Curriculum Vitae

Tara E. Mastren

Assistant Professor
University of Utah
50 South Central Campus Drive MEB 3280B, Salt Lake City, Utah 84112
Tara.Mastren@Utah.edu

EDUCATION

Dec 2014	Ph.D. Chemistry, Washington University in St Louis, St Louis, MO
May 2008	B.S. Chemistry, Maryville University, St Louis, MO

EXPERIENCE

2018-Present	Assistant Professor, Nuclear Engineering Program, University of Utah
2018-Present	Assistant Professor, Civil and Environmental Engineering, University of Utah
2018-2020	Guest Scientist, Isotope Team, Chemistry Division, Los Alamos National Laboratory
2016-2018	Postdoctoral Researcher, Isotope Team, Chemistry Division, Los Alamos National Laboratory
2015-2016	Postdoctoral Researcher, Radiology, UT Southwestern Medical Center
2010-2014	Graduate Research Assistant, Department of Chemistry, Washington University in St Louis
2008-2010	Research Chemist I, Monsanto Company, St Louis, MO
2007-2008	Laboratory Technician, Washington University in St Louis School of Medicine

CONTINUING EDUCATION

2014	NSSC-LANL Nuclear Safeguards Summer School
2011	EBSS2011 Tenth Exotic Beam Summer School

HONORS AND AWARDS

2017	Article "Simultaneous Separation of Actinium and Radium Isotopes from a Proton Irradiated Thorium Matrix made "Top 100 in Chemistry in 2017" (out of >5000) in Scientific Reports
2012	14th International Workshop on Targetry and Target Chemistry, Travel Award
2006	Outstanding Junior Award, American Chemical Society, Saint Louis Section

PROFESSIONAL SOCIETIES

2011-Present	Society of Nuclear Medicine
2015-Present	American Chemical Society, Nuclear Division Program Chair 2021- Isotope Production Steering Committee 2019-

UNIVERSITY SERVICE ACTIVITIES

Society of Women Engineers Faculty Advisor 2019-Present
Graduate Recruitment Committee-Chair (2019, 2020), Member-2021
Safety Committee-2018, 2019, 2020, 2021
Graduate Application Review Committee-2018, 2019, 2020, Chair-2021
Nuclear Engineering Faculty Hiring Committee-2018

SERVICE ACTIVITIES

Editorial Board:	Plos One (Academic Editor)
Journal Reviewer:	Plos One, Journal of Current Radiopharmaceuticals, Scientific Reports, Applied Radiation and Isotopes, IEEE Transactions on Nuclear Science
Abstract Reviewer:	Society of Nuclear Medicine and Molecular Imaging Annual Meeting
Proposal Reviewer:	DOE SBIR/STTR Proposal Review Panel, DOE Office of Science Nuclear Physics Nuclear Data Review Panel
ACS NUCL:	Spring 2021/Spring 2022 program chair for the nuclear division at the national meeting

TEACHING EXPERIENCE

2018, 2019, 2020	Graduate Radiochemistry, University of Utah
2019, 2020, 2021	Radiation Interactions, University of Utah

Current Trainees: Graduate Researchers
Doctoral
George Diehl (2019-Present)
Erin Johnston (2020-2021)
Connor Holiski (2020-Present)
Aidan Bender (2020-Present)
Christoph Schulzke (2020-Present)

Master
Ryan Forrester (2020-Present)

Current Trainees: Undergraduate Researchers
Sophia Birkner (2021-Present)

Past Trainees:
Undergraduate Researchers
Jeri Landeros (2019-2021)
Tavie Parker (2020-2020)
Colton Dixon (2020-2021)
Xandi Carver (2019-2020)
Thomas Ashton (2019-2020)
Gabriel Mensinger (2018-2020)
Rachel Payne (2018-2020) UROP Awardee Spring 2019

