

# Cassandra J. Porter

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## Education

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<b>P.h.D</b>	<b>Yale University</b> , New Haven, CT Department of Chemical and Environmental Engineering Prospectus: Co-advisors: Professor Menachem Elimelech Professor Mingjiang Zhong	<b>2016-2021</b> (expected)
<b>M.Phil</b>	<b>Yale University</b> , New Haven, CT Department of Chemical and Environmental Engineering	<b>2016 – 2019</b>
<b>M.Sci</b>	<b>Yale University</b> , New Haven, CT Department of Chemical and Environmental Engineering	<b>2016 – 2018</b>
<b>B.S.</b>	<b>University of Kentucky</b> , Lexington, KY Department of Chemical Engineering	<b>2012 – 2016</b>

## Research Experience

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<b>Graduate Research Fellow</b>	Aug. 2016 – Present <i>Yale University, New Haven, CT, Advisors: Prof. Menachem Elimelech and Prof. Mingjiang Zhong</i> <ul style="list-style-type: none"><li>• Surface-Initiated Atom Transfer Radical Polymerization to produce dense polymer brushes as ultrathin selective layers and for other surface modification</li><li>• New methods to control brush layer synthesis and characterization</li><li>• Modelling to identify key issues and best-case outcomes for various biomimetic membrane technologies</li></ul>
<b>Paid Research Assistant</b>	May 2016 – Aug. 2016 <i>University of Kentucky, Lexington, KY, Laboratory of Prof. Dibakar Bhattacharyya</i> <ul style="list-style-type: none"><li>• Synthesized a bioinspired, bioincorporative membrane with porins by utilizing layer-by-layer functionalization</li></ul>
<b>Research and Development Materials Engineering Intern</b>	May 2015 – Aug. 2015 <i>Belden Incorporated, Richmond, IN</i> <ul style="list-style-type: none"><li>• Eliminated high-risk phthalate from a cable jacket material by replacing plasticizers with natural oils and developing a new plasticizer in collaboration with chemical provider</li><li>• Reduced stress-whitening in blue plenum cable insulation material with a modified formulation</li></ul>
<b>Credited Undergraduate Research Assistant</b>	May 2014 – May 2016 <i>University of Kentucky, Lexington, KY, Laboratories of Prof. Dibakar Bhattacharyya and Prof. Kimberly Anderson</i> <ul style="list-style-type: none"><li>• Modelling cancer metastasis using polydimethylsiloxane microfluidic device, under Prof. Anderson</li><li>• Functionalizing polymer membranes and immobilizing biomolecules, under Prof. Bhattacharyya</li></ul>

## Publications

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- I. Porter, C. J.,** J. R. Werber, M. Zhong, C. J. Wilson, and M. Elimelech, “Pathways and Challenges for Biomimetic Desalination Membranes with Sub-Nanometer Channels.” *ACS Nano*, 2020. 14 (9): p. 10894-10916.

2. **Porter, C. J.**, J. R. Werber, C. L. Ritt, Y.-F. Guan, M. Zhong, and M. Elimelech, “Controlled grafting of polymer brush layers from porous cellulosic membranes.” *Journal of Membrane Science*, 2020. 596 (15): p. 117719.
3. Li, M., X. Wang, **C. J. Porter**, W. Cheng, X. Zhang, L. Wang, and M. Elimelech, “Concentration and Recovery of Dyes from Textile Wastewater Using a Self-Standing, Support-Free Forward Osmosis Membrane.” *Environmental Science & Technology*, 2019. 53(6): p. 3078-3086.
4. Werber, J. R., **C. J. Porter**, and M. Elimelech, “A Path to Ultraspecificity: Support Layer Properties To Maximize Performance of Biomimetic Desalination Membranes.” *Environmental Science & Technology*, 2018. 52(18): p. 10737-10747.
5. Dizge, N., R. Epsztein, W. Cheng, **C. J. Porter**, and M. Elimelech, “Biocatalytic and salt selective multilayer polyelectrolyte nanofiltration membrane.” *Journal of Membrane Science*, 2018. 549: p. 357-365.
6. Hernandez, S., **C. Porter**, X. Zhang, Y. Wei, and D. Bhattacharyya, “Layer-by-layer assembled membranes with immobilized porins.” *RSC Advances*, 2017. 7(88): p. 56123-56136.

