

December 2025

USTUR Newsletter



DIRECT FROM THE DIRECTOR

Dear Registrants and Families,

It is a privilege to reconnect with you and share highlights of the Registries' activities and accomplishments during this past year. Your continued participation has been essential to advancing our research.

This year was scientifically successful for the USTUR, which was established nearly 60 years ago. USTUR research continues to demonstrate its importance and uniqueness in the field of radiation protection, while opening new opportunities to improve the outcomes of epidemiological studies. We have maintained our close collaboration with the Million Person Study (MPS). Three presentations were delivered during the 61st Annual Meeting of the National Council on Radiation Protection and Measurements, which was dedicated to the Million Person Study: Current Results and Vision for Radiation Epidemiology and Protection. In addition, Ms. Xirui Liu was invited to present at the MPS special session during the 2025 Annual Meeting of the American Public Health Association.

USTUR members also earned national recognition this year. Dr. Tabatadze was elected to the Health Physics Society's Board of Directors, and I was elected to serve on the Beryllium Health and Safety Committee. These honors highlight the growing influence of the USTUR's work and reflect the dedication of our staff.

Also, I am pleased to share good news regarding long-term bioassay follow-up program for participants who provided urine samples. After years of efforts to find an outside laboratory for analyses, we finally established a collaboration with the U.S. Air Force School of Aerospace Medicine Radioanalytical Laboratory. This partnership gives us confidence that collected bioassay samples will now be analyzed in a timely manner.

Together with the Cougar Tracks Program at Washington State University Tri-Cities, we prepared a two-year proposal to the Department of Energy to establish the Radiological and Nuclear Security Leadership Academy. The Cougar Tracks Program offers continuing education and workforce training to address a wide range of national needs. This funding opportunity will enable us to hire an entry-level technical assistant to support operations in our radiochemistry laboratory.

Finally, I am honored to thank every Registrant for your continued participation in USTUR's research, and I extend my best wishes to you and your families for good health and happiness in 2026.



← Visit us on the web!

Sergey Tolmachev



MPS COHORTS

DOE workers

260,000

Atomic veterans

114,000

Nuclear power plant workers

135,000

Industrial radiographers

123,000

Medical radiation workers

109,000

Nuclear submariners

126,000

Shipyard workers

96,000

Radium dial painters

3,300

Other

~40,000

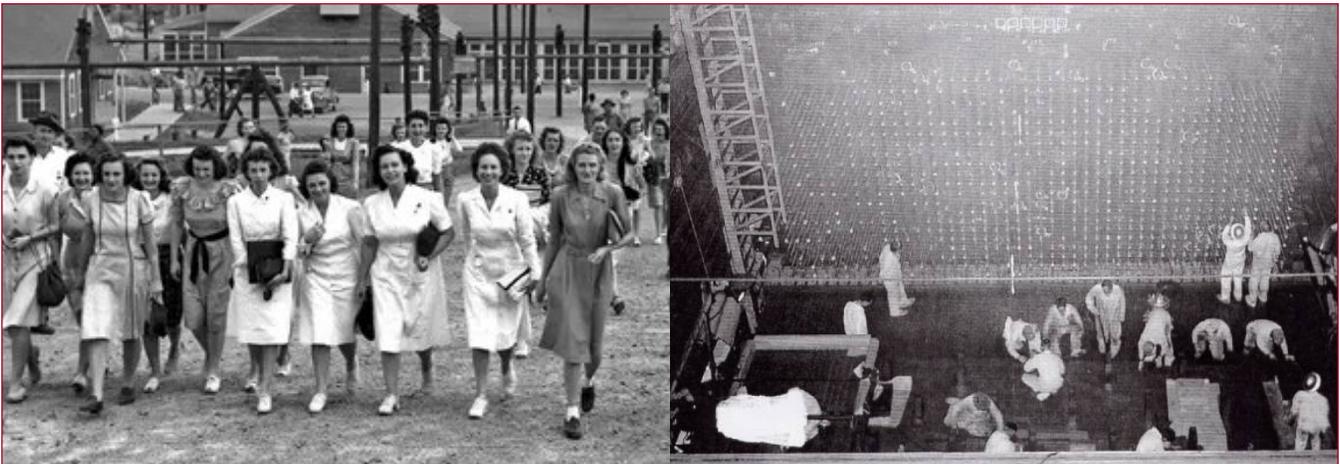


The Million Person Study

A GUEST ARTICLE BY LAWRENCE DAUER

Scientific Director of the Million Person Study for the National Council on Radiation Protection and Measurements

