

ROLES AND PERSPECTIVES OF DOE OFFICE OF INTERNATIONAL HEALTH STUDIES IN BIODOSIMETRY RESEARCH

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The Office of International Health Studies (HS-14) is a part of the Office of Health and Safety (HS-10) in the Office of Health, Safety and Security (HSS) at the U.S. Department of Energy. The mission of this office is to study the health effects of radiation in special populations exposed radiation incidents/accidents or prolonged occupational exposures. Currently, there are two foreign sites where biodosimetry studies are funded, as follows:

The Russian Health Studies Program assesses worker and public health risks from radiation exposure resulting from nuclear weapons production activities at the Mayak Production Association in the Urals. The goals of this program are to clarify the relationship between health effects and chronic, low, medium and high dose radiation exposures and estimate cancer risks from exposure to gamma, neutron, and alpha radiation, in order to provide input to national/international organizations that determine radiation protection standards and practices. Research is focused on Mayak workers and on the residents of the surrounding communities of Techa River, and includes epidemiologic, radiation dose reconstruction, and molecular and radiobiological studies.

Some of the radiation doses to the Mayak workers and the Techa River population were received as long as 50 years ago and reconstruction of both external and internal doses has been a major focus. Several retrospective validation techniques have been tried such as Electron Paramagnetic Resonance (EPR) of teeth and Fluorescence in-situ hybridization (FISH) in lymphocytes, and reconstruction of Strontium⁹⁰ intake in teeth. Other methods include uncertainty analysis of dosimetry models, such as plutonium dosimetry model, as well as urine bioassays.

The office also funds studies of the Japanese atomic bomb survivors at the Radiation Effects Research Foundation (RERF) in Hiroshima and Nagasaki, Japan. Objective of the RERF is "to conduct research and studies, for peaceful purposes, on medical effects of radiation on man and on diseases which may be affected by radiation, with a view to contributing to the maintenance of the health and welfare of atomic bomb survivors and to the enhancement of the health of all mankind" The Life Span Study is the major RERF epidemiologic study that generates data on cancer incidence, cancer mortality, and non-cancer effects in relation to radiation dose. The RERF research program also includes in-utero, genetic, mechanistic, and clinical (Adult Health Studies) studies, as well as, follow-up studies on the children of the survivors (F1 studies). The validation of retrospective doses is a major issue even in these studies. The presentation will discuss in more detail the need for validation techniques of retrospectively obtained doses in these populations.

Reference: <http://www.hss.energy.gov/HealthSafety/>

