

Education

University of Texas at Austin

PhD in Chemical Engineering

Austin, TX
08/2021 - Present

- Cumulative GPA: 4.0/4.0

University of Kentucky

Bachelor of Science in Chemical Engineering, Minor in Mathematics

Lexington, KY
08/2017 - 05/2021

- Cumulative GPA: 4.0/4.0
- Scholars in Engineering and Management Honors Pathway

Research Experience

NSF Graduate Research Fellow - University of Texas at Austin

08/2021 - Present

Advisors: Dr. Manish Kumar and Dr. Benny Freeman

- Investigate the incorporation of protein channels into nanomaterials and the integration of these materials into polymer membranes for the removal of small solutes from water
- Study the interaction of attendees with a hybrid conference held by the North American Membrane Society and the benefits of hybrid conferences

Undergraduate Researcher - University of Kentucky

08/2018 - 05/2019; 08/2019 - 07/2021

Advisor: Dr. Dibakar Bhattacharyya

- Developed a temperature-responsive thin-film composite membrane for the removal of fluorinated contaminants from water
- Synthesized and characterized polyelectrolyte-functionalized membranes capable of immobilizing enzymes for antiviral applications
- Studied capture of mercury ions from industrial wastewater by thiol-functionalized membranes

NSF REU Student - University of Arkansas

06/2019 - 07/2019

Advisor: Dr. Ranil Wickramasinghe

- Assessed the ability of membranes containing ionic liquid to separate nucleobases
- Modeled supported-ionic-liquid membrane systems to determine the effects of feed concentration, membrane thickness, and membrane configuration (Spring and Summer 2020)

NSF REU Student - University of Kentucky

06/2018 - 07/2018

Advisor: Dr. Dibakar Bhattacharyya

- Fabricated eco-friendly membranes from cellulose and poly(acrylic acid)
- Assessed and compared capacities of carboxyl-functionalized membranes for divalent-ion capture

Research Publications and Presentations

Journal Publications

5. Mills, R.; **Vogler, R. J.**[†]; Bernard, M.[†]; Concolino, J.; Hersh, L. B.; Wei, Y.; Hastings, J. T.; Dziubla, T.; Baldrige, K. C.; Bhattacharyya, D. "Aerosol capture and coronavirus spike protein deactivation by enzyme functionalized antiviral membranes." *Communications Materials* **2022**, 3 (1), 34. DOI: 10.1038/s43246-022-00256-0.
4. Léniz-Pizarro, F.; **Vogler, R. J.**; Sandman, P.; Harris, N.; Ormsbee, L. E.; Liu, C.; Bhattacharyya, D. "Dual-Functional Nanofiltration and Adsorptive Membranes for PFAS and Organics Separation from Water." *ACS ES&T Water* **2022**, 2 (5), 863-872. DOI: 10.1021/acsestwater.2c00043.
3. Islam, M. S.; **Vogler, R. J.**; Abdullah Al Hasnine, S. M.; Hernández, S.; Malekzadeh, N.; Hoelen, T. P.; Hatakeyama, E. S.; Bhattacharyya, D. "Mercury Removal from Wastewater Using Cysteamine Functionalized Membranes." *ACS Omega* **2020**, 5 (35), 22255-22267. DOI: 10.1021/acsomega.0c02526.
2. Kamaz, M.; **Vogler, R. J.**; Jebur, M.; Sengupta, A.; Wickramasinghe, R. "π Electron induced separation of organic compounds using supported ionic liquid membranes." *Separation and Purification Technology* **2020**, 236, 116237. DOI: 10.1016/j.seppur.2019.116237.

1. Colburn, A.; **Vogler, R. J.**; Patel, A.; Bezold, M.; Craven, J.; Liu, C.; Bhattacharyya, D. “Composite Membranes Derived from Cellulose and Lignin Sulfonate for Selective Separations and Antifouling Aspects.” *Nanomaterials* **2019**, 9 (6). DOI: 10.3390/nano9060867.

† Authors contributed equally

Patent Applications

2. Two provisional patent applications filed in August 2023
1. Bhattacharyya, D.; Hastings, J. T.; Dziubla, T.; Wei, Y.; Mills, R.; **Vogler, R. J.**; Bernard, M.; Concolino, J. “Antiviral mask and antiviral filter made from a breathable microporous polymeric membrane.” *WO Patent Application* PCT/US2021/035470, **filed June 2, 2021**.

Conference Publications

1. Tapia II, J. C.; Dutton, D. N.; **Vogler, R. J.**; Yang, E.; Wilson, S. A. “Work in Progress: Development and Evaluation of Self-Contained, Shippable Outreach Experiments for Online Implementation in K-12 Classrooms.” *ASEE Virtual Annual Conference Content Access* **2021**, Paper ID: 33043. <https://peer.asee.org/38141>.

Oral Presentations (Presenting Author)

5. “Work in Progress: Development and Evaluation of Self-Contained, Shippable Outreach Experiments for Online Implementation in K-12 Classrooms.” *ASEE Annual Conference & Exposition, July 2021*, online.
4. “Experimental Investigation and Theoretical Comparison for Nucleobase Separations With Supported Ionic Liquid Membranes.” *AICHE National Student Paper Competition, November 2020*, online.
3. “Supported Ionic Liquid Membranes for the Separation of Nucleobases.” *AICHE Southern Regional Student Paper Competition, April 2020*, online.
2. “Supported Ionic Liquid Membranes Using π Electron Cloud Interactions for Specific Separation.” *Materials Research Society (MRS) Fall Meeting & Exhibit, December 2019*, Boston, MA.
1. “Functionalization of PVDF and Cellulose Membranes With Different Functional Groups for Water Remediation Applications.” *National Conference on Undergraduate Research, April 2019*, Kennesaw, GA.

