

# Maura Sepesy, PhD

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## EDUCATION

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| <b>Doctor of Philosophy in Chemical Engineering</b><br>Case Western Reserve University (CWRU)<br>GPA: 4.0/4.0<br>Thesis: Aminated Membrane Adsorbers in Pursuit of Radiopharmaceutical Separation.                 | August 2023<br>Cleveland, OH |
| <b>Bachelor of Science in Chemical Engineering</b> , Minor in Applied Statistics<br>Rochester Institute of Technology (RIT)<br>GPA: 3.52/4.00<br>Designations: Cum Laude, RIT Achievement Scholarship, Dean's List | May 2017<br>Rochester, NY    |

## PROFESSIONAL HONORS AND AWARDS

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|--------------------------------------------------------------------------|------|
| UB New Faculty Academy Fellow                                            | 2024 |
| CWRU Chemical & Biomolecular Engineering Graduate Student Teaching Award | 2023 |
| Ohio Public Interest Fellowship                                          | 2022 |
| NAMS Elias Klein Travel Supplement                                       | 2022 |
| CWRU School of Graduate Studies Travel Award to attend NAMS 2021         | 2021 |
| AIChE Beer Brewing Competition Best Poster Presentation                  | 2021 |
| CWRU Chemical & Biomolecular Engineering Graduate Student Service Award  | 2020 |
| Poster Award at American Filtration Society Meeting                      | 2019 |
| Poster Award (Honorable Mention) at CWRU Research ShowCASE               | 2019 |

## REFEREED PUBLICATIONS

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**Sepesy, MR** and Banik, T; Scott, J; Venturina, LAF; Johnson, A; Schneider, BL; Sibley, MM; Duval, CE. "Chemically Stable Styrenic Electrospun Membranes with Tailorable Surface Chemistry" *Membranes*. (October 2023). DOI: 10.3390/membranes13110870

**Sepesy, MR**; Fugate, B; Duval, CE. "Amine-functionalized membrane adsorbers to purify copper from acidic solutions." *ACS Applied Polymer Materials*. (January 2022). DOI: 10.1021/acsapm.1c01512

Hostert, **Sepesy**, Duval and Renner "Clickable polymer scaffolds enable cerium recovery with peptide ligands." *Soft Matter*. (March 2023). DOI: 10.1039/D2SM01664H

## PUBLICATIONS IN PREPARATION

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**Sepesy** and Duval. "A beginner's guide to membrane adsorbers." *In preparation for Frontiers in Chemical Engineering*.

## POSTERS AND PRESENTATIONS

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1. **Sepesy, MR**. "Making Learning Fun: A Student-Centered Learning Approach" Oral Presentation at *New Faculty Academy Showcase*, Buffalo, NY May 2024
  2. **Sepesy, MR**; Duval, CE. "Upstream radiopharmaceutical purification: purifying metals in strong acids." Poster Presentation at *North American Membrane Society*, Tuscaloosa, Al, May 2023

