



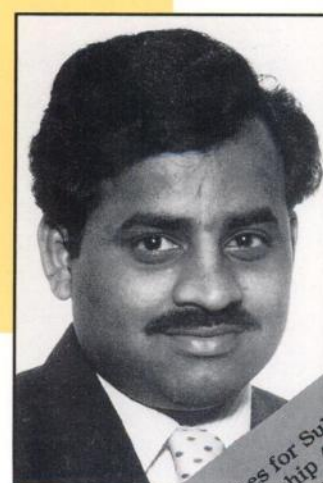
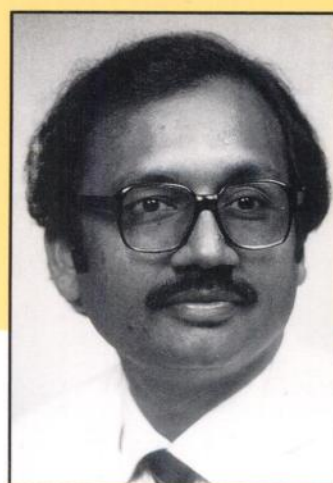
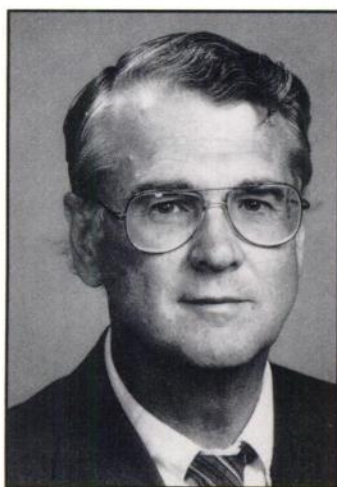
February 1, 1990

