

## Maia Avtandilashvili, PhD

**Dr. Maia Avtandilashvili**, Assistant Research Professor

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U.S. Transuranium and Uranium Registries

College of Pharmacy and Pharmaceutical Sciences

Washington State University

Tel: + 1 (509) 946

6870

1845 Terminal Drive, Suite 201

FAX: + 1 (509) 946

7972

Richland, WA 99354-4959 USA

E-mail: [m.avtandilashvili@wsu.edu](mailto:m.avtandilashvili@wsu.edu)

### **Education**

MS Experimental Nuclear Physics, I. Javakhishvili Tbilisi State University (Tbilisi, Rep. of Georgia) 1984

PhD Health Physics, Idaho State University (Pocatello, ID) 2011

### **Biographical Sketch**

Dr. Maia Avtandilashvili is an Assistant Research Professor (Health Physics) at the College of Pharmacy and Pharmaceutical Sciences (CPPS), Washington State University (WSU). Her research is focused on analysis of individual USTUR cases in support of internal dosimetry and radiation protection. Dr. Avtandilashvili is responsible for population of the USTUR health physics database: standardization of exposure records and industrial hygiene data, bioassay and in-vivo counting results.

Maia Avtandilashvili earned her Diploma (with Honors) in Physics (Equivalent to MS) at I. Javakhishvili Tbilisi State University (Georgia) in 1984, majoring in Experimental Nuclear Physics. After graduation, she joined the research group at the Radiocarbon and Low-Level Counting Section (RLLCS) of Tbilisi State University (TSU). In 1986-1990, she was enrolled in post-graduate program in Nuclear and Particle Physics at TSU. Her research was focused on studying the annual and seasonal variations of cosmogenic and anthropogenic  $^{14}\text{C}$  concentrations in atmospheric air and biota. This study was conducted in collaboration with the Physics Department of Bratislava University (Slovakia). She was also involved in radiocarbon dating activities funded by the Archeological Research Center of Georgian Academy of Science. Starting in 1994, Maia Avtandilashvili had been participating in radioecology research projects conducted at RLLCS. From 1997 to 2002, she was involved in the IAEA Regional Project "Marine Environmental Assessment of the Black Sea Region". In 1999, Maia Avtandilashvili was awarded an IAEA Fellowship for on-the-job training at the leading research centers in Germany in the field of environmental radioactivity monitoring. In 2002-2009, Maia Avtandilashvili was involved as a research associate in a number of cooperative research projects jointly implemented by Idaho State University (ISU) Physics Department and RLLCS: Advanced Accelerator Applications – Dose Conversion Coefficients (AAA-DCC) project funded by the US Department of Energy (2002-2004); Independent Radiological Monitoring program in cooperation with ISU Environmental Monitoring Laboratory (2003-2006); Tbilisi Radon Assessment Initiative supported by the US Civil Research and Development Foundation (CRDF).

In 2006, Maia Avtandilashvili was awarded a scholarship for doctoral study in Health Physics at Idaho State University. As an ISU PhD student, she was involved in research activities of the US Transuranium and Uranium Registries as an ISU/USTUR Internal Dosimetry Research Team member. The main objective of her dissertation was to study the lung clearance patterns for refractory plutonium particles using the human data available for the USTUR tissue donors. Working with the USTUR cases during the graduate study has provided her with a great deal of experience in: (a) understanding the internal dosimetry concepts and models, as well as the basics of the occupational bioassay monitoring programs; (b) interpreting the in-vivo and in-vitro bioassay data for retrospective internal dose assessment; (c) performing bioassay and dosimetric calculations using the IMBA Professional Plus software; (d) quantifying the uncertainties in the "best estimates" of intake and tissue doses using the IMBA Uncertainty Analyzer software tool. In 2007, Maia Avtandilashvili was awarded the Health Physics Society' Burton J Moyer Fellowship for graduate studies. She earned her degree of Doctor of Philosophy (PhD) in Applied Physics with an emphasis of Health Physics in 2011.

