



WASHINGTON STATE UNIVERSITY
College of Pharmacy and
Pharmaceutical Sciences



2025 USTUR Scientific Advisory Committee Meeting
Hampton Inn, Richland, Washington; April 9–10, 2025

Research and Operation in FY2026



Sergey Y. Tolmachev, *Research Professor and Director*

United States Transuranium and Uranium Registries

1845 Terminal Drive, Suite 201, Richland, WA 99354

ustur.wsu.edu | stolmachev@wsu.edu

“Learning from Plutonium and Uranium Workers”

Mission

- Follow up occupationally-exposed individuals (volunteer Registrants) by studying the biokinetics (deposition, translocation, retention, and excretion) and tissue dosimetry of uranium and transuranium elements, such as plutonium, americium, curium, and neptunium
- Obtain, analyze, preserve, and make available for future research, materials from individuals who had documented intakes of uranium and transuranium elements
- Apply USTUR data to refine dose assessment methods in support of reliable epidemiological studies, radiation risk assessment, and regulatory standards for radiological protection of workers and public



Specific Aims

- Manage and operate the Registries
- Conduct scientific research
- Demonstrate and promote broader use and application of USTUR research, data, and materials
- Contribute to the education of a new generation of scientists





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Fiscal Year 2026 (FY2026)

