

Cancer Epidemiology Biomarkers & Prevention

July/August 1992
Volume One • Number Five
Pages 339-426
ISSN 1055-9965



A Publication of the
American Association for Cancer Research
Cosponsored by the
American Society of Preventive Oncology

AACR SPECIAL CONFERENCE IN CANCER RESEARCH

Molecular and Biochemical Methods in Cancer Epidemiology and Prevention - The Path Between the Laboratory and the Population

September 23-26, 1992
The Registry Resort, Naples, Florida



CONFERENCE CHAIRPERSON

David Schottenfeld / Ann Arbor, MI

PROGRAM COMMITTEE

Myron Essex / Boston, MA
Curtis C. Harris / Bethesda, MD
Thomas E. Moon / Tucson, AZ

Stephen S. Hecht / Valhalla, NY
Barbara S. Hulka / Chapel Hill, NC

Lewis H. Kuller / Pittsburgh, PA
Mortimer L. Mendelsohn / Livermore, CA
Paul A. Schulte / Cincinnati, OH

SCIENTIFIC PROGRAM

Keynote Addresses

Paul A. Schulte / Cincinnati, OH
Mortimer L. Mendelsohn / Livermore, CA
Curtis C. Harris / Bethesda, MD

Assessment of Exposure to Genotoxic Agents

Stephen S. Hecht / Valhalla, NY
Steven R. Tannenbaum / Cambridge, MA
Frederica Perera / New York, NY
John D. Groopman / Baltimore, MD
Gerald N. Wogan / Cambridge, MA

Biological Markers of Genetic Susceptibility

Louise C. Strong / Houston, TX
Bruce A.J. Ponder / Sutton, England
Mark Leppert / Salt Lake City, UT
Kenneth H. Buetow / Philadelphia, PA

Viral Agents

Myron Essex / Boston, MA
W. Thomas London / Philadelphia, PA
Wayne D. Lancaster / Detroit, MI
Mark Schiffman / Bethesda, MD
Nancy E. Mueller / Boston, MA

Dietary Biomarkers in Preventive Intervention Studies

Thomas E. Moon / Tucson, AZ
John D. Potter / Minneapolis, MN
Gladys Block / Bethesda, MD
David P. Rose / Valhalla, NY

Measurement of Endogenous Sex Steroid Hormones in Breast and Prostate Neoplasia

Lewis H. Kuller / Pittsburgh, PA
James Gutai / Detroit, MI
David Schottenfeld / Ann Arbor, MI

Disorders of Immune Function in Human Carcinogenesis

Charles Rabkin / Bethesda, MD
Ian T. Magrath / Bethesda, MD
David T. Purtle / Omaha, NE

Evaluation of the Applications of Biochemical and Molecular Markers in Epidemiological Studies

Barbara S. Hulka / Chapel Hill, NC
Neil E. Caporaso / Bethesda, MD
Nathaniel Rothman / Bethesda, MD
Arthur Schatzkin / Bethesda, MD
Mark Schiffman / Bethesda, MD

Information and Application Forms

American Association for Cancer Research
Public Ledger Building
620 Chestnut Street, Suite 816
Philadelphia, PA 19106-3483

215-440-9300 215-440-9313 (FAX)

Cancer Epidemiology & Prevention

Biomarkers

A Publication of the American Association for Cancer Research ■ Cosponsored by the American Society of Preventive Oncology

American Association for Cancer Research, Inc.

