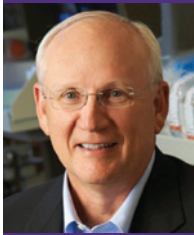


# CANCER PREVENTION RESEARCH

The Forefront of Prevention Science



**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  
Jack Cuzick  
Zigang Dong  
Marc Gunter  
Mark Hull  
Daehee Kang  
Thomas W. Kensler  
Mark LaBarge  
Lawrence J. Marnett  
David Sidransky  
Ignacio I. Wistuba

## Statistical Editor

J. Jack Lee

## Editorial Staff

### Associate Editor

Jing Peng

### Managing Editor

Gregory Pavlovcak

### Special Content Manager

Chris Vesci

### Editorial Assistant

Darien Dillon

# CANCER PREVENTION RESEARCH

## Editorial Board

Rajesh Agarwal  
Leonard Augenlicht  
Jennifer Beane  
Raymond Bergan  
Deborah J. Bowen  
Norman F. Boyd  
Dean E. Brenner  
Karen Brown  
John Burn  
Andrew T. Chan  
Elizabeth Y. Chiao  
Margie L. Clapper  
Deirdre P. Cronin-Fenton  
K. Michael Cummings  
Mary B. Daly  
Angelo M. De Marzo  
Andrea DeCensi  
Albena T. Dinkova-  
Kostova  
Ethan Dmitrovsky  
Susan M. Domchek  
Steven M. Dubinett  
Isam-Eldin Eltoum  
Carol J. Fabian  
Alessandro Fatatis  
Jonine D. Figueroa  
Rebecca C. Fitzgerald  
Leslie G. Ford  
Agnès Fournier  
Stephen J. Freedland  
Christine M.  
Friedenreich

Patricia A. Ganz  
Judy E. Garber  
Maura L. Gillison  
Karen Glanz  
Scarlett Lin Gomez  
Mary Gospodarowicz  
J. Silvio Gutkind  
Heather Hampel  
Samir M. Hanash  
Stephen S. Hecht  
James G. Herman  
Fred R. Hirsch  
Chanita Hughes-  
Halbert  
Neil M. Iyengar  
Jin Jen  
V. Craig Jordan  
Humam Kadara  
Seema A. Khan  
T. Peter Kingham  
Anita Y. Kinney  
Eric A. Klein  
Ah-Ng Kong  
Ernst J. Kuipers  
Stephen Lam  
Christopher I. Li  
Karen T. Liby  
Paul J. Limburg  
Steven M. Lipkin  
Minetta C. Liu  
Karen H. Lu  
Anirban Maitra

Sharon L. Manne  
James R. Marshall  
Frank L. Meyskens  
Altaf Mohammed  
Luis M. Montuenga  
Lorelei A. Mucci  
James L. Mulshine  
Tracy A. O'Mara  
Kenneth Offit  
Frank G. Ondrey  
Ana Patricia Ortiz  
Vassiliki  
Papadimitrakopoulou  
Electra D. Paskett  
John W. Pepper  
Jennifer B. Permuth  
Ulrike Peters  
Gloria M. Petersen  
Natalie Porat-Shliom  
You-Lin Qiao  
Michael Quante  
Doreen Ramogola-  
Masire  
Chinthalapally V. Rao  
Mary W. Redman  
Mary E. Reid  
Rebecca Richards-  
Kortum  
Daniel W. Rosenberg  
Rajiv Sarin  
Norie Sawada

Lecia V. Sequist  
Mark E. Sherman  
Dong M. Shin  
Imad Shureiqi  
Yu Shyr  
Shivendra V. Singh  
Samuel G. Smith  
Michael B. Sporn  
Sudhir Srivastava  
D. Cristina Stefan  
Gary Stoner  
Nanjoo Suh  
Young-Joon Surh  
Henry J. Thompson  
Ian M. Thompson  
Benjamin A. Toll  
Adetunji T. Toriola  
Asad Umar  
Toshikazu Ushijima  
Bethany Van Guelpen  
Sooryanarayana  
Varambally  
Eduardo Vilar  
Cynthia Vinson  
Victor G. Vogel  
Robert J. Volk  
Thomas T. Wang  
Dennis A. Wigle  
Benjamin C.Y. Wong  
Chung S. Yang

# CANCER PREVENTION RESEARCH PUBLISHING INFORMATION

## AACR Officers

David A. Tuveson, President  
Lisa M. Coussens,  
President-Elect  
Antoni Ribas, Past President  
William N. Hait, Treasurer  
Margaret Foti, Chief Executive  
Officer

## Publications Committee

Victor E. Velculescu, Chairperson  
Adriana Albini  
Laura Fejerman  
Masanori Hatakeyama  
Catriona H.M. Jamieson  
Jos Jonkers  
Virginia G. Kacklamani  
Andrew Kung  
Jonathan D. Licht  
Ira Mellman  
Gordon B. Mills  
Kunle Odunsi  
Kenneth J. Pienta  
Joshua D. Rabinowitz  
Timothy R. Rebbeck  
David L. Rimm  
Mack Roach  
Michael B. Yaffe

## 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

### Deputy 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 commentaries in the fields of cancer prevention and interception. The journal comprises preclinical, clinical, translational, and implementation research, with special attention given to molecular discoveries and an emphasis on building translational and mechanistic bridges between the basic, clinical, and population sciences. The editors welcome manuscript submissions that describe mechanisms of carcinogenesis; develop preventive interventions to intercept cancer development at early stages; or evaluate implementation of evidence-based preventive practices.

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

## Publication Charges

Articles will be published with the understanding that the author(s) will pay both a publication fee plus a display item fee. For more detail, please see the Publication Fees and Reprints page which is available at <https://aacrjournals.org/content/authors/publication-fees-and-reprints>.

## Subscription Information

### 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](mailto:Membership@aacr.org) or visit the membership page at [www.aacr.org](http://www.aacr.org) for more information.

### Nonmember Individuals

Subscriptions include online access only. 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](mailto:pubsales@aacr.org)

### Japan

[e-support@maruzen.co.jp](mailto:e-support@maruzen.co.jp);  
[journal@kinokuniya.co.jp](mailto:journal@kinokuniya.co.jp); [usaco@usaco.co.jp](mailto:usaco@usaco.co.jp)

### Site Licenses

For information about institutional site licenses, contact [pubsales@aacr.org](mailto:pubsales@aacr.org).

### Single Issue Sales

Single or back issues may be purchased for \$75 (U.S.) or \$90 (outside the U.S.) each. The cost must be prepaid. Contact [pubsales@aacr.org](mailto:pubsales@aacr.org) to order single or back issues.

### Claims

Claims are only applicable to member subscriptions. 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. For claims, AACR members should contact: [membership@aacr.org](mailto:membership@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](mailto:maura.paoletti@wt-group.com).

## Copyright and Permissions

Content printed in or disseminated by *Cancer Prevention Research* is protected by copyright. Authors publishing in *Cancer Prevention Research* may either formally transfer copyright to the AACR or may select the Open Access option and publish the article under one of two Creative Commons Attribution licenses—Attribution-NonCommercial-NoDerivatives 4.0 International (CC BY-NC-ND 4.0) or Attribution 4.0 International (CC BY 4.0)—depending on funder requirements. Please visit <https://aacrjournals.org/content/authors/copyright-permissions-and-access>.