April 1, 2025 – March 31, 2026

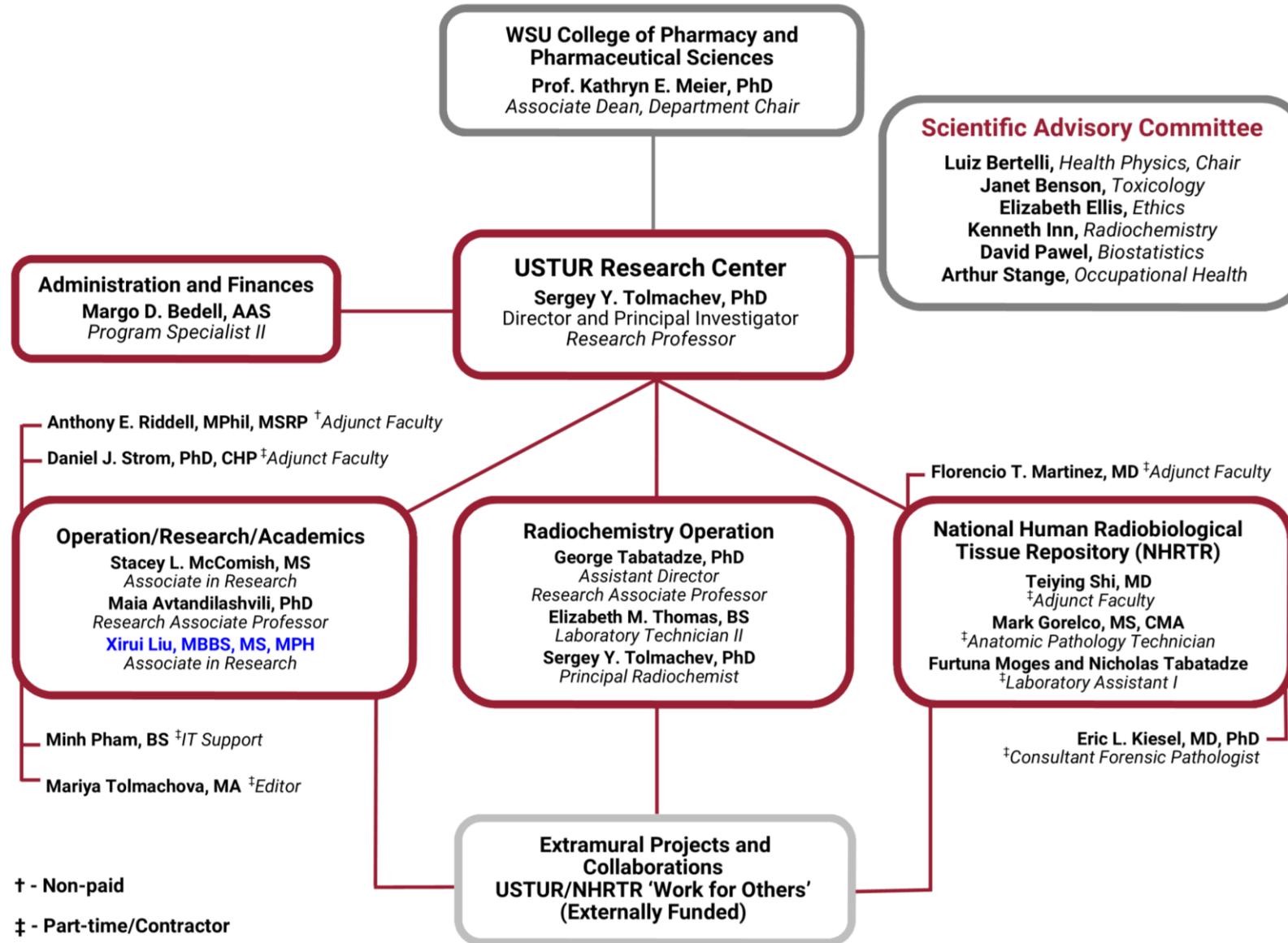


USTUR in FY2026

- **Funded:** DOE, Office of Domestic and International Health Studies
- **Managed:** Washington State University, College of Pharmacy and Pharmaceutical Sciences (Award: DE-HS0000073)
- **Operated:** Central DOE IRB #WASU-68-50181 (July 28, 2025)
- **Budget:** \$1,367,082
- **Personnel (part-time):** 6.5 (0.5) FTE



Organization Structure and Personnel



Management and Operation

- Accept Registrant donations
- Communicate with Registrants and next-of-kin
- Conduct radiochemical analyses of tissues
- Develop and populate USTUR database system
- Operate the National Human Radiobiological Tissue Repository (NHRTR)
- FY2028–FY2032 budget proposal



Radiochemistry Group Tasks

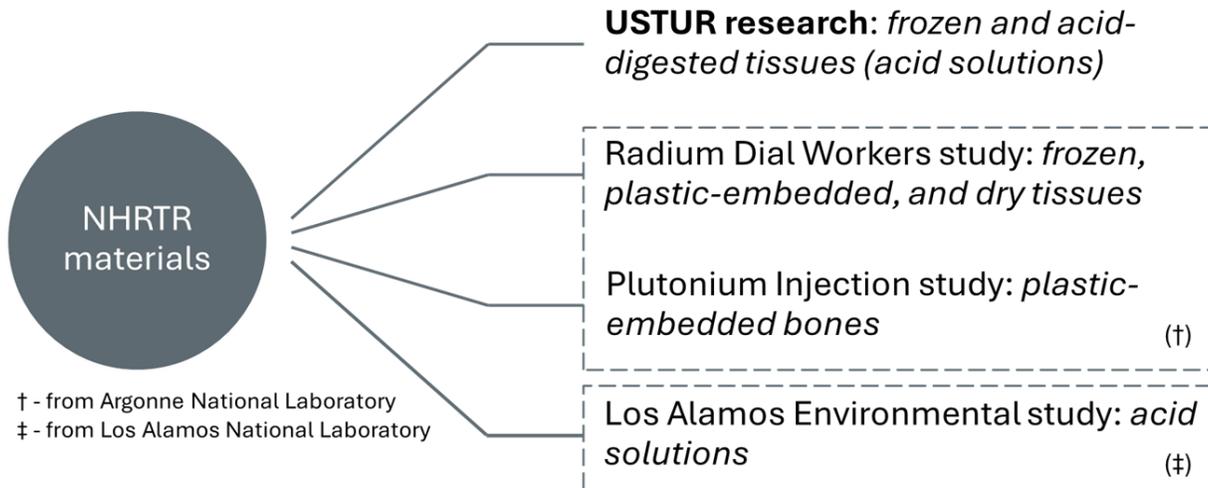
- (Re)-establish analysis throughput of (450)–600 tissue samples
- Complete implementation of vacuum drying procedure
- Populate radiochemistry database

USTUR tissue analysis protocol



Database and Material Inventory Tasks

- Health physics database – updating with missing data (requested)
- Database harmonization – purchasing LIMS if funding permits
- National Human Radiobiology Tissue Repository inventory
 - USTUR tissue samples – as received
 - Other collections – if funding permits