GRANT SUPPORT

ERF/NETRF Nuclear Medicine Pilot Grant 2019-2022
ERF $95,238 direct costs
Functionalized Silica Nanoparticles: Development of a Combined PET and TAT Theranostic Agent for Neuroendocrine Tumors

LANL Laboratory Directed Research and Development
LANL 2019-2022
$^{225}Ac/^{213}Bi$ Generator Based on Microfluidics Controlled Electrodeposition $90,000 total costs

INL Laboratory Directed Research and Development
INL 2019-2022
Development of novel radiometal chelators for imaging and therapeutic nuclear medicine $235,000 total costs

INL Laboratory Directed Research and Development
INL 2020
Photonuclear production of radionuclides $30,000 total costs

INL
INL 2020-2022
Alpha Emitting Materials $120,000 total costs

1U4U
University of Utah 2020-2021
Targeted Alpha Therapy for the Treatment of Alzheimer's Disease $30,000 direct costs

Department of Energy Isotope Program 2020-2022
DOE $450,000 of $800,000
Collaborative Effort between University of Wisconsin and Hunter College
Production and Improved Separation of Therapeutic Radionuclides Tb-161 and Er-165

Department of Energy Office of Science 2021-2026
DOE $750,000
Early Career Award
Nanomaterials for use in Radionuclide Generator Systems for Alpha Emitting Radionuclides

PUBLICATIONS

1. Guiyang Hao, **Tara Mastren**, William Silvers, Gedaa Hassan, Orhan K. Öz, and Xiankai Sun, Copper-67 Radioimmunotheranostics for Simultaneous Immunotherapy and Immuno-SPECT, **2021**, S*cientific Reports*, 11(1), 1-11
2. Antonietta M. Lillo, Nileena Velappan, Julia M. Kelliher, Austin J. Watts, Samuel P. Merriman, Grace Vuyisich, Laura M. Lilley, Kent E. Coombs, **Tara Mastren**, Munehiro Teshima, Benjamin W. Stein, Gregory L. Wagner, Srinivas Iyer, Andrew R. M. Bradbury, Jennifer Foster Harris, Armand E. Dichosa, and Stosh A. Kozimor, Development of anti-Y. pestis human antibodies with features required for diagnostic and therapeutic applications, **2020**, *Immunotargets and Therapy,* 9, 299-316

