

# Cancer Immunology Research

*Illuminating the Interplay of Cancer and the Immune System*

# AACR

American Association  
for Cancer Research

AN OFFICIAL JOURNAL OF THE AMERICAN ASSOCIATION FOR CANCER RESEARCH

## Editors-in-Chief

**Robert D. Schreiber**  
**Philip D. Greenberg**

### Executive Editor

Linda J. Miller

### Deputy Editors

James P. Allison  
Glenn Dranoff  
Elizabeth M. Jaffee  
Stanley Riddell  
Robert H. Vonderheide

### Senior Editors

Maxim N. Artyomov  
Nina Bhardwaj  
Vincenzo Bronte  
Xuetao Cao  
Lisa M. Coussens  
Charles G. Drake  
Olivera J. Finn  
Lawrence H. Fong  
Eli Gilboa  
F. Stephen Hodi  
Carl H. June  
Lewis L. Lanier  
Alberto Mantovani  
Cornelis J.M. Melief  
Evan Newell  
Pamela S. Ohashi  
Drew M. Pardoll  
Ellen Puré  
Hiroshi Shiku  
Mark J. Smyth  
Pramod K. Srivastava  
Cornelia L. Trimble  
Benoît J. Van den Eynde  
Louis M. Weiner  
E. John Wherry

### Biostatistics Editor

Rosemarie Mick

## Editorial Board

Jean-Pierre Abastado  
Gregory P. Adams  
Gosse J. Adema  
Steven M. Albelda  
Frances R. Balkwill  
Robert J. Binder  
Renier Brentjens  
Joshua Brody  
Steven Burakoff  
William E. Carson  
Vincenzo Cerundolo  
Adelheid Cerwenka  
Lieping Chen  
Mario P. Colombo  
George Coukos  
Tanja D. de Gruijl  
Michelle De Palma  
I. Jolanda de Vries  
Reno Debets  
Nora L. Disis  
Edgar G. Engleman  
Dean W. Felsher  
Robert L. Ferris  
Soldano Ferrone  
Ian H. Frazer  
Gordon J. Freeman  
Alan B. Frey  
Wolf H. Fridman  
Yang-Xin Fu

Dmitry I. Gabrilovich  
Luca Gattinoni  
Sacha Gnjatich  
Naoto Hirano  
Yuhui Huang  
Patrick Hwu  
Darrell Irvine  
Masahisa Jinushi  
Yutaka Kawakami  
Khashayarsha Khazaie  
Alexander Knuth  
Vijay Kuchroo  
Peter P. Lee  
Haiyan Liu  
Ignacio Melero  
Miriam Merad  
Jeffrey S. Miller  
James J. Mulé  
David H. Munn  
Hiroyoshi Nishikawa  
Kunle Odunsi  
Suzanne Ostrand-Rosenberg  
Karolina Palucka  
Mikael J. Pittet  
Scott K. Pruitt  
Gabriel A. Rabinovich  
David H. Raulet  
Nicholas P. Restifo

Cliona M. Rooney  
Alexander Y. Rudensky  
Michel Sadelain  
Ugur Sahin  
Shimon Sakaguchi  
John H. Sampson  
Noriyuki Sato  
Michael Schmitt  
Charles L. Sentman  
Padmanee Sharma  
Arlene Sharpe  
Michail Sitkovsky  
Craig L. Slingluff  
Mark X. Sliwkowski  
Eduardo M. Sotomayor  
Daniel E. Speiser  
Melody A. Swartz  
Mario Sznol  
Hideaki Tahara  
Giorgio Trinchieri  
Shannon J. Turley  
Sjoerd H. van der Burg  
Richard G. Vile  
Eric Vivier  
Irving L. Weissman  
Kai W. Wucherpfennig  
Cassian Yee  
Weiping Zou

## Editorial Staff

### Assistant Editor

Adriana D. Benavides

### Assistant Managing Editor

Jen Zimmerman

### Editorial Associate

Brittany Rubio

### Special Content Manager

Chris Vescei

### Senior Production Editor

Stacey L. Reid

In collaboration with the Cancer Research Institute

**Editorial Office:** *Cancer Immunology Research* [ISSN: 2326-6066 (Print); ISSN: 2326-6074 (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. Periodicals postage paid at Philadelphia, PA, and additional mailing offices. POSTMASTER: Send address changes to *Cancer Immunology Research*, AACR Member Services, 615 Chestnut St., 17th Floor, Philadelphia, PA 19106-4404 or E-mail: [membership@aacr.org](mailto: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 Immunology Research

# Publishing Information

**AACR**

American Association  
for Cancer Research

Print ISSN: 2326-6066 • Online ISSN: 2326-6074

## 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

Victor E. Velculescu, Chairperson  
Dafna Bar-Sagi  
Mary Helen Barcellos-Hoff  
Michael E. Berens  
John D. Carpten  
Maura L. Gillison  
Rakesh K. Jain  
Pasi A. Jänne  
Gerrit A. Meijer  
Gordon B. Mills  
Steffi Oesterreich  
Gloria M. Petersen  
David R. Piwnica-Worms  
William Pao  
Charles W.M. Roberts  
Alice T. Shaw  
Lillian L. Siu  
Saraswati Sukumar  
Toshikazu Ushijima

## 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

### Marketing and Creative

### Services

### Senior Director

Paul Driscoll

### Design Staff

Susan Moore

## Scope

*Cancer Immunology Research* publishes outstanding original articles reporting major advances in cancer immunology that span the discipline from basic investigations in host-tumor interactions to developmental therapeutics in model systems, early translational studies in patients, and late-stage clinical trials. The Journal disseminates knowledge of immunology to the cancer research community, catalyzing cross-disciplinary work that yields a deeper understanding of the host-tumor relationship, more potent cancer treatments, and improved clinical outcomes.

*Cancer Immunology 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://cir.msubmit.net>. Before submitting a manuscript, please read the Instructions for Authors, which is available from the Journal's home page at <http://cancerimmunolres.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://cancerimmunolres.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](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)

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](mailto: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](mailto:membership@aacr.org) or visit the membership page at [www.aacr.org](http://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](mailto: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](mailto:membership@aacr.org)

## Nonmembers and Institutions

[pubsales@aacr.org](mailto:pubsales@aacr.org)

## Advertising Information

For information about advertising in AACR journals, contact Pharmaceutical Media Inc., 30 East 33<sup>rd</sup> St., 4<sup>th</sup> Floor, New York, NY 10016; 212-904-0360; [Dsimone@pminy.com](mailto:Dsimone@pminy.com)

## Copyright and Permissions

Content printed in or disseminated by *Cancer Immunology Research* is protected by copyright. Authors who wish to publish material in *Cancer Immunology 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>.