# Cancer Research

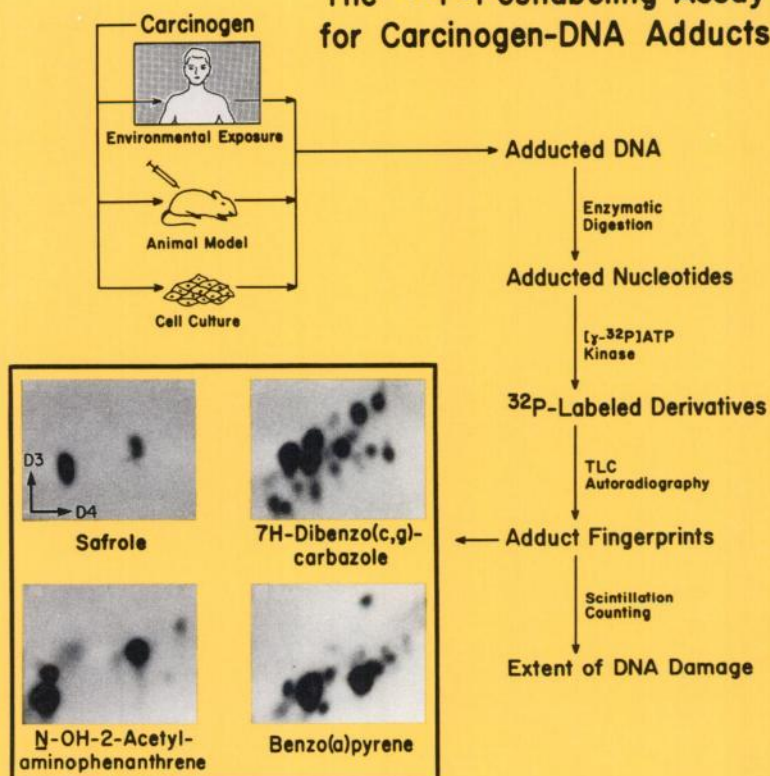
OFFICIAL JOURNAL OF THE AMERICAN ASSOCIATION FOR CANCER RESEARCH

VOLUME 50 • NO. 3 • PP 451-772

ISSN 0008-5472 • CNREA 8

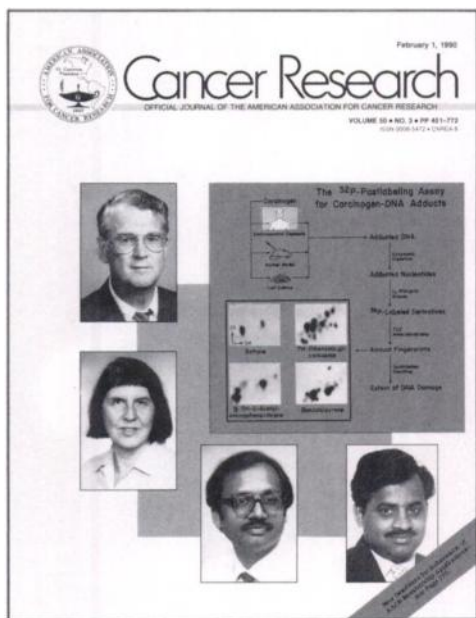


## The $^{32}\text{P}$ -Postlabeling Assay for Carcinogen-DNA Adducts



New Deadlines for Submission of AACR Membership Applications-- See Page 770.

# COVER LEGEND



A decided advance in the discovery and identification of DNA-carcinogen adducts was the  $^{32}\text{P}$  postlabeling technique developed in the laboratories of Kurt Randerath and Ramesh C. Gupta. As shown in the diagram, adducted DNA is digested with DNase, the nucleotides are isolated by usual methods and then phosphorylated enzymatically with  $^{32}\text{P}$ ATP, and the labeled nucleotides are separated by thin layer chromatography and autoradiography. The adducted nucleotides can be identified by fingerprint analysis and quantitated by scintillation counting. The principle was applied originally to study methylated RNA in transfer RNA (Cancer Res., 31: 658, 1971; 34: 643, 1974) by tritium postlabeling. After development of new separation techniques and enzymatic  $^{32}\text{P}$  label-

ing, its applicability to various carcinogens was demonstrated [Proc. Natl. Acad. Sci. USA, 78: 6126, 1981; Carcinogenesis (Lond.), 3: 1081, 1982].

$^{32}\text{P}$  postlabeling of DNA-carcinogen adducts is a highly sensitive, versatile method now used widely to measure DNA modifications from many exogenous and endogenous sources. It has been used to measure a wide variety of DNA-carcinogen adducts [Carcinogenesis (Lond.), 5: 231, 1984; Environ. Health Perspect., 62: 57, 1985], complex mixtures such as cigarette smoke [Cancer Res., 46: 5869, 1986; 49: 1916, 1989], DNA alterations by estrogens [Proc. Natl. Acad. Sci. USA, 83: 5301, 1986], or 2,3,7,8-tetrachlorodibenzo-*p*-dioxin [Carcinogenesis (Lond.), 9: 2285, 1988], and age-dependent DNA modifications termed I compounds, in unexposed animals [Carcinogenesis (Lond.), 9: 1843, 1988; 10: 1337, 1989]. Other important applications are: measuring the capacity of human cells to metabolize carcinogens and determine interindividual variations (Proc. Natl. Acad. Sci. USA, 85: 3513, 1988); and examining the distribution of adducts in rat repetitive DNA sequences (Proc. Natl. Acad. Sci. USA, 81: 6943, 1984) and DNA loops (Proc. Natl. Acad. Sci. USA, 82: 6605, 1985).

Pictured, *counterclockwise from left*, are: Drs. Kurt and Erika Randerath, professors in the Department of Pharmacology, Baylor University School of Medicine, Houston; Dr. Ramesh C. Gupta, professor in the Department of Preventive Medicine, University of Kentucky, Lexington; and Dr. M. V. Reddy of the Environmental and Health Science Laboratory, Mobil Oil Corporation, Princeton.

Drs. K. and E. Randerath and Ramesh C. Gupta provided the information and photos.

John H. Weisburger