Jessica R. Ray

Assistant Professor
University of Washington
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ACADEMIC QUALIFICATIONS

University of California, Berkeley Berkeley, California
Miller Institute Postdoctoral Research Fellow 2015 – 2018
Host: Dr. David Sedlak

Washington University in St. Louis St. Louis, Missouri
Ph.D., Energy, Environmental & Chemical Engineering 2010 – 2015
Dissertation title: "Interactions, Fate and Transport of Natural and Engineered Oxide Nanoparticles in Wastewater and Colloids in Water Treatment Systems"
Graduate Advisor: Dr. Young-Shin Jun

Washington University in St. Louis St. Louis, Missouri
M.S., Energy, Environmental & Chemical Engineering 2009–2010
Graduate Advisor: Dr. Young-Shin Jun

Washington University in St. Louis St. Louis, Missouri
B.S., Chemical Engineering 2005–2009

PROFESSIONAL ACTIVITIES

Assistant Professor University of Washington
Department of Civil & Environmental Engineering January 2019 – Present

- Investigating new selective adsorbents for removal of recalcitrant trace organic compounds such as per- and polyfluoroalkyl substances (PFAS) as well as novel nanomaterial approaches for PFAS defluorination and mineralization. Treatment trains are being developed to facilitate removal of persistent trace organics in dilute waste streams and subsequent destructive treatments for safe and effective remediation with minimal risk of co-contamination due to selectivity of novel adsorbents.
- Modifying and characterizing adsorbents and materials to generate low-cost engineered geomedia for removal or degradation of trace organic compounds and trace metals in urban stormwater. Laboratory and pilot scale studies are being performed to assess the environmental and ecological implications of amending green stormwater infrastructure with the geomedia generated in our group
- Designing new, selective adsorbents for recovery of valuable materials in waste streams including phosphorus, nutrients and metals

Miller Institute Postdoctoral Research Fellow University of California, Berkeley
Department of Civil & Environmental Engineering September 2015 – December 2018

- Directed international collaboration with colleagues at The Hebrew University of Jerusalem to design and implement functionalized clays for passive treatment of trace metals and organic compounds in urban stormwater
- Compared and measured remediation of highly toxic perfluorinated compounds using selective and non-selective sorbents under simulated and real groundwater conditions
- Examined new in situ chemical oxidation treatment methods for the degradation of perfluorinated compounds in highly contaminated groundwater

Graduate Research Assistant Washington University in St. Louis
Department of Energy, Environmental & Chemical Engineering August 2008 – June 2015

- Employed multidisciplinary techniques, including high resolution transmission electron microscopy, scanning electron microscopy, inductively coupled plasma-mass spectrometry and inductively coupled plasma-optical emission spectroscopy, atomic force microscopy, X-ray diffraction, and Raman spectroscopy to investigate the effects of substrate and solution properties on iron oxide and cerium oxide nanoparticles, and calcium carbonate and calcium sulfate colloids
- Conducted experiments using synchrotron, X-ray facilities such as pair distribution function analysis (in collaboration with Dr. Karena Chapman), X-ray absorption spectroscopy (in collaboration with Dr. Matthew Newville), and grazing incidence small angle X-ray scattering (in collaboration with Dr. Byeongdu Lee) at the Advanced Photon Source, Argonne National Laboratory
- Performed techniques and operated equipment at the Washington University in St. Louis, Nano Research Facility cleanroom which includes reactive-ion etching, physical vapor deposition, ellipsometry, and nanolithography
- Participated in collaborative research projects with Dr. Srikanth Singamaneni (Washington University in St. Louis, Department of Mechanical Engineering & Materials Science) which resulted in a successful Washington University in St. Louis International Center for Advanced Renewable Energy and Sustainability (I-CARES) proposal and a publication
- Composed nine accepted general user proposals to U.S. Department of Energy National Research Laboratories
- Synthesized titanium dioxide and hematite nanoparticles for applications in groundwater remediation at contaminated sites

Graduate STEM Fellow, GK-12 Fellowship Washington University in St. Louis
Department of Chemical Engineering/Institute for School Partnership June 2009 – August 2010

