

Nikki A. Thiele, PhD

R&D Staff Scientist
Chemical Sciences Division
Oak Ridge National Laboratory
1 Bethel Valley Road, Oak Ridge, TN 37830

Office Phone: (865) 574-6717

E-mail: thielena@ornl.gov

PROFESSIONAL EXPERIENCE**Oak Ridge National Laboratory**

Staff Scientist, Chemical Sciences Division, Oak Ridge, TN

2023–present

Associate Staff Scientist, Chemical Sciences Division, Oak Ridge, TN

2020–2022

Research focus: Development of new chelation platforms for targeted radionuclide therapy and imaging; coordination chemistry of underexplored radioactive ions relevant to nuclear medicine; separation and recovery of critical materials (e.g., rare earth elements) and radioisotopes; molecular recognition

Cornell University**2016–2019**

Postdoctoral Associate, Department of Chemistry and Chemical Biology, Ithaca, NY

Advisor: Prof. Justin J. Wilson

Research focus: Ligand development for selective and stable chelation of heavy metal ions (e.g., Ba^{2+} , $^{223}Ra^{2+}$, Ln^{3+} , $^{225}Ac^{3+}$) for diagnostic, therapeutic, and industrial applications

EDUCATION**University of Florida****2011–2016**

Ph.D. Pharmaceutical Sciences, Department of Medicinal Chemistry, Gainesville, FL

Advisor: Prof. Kenneth Sloan

Dissertation: Prodrug Strategies for Therapeutic Delivery and Neuroprotection in Parkinson's Disease

State University of New York at Potsdam**2009**

B.A. Biology, Department of Biology, Potsdam, NY

TEACHING & MENTORING**Oak Ridge National Laboratory**Graduate Student Interns:

(6) **Doctor Stephen**, graduate research (GRO) internship, **Summer 2024**

Graduate student, Oregon State University, Department of Chemistry (Advisor: Prof. May Nyman)

(5) **Nidhi Girish**, SULI student, **Summer 2024**, ECO student, **Fall 2024**

Undergraduate honors student, University of Pittsburgh

(4) **Ann Badia**, GEM student, **Summer 2024**

Post-bachelor's student, SUNY Binghamton, biomedical engineering

(3) **D. Mike Todd**, graduate research (GRO) internship, **Fall 2023/Spring 2024**

2nd year graduate student, Michigan State University, Department of Chemistry (Advisor: Prof. Alyssa Gaiser)

(2) **Caroline Lara**, GEM student, **Summer 2022**

2nd year graduate student, University of Notre Dame, Department of Biological Sciences (Advisor: Prof. Rebecca Wingert)

(1) Aohan Hu, ORISE virtual Graduate Research Summer Internship, Summer 2021

4th year graduate student, Cornell University, Department of Chemistry and Chemical Biology (Advisor: Prof. Justin Wilson)

Postdoctoral Associates:**(6) Dr. Rachel Goodlett, 4/2024–present**

Ph.D. Organic Chemistry, University of South Carolina (Prof. Linda Shimizu)

(5) Dr. Md Faizul Islam, 4/2023–present

Ph.D. Chemistry, University of South Carolina (Prof. Linda Shimizu)

(4) Dr. Megan Sibley, 1/2023–12/2024

Ph.D. Chemistry, Clemson University (Prof. Modi Wetzler). Current position: Associate Staff Scientist, Radioisotope Science and Technology Division (ORNL)

(3) Dr. Ana Belen Cueva Sola, 5/2023–7/2024

Ph.D. Resources Engineering, Korea University of Science and Technology (Dr. Jin-Young Lee, Dr. Rajesh Kumar Jyothi)

(2) Dr. Briana Schrage, 7/2022–8/2023

Ph.D. Inorganic Chemistry, University of Akron (Prof. Christopher Ziegler). Current position: Associate Staff Scientist, Radioisotope Science and Technology Division (ORNL)

(1) Dr. Janel Dempsey, 8/2021–7/2022

Ph.D. Chemistry, Notre Dame (Prof. Bradley Smith). Current position: Applied Photophysics (Beverly, MA)

Technical Staff:**(2) Lesta Fletcher, 4/2024–present**

Ph.D. Environmental Science/Chemistry, Tennessee Tech University

(1) Megan Simms, 3/2022–8/2023

B.S. Biochemistry, Metropolitan State University of Denver. Current position: Technical Staff, Radioisotope Science and Technology Division

