MEMORIAL RESOLUTION

ROBERT F. KALLMAN, PH.D.

(1922–2003)

The Stanford Department of Radiation Oncology lost one of its most important basic science researchers with the death of Robert F. Kallman on August 8, 2003. He was 81 years old at the time of his death from lung disease.

"Bob" to his many friends and colleagues, was a major figure in experimental radiotherapy and played an important part in developing our present day understanding of the importance of the low oxygen levels of solid cancers to their response to radiotherapy. His research also led to the finding of a beneficial interaction between radiation and the widely used anticancer drug cisplatin – an observation that presaged the current widely used treatment of many cancers using a combination of radiation with chemotherapeutic drugs. Kallman also played a major role in graduate education at Stanford with the founding in 1978 of the interdisciplinary program in Cancer Biology. This program has graduated several hundred PhDs and has been of great benefit to the productivity and scholarship of numerous faculty in the school of medicine with particular importance to basic science investigators in clinical departments within the medical school.

Bob Kallman was born May 21, 1922 in Brooklyn, New York, and grew up in Woodmere, Long Island, NY. He received his undergraduate degree from Hofstra College in 1943 and then served in the U.S. Army as a medic in Europe. After the war he attended graduate school at New York University, receiving a Ph.D. in Physiology in 1952. He and his wife Francis (Pat) Green then moved to San Francisco to take up a position at the University of California in San Francisco in the Radiological Laboratory where he became interested in the acute and chronic effects of radiation on normal tissues. In 1956 he was recruited by Dr. Henry Kaplan, then chair of Stanford's Department of Radiology, and in 1959 moved to the newly located medical school on the Stanford campus. His job was to initiate a program in basic research of radiation with a focus on its application to the treatment of cancer by radiotherapy. Three years later Bob became head of the newly formed Division of Radiobiology in the Department of Radiology. Together, Drs. Kaplan and Kallman recruited an extraordinary cadre of faculty and trainees and united the basic science, translational, and clinical research efforts of the Department into an integrated research program that garnered international recognition for the excellence, depth and breath of its activities. Laboratory investigators explored the new horizons opened by the developing knowledge in areas as diverse as tumor hypoxia and oxygen effects, cell proliferation patterns in tumors and normal tissues, DNA damage and repair, and viral carcinogenesis, and also by the development of new animal and cell culture models for use in quantitative experimental cancer therapy.

Bob's research interests ranged widely over the field of radiobiology. His early studies on the hematologic toxicities of radiation demonstrated the importance of genetically-determined differences in cellular radiosensitivity and repair of radiation damage in determining the radiation response of tissues and organisms. Extension of these studies to multiple irradiations with different doses and intervals between treatments illustrated the

importance of repopulation and repair in determining the response of tissues to multi-fraction radiation regimens.

Realizing the need for similar studies in tumors, Bob Kallman was active in the development of mouse models for use in cancer research. He studied the characteristics, advantages, limitations and appropriate use of the autochthonous tumors characteristic of inbred strains of mice. With the development of quantitative assays for measuring the survival of cells from solid tumors, Bob rapidly moved to develop stable, well characterized, syngeneic tumor systems in highly inbred mouse lines, and to use these model systems to study the effects of radiation and anticancer drugs. His lab was among the first to develop and use colony formation assays in cell culture to measure the survival of cells suspended from solid tumors, and he developed the EMT6 and RIF1 tumor systems which remain in widespread use today. His numerous papers and talks on this subject were of tremendous value to those interested in preclinical and translational research. The book Bob organized and edited, “Rodent Tumor Models in Experimental Cancer Therapy” New York: Pergamon Press; 1987, is still the "bible" for people measuring tumor response to therapy.

Bob Kallman is probably best known in the radiation community for his work on tumor hypoxia. He identified and characterized, with his colleague Luke van Putten of the Netherlands, the phenomenon of reoxygenation in tumors following irradiation. His studies of the therapeutic implications of tumor hypoxia, of tumor blood flow, and of the effect of the “3 Rs” (reoxygenation, repair, and repopulation) in determining the response of tumors to fractionated irradiation shaped thinking in this area of experimental radiobiology.

Bob’s interest in experimental radiotherapy later expanded to include studies of the interactions between radiation and anticancer drugs in experimental model systems; these extensive studies involved a host of collaborators and helped set the stage for the development of clinical regimens using concomitant chemoradiotherapy. In particular his studies showing the improvement in the therapeutic ratio of fractionated radiation by the concomitant use of cisplatin presaged the widespread clinical use of this combination.

Bob’s research is published in over 100 research articles and was presented at hundreds of national and international meetings. He was an active member of the Radiation Research Society, and was active on the working committees of the Society throughout his life and co-chaired the emeritus member committee at the time of his death. He served as the 25th president of the Radiation Research Society from 1976-77. Bob stepped down from his major administrative roles in 1984 and devoted more time to his research until his retirement in 1992.

One of Bob's most lasting contributions – certainly to Stanford and to the many graduates of the program – was his founding, in 1978, of Stanford’s Cancer Biology Program. Founding this program was no small feat. The opposition within the University to having a graduate program based on a disease was enormous and it is unquestionably a tribute to Bob's persistence and powers of persuasion that this program ever got off the ground. Bob served as the first Director of this program, and his leadership and guidance over his six years as Director established the program as a vibrant and valuable addition to the University. The grant Bob received from the National Cancer Institute to fund the

program is currently in its 25th year of uninterrupted funding and there are currently over 50 graduate students and a half-dozen postdoctoral trainees in the program.

Committee:

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