- Designed water remediation and environmental engineering curriculum to educate K-12 students on the benefits of studying engineering:

  Jessica Ray, Phyllis Balcerzak, Barry Williams, and Carleigh Samson. Curricular Unit: *Environmental Engineering and Water Chemistry*. 2010. TeachEngineering.org. http://www.teachengineering.org/view_curricularunit.php?url=collection/wst_/curricular_units/wst_environmental/wst_environmental_unit.xml
- Led lectures and lab activities with K-12 students based on designed curriculum in collaboration with GK-12 instructor's curriculum
- Assisted GK-12 instructor with teaching curriculum and mentored K-12 students in the classroom for ten hours a week

HONORS AND AWARDS

Miller Institute for Basic Research Postdoctoral Fellow	University of California, Berkeley	$225K	2015 – 2018
Graduate Student Award in Environmental Chemistry	American Chemical Society	$500	2014
Doctorate Student Research Award	WUStL* Department of Energy, Environmental & Chemical Engineering	$500	2013
Science to Achieve Results (STAR) Graduate Fellowship	Environmental Protection Agency	$132K	2012 – 2015
Graduate Student Teaching Award	WUStL Department of Energy, Environmental & Chemical Engineering	$500	2011
GK-12 Fellowship	National Science Foundation	$50K	2009 – 2010

*WUStL = Washington University in St. Louis

JESSICA R. RAY ▪ UNIVERSITY OF WASHINGTON
CIVIL & ENVIRONMENTAL ENGINEERING ▪ JESSRAY@UW.EDU

SUCCESSFUL RESEARCH GRANTS

- Royalty Research Fund, $40K: "Fe(VI)-coated sand for passive oxidation of toxic and persistent polychlorinated biphenyls in urban stormwater", University of Washington, (**June 2019 – June 2020**), PI: **Jessica R. Ray**

PUBLICATIONS

In Preparation

1. **Jessica R. Ray** and Gokhan Barin, "Selective, Scalable Adsorbents for Removal and Recovery of Perfluoralkyl Substances in Reverse Osmosis Brines," *In preparation.*
2. Fanny Okaikue-Woodi, Katya Cherukumilli and **Jessica R. Ray**, "A Critical Review of Contaminant Removal by Conventional and Emerging Media for Urban Stormwater Treatment," *In preparation*.

Accepted/Published

1. **Jessica R. Ray**, Xuanhao Wu, Chelsea W. Neil, Haesung Jung, Zhichao Li and Young-shin Jun, "Redox Chemistry of CeO_2 Nanoparticles in Aquatic Systems Containing Cr(VI)(aq) and Fe^{2+} Ions," *Environmental Science: Nano*, **2019**, 6, 2269-2280.
2. **Jessica R. Ray**, Itamar A. Shabtai, Marc Teixidó, Yael G. Mishael, and David L. Sedlak, "Polymer-Clay Composite Geomedia for Sorptive Removal of Trace Organic Compounds and Metals in Urban Stormwater," *Water Research,* **2019**, 157, 454-462.
3. **Jessica R. Ray**, Whitney Wong, and Young-Shin Jun, "Antiscaling Efficiency of $CaCO_3$ and $CaSO_4$ on Polyethylene Glycol (PEG)-modified Reverse Osmosis Membranes in the Presence of Humic Acid: Interplay of Membrane Surface Properties and Water Chemistry," *Physical Chemistry Chemical Physics*, **2017**, 19 (7), 5647-5657.
4. Chelsea W. Neil, **Jessica R. Ray**, Byeondgu Lee, and Young-Shin Jun, "Fractal Aggregation and Disaggregation of Newly Formed Iron(III) (Hydr)oxide Nanoparticles in the Presence of Natural Organic Matter," *Environmental Science: Nano*, **2016**, 3 (3), 647-656.
5. **Jessica R. Ray**,† Sirimuvva Tadepalli,† Saide Z. Nergiz, Keng-Ku Liu, Le You, Yinjie Tang, Srikanth Singamaneni, and Young-Shin Jun, "Hydrophilic, Bactericidal Nanoheater-Enabled Reverse Osmosis Membranes to Improve Fouling Resistance," *ACS Applied Materials & Interfaces*, **2015**, 7 (21), 11117-11126.
6. Xuyang Liu,† **Jessica R. Ray**,† Chelsea W. Neil,† Qingyun Li, and Young-Shin Jun, "Enhanced Colloidal Stability of CeO_2 Nanoparticles by Ferrous Ions: Adsorption, Redox Reaction, and Surface Precipitation," *Environmental Science & Technology*, **2015**, 49 (9), 5476-5483.
7. Jiaxi Fang, Yang Wang, Michel Attoui, Tandeep S. Chadha, **Jessica R. Ray**, Wei-Ning Wang, Young-Shin Jun, and Pratim Biswas, "Measurement of Sub-2 nm Clusters of Pristine and Composite Metal Oxides during Nanomaterial Synthesis in Flame Aerosol Reactors," *Analytical Chemistry*, **2014**, 86 (15), 7523-7529.
8. **Jessica R. Ray**, Wei Wan, Benjamin Gilbert, and Young-Shin Jun, "Effects of Formation Conditions on the Physicochemical Properties, Aggregation, and Phase Transformation of Iron Oxide Nanoparticles," *Langmuir*, **2013**, 29 (4), 1069-1076.
9. **Jessica R. Ray**, Byeongdu Lee, Jonas Baltrusaitis, and Young-Shin Jun, "Formation of Iron(III) Hydroxides on Polyaspartate- and Alginate-Coated SiO_2: Effects of Substrate Hydrophilicity and Functional Groups at the Surface," *Environmental Science & Technology*, **2012**, 46 (24), 13167-13175.