Cornell University

Supervised and mentored two undergraduate chemistry majors in synthetic organic chemistry and analytical chemistry techniques

University of Florida

Teaching assistant for PharmD-level courses including Fundamentals of Medicinal Chemistry, Medicinal Chemistry I, Medicinal Chemistry II, and Structure and Function of Nucleotides

HONORS & AWARDS

2021 Laboratory Space Manager (LSM) Notable, ORNL

2018 Trainee Scholarly Exchange Program, Weill Cornell/Cornell Ithaca Cross Campus

2017 First Place Poster, Hunter College Symposium on Radiometals

2009 Biology Department Scholar, SUNY Potsdam

2007 Chemistry Department Award, Sullivan County Community College

2007 Natural & Health Sciences, Mathematics, and Physical Education Division Award, Sullivan County Community College

SERVICE & ACTIVITIES**Internal Service**

2020–present Radiological Laboratory Manager, ORNL

2023 Chemical Transformations Section Head Search Committee

2023 SEED Proposal Reviewer
 2023 BRaVE Pre-Proposal Reviewer
 2021 LDRD Proposal Reviewer

Professional Organization Membership

American Chemical Society, Inorganic Chemistry Division
 American Chemical Society, Nuclear Chemistry & Technology Division
 Society of Radiopharmaceutical Sciences
 Society of Nuclear Medicine and Molecular Imaging

External Referee and Committee Duties

Reviewer for: *Chem. Sci.*, *Chem. Commun.*, *Inorg. Chem.*, *Inorg. Chem. Front.*, *J. Nucl. Med.*, *J. Inorg. Biochem.*, *Solvent Extr. Ion Exch.*, *JOVE*, *RSC Adv.*, *Bioconjugate Chem.*, *Radiat. Res.*
 2025 U.S. Department of Energy Mail-In Reviewer
 2024 UT-Oak Ridge Innovation Institute Research Faculty Search Committee
 2024 NNSA Path Scholarship Reviewer
 2023 World Molecular Imaging Society Abstract Reviewer
 2021 New Frontiers in Research Fund Exploration Competition of Canada Reviewer

PUBLICATIONS

* denotes corresponding authorship

† denotes co-first authorship

Independent Career

- (31) Olson, A. P.; Schrage, B. R.; Islam, M. F.; Fletcher, L.; Verich, F.; Dierolf, M. A.; Aluicio-Sarduy, E.; Becker, K. V.; Driscoll, D. M.; Girish, N.; Simms, M. E.; Kertesz, V.; White, F. D.; Boros, E.; Ivanov, A. S.; Engle J. W.;* **Thiele, N. A.*** Towards the stable chelation of radioantimony(V) for targeted Auger theranostics. *Angew. Chem. Int. Ed.* **2025**, DOI: 10.1002/anie.202423878
- (30) Islam, M. F.; Lin, L.; Ray, D.; Premadasa, U. I.; Ma, Y.-Z.; Sacci, R. L.; Kertesz, V.; Custelcean, R.; Bryantsev, V. S.;* Doughty, B.;* **Thiele, N. A.*** Conformationally adaptable extractant flexes strong lanthanide reverse-size selectivity. *J. Am. Chem. Soc.* **2025**, *147*, 5080–5088.
- (29) Sanwick, A. M.; Haugh, K. N.; Williams, E. J.; Perry, K. A.; **Thiele, N. A.**; Chaple, I. F.* [⁸⁹Zr]Zr-DFO-TOC: A novel radiopharmaceutical for PET imaging of somatostatin receptor positive neuroendocrine tumors. *EJNMMI Radiopharm. Chem.* **2024**, *9*, 88.
- (28) Simms, M. E.; Sibley, M. M.; White, F. D.; Lara, C. M.; Johnstone, T. C.; Kertesz, V.; Fears, A.; Li, Z.; Thorek, D. L. J.;* **Thiele, N. A.*** PYTA: A universal chelator for advancing the theranostic palette of nuclear medicine. *Chem. Sci.* **2024**, *15*, 11279–11286.
Featured on back cover
- (27) White, F. D.;* **Thiele, N. A.**;* Simms, M. E.; Cary, S. K. Structure and bonding of a radium coordination compound in the solid state. *Nat. Chem.* **2024**, *16*, 168–172.
 - *Highlighted in Chemistry World ([First x-ray structure of radium compound gives glimpse of element's coordination chemistry | Research | Chemistry World](#))*.
 - *Highlighted by DOE Isotope Program ([A First Look Inside Radium's Solid-State Chemistry | Department of Energy](#))*
- (26) Gilhula, J. C.; Xu, L.; White, F. D.; Adelman, S. L.; Aldrich, K. E.; Batista, E. R.;* Dan, D.; Jones, Z. R.; Kozimor, S. A.;* Mason, H. E.; Meyer, R. L.; **Thiele, N. A.**;* Yang, P.;* Yuan, M. Advances in heavy alkaline earth chemistry provide insight into complexation of weakly polarizing Ra²⁺, Ba²⁺, and Sr²⁺ cations. *Sci. Adv.* **2024**, *10*,

