Cancer Research is sponsored by the American Association for Cancer Research, Inc. Payment of subscription fees is also met by a grant from the Elisa U. Pardee Foundation. Through the kind assistance of the Japanese Cancer Association, accelerated mailing of all AACR journals to AACR members in Japan is supported by a generous grant from the Banyu Pharmaceutical Company, Tsukuba, Japan.

Subscription Information

Cancer Research is published twelve a month, one volume per year, by the American Association for Cancer Research (AACR), Inc. Subscriptions include the Proceedings of the American Association for Cancer Research, issued in March of each year. Except for members of the AACR, all subscriptions are payable in advance to AACR, Subscription Office, P.O. Box 11806, Birmingham, AL 35202 [Telephone: (800) 633-4931 or (205) 995-1567; FAX: (205) 995-1588], to which all business communications, remittances (in United States currency or its equivalent), and subscription orders should be sent. In Japan, send orders and inquiries to (sole agent): USACO Corporation, Tsutsumi Bldg., 13-12, Shimbashi 1-chome, Minato-ku, Tokyo 105, Japan; Tel. (03) 502-6471. Individuals who are not AACR members may subscribe to Volume 57 (1997) of Cancer Research at the rate of $460 U.S./$550 foreign. Cancer Research is only available to institutions as a combined subscription with Clinical Cancer Research. The combined 1997 subscription institutional price of $685 U.S./$815 foreign includes $170 U.S./$210 foreign for a subscription to Clinical Cancer Research. (Foreign subscription cost includes cost of contact mail. For faster delivery, expedited mailing rates are available by contacting the AACR Publications Department.) Canadian subscribers should add 7% GST. Changes of address notification should be sent 60 days in advance and include both old and new addresses. Member subscriptions should send address changes to: AACR Member Services, Public Ledger Bldg., Suite 826, 150 South Independence Mall West, Philadelphia, PA 19106-3483. Nonmember subscribers should send changes of address to: AACR Subscription Office, P.O. Box 11806, Birmingham, AL 35202. Copies of the journal which are undeliverable because of address changes will be destroyed.

American Association for Cancer Research, Inc.

Publications Staff
Managing Editor
Margaret Foti
Assistant Managing Editor
Mary Anne Mennie
Manager, Editorial Services
Heide M. Puxaday
Staff Editors
Michael J. Beveridge
Kathleen C. Assenmacher
Pamela R. Arnold
Laurie B. Baker
Ronald M. Vitale
Staff Assistant
Mary Ellen Pirring
Administrative Coordinator
Holly M. Haskett
Senior Editorial Assistant
Theresa A. Griffin
Editorial Assistants
Valerie L. Samuel
Andrea Conrad
Cecilia Gallo
Marketing Coordinator
Robert B. O’Malley
Administrative Staff
Executive Director
Margaret Foti
Director of Administration
Adam D. Bluestein
Controller
Joan D. Ritchie
Coordinator, Financial Operations
George L. Moore
Manager, Meetings and Exhibits
Jeffrey M. Ruben
Meeting Planner
Carole L. Kanoff
Public Information Coordinator
Jenny Anne Horst-Martz
Assistant to the Executive Director
Ruth E. Fortson
Membership Development Coordinator
Robin E. Felder
Administrative Assistant
Margaret A. Pickels
System Specialist
Lydia I. Rodriguez
Secretary
Malika L. Wright
Editorial Assistant
Diana F. Certo
Office Clerk
James J. Watters
Data Entry Clerk
Robert A. Simms II