10. Yandi Hu, **Jessica R. Ray**, and Young-Shin Jun, "Na^+, Ca^{2+}, and Mg^{2+} in Brines Affect Supercritical CO_2–Brine–Biotite Interactions: Ion Exchange, Biotite Interactions: Ion Exchange, Biotite Dissolution, and Illite Precipitation," *Environmental Science & Technology*, **2012**, 47 (1), 191-197.
11. Daniel Garcia, Hongbo Shao, Yandi Hu, **Jessica R. Ray**, and Young-Shin Jun, "Supercritical CO_2–Brine Induced Dissolution, Swelling, and Secondary Mineral Formation on Phlogopite Surfaces at 75–95°C and 75 atm," *Energy & Environmental Science*, **2012**, 5 (2), 5758-5767.
12. Yandi Hu, **Jessica R. Ray**, and Young-Shin Jun, "Biotite–Brine Interactions under Acidic Hydrothermal Conditions: Fibrous Illite, Goethite, and Kaolinite Formation and Biotite Surface Cracking," *Environmental Science & Technology*, **2011**, 45 (14), 6175– 6180.
13. Hongbo Shao, **Jessica R. Ray**, and Young-Shin Jun, "Effects of Salinity and the Extent of Water on Supercritical CO_2-Induced Phlogopite Dissolution and Secondary Mineral Formation," *Environmental Science & Technology*, **2011**, 45 (4), 1737 – 1743.
14. Hongbo Shao, **Jessica R. Ray**, and Young-Shin Jun, "Dissolution and Precipitation of Clay Minerals under Geologic CO_2 Sequestration Conditions: CO_2-Brine-Phlogopite Interactions," *Environmental Science & Technology*, **2011**, 44 (15) 5999-6005.
15. Hongbo Shao, **Jessica R. Ray**, and Young-Shin Jun, "Effects of Organic Ligands on Supercritical CO_2–Induced Phlogopite Dissolution and Secondary Mineral Formation," *Chemical Geology*, **2011**, 290 (3-4), 121-132.

