

CURRICULUM VITAE – SUZANNE E. LAPI PHD

BORN: August 9, 1977; Duncan, Canada

CITIZENSHIP: USA, Canada

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Washington University School of Medicine
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PRESENT POSITION: Assistant Professor
Mallinckrodt Institute of Radiology
Washington University School of Medicine, St. Louis, MO

EDUCATION:

Undergraduate:

Sept 1995 – May 2001

Simon Fraser University: Bachelor of Science,
Department of Environmental Science

Graduate:

Jan 2002 - Aug 2003

Simon Fraser University: Master of Science
Thesis Title: Development of an intense ^{15}O beam using low energy protons
Department of Chemistry
Co-supervisors: Dr. Thomas Ruth and Dr. John D'Auria

Sept 2003 – August 2007

Simon Fraser University: Doctor of Philosophy
Thesis Title: Production and evaluation of high specific activity ^{186}Re
Department of Chemistry
Co-supervisors: Dr. Thomas Ruth and Dr. Paul Percival

ACADEMIC POSITIONS / EMPLOYMENT:

Jan 1998 to August 1998

Environment Canada
Pacific Environmental Research Center
North Vancouver B.C.
Analytical Chemistry Technician

May 2000 to August 2000 and May 1999 to Dec 1999

Stanley Pharmaceuticals
North Vancouver B.C.
Analytical Chemistry Technician

Sept 2002 to Dec 2002

Simon Fraser University
8888 University Drive, Burnaby, B.C.
Teaching Assistant for Chemistry 122 (General Chemistry II)
Supervisor: Dr. Zuo-Guang Ye

April 2005 to July 2007

Accsys Technology
1177 A Quarry Lane, Pleasanton, CA
Consultant

Sept 2005 to Nov 2005

Oak Ridge National Lab: Physics Division
Oak Ridge, TN.
Ph. D. Thesis Research
Supervisor: Dr. Kenneth Carter

Sept 2003 to August 2007

TRIUMF PET Group
4004 Wesbrook Mall, Vancouver, B.C.
Ph. D. Thesis Research
Supervisor: Dr. Thomas Ruth

Sept 2007 to Dec 2008

UCSF Radiology and Biomedical Imaging
185 Berry St, San Francisco, CA
Postdoctoral Fellow
Supervisor: Dr. Henry VanBrocklin

Jan 2009-Present

Washington University Radiology
510 S. Kingshighway, Saint Louis, MO
Assistant Professor

August 2012-Present**Washington University Biomedical Engineering**

510 S. Kingshighway, Saint Louis, MO
Assistant Professor

September 2012-Present**Washington University Chemistry**

510 S. Kingshighway, Saint Louis, MO
Adjunct Assistant Professor

January 2013-Present**Washington University Division of Biology and Biomedical Sciences**

510 S. Kingshighway, Saint Louis, MO
Assistant Professor

UNIVERSITY APPOINTMENTS AND COMMITTEES:

Siteman Cancer Center Member 2010-Present

Cyclotron Users Group 2009-Present

Positron Emitting Radionuclides Radiation Committee (PERCS) 2010-Present

Animal Studies Committee 2011-present

Director, MIR Summer Research Program 2010-Present

Chemistry Faculty Search Committee – Fall 2011

Director of Solid Target Isotope Production 2011- Present

MOOG scholarship selection committee 2010-Present

HONORS AND AWARDS:

August 2010 Mario Nicolini Prize, Terachem, Italy

June 2010 Harry Gray Family Fund Award, Metals in Medicine, NH

January 2007 President's Research Stipend, Simon Fraser University.

September 2006 Student Travel Bursary, Tc Symposium, Bressanone, IT.

May 2006 2006 Chemistry Poster Competition – 1st Place, SFU.

February 2006 SNM Student Travel Bursary for Midwinter meeting, Tempe, AZ.

February 2006 Carl H. Westcott Fellowship, University of Alberta/TRIUMF.

December 2005 Student Bursary, Pacific Rim Chemistry Symposium, Honolulu, HI.