3. **Tara Mastren**, Andrew Akin, Roy Copping, Mark Brugh, D. Scott Wilbur, Eva R. Birnbaum, Francois M. Nortier, Kevin D. John, and Michael E. Fassbender, A Reverse $^{230}U/^{226}Th$ Radionuclide Generator for Targeted Alpha Therapy Applications, **2020**, *Nuclear Medicine and Biology,* 90-91, 69-73
4. Maryline G. Ferrier, Yawen Li, Ming-Kuan Chyan, Roger Wong, Lily Li, Donald K. Hamlin, **Tara Mastren**, Michael E. Fassbender, Chris Orvig, and D. Scott Wilbur, Thorium chelators for Targeted Alpha Therapy: Rapid chelation of thorium-226, **2020**, *Journal of Labelled Compounds and Radiopharmaceuticals*, 63 (12), 502-516
5. Mitchell T Friend, T Gannon Parker, **Tara Mastren**, Veronika Mocko, Mark Brugh, Eva R Birnbaum, and Michael E Fassbender, Extraction chromatography of 225Ac and lanthanides on N, N-dioctyldiglycolamic acid/1-butyl-3-methylimidazolium bis (trifluoromethylsulfonyl) imide solvent impregnated resin, **2020**, Journal of Chromatography A, 1624, 461219.
6. Mitchell T. Friend, **Tara Mastren**, T. Gannon Parker, Christiaan E. Vermeulen, Mark Brugh, Eva R. Birnbaum, F. Meiring Nortier, and Michael E. Fassbender, Production of ^{230}Pa by proton irradiation of ^{232}Th at the LANL isotope production facility: Precursor of ^{230}U for targeted alpha therapy, **2020**, *Applied Radiation and Isotopes*, 108973.
7. Kattathu Mathew, Theresa Kayzar-Boggs, Zsolt Varga, Amy Gaffney, Joanna Denton, James Fulwyler, Katherine Garduno, Andrew Gaunt, Jeremy Inglis, Russ Keller, William Kinman, Dana Labotka, Elmer Lujan, Joel Maassen, **Tara Mastren**, Iain May, Klaus Mayer, Adrian Nicholl, Chelsea Ottenfeld, Tashi Parsons-Davis, Donivan Porterfield, Jung Rim, John Rolison, Floyd Stanley, Rob Steiner, Lav Tandon, Mariam Thomas, Richard Torres, Kerri Treinen, Maria Wallenius, Allison Wend, eRoss Williams, and Josh Wimpenny, Intercomparison of the Radio-Chronometric Ages of Plutonium-Certified Reference Materials with Distinct Isotopic Compositions, **2019**. *Analytical Chemistry*, 91 (18), 11643-11652
8. E Paige Abel, Mikael Avilov, Virginia Ayres, Eva Birnbaum, Georg Bollen, Greg Bonito, Todd Allen Bredeweg, Hannah Clause, Aaron Couture, Joe DeVore, Matthew Dietrich, Paul Ellison, Jonathan Engle, Richard Ferrieri, Jonathan Fitzsimmons, Moshe Friedman, Dali Georgobiani, Stephen Graves, John Greene, Suzanne Lapi, C Shaun Loveless, **Tara Mastren**, Cecilia Martinez-Gomez, Sean McGuinness, Wolfgang Mittig, David Morrissey, Graham Peaslee, Frederique Pellemoine, J David Robertson, Nicholas Scielzo, Matthew D Scott, Gregory W Severin, Dawn Shaughnessy, Jennifer Shusterman, Jaideep Singh, Mark Stoyer, Logan Sutherlin, Ate Visser, and John Wilkinson, Isotope harvesting at FRIB: additional opportunities for scientific discovery, **2019.** *Journal of Physics G: Nuclear and Particle Physics*, 46(10), 1-33
9. **Tara Mastren**, Christiaan Vermeulen, Mark Brugh, Eva R. Birnbaum, Meiring F. Nortier, and Michael E. Fassbender, Natural nickel as a proton beam energy monitor for energies ranging from 15 to 30 MeV, **2019**. *Nuclear Instruments and Methods in Physics Research B*, 443, 1-4
10. **Tara Mastren**, Benjamin W. Stein, T Gannon Parker, Valery Radchenko, Roy Copping, Allison Owens, Lance E Wyant, Mark Brugh, Stosh A Kozimor, F Meiring Nortier, Eva R Birnbaum, Kevin D John, and Michael E Fassbender, Separation of protactinium employing thiol-based extraction chromatographic resins, **2018**. *Analytical Chemistry*, 90(11), 7012-7017
11. Philip D. Hopkins, **Tara Mastren**, Justyna A. Florek, Roy Copping, Mark Brugh, Kevin D John, Meiring F Nortier, Eva R Birnbaum, Freddy Kleitz, and Michael E Fassbender, Synthesis and radiometric evaluation of diglycolamide functionalized mesoporous silica for the chromatographic separation of actinides Th, Pa and U, **2018**. *Dalton Transactions*, 47, 5189-5195.
12. **Tara Mastren**, Valery Radchenko, Philip Hopkins, Jonathan W Engle, John W Weidner, Roy Copping, Mark Brugh, F Meiring Nortier, Eva R Birnbaum, Kevin D John, and Michael E Fassbender, Separation of ^{103}Ru from a proton irradiated thorium matrix: A potential source of ^{103m}Rh an isotope of interest for Auger therapy, **2017**. *Plos One*, 12.
13. **Tara Mastren**, Valery Radchenko, Jon Engle, John W Weidner, Allison Owens, Lance E Wyant, Roy Copping, Mark Brugh, F Meiring Nortier, Eva R Birnbaum, Kevin D John, and Michael E Fassbender. Chromatographic separation of the theranostic radioisotope ^{111}Ag from a proton irradiated thorium matrix, **2017**. *Analytica Chimica Acta,* 998.