In 2012, Dr. Avtandilashvili joined the US Transuranium and Uranium Registries (USTUR) research team. Her current research focuses on modeling of actinide biokinetics using unique human data from former nuclear workers (volunteer donors to the USTUR) with accidental internal depositions of actinide elements. Dr. Avtandilashvili applies advanced statistical analysis methods to bioassay and tissue radiochemical analysis data from the USTUR donors (i) to test, validate, improve and parameterize biokinetic models for radiological protection, (ii) to evaluate uncertainties in internal dose estimates in support of epidemiological studies, and (iii) to investigate effects and mechanisms of actinide decorporation using chelating agents.

Dr. Avtandilashvili has been a member of US Health Physics Society (HPS) since 2007 and an associate member of the European Radiation Dosimetry Group (EURADOS) Working Group 7 (WG7) on "Internal Dosimetry" since 2017. Dr. Avtandilashvili currently serves as a member of the National Council on Radiation Protection and Measurements (NCRP) Scientific Committee 6-12 "Development of Models for Brain Dosimetry for Internally Deposited Radionuclides". She is also an Editorial Board member of *Austin Biometrics and Biostatistics* journal and a Guest Co-Editor of the USTUR special issue of the *Health Physics* journal.

Dr. Avtandilashvili is fluent in English, Georgian, and Russian, and is proficient in German.

### **Selected publications**

1. Breustedt B, **Avtandilashvili M**, McComish SL, Tolmachev SY. USTUR Case 0846: Modeling americium biokinetics after intensive decorporation therapy. *Health Physics Accepted*; **2018**.
2. **Avtandilashvili M**, Tolmachev SY. Modeling skeleton weight of an adult Caucasian man. *Health Physics*; *Published ahead-of-print*; **2018**. DOI: [10.1097/HP.0000000000000881](https://doi.org/10.1097/HP.0000000000000881)
3. Dumit S, **Avtandilashvili M**, Tolmachev SY. Evaluating plutonium intake and radiation dose following extensive chelation treatment. *Health Physics*; *Published ahead-of-print*; **2018**. DOI: [10.1097/HP.0000000000000882](https://doi.org/10.1097/HP.0000000000000882)

4. **Avtandilashvili M**, Dumit S, Tolmachev SY. USTUR whole-body case 0212: 17-year follow-up of plutonium contaminated wound. *Radiat. Prot. Dosim.* 2018, 178 (2), 160-169.
5. Tolmachev SY, Nielsen CE, **Avtandilashvili M**, Puncher M, Martinez F, Thomas EM, Miller FL, Morgan WF, Birchall A. The Mayak Worker Dosimetry System 2013 (MDSW-2013): Soluble plutonium retention in the lungs of an occupationally exposed USTUR case. *Radiat. Prot. Dosim.* 2017, 176 (1-2), 45-49.
6. **Avtandilashvili M**, Puncher M, McComish SL, Tolmachev SY. US Transuranium and Uranium Registries case study on accidental exposure to uranium hexafluoride. *J. Radiol. Prot.* 2015, 35, 129-151.
7. **Avtandilashvili M**, Brey R, Birchall A. Application of Bayesian inference to the bioassay data from long-term follow-up of two refractory PuO<sub>2</sub> inhalation cases. *Health Physics* 2013, 104 (4), 394-404.
8. **Avtandilashvili M**, Brey R, James AC. Maximum likelihood analysis of bioassay data from long-term follow-up of two refractory PuO<sub>2</sub> inhalation cases. *Health Physics* 2012, 103 (1), 70-79.
9. Pagava S, Rusetski V, Robakidze Z, Farfan EB, Dunker RE, Popp JL, **Avtandilashvili M**, Wells DP, Donnelly EH. Initial Investigation of <sup>222</sup>Rn in the Tbilisi Urban Environment. *Health Physics* 2008, 95 (6), 761-765.
10. Burchuladze AA, Pagava SV, Togonidze GI, **Avtandilashvili MV**. Radiocarbon and 11-year variations of cosmic rays. *Radiocarbon* 1993, 35(3), 347-350.