October 2005 2005 Chemistry Oral Competition – 2nd Place, SFU.

August 2005 TRIUMF Life Sciences Scholarship.

July 2005 Student Travel Bursary for 2005 International Symposium on Radiopharmaceutical Chemistry, University of Iowa.

May 2005 Student Travel Bursary for Summer School on Targets and Ion Sources for the Production of Radioactive Ion Beams, Oak Ridge, TN.

August 2005 Student Travel Bursary for the 288th American Chemical Society Meeting, Philadelphia, PA.

September 2004 Student Travel Bursary for 2004 International Symposium on Radiohalogens, Whistler, BC.

November 2003 Graduate Fellowship for Spring 2004, SFU.

PROFESSIONAL SOCIETIES AND ORGANIZATIONS:

Society of Nuclear Medicine
Member 2008-Present

Radiopharmaceutical Sciences Council
Member 2008-Present
Board Member 2011-Present

Society of Radiopharmaceutical Sciences
Member 2008-Present

American Chemical Society
Member 2008-Present
Board Member 2011-Present

American Nuclear Society
Member 2010-Present
Organizing Committee 2010, 2014 Conference on Isotopes

Working Group on Isotope Harvesting at FRIB: 2010-Present

Organizing Committee: 2012 Workshop on Targetry and Target Chemistry

Organizing Committee: 2013 Radiometals Meeting

Chief Scientific Investigator (USA) on the International Atomic Energy Agency (IAEA)
coordinated research project "Production and utilization of Copper-64 and Iodine -124" 2010-present

Chief Scientific Investigator (USA) on the International Atomic Energy Agency (IAEA)
coordinated research project "Production and utilization of Copper-64 and Iodine -124" 2012-present

JOURNAL AND ABSTRACT REVIEWER:

Journal of Nuclear Medicine, Cancer Research, Molecular Imaging, Applied Radiation and Isotopes, Nuclear Medicine and Biology, Pharmaceutical Research, Current Topics in Medicinal Chemistry, Plos One, Nature Protocols, Molecules, Molecular Imaging and Biology, Future Medicinal Chemistry, Radiochimica Acta, Cancer Biology, Bioconjugate Chemistry

Abstract Reviewer: Society of Nuclear Medicine, World Molecular Imaging Society, International Society of Radiopharmaceutical Chemistry, Workshop on Targetry and Target Chemistry

INVITED LECTURES:

1. **Lapi, S.E.**, (2010) Development of Zr-89, a longer lived PET radionuclide for molecular imaging. Presented at **Metals in Medicine Gordon Conference**, Andover, NH
2. **Lapi, S.E.**, (2010) Opportunities for the production of medical isotopes with FRIB. Presented at the **American Chemical Society Annual Meeting**, Boston, MA
3. **Lapi, S.E.** (2010) From Antimatter to Disease Detection: The Use of Radioisotopes in the Life Sciences. Presented at **Oak Ridge National Laboratory**

4. **Lapi, S.E.** (2010) Sugar-free PET: New developments in radiometal imaging agents. Presented at **Memorial Sloan-Kettering Cancer Center**
5. **Lapi, S.E.** (2011) Radioactive Transition Metals: Cyclotron Production and Uses in Medical Imaging: Presented at **Chemistry Department, Washington University, MO**
6. **Lapi, S.E.** (2011) Imaging Applications of Radiometals. Presented at **Beckman Institute for Imaging, University of Illinois, Urbana**
7. **Lapi, S.E.** (2011) Ag-111: a radiotracer for silver chemistry and biochemistry. Presented at **Chemistry Department, University of Akron, OH**
8. **Lapi, S.E.** (2011-invited) Imaging with Radiometals. Presented at **Society of Nuclear Medicine Annual meeting, San Antonio, TX**
9. **Lapi, S.E.** (2012) Diagnostic-Therapeutic Radioisotope Pairs. Presented at **Society of Nuclear Medicine Midwinter meeting, Orlando, FL**
10. **Lapi, S.E.** (2012) Copper-64 and Zirconium-89 PET Imaging Agents in Oncology Presented at **Chemistry Department, Missouri University, Columbia, MO**
11. **Lapi, S.E.** (2012) From Antimatter to Disease Detection, Presented at **Chemistry Department, Hope College, MI**
12. **Lapi, S.E.** (2012) Imaging with Radiometals, The Nonstandard Isotopes become Standard. Presented at **Canadian Society of Chemistry Annual Meeting, Calgary, AB**
13. **Lapi, S.E.** (2012) PET Imaging with Radiometals, Presented at **MGH, Boston, MA**

