

# Julianne Rolf

julianne.rolf@yale.edu

17 Hillhouse Avenue, Room 524, New Haven, CT 06511

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## EDUCATION

- August 2017–Present      **Yale University**      New Haven, CT
- **Master of Science**, Chemical and Environmental Engineering (received December 2018)
  - **Master of Philosophy**, Chemical and Environmental Engineering (received May 2020)
  - **Doctorate of Philosophy**, Chemical and Environmental Engineering (expected May 2023)
    - Advisor: Menachem Elimelech
- Sept. 2011–June 2016      **University of California, Riverside**      Riverside, CA
- **Bachelor of Science**, Environmental Engineering – Summa Cum Laude with a 3.88 GPA
  - Honors Thesis: *Electrically-Conductive Carbon Nanotube Membranes for Wastewater Treatment*
    - Advisor: David Jassby

## SKILLS

- Membrane systems, membrane synthesis, water quality, pretreatment chemicals, polymer synthesis, technical writing, teaching, mentoring, project management, data analysis, public speaking, website design, Microsoft Office, MATLAB, Arduino, R, Origin, ChemDraw, MestReNova, Adobe InDesign
- Analytical equipment:
  - Atomic force microscopy (AFM), contact angle goniometer, Fourier transform infrared spectroscopy (FTIR), gel permeation chromatography (GPC), mass spectroscopy, nuclear magnetic resonance (NMR), scanning electron microscope (SEM) with energy dispersive X-ray spectroscopy (EDS), ultraviolet-visible spectroscopy, zeta potential analyzer
- Selected courses:
  - Water Quality Engineering, Water Quality Systems Design, Fate and Transport of Environmental Contaminants, Biological Unit Processes, Applied Fluid Mechanics, Engineering Thermodynamics, Fundamentals of Air Pollution Engineering, Polymer Physics, Biogeochemistry and Pollution, Environmental Physicochemical Processes

## RESEARCH EXPERIENCE

- August 2017–Present      **Yale University – Dr. Menachem Elimelech’s Laboratory**      New Haven, CT
- Modifying membrane surface morphology for increased water recovery during treatment processes
  - Studying antiscalant effectiveness in membrane processes using dynamic light scattering techniques
  - Participating in the Nanotechnology Enabled Water Treatment ([NEWT](#)) through research collaboration, professional development, and outreach in the New Haven area
- Sept. 2016–July 2017      **Leibniz-Institute of Freshwater Ecology & Inland Fisheries**      Stechlin, Germany
- Analyzed lake trophic status and cyanobacteria concentration impact on the temporal sequence of calcite precipitation using data collected for over 40 years at twelve sample sites in the northeast region of Germany
- June 2015–August 2015      **Smithsonian Environmental Research Center (SERC) REU**      Edgewater, MD
- Studied the effect of Regenerative Stormwater Conveyance (RSC), a method for stream restoration, on sediment and nutrient transport in water systems by taking weekly samples, developing a protocol for water sampling, and analyzing data
- June 2014–August 2014      **UC LEADS: UC Berkeley – Dr. David Sedlak’s Laboratory**      Berkeley, CA
- Researched the treatment of synthetic BPA-contaminated stormwater via packed columns of commercial and lab-made manganese-oxide coated sand for ReNUWI through the UC LEADS program
- June 2013–June 2016      **UC LEADS: UC Riverside – Dr. David Jassby’s Laboratory**      Riverside, CA
- Studied wastewater treatment methods by synthesizing electrically-conductive carbon nanotube ultrafiltration and membrane distillation membranes for synthetic wastewater with organics, an oil/water emulsion, or high salinity concentrations

June 2012–Sept. 2015      **EPA P3–Phase 2 Design Competition**      Riverside, CA

- Designed and built a Solar Thermal Closet Dryer that was installed in a low-income community; the system included a solar thermal collector, fans, solar panels, safety features, and a personalized closet to dry clothes
- Acted as the liaison between the Solar Thermal Closet Dryer and Integrated Appliance System while designing an appliance system to include a hot water heater and space heater with the closet dryer

