

2012 Scientific Advisory Committee Meeting
Anthony's at Columbia Point, Richland, WA
September 7 - 8, 2012

Research & Operation Plan for FY2013



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*“Learning from Plutonium
and Uranium Workers”*

Research & Operation Concept

USTUR Research Center (Intramural Project)

Sergei Y. Tolmachev, *PhD, Director, Associate Research Professor*

Radiochemistry/Mass Spectrometry

Sergei Y. Tolmachev, PhD

- Expedient Analysis of Donated Tissues
- Application of New Actinide Separation Techniques
- Application of Advanced Measurement Techniques

Tissue Repository & Databases

Stacey L. McComish, MS/Maia Avtandilashvili, PhD

National Human
Radiobiological Tissue
Repository (NHRTR)

Case Narratives, Health
Physics, Radiochemistry,
Pathology

Extramural Projects/Collaborations

- WSU, Pullman (Np, Cm)
- NAU, Flagstaff (U, Pu, Am; ICP-MS)
- AREVA, Richland (U; ICP-MS)
- HC, Ottawa (U, Pu, Monte C)
- SUBI, Russia (Pu, Am)
- U. Ghent, Belgium (Zr; Synchrotron XRF)
- JPC, Silver Sprng (DU, toxicology)
- U. Laval, Quebec (U, Be)
- KIT, Germany (ext. γ -counting)

PNNL/Radiation Biology
William F. Morgan, *Director*
Christopher E. Nielsen, *WSU PhD Student*
Additional PNNL Staff/Students

KIT/Radiation Protection
Bastian Breustedt, *Head*

**WSU, Tri-Cities
Nursing Program**
Phyllis Morris, *Director*

**WSU, Tri-Cities
Grad. Cert. Program**
James R. Pratt, *Director*

EURADOS/WG-7
Maria Lopez, *Chair*

EU/SOLO/HPA
John Harrison, *Coordinator*

NIRS/Dosimetry
Osamu Kurihara, *Head*

“Work for Others”

WSU – Washington State University
NAU – Northern Arizona University
AREVA – AREVA NP Inc
HC – Health Canada
JPC – Joint Pathology Center

Key
SUBI – Southern Urals Biophysics Institute
KIT – Karlsruhe Institute of Technology
PNNL – Pacific Northwest National Laboratory

EURADOS/WG-7 – European Radiation Dosimetry Working Group 7
EU – European Atomic Energy Community (Euratom)
SOLO – Epidemiological Studies of Exposed Southern Urals Populations
HPA – Health Protection Agency (UK)
NIRS – National Institute of Radiological Sciences (Japan)



FY2013 Operational Budget

U.S. Department of Energy, Office of Illness and Injury Prevention Programs (DOE/HS-13)

Management and Operation of the United States Transuranium and Uranium Registries

✓ Budget: \$871,523

Health Protection Agency (HPA)

