CURRICULUM VITAE

Sergei Y. Tolmachev, PhD

U.S. Transuranium and Uranium Registries
College of Pharmacy, Washington State University
1845 Terminal Drive, Suite 201, Richland WA 99354
e-mail: stolmachev@wsu.edu

EDUCATION

04/1998 – 03/2001, PhD in Chemistry, *Environmental Radiochemistry*

Kyushu University, Division of Science (Fukuoka, Japan): *The behavior of ^{210}Po in coastal seawater and maritime aerosols at Kyushu Island, Japan.*

09/1987 – 03/1993, MS in Nuclear-Chemical Engineering, *Radiochemistry*

Mendeleev University of Chemical Technology of Russia, Department of Radiation Chemistry and Radiochemistry (Moscow, Russia): *Application of rdiochemically and isotopically ultra-pure ^{237}Pu and ^{236}Pu for ^{238}Pu and $^{239+240}$Pu determination in soils under global monitoring*

PROFESSIONAL EXPERIENCE

10/2010 – *present*, Associate Research Professor/Director

U.S. Transuranium and Uranium Registries, College of Pharmacy, Washington State University, Richland, USA

04/2015 – 03/2016, Visiting Professor

Central Institute of Radioisotope Sciences and Safety, Kyushu University, Fukuoka, Japan

06/2011 – 05/2017, Adjunct Professor

Department of Chemistry, Laval University, Quebec, Canada

02/2007 – 09/2010, Associate Research Professor/Radiochemistry Laboratory Manager

U.S. Transuranium and Uranium Registries, College of Pharmacy, Washington State University, Richland, USA

04/2006 – 12/2006, Staff Scientist

National Institute of Radiological Sciences, Research Center for Radiation Safety, Chiba, Japan

10/2004 – 03/2006, Postdoctoral Researcher

National Institute of Radiological Sciences, Office of Biospheric Assessment for Waste Disposal, Chiba, Japan

04/2004 – 09/2004, Technical Research Staff

Radiation Application Development Association, Tokai-mura, Japan

04/2001 – 03/2004, Postdoctoral Researcher

Japan Atomic Energy Research Institute, Department of Health Physics, Tokai-mura, Japan

09/1993 – 09/1997, Junior Staff Scientist

Joint Institute for Nuclear Research, Flerov Laboratory of Nuclear Reactions, Dubna, Russia

Professional Affiliations

- Member, since 2014, Radiation Research Society, USA
- Member, since 2011, European Radiation Dosimetry Group (EURADOS) WG-7 on Internal Dosimetry
- Member, since 2008, Japan Health Physics Society, Japan
- Member, since 2007, Health Physics Society, USA
- Member, since 1999, Society of Nuclear and Radiochemical Sciences, Japan

Professional Service

Advisory Board

- Herbert M. Parker Foundation/ Washington State University Foundation, 2016 - 2018
- International Radiation Protection Association Societies Admission and Development Committee, 2014 – 2016
- Washington State University, Graduate Certificate Program in Radiation Protection, 2011 – 2015

Editorial Board

- Japanese Journal of Health Physics, 2009 – 2017

Academic Service

Graduate Committee Member

- PhD Thesis, Sara Dumit, College of Pharmacy, Washington State University, 2015 - 2018
- MS Thesis, Christopher Nielsen, College of Arts and Sciences, Washington State University, 2011 - 2012

Research Supervisor

- PhD sabbatical researcher, Dr. Bastian Breustedt, Karlsruhe Institute for Technology, Germany, 2011 - 2012
- PhD student, Christopher Nielsen, College of Arts and Sciences, Washington State University, 2013
- FNP student, Becky Phillips, College of Nursing, Washington State University, 2013
- MS student, Christopher Nielsen, College of Arts and Sciences, Washington State University, 2011 - 2012

Honors and Awards

- International Workshop on Internal Dosimetry of Radionuclides, Young Scientist Award, 2002
- Ministry of Education Culture and Sport of Japan (*MONBUSHO*), Doctoral Fellowship, 1998 – 2001
- Ministry of Education Culture and Sport of Japan (*MONBUSHO*), Research Student Fellowship, 1997 – 1998

PEER-REVIEWED PUBLICATIONS

34. **Tolmachev SY**, Nielsen CE, Avtandilashvili M, Puncher M, Martinez F, Thomas EM, Miller FL, Morgan WF, Birchall A. Mayak Worker Dosimetry System (MWDS 2013): Soluble plutonium distribution in the lungs of an occupationally exposed USTUR case. Radiation Protection Dosimetry: *In Press, Submitted Manuscript*, **2016**.

