

Lawrence, J. H. W-7405-ENG-48
 A2A1099 INTERNAL IRRADIATION AND HEMATOLOGICAL RESPONSE.
 California. Univ., Berkeley. Lawrence Radiation Lab.

This is a long-term study in humans of the effects of internal irradiation from P-32, Y-90, Sr-90, and I-131 when therapeutically used in certain diseases, and the evaluation of the hematological response obtained from their use.

Internal irradiations using the above radioisotopes have been continued and their clinical therapeutic and irradiation effects studied in patients with polycythemia, the chronic leukemias, multiple myeloma, the lymphogranuloses and thyroid disorders, including thyroid carcinoma. The patients receiving internal irradiation over the past 25 years have been closely followed. A high percentage of post-mortem examinations have been obtained on the deceased patients. Studies have been directed to the evaluation of the data obtained and its importance in ascertaining the chronic effects of internally administered irradiation as well as the therapeutic benefit to the patient in specific disease states.

Metabolic studies have proven of value in determining hematological response to internal irradiation. These include red cell life studies with Fe-59, DFP-32, leukocyte and platelet studies with DFP-32.

Auerbach, H. W-31-109-ENG-38
 A2A1128 ANALYSIS OF BONE TUMOR DEATH RATES IN ILLINOIS.
 Argonne National Lab., Ill.

The specific purpose of this project is to determine whether residence in areas using "high" radium water supplies is correlated with an increase in bone tumor death rates, Illinois, because of its geology and distribution of population, presents a unique opportunity to conduct such epidemiological studies on possible effects of Ra²²⁶ as a constant low-level environmental contaminant. Discrete identified populations within the state have been and are presently using water supplies containing more than 4 micromicrograms of radium per liter, one-tenth the maximum permissible level. Bone tumor death rates in this population will be compared (after correction for over-reporting of bone tumor deaths and for bone tumors attributable to occupational or therapeutic exposure to radium) with the remainder of the state population, for which the water supply contains from 0.03 to 4 micromicrograms radium per liter.

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Finkel, M. P. W-31-109-eng-38
 A2A1142 CARCINOGENIC EFFECTS OF INTERNALLY DEPOSITED Sr-90.
 Argonne National Lab., Ill. SP 2; MYr 0.2.

A major experiment will be initiated concerning the induction of osteogenic sarcomas in the mouse exposed to small amounts of Sr⁹⁰. Approximately 20,000 animals will be employed, and these will be distributed across about six dose levels, including a control. The control will require 5000 mice and the highest injected dose, 0.2 $\mu\text{c}/\text{gm}$ body weight, will involve about 1000 mice. Other dose levels will probably be 0.1, 0.05, 0.01, and 0.005 $\mu\text{c}/\text{gm}$. The primary endpoint of the study is the determination of the incidence of osteogenic sarcomas, though life expectancy data will be an automatic concurrent observation. Sr⁹⁰ will be given as a single intravenous injection to male and female CF#1/Anl mice at 70 days of age. The animals will be housed individually, a procedure which provides an open-ended quality to the experiment. If the early results should indicate, for example, a degree of nonlinear dose-response relationship that requires an increase in sample size at the control and lowest doses to assure statistical significance, empty spaces in the monomouse housing system can be filled with the required animals. A steady-state population of 20,000 could thus be maintained, yet the total number in the experiment could be any number above this. Sample sizes will reflect existing experience with the CF#1/Anl mouse exposed to Sr⁹⁰ and the desire to differentiate an essentially linear dose-response relation from a nonlinear or quadratic response. All mice will be radiographed at death, and osteogenic sarcomas will be histologically confirmed.

Finkel, Miriam P. W-31-109-eng-38
 A2A1143 PATHOLOGIC CONSEQUENCES OF EXPOSURE TO RADIOELEMENTS.
 Argonne National Lab., Ill. SP 4; MYr 1.8.

The toxicity of a variety of radioelements is being studied in a standard test system involving the intravenous injection of the isotope into 70-day-old CF#1 female mice and the subsequent examination of the animals during the course of their lives and after death for any changes attributable to radiation. The processing of the data from the Sr-90 and the original Ra-228 experiments is almost finished; the Ca-45, U-233, and Po-210 experiments are ready to be analyzed; the collecting of data from the second Ra-226 experiment is continuing and more animals are being added at lower levels of exposure; and the breeding of animals for a modified Sr-90 experiment containing 20,000 mice is under way.