eadj8765.

- (25) Doughty, B.; Premadasa, U. I.; Lin, L.; Ma, Y.-Z.; Sacci, R. L. Bocharova, V.; Thiele, N. A. Probing liquid/liquid interfaces at and away from equilibrium using vibrational sum frequency generation, *Proc. SPIE 12681, Ultrafast Nonlinear Imaging and Spectroscopy XI*, 126810D.
- (24) Simms, M. E.; Sibley, M. M.; Driscoll, D. M.; Kertesz, V.; Damron, J. T.; Ivanov, A. S.;* White, F. D.;* **Thiele, N. A.*** Reining in radium for nuclear medicine: Extra-large chelator development for an extra-large ion. *Inorg. Chem.* **2023**, *62*, 20834–20843.
Invited Forum Article for the issue “Inorganic Chemistry of Radiopharmaceuticals”
- (23) Cahill, J. F.;* Kertesz, V.; Saint-Vincent, P.; Valentino, H.; Drufva, E.; **Thiele, N. A.**; Michener, J. K. High throughput characterization and optimization of polyamide hydrolase activity using open port sampling interface mass spectrometry. *J. Am. Soc. Mass Spectrom.* **2023**, *34*, 1383–1391.
- (22) Premadasa, U. I.; Bocharova, V.; Lin, L.; Genix, A.-C.; Heller, W. T.; Sacci, R. L.; Ma, Y.-Z.; **Thiele, N. A.**; Doughty, B. Tracking molecular transport across oil/aqueous interfaces: Insight into ‘antagonistic’ binding in solvent extraction. *J. Phys. Chem. B*, **2023**, *127*, 4886–4895.
- (21) King, A. P.; Gutsche, N. T.; Natarajan, R.; Baidoo, K. E.; Bell, M. M.; Swenson, R.; Lin, F. I.; Sadowski, S. M.; Adler, S.; **Thiele, N. A.**; Wilson, J. J.; Choyke, P. L.; Escorcía, F. E. ²²⁵Ac-macropatate: A novel alpha particle peptide receptor radionuclide therapy for neuroendocrine tumors. *J. Nucl. Med.* **2023**, *64*, 549–554.
- (20) Gibson, L. D.; Jayanthi, K.; Yang, S.; **Thiele, N. A.**; Anovitz, L. M.; Sacci, R. L.; Navrotsky, A.; Bryantsev, V. S. Characterization of lanthanum monazite surface chemistry and crystal morphology through density functional theory and experimental approaches. *J. Phys. Chem. C*. **2022**, *126*, 18952–18962.
- (19) Ivanov, A.;* Simms, M. E.; Bryantsev, V. S.; Benny, P. D.; Griswold, J. R.; Delmau, L. H.; **Thiele, N. A.*** Elucidating the coordination chemistry of the radium ion for targeted alpha therapy. *Chem. Commun.* **2022**, *58*, 9938–9941.
- *Highlighted in two segments of the WVLN nightly news (local CBS station, [ORNL scientist working on a more targeted treatment for cancer \(wvlt.tv\)](https://www.wvlt.tv)).*
 - *Featured in Chemistry World (<https://www.chemistryworld.com/news/radium-chelator-researchers-working-to-improve-targeted-cancer-therapies/4016608.article>).*
 - *Highlighted by the Department of Energy Isotope Program: [Capturing the Chemistry of Radium-223 for Cancer Treatment | Department of Energy](#)*
- (18) Hu, A.; Simms, M. E.; Kertesz, V.; Wilson, J. J.;* **Thiele, N. A.*** Chelating rare-earth metals (Ln³⁺) and ²²⁵Ac³⁺ with the dual-size-selective macrocyclic ligand py₂-macrodiapa. *Inorg. Chem.* **2022**, *61*, 12847–12855.
- (17) Stamberg, D.; **Thiele, N. A.**; Custelcean, R. Synergistic direct air capture of CO₂ with aqueous guanidine/amino acid solvents. *MRS Advances*. **2022**, *7*, 399–403.
- (16) Premadasa, U. I.; Ma, Y.-Z.; Sacci, R. L.; Bocharova, V.; **Thiele, N. A.**; Doughty, B. Understanding self-assembly and the stabilization of liquid/liquid interfaces: The importance of ligand tail branching and oil-phase solvation. *J. Colloid Interface Sci.* **2022**, *609*, 807–814.