14. **(Top 100 Chemistry 2017) Tara Mastren,** Valery Radchenko, Allison Owens, Roy Copping, Rose Boll, Justin R Griswold, Saed Mirzadeh, Lance E Wyant, Mark Brugh, Jonathan W Engle, Francois M Nortier, Eva R Birnbaum, Kevin D John, and Michael E Fassbender, Simultaneous Separation of Actinium and Radium Isotopes from a Proton Irradiated Thorium Matrix, **2017**. *Scientific Reports*, 7:8216.
15. Valery Radchenko, **Tara Mastren**, Catherine A. L. Meyer, Alexander S Ivanov, Vyacheslav S Bryantsev, Roy Copping, David Denton, Jonathan W Engle, Justin R Griswold, Karen Murphy, Justin J Wilson, Allison Owens, Lance Wyant, Eva R Birnbaum, Jonathan Fitzsimmons, Dmitri Medvedev, Cathy S Cutler, Leonard F Mausner, Meiring F Nortier, Kevin D John, Saed Mirzadeh, and Michael E Fassbender. Radiometric Evaluation of Diglycolamide Resins for the Chromatographic Separation of Actinium from Fission Product Lanthanides, **2017**. *Talanta*, 175, 318-324.
16. **Tara Mastren**, Valery Radchenko, Hong T. Bach, Ethan R Balkin, Eva R Birnbaum, Mark Brugh, Jonathan W Engle, Matthew D Gott, James Guthrie, Heather M Hennkens, Kevin D John, Alan R Ketring, Marina Kuchuk, Joel R Maassen, Cleo M Naranjo, F Meiring Nortier, Tim E Phelps, Silvia S Jurisson, D Scott Wilbur, and Michael E Fassbender, Bulk Production and Evaluation of High Specific Activity ^{186g}Re for Cancer Therapy Using Enriched $^{186}WO_3$ Targets in a Proton Beam, **2017**. *Nuclear Medicine and Biology,* 49, 24-29.
17. Valery Radchenko, Jonathan W. Engle, Dmitri. G. Medvedev, Joel M Maassen, Cleo M Naranjo, George A Unc, Catherine AL Meyer, **Tara Mastren**, Mark Brugh, Leonard Mausner, Cathy S Cutler, Eva R Birnbaum, Kevin D John, F Meiring Nortier, and Michael E Fassbender, Proton-induced production and radiochemical isolation of ^{44}Ti from scandium metal targets for ^{44}Ti/^{44}Sc generator development, **2017**. *Nuclear Medicine and Biology,* 50, 25-32.
18. Valery Radchenko, Catherine Meyer, Jonathan W. Engle, Cleo Micah Naranjo, George A Unc, **Tara Mastren**, Mark Brugh, Eva R Birnbaum, Kevin Dale John, Francois Meiring Nortier, and Michael E Fassbender, Separation of ^{44}Ti from proton irradiated scandium by using solid-phase extraction chromatography and design of ^{44}Ti/^{44}Sc generator system, **2016**. *Journal of Chromatography A*, 1477, 39-46.
19. Amit Kumar, **Tara Mastren**, Bin Wang, Jer-Tsong Hsieh, Guiyang Hao, and Xiankai Sun, Design of a Small-Molecule Drug Conjugate for Prostate Cancer Targeted Theranostics, **2016**. *Bioconjugate Chemistry*, 27, 1681-1689.
20. **Tara Mastren,** Aranh Pen, Shaun Loveless, Bernadette V Marquez, Elizabeth Bollinger, Boone Marois, Nicholas Hubley, Kyle Brown, David J Morrissey, Graham F Peaslee, and Suzanne E Lapi, Harvesting ^{67}Cu from the Collection of a Secondary Beam Cocktail at the National Superconducting Cyclotron Laboratory, **2015**. *Analytical Chemistry*, 87, 10323-10329.
21. **Tara Mastren,** Bernadette V. Marquez, Deborah E Sultan, Elizabeth Bollinger, Paul Eisenbeis, Tom Voller, and Suzanne E Lapi, Cyclotron production of high specific activity ^{55}Co and the evaluation of the stability of ^{55}Co metal-chelate-peptide complexes in vivo, **2015**. *Molecular Imaging*, 14.
22. **Tara Mastren**, Aranh Pen, Graham F. Peaslee, Nick Wozniak, Shaun Loveless, Scott Essenmacher, Lee G Sobotka, David J Morrissey, and Suzanne E Lapi, Feasibility of Isotope Harvesting at a Projectile Fragmentation Facility: ^{67}Cu, **2014**. *Scientific Reports*, 4, 6706.
23. **Tara Mastren**, James Guthrie, Paul Eisenbeis, Tom Voller, Efrem Mebrahtu, J David Robertson, and Suzanne E Lapi, Specific Activity Measurement of ^{64}Cu: A Comparison of Methods, **2014**. *Applied Radiation and Isotopes*, 90, 117-121.
24. Aranh Pen, **Tara Mastren**, Graham F. Peaslee, Kelly Petrasky, Paul A DeYoung, David J Morrissey, and Suzanne E Lapi, Design and construction of a water target system for harvesting radioisotopes at the National Superconducting Cyclotron Laboratory, **2014**. *Nuclear Instruments and Methods in Physics Research Section A*, 747, 62-68
25. Tolulope A. Aweda, Oluwatayo Ikotun, **Tara Mastren**, Carolyn L Cannon, Brian Wright, Wiley J Youngs, Cathy Cutler, James Guthrie, and Suzanne E Lapi, The use of ^{111}Ag as a tool for studying biological distribution of silver-based antimicrobials, **2013**. *Med Chem Comm*, 4, 1015-1017.