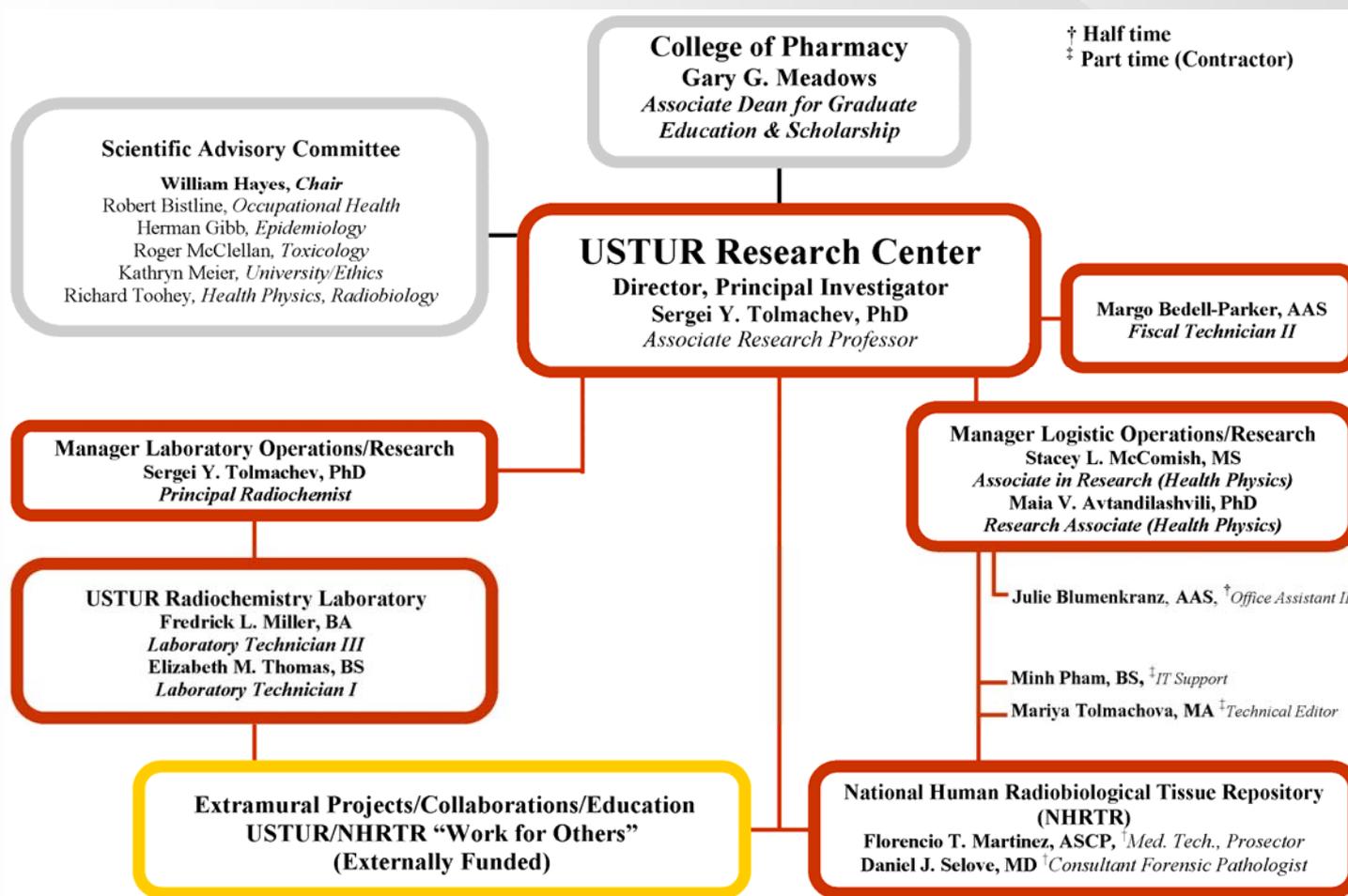
Microdistribution and Long-Term Retention of $^{239}\text{Pu}(\text{NO}_3)_4$ in the Human Respiratory Tract

✓ Budget: \$20,992

• Total Operational Budget: \$892,515



Organization Structure



Research & Operational Tasks

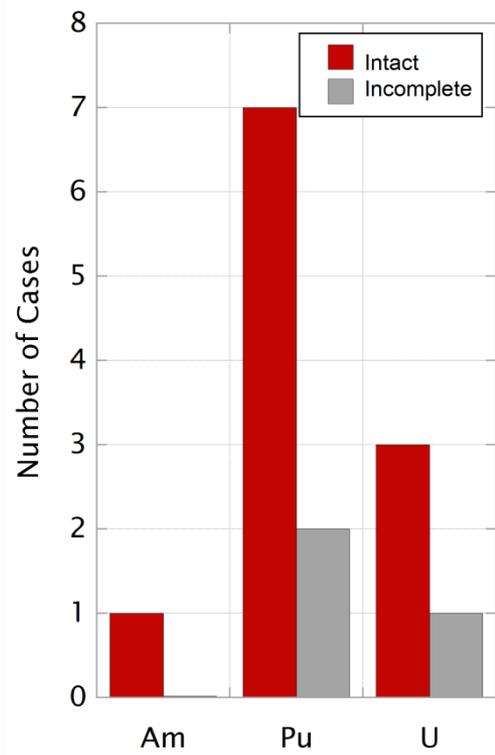
- Accept Registrants' Tissue Donations
- Analyze Donated Tissues Expeditiously
- Populate a Searchable, Comprehensive Database of All Case Data
- Keep Scientific Collaborations Active
- Publish Results