Editor-in-Chief
Carlo M. Croce

Associate Editors
Stuart A. Aaronson
David S. Alberts
Carmen J. Allegra
Frederick R. Alpnaug
Leonard H. Augenlicht
Silvia Bacchetti
William M. Baird
Allan Balmann
J. Carl Barrett
Renato Baserga
Stephen B. Baylin
William T. Beck
Nathan A. Berger
Joseph R. Bertino
Diane F. Birn
Mina J. Bissell
Claudia D. Bloomfield
Ronald H. Blum
Gianni Bonadonna
Rodrigo Bravo
Edward Bresnick
Garrett M. Brodeur
Paul A. Burns, Jr.
C. Patrick Burns
Fernando Canabillas
Bruno Calabretta
Eli Canaan
Robert L. Capizzi
Webster K. Cavenoe
Ann F. Chambers
Bruce D. Cheson
David Colcher
Robert L. Comis
Allan H. Conney
Neal G. Copeland
Pelayo Correa
Suzanne Cory
William M. Crist
Riccardo Dalla-Favera
Mary B. Daly

Nancy E. Davidson
Benoit de Crombrugghe
Albert B. Deisseroth
Luigi M. DeLuca
Eugene R. DeSombre
Vincent T. DeVita, Jr.
T. Michael Dexter
Ralph E. Durand
Alan Eastman
Merrill J. Egorin
Gertrude B. Elion
Leonard C. Erickson
Nelson Fausto
Eric R. Fearon
Andrew P. Feinberg
Olivera J. Finn
Richard B. Hochberg
Wun Ki Hong
Tatsuko Hojo
H. Robert Horvitz
Janet A. Houghton
Kay Huebner
Mark A. Israel
Elaine S. Jaffe
Rakesh K. Jain
Peter A. Jones
V. Craig Jordan
Fred F. Kadlubar
Michael B. Kastan
John H. Kersey
Young S. Kim
Kenneth W. Kinzler
Hynda K. Kleinman
Alfred G. Knudson, Jr.
Richard D. Kolodner
Laurence N. Kolonel
Peter H. Kramer
David P. Lane
Edmund C. Lattime
John S. Lazo
Victor A. Levin
Jay A. Levy
Victor Ling
Lance A. Liotta
Martin Lipkin
Marc A. Lippman
Gerald Litwack
F. Peter Guegnerich
Sen-ichiro Hakomori
Stanley R. Hamilton
Curtis C. Harris
Stephen S. Hecht
Carl-Henrik Heldin
Ingegerd Hellstrom
Briana E. Henderson

James B. Mitchell
Malcolm S. Mitchell
Rath J. Muschel
Yusuke Nakamura
Susan L. Naylor
Kenneth Nilsson
Sasumu Nishimura
Jeffrey A. Norton
Kenneth Olden
Allen I. Offit
Richard J. O’Reilly
Robert F. Ozols
Michael A. Palladino, Jr.
Luis F. Paradav
Drew M. Pardoll
Anthony E. Pegg
Pier Giuseppe Pellicci
Angel Pellicer
Bice Persuza
Lester J. Peters
Theresa C. Phillips
Cecil B. Pickett
Jacalyn A. Pierce
Jennifer A. Pietenpol
Yves G. Pommier
Bruce A. J. Ponder
Theresa P. Pretlow
Vito Quaranta
Frank J. Rauscher III
John C. Reed
Richard A. Rifkind
Leslie L. Robison
Igor B. Roninson
Eric K. Rowinsky
Howard I. Scher
Robert T. Schmick
J. Schlessinger
Manfred Schwab
Jerry W. Shay
David Sidransky
Joseph V. Simone
Francis M. Sirovsk
Anna Marie Sklaka
Michael B. Sporn
Martha R. Stampfer
Eric J. Stanbridge
Patricia S. Stieg
Glenne Steele, Jr.
Gary S. Stein
Gary D. Stoner
Takahsi Sugimura
Sarasukhi Sukumar
Paul Talalay
Tadatsuji Taniguchi
Steven R. Tannenbaum
Masaki Terada
Kenneth D. Tew
Donald J. Tidiss
Thea D. Tiday
Jeffrey M. Trent
Giorgio Trinchieri
Takashi Tsurow
Axel Ullrich
George F. Vande Woude
Peter W. Vaupel
Giancarlo Vecchioni
Pier K. Vogt
Daniel D. von Hopp
Cheryl Walker
Michael D. Waterfield
La W. Wattenberg
Ralph R. Weichselbaum
Bengt Westmark
Raymond L. White
Alice S. Whitemore
Max S. Wicha
Wendell Wierenga
Roger Wiseman
Sheldon Wolff
Harald zur Hausen