33. Puncher M, Birchall A, **Tolmachev SY**. Mayak Worker Dosimetry System (MWDS 2013): A re-analysis of USTUR case 0269 to determine whether plutonium binds to the lungs. Radiation Protection Dosimetry: *In Press, Submitted Manuscript*, **2016**.

32. Suslova KG, Sokolova AB, **Tolmachev SY**, Miller SC. Mayak Worker Dosimetry System (MWDS 2013): Estimation of plutonium skeletal content from limited autopsy bone samples from Mayak PA workers. Radiation Protection Dosimetry: *In Press, Submitted Manuscript*, **2016**.

31. Brooks AL, Church BW, Smith JN, **Tolmachev SY**. Annual ^{137}Cs environmental half-life without remediation: Impact on radiation dose. Jap J Health Phys, *In Press, Accepted Manuscript*, **2015**.

30. Nogueira P, Rühm W, Lopez MA, Vrba T, Buchholz W, Fojtík P, Etherington G, Broggio D, Huikari J, Marzocchi O, Lynch T, Lebacq AL, Li C, Ośko J, Malátova I, Franck D, Breustedt B, Leone D, Scott J, Shutt A, Hauck B, Capello K, Pérez-López B, Navarro-Amaro JF, Pliszczyński T, Fantínová K, **Tolmachev SY**. EURADOS ^{241}Am skull measurement intercomparison. Radiation Measurements 82: 64-73; **2015.**

29. Kathren RL, **Tolmachev SY**. Natural uranium tissue content of three Caucasian males. Health Physics 109: 187-197; **2015**.

28. Vergucht E, De Samber B, Izmer A, Vekemans B, Appel K, **Tolmachev S**, Vincze L, Vanhaecke F. Study of the distribution of actinides in human tissues using synchrotron radiation micro X-ray fluorescence spectrometry. Analytical and Bioanalytical Chemistry 407: 1559-1566; **2015**.

27. Avtandilashvili M, Puncher M, McComish SL, **Tolmachev SY**. US Transuranium and Uranium Registries case study on accidental exposure to uranium hexafluoride. Journal of Radiological Protection 35: 129-151; **2015.**

26. Gibb H, Fulcher K, Nagarajan S, McCord S, Fallahian NA, Hoffman HJ, Haver C, **Tolmachev S**. Respond to "Incorrect analysis of radiation and mesothelioma". American Journal of Public Health 104: e1-e2; **2014**.

25. Nielsen CE, Wang X, Robinson R, Brooks A, Lovaglio J, Patton K, McComish SL, **Tolmachev SY**, Morgan WF. Carcinogenic and inflammatory effects of plutonium-nitrate retention in an exposed nuclear worker and beagle dogs. International Journal of Radiation Biology 90: 60 - 70; **2014**.

24. Gibb H, Fulcher K, Nagarajan S, McCord S, Fallahian NA, Hoffman HJ, Haver C, **Tolmachev S**. Analyses of radiation and mesothelioma in the US Transuranium and Uranium Registries. American Journal of Public Health 103: 710-716; **2013**.

