A Collaborative Research Project Involving the Human Tissue Analysis Programs of the United States and the Russian Federation

R. E. Filipy, V. F. Khokhryakov, K. G. Suslova, and E. E. Aladova*

**The United States Transuranium and Uranium Registries, Washington State University, Tri-Cities Richland, WA 99352; Branch No. 1 of the Federal Research Center Institute of Biophysics, Ozersk, Russian Federation*

The United States Transuranium and Uranium Registries (USTUR) is a human tissue analysis program established for the purpose of characterizing the distribution of actinide elements in the human body. The U.S. Department of Energy Office of Epidemiology and Health Surveillance provides the support for the program and it is operated by the Washington State University College of Pharmacy.

Tissues are collected at autopsy of volunteer donors who worked at facilities that processed uranium, plutonium, or other transuranic elements. The tissues are analyzed by the USTUR Radiochemistry Laboratory and the results of the analyses are contained in an automated database along with information about exposure histories and the medical histories of the donors. Such data arte useful for comparing estimates of actinide intakes, made during life, with the body burdens measured after death and for the verification of models that describe the deposition and translocation of the actinides among body organs.

The USTUR and the Dosimetry Registry of the Mayak Industrial Association (DRMIA) have been engaged in a collaborative research project for the past five years. Both Registries collect tissue from workers at plutonium processing facilities and analyze those tissues for plutonium content. The purpose of this collaborative research project was to combine the data collected by both Registries for the purpose of characterizing the biokinetics of plutonium in the human body.

Analyses of these data were directed toward characterization of a plutonium biokinetics model used by the DRMIA for internal dose assessments at the Mayak facility. Relationships between model parameters and the workplace aerosols inhaled by workers at Mayak were demonstrated, as was a relationship between the health status of an individual and plutonium excretion rates.

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