Cancer Research, 11806 Northlake Blvd., Birmingham, AL 35202, U.S.A. (Phone: 205-995-1588), is published monthly by the American Association for Cancer Research, Inc., 11806 Northlake Blvd., Birmingham, AL 35202, U.S.A. (Phone: 205-995-1588). Subscriptions for individuals, $210; institutions, $420. Canadian subscribers add 7% GST. Associate members pay $105. Members in Japan pay $210. Orders should be sent to the address of your choice: AACR, Subscription Office, P.O. Box 11806, Birmingham, AL 35202. Postmaster: Send address changes to the above address. Copyright 1997 by AACR. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior written permission of AACR.
Notice to Members of the American Association for Cancer Research (AACR)

Officers for 1997–1998

President: Donald S. Coffey, Johns Hopkins University School of Medicine, Baltimore, MD 21287-2101
President-Elect: Webster K. Cavenee, Ludwig Institute for Cancer Research, La Jolla, CA 92039-0660
Treasurer: Bayard D. Clarkson, Memorial Sloan-Kettering Cancer Center, New York, NY 10021
Executive Director: Margaret Foti, AACR, Public Ledger Bldg., Suite 826, 150 South Independence Mall West, Philadelphia, PA 19106-3483

Annual Dues

The annual dues of active members of the AACR are $175, $90 of which may be applied to a subscription to Cancer Research. Corresponding members of the Association will be charged an appropriate fee to offset postage costs. Payment of dues and changes of address of members of the Association should be sent promptly to: Member Services, AACR, Public Ledger Bldg., Suite 826, 150 South Independence Mall West, Philadelphia, PA 19106-3483. Telephone: (215) 440-9300; FAX: (215) 440-9313.

Back issues and Single Copy Sales of the Journal

Copies of back stock of the journal Cancer Research may be ordered from AACR Subscription Office, P.O. Box 11806, Birmingham, AL 35202 [Telephone: (800) 633-4931 or (205) 995-1567; FAX: (205) 995-1588]. As long as supplies permit, single copies of Cancer Research will be sold at $30 per copy for regular and Supplement issues, plus $4 shipping for orders outside the U.S. The annual Proceedings of the American Association for Cancer Research is available at $45 per copy, plus $6 shipping for orders outside the U.S.

Advertisements in Cancer Research

Advertisements insertion orders and copy must be received approximately 5 weeks prior to the date of the issue in which the advertisement is to be published. The journal is mailed approximately 5 days preceding the date of issue. Inquiries about advertising should be directed to: M. J. Mircova Associates, Inc., 155 South White Horse Pike, Berlin, NJ 08009 [Telephone: (609) 766-9360; FAX: (609) 753-0064].

Historical Cover Themes

Readers are invited to submit themes (events, persons, institutions) for consideration for the illustrated covers of Cancer Research. Correspondence regarding suggested cover themes, or other matters regarding covers, should be addressed to the Cover Editor, AACR Publications Department.

Submission of Manuscripts

Manuscripts should be sent to the attention of: Dr. Carlo M. Croce, Editor-in-Chief, AACR Publications Department, Public Ledger Bldg., Suite 826, 150 South Independence Mall West, Philadelphia, PA 19106-3483. Telephone: (215) 440-9300. If accepted, they will be listed under one of ten categories in the Table of Contents. Please specify in a covering letter which category applies to your submission: biochemistry and biophysics, carcinogenesis, clinical investigations, endocrinology, epidemiology and prevention, experimental therapeutics, immunology, molecular biology and genetics, tumor biology, and virology. (Final categorization in the Table of Contents is at the discretion of the Editor-in-Chief.) Consult the "Instructions for Authors" printed in the January 1 issue of the journal for other submission requirements. Reprints of the "Instructions" are available upon request.

