

Cancer Prevention Research

The Forefront of Prevention Science

AACR

American Association
for Cancer Research

AN OFFICIAL JOURNAL OF THE AMERICAN ASSOCIATION FOR CANCER RESEARCH

Editor-in-Chief

Scott M. Lippman

Special Advisors to the Editor-in-Chief

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

Deputy Editors

Ernest T. Hawk
Eva Szabo
Timothy C. Wang

Senior Editors

Cory Abate-Shen
Powel H. Brown
Andrew J. Dannenberg
Zigang Dong
Paul F. Engstrom
Jean-Pierre Issa
Thomas W. Kensler
Lawrence J. Marnett
William G. Nelson
Brian J. Reid
David Sidransky
Avrum Spira
Makoto Mark Taketo
Eileen P. White
Ignacio I. Wistuba

Statistical Editor

J. Jack Lee

Editorial Staff

Assistant Managing Editor

Jen Zimmerman

Associate Editor

Leona Flores

Special Content Manager


Chris Vesci

Editorial Associate

Karen Quann
Brittany Rubio

Editorial Board

James L. Abbruzzese	Wendy Demark-Wahnefried	Fadlo R. Khuri	Charles M. Rudin
Lucile L. Adams-Campbell	Phillip A. Dennis	Eric A. Klein	Carmen Sapienza
Rajesh Agarwal	John DiGiovanni	Ah-ng Tony Kong	Dong Moon Shin
Bharat B. Aggarwal	Ethan Dmitrovsky	Ernst Kuipers	Imad Shureiqi
David S. Alberts	Mitchell Dowsett	Stephen Lam	Yu Shyr
Garnet L. Anderson	Steven M. Dubinett	Ho-Young Lee	Shivendra V. Singh
Karen Anderson	Adel El-Naggar	Scott J. Leischow	Michael B. Sporn
Michael A. Andrykowski	Craig A. Elmetts	Christopher Li	Sudhir Srivastava
Leonard H. Augenlicht	Isam-Eldin Eltoum	Karen T. Liby	Silvia D. Stan
Mariano Barbacid	Carol J. Fabian	Paul J. Limburg	Vernon E. Steele
John A. Baron	Olivera J. Finn	Mark W. Lingen	William P. Steward
Steven A. Belinsky	Leslie G. Ford	Steven M. Lipkin	Gary D. Stoner
Raymond C. Bergan	Wilbur A. Franklin	Karen H. Lu	Henry T. Lynch
Diane F. Birt	Stephen J. Freedland	Henry T. Lynch	Carlo C. Maley
Maarten Bosland	Patricia A. Ganz	Carlo C. Maley	Sharon L. Manne
G. Timothy Bowden	Judy E. Garber	Li Mao	Sanford D. Markowitz
Deborah J. Bowen	Andreas J. Gescher	Sanford D. Markowitz	James R. Marshall
Norman F. Boyd	Maura L. Gillison	James R. Marshall	Rajendra G. Mehta
Douglas E. Brash	Karen Glanz	Rajendra G. Mehta	Frank L. Meyskens
Otis W. Brawley	Jeffrey E. Green	Frank L. Meyskens	Stefan Michiels
Dean E. Brenner	Peter Greenwald	Stefan Michiels	John D. Minna
John Burn	Clinton J. Grubbs	John D. Minna	James L. Mulshine
Joseph A. Califano	Lorraine J. Gudas	James L. Mulshine	Kenneth Offit
Ya Cao	J. Silvio Gutkind	Kenneth Offit	Olufunmilayo Olopade
Philip E. Castle	Heather Hampel	Olufunmilayo Olopade	Frank G. Ondrey
Andrew T. Chan	Samir M. Hanash	Frank G. Ondrey	Vali Papadimitrakopoulou
Rowan T. Chlebowski	Lynn C. Hartmann	Vali Papadimitrakopoulou	Howard L. Parnes
Margie L. Clapper	Stephen S. Hecht	Howard L. Parnes	Electra D. Paskett
James A. Crowell	James G. Herman	Electra D. Paskett	Richard Peek
Jack Cuzick	Fred R. Hirsch	Richard Peek	John Pepper
Mary B. Daly	Waun Ki Hong	John Pepper	Gloria M. Petersen
Roderick H. Dashwood	Anthony Howell	Gloria M. Petersen	Michael N. Pollak
Nancy E. Davidson	Chanita Hughes-Halbert	Michael N. Pollak	Chinthalapally Rao
Andrea De Censi	Stephen D. Hursting	Chinthalapally Rao	Rebecca R. Richards-Kortum
Silvio De Flora	Peter A. Jones	Rebecca R. Richards-Kortum	Daniel W. Rosenberg
Angelo M. De Marzo	V. Craig Jordan	Daniel W. Rosenberg	Miriam P. Rosin
	Humam N. Kadara	Miriam P. Rosin	
	Robert L. Keith		

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. 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 2018 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

Publishing Information

AACR
American Association
for Cancer Research

Print ISSN: 1940-6207 • Online ISSN: 1940-6215

AACR Officers

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

Publications Committee

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
Victor E. Velculescu, Chairperson

Publishing Staff

Publisher

Christine B. Rullo

Director, Journal Operations and Systems

Daniel S. Evanko

Director, Journal

Sales and Marketing

Nicola L. Hill

Director, Digital Publishing

Robert Spanier

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 is devoted exclusively to cancer prevention. The Journal publishes important original studies, reviews, and commentaries within the major topic areas of biology of premalignancy, risk factors and risk assessment, early detection research, immunoprevention and chemopreventive and other interventions, including the basic science behind them. The Journal includes 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

Beginning with manuscripts submitted January 1, 2016 or after, 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 Pharmaceutical Media Inc., 30 East 33rd St., 4th Floor, New York, NY 10016; 212-904-0360; Dsimone@pminy.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>.