The Million Person Study (MPS) of low-dose health effects of radiation-exposed workers and veterans was designed to evaluate the health consequences following prolonged exposure to radiation over time. The MPS is being facilitated by the National Council on Radiation Protection and Measurements and is the largest occupational radiation epidemiology study. The MPS includes individuals from occupational or service groups that were potentially exposed to radiation at varying times from 1913 to the present, including workers involved in the Manhattan project and at nuclear facilities of the U.S. Department of Energy, atomic veterans of the U.S. Department of Defense, nuclear power plant workers, industrial radiographers, medical radiation workers, nuclear submariners and other U.S. Navy personnel, and radium dial workers. The project is a U.S. national effort with active cooperation of several federal agencies for support. The MPS is providing explicit scientific understanding of potential health effects. The results of the MPS are contributing to improving guidelines for worker protection and the public policy setting. The MPS will provide evidence to directly evaluate appropriate risk models for radiation protection programs impacting worker safety, cleanup criteria, and energy production as well as contribute sound science for operational site radiation protection programs. MPS's comprehensive and rigorous approach is positioning scientists to answer important questions including cancer risks, non-cancer outcomes, and information on how exposures to specific radionuclides may impact adverse outcomes in differing ways. The USTUR is an important member of the MPS collaborative team that provides essential insights into radiation dosimetry, outcome assessment, and dose-response model validation.



Left to Right: Shift change at the Oak Ridge Y-12 plant, 1945. (Ed Wescott/Department of Energy); Face of the Hanford B reactor during construction, 1944. (Department of Energy)

MILLION PERSON STUDY: SPOTLIGHT ON PARKINSON'S DISEASE

BY LAWRENCE DAUER

Parkinson's disease is the second-most common chronic and progressive brain problem (neurodegenerative disorder) in the United States (U.S.), right after Alzheimer's disease. About 1 million people in the U.S. and 10 million people worldwide suffer from Parkinson's disease and about 90,000 new cases are diagnosed every year in the U.S. Scientists don't know the exact cause but they think it is related to a mix of a person's genes and environmental factors that contribute. The MPS evaluates all causes of death among cohort populations, including Parkinson's disease. A recent analysis including six separate cohorts within the MPS consisting of 517,608 workers to date and with 17,219,001 person-years of observation showed large ranges of cumulative radiation dose to the brain. The National Council on Radiation Protection and Measurements, with participation and assistance of the USTUR team, developed refined and specific methodologies for more accurate estimates of radiation dose to the brain. There were 1,517 deaths due to Parkinson's disease in the study group and a statistical evaluation of the data found that the risk of Parkinson's disease was higher for people who had more exposure to radiation. This is a new and important finding, which shows the importance of future work associated with understanding possible mechanisms, potential confounding variables, and assessing implications for radiation protection guidance. The MPS is continuing follow-up in all cohorts and will be evaluating additional worker groups (e.g., Hanford, Savannah River, Fernald, and Oak Ridge [X-10, Y-12, K25], and nuclear submariners) and more statistically precise estimates of radiation risk following chronic worker exposures are anticipated. The USTUR information is directly enabling more accurate and important answers about the risks of long-term radiation exposure.

MODELING INHALED CURIUM IN THE HUMAN BODY

A unique donation to the USTUR is that of a former nuclear worker who inhaled curium. His curium intake was minor in comparison to a much larger plutonium intake; however, relatively little direct human data about curium in humans is available. Curium is a minor actinide that has mostly been studied in animal models, or in terms of excretion of curium in urine after an intake. To our knowledge, this is the first time that the curium biokinetic model has been combined with direct measurements of curium in human tissues.

This Registrant received an acute inhalation of curium-244 when a glove box failed. The worksite analyzed one urine sample for curium, but the amount of curium-244 in the sample was below the detection limit. Over five decades later, this individual passed away and donated selected tissues to the USTUR. The USTUR carried out post-mortem measurements to determine the amount of curium in 10 bones and 18 soft tissues. The results of these analyses confirmed that an intake had occurred. The worker was estimated to have inhaled approximately 840 mBq of curium-244, most of which was retained in the skeleton (90%), followed by muscle tissue (3.4%) and the liver (2.2%). The mass of the skeleton, and the muscular system, is much larger than that of the liver. This makes it useful to consider the concentration of radionuclides, such as curium, in tissues rather than the total activity. The highest concentration of curium-244 was observed in the tissues of the respiratory tract (182 mBq per kg), followed by the skeleton (77 mBq per kg) and the liver (15 mBq per kg). Sergey Tolmachev presented this research at the 2025 Radiation Research Society meeting in September.



