal Operations and Systems

Daniel S. Evanko

Director, Journal Sales and Marketing

Nicola L. Hill

Director, Digital Publishing

Mark Jacobson

Associate Director, Production

Charlene Squibb

Assistant Director, Journal Marketing

Joanna Arnold

Assistant Director, Institutional Sales & Outreach

Karola Rac

Senior Director, Marketing and Creative Services

Paul Driscoll

Design Staff

Susan Moore

Scope

Cancer Prevention Research publishes original studies, reviews, and perspectives in the field of cancer prevention. Its scope includes the molecular and cellular biology of premalignancy and early lesions; genetic and environmental risk factors; risk assessment and reduction; early detection research (cancer screening and diagnosis); and preventive interventions (chemoprevention, immunoprevention, and others) to intercept cancer development at early stages prior to initiation, promotion, or progression. The journal comprises preclinical, clinical, and translational research, with special attention given to molecular discoveries and an emphasis on building a translational bridge between the basic and clinical sciences.

Cancer Prevention Research is abstracted and/or indexed in Current Contents/Clinical Medicine, MEDLINE, Science Citation Index, Scopus, and Web of Science.

Submission of Manuscripts

Online manuscript submission is welcomed at <http://capr.msubmit.net>. Before submitting a manuscript, please read the Instructions for Authors, which is available from the Journal's home page at <http://cancerpreventionresearch.aacrjournals.org>.

Publication Charges

Articles will be published with the understanding that the author(s) will pay both a publication fee plus a color figure handling fee. Please see the Instructions for Authors, which are available from the Journal's home page at <http://cancerpreventionresearch.aacrjournals.org>.

Subscription Information

Nonmember Individuals

Subscriptions include print version with online access. Contacts listed below are for nonmember individual subscriptions.

USA and Rest of World (excluding Japan)
American Association for Cancer Research,
615 Chestnut Street, Philadelphia, PA 19106;
1-855-744-4667; pubsales@aacr.org

Japan

e-support@maruzen.co.jp;
journal@kinokuniya.co.jp; usaco@usaco.co.jp

International print subscriptions include cost of surface mail. Expedited mailing is available. Contact the American Association for Cancer Research for rates.

Site Licenses

For information about institutional site licenses, contact pubsales@aacr.org.

AACR Members

AACR members may opt to receive either a print subscription with online access to content or an online-only subscription. Contact membership@aacr.org or visit the membership page at www.aacr.org for more information.

Single Issue Sales

Subject to their availability, single or back issues may be purchased for \$60 (U.S.) or \$65 (outside the U.S.) each. The cost must be prepaid. Contact pubsales@aacr.org.

Claims

One-time claims for missing issues made within 120 days of the issue's publication will be honored, subject to availability. No credit or refund will be given if an issue is out of print at the time of claim.

AACR Members

membership@aacr.org

Nonmembers and Institutions

pubsales@aacr.org

Advertising Information

For information about advertising in AACR journals, contact The Walchli Tauber Group, Inc., 2225 Old Emmorton Road, Suite 201, Bel Air, MD 21015; (443) 512-8899; maura.paoletti@wt-group.com

Copyright and Permissions

Content printed in or disseminated by *Cancer Prevention Research* is protected by copyright. Authors who wish to publish material in *Cancer Prevention Research* must formally transfer copyright to the AACR. All authors must sign copyright transfer forms before the AACR can proceed with publication.

To read the complete AACR Copyright and Permissions Policy, visit <http://aacrjournals.org/content/authors/copyright-permissions-and-access>.