Mentored Work

- (15) Fiszbein, D. J.; Brown, V.; **Thiele, N. A.**; Woods, J. J.; Wharton, L.; MacMillan, S. N.; Radchenko, V.; Ramogida, C. F.; Wilson, J. J. Tuning the kinetic inertness of Bi³⁺ complexes: The impact of donor atoms on diaza-18-crown-6 ligands as chelators for ²¹³Bi targeted alpha therapy. *Inorg. Chem.* **2021**, *60*, 9191–9211.
- (14) Abou, D. S.;† **Thiele, N. A.**;† Gutsche, N. T.; Villmer, A.; Zhang, H.; Woods, J. J.; Baidoo, K. E.; Escorcía, F. E.; Wilson, J. J.; Thorek, D. J. Towards the stable chelation of radium for biomedical applications with an 18-membered macrocyclic ligand. *Chem. Sci.* **2021**, *12*, 3733–3742.

- (13) **Thiele, N. A.**; Fiszbein, D. J.; Woods, J. J.; Wilson, J. J. Tuning the separation of light lanthanides using a reverse-size selective aqueous complexant. *Inorg. Chem.* **2020**, *59*, 16522–16530.
- (12) Aluicio-Sarduy, E.;[†] **Thiele, N. A.**;[†] Martin, K. E.; Vaughn, B. A.; Devaraj, J.; Olson, A. P.; Barnhart, T. E.; Wilson, J. J.; Boros, E.; Engle, J. W. Establishing radiolanthanum chemistry for targeted nuclear medicine applications. *Chem. Eur. J.* **2020**, *26*, 1238–1242.
- (11) **Thiele, N. A.**; Woods, J. J.; Wilson, J. J. Implementing f-block metal ions in medicine: Tuning the size selectivity of expanded macrocycles. *Inorg. Chem.* **2019**, *58*, 10483–10500.
Invited Forum Article for the issue “Celebrating the Year of the Periodic Table: Emerging Investigators in Inorganic Chemistry”
- (10) Kelly, J. M.; Amor-Coarasa, A.; Ponnala, S.; Nikolopoulou, A.; Williams Jr., C.; **Thiele, N. A.**; Schlyer, D.; Wilson, J. J.; DiMagno, S. G.; Babich, J. W. A single dose of ²²⁵Ac-RPS-074 induces a complete tumor response in a LNCaP xenograft model. *J. Nucl. Med.* **2019**, *60*, 649–655.
- (9) **Thiele, N. A.**; MacMillan, S. N.; Wilson, J. J. Rapid dissolution of BaSO₄ by macropa, an eighteen-membered macrocycle with high affinity for Ba²⁺. *J. Am. Chem. Soc.* **2018**, *140*, 17071–17078.
Highlighted in the news: “Macrocyclic Ligand Dissolves Barium Sulfate in Pipelines,” ChemistryViews.org
- (8) **Thiele, N. A.**; Wilson, J. J. Actinium-225 for targeted α therapy: Coordination chemistry and current chelation approaches. *Cancer Biother. Radiopharm.* **2018**, *33*, 336–348.
Invited review article, 3rd most-read paper from the journal in the last 12 months (6/2018–6/2019)
- (7) **Thiele, N. A.**; Kärkkäinen, J.; Sloan, K. B.; Rautio, J.; Huttunen, K. M. Secondary carbamate linker can facilitate the sustained release of dopamine from brain-targeted prodrug. *Bioorg. Med. Chem. Lett.* **2018**, *28*, 2856–2860.
- (6) **Thiele, N. A.**; Brown, V.; Kelly, J. M.; Amor-Coarasa, A.; Jermilova, U.; MacMillan, S. N.; Nikolopoulou, A.; Ponnala, S.; Ramogida, C. F.; Robertson, A. K. H.; Rodríguez-Rodríguez, C.; Schaffer, P.; Williams Jr., C.; Babich, J. W.; Wilson, J. J. An eighteen-membered macrocyclic ligand for actinium-225 targeted alpha therapy. *Angew. Chem. Int. Ed.* **2017**, *56*, 14712–14717.
- (5) **Thiele, N. A.**;^{*} Sloan, K. B. A double prodrug with improved membrane permeability over the parent chelator HBED provides superior cytoprotection against hydrogen peroxide. *ChemMedChem.* **2016**, *11*, 1596–1599.
- (4) **Thiele, N. A.**; McGowan, J.; Sloan, K. B. 2-O-Acyl-3-O-(1-acyloxyalkyl) prodrugs of 5,6-isopropylidene-L-ascorbic acid and L-ascorbic acid: antioxidant activity and ability to permeate silicone membranes. *Pharmaceutics* **2016**, *8*, 22.
- (3) **Thiele, N. A.**;^{*} Abboud, K. A.; Sloan, K. B. Novel double prodrugs of the iron chelator *N,N'*-bis(2-hydroxybenzyl)ethylenediamine-*N,N'*-diacetic acid (HBED): Synthesis, characterization, and investigation of activation by chemical hydrolysis and oxidation. *Eur. J. Med. Chem.* **2016**, *118*, 193–207.
- (2) Prybylski, J.; **Thiele, N. A.**; Sloan, K. B. Regioselective synthesis of 2-O-acyl-3-O-(1-acyloxyalkyl) prodrugs of 5,6-isopropylidene-L-ascorbic acid. *Tetrahedron Lett.* **2016**, *57*, 1619–1621.
- (1) McGowan, J.; **Thiele, N.**; Sloan, K. B. Prodrugs of vitamin C: the reaction of 1-acyloxyalkyl-1-iodides with vitamin C 5,6-acetonide. *Tetrahedron Lett.* **2015**, *56*, 5441–5444.

PATENTS

Granted

- (1) John W. Babich, Justin Wilson, Nikki Thiele, James Kelly, Shashikanth Ponnala. “Macrocyclic complexes of alpha-emitting radionuclides and their use in targeted radiotherapy of cancer.” Patent No US 11,279,698 B2, Granted March 22, 2022. (Cornell)

Published

- (3) Nikki Thiele, Janel Dempsey, Bruce Moyer. "Size-Selective Acyclic Chelators and Their Use for the Recovery of Rare Earth Elements." U. S. Patent Application Publication No. US 2024/0294553 A1, Publication Date September 5, 2024. (ORNL)
- (2) Daniel Thorek, Diane Abou, Justin Wilson, Nikki Thiele. "Compositions and Methods for Radiotherapy using Chelated Radiotherapeutic Agents and Non-Target Tissue Blockade." U.S. Patent Application Publication No. US 2022/0152228 A1, Publication Date May 19, 2022. (Cornell)
- (1) Nikki Thiele, Justin Wilson. "Metal-Chelating Compositions and their Use in Methods of Removing or Inhibiting Barium Scale." U.S. Patent Application Publication No. US 2021/0221715 A1, Publication Date July 22, 2021. (Cornell)

Non-Provisional

- (3) Nikki Thiele, Megan Simms, Md Faizul Islam. "Macrocyclic Complexes of Radionuclides and Use Thereof." U. S. Patent Application No. 19/050,255, Filing Date February 11, 2025. (ORNL)
- (2) Jonathan Engle, Aeli Olson, Nikki Thiele, Briana Schrage, Md Faizul Islam. "Antimony Chelates for Targeted Auger Therapy and Imaging Diagnostics." U. S. Patent Application No. 18/826,309, Filing Date September 7, 2024. (joint ORNL/UW Madison)
- (1) Justin J. Wilson, Aohan Hu, Nikki Thiele. "Macrocycles and Complexes with Radionuclides useful in Targeted Radiotherapy of Cancer." International Patent Application No. PCT/US22/31196, Filing Date May 26, 2022. (joint ORNL/Cornell application)