#### **PUBLICATIONS (H-INDEX: 5)**

- Sun, M., Boo, C., Shi, W., **Rolf, J.**, Shaulsky, E., Cheng, W., Plata, D.L., Qu, J., & Elimelech, M. (2019). Engineering carbon nanotube forest superstructure for robust thermal desalination membranes. *Advanced Functional Materials*, p.1903125. [DOI: 10.1002/adfm.201903125](https://doi.org/10.1002/adfm.201903125)
  - Front cover featured: [DOI: doi/abs/10.1002/adfm.201970245](https://doi.org/10.1002/adfm.201970245)
- Karanikola, V., Boo, C., **Rolf, J.**, & Elimelech, M. (2018). Engineered slippery surface to mitigate gypsum scaling in membrane distillation for treatment of hypersaline industrial wastewaters. *Environmental Science & Technology*, 52(24), 14362-14370. [DOI: 10.1021/acs.est.8b04836](https://doi.org/10.1021/acs.est.8b04836)
- Dudchenko, A. V., Chen, C., Cardenas, A., **Rolf, J.**, & Jassby, D. (2017). Frequency-dependent stability of CNT Joule heaters in ionizable media and desalination processes. *Nature Nanotechnology*, 12(6), 557-563. [DOI: 10.1038/nnano.2017.102](https://doi.org/10.1038/nnano.2017.102)
- Dudchenko, A. V., **Rolf, J.**, Shi, L., Olivas, L., Duan, W., & Jassby, D. (2015). Coupling underwater superoleophobic membranes with magnetic pickering emulsions for fouling-free separation of crude oil/water mixtures: An experimental and theoretical study. *ACS Nano*, 9(10), 9930-9941. [DOI: 10.1021/acsnano.5b04880](https://doi.org/10.1021/acsnano.5b04880)
- Dudchenko, A. V., **Rolf, J.**, Russell, K., Duan, W., & Jassby, D. (2014). Organic fouling inhibition on electrically conducting carbon nanotube–polyvinyl alcohol composite ultrafiltration membranes. *Journal of Membrane Science*, 468, 1-10. [DOI: 10.1016/j.memsci.2014.05.041](https://doi.org/10.1016/j.memsci.2014.05.041)

#### **ORAL PRESENTATIONS**

October 2020: **43<sup>rd</sup> Annual Fulbright Conference–Virtual** (During COVID-19 Pandemic)

- Reimaging Water Treatment for Rural and Water-Scarce Communities: Potential of Solar Energy-Powered Membrane Distillation Technology

September 2018: **North East Graduate Student Water Symposium–UMass-Amherst, MA**

- High Recovery of Industrial Wastewater by Membrane Distillation via Engineered Slippery Surface

March 2017: **Fulbright Seminar–Berlin, Germany**

- Relationship of Calcite Precipitation and Phytoplankton in Lakes in the Northeast Region of Germany

April 2016: **Symposium for Undergraduate Research, Scholarship, and Creative Activity–UC Riverside, CA**

- Conductive RO–Polyamide Membranes for Silica-Containing Wastewater Treatment

September 2015: **REU Summer Internship Presentation Series–SERC, Edgewater, MD**

- Stream Restoration by Regenerative Stormwater Conveyance (RSC) to Improve Water Quality in the Chesapeake Bay

July 2014: **Summer Research Opportunity Symposium–UC Berkeley, CA**

- Treatment of BPA-Contaminated Stormwater with Manganese Oxide-Coated Sand

November 2013: **Southern California Conferences for Undergraduate Research–Whittier College, Whittier, CA**

- Heating Attic Air for Space Heating and Dryer Applications using Solar Thermal Energy

#### **POSTER PRESENTATIONS**

October 2020: **Nanosystems Engineering Research Center for Nanotechnology-Enabled Water Treatment (NEWT) Mid-Year Meeting–Rice University, Houston, TX (Virtual)**

- Models and Methods for Characterizing and Elucidating Inorganic Scaling in Membrane Desalination

May 2020: **NEWT Annual Meeting/NSF Site Visit–Virtually**

- Elucidating Antiscalant Mechanisms for Gypsum Scaling Mitigation

October 2019: **Nanosystems Engineering Research Center for Nanotechnology-Enabled Water Treatment (NEWT) Mid-Year Meeting–Arizona State University, Phoenix, AZ**

- Elucidating Antiscalant Mechanisms for Mitigation of Gypsum Scaling

August 2018: **Gordon Research Symposium–Membranes: Materials and Processes**–New London, NH  
– Engineered Slippery Surface to Mitigate Scaling in Membrane Distillation for High Recovery Industrial Wastewater Desalination

March 2016, 2015, 2014: **UC LEADS Research and Leadership Symposium**

- Stream Restoration by Regenerative Stormwater Conveyance (RSC) to Improve Water Quality in the Chesapeake Bay (UC Davis–2016)
  - *Outstanding Research Poster Award Winner*
- Treatment of BPA–Contaminated Stormwater with Manganese Oxide-Coated Sand (UC Merced–2015)
  - *Outstanding Research Poster Award Winner*
- Degradation of Carbon Nanotubes (UC Riverside-2014)
  - *Outstanding Research Poster Award Winner*

November 2015: **Geological Society of America Annual Meeting**–Baltimore, MD

- Stream Restoration by Regenerative Stormwater Conveyance (RSC) to Improve Water Quality in the Chesapeake Bay
  - *On To the Future (OTF) Travel Scholarship Recipient*

October 2015: **SACNAS National Conference**–Washington, D.C.