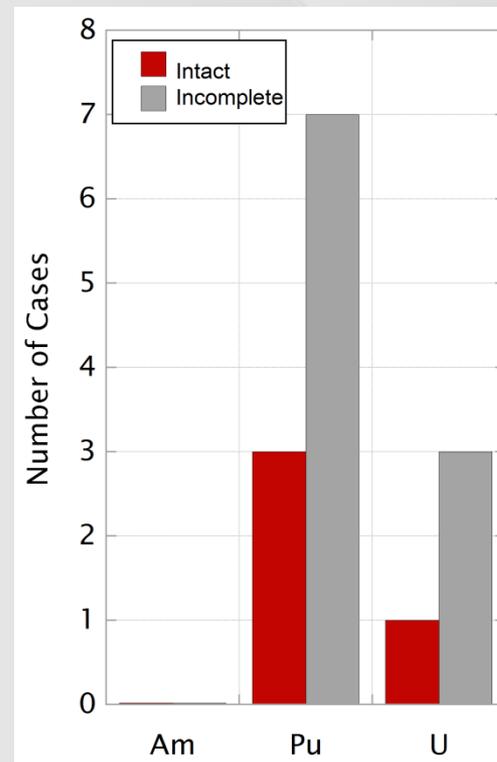
Radiochemistry FY2013



FY2012 Radiochemistry Progress: Whole-Body Cases



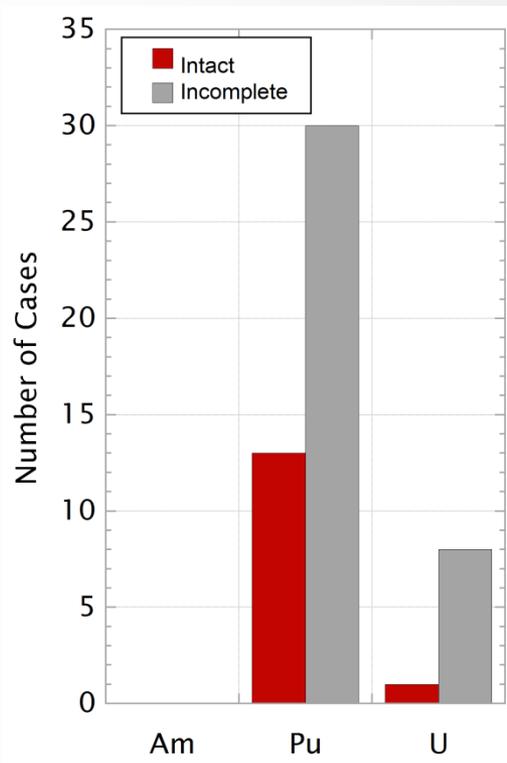
July 20, 2011



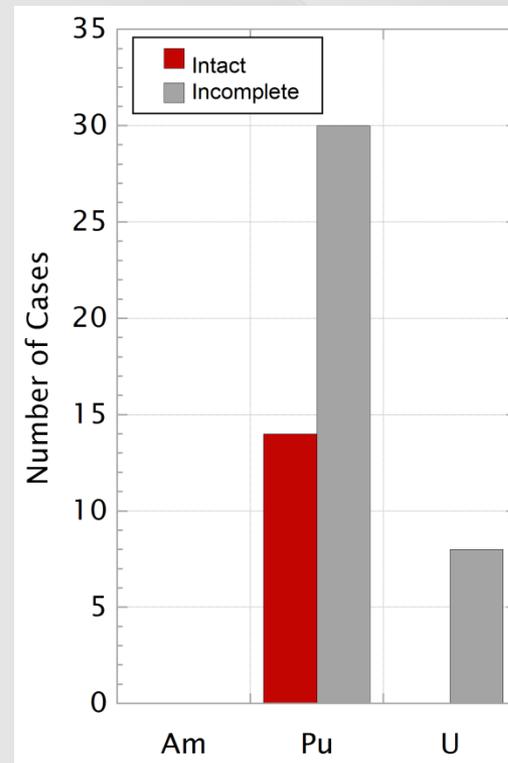
September 7, 2012



FY2012 Radiochemistry Progress: Partial-Body Cases



July 20, 2011



September 7, 2012



FY2013 Analyses

- Priority: elimination of 14 intact cases
- Perform: analysis of 10 soft tissue and 5 bone samples (survey analysis) to obtain key initial scientific information
- Cases: 1 (1 whole-body) for U and 13 (3) for Am/Pu
- SOLO/PhD: Case 0269 and Case 0636
- Total samples: 270 - 320



Cost Optimization

- Using 1-ml vs 2-ml TEVA-TRU-DGA cartridges for Pu/U/Am analysis
 - ✓ Cost/Savings: \$39.2/\$13.7
- Using TEVA-DGA for Pu/Am analysis
 - ✓ Cost/Savings: \$27.7/\$10.4
- Using ICP-MS for U analysis
 - ✓ Cost/Savings: \$50.1/\$0.1
 - ✓ Benefit: ^{236}U , precise $^{234,235,238}\text{U}$



Standard Operation Procedures

- Five SOPs Need to be Published
 - ✓ Microwave Digestion
 - ✓ Am/Pu Separation
 - ✓ U/Th Separation
 - ✓ Electrodeposition
 - ✓ Alpha Spectrometric Counting



USTUR Database



Tasks

- Health Physics Data Entry
- Radiochemistry Database
 - ✓ Determine Scope of Database
 - ✓ Develop Standardized Input File (Template)
 - ✓ Design Database