3. **Sepesy, MR**; Fugate, B; Che, A; Duval, CE. "Membrane Adsorbers to Capture Cu from Mixed Metal Acidic Solutions in Support of Radiopharmaceuticals" Oral Presentation at *American Institute of Chemical Engineers National Meeting*, Phoenix, Az, November 2022.
4. **Sepesy, MR**. "Advanced Membrane Separations as a Teaching-Focused Faculty Member" Poster Presentation at *American Institute of Chemical Engineers National Meeting*, Phoenix, Az, November 2022.
5. **Hostert, J. D.**; Sepesy, M.; Duval, C. E.; Renner, J. N., "Rare Earth Element Recovery Is Only a 'Click' Away: Recovering Lanthanides with Peptide-Functionalized Polyvinylidene (PVDF) Membranes." *American Institute of Chemical Engineers National Meeting*, Phoenix, Az, November 2022.
6. **Sepesy, MR**; Fugate, B; Johnson, A; Duval, CE. "Adsorption of Cu from Acidic Solutions in Support of Theranostics." Poster Presentation at *North American Membrane Society*, Tempe, Az, May 2022
7. **Sepesy, MR**; Fugate, B; Duval, CE. "Cu-selective membrane adsorbers for medical isotope production" Oral Presentation at *American Institute of Chemical Engineers National Meeting*, Boston, MA, October 2021.
8. **Sepesy, MR**; Issa, M; Yu H; Hostert, J. "The Brew Crew: Spooky beers for chemical engineers" Poster Presentation at *American Institute of Chemical Engineers National Meeting Brewing Competition*, Boston, MA, October 2021. **\*\*Award winner**
9. **Sepesy, MR**; Fugate, B; Johnson, A; Duval, CE. "Radiopharmaceutical Separation Using Membrane Adsorbers." Poster Presentation at *North American Membrane Society*, Estes Park, CO August 28 2021.
10. **Sepesy, MR**; Fugate, B; Pataroque, K; Duval, CE. "Membrane-Based Purification of Cu-67 for use in Theranostics" Oral Presentation at *American Institute of Chemical Engineers (AIChE) Fall Conference*, San Francisco, CA, May 2020. Online due to COVID-19
11. **Sepesy, MR**; Fugate, B; Duval, CE. "Membrane adsorbers for medical isotope production." Poster Presentation at *North American Membrane Society Meeting*, Online due to COVID-19, May 2020.
12. **Sepesy, MR**; Duval, CE. "Membrane separation of Cu-67." Poster Presentation at *American Filtration Society Meeting*, Cleveland OH, September 2019. **\*\*Award winner**
13. **Sepesy, MR**; Fugate, B; Duval, CE. "Membrane-based purification of Cu-67 for use in theranostics." Poster Presentation at *Research ShowCASE*, Cleveland OH, April 2019.  
**\*\*Honorable mention**

## TEACHING EXPERIENCE

### University at Buffalo (UB)

Assistant Professor of Teaching

Fall 2023 – present

- CE 202 – Welcome to Chemical Engineering
  - Sp26 (53 students, instructor rating: 4.7/5)
- CE 212 – Fundamentals of Chemical Engineering
  - Summer24 (15 students), Summer25 (23 students), Summer26 (17 students)
- CE 317 – Transport Process I
  - F23 (51 students, instructor rating: 4.6/5), F24 (43 students, instructor rating: 4.4/5)
- CE 327 – Chemical Engineering Lab I
  - F23 (52 students, instructor rating: 4.6/5), F24 (39 students, instructor rating: 4.5/5)

- Created new laboratory activity to introduce students to workshop tools and innerworkings of valves
- CE 328 – Chemical Engineering Lab II
  - Sp24 (45 students, Instructor rating: 4.6/5), Sp25 (36 students, instructor rating: 4.2/5), Sp26 (53 students, instructor rating: 4.6/5)
  - Developed new laboratory activity to help students understand refrigeration and heat pumps
- CE 411 – Beer, Wine, and Spirits
  - F24 (31 students, instructor rating: 4.7/5)
- CE 415 – Coffee, Tea, and Cannabis Science
  - Sp24 (32 students, Instructor rating: 5/5), Sp25 (25 students, instructor rating: 4.9/5), Sp26 (34 students, instructor rating: 4.9/5)
  - Developed this new course
  - Utilized gamification techniques to reinforce learning
- CE 496 – internship/Practicum
  - Sp24 (4 students), F24 (3 students), Sp25 (1 student), Sp26 (3 students), Summer26 (1 student)
- CE 498 – Undergraduate Research
  - Sp24 (7 students), Sp25 (7 students)
- Guest Lecturer
  - CE 341 – Applied CE Math (F23)
  - CE 405 – Intro to Nuclear Engineering (Sp26)
  - CE 427 – Chemical Engineering Laboratory III (F24)
  - CE 498 – Undergraduate Research (Sp26)

### **New Faculty Academy**

New Faculty Academy Fellow

2023 – 2024

In collaboration with the University Libraries and the Office of Curriculum, Assessment and Teaching Transformation (CATT), the Office of the Vice Provost for Faculty Affairs designed a focused, two-track curriculum for a select cohort of 15-25 recently-hired faculty to enter into a New Faculty Academy for Teaching.

