

The United States Transuranium and Uranium Registries: Fifty Years of Contributions to Understanding of Plutonium in Humans

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This presentation marks the 50th anniversary of the United States Transuranium and Uranium Registries (USTUR). The potential toxicity of plutonium was recognized during the early days of the Manhattan Project. The mission of the USTUR is to study the uptake, translocation, retention and excretion (biokinetics), and tissue dosimetry of internally deposited actinides (uranium, plutonium, and americium) in occupationally exposed volunteer tissue donors. The USTUR is an invaluable national and international resource for testing and improving the application of bioassay data to predict tissue dose rates measured at autopsy. Postmortem radiochemical analyses of tissues obtained at autopsy have led to improved knowledge on distribution and long-term retention of ²³⁹Pu and ²³⁸Pu in the human body and have helped in parameterizing biokinetic constants for these radionuclides. The USTUR's research is fundamental to evaluating and improving the reliability of, and confidence in, both prospective and retrospective assessments of tissue radiation doses and risks from intakes of plutonium and other actinides. These data are vital for refining the biokinetic models underlying safety standards for these radioactive elements. Since 1992, Washington State University has successfully operated the USTUR, and the associated National Human Radiobiology Tissue Repository (NHRTR) as a grant research project administered by the College of Pharmacy. Currently, the USTUR holds records and data for 309 partial-body donors and 45 whole-body donors. The NHRTR has preserved and held frozen tissue samples, histological slides, and formalin-fixed paraffin-embedded tissue blocks from 158 donations (114 partial-body and 34 whole-body). NHRTR materials are a valuable, however, underexplored, resource for other studies such as biomarker and cytogenetic research.

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