BOOK CHAPTERS

Eva R Birnbaum, Michael E Fassbender, Maryline G Ferrier, Kevin D John, and **Tara Mastren**, Actinides in Medicine, The Heaviest Metals: Science and Technology of the Actinides and Beyond, Encyclopedia of Inorganic and Bioinorganic Chemistry, John Wiley & Sons, Ltd, **2018**.

INVITED PRESENTATIONS

Tara Mastren, *The Production and Application of Radionuclides for Targeted Radiotherapy,* Colorado State University Health Physics Seminar Series, November 5, 2021.
Tara Mastren, *The Production and Application of Radionuclides for Targeted Radiotherapy,* Washington University in St Louis Chemistry Seminar, October 14, 2021.
Tara Mastren, *Applications of Nuclear Medicine*, American Physics Society Department of Nuclear Physics Conference Workshop Series, October 11, 2021.
Tara Mastren, *The Production and Application of Radionuclides for Targeted Radiotherapy,* University of Alabama/University of Wisconsin Seminar Series, October 6, 2021.
Tara Mastren, *Production and Application of Beta Emitting Radionuclides for Targeted Radiotherapy*, World Molecular Imaging Society Webinar Series, March 24, 2021.
Tara Mastren, *The Production and Application of Radionuclides for the Treatment of Cancer*, University of Tennessee Nuclear Engineering Colloquium, January 22, 2020.
Tara Mastren, DOE Isotope Program University Isotope Network Reactor Production Workshop, November 5, 2019.
Tara Mastren, *Isotope Production*, Exotic Beam Summer School 2019, Oak Ridge National Laboratory, June 26, 2019