CONSULTING RELATIONSHIPS AND BOARD MEMBERSHIPS:

Advanced Applied Physics Solutions, Vancouver, B.C., Canada

Consultant – Sept 2008-Present

Radiopharmaceutical Sciences Council

Board Member 2011-Present

American Chemical Society

Board Member 2011-Present

ACTIVE RESEARCH SUPPORT:

HHSN268201000046 (Gropler)

08/10-07/15

NIH

\$17.8M total costs (Lapi subaward - \$178,000)

Integrated Nanosystems for Diagnosis and Therapy

Role: Co-Investigator

The central mission of this project is to develop a group of well-characterized and versatile nanoscale agents that can be assembled, labeled, targeted, filled, and activated as needed for the diagnosis and treatment of various diseases of relevance to the National Heart Lung and Blood Institute (NHLBI).

DESC00002032 (Lapi)

09/08-8/13

DOE

\$1,030,032 total costs

Integrated Research Training Program of Excellence in Radiochemistry

The goal of this training grant is provide a rich and deep research experience in state-of-the-art radiochemistry and in the fundamentals of radioisotopic labeling and tracer methodology to develop researchers who will be capable of meeting the challenges of designing and preparing radiotracers of broad applicability for monitoring and imaging diverse biological systems and environmental processes.

- DESC0006435 (Lapi) 10/11-9/16
 DOE \$750,000 total costs
 Production of ^{99m}Tc using a medical cyclotron
 The goal of this project is to investigate to production capability of ^{99m}Tc using a small medical cyclotron. Production rates will be determined and targetry, separation and quality control procedures will be developed.
- DESC0006862 (Lapi) 10/11-9/16
 NNSA (sub from UCB) \$25M total costs (Lapi subaward \$900,000 total)
 National Nuclear Science Consortium
 Role: Principle Investigator, Washington University
 The goal of this project is to provide a pipeline of nuclear educated experts to work in the fields of nuclear chemistry and physics. To this end students and postdocs will gain experience in isotope production and separation techniques which are applicable in a variety of fields.
- DESC0007352 (Lapi/Peaslee at Hope College) 01/12-12/13
 DOE \$840,000 total costs (Lapi subaward \$189,000)
 Potential for Isotope Harvesting at FRIB
 Role: Co-PI
 The Facility for Rare Isotope Beams (FRIB) will be a new national user facility for nuclear science, funded by the Department of Energy Office of Science (DOE-SC) Office of Nuclear Physics and operated by Michigan State University (MSU). This nuclear physics facility will generate a host of new isotopes that could be “harvested” for off-line use without affecting the users of the radioactive ion beam facility. This project is a feasibility study to harvest useful long-lived radioisotopes from the Facility for Rare Isotope Beams (FRIB) under similar conditions available now at the National Superconducting Cyclotron Lab (NSCL).
- DESC0008432 (Lapi) 09/12-8/16
 DOE \$2,000,000 total costs
 Training in Techniques and Translation: Novel Nuclear Medicine Imaging Agents for Oncology and Neurology
 The goal of this proposal is to provide critical interdisciplinary research training for the next generation of radiochemists and nuclear medicine physicians. The training projects will draw upon the extensive and diverse expertise of faculty from the Department of Radiology at Washington University in St. Louis and the Department of Chemistry at the University of Illinois at Urbana-Champaign. This multidisciplinary team consists of tenured and tenure-track basic science and clinical faculty who are actively involved in the development, application, and translation of radiopharmaceuticals. The research and training plans are also supported through outstanding clinical research collaborators in neurology, immunology, oncology and neurosurgery.
- 1355 (Lapi) 01/12-12/12
 ACRIN \$189,000 direct
 ACRIN 6682 IND Agent Distribution
 The goal of this project is to provide the radiopharmaceutical [^{64}Cu]ATSM for human use to support a clinical trial.