23. Lariviere D, **Tolmachev SY**, Kochermin V, Johnson S. Uranium bone content as an indicator of chronic environmental exposure from drinking water. Journal of Environmental Radioactivity 121: 98-103; **2013.**

22. Nielsen CE, Wilson DA, Brooks AL, McCord SL, Dagle GE, James AC, **Tolmachev SY**, Thrall BD, Morgan WF. Microdistribution and long-term retention of $^{239}Pu(NO_3)_4$ in the respiratory tracts of an acutely exposed plutonium worker and experimental beagle dogs. Cancer Research 72: 5529-5536; **2012.**

21. Lariviere D, Tremblay M, Durand-Jezequel M, **Tolmachev S**. Detection of beryllium in digested autopsy tissues by inductively coupled plasma mass spectrometry using a high matrix interface configuration. Analytical and Bioanalytical Chemistry 403: 409-418; **2012.**

20. Kramer GH, López MA, Broggio D, **Tolmachev S**, Rühm W. Reply to Spitz et al "Natural vs. artificial anthropometric phantoms for measuring bone-seeking radionuclides". Health Physics 102: 2; **2012**.

19. **Tolmachev SY**, Ketterer ME, Hare D, Doble P, James AC. The US Transuranium and Uranium Registries: Forty years' experience and new directions in the analysis of actinides in human tissues. Proceedings in Radiochemistry - A Supplement to Radiochimica Acta 1: 173-181; **2011.**

18. López MA, Broggio D, Capello K, Cardenas-Mendez E, El-Faramawy N, Franck D, James AC, Kramer GH, Lacerenza G, Lynch TP, Navarro JF, Navarro T, Perez B, Rühm W, **Tolmachev SY**, Weitzenegger E. EURADOS intercomparison on measurements and Monte Carlo modelling for the assessment of americium in a USTUR leg phantom. Radiation Protection Dosimetry 144: 295-299; **2011.**

17. Li C, Elliot N, **Tolmachev S**, McCord S, Shultz T, Shi Y, Kramer GH. Measurement of uranium isotopes in human tissue samples by TIMS. Journal of Analytical Atomic Spectrometry 26: 2524-2527; **2011.**

16. Kramer GH, Hauck B, Capello K, Rühm W, El-Faramawy N, Broggio D, Franck D, López MA, Navarro T, Navarro JF, Perez B, **Tolmachev S**. Comparison of two leg phantoms containing ^{241}Am in bone. Health Physics 101: 248-258; **2011.**

15. Li C, Benkhedda K, **Tolmachev S**, Carty L, Ko R, Moir D, Cornett J, Kramer G. Measurement of ^{236}U in human tissue samples using solid phase extraction coupled to ICP-MS. Journal of Analytical Atomic Spectrometry 25: 730-734; **2010**.

14. Hare D, **Tolmachev S**, James A, Bishop D, Austin C, Fryer F, Doble P. Elemental bio-imaging of thorium, uranium, and plutonium in tissues from occupationally exposed former nuclear workers. Analytical Chemistry 82: 3176-3182; **2010**. (**Featured Article**, Webb S. MS maps actinides in exposed workers. Analytical Chemistry 82: 3409-3410; 2010).

13. Lynch TP, **Tolmachev SY**, James AC. Estimating ^{241}Am activity in the body: comparison of direct measurements and radiochemical analyses. Radiation Protection Dosimetry 134: 94-101; **2009**.

12. **Tolmachev S**, Kuwabara J, Noguchi H. Concentration and daily excretion of uranium in urine of Japanese. Health Physics 91: 144-153; **2006**.

11. **Tolmachev S**, Tagami K, Uchida S. Determination of ^{226}Ra in surface waters using high-resolution inductively coupled plasma mass spectrometry after selective extraction. Proceedings of the 2nd International Conference

on Environmental Radioactivity (Nice, France, 2–6 October 2005). Strand, P.; Borretzen, P.; Jolle, T. (Eds): 592-596; **2005**.

10. **Tolmachyov SY**, Maeda Y, Momoshima N. Polonium-210 concentration in coastal seawater: Effect of suspended particulate matter and colloids on isotope behavior. Proceedings of the International Symposium on Radioecology and Environmental Dosimetry (22 – 24 October 2003, Rokkasho, Aomori, Japan). Inaba, J.; Tsukada, H.; Takeda, A. (Eds) Institute for Environmental Sciences, Rokkasho, Aomori, Japan. ISBN 4-9980604-6-5; 366 - 371; **2004**.