WITH GREAT SADNESS...

On November 27, 2024, a former director of the Registries, Bryce Breitenstein, passed away. Dr. Breitenstein was a physician who directed what was then the U.S. Transuranium Registry from 1976 to 1982. He played a crucial role in occupational medicine and was the primary physician responsible for the treatment of the “Atomic Man,” a Hanford worker who received an unprecedented americium intake in 1976.

COUGAR TRACKS



The USTUR has partnered with WSU's Cougar Tracks program to submit a proposal to the Department of Energy to develop a Radiological and Nuclear Security Leadership Academy (RNSLA) at WSU. The RNSLA is designed to meet the nation's growing demand for expertise in radiochemistry, radiation protection, and radiological security. If approved, it will offer a noncredit online certificate in radiological security and protection, establish a 12-month USTUR Radiochemistry Training Program, and provide a leadership summit that builds leadership and decision-making skills.

Though the online certificate program would not qualify for university credits, participant in it and the leadership summit would be eligible to earn continuing education units. The USTUR Radiochemistry Training Program would provide an entry-level, hands-on experience. This would help the next generation of radiation protection professionals to develop scientific expertise, while providing the USTUR with much needed assistance in the laboratory.

THANK YOU AGAIN TO THOSE WHO SUBMITTED URINE SAMPLES!

We would again like to thank those Registrants who submitted urine samples to us in 2022. We are pleased to say that we were able to have them analyzed this year. Since analyzing these samples in-house was not practical, the USTUR needed to find a commercial or research laboratory with credible experience. This took some time, and ultimately the U.S. Air Force School of Aerospace Medicine Radioanalytical Laboratory agreed to analyze the samples. Results were mailed out to Registrants in early December. If you expected to receive a copy of your urinalysis results, but have not received it, please give us a call.

We plan to collect a second urine sample from Registrants who expressed an interest in submitting periodic samples. The next collection date will be in February 2026. Letters for this have also been mailed, so if you are interested in continuing to participate in our follow-up urine collection program, but have not received a letter, please let us know.



MORE ABOUT COUGAR TRACKS

Cougar Tracks, named after WSU's cougar mascot, is a WSU program that provides continuing education and workforce training to fulfill a variety of needs, including students seeking professional growth, small business owners in need of safety and onboarding trainings, and teams interested in leadership and teambuilding initiatives.

*Wishing a
Happy
Holidays
to you and yours!*

MILLION PERSON STUDY: A FINAL NOTE

The Million Person Study was the topic of a special session at the 2025 American Public Health Association (APHA) Meeting. This special session was designed to introduce the Million Person Study to a new audience: public health professionals. During this session, the USTUR's Xirui Liu discussed how cause-of-death errors on death certificates can affect the findings of epidemiological studies.

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USTUR faculty and affiliates at the APHA special session. Left to Right: Stacey McComish, Sergey Tolmachev, Annie Allred (The George Washington University), Joey Zhou (DOE), Xirui Liu

WSU INVITED TO JOIN ORAU CONSORTIUM OF UNIVERSITIES

In October, Washington State University was invited to join the Oak Ridge Associated Universities' (ORAU) consortium. ORAU is composed of 161 universities across 39 states, for which it facilitates collaborative work to advance scientific research on STEM (science, technology, engineering, mathematics) topics. ORAU became acquainted with WSU through USTUR director, Sergey Tolmachev's, work with the Million Person Study. WSU would be the first Washington university to join ORAU.

ORAU grew out of the Manhattan Project, and was established during the post-World War II era. The Manhattan Project pulled together thousands of workers, including leading scientists, to support the war effort. When the war ended, many civilians returned to the jobs that they held before the war. This included professors from southern universities who were returning from work at Oak Ridge. Recognizing the value of collaboration, ORAU's predecessor organization – Oak Ridge Institute of Nuclear Studies – was established with 14 founding universities. The institute's earliest work focused on medical research such as cancer treatment. To learn more about ORAU, visit: www.orau.org