



Department of Energy
Office of Science
Washington, DC 20585

Office of the Director

July 15, 2005

Ralph J. Cicerone, Ph.D.
President
National Academy of Sciences
500 Fifth Street, NW
Washington, DC 20001

Ralph
Dear Dr. Cicerone:

I am writing to express my disappointment in the newly released BEIR VII Report, with regard to its overall conclusions and, in my view, an inadequate consideration of the significance of recent scientific advances. Many of us in the scientific community are concerned that the BEIR Committee chose to use only published analyses of data from the Japanese A-bomb Life Span Study in its estimates of risks for the U.S. population, and to reaffirm the use of the linear no-threshold (LNT) hypothesis for extrapolation of risks to low doses of radiation.

I appreciate the enormity of the task faced by the BEIR VII Committee and realize that a review of the literature for such an effort does need to be cut off at some point to give adequate time for final editing, review, and approval. However, between the BEIR V Report of 1990 and last year, new and exciting biological research has been published demonstrating that cells in tissues respond very differently to radiation than isolated cells in culture and that cellular responses to low doses of radiation are very different from responses to high doses of radiation. In addition, a number of significant epidemiological studies of workers exposed occupationally to low dose/low dose-rate radiation (BEIR VII Table 8.2) have been published. Although some of these various studies were discussed in the BEIR VII Report, they were, in the end, left out of the Committee's final deliberations.

The LNT model is based on two assumptions: that any energy deposition can cause DNA damage and that DNA damage alone is the fundamental risk factor for carcinogenesis. While the former biophysical assumption may be true, the latter biological assumption is certainly no longer accurate. Biological mechanisms are now known to exist at molecular, cellular and tissue/organismal levels to repair the damage, to delete damaged cells, and to suppress tumorigenesis. In fact, comparisons among older and more recent studies now show that for very low radiation doses, the energy deposition patterns, the biological processes, and the epidemiological outcomes all appear to be different from those observed at higher doses.



I believe that a prestigious group like the BEIR VII Committee has a unique opportunity and responsibility to strongly acknowledge the existence of these newer data, to more fully discuss the implications of this new, but rapidly maturing, research for estimating human risk from low doses of radiation, and to begin outlining the utility, or lack thereof, of this research for future risk estimation.

In the coming weeks and months there will be opportunities for open debate and review of the BEIR VII Report by many individuals and professional groups. I hope that the National Academies participate in these discussions and uses its prestige and its reputation for scientific excellence to help guide the scientific community in its quest to provide new research results that will fully inform the process by which we evaluate and establish current and future radiation protection standards.

Sincerely,



Raymond L. Orbach, Ph.D.
Director