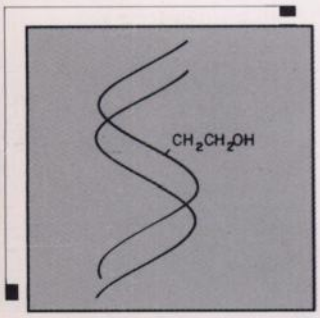
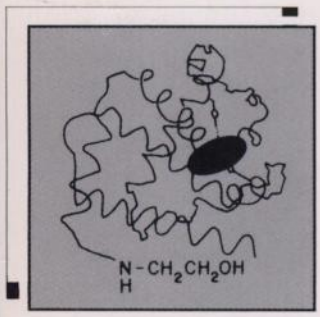
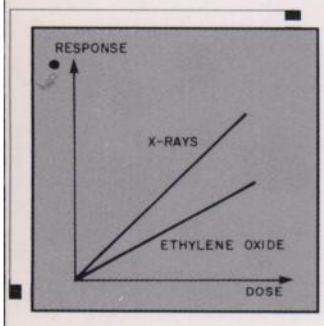
AMERICAN ASSOCIATION FOR CANCER RESEARCH
Ut Cancrum Vincamus
1907

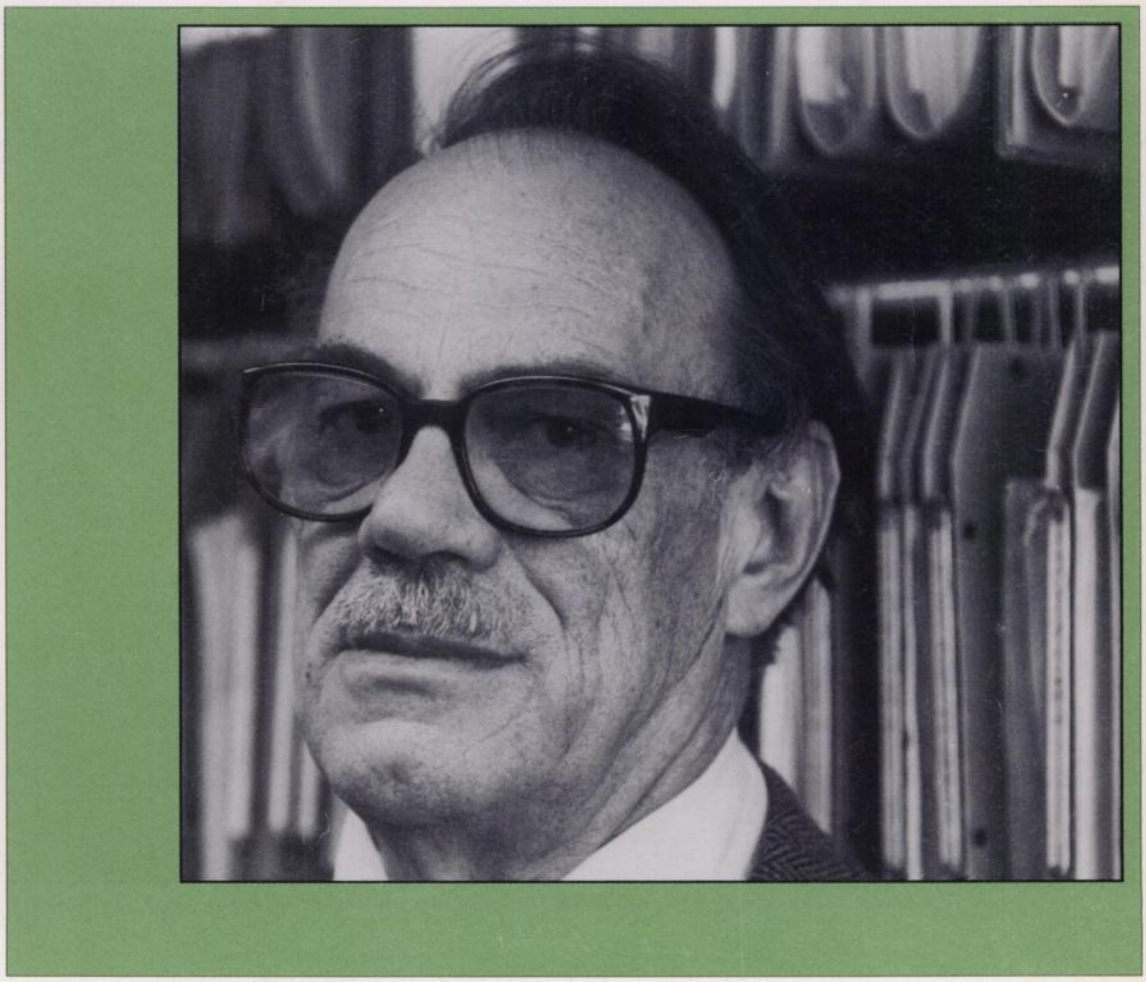
Cancer Research

VOLUME 47 • NO. 18 CNREA 8 • PP 4755–4994
September 15, 1987









ELEVENTH ANNUAL BRISTOL-MYERS AWARD FOR DISTINGUISHED ACHIEVEMENT IN CANCER RESEARCH

The Bristol-Myers Company presents an annual award to a scientist making an outstanding contribution in cancer research. The candidates for the award are to be nominated by medical schools, free-standing hospitals and cancer research centers.

