

**Key Facts Justifying Opposition to Nuclear Pollution at Any Level: A Brief Letter of Concern**

February 6, 2001

To Whom It May Concern:

In 1963, the Atomic Energy Commission requested that I establish the Biomedical Research Division at its Livermore National Laboratory. I served as its first Director, and as an Associate Director of the entire LNL. In 1973, I returned to my professorship at the University of California, Berkeley. My own research into the health hazards from human exposure to ionizing radiation continues to this very day. My most recent monograph on the topic was published in November 1999: [*Medical Radiation in the Pathogenesis of Cancer and Ischemic Heart Disease*](#).

The topic of this letter is the fact that there exists no threshold dose of ionizing radiation below which natural repair, of radiation damage to the genetic molecules, always occurs perfectly.

Until 1990, it was often written that it was scientifically impossible to settle the threshold issue, and might remain so. My 1990 monograph, [*Radiation-Induced Cancer from Low-Dose Exposure*](#), showed how it is possible to settle the issue scientifically, by combining existing evidence from irradiated humans and from the physics of ionizing radiation. My monograph proved, by any reasonable standard of biomedical proof, that there is no threshold dose with respect to causing carcinogenic mutations.

In short, a single x-ray photon or the radioactive decay of a single atom is physically capable of causing permanent and consequential mutations --- including mutations which cause cancer. The chance that this will occur is proportional to dose, right down to zero dose. Subsequently, monographs by others in this field have reached the same conclusion. For example, in 1995, the British government's National Radiological Protection Board issued its monograph, *Risk of Radiation-Induced Cancer at Low Doses and Low Dose Rates*. It concludes that "the weight of the evidence, in respect of the induction of the majority of common human tumors, falls decisively in favor of the thesis that, at low doses and low dose rates, tumorigenic risk rises as a simple function of dose without a low dose interval within which risk may be discounted." No threshold.

It follows from the absence of any safe dose that citizens everywhere have a strong scientific basis for opposing activities which can cause radioactive pollution at any level. The fact that humans cannot escape exposure to ionizing radiation, from various natural sources, is no reason to let human activities increase the exposure. Moreover, the record of governments and their licensed agents has often been horrible regarding containment of radioactive poisons. This record argues strongly against confidence in any promises of future containment.

Very truly yours,

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