† - from Argonne National Laboratory
 ‡ - from Los Alamos National Laboratory



MoU with the UKHSA

Initial 5-year MoU signed on 2/18/2019

- **Free** licenses for Taurus and IMBA® internal dosimetry software

New MoU draft received on 11/20/2024

- Sent to WSU/CPPS for approval on 11/20/2024
- Sent to DOE/EHSS-13 on 2/27/2025

UKHSA issued 3-month temporary licenses

- Taurus – **£12,500** to buy
- IMBA® USTUR version (not commercially available) – **free** under MoU



Taurus

File Preferences User guide Notebook Refresh screen Advanced About

Input

Reference: ref_name_max_20chars

Nuclide: Ac-224 2.78h

Deposition parameters: ICRP OIR series defaults (selected), Light work, 5.0 microns AMAD

Absorption parameters: ICRP OIR series defaults (selected)

Systemic biokinetics: ICRP OIR series defaults (selected)

Alimentary tract: ICRP OIR series defaults (selected)

Respiratory tract: ICRP OIR series defaults (selected)

Wound model: NCRP defaults (selected)

Intake regimes: Number of intake regimes (max. 20): 0

LR	LRfrac	Dep	Form	Route	Mode	Start	End	Intake	fA	fr	sr	ss
1	A	1.0000	5.0 um AMAD		Acute							

Reference year: 1901 01/01 is the first day (t=0)

End year: 1990

Help

Taurus licence - [C:\Program Files (x86)\Taurus_A\Taurus_Licence_Activation_File_005.txt]

WARNING DO NOT MODIFY THIS LICENCE ACTIVATION FILE AS IT MAY STOP TAURUS FF

TAURUS Internal Dosimetry Software - Advanced Version 2.2 - Temporary Licence

© Crown Copyright UK Health Security Agency 04/03/2025

Licence Number: TAU2025_AT2-2_005

Licensee Name: USTUR - WSU

Licensed Number of Users: 5

Expiry Date: 04/06/2025

License Key: 1110715017835077412233881052014457048758072

Bioassay quantities:

Whole body	24h Urine	Blood	Liver
Lungs	24h Faeces	Thyroid	Kidneys
Adipose	Wound	Skeleton	GI tract

Licence information

This copy of Taurus is registered to USTUR - WSU for 5 users. It will expire on 04/06/2025.



Research Topics

Internal projects

- Uncertainties in radiation epidemiology outcomes
- Plutonium biokinetics and worksite-specific dose assessment
- Curium (^{244}Cm) distribution and biokinetics
- Actinide partitioning among internal organs
- Occupational exposure to non-radioactive materials
- Digital autoradiography of alpha-emitting radionuclides

Collaborative projects

- Individual organ/tissue dosimetry: actinide and radium in the human heart
- Neptunium (^{237}Np) distribution and biokinetics



Urine Sample Analyses and Follow-Up Collection



April
2025

- First batch of seven cases for Pu/Am analyses

May
2025

- Second batch of seven cases for Pu/Am/Np analyses

June
2025

- MoU with USAFSAM/OEA Radioanalytical Laboratory

July
2025

- Reporting results to the Registrants/Families

Sept
2025

- Urine sample collection from living registrants (seven?)



Latent Class Model in Logistic Regression - GWSPH MPH Practicum -

- Prof. Heather Hoffman (George Washington University Milken Institute School of Public Health; 2016–2023 SAC member) – possibility of 120-h practicum required for Master of Public Health degree
- Joey Zhou – application of the LCM to adjust for misclassification in logistic regression
- Annie Allred (BS Mathematics and Anthropology) – MPH, Biostatistics (May 2026)



Annie with the USTUR Family during 2025 NCRP Meeting



Cougar Tracks at WSU Tri-Cities

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Michelle Hrycauk Nassif | Director, Cougar Tracks

m.hrycauknassif@wsu.edu

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Introduction to Radiological Security

A program designed to familiar students with the fundamentals of radiological security and the international and domestic policy response.

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Protect - Remove - Reduce

Introduction to Radiological Security

What are Radioactive Materials?

Radioactive materials are materials that emit energy in the form of particles or waves.