## Awards and Honors

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<b>2019 Graduate Student Award in Environmental Engineering (ACS)</b>	2019
<b>National Science Foundation Graduate Research Fellowship Program (NSF-GRFP)</b> \$126,000 fellowship to support three years of graduate studies, based on personal and research statements.	2016 – Present
<b>National Water Research Institute-American Membrane Technology Association (NWRI-AMTA) Fellowship for Membrane Research</b> \$20,000 fellowship awarded to two students yearly to support two years of graduate research, based on personal and research statements.	2018 – 2020
<b>Graduated Summa Cum Laude at University of Kentucky, Lexington, KY</b> Based on GPA of 3.97 on a 4.0 scale.	2016
<b>University of Kentucky Outstanding Chemical Engineering Senior Award</b> Awarded yearly to one undergraduate senior student for academic excellence, by faculty vote.	2016
<b>University of Kentucky Outstanding Chemical Engineering Junior Award</b> Awarded yearly to one undergraduate junior student for academic excellence, by faculty vote.	2015
<b>UK College of Engineering Academic Scholarship</b> \$3,000/year for undergraduate studies, based on ACT score.	2012 – 2016
<b>National Excellence Scholarship</b> \$4,500/year for undergraduate studies, based on ACT score and high school GPA.	2012 – 2016
<b>Graduated Valedictorian at Scott County High School, Georgetown, KY</b>	2006
<b>National Arts and Letters, Talent in All the Arts</b>	2006

## Presentations

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1. **Porter, C. J.**, J. R. Werber, C. Ritt, Y. Guan, M. Zhong, and M. Elimelech, “Polymer Brushes on Porous Cellulosic Supports as Ultrathin Selective Layers.” *EMS-NAMS Imagine Membrane 2019*, Horta, Island of Faial, Azores, Portugal. Poster presentation. Sept. 24, 2019.
2. **Porter, C. J.**, Y. Guan, J. Werber, M. Elimelech, and M. Zhong, “Brush Away those Layer-by-Layer Membranes: Fundamentals of Polyelectrolytic Brush Membranes.” *AMTA-AWWA 2019 Membrane Technology Conference & Exposition*, New Orleans, LA. Oral presentation. Feb. 27, 2019.

3. **Porter, C. J.**, J. Werber, Y. Guan, M. Elimelech, and M. Zhong, “Brush Up on Your Membrane Science: Selective Polymer Brush Layers.” *16th Annual Robert M. Langer Symposium*, New Haven, CT. Oral presentation. Dec. 14, 2018.  
*Received Best Presentation Award*
4. **Porter, C. J.**, Y. Guan, J. Werber, M. Zhong, and M. Elimelech, “Brush Up on Your Membrane Science: Polymer Brushes on Membrane Substrates.” *Gordon Research Seminar, Membranes: Materials and Processes*, New London, NH. Poster presentation. Aug. 12, 2018.  
*Received 2<sup>nd</sup> Place in Student Poster Competition*
5. **Porter, C. J.**, Y. Guan, J. Werber, M. Zhong, and M. Elimelech, “Brush Up on Your Membrane Science: Polymer Brushes on Membrane Substrates.” *Gordon Research Seminar, Membranes: Materials and Processes*, New London, NH. Oral presentation. Aug. 12, 2018.
6. **Porter, C. J.**, J. Werber, M. Zhong, and M. Elimelech, “Surface-initiated atom transfer radical polymerization for an amphiphilic triblock copolymer brush with aquaporins.” *The 11<sup>th</sup> International Conference on Membrane and Membrane Processes*, San Francisco, CA. Poster presentation. July 29 – Aug. 4, 2017.  
*Received Best Poster Award*
7. **Porter, C. J.**, S. Hernandez, X. Zhang, Y. Wei, and D. Bhattacharyya, “Functionalization of Membranes with OmpF Porins.” *The North American Membrane Society 26<sup>th</sup> Annual Meeting*, Bellevue, WA. Poster presentation. May 21 – 25, 2016.  
*Received 2<sup>nd</sup> Place Poster Award in Life Science, Biomed, and Sensors*
8. **Porter, C. J.**, S. Hernandez, X. Zhang, Y. Wei, and D. Bhattacharyya, “From Nanofiltration to Layer-by-Layer Assembly Membranes with Porins,” *AIChE Annual Student Conference*, Salt Lake City, UT. Poster presentation. Nov. 6 – 9, 2015.  
*Received 3<sup>rd</sup> Place Poster Award in Separations*