Provisional

- (1) Nikki Thiele, Benjamin Doughty, Md Faizul Islam, Lu Lin. "Novel Extractants for Rare Earth Chelation and Separation." U. S. Provisional Patent Application No. 63/730,473, Filing Date December 11, 2024. (ORNL)

PRESENTATIONS**Independent Career**

- 7/2024 "Advancing Radio-Antimony Beyond the Valley of Death for Targeted Radiotheranostic Applications." Gordon Research Conference, Radionuclide Theranostics for the Management of Cancer. Newry, ME, USA (poster selected for short talk).
- 3/2024 "Establishing Radioantimony(V) Chemistry for Sb-119 Targeted Auger Therapy." American Chemical Society National Meeting. New Orleans, LA, USA.
- 10/2023 "Liberating Rare-Earth Elements from Mineral Captivity Using SMART Lixiviants." *Angular Momentum Symposium*. Virtual (invited talk).
- 10/2023 "Taming Exotic Elements for Medicine: The Coordination Chemistry Behind Radiopharmaceuticals." Washington University in St. Louis, Department of Radiology and Department of Chemistry. St. Louis, Missouri, USA (invited talks).
- 8/2023 "Liberating Rare-Earth Elements from Mineral Captivity Using SMART Lixiviants." American Chemical Society National Meeting. San Francisco, CA, USA (invited talk).
- 5/2023 "Actinides in Medicine: Actinium and Beyond." ORNL Glenn T. Seaborg Initiative Workshop. Oak Ridge, TN, USA (invited talk).
- 3/2023 "Chelation Platform Development for Emerging Medical Radionuclides at Oak Ridge National Laboratory." American Chemical Society National Meeting. Indianapolis, IN, USA (invited talk).
- 3/2023 "Advancing Actinium-225 Coordination Chemistry and Chelator Development for Targeted Alpha Therapy." The Minerals, Metals, and Materials Society Annual Meeting. San Diego, CA, USA (invited talk).
- 3/2023 "Taming Exotic Elements for Medicine and Materials: A Coordination Chemistry Approach." University of Missouri Chemistry Colloquium. Columbia, Missouri, USA (invited talk).

- 11/2022 “Establishing the Complexation Thermodynamics of Ra²⁺ and Ac³⁺: Towards Targeted Separations and Therapeutics.” DOE Isotope Program’s Virtual Seminar Series. On the Horizon: Novel Isotopes and Future Leaders. Virtual ([invited talk](#)).
- 11/2022 “Chelation Platform Development for Emerging Medical Radionuclides at ORNL.” ARIA Workshop, Evolving Targeted Therapies for Cancer. Oak Ridge, TN, USA ([invited talk](#)).
- 10/2022 “Dissolution by Design: Selective Leaching of Rare Earth Elements using SMART Lixiviants.” CMI Diversifying Supply videoconference. Virtual ([invited talk](#)).
- 7/2022 “Chelation Platform Development for Medical Isotopes at Oak Ridge National Lab.” Gordon Research Conference, Radionuclide Theranostics for the Management of Cancer. Newry, ME, USA ([poster selected for short talk](#)).
- 3/2022 “Unconventional Ligand Design Strategies for Precision Recovery of REEs.” American Chemical Society National Meeting. San Diego, CA, USA.
- 3/2022 “Towards the Development of High-Affinity Chelators for ²²³Ra Targeted Alpha Therapy: A Stability Constant Roadmap.” American Chemical Society National Meeting. San Diego, CA, USA.
- 2/2022 “Developing High-Affinity Chelators for Targeted Alpha Therapy Radioisotopes: A Stability Constant Roadmap.” Brigham and Women’s Hospital Joint Program in Nuclear Medicine Seminar Series. Boston, MA, USA ([invited talk](#)).
- 9/2021 “Unveiling the Elusive Coordination Chemistry of Radium and Actinium: Towards Targeted Separations and Therapeutics.” Oak Ridge National Laboratory Radioisotope Portfolio Seminar Series. Oak Ridge, TN, USA.
- 4/2021 “Unveiling the Elusive Coordination Chemistry of Radium and Actinium: Towards Targeted Separations and Therapeutics.” American Chemical Society National Meeting. Virtual.
- 10/2020 “Selective Chelation of Metal Ions: Saving Lives, Money, and the Toyota Prius.” State University of New York at Potsdam, Department of Chemistry. Potsdam, NY, USA ([invited talk](#)).