- Stream Restoration by RSC to Improve Water Quality in the Chesapeake Bay

July 2015: **Soil and Water Conservation Society International Annual Conference**–Greensboro, NC

- Treatment of BPA–Contaminated Stormwater with Manganese Oxide-Coated Sand

May 2015, 2014: **Metropolitan Water District (MWD) Spring Green Expo**–Los Angeles, CA

- Integrated Appliance System (IAS) (2015)
- Heating Attic Air for Space Heating and Dryer Applications using Solar Thermal Energy (2014)
  - *ECO Innovators Award of Excellence-Team Category (First Place)*

April 2015: **Small Manufacturing Institute Design Competition**–Los Angeles, CA

- Integrated Appliance System (IAS)
  - *2<sup>nd</sup> Place (Team Competition)*

February 2015: **Emerging Researchers National (ERN) Conference for STEM**–Washington, D.C.

- Treatment of BPA–Contaminated Stormwater with Manganese Oxide-Coated Sand
  - *Travel Scholarship Recipient*

April 2014: **Symposium for Undergraduate Research, Scholarship, and Creative Activity**–UC Riverside, CA

- Degradation of Carbon Nanotubes
  - *2014 Best Poster Award Winner*

April 2014: **EPA National Sustainable Design Expo**–Washington, D.C.

- Heating Attic Air for Space Heating and Dryer Applications using Solar Thermal Energy

November 2013: **Southern California Conferences for Undergraduate Research**–Whittier College, Whittier, CA

- Optimization of Semi-Permeable Conductive Carbon Nanotube-Polymer Thin Films

August 2013: **MSRIP Summer Research Program Symposium**–UC Riverside, CA

- Optimization of Semi-Permeable Conductive Carbon Nanotube-Polymer Thin Films

#### **INVITED TALKS**

- March 2021: **From California to Yale: Trying to Solve My Home State’s Water Crisis**–WISAY, Virtual
- October 2020: **Toward Inclusion Moderator**–Yale University, Virtual
- October 2020: **Picture a Scientist-Movie Screening & Discussion Moderator**–MIT, Virtual
- June 2020: **Graduate School Webinar**–Goldwater Scholarship Community, Virtual
- November 2018: **Goldwater Information Session**–Yale University
- September 2018: **Graduate School Webinar**–Goldwater Scholarship Foundation, Virtual
- August 2017: **Applying for a Fulbright Scholarship**–UC Riverside
- April 2016: **Highlander Day – BCOE Welcome**–UC Riverside
- November 2014: **Parents Association Meeting**–UC Riverside
  - Water Quality: My Undergraduate Research Experience

## HONORS AND AWARDS RECEIVED

- ACS New Haven Local Section Conference Buddy Award (March 2021)
- ACS Division of Environmental Chemistry Graduate Student Awardee: \$125 (February 2021)
- NSF Graduate Research Fellowship Recipient: \$102,000 (June 2018-May 2021)
- Yale University Combined Fellowship Award: \$12,000 (June 2018-May 2021)
- UC Riverside Bourns College of Engineering Commencement Speaker (June 2016)
- United States Fulbright Scholarship Recipient – Germany (March 2016)
- Chancellor’s Research Fellowship: \$5,000 (May 2015)
- Inland County Water Association Scholarship Recipient: \$500 (August 2015)
- Goldwater Scholarship Recipient: \$7,500 (April 2015)
- Academic Excellence Award – Bourns College of Engineering, Environmental Engineering (2015)
- UC Office of the President Sustainability Fellowship: \$1,500 (February 2015)
- University Honors Scholarship Recipient: \$1,500 (February 2015)
- Citizens University Committee Scholarship Recipient: \$1,000 (204-2015)
- Del Pizzo Scholarship Recipient: \$500 (2014-2015)
- Inland County Water Association Scholarship Recipient: \$500 (September 2014)
- Marlan and Rosemary Bourns College of Engineering Award (Spring 2014)
- Krieger & Stewart Fellowship Recipient: \$2,500 (Spring 2014)
- Goldwater Scholarship Honorable Mention (April 2014)
- CCPOA Scholarship Recipient: \$1,400 (Spring 2014, 2012, 2011)
- UC Leadership Excellence through Advanced DegreeS (UC LEADS) Scholar: \$8,500 (2013-2015)
- Bourns Foundation Scholarship Recipient: \$1,585 (Spring 2013)
- University Honors Fellowship – Enrichment Scholarship for On-Campus Activities: \$500 (Spring 2013)
- Recognition for Philanthropy Work at UCR (February 2013)
- Dean’s Academic Distinction Award: Maintaining 3.9+ GPA (2012-2016)
- University Honors Fellowship – GPA Scholarship: \$750 (Spring 2012)
- Chancellor’s Honor List (2011-2012, 2012-2013, 2014-2015)
- Dean’s Honor List (Fall 2011-Winter 2014, Fall 2014-Spring 2015, Spring 2016)
- Chancellor’s Scholarship Recipient: \$10,000 (2011-2015)

