Combination of the Actinide Analysis Data of Two Human Tissue Analysis Programs: Triumphs and Problems

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The United States Transuranium and Uranium Registries (USTUR) and the Dosimetry Registry of the Mayak Industrial Association (DRMIA) are the two primary human tissue analytical programs known to the world. Each Registry ahs collected actinide element exposure information and analytical data from tissues collected at autopsy of occupationally-exposes workers in plutonium and uranium processing facilities. The two Registries have been collaborating to combine their data into a joint database for use in the study of uptake, retention, translocation, and excretion of actinide elements in humans. During the four-year collaborative research project, a number of similarities and differences in the methods used to collect the data were found. This report contains a discussion of the similarities and some of the major differences.

The methods for analyzing tissue samples used by the two Registries were quite different in the past; however, a series of sample exchanges with comparisons of the analytical results has shown the results to be in close agreement. One parameter used by both Registries that was not in agreement was the “residence time”, the time between exposure, or probable exposure, of a worker to the actinides and the death of the individual. Another differences between the Registries involved the methods used in calculation of skeletal actinide content on the basis of a limited number of bone samples collected at autopsy. And explanation of these differences with an evaluation of their impacts, along with potential solutions will be presented. These differences, discovered during he collaborative e project, did not preclude the use of the data, either separately or combined, to characterize the biokinetics of actinide elements in the human body.

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