RESEARCH FUNDING

Funding as Lead PI

(7) DOE Isotope Program

Proposal/award number: 0000277681

Title: Reeling in Radium: Solubility-Based Separation Schemes to Recover the Critical Isotope Ra-226

Award period: 4/2024–3/2026

Total amount: \$1,100,000 (with \$480K to Gauthier Deblonde, LLNL)

Project overview: Develop new separation strategies to recover the critical radioisotope radium-226 from untapped energy waste resources.

(6) DOE AMMTO Critical Materials Innovation Hub

Proposal/award number: AL-12-350-001

Title: Advanced Leaching Methods to Recover Critical Materials from Mineral Sources

Award period: 10/2023–6/2025

Total amount: \$919,000 (with \$397K to Dr. Long Qi, Ames Lab)

Project overview: Development of lixiviant chelators to selectively leach rare earth elements from mineral ores.

(5) DOE Isotope Program

Proposal/award number: 0000262370

Title: Establishing the Chelation Chemistry of Antimony-119 for Targeted Auger Therapy

Award period: 7/2022–12/2024

Total amount: \$500,000 (with \$100K to Prof. Jonathan Engle, UW-Madison)

Project overview: Bifunctional chelator development for Sb-119 to advance its use in targeted Auger therapy applications for the treatment of micrometastases and single-cell disease.

(4) Laboratory Directed Research and Development Program, ORNL

Proposal/award number: 10737

Title: Towards Ultrachelating Ligands for Targeted Radionuclide Therapy

Award period: 10/2021–9/2024

Total amount: \$3,279,000

Project overview: Development of new chelation platforms to expand the use of emerging α -, β -, and Auger electron-emitting radionuclides in targeted radionuclide therapy of cancer. Advancing characterization capabilities for radioactive ions at ORNL.

(3) DOE AMO Critical Materials Institute

Proposal/award number: AL-12-350-001

Title: Dissolution by Design: Selective Leaching of Rare Earth Elements using SMART Lixivants

Award period: 7/2021–6/2023

Total amount: \$500,000

Project overview: Development of lixiviant chelators to selectively leach rare earth elements from mineral ores.

(2) DOE Isotope Program, Core R&D

Proposal/award number: N/A

Title: Unveiling the Elusive Coordination Chemistry of Radium and Actinium for Enhanced Recovery of High-Priority Isotopes

Award period: 10/2020–9/2021

Total amount: \$150,000

Project overview: The objective of this proposal is to advance the understanding of the aqueous coordination chemistry of Ra and Ac with the goal of elucidating the ligand design principles and key molecular interactions that give rise to receptors with high affinity and selectivity for these ions.

(1) Laboratory Directed Research and Development Program, ORNL (Strategic Hire)

Proposal/award number: 10067

Title: Liberating Rare Earth Elements from Mineral Captivity: A Molecular Recognition Approach

Award period: 1/2020–9/2021

Total amount: \$327,000

Project overview: Explore selective dissolution of rare earth phosphate using new molecular receptors developed within the project.

Funding as Co-PI

(3) DOE Basic Energy Sciences

Proposal/award number: ERKCC08

Title: Principles of Chemical Recognition and Transport in Extractive Separations

Award period: 10/2022–9/2025

Total amount: \$4,350,000

Project overview: Ion binding with amphiphilic receptors organized at liquid-liquid interfaces.

(2) AMO Critical Materials Institute

Proposal/award number: N/A

Title: Transformative Rare Earth Recovery with AI-Accelerated Ligand Synthesis and Separation

Award period: 1/2022–6/2023

Total amount: \$1,200,000

Project overview: High throughput synthesis and separations for critical element recovery guided by AI.

(1) Laboratory Directed Research and Development Program, ORNL

Proposal/award number: 10259

Title: Dynamic Ligand Libraries from Direct CO₂ Capture

Award period: 10/2020–9/2021

Total amount: \$150,000

Project overview: Use an active data-driven approach that uniquely combines in situ spectroscopies and dynamic covalent chemistry (DCC) to realize the simultaneous capture and conversion of CO₂.