### **Teaching Mentorship**

Teaching mentee

Fall 2022

- ECHE 260 - Introduction to Chemical Systems
- Developed two modules on chemical engineering concepts (lectures and homework problems)
- Expanded course to include Excel basics with homework sets
- Engaged in weekly journal club studying papers focused on inclusive teaching, active learning, and backwards design
- Delivered course content to 50 sophomore-level chemical engineering students using active learning techniques

### **CWRU Department of Chemical Engineering**

Guest lecturer

Fall 2019 & 2021

- ECHE 362 - Chemical Engineering Laboratory

- Guest lectured two years, once as a TA, and the other the following year after successful first lecture
- Taught advanced Excel techniques and other tips for chemical engineering needs using Excel
  - Data Tables, Solver, Goal Seek, Vlookup, and introduced VBA
- ECHE 260 - Introduction to Chemical Systems
  - Guest lectured once, after TA semester
  - Taught basic Excel techniques
    - Organizing Excel sheet, making graphs and tables, Goal Seek, and Solver

Teaching assistant

Fall semester 2018, 2019, & 2022

- ECHE 260 - Introduction to Chemical Systems
  - Held office hours, graded homework, and held recitations for the first chemical engineering class the students take.
    - Topics covered: understanding units and process variables, material balances for non-reactive and reactive processes, equations of state and single phase systems, materials balance for multi-phase systems, energy balances for non-reactive and reactive systems, and combines mass and energy balances
- ECHE 362 - Chemical Engineering Laboratory
  - Held office hours, reviewed laboratory work proposal, and oversaw laboratory work for gas membrane systems.
  - Topics covered: gas membrane system: laboratory safety, creating efficient Excel sheets, writing a well thought out experimental plan, and executing proposed plan within time and resource constraints.
- ECHE 360 - Transport Phenomena for Chemical Systems
  - Held office hours, attended lectures, and taught a lecture and two recitations.
  - Topics covered: fluid flow, heat, and mass transfer; applications to chemical engineering systems (steady-state and transient); convective and molecular transport; design of unit operations; and vector/tensor and dimensional analysis.

### **Future Faculty Certificate Program**

Fall semester 2018

Participant

- ECHE 401C; learned effective teaching strategies with focus on in-person classroom and laboratory settings
- Topics covered: Developing student-centered curriculum, creating effective course and assignment design, creating a welcoming, inclusive, and motivating classroom environment, leading engaging lectures and classroom discussions, and providing meaningful assessments of student work.

### **RIT Department of Chemical Engineering**

Teaching assistant

Spring semester 2017

- CHME 301 - Analytical Techniques for Chemical Engineering I
- Held office hours, graded homework, provided feedback on VBA coding, and provided guidance for implementing mathematical procedures in Excel
- Topics covered: roots of equations, fitting equations to data, solution of systems of algebraic equations, interpolation, optimization, numerical differentiation and integrations, and numerical solutions to ordinary differential equations.

### **RIT Year One Program**

Peer advisor

Fall semester 2016

- Help first year college students adjust and navigate college life
- Serve as a teaching aid for the administrator of the class
  - Taught and created lessons plans; led class discussions

### **TRIO Student Success**

Tutor

2013 - 2014

- TRIO offered tutoring services to students who were low-income, first-generation college students, or individuals with disabilities.
- Tutored students (2-5) in subjects such as calculus, statistics and chemistry

### **OUTREACH**

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#### **Science Exploration Day**

Annually, 2026 – present

Activity leader

Science Exploration Day brings scientists, engineers and health care professionals to campus to offer students a real-world glimpse at how science can impact the world.

- Exploring Chemical Engineering with Tea
  - Using the chemistry of tea to show how it can be an indicator for pH, metals, and bleaching agents.

#### **ChemE Camp**

Annually, 2024 – present

Organizer and activity leader

A day camp for about 20 high school juniors and seniors to expose them to chemical engineering

#### **STANYS Mini-Conference**

Annually, 2024 – present

Faculty volunteer

Discuss and answer any questions about CBE with local high school science teachers, provide resources for chemical engineering STEM in class activities, and make connections for future high school outreach opportunities.