PROFESSIONAL PRESENTATIONS

Invited Talks

1. **Jessica R. Ray**, "Low-cost Polymer-Clay Composites for Urban Stormwater Treatment." Department of Civil and Environmental Engineering, Northwestern University, October 25, **2019**. ***Invited Departmental Seminar***
2. **Jessica R. Ray**, Itamar A. Shabtai, Marc Teixido Planes Yael G. Mishael, and David L. Sedlak, "Polymer-clay Composite Engineered Geomedia for Trace Contaminant Sorption in Urban Stormwater Treatment Systems." 257th ACS National Meeting & Exposition, San Diego, CA, August 25-29, **2019**. ***Invited Graduate Student Symposium Planning Committee (GSSPC) Speaker***
3. **Jessica R. Ray,** "Selective Adsorbents for Trace Metal and Trace Organic Contaminant Removal from Urban Runoff and Groundwater." Department of Civil and Environmental Engineering, Cornell University. November 12, **2017**. ***Invited Departmental Seminar***
4. **Jessica R. Ray, "**Interfacial Reactions of Nanomaterials in Natural and Engineered Aqueous Systems." Astani Department of Civil & Environmental Enginooeering, University of Southern California, Los Angeles. May 1, **2017**. ***Invited Departmental Seminar***
5. **Jessica R. Ray**, "The Road to Environmental Engineering: My Role in the Water Crisis." Science & Biotechnology Department, Berkeley City College, April 7, **2016**. ***Invited Departmental Seminar***
6. **Jessica R. Ray**, "Interfacial Reactions of Natural and Engineered Nanoparticles in Water and Wastewater Treatment Systems." Department of Civil and Environmental Engineering, Stanford University, February 12, **2016**. ***Invited Departmental Seminar***

Conference Presentations & Posters

7. **Jessica R. Ray**, Itamar A. Shabtai, Marc Teixido Planes Yael G. Mishael, and David L. Sedlak, "Low-cost polymer-functionalized clay composites for trace organic compound and metal removal during urban stormwater treatment." 257th ACS National Meeting & Exposition, San Diego, CA, August 25-29, **2019**. *Oral Presentation*
8. **Jessica R. Ray**, Itamar A. Shabtai, Marc Teixido Planes Yael G. Mishael, and David L. Sedlak, "Polymer-clay Composites for Passive Removal of Trace Organic Compounds and Metals during Urban Stormwater Treatment." 2019 AEESP Research and Education Conference, Arizona State University, Tempe, AZ, May 14-16, **2019**. *Oral Presentation*
9. **Jessica R. Ray**, Itamar A. Shabtai, Marc Teixido Planes Yael G. Mishael, and David L. Sedlak, "Polymer-clay Composites for Sorptive Removal of Trace Organic Compounds and Metals during Urban Stormwater Treatment." 257th ACS National Meeting & Exposition, Orlando, FL, March 31-April 4, **2019**. *Oral Presentation*
10. **Jessica R. Ray**, Itamar A. Shabtai, Marc Teixido Planes Yael G. Mishael, and David L. Sedlak, "Polymer-clay Composite Geomedia for Adsorption of Trace Contaminants during Urban Stormwater Treatment." 2018 Gordon Research Conference on Environmental Science: Water, Holderness, NH, June 24 – June 29, **2018**. *Poster Presentation*
11. **Jessica R. Ray**, Itamar A. Shabtai, Marc Teixido Planes Yael G. Mishael, and David L. Sedlak, "Polymeric Functionalized Clay Composites for Adsorption of Trace Contaminants in Urban Stormwater." 255th ACS National Meeting & Exposition, New Orleans, LA, March 18-22, **2018**. *Oral Presentation*
12. **Jessica R. Ray**, Sirimuvva Tadepalli, Saide Z. Nergiz, Keng-Ku Liu, Le You, Yinjie, Srikanth Singamaneni, and Young-Shin Jun, "Photothermal and Hydrophilic Functionalization of Reverse Osmosis Membranes for Enhanced Resistance of Mineral Scaling, Organic, and Bio-Fouling." 253rd ACS National Meeting & Exposition, San Francisco, CA, April 2-6, **2017**. *Oral Presentation*
13. **Jessica R. Ray**, Sirimuvva Tadepalli, Saide Z. Nergiz, Keng-Ku Liu, Le You, Yinjie, Srikanth Singamaneni, and Young-Shin Jun, "Nanostructure-enabled Membranes for Better Reverse Osmosis Processes." 251st ACS National Meeting & Exposition, San Diego, CA, March 13-17, **2016**. *Oral Presentation*
14. **Jessica R. Ray**, Chelsea W. Neil, Haesung Jun, Zhichao Liu, and Young-Shin Jun, "Effect of Fe^{2+} and Cr(VI) on Redox-Active CeO_2 Nanoparticle Surface Properties and Transformation in Aqueous Systems." 251st ACS National Meeting & Exposition, San Diego, CA, March 13-17, **2016**. *Oral Presentation*
15. **Jessica R. Ray**, Byeongdu Lee, and Young-Shin Jun, "Efficacy of $CaCO_3$ and $CaSO_4$ Scaling Resistance of Polyethylene Glycol Hydrophilically-Modified Reverse Osmosis Membranes in the Presence of Humic Acid." 249th ACS National Meeting & Exposition, Denver, CO, March 22-26, **2015**. *Oral Presentation*
16. **Jessica R. Ray**, Byeongdu Lee, and Young-Shin Jun, "Photothermally Active Reverse Osmosis Membranes for Improved Resistance against Mineral Scaling and Organic Bio-Fouling." 249th ACS National Meeting & Exposition, Denver, CO, March 22-26, **2015**. *Poster Presentation*
17. **Jessica R. Ray**, Byeongdu Lee, and Young-Shin Jun, "In Situ Investigation of Nucleation Mechanisms Governing Iron(III) (Hydr)oxide Formation on Environmentally Abundant Polymeric Organic-Coated Substrates." 2014 Argonne National Laboratory Meeting SES-VI, Argonne IL, September 11-12, **2014**. *Poster Presentation*
18. **Jessica R. Ray**, Sirimuvva Tadepalli, Saide Z. Nergiz, Keng-Ku Liu, Le You, Yinjie Tang, Srikanth Singamaneni, and Young-Shin Jun, "Photothermally Active Reverse Osmosis Membranes for