9. **Tolmachyov SY**, Kuwabara J, Noguchi H. Flow injection extraction chromatography with ICP-MS for thorium and uranium determination in human body fluids. Journal of Radioanalytical and Nuclear Chemistry 261: 125-131; **2004**.

8. **Tolmachyov SY**, Momoshima N, Maeda Y. Role of suspended particulate matter and colloids in 210Po behavior in coastal seawaters. Proceedings of the 1st International Conference on Environmental Radioactivity (Monaco, 1–5 September 2002). Borretzen, P.; Jolle, T.; Strand, P. (Eds): 481-484; **2002**.

7. Kuwabara J, **Tolmachyov S**, Noguchi H. The development of flow injection technique for rapid uranium determination in urine samples. Journal of Nuclear Science and Technology Suppl: 556-559; **2002**.

6. **Tolmachyov S**, Mitarai S, Momoshima N, Yamamoto M, Maeda Y, Nakashima T. Application of PXAMS technique for Cl-36 analysis in soil collected at Semipalatinsk Nuclear Test Site. Journal of Radioanalytical and Nuclear Chemistry 251: 217-220; **2002**.

5. **Tolmachyov S**, Ura S, Momoshima N, Yamamoto M, Maeda Y. Determination of Cl-36 by liquid scintillation counting from soil collected at the Semipalatinsk Nuclear Test Site. Journal of Radioanalytical and Nuclear Chemistry 249: 541-545; **2001**.

4. Gamo T, Momoshima N, **Tolmachyov S**. Recent upward shift of the deep convection system in the Japan Sea, as inferred from the geochemical tracers tritium, oxygen, and nutrients. Geophysical Research Letters 28: 4143-4146; **2001**.

3. Momoshima N, **Tolmachyov S**, Song L-X, Maeda Y, Osaki S. A new source of atmospheric polonium. In: Distribution and speciation of radionuclides in the environment. Inaba, J.; Hisamatsu, S.; Ohtsuka, Y. (Eds) Institute for Environmental Sciences, Rokkasho, Aomori, Japan. ISBN 4-9980604-3-0; 147-151; **2000**.

2. **Tolmachev SY**, Dmitriev SN, Maslov OD, Molokanova LG, Gustova MV, Sabel'nikov AV. Determination of natural and technogenic actinides in natural waters by photofission-based method. Radiokhimiya (in Russian) 41: 469-473; **1999**.

1. Maslov OD, Dmitriev SN, Molokanova LG, **Tolmachyov SY**. Low-level measurements of thorium and neptunium in environmental samples using the (γ, f) reaction. Journal of Radioanalytical and Nuclear Chemistry 226: 181-183; **1997**.

PEER-REVIEWED ABSTRACTS (SINCE AT WSU)

8. Avtandilashvili M, Puncher M, McComish S, **Tolmachev S**. Modeling uranium hexafluoride inhalation. Health Physics 109: S58; **2015**.

7. Miller B, Tabatadze G, Frost S, Orozco J, Press O, Sandmaier B, Miederer M, **Tolmachev S**. Quantitative single-particle digital autoradiography with the ionizing-radiation quantum imaging detector. Health Physics 109: S108; **2015**.

6. Tabatadze G, Miller B, **Tolmachev S**. Radionuclide distribution measurement within anatomical bone structures using digital autoradiography. Health Physics 109: S59; **2015**.

5. Kathren RL, **Tolmachev SY**. Uranium distribution and concentrations in the tissues of whole-body donations to the USTUR. Health Physics 107: S107; **2014**.

4. Avtandilashvili M, McComish SL, **Tolmachev SY**. USTUR whole-body Case 0212: testing NCRP wound model. Health Physics 107: S108 – S109; **2014**.

3. Khalaf M, Brey R, **Tolmachev S**. A new leg voxel model in two different positions for simulation of the non-uniform distribution of ^{241}Am in a leg bones. Health Physics 103: S18; **2012**.