## WORK EXPERIENCE

- October 2015–July 2016      **Student Success Programs Student Coordinator**      Riverside, CA
- Prepared and gave presentations on prestigious scholarships/awards and UC Riverside opportunities
  - Hosted weekly office hours to assist prospective scholarship candidates with the application process
  - Advertised application information on social media and on campus
  - Coordinated with members of the UCR Undergraduate Journal Student Editorial Board and Chancellor’s Research Fellowship to market the opportunities provided by the respective programs
- April 2013–June 2016      **Academic Resource Center Peer Counselor/Mentor**      Riverside, CA
- Assisted and tutored students on Academic Probation (AP) and Subject to Dismissal (STD) at UC Riverside
  - Delivered Study Skills Workshops to students on AP and STD to help them develop good studying habits
  - Mentored and trained new peer counselors to assist students in the upcoming academic year
- April 2013–June 2013      **Office of Sustainability GCAP Intern**      Riverside, CA
- Established UC Riverside’s Green Event Program, expanded the Green Office Program, and made 100 UCR Quit Kits for the UC smoke-free initiative
- October 2011–June 2012      **UC Riverside UECC AmeriCorps–Stratton Community Center**      Riverside, CA
- Mentored and tutored youth in mathematics and English during the afterschool program
  - Organized and ran age-appropriate activities for the elementary school children in the program
  - Participated in volunteer activities organized by the AmeriCorps UECC Chapter and City of Riverside

## **EDITORIAL EXPERIENCE**

- Nov. 2018–August. 2020     **DISTILLED Treasurer & Developmental Editor**     New Haven, CT
- Edited two essays for Yale’s DISTILLED, an annual student-run publication that aims to spark a dialogue about the technological future of society by presenting well-reasoned, scientifically detailed essays
  - Worked with the EIC to fundraise for the magazine, assisted with planning the Launch Event, and helped coordinate final essay submissions
- March–May 2015             **UCR Undergraduate Research Journal Editor-In-Chief**     Riverside, CA
- Matched editors with articles for the review process and acted as the liaison with the UC Riverside Undergraduate Education staff
  - Worked closely with the Faculty Advisory Board and Student Editorial Board to ensure that the review of submissions moved forward as scheduled
  - Oversaw final proof-read and layout of the journal