These materials could include spent fuel from non-power reactors, sealed radioactive sources, and bulk radioactive material suitable.

Importance of Radiological Safety

A radiological release incident has the potential to be a catastrophic event.

- Negatively impact the economy
- Cause disruption to everyday life
- Result in casualties and loss of life
- Contaminate the environment for years to come

Example

On April 15, 2013, a bomb was detonated during the Boston Marathon. Although the explosion during the Boston Marathon Bombing did not involve radioactive material, consider the impact had the terrorists added radioactive material to pressure-cooker bombs.

Learn more about the Boston Marathon by visiting the article [Boston Marathon Bombing](#).

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Radiation Fundamentals

What is Radiation?

Radiation is defined as energy moving through space, either as particles or electromagnetic waves. There are sources of radiation all around us, both natural and man-made.

Background radiation is radiation that is around us all the time and exists in varying levels. Naturally occurring radioactive material (NORM) in the ground and in water, as well as cosmic radiation from space, produce background radiation. Man-made sources of radiation used in industry or other sources also contribute to background radiation.

Key Terms

- Radioisotope**
An atom that is unstable and emits radiation until it becomes stable.
- Radioactive decay**
A process where there is a loss in energy by emitting ionizing particles.
- Becquerel (Bq)**
Units used to measure radioactive decay.
- Curie (Ci)**
Units used to measure radioactivity.
- Half-Life**
The time required for a quantity of a radioisotope to decay by half.

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Careers in Radiological Security

Career paths in radiological security are varied, as are the agencies and organizations that support the field. It is important to recognize that radiological security is frequently assumed to be a technical field. However, many different career paths exist for students of varying backgrounds, such as the listed ones.

- Science
- Engineering
- Management
- Intelligence and security
- Legal and regulatory
- Law enforcement and response
- International relations and policy

Student Resources

The National Nuclear Security Administration (NNSA) sponsors internships sponsored through the Merit-Stevens Institute Internship Program (MSIP).

For graduate students, NNSA offers the Nonproliferation Graduate Fellowship Program (NGFP).



Conferences



71st Annual International Meeting

Call for Abstracts

San Juan, Puerto Rico ■ Hilton Caribe
September 21 – 24, 2025



APHA 2025

ANNUAL MEETING & EXPO

NOVEMBER 2-5, 2025 • WASHINGTON, D.C.



HPS 2025

13–17 July 2025 • Madison, WI



ISoRED
INTERNATIONAL SOCIETY OF RADIATION
EPIDEMIOLOGY AND DOSIMETRY

ISoRED 2025 Meeting

Save the date for the 2nd meeting of the
International Society of Radiation Epidemiology and Dosimetry
9-11 September 2025, Lyon, France

Mark your calendars for the **2nd meeting of the International Society of the Radiation Epidemiology and Dosimetry** to be held at the **International Agency for Research on Cancer (IARC) in Lyon, France on 9-11 September, 2025** and will be offered in a hybrid format allowing both in-person and remote participation. The meeting will consist of three days of presentations covering topics of medical, occupational, and environmental radiation exposure. The sessions will touch on both epidemiologic and dosimetry aspects and, as appropriate, related fields such as clinical medicine, biology, and social sciences.

Details on registration, abstract submission, scientific program, hotel, social activities, and award opportunities for early career scientists will be provided as they are developed. Visit the [meeting website](#) for all the details.



ICRP 2025

8th INTERNATIONAL SYMPOSIUM ON THE SYSTEM OF RADIOLOGICAL PROTECTION
7-9 OCTOBER 2025 • ABU DHABI, UAE



Publications in Progress

- Disaster Medicine and Public Health Preparedness (1.9[†])

Lopez MA, Alves A, **Avtandilashvili M**, Bertelli L, Dumit S, Fojtik P, Franck D, Gadd M, Hetrick L, Klumpp J, Li C, Navarro JF, Osko J, Pérez López B, Petitot F, Poudel D, Riddell A, **Šefl M**, Sugarman S, **Tolmachev S**, Broggio D (2025) *EURADOS/REMPAN review on monitoring and dosimetry for radionuclide contaminated wounds*. *Accepted*

- Journal of Radiological Protection (1.4)

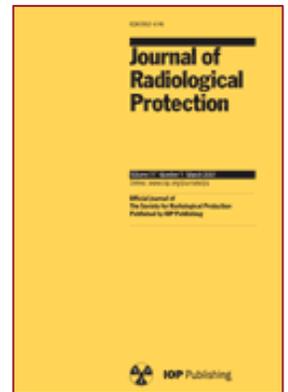
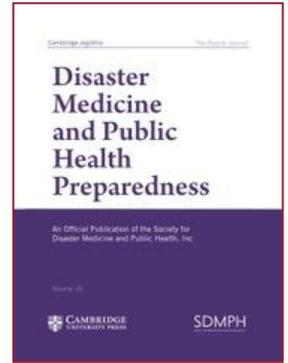
Romanyukha A, Consani K, **Tolmachev SY** (2025) *Variability of radiation doses reconstructed by EPR in teeth of former United States nuclear workers*. *Submitted*

- Scientific Reports (3.8)

Avtandilashvili M, **Šefl M**, Zhou JY, **Tolmachev SY** (2025) *Validation of Bayesian modeling approach of uncertainty in organ doses using post-mortem measurements*. *Submitted*

Liu X, **McComish SL**, Howard S, Zhou JY, **Tolmachev SY**. *Quantifying the impact of misclassification on health risk models: An analysis in radiation-exposed workers*.

†- impact factor



Publications in Preparation

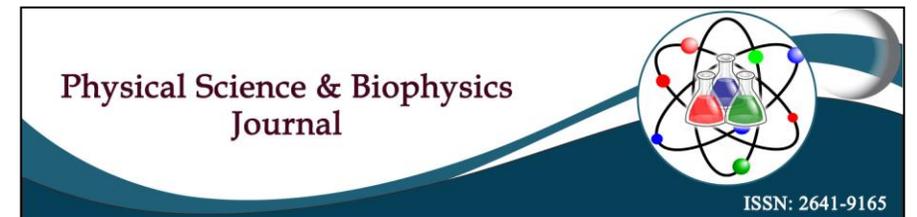
1. Lopez MA, Alves A, Avtandilashvili M, Bertelli L, Dumit S, Fojtik P, Franck D, Gadd M, Hetrick L, Klumpp J, Li C, Navarro JF, Osko J, Pérez López B, Petitot F, Poudel D, Riddell A, Sefl M, Sugarman S, Tolmachev S, Broggio D. *Clinical management of radionuclide intakes through wounds: a EURADOS/REMPAN review*. Disaster Medicine and Public Health Preparedness
2. Poudel D, Klumpp JA, Avtandilashvili M, Tolmachev SY. *Mechanisms for long-term retention of plutonium in the respiratory tract: Inferences from animal and human studies*. Health Physics
3. Tabatadze G, Strom DJ, Thomas EM, Avtandilashvili M, McComish SL, Tolmachev SY. *Development of data quality objective for measurement sensitivity in research laboratory*. Journal of Radioanalytical and Nuclear Chemistry
4. Tolmachev SY, Avtandilashvili M, Lariviere D, Kawamura H, Momoshima N, Arbova DL, Brockman JD. *Beryllium in human tissues: application to biokinetic studies*. Toxicology
5. Tolmachev SY, Tabatadze G, Avtandilashvili M. Distribution and biokinetics of ^{244}Cm in a human body. Radiation Research
6. Tolmachev SY. *Importance of human data – U.S. Transuranium and Uranium Registries*. Journal of Radiological Protection (Special Issue)



Professional and Academic Service



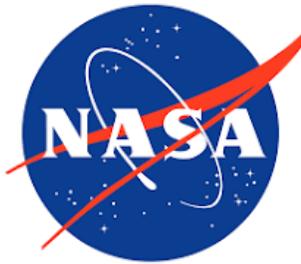
National Council on Radiation Protection and Measurements



Collaborative Research Network



National Council on Radiation Protection and Measurements



U.S. AIR FORCE



World Health Organization





Thank you for your attention!

¹⁶ S Sulfur 32.07	⁶⁸ Er Erbium 167.26	³² Ge Germanium 72.63	³⁹ Y Yttrium 88.905
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