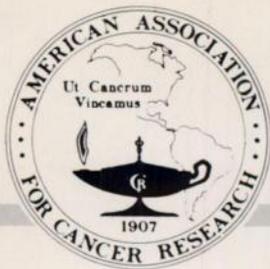


July 15, 1988

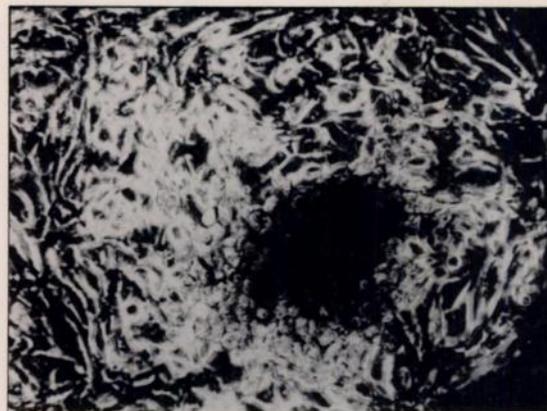


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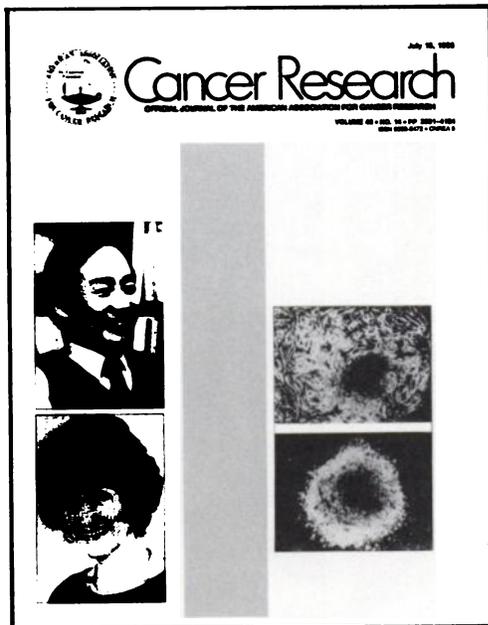
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COVER LEGEND



The study of human cell transformation *in vitro* by chemical and physical agents is of particular importance for understanding the cellular and molecular mechanisms underlying human carcinogenesis. Two pioneers in the fields of chemical and radiogenic human cell transformation are Takeo Kakunaga and Carmia Borek, respectively.

Kakunaga first demonstrated in 1977 that adult diploid human skin fibroblasts (KD) can be transformed *in vitro* to malignancy by chemical carcinogens (T. Kakunaga, Cold Spring Harbor Symp., 1977; Proc.

Natl. Acad. Sci. USA, 1978). Borek first demonstrated in 1979 that the normal adult diploid human skin fibroblasts (KD) can be transformed to malignancy *in vitro* by a single acute dose of X-irradiation [Radiat. Res. abstract, 1979; Nature (Lond.), 1980].

Borek was born in Tel Aviv, Israel. She received her Ph.D. degree in 1967 from the Department of Genetics at the Weizmann Institute of Science, Rehovoth, Israel. Her findings during that period, in collaboration with Leo Sachs, provided the original demonstration of malignant transformation of mammalian cells *in vitro* by X-irradiation [Nature (Lond.), 1966]. Borek is currently Professor of Pathology in the Radiological Research Laboratory of Columbia University.

Kakunaga was born in Keijo, Japan. He received his Ph.D. degree in 1966 from the Department of Pharmacology at Osaka University, Japan. During that period, Kakunaga worked extensively on the malignant transformation of mammalian cells *in vitro* by chemical carcinogens (Kamahora and Kakunaga, Proc. Jpn. Acad., 1966). Kakunaga, who spent several years at the National Institutes of Health in Bethesda, is currently Professor and Chairman of the Department of Oncogene Research and Director of the Oncogene Research Center at Osaka University.

Pictured are Kakunaga (*top*), Borek (*bottom*), and human fibroblasts transformed *in vitro* by X-irradiation. *Top*, focus of transformed cells growing in monolayer culture; *bottom*, colony of transformed cells growing in agar.

M. B. S.