#### **High School Outreach**

Organizer and activity leader

2024 – present

Work with local high school science teachers to teach students about chemical engineering and UB

- Bio plastics
  - Scientific concept: polymerization, scale-up, and product development
  - Activity: create bioplastics out of potato starch, observe different processing times due to surface area, discuss challenges with scaling up the process
- Caffeine sublimation and detection
  - Scientific concept: sublimation, chromatography
  - Activity: Students heat loose leaf tea, observe the formed crystals, dissolve the crystals in ethyl acetate, and run the sample on TLC plates

#### **UB Open House**

Faculty volunteer

2023 – present

Discuss and answer any questions about CBE with perspective students and guardians,

#### **Engineering Carnival at CWRU (ages 5 - 14)**

Activity Leader

Annually, 2019 – 2023

Each year, I worked collaboratively with other graduate students to design and deploy new activities, like:

- Candy membrane
  - Scientific concept: size exclusion, membrane filtration
  - Activity: Students arrange cardboard sieves in different orders to filter a mixture of candy with different sizes (yes, they kept the candy)
- Unbelievable ooze
  - Scientific concept: states of matter, complex fluids
  - Activity: Mix corn starch and water to make a non-Newtonian fluid and observe its flow properties and response to shear force
- Science is RAD
  - Scientific concept: radiation and shielding
  - Activity: Using Geiger counter, students explored how shielding and distance affect radiation dose; with a cloud chamber, students were able to visually identify types of radiation; and ultimately students learned about radiation in everyday life
- Can you help me find my [Pu]ppy?
  - Scientific concept: nuclear forensics, radiation, shielding, radiation detection
  - Activity: An interactive virtual presentation where students learned about different types of radiation detectors, identifying a radioactive source, how shielding affects radiation detection, and other basics of nuclear forensics

### **Girl Scouts of NE Ohio “Get to Know Nuclear” (ages 8 - 14)**

Organizer and Activity Leader

Annually, 2020 – 2023

- Scientific concept: modeling radioactive and stable atoms, half-lives, chain reactions, controlling nuclear reactors, calculating radiation dose, detecting radiation
- Activities:
  - Building atoms and decay particles as a physical aid to understand fission
  - M&M half-life used to plot radioactive decay
  - Balloon reactor helped understand how chain reactions start and role of control rods in nuclear reactors
  - Using bananas worth of radiation to understand that radiation is not always scary
  - Cloud chamber activity where Girl Scouts visualize and identify different types of radiation
- Organizer:
  - Created, planned, and executed a daylong seminar following the American Nuclear Society guidelines.
  - Met with CWRU Leonard Gelfand STEM Center to plan and prepare having minors on campus.
  - Worked with Girl Scouts of Northeast Ohio to get approval for hosting and advertise event.
  - Create scheduled events, organize and train volunteers, and obtain supplies for day of activities.

### **Sciencepalooza (ages 14 - 19)**

Activity Leader

November 2020

- Having fun with nuclear science!
  - Scientific concepts: radiation, shielding, and dose calculations

- Activities: An interactive virtual presentation with a hand out available via a QR code; learned structure of atoms, how radioactive decay occurs, the difference between ionizing and non-ionizing radiation, and types of shielding.

### **CWRU COVID-19 Vaccine Clinic**

Volunteer

March 2021

- Helped queue up and lead those getting vaccines to the correct station and let the vaccinated know when their 15 minutes were finished.

## **LEADERSHIP AND PROFESSIONAL SERVICE**

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### **University at Buffalo**

Member of Chemical and Biological Engineering Undergraduate Committee 2023 – present

Member of UB CBE DAB Pre-College Outreach Committee 2023 – present

Member of ABET SO5 Taskforce 2024

Poster judge

- Postdoc Research Symposium (2024)
- CBE Annual Graduate Research Symposium (2023)

Faculty Advisor for student chapter AIChE 2024 – present

Faculty Advisor for UB Nuclear in Clean Energy (NiCE) Club 2025 – present

### **CWRU Chemical Engineering Graduate Student Organization (ChEGSO)**

Women of ChEGSO Liaison, elected position 2021 – 2022

- Created events to bring gender minorities within ChEGSO together
- Brainstormed and enacted ways for ChEGSO to be more inclusive

President, elected position 2020 – 2021

- Planned, organized, and delegated tasks to host events to bring together chemical engineering graduate students both professionally and socially
  - Pivoted to keep graduate students and professors engaged virtually during the beginning of the pandemic
- Lead a team of 5 other graduate student officers
- Created space for gender minorities in ChEGSO by creating and appointing the Women of ChEGSO liaison within my term as president

### **CWRU Engineering Graduate Government (EGG)**

Chemical Engineering Department Representative 2020 – 2021

- Represented the Chemical and Biomolecular Engineering Department in EGG meetings
- Polled and connected with chemical engineering graduate students to understand their opinions and best represent them in meetings
- Created, planned, and hosted event both in person and then virtual for the engineering school to keep students engaged with other programs before and during pandemic

### **CWRU Graduate Student Council (GSC)**

Engineering School Representative 2020 – 2021

- Represented the School of Engineering in GSC meetings
- Polled and connected with all engineering graduate students to understand their opinions and best represent them in meetings
- Attended GSC meeting and voted on budget allocation, public transportation agreements for the graduate school, and other topics that arose during the academic year.