Executive Director and Director of Publications Margaret Foti

Publications Staff

Associate Director of Publications

Mary Anne Mennite

Production Manager

Heide M. Pusztay

Editorial Assistants

Angela Barry

Linda Pote Musumeci

James D. Tang

Supervisor, Manuscript Processing

Margaret A. Pickels

Assistant Supervisor, Manuscript Processing

Theresa A. Griffith

Editorial Secretaries

Mary Ellen Pirring

June A. Holloway

Valerie L. Taylor

Luz M. Torres

Administrative Staff

Associate Director of Administration

Adam D. Blistein

Senior Accountant

Anthony P. Blengino

Financial Assistant

George L. Moore

Meetings and Development Coordinator

Jeffrey M. Ruben

Executive Assistant for Programs

Ruth E. Fortson

Administrative Assistant

Elizabeth A. Moore

Staff Assistant for Member Services

Robin E. Felder

Editorial Secretary

Diana F. Certo

Office of the Editor-in-Chief

Editorial Secretary

Cheryl C. Carter

Editor-in-Chief

Pelayo Correa

Associate Editors

Webster K. Cavenee

Joseph F. Fraumeni, Jr.

Ellen R. Gritz

Curtis C. Harris

Frederick P. Li

W. Thomas London

Thomas E. Moon

James A. Swenberg

Steven R. Tannenbaum

Alice S. Whittemore

Mimi C. Yu

Assistant Editor

Elizabeth T. H. Fontham

Editorial Advisory Board

David B. Abrams

Bruce K. Armstrong

Helmut Bartsch

Valerie Beral

John S. Bertram

Joan R. Bloom

William J. Blot

John D. Boice, Jr.

George E. Bonney

Ricardo R. Brentani

W. Robert Bruce

Eva Buiatti

Lan Bo Chen

Philip Cole

K. Michael Cummings

Susan J. Curry

Eduardo DeStefani

Paul F. Engstrom

Virginia L. Ernster

Yu Tang Gao

E. Robert Greenberg

Raymond S. Greenberg

Peter Greenwald

John D. Groopman

F. Peter Guengerich

Clark W. Heath, Jr.

Stephen S. Hecht

Kari Hemminki

Rolando Herrero

Elizabeth A. Holly

Lars-Erik Holm

Robert N. Hoover

Geoffrey R. Howe

Barbara S. Hulka

Ronald H. Jensen

Fred F. Kadlubar

Leo J. Kinlen

Alfred G. Knudson, Jr.

Laurence N. Kolonel

Lance A. Liotta

Martin Lipkin

Richard R. Love

Christopher J. Michejda

John D. Minna

Ruggero Montesano

John J. Mulvihill

Nubia Muñoz

Alfred I. Neugut

Abraham M. Y. Nomura

Gilbert S. Omenn

C. Tracy Orleans

David L. Page

Frederica Perera

Nicholas L. Petrakis

Miriam C. Poirier

John D. Potter

Ross Prentice

Barbara Rimer

George C. Roush

Jose Russo

Jonathan M. Samet

Rodolfo Saracci

David Schottenfeld

Paul A. Schulte

Roy E. Shore

Margaret R. Spitz

Louise C. Strong

Takashi Sugimura

G. Marie Swanson

Cesar Victoria

Jürgen Wahrendorf

Nicholas Wald

Lee W. Wattenberg

I. Bernard Weinstein

John H. Weisburger

Walter C. Willett

Rodger J. Winn

Gerald N. Wogan

Sandra R. Wolman

Ernst L. Wynder

Witold Zatonski

Harald zur Hausen

Cancer Epidemiology, Biomarkers & Prevention is published bimonthly, one volume per year, by the American Association for Cancer Research, Inc. Except for members of the American Association for Cancer Research, all subscriptions are payable in advance to Waverly Press, Inc., 428 E. Preston St., Baltimore, Maryland 21202-3993, 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. Nonmembers of the American Association for Cancer Research within the United States may subscribe to Volume 1 of **Cancer Epidemiology, Biomarkers & Prevention** at the rate of \$85.00 (individual nonmembers) or \$130.00 (institutional nonmembers), including postage. Institutional and individual nonmembers outside of the United States should add \$20.00 to their respective rates to offset second-class postage costs. Air mail and other means of delivery are available at extra charge; contact Waverly Press for information. Changes of address notification should be sent 60 days in advance and include both old and new addresses. Member subscribers should send address changes to: Member Services, American Association for Cancer Research, Inc., Public Ledger Bldg., 620 Chestnut St., Suite 816, Philadelphia, PA 19106-3483. Nonmember subscribers should notify Waverly Press of changes of address. Copies of the journal which are undeliverable because of address changes will be destroyed.