Manuscript Processing Fee

Journal policy requires that a manuscript processing fee of $75 be assessed for each paper to defray the expenses incurred in the editorial review process. Each manuscript submitted for publication should be accompanied by a check (drawn on a U.S. bank) for $75 in U.S. currency, payable to AACR, Inc., or credit card information (VISA, Mastercard, or American Express) should be supplied. Note: If an author resubmits a manuscript that our Editors previously found unacceptable for publication, it is journal policy to consider it a new submission, assign it a new manuscript number, and charge the author another $75 handling fee to cover the cost of review.

Page Charges

Accepted manuscripts will be published with the understanding that the author(s) will pay a charge of $75 per printed page. Under exceptional circumstances, when no source of grant or other support exists, the author(s) may apply to Dr. Carlo M. Croce, Editor-in-Chief, at the time of submission, for a waiver of the page charges. All such applications must be countersigned by an appropriate institutional official stating that no funds are available for the payment of page charges.

Copyright and Copyright Clearance Center

The Copyright Revision Act (PL 94-553), which became effective January 1, 1978, states that the copyright of a work is vested in the author from the moment of creation. Therefore, all authors who wish to publish in Cancer Research must formally transfer copyright to the proprietor of the journal, AACR, Inc. It is understood by this transfer that the authors relinquish all exclusive rights of copyright ownership, including the rights of reproduction, distribution, display, and sale. Authors who prepared their articles as part of their official duties as employees of the U.S. Federal Government are not required to transfer copyright to the American Association for Cancer Research, Inc., since these articles are considered to be in the public domain. However, it is necessary for these authors to sign the appropriate section of the transfer form. In the case of articles supported by federal grants or contracts, copyright transfer to AACR, Inc., is required. The federal government may retain a nonexclusive license to publish or republish such material.

Copies of articles for which AACR, Inc. owns the copyright may be made for personal or internal use, provided that the copier pay the per-copy fee of $4 through the Copyright Clearance Center, Inc. This Center is a nonprofit organization through which individuals and institutions may reimburse a copyright owner for photocopying journal articles beyond what is defined as "fair use" in Sections 107 and 108 of the Copyright Revision Act of 1978. Those who wish to photocopy Cancer Research articles may report the number of copies they have made, together with the fee code 0008-5472/97 $4.00, to: Copyright Clearance Center, Inc., 222 Rosewood Drive, Danvers, MA 01923; (508) 750-8400. Remittances may be sent to the Center at the time of reporting or the Center will bill the user on a monthly basis. Deposit accounts and prepayment plans may also be arranged. Between June 1978 and August 1983, a fee code appeared on the first page of all articles for which Cancer Research owned the copyright. For those issues, it is understood that any articles which did not carry this code are in the public domain.

Cancer Research is abstracted or indexed in Biological Abstracts, Chemical Abstracts, Index Medicus, MEDLINE, Current Contents, and Reference Update. This journal is printed on acid-free paper.

No responsibility is accepted by the Editors, by AACR, Inc., or by Cadmus Journal Services for the opinions expressed by contributors or for the content of the advertisements.

Cancer Research (ISSN 0008-5472) is published twice a month by the American Association for Cancer Research, Inc., Public Ledger Bldg., Suite 826, 150 South Independence Mall West, Philadelphia, PA 19106–3483 for $90 annually for members and $460 for individual nonmembers. Cancer Research is only available to institutions as a combined subscription with Clinical Cancer Research. The combined 1997 institutional subscription price of $685 includes a subscription to Clinical Cancer Research. Periodicals postage paid at Philadelphia, PA and additional mailing offices. POSTMASTER: Send address changes to AACR Subscription Office, P.O. Box 11806, Birmingham, AL 35202. Copyright 1997 by the American Association for Cancer Research, Inc. Printed in the U.S.A.