 - ✓ Radiochemistry Data Entry



National Human Radiobiological Tissue Repository (NHRTR)



NHRTR Inventory

- Complete Inventory of Frozen Tissues
- Continue Inventory of Acid Solutions
- Start Inventory of Frozen Tissues from Radium Dial Painters
- Estimate the Total 'RAM' Holding of the NHRTR



The Management Information System

- No THEMIS Upgrade to LIMS (SAC 2011)
- THEMIS Update
 - ✓ Tracking sample-mass changes and generating mass history reports for each sample
 - ✓ Generating pre-filled “Sample Dissolution Sheet”



Research Collaborations



FY2013 Collaborations

- PNNL/HPA/WSU
 - ✓ Pu-nitrate study
 - ✓ Molecular biology
- Joint Pathology Center
 - ✓ DU toxicology
- Health Canada
 - ✓ ^{241}Am distribution in bone
- EURADOS WG7
 - ✓ DTPA therapy model
 - ✓ Monte Carlo methods and voxel phantoms
 - ✓ ^{241}Am biokinetics (as a ^{241}Pu progeny)



Do Not Be a Stranger to WSU

- College of Pharmacy
- Graduate Certificate Program in Radiation Protection
- School of Earth & Environmental Sciences Graduate Committee



Publications in Preparation

- Peer-reviewed Journals (Impact Factor)
 - ✓ Cancer Research (7.86) 1
 - ✓ J. Analytical At. Spectrometry (3.22) 1
 - ✓ J. Environmental Monitoring (1.99) 1
 - ✓ Health Physics (0.92) 1
- Presentations
 - ✓ Podium 1
 - ✓ Poster 2

