

U.S. Transuranium and Uranium Registries: 50 y of Research Relevant to New Biomarker

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The potential toxicity of plutonium and other artificially-produced actinide elements was recognized during the early days of the Manhattan Project. The mission of the United States Transuranium and Uranium Registries (USTUR) is to study the uptake, translocation, retention and excretion (biokinetics), and tissue dosimetry of uranium, plutonium, americium, and other actinides in occupationally exposed volunteer Registrants (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. These studies are fundamental to evaluating and improving the reliability of, and confidence in, both prospective and retrospective assessments of tissue doses and risks from intakes of actinides. Washington State University has successfully operated the USTUR and the associated National Human Radiobiology Tissue Repository (NHRTR) since 1992, as a grant research project administered by the College of Pharmacy. Currently, the USTUR holds records and data for 304 partial-body donors and 43 whole-body donors. The NHRTR has preserved and held frozen tissue samples, histological slides, and formalin-fixed paraffin-embedded tissue blocks from 151 donations (109 partial-body and 32 whole-body). NHRTR materials are, however, valuable unexplored resource for the biomarker and cytogenetic studies. Recently conducted study by Radiation Emergency Assistance Center and Training Site (REAC/TS) in collaboration with the USTUR demonstrated that the Pseudo Pelger-Huet anomaly could be used as a permanent radiation biomarker.

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