## **VOLUNTEERING EXPERIENCE**

- June 2020–October 2020     **Yale CEE Culture and Climate Committee**     New Haven, CT
- Developed a diversity, equity, and inclusion (DEI) survey for the Chemical and Environmental Engineering Department’s Climate Action Plans’ three committees
  - Worked with faculty and students to develop Culture and Climate Committee’s 1-year, 3-year, and 5-year Action Plans based on the survey results
  - Reviewed the Action Plans from the other two committee (Faculty Recruitment Committee and Graduate Student and Postdoc Recruitment Committee)
- November 2018–Present     **Equity in the Job Search Symposium Co-Chair**     New Haven, CT
- Planning the 5<sup>th</sup> annual symposium
  - Designed the new EJS website and our organization’s Yale Connect profile on Campus Groups
  - Co-chaired the 4<sup>th</sup> annual symposium, which was held virtually due to COVID-19
  - Co-chaired the 3<sup>rd</sup> annual symposium at Yale University, which provided practical, hands-on workshops and presentations to assist graduate students and postdocs at all stages of the STEM job search by integrating this career advice with data-driven discussions of gender bias
  - Planned the event’s schedule, assisted in recruiting speakers, managed the symposium’s finances, and organized advertising
- Winter 2019                 **Environmental Engineering Recruitment Weekend Advisor**     New Haven, CT
- Used my experience from co-running Recruitment Weekend for Yale’s Environmental Engineering program in 2018 to advise the new committee and provide them tips to streamline the planning process
- August 2019–Present       **Title IX Graduate and Professional Advisory Board**     New Haven, CT
- Meet regularly with members of the Title IX Office and the Title IX Steering Committee to discuss sex- and gender-based discrimination and sexual misconduct at Yale
  - Provide student perspectives and guidance on Yale’s policies, procedures, and programs relating to Title IX.
  - Developed and implemented initiatives and projects to promote a climate of inclusion and respect at Yale.
- Winter 2018                 **Environmental Engineering Recruitment Weekend Co-Chair**     New Haven, CT
- Co-led the committee to recruit eleven graduate students to Yale’s Environmental Engineering program by planning four days of activities, meetings, presentations, and travel arrangements
  - Successfully recruited seven of the students to attend in Fall 2018
- February 2018             **Girls’ Science Investigation Group Leader**     New Haven, CT
- Led a group of female middle school students from the New Haven area through nine activities related to understanding states of matter and phase changes for an event held at Yale University
- May 2017                   **English Teacher**     Stechlin, Germany
- Delivered one lecture to an elementary school class in English to teach them American slang and culture
- June 2013                  **ACS Conference Volunteer**     Riverside, CA
- Helped prepare for the conference held at UC Riverside and checked guests in while answering all their questions about the events for the conference

- April 2013                      **Science and Engineering Camp Planner & Volunteer Coordinator**      Riverside, CA  
 – Planned ten activities related to science and engineering for underprivileged youth in Riverside that were implemented over the course of a week-long camp at Stratton Community Center  
 – The UCR Honors Program provided funding and volunteers for the Camp
- Spring 2012, 2013              **Coach for Lil' Kickers Soccer League**                                      Riverside, CA  
 – Taught the fundamentals of soccer with an emphasis on teamwork to 6 and 7-year-old children
- Winter 2011/2012              **Coach for Redlands High School Varsity Girls Soccer**                      Redlands, CA  
 – Shadowed and assisted the head coach with training and coordinating drills for the Varsity Girls Team

**TEACHING EXPERIENCE**

- Fall 2018                      **ENVE 373/F&ES 773–Air Pollution Control Teaching Fellow**      New Haven, CT  
 – Attended class, hosted weekly office hours, and graded homework assignments for this class at Yale University taught by Prof. Drew Gentner, which focused on air quality problems worldwide and quantitative assessment of air pollution
- July 2018, 2019              **EduExplora Teacher – Introduction to Environmental Eng.**      New Haven, CT  
 – Prepared and taught ten 1.75 hourlong lectures with activities and quizzes related to environmental science and engineering to high school students from Latin America for the EduExplora program at Yale University

**MEMBERSHIPS AND EXTRACURRICULAR ACTIVITIES AT YALE UNIVERSITY**

- National Center for Faculty Development & Diversity (NCFDD): *Member* (December 2020–Present)
- American Chemical Society (ACS): *Member* (October 2020–Present)
- American Membrane Technology Associations (AMTA): *Member* (December 2018–Present)
- Yale University Graduate Fellowship Affiliates: *Affiliate* (September 2018–Present)
- Graduate Student Assembly (GSA): *Representative for the Chemical and Environmental Engineering Department* (September 2018–Present)
  - o GSA Steering Committee (September 2019-May 2020)
  - o GSA Academic and Professional Development Committee (September 2018–June 2020)

**MEMBERSHIPS AND EXTRACURRICULAR ACTIVITIES AT UC RIVERSIDE**

- UCR Alumni Association: *Lifetime Member* (June 2016–Present)
- BCOE Dean Search Committee: *Student Representative* (May-June 2016)
- BCOE Leadership Council: *Member* (September 2015-June 2016)
- Tau Beta Pi Engineering Honors Society: *Treasurer* (June 2015–February 2016), *Community Service Co-Captain* (February 2014–June 2015), *Member* (October 2013–Present)
- Sigma Xi – UC Berkeley: *Member* (March 2015–March 2016)
- Engineers Without Borders–UCR: *President* (March 2015–March 2016), *Vice President* (March 2014–March 2015), *Treasurer* (April 2012–March 2014), *Member* (March 2012–June 2016)
- University Honors Program Community Service Committee: *Member* (January–April 2013)
- Golden Key Honors Society: *Member* (November 2012–Present)
- University Honors Program: *Member* (September 2011-June 2016)