

## The United States Transuranium and Uranium Registries (USTUR): Return on DOE HSS Investment – October, 2007

The USTUR and their research collaborators contributed two presentations at the 53<sup>rd</sup> Annual Radiobioassay and Radiochemical Measurements Conference, Jackson Hole, WY, October 29<sup>th</sup> – November 2<sup>nd</sup>. USTUR has published these presentations on their new web site ([http://www.ustur.wsu.edu/Conferences/2007\\_RRMC/index.html](http://www.ustur.wsu.edu/Conferences/2007_RRMC/index.html)).

The screenshot shows the website for the United States Transuranium and Uranium Registries (USTUR) at Washington State University. The header includes the WSU logo and navigation links like 'A-Z Index', 'Campuses', 'myWSU', 'WSU Search', and 'WSU Home'. The main title is 'Washington State University College of Pharmacy United States Transuranium & Uranium Registries'. A central banner features a photo of the Pullman Campus and the text 'LEARNING FROM PLUTONIUM & URANIUM WORKERS'. Below this, there are links for 'Advisory Committee', 'Policy/Procedures', 'Faculty/Staff', 'Graduate Projects', and 'Publications/Presentations'. The right-hand column contains two news items: 'Annual SAC Meeting' and 'Standardizing Bioassay Assessment'. The left-hand column has a navigation menu with categories like 'What's New?', 'Contact Us', 'College of Pharmacy', 'Home', 'History of Registries', 'USTUR', 'De-identified Data', 'Case Narratives', 'Radiochemistry', 'Health Physics', 'Pathology', 'NHRTR', 'NRA', and 'Links'. The footer provides contact information and copyright details.

- Dr. Sergei Tolmachev, USTUR's Radiochemistry Laboratory Manager, described a new USTUR initiative to apply high resolution Sector Field Inductively Coupled Plasma Mass Spectrometry (SF-ICP-MS) to obtain more comprehensive isotopic composition data from samples of donated human tissues, while also reducing the cost of sample analysis over  $\alpha$ -spectrometry. This work is being carried out with Dr. Michael Ketterer, Professor of Chemistry and Biochemistry, College of Engineering and Natural Sciences, Northern Arizona University (NAU), Flagstaff, AZ. The initial results are highly promising. These include demonstrating the ability of SF-ICP-MS to measure directly  $^{241}\text{Am}$  and its soft- $\beta$  emitting parent  $^{241}\text{Pu}$  in lung, lymph node and liver samples, and  $^{234,235,238}\text{U}$  in all tissue samples (including those from donors occupationally exposed only to plutonium/ameridium). For uranium-exposed donors,

the  $^{236}\text{U}$ : $^{238}\text{U}$  atomic ratio can also be measured. These new measurement capabilities will enable USTUR (and the scientific community) to interpret and model USTUR case data in significantly greater depth, for example, by resolving definitively for an individual donor the components of actinide burden (and tissue dose) contributed by multiple intake events (different materials). USTUR/NAU's poster presentation entitled "Determination of Pu and Am in Digested Bone and Soft Tissue Samples by SF-ICP-MS: Comparison with  $\alpha$ -spectrometry" is available at [http://www.ustur.wsu.edu/Publications/Pubs\\_files/Publications07/pdf/USTUR-0234-07\\_RRMC.pdf](http://www.ustur.wsu.edu/Publications/Pubs_files/Publications07/pdf/USTUR-0234-07_RRMC.pdf). This SF-ICP-MS work will be continued by NAU in FY2008, under sub-contract from Washington State University (WSU)/USTUR.

- Mr. Timothy Lynch, Pacific Northwest National Laboratory's (PNNL) In Vivo Monitoring Program Manager, Radiation and Health Technology, described recent results of a collaborative project between PNNL and USTUR. Tim chaired the "DOE Lung Intercalibration Committee Workshop" at the RRMC 2007 Conference, introducing this with a presentation entitled "Comparison of  $^{241}\text{Am}$  Organ Activity from Radiochemistry and Direct Measurements." PNNL (and its Hanford predecessors) have followed a select group of USTUR (and its predecessors') Registrants through their employment at Hanford, and with high resolution measurements of externally emitted  $^{241}\text{Am}$  59 keV  $\gamma$ -ray post mortem (prior to autopsy). Comparison of the "in vivo" (external) measurement estimates of skeletal, lung and liver  $^{241}\text{Am}$  content with USTUR's tissue radiochemical analysis results provides a unique opportunity to determine how accurate and reliable these operational "in vivo" measurements are in each case. The donors were variously exposed by inhalation or skin wound, and to various types of actinide materials. PNNL/USTUR's presentation is available for viewing and download at [http://www.ustur.wsu.edu/Publications/Pubs\\_files/Publications07/pdf/USTUR-0235-07\\_RRMC.pdf](http://www.ustur.wsu.edu/Publications/Pubs_files/Publications07/pdf/USTUR-0235-07_RRMC.pdf). This collaborative study will be continued in FY2008 under WSU/USTUR sub-contract to PNNL.