ORAL PRESENTATIONS

Tara Mastren, *Production and separation of ^{230}Pa for targeted alpha therapy applications utilizing progeny radionuclides ^{230}U/^{226}Th*, 17th International Workshop on Targetry and Target Chemistry, Coimbra, Portugal, August 30, 2018
Tara Mastren, *Chromatographic separation of Medically-Related Radionuclides from Proton-Irradiated Thorium Targets*, 254th American Chemical Society National Meeting & Exposition, Washington D.C., August 20, 2017
Tara Mastren, *A generator concept to yield ^{226}Th: an isotope of interest for targeted alpha therapy*, 22nd International Symposium on Radiopharmaceutical Sciences, Dresden, Germany, May 15, 2017
Tara Mastren, *Selective Extraction of Medically-Related Radionuclides from Proton-Irradiated Thorium Targets*, 16th International Workshop on Targetry and Target Chemistry, Santa Fe, NM, August 29, 2016
Tara Mastren, *Isotope Harvesting at Heavy Ion Fragmentation Facilities*, 15th International Workshop on Targetry and Target Chemistry, Prague, Czech Republic, August 20, 2014
Tara Mastren, *Separation Chemistries for Isotope Harvesting at Heavy Ion Fragmentation Facilities*, University Industry Technical Interchange, Walnut Creek, CA, June 5, 2014.
Tara Mastren, *Transition Metal Ion Chromatography to Measure True Specific Activity of ^{64}Cu*, Radiometals, Sonoma, CA, June 16, 2013.
Tara Mastren, *Studies for Isotope Harvesting at the Facility for Rare Isotope Beams*, NSSC Webinar, March 21, 2013.

STUDENT PRESENTATIONS

Emily K. Kirkeby, Ming-Kuan Chyan, Yawen Li, D. Scott Wilbur, Andrew G. Roberts, Tara Mastren, *Evaluating the Potential of At-211 as Targeted Alpha Therapy for the Treatment of Alzheimer's Disease*, Poster Presentation, Gordon Research Conference on Medicinal Chemistry, West Dover, VT October 2021
George L. Diehl III, Viktoriya Semeykina, Gabriel Mensinger, Illya Zharov and Tara Mastren, *Silica Nanoparticles as a vehicle for $^{225}Ac/^{89}Zr$ delivery for use as a theranostic agent in targeted alpha therapy*, Poster presentation, American Chemical Society, Philadelphia, PA, March 2021
Emily K. Kirkeby, George L. Diehl III, Rachel Payne, Andrew G. Roberts, Tara Mastren, *An At-211 labelled small molecule based on the flutemetamol scaffold: a potential theranostic for Alzheimer's disease*, Poster Presentation, American Chemical Society, Philadelphia, PA, March 2021
Rachel Payne, George L. Diehl III, Tara Mastren, *Thermodynamic, Heat, and Radiolytic Stability of LN and DGA Resins for the Production of ^{161}Tb*, Oral Presentation, American Chemical Society, Philadelphia, PA, March 2021
George L. Diehl III, Viktoriya Semeykina, Gabriel Mensinger, Illya Zharov and Tara Mastren *Silica Nanoparticles as a vehicle for $^{225}Ac/^{89}Zr$ delivery for use as a theranostic agent in targeted alpha therapy*, Poster presentation, International Symposium on Biomedical Materials for Drug/Gene Delivery, Salt Lake City, UT, February 8, 2020

CONFERENCE PROCEEDINGS

Mastren, T., Sultan, D., Lapi, S.E., (2012) Production and Separation of ^{55}Co via the $^{58}Ni(p,\alpha)$ Reaction, Proceedings of the 2012 Workshop on Targetry and Target Chemistry, Cancun, MX, AIP Conference Proceedings-American Institute of Physics, 1509, 96.

PATENTS

- B. Stein, **T. Mastren**, M.E. Fassbender, S. Kozimor, Extractants and extractant compositions for radioisotope and metal recovery. US Patent # 10998107
- **T. Mastren**, M.E. Fassbender, A generator concept to yield ^{226}Th: an isotope of interest for targeted alpha therapy. US Patent # 10562835