## Professional Service and Other Achievements

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### **Elimelech Lab Reactivation Committee Member**

June 2020 – Present

Worked on a team of five lab members to develop safe lab practices and protocols for restarting research during each Reactivation Phase at Yale during the COVID-19 pandemic. Procedures included how to best track activities, limit personnel, sanitize spaces, acquire PPE, and apply for permission to conduct research.

### **Elimelech Lab Photographer**

Aug. 2017 – Present

Photographs and edits lab social events, group shots, and new profile pictures for lab members.

### **Yale Distilled Magazine**

#### *Illustrator*

Sept. 2018 – May 2020

Produced the images to accompany articles on broader science-related questions pertaining to societal impacts, scientific goals and obligations, and future conflicts. Images were tailored to catch the eye of common readers, connecting scientific inquiry and environmental concerns with the general public.

### **Yale Student Salsa Society (YaSSS)**

#### *Treasurer*

June 2019 – June 2020

Established new nonprofit society accounts and nonprofit status. Budgeted for seasonal events and maintained funds. Paid instructors, DJs, and venues. Sought reimbursement for event expenses. Advertised and recruited for the society at student welcome events.

#### *Personal Relations/Advertisement Coordinator*

May 2018 – June 2019

Responsible for creating and distributing event advertisements and for personal relations that connect a Yale-based Latin dance society with the broader New Haven community. Established the advertising routes for the new society. Taught beginner salsa lessons for YaSSS’s summer outdoor series, Salsa Under the Stars.

### **Yale Chemical and Environmental Engineering Recruitment**

Spring of 2017 – 2019

Attended dinners, brunch, campus tour, and evening out events to socialize with and inform prospective graduate students.

**Women in Engineering & Applied Science Summer Camp**

Summer 2016

Demonstrated membrane science experiments to female high school students. Participated in a question and answer panel to talk about careers/education in chemical engineering.

**University of Kentucky Freshmen Orientation Che. Eng. Video**

Fall 2016

Created a two-minute video for incoming freshmen at University of Kentucky as a pitch for chemical engineering, discussing my experience at UK as well as current research at Yale University.

**Professional Ballerina**

*Alabama Ballet Apprentice Dancer, Birmingham, AL*

Sept. 2009 – May 2011

Attended morning class and daily rehearsals. Publicly performed classical ballet and modern dance.

*Nashville Ballet Trainee Dancer, Nashville, TN*

Aug. 2007 – May 2009

Attended company and trainee classes and rehearsals. Performed in outreach ballets at schools and in large public productions on stage. Read ballet stories to children and led them in dance exercises at libraries and bookstores.

**Teaching and Mentoring**

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**Teaching Assistant at Yale University**

Aug. 2017 – Dec. 2017

Assisted in teaching Environmental Transport Processes, an undergraduate and graduate level course. Provided mentorship in completing homework assignments, understanding material, and studying for tests. Graded and provided feedback on homework sets.

**Undergraduate Research Mentor**

*Advised Scarlet-Marie Kilpatrick*, a Yale University undergraduate student.

Aug. 2019 – March 2020

Affiliation during mentorship: First-generation undergraduate student in Chemical Engineering at Yale University.

Current affiliation: Graduate student in the Stanford University School of Earth, Energy, and Environmental Sciences.

In addition to training on experimental skills, coached on literature searches, developing research projects, and writing skills for Scarlet's Personal and Research Statements for the 2019 NSF-GRFP, which she was awarded.

*Advised Erika MacDonald*, a Harvey Mudd College undergraduate student.

Summer 2019

Current affiliation: Undergraduate student in Engineering Program at Harvey Mudd College.

Additional training beyond experimental skills was given in effective presentations, from outline/organization to figure creation to speaking skills to anticipating and effectively answering questions. Erika received high reviews from lab-mates and Menachem Elimelech for her final presentation.