AWARD: $50,000 U.S.
DEADLINE FOR RECEIPT OF NOMINATIONS
December 1, 1987
ANNOUNCEMENT OF AWARD RECIPIENT
Spring 1988

SELECTION COMMITTEE

John R. Durant, M.D., Selection Committee Chairman
Fox Chase Cancer Center

Daniel E. Bergsagel, M.D., D.Phil.
Ontario Cancer Institute/
Princess Margaret Hospital

Emil Frei, III, M.D.
Harvard Medical School/
Dana-Farber Cancer Center

George Klein, M.D.
The Karolinska Institute

Joshua Lederberg, Ph.D.
The Rockefeller University

Albert H. Owens, Jr., M.D.
The Johns Hopkins University School of Medicine

Henry C. Pitot, M.D., Ph.D.
McArdle Laboratory for Cancer Research

Phillip A. Sharp, Ph.D.
Massachusetts Institute of Technology
Cancer Research Center

Richard J. Steckel, M.D.
Jonsson Comprehensive
Cancer Center, UCLA

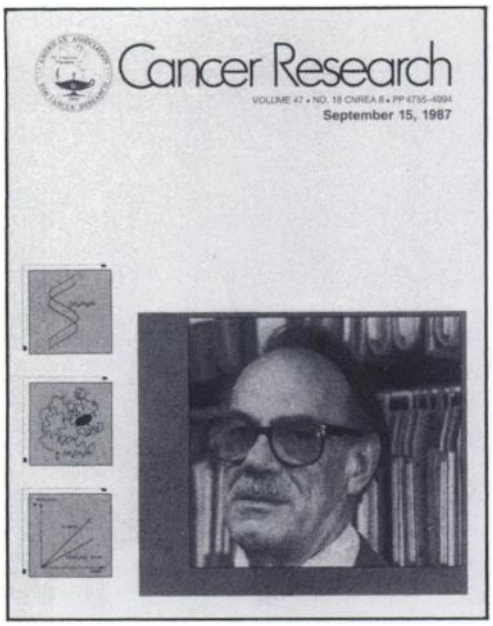
Haruo Sugano, M.D.
Japanese Foundation for Cancer Research

E. Donnall Thomas, M.D.
Fred Hutchinson Cancer Research Center

James D. Watson, Ph.D.
Cold Spring Harbor Laboratory

Rules and official nomination forms are available from: Secretary, Award Committee, 345 Park Avenue, Room 43-38, New York, New York 10154, or (212) 546-4337.

COVER LEGEND



The hazards from chemicals in our environment are today a generally recognized problem of relevance to carcinogenesis, teratogenesis, heritable disorders, and aging, and possibly atherosclerosis and other diseases as well. The ability of chemicals to induce mutations was revealed by Auerbach, Oehlkers and Rapoport in the 1940s, but the possible consequences to human health were hardly explored until the end of the 1950s. One of the first scientists to realize the potential genetic risks of environmental chemicals was Lars Ehrenberg at Stockholm University.

The pioneering work of Ehrenberg and Åke Gustafsson at the Institute of Forest Research in Stockholm applied radiation and chemical mutagens in plant breeding. In 1959 Ehrenberg and Gustafsson submitted to the National Board of Health in Sweden an overview of chemicals in the human environment that could be suspected to pose a genetic risk. Although their paper was directed to a Swedish governmental agency, it had a profound effect internationally by awakening the concern of both the scientific community and the public to this long-term threat to human health.

Ehrenberg has since then been in the front line of research in both radiation and chemical mutagenesis and his contributions, particularly in the area of risk assessment, have been of great significance. It is appropriate to recognize this fact at this point, when he is retiring from his position as Professor of Radiobiology at Stockholm University, which he has held since 1962. Ehrenberg's career was honored this year in an international conference on "Detection Methods for DNA Damaging Agents in Man: Applications in Cancer Epidemiology and Prevention" held in Helsinki on September 2–4.

Ehrenberg received his first scientific education at the University of Lund, then moved to Stockholm where he studied the effects of radiation on plant material, which was the theme for his doctoral thesis in 1955. During the 1960s he became interested in the mechanisms of action of genotoxic chemicals, studying dose-response relationships for the induction of biological effects and methodology of risk estimation. For the comparison of, and for the calculation of the cumulative effects of, risks of various origin he advocated the use of a "quality factor," the rad-equivalent, which was defined as the dose of a reactive chemical or intermediate that gives the same response as one rad of γ-radiation. The rad-equivalent is determined in relevant *in vitro* or *in vivo* test systems for genotoxic activity. Risk estimations for humans may then be based on dose determinations and utilize the rad-equivalent and risk coefficients for cancer in humans established for γ-radiation.

An important characteristic of most chemical mutagens and carcinogens is their ability to form adducts to macromolecules. The relevance of using adduct levels as a measure of dose has been studied by Ehrenberg and coworkers since the early 1970s. Hemoglobin of peripheral erythrocytes was found to be particularly suitable as a monitor molecule. The correlation between hemoglobin and DNA adduct levels has been determined in experimental animals for several model compounds. Highly sensitive methods based on gas chromatography/mass spectrometry have been worked out for the identification and quantification of human exposure to genotoxic compounds through their adducts to hemoglobin. Interest has been focused on low molecular weight alkylating agents, especially ethylene oxide.

Ehrenberg has published about 300 papers in the fields of genetics, cytology, biochemistry, radiation, chemical mutagenesis, reaction kinetics, risk analysis, and especially risk estimation. He has been assigned as an expert by OECD, IAEA, FAO/WHO, ICPEMC and various Swedish commissions and is a member of the Royal Swedish Academy of Sciences.

On the cover, Ehrenberg is shown with molecules of DNA (*top*) and hemoglobin (*middle*) to which ethylene oxide residues are bound. The chart (*bottom*) equates risks of ethylene oxide and γ-radiation. We are indebted to Drs. Kari Hemminki and William G. Thilly for the information and illustrations.