Copyright © 1992 by the American Association for Cancer Research, Inc.



B14H-OAK-5QEG



Notice to Members of the American Association for Cancer Research

Officers for 1992-1993

President: Lee W. Wattenberg, University of Minnesota, Minneapolis, MN 55455

President-Elect: Margaret L. Kripke, M.D. Anderson Cancer Center, Houston, TX 77030

Treasurer: Thomas J. King, Georgetown University Medical Center, Washington, DC 20007

Executive Director: Margaret Foti, AACR, Public Ledger Building, Suite 816, Philadelphia, PA 19106-3483

Annual Dues

The annual dues of active members of the American Association for Cancer Research are \$125.00 and they include a subscription to one AACR journal. The member rate for each additional journal is \$45.00. Corresponding members of the Association will be charged an appropriate fee to offset second-class postage costs. Payment of dues and changes of address of members of the Association should be sent promptly to Margaret Foti, Executive Director, American Association for Cancer Research, Public Ledger Building, 620 Chestnut Street, Suite 816, 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 may be ordered from Waverly Press, Inc. As long as supplies permit, single copies will be sold by this company at \$12.50 per copy. Orders outside the U.S. add \$1.50/copy to offset postage costs.

Advertisements

Advertisement insertion orders and copy must be received 60 days prior to the date of issue in which the advertisement is to be published. The journal is mailed on approximately the 10th day of the month of issue. Inquiries about advertising should be directed to: Elizabeth Mosko, Williams and Wilkins, 428 E. Preston Street, Baltimore, MD 21202-3993. Telephone: (410)528-4005.

Copyright and Copyright Clearance Center

Authors who wish to publish in *Cancer Epidemiology, Biomarkers & Prevention* must formally transfer copyright to the proprietor of the journal, the American Association for Cancer Research, Inc. It is understood by this transfer that the authors relinquish all exclusive rights of copyright ownership, including the rights of reproduction, derivation, distribution, sale, and display.

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. In the case of articles supported by federal grants or contracts, copyright transfer to the American Association for Cancer Research, Inc., is required. The federal government may retain a nonexclusive license to publish or republish such material.

The journal will routinely allow authors (or others with the permission of the authors) to include select parts of a copyrighted article in reviews, books, or subsequent papers, upon written request to the AACR Director of Publications. Requests to reproduce an article in its entirety will be considered on an individual basis and permission may be granted contingent upon payment of an appropriate copyright fee. All reproduction requests must include a brief description of intended use and a

stamped, self-addressed envelope. Third parties should obtain the approval of the authors before corresponding with the AACR.

Copies of articles for which the American Association for Cancer Research, Inc. owns the copyright may be made for personal or internal use, provided that the copier pay the per-copy fee of \$2.00 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 articles may report the number of copies they have made, together with the fee code 1055-9965/92 \$02.00, to: Copyright Clearance Center, Inc., 27 Congress St., Salem, MA 01970. 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.

No responsibility is accepted by the Editors, by the American Association for Cancer Research, Inc., by the American Society of Preventive Oncology, or by Waverly Press, Inc. for the opinions expressed by contributors or for the content of the advertisements.

Cancer Epidemiology, Biomarkers & Prevention is indexed in *Current Contents/JCM*[®].

Cancer Epidemiology, Biomarkers & Prevention (ISSN 1055-9965) is published bimonthly for \$85 (individual nonmembers) and \$130 (institutional nonmembers) per year by the American Association for Cancer Research, Inc., 428 East Preston Street, Baltimore, MD 21202-3993. Application to mail at second-class postage rates is pending at Baltimore, MD and additional mailing offices. POSTMASTER: Send address changes to *Cancer Epidemiology, Biomarkers & Prevention*, c/o Waverly Press, Inc., 428 East Preston Street, Baltimore, MD 21202-3993. This journal is printed on acid-free paper.