2. Breustedt B, McCord SL, **Tolmachev SY**. Modeling of chelation therapy for ^{241}Am – USTUR Case 0846. Health Physics 103: S80; **2012**.

1. McCord SL, James AC, **Tolmachev SY**. Distribution of terminal lung and liver dose rates in United States Transuranium and Uranium Registries registrants. Health Physics 101: S18; **2011**.

CONFERENCE PRESENTATIONS (SINCE AT WSU)

Invited Presentations

6. Uranium content, distribution, and biokinetics in human body. International Workshop on Uranium, Thorium, and Plutonium Sciences, Fukuoka, Japan, December 10, **2015**.

5. The National Human Radiobiology Tissue Repository. 1st International Workshop on Sample/Tissue Archiving of Radiobiology (STAR2015), Kyoto, Japan, May 24-25, **2015**.

4. Update on the U.S. Transuranium and Uranium Registries (USTUR) and research. 2015 DOE Annual Occupational Medicine Workshop and Webinar, Washington, DC, March 16-17, **2015**.

3. The National Human Radiobiological Tissue Repository: A unique resource for scientists. 60th Radiation Research Society Meeting, Las Vegas, NV, September 21-24, **2014**.

2. The U.S. Transuranium and Uranium Registries: Beyond archiving. DoReMi/STORE Workshop on Sharing Data and Biomaterials from Radiation Science, Rome, Italy, January 25-26, **2012**.

1. Radiochemistry Program at the U.S. Transuranium and Uranium Registries. Joint Symposium between Kyushu Environmental Evaluation Association and Kyushu University Radioisotope Center, Fukuoka, Japan, April 6, **2010**.

Podium Presentations

19. Analysis of high-fired plutonium oxide and other actinides in MAPEP soil samples. 61th Radiobioassay and Radiochemical Measurements Conference. Iowa City, IA, October 25-30, **2015**.

18. Radionuclide distribution measurement within anatomical bone structures using digital autoradiography. 60th Annual Meeting of the Health Physics Society, Indianapolis, IN, July 12-16, **2015**.

17. Modeling uranium hexafluoride inhalation. 60th Annual Meeting of the Health Physics Society, Indianapolis, IN, July 12-16, **2015**.

16. Quantitative single-particle digital autoradiography with the ionizing-radiation quantum imaging detector. 60th Annual Meeting of the Health Physics Society, Indianapolis, IN, July 12-16, **2015**.

15. USTUR whole-body Case 0212: testing NCRP wound model. 59th Annual Meeting of the Health Physics Society, Baltimore, MD, July 13-17, **2014**.

14. USTUR case study on accidental exposure to uranium hexafluoride. 11th International Conference on Health Effects of Incorporated Radionuclides, Berkeley, CA, October 13-17, **2013**.

13. Biodosimetry of plutonium workers. Plenary Meeting of the European Radiation Dosimetry (EURADOS) Working Group 7 on Internal Dosimetry, Bologna, Italy, October 1-3, **2013**.

12. Application of microwave-assisted techniques for human tissue samples preparation for actinide analysis. 58th Radiobioassay and Radiochemical Measurements Conference. Fort Collins, CO, October 29 - November 2, **2012**.

11. USTUR studies: An update. Plenary Meeting of the European Radiation Dosimetry (EURADOS) Working Group 7 on Internal Dosimetry, Budapest, Hungary, October 1-3, **2012**.

10. Biokinetic modeling of chelation therapy for ^{241}Am – USTUR Case 0846. 57th Annual Meeting of the Health Physics Society, Sacramento, CA, July 22-26, **2012**.

9. Distribution of terminal lung and liver dose rates in United States Transuranium and Uranium Registries Registrants. Plenary Meeting of the European Radiation Dosimetry (EURADOS) Working Group 7 on Internal Dosimetry, Ghent, Belgium, September 14-16, **2011**.