Poster Presentations (Presenting Author)

7. “Incorporation Of Aquaporins Into 2D Materials and Membranes Towards Water Desalination.” *North American Membrane Society Meeting, May 2022*, Tempe, AZ.
6. “Application of Supported-Ionic-Liquid Membranes to a Binary Separation of Nucleobases.” *Virtual AIChE Annual Meeting - Separations-Division Poster Session, November 2020*, online.
5. “Functionalization of Polyvinylidene Fluoride Membranes for Ion Separation Applications.” *North American Membrane Society Meeting, May 2020*, online.
4. “Synthesis of Polymeric Membranes with Carboxylic Acid and Thiol Groups for Ion Adsorption Applications.” *Annual AIChE Student Conference, November 2019*, Orlando, FL.
3. “Functionalization of PVDF Membranes with Thiol Groups for Heavy-Metal Capture.” *North American Membrane Society Meeting, May 2019*, Pittsburgh, PA.
2. “Functionalization of PVDF Membranes with Thiol Groups for Heavy-Metal Capture.” *Kentucky Water Resources Annual Symposium, March 2019*, Lexington, KY.
1. “Functionalized Cellulosic and PVDF Membranes Synthesis to Applications.” *Annual AIChE Student Conference, October 2018*, Pittsburgh, PA.

Honors/Awards

- Offered Dr. Thomas F. Edgar Endowed Graduate Fellowship in Chemical Engineering 06/2021
 - Declined due to overlap with NSF GRFP funding
- Awarded Tau Beta Pi Fellowship 04/2021
- Awarded Engineering Doctoral Fellowship (University of Texas at Austin) 03/2021
- Awarded NSF Graduate Research Fellowship 03/2021

- AIChE National Student Paper Competition: 3rd 11/2020
- North American Membrane Society Poster Competition: 2nd, Undergraduate Division 05/2020
- AIChE Regional Student Paper Competition: 1st, Southern Region 04/2020
- AIChE Student Poster Competition: T-3rd, Materials Engineering and Sciences XII 11/2019
- Outstanding Chemical Engineering Junior: Honorable Mention 04/2019
- North American Membrane Society Undergraduate Student Travel Award 03/2019
- Best Blog (2018 summer research) 08/2018

Skills

Material-Characterization Methods: Dead-end filtration, Crossflow filtration, Scanning electron microscopy (SEM), Transmission electron microscopy (TEM), Surface-zeta-potential measurement, Contact-angle measurement, FTIR spectroscopy, Diffusion-cell studies, Dynamic Light Scattering (DLS)

Solution-Analysis Techniques: Total-organic-carbon analysis, UV-Visible spectroscopy, Bradford Assay, Plate Reader, Fast Protein Liquid Chromatography

Computer: Python, MATLAB, Aspen Plus, ChemCAD

Other: Lean systems

Students Mentored

- Dominic Bujanos, Undergraduate, University of Texas at Austin Fall 2023 - Present
- Katherine Kimball, Undergraduate, University of Texas at Austin Fall 2023 - Present
- Raman Dhiman, PhD Student, University of Texas at Austin Spring 2023
- Pranav Abbaraju, Undergraduate, University of Texas at Austin Spring 2022, Fall 2022

Extracurricular Activities and Service

Director of Corporate Relations – Texas Advanced Degree 2 Consulting 10/2023 - Present

- Recruit individuals from the consulting industry to share their experiences as guest speakers at club meetings

President - ChE Graduate Student Safety Committee 10/2023 - Present

- Oversee and assist with activities that promote safe research practices in the McKetta Department of Chemical Engineering

Member - U. of Kentucky Engineering Young Alumni Philanthropy Council 08/2023 - Present

- Collaborate with other council members to allocate a pool of donated money to various initiatives supporting the University of Kentucky Pigman College of Engineering

Webmaster - North American Membrane Society 04/2022 - 05/2022

- Maintained a website and Twitter account for the North American Membrane Society

Peer Reviewer (Under Supervision) - Environmental Science & Technology 02/2022 - 03/2022

- Collaborated with a senior graduate student to peer review two manuscripts submitted to Environmental Science & Technology (under the supervision of our faculty advisor)

Treasurer - University of Kentucky AIChE Student Chapter 04/2020 - 04/2021

- Raised funds for registration of ~35 students to the 2020 AIChE Annual Student Conference

Treasurer - Interdisciplinary Engineering Outreach Organization 02/2020 - 04/2021

- Collaborated to raise \$3,000 and prepare materials for a project on creating mini-experiments for local middle- and high-school students

Engineering Peer Tutor - University of Kentucky 01/2020 - 04/2020

- Provided chemical-engineering tutoring services at the University of Kentucky

Engineering Peer Mentor - University of Kentucky 08/2018 - 04/2019

- Created and conducted academic, career-focused, and recreational events for mentees

Vice President - UK Energy Club 08/2018 - 04/2019

- Wrote or presented sections of proposals that generated ~\$8,900 of funding for a club project, meetings, an on-campus energy-conservation campaign, and a trip to a conference

Professional Organizations

AIChE, North American Membrane Society (NAMS), Tau Beta Pi