DESC0008657 (Lapi) 08/12-07/13
 DOE \$305,592 direct
 Production of Positron Emitting Radiometals: Cu-64, Y-86, Zr-89
 This proposal seeks support to increase our production of yttrium-86 and zirconium-89 production while continuing to produce copper-64.

0123820001 (Lapi) 05/12-05/13
 Pfizer \$48,774 direct
 Preclinical Imaging of GLP-1R
 The goal of this project is to obtain preclinical data in rats for a ⁶⁴Cu PET radioligand in preparation for first in human studies with a targeted therapeutic oral agent (Pfizer) to confirm GLP-1 receptor occupancy.

PAST RESEARCH SUPPORT:

DESC0002114 (Lapi) 10/09-9/12
 DOE \$594,000 total costs
 Novel, dually radiolabeled peptides for simultaneous monitoring of enzymatic activity and protein targets
 Role: Principle Investigator

DESC0004038 (Welch) 10/10-09/12
 DOE \$420,000 total costs (Lapi subaward - \$124,800)
 Improved Production and Separation Technologies for non-standard PET Isotopes
 Role: Project 1 Principle Investigator

Glaxosmithkline (Lapi) 12/10-12/11
 Corporate funding \$154,401
 Title: ¹¹C-acetate imaging of response to therapy
 Role: Principle Investigator

Midwest Stone Institute (Lapi) 03/10-03/11
 (Role: Principle Investigator) \$50,000
 Imaging Research
 Title: Preclinical Molecular Imaging of Metabolic Response to Antiangiogenic Therapy in Prostate Cancer

PATENTS:

Lapi, S. Ruth, T.J., Becker, D.W. "Method and apparatus for isolating rhenium-186 for therapeutic and/or diagnostic radiopharmaceuticals." US 2008241025

Publicover, J.G., **Lapi, S.E.**, Ruth, T.J. "Method for calibrating particle beam energy" US 2007016783

TEACHING TITLES AND RESPONSIBILITIES:

Lecturer for Contrast Agents in Biological Imaging (CABI) - Spring 2009, Spring 2010
Course Master for Contrast Agents in Biological Imaging (CABI) - Spring 2012, 2013
Course Master for Radiochemistry for the Life Sciences – Spring 2011
Organizer and lecturer for NCI Imaging Camp – Summer 2011
Lecturer for Nuclear Medicine Residents (2-3 lectures/year) - 2010, 2011, 2012

PAST TRAINEES:

Sandeep Jain – Postdoctoral Fellow 2009-2010
Currently Staff Scientist at Sun Pharma Advanced Research Company Ltd, India
Ravindra DeSilva - Postdoctoral Fellow 2010-2011
Currently Staff Scientist at Center for Probe Development, Toronto, Canada
Mai Lin – Postdoctoral Fellow 2010-2012
Currently Staff Scientist at MD Anderson
Albert Chang – Radiation Oncology Resident 2011-2012
Currently Assistant Professor, UCSF
Efrem Mebrahtu - Postdoctoral Fellow 2012-2012
Currently Staff Scientist at Washington University

TRAINEE AWARDS:

Oluwatayo Ikotun (Postdoctoral Fellow) 2009-present
American Cancer Society Postdoctoral Fellowship