8. From single bone analysis to total skeleton content. Plenary Meeting of the European Radiation Dosimetry (EURADOS) Working Group 7 on Internal Dosimetry, Ghent, Belgium, September 14-16, **2011**.

7. Comparison of two leg phantoms containing Am-241 in bone. 56th Annual Health Physics Society Meeting, West Palm Beach, FL, June 26 - 30, **2011**.

6. Distribution of terminal lung and liver dose rates in United States Transuranium and Uranium Registries Registrants. 56th Annual Health Physics Society Meeting, West Palm Beach, FL, June 26-30, **2011**.

5. The U.S. Transuranium and Uranium Registries: Forty years' experience and new directions in the analysis of actinides in human tissues. 4th Asia-Pacific Symposium on Radiochemistry, Napa, CA, November 29 – December 5, **2009**.

4. Analysis of beryllium in autopsy tissues from nuclear weapons site worker. Beryllium Health and Safety Committee Meeting, Las Vegas, NV, November 3-5, **2009**.

3. Beryllium in the tissues of weapons-site workers. 3rd International Symposium on Beryllium Particulates and Their Detection, Albuquerque, New Mexico, November 17-19, **2008**.

2. Beyond α-spectrometry for actinide determination in human tissues? 42nd Annual Meeting of the Health Physics Society of Japan, Okinawa, Japan, June 26-27, **2008**.

1. Comparison of ^{241}Am organ activity from radiochemistry and direct measurements. 53rd Radiobioassay and Radiochemical Measurements Conference, Jackson Hole, WY, October 29 – November 2, **2007**.

Poster Presentations

12. The National Human Radiobiology Tissue Repository: Human tissue collection at the US Transuranium and Uranium Registries. 15th International Congress of Radiation Research (ICRR2015), Kyoto, Japan, May 25-29, **2015**.

11. Uncertainty analysis on lung doses for US nuclear workers. 11th International Conference on Health Effects of Incorporated Radionuclides, Berkeley, CA, October 13-17, **2013**.

10. The U.S. Transuranium and Uranium Registries: A unique human data resource. 58th Annual Meeting of the Radiation Research Society, San Juan, Puerto Rico, September 30 - October 3, **2012**.

9. An analysis of the microdistribution and long-term retention of $^{239}Pu(NO_3)_4$ in the respiratory tracts of an exposed plutonium worker and experimental beagles. 58th Annual Meeting of the Radiation Research Society, San Juan, Puerto Rico, September 30 - October 3, **2012**.

8. The United States Transuranium and Uranium Registries (USTUR). WSU College of Pharmacy Research and Scholarship Day, Spokane, WA, August 10, **2012**.

7. Maximum likelihood analysis of refractory PuO_2 inhalation cases. WSU College of Pharmacy Research and Scholarship Day, Spokane, WA, August 10, **2012**.

6. A new leg voxel model in two different positions for simulation of the non-uniform distribution of ^{241}Am in leg bones. 57th Annual Meeting of the Health Physics Society, Sacramento, CA, July 22-26, **2012**.

5. Elemental imaging of actinides in human tissues using LA-ICP-MS and SR micro-XRF. 2012 European Conference on X-Ray Spectrometry (EXRS 2012), Vienna, Austria, June 18-22, **2012**.

4. Uranium in drinking water: Impact on uranium bone content. 2nd International Conference on Radioecology and Environmental Radioactivity, Hamilton, Canada, June 19-24, **2011**.

3. Elemental bio-imaging of actinides and beryllium in lymph nodes of former nuclear workers. 54th Annual Meeting of the Health Physics Society, Minneapolis, MN, July 12-16, **2009**.

2. Determination of U, Pu, and Am in biological samples by SF-ICPMS for biokinetic studies of actinides. 2008 Winter Conference on Plasma Spectrochemistry, Temecula, CA, January 7 – 12, **2008**.

1. Determination of Pu and Am in digested bone and soft tissue samples by SF-ICP-MS: Comparison with α-spectrometry. 53rd Radiobioassay and Radiochemical Measurements Conference, Jackson Hole, WY, October 29 – November 2, **2007**.