**CWRU SOURCE Undergraduate Research Office**

Reviewer for undergraduate summer fellowship proposals

2020 - present

- Reviewed, rated, and provided constructive feedback for SOURCE research proposals

**RIT Center for Residence Life**

Senior Resident Advisor

2016 - 2017

- In addition to other RA duties, lead a team of 8 RAs to create building-wide activities
- Worked with a team of other Senior RAs to create residence wide activities and outreach programs

Resident Advisor

2013 - 2016

- Responsible for a co-ed floor of students' adjustment to life at RIT
  - Develop and market programs
  - Manage a budget to host events
  - Supervise residents
  - Promote a healthy living and learning community
  - Help find and mediate solutions when problems arise within the community

**Women in Engineering (WE @ RIT)**

Member

2012 - 2017

- Hosted high school senior girls in an overnight event to encourage them to explore their interests in engineering

**Alumni Relations**

Student Alumni Ambassador

2016 - 2017

- Planned, organized, and executed events to bring alumni back to campus and to stay engaged with RIT

**American Institute of Chemical Engineers (AIChE)**

Head of ChemE Car, elected position

2016 - 2017

- Worked with three ChemE Car teams to create experimental plans to improve their cars design
  - These are shoebox-sized "cars" that run and stop based on chemical reactions
  - Day of the competition teams are told how far cars will have to go and stop
- Allocated funds and managed project lab ChemE Car teams used to work on their projects
- Created and presented outreach booth during Imagine RIT to showcase the cars teams had been working on

**PROFESSIONAL SOCIETIES**

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**American Institute of Chemical Engineers (AIChE)**

Member

2012 - present

**North American Membrane Society (NAMS)**

Member

2020 - present

**American Society for Engineering Education, Educational Research and Methods Division**

Member

2022 - present

**National Science Policy Network**

Member

2022 - present

## ENGINEERING EXPERIENCE

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### Ohio Environmental Protection Agency

May 2022 - August 2022

Ohio Public Interest Fellow, Office of Compliance and Pollution Prevention, Division of Environmental and Financial Assistance

- Work with Solid Waste Management Districts to help improve their Recycle Right programs
  - Created survey to better understand where improvements were needed in Ohio EPA outreach
- Created a Pollution Prevention (P2) Tool Kit for National Emphasis Areas (NEA)
  - Organize and summarize P2 practices of NEAs who previously received an Encouraging Environmental Excellence (E3) Award
  - Contact and perform site visits with E3 awardees to work with them to continue their environmental stewardship
- Planned and prepared for virtual conferences

### Lubrizol Advanced Materials

January 2018 - August 2018

Laboratory Assistant

- Created, processed, and tested membranes using new and innovative materials
- Optimized the process time for membrane production
- Worked with multidisciplinary teams to explore the qualities of the membranes

### Graphenix Development Inc

January 2016 - May 2016

Research Co-op

- Gained experience in the start-up and maintenance of a start-up business
- Researched how different carbon formulations affect the performance of a supercapacitor
  - Created and coated supercapacitor electrodes
  - Applied statistical test methods to analyze the data
  - Ran testing to characterize the durability of the supercapacitors

### Honda R&D Americas

June 2014 - January 2015

Advance Materials Research Co-op

May 2015 - July 2015

- Showed a correlation between natural and laboratory weathering using ASTM D7869 and SAE J2527
- Researched how changing temperature, oil, and the materials of a piston's liner and ring can affect the physical properties of an engine
- Researched how different adhesive formulations and metals affect the samples performance
  - Identified how different adhesives and pre-strains can affect the strength of a peel
- Developed a new analytical method that measures the time it takes for samples to acquire red rust and for corrosion growth to occur in market
  - Weathered samples with different coatings and pre-treatments on various metal