BIBLIOGRAPHY:Peer Reviewed Manuscripts

1. **Lapi, S.**, Ruth, T.J., Zyuzin, A., D'Auria, J.M. (2003) Development of an intense ^{15}O radioactive ion beam using low energy protons. **Nuclear Instruments and Methods B** 204: 444-446
2. Britto, D.T., Ruth, T.J., **Lapi, S.**, Kronzucker. H.J. (2004) Cellular and whole-plant chloride dynamics in barley: Insights into chloride-nitrogen interactions and salinity responses **Planta** 218: 615-622
3. Sossi, V., Buckley, K., Piccioni, P., Rahmin, A., Camborde, M., **Lapi, S.**, Ruth, T.J. (2005) Printed Sources for Positron Emission Tomography. **IEEE Nuclear Science** 52: 114-118
4. Guo, B., Liu, W.P., Trinczek, M., **Lapi, S.**, Ames, F., Buckley, K.R., D'Auria, J.M., Jayamanna, K., Ruiz, C., Ruth, T.J. (2006) Production of intense radioactive beams using low energy protons. **High energy physics and nuclear physics (Chinese edition)** 30: 675-679

5. Trinczek, M., **Lapi, S**, Guo, B., Ames, F., Buckley, K.R., D'Auria, J.M., Jayamanna, K., Liu, W.P., Ruiz, C., Ruth, T.J. (2006) Production of intense radioactive beams at ISAC using low energy protons. **Canadian Journal of Physics** 84: 323-333
6. Heath, S.J., Olson, J.A., Buckley, K. R., **Lapi, S.**, Ruth, T.J., Martinez, D.M. (2007) Visualization of the flow of a fiber suspension through a sudden expansion using PET. **American Institute of Chemical Engineering Journal** 53: 327-334
7. **Lapi, S.**, Ressler, J.J., Cox, M.E., Ruth, T.J., (2006) High-specific activity ^{186}Re -labeled antibodies for radioimmunotherapy. In Technetium, Rhenium and other metals in chemistry and nuclear medicine, U. Mazzi, ed, S.G. Editoriali, Padova, 2006. 593-596
8. **Lapi, S.**, Wilson, J., McQuarrie, S., Publicover, J., Schueller, M., Schyler, D., Ressler, J.J., Ruth, T.J. (2007) Measurement of production cross-sections of $^{181,186}\text{Re}$ isotopes from proton bombardment of natural tungsten. **Applied Radiation and Isotopes** 65: 345-349
9. Ferreira, C.L., **Lapi. S.**, Steele, J., Green, D.E., Ruth, T.J., Adam, M.J. (2007) ^{55}Co Complexes with Pendant Carbohydrates as Potential PET Imaging Agents. **Applied Radiation and Isotopes** 65:1303-1308
10. Ruprecht, G., Vockenhuber, C., Buchmann, L., Woods, R., Ruiz, C., **Lapi, S.**, Bremmerer, D. (2008) Precise measurement of β -decay and EC modifications in low temperature metal hosts. **Physics Review C** 77: 065502
11. Annett, A. L., **Lapi, S.**, Ruth, T.J., Maldonado, M.T. (2008) The effects of Cu and Fe availability on the growth and Cu:C ratios of marine diatoms. **Journal of Limnology and Oceanography** 53: 2451-2461
12. Kronenberg, A., Spejewski, E.H., Carter, H.K., Mervin, B., Jost. C., Stracener, D.W., **Lapi, S.**, Bray, T. (2008) Molecular sidebands for refractory elements for ISOL. **Nuclear Instruments and Methods B** 266: 4252-4256
13. **Lapi, S.E.**, Voller, T., Welch, M.J. (2009) Positron Emission Tomography Imaging of Hypoxia **PET Clinics** 4: 39-47
14. **Lapi, S.E.**, Wahnische, H., Pham, D., Wu., L.Y., Nedrow-Byers, J.R., Liu, T., VanBrocklin, H.F., Berkman, C.E. Jones, E.F. (2009) Assessment of a [^{18}F]-labeled phosphoramidate peptidomimetic as a new PSMA targeted imaging agent for prostate cancer. **Journal of Nuclear Medicine**, 50:2042-8
15. **Lapi, S.E.**, Ladouceur, K., Ruth, T.J., D'Auria, J.M. (2010) The MoRe project: An alternative route to the production of High Specific Activity ^{99}Mo In Technetium, Rhenium and other metals in chemistry and nuclear medicine, U. Mazzi, ed, S.G. Editoriali, Padova, 2010. 435-436
16. Guo, J., Annett, A. L., Taylor, R. L., **Lapi, S.**, Ruth, T. J. and Maldonado, M. T. (2010), Copper-uptake kinetics of coastal and oceanic diatoms. **Journal of Phycology**, 46: 1218–1228.

17. Gagnon, K., Jensen, M., Thisgaard, H., Publicover, J., **Lapi, S.**, McQuarrie, S.A., Ruth, T.J. (2010) A new and simple calibration-independent method for measuring the beam energy of a cyclotron. **Applied Radiation and Isotopes** 69(1):247-53.
18. Ikotun, O., **Lapi, S.** (2011) The rise of metal radionuclides in medical imaging: copper-64, zirconium-89 and yttrium-86. **Future Medicinal Chemistry**, 2011 3(5), 599-621
19. Chang, A.J., DeSilva, R., Jain, S., Lears, K., Rogers, B., **Lapi, S.E.** (2012) ⁸⁹Zr-Radiolabeled Trastuzumab Imaging in Orthotropic and Metastatic Breast Tumors. **Pharmaceuticals**, 5(1), 79-83
20. **Lapi, S.E.**, Welch, M.J. (2012) A Historical Perspective on the Specific Activity of Radiopharmaceuticals: What have we learned in the 35 years of the ISRC? **Nuclear Medicine and Biology** 39(5), 601-8
21. Kume, M., Carey, P.C., Gaehle, G., Madrid, E., Voller, T., Margenau, B., Welch, M.J., **Lapi, S.E.**, (2012) A Semi-Automated System for the Routine Production of Copper-64 **Applied Radiation and Isotopes** 70(8), 1803-6
22. Lin, M., Ranganathan D., Mori, T., Hagooley, A., Rossin, R., Welch, M.J., **Lapi, S.E.** (2012) Long-term evaluation of TiO₂-based ⁶⁸Ge/⁶⁸Ga generators and optimized automation of ⁶⁸Ga-DOTATOC radiosynthesis, **Applied Radiation and Isotopes** 70(10), 2539-44
23. Chang, A.J., DeSilva, R, **Lapi, S.E.** (2012) Development and Characterization of ⁸⁹Zr-labeled Panitumumab for ImmunoPET Imaging of the EGF Receptor, **Molecular Imaging**, *in press*
24. Mebrahtu, E., Zheleznyak, A, Hur, M., **Lapi, S.E.**(2012) Initial characterization of a dually radiolabeled peptide for simultaneous monitoring of protein targets and enzymatic activity **Nuclear Medicine and Biology** Nov 12 2012 [Epub ahead of print]

Submitted Manuscripts

1. Chang, A.J., Sohn, R., Lu, Z. H., Arbeit, J.A., **Lapi, S.E.** (2012) Detection of rapalog-mediated therapeutic response in renal cancer xenografts using ⁶⁴Cu-bevacizumab ImmunoPET *submitted to PLoS One (in revision)*
2. Lin, M., Welch, M.J., **Lapi, S.E.** (2012) Effects of Chelator Modifications on ⁶⁸Ga-Labeled [Tyr3]Octreotide Conjugates *submitted to Molecular Imaging and Biology*
3. Zheleznyak, A., Ikotun, O.F., Dimitry, J., Frazier, W.A., **Lapi, S.E.** (2013) Imaging of CD47 Expression in Xenograft and Allograft Tumor Models *submitted to Journal of Nuclear Medicine*
4. Aweda, T., Ikotun, O.F., Mastren, T., Cannon, C.L., Wright, B., Youngs, W.J., Cutler, C., Guthrie, J., **Lapi, S.E.** (2013) The use of ¹¹¹Ag as a tool for studying biological distribution of silver-based antimicrobials *submitted to Chemical Communications*