Improved Resistance against Mineral Scaling and Organic Bio-Fouling." 2014 Gordon Research Conference on Environmental Science: Water, Holderness, NH, July 27 – August 1, **2014**. *Poster Presentation*

19. **Jessica R. Ray**, Benjamin Gilbert, and Young-Shin Jun, "Drying-Induced Aggregation and Phase Transformation of Iron Oxide Nanoparticles: *In Situ* and *Ex Situ* Properties Governed by Formation Conditions." 50th Anniversary Annual Meeting of the Clay Minerals Society, Urbana, IL, October 6-10, **2013**. *Oral Presentation*
20. **Jessica R. Ray**, Byeongdu Lee, and Young-Shin Jun, "Hydrophilicity and Surface Functional Group-Controlled Iron(III) Hydroxide Formation on Polymer-Coated Substrates." 18th Annual Mid-American Environmental Engineering Conference, St. Louis, MO, September 20-21, **2013**. *Oral Presentation*
21. **Jessica R. Ray**, Byeongdu Lee, and Young-Shin Jun, "Reverse Osmosis Membrane Modification for Calcium Carbonate Fouling Inhibition." 18th Annual Mid-American Environmental Engineering Conference, St. Louis, MO, September 20-21, **2013**. *Poster Presentation*
22. **Jessica R. Ray**, Byeongdu Lee, and Young-Shin Jun, "Effects of Surface Hydrophilicity and Functional Group of Organic Coated Substrates on Iron(III) (Hydr)oxide Nucleation." 245th ACS National Meeting & Exposition, New Orleans, LA, April 7-11, **2013**. *Oral Presentation*
23. **Jessica R. Ray**, Byeongdu Lee, Jonas Baltrusaitis, and Young-Shin Jun, "Surface Hydrophilicity and Functional Group-Driven Iron(III) Hydroxide Nucleation on Organic-Coated Substrates in Aqueous Environments." 2012 American Geochemical Union Fall Meeting, San Francisco, CA, December 3-7, **2012**. *Poster Presentation*
24. **Jessica R. Ray**, Wei Wan, and Young-Shin Jun, "Effects of Synthesis Conditions on Simultaneous Hematite and Maghemite Nanoparticle Formation, their Physico-chemical Properties, and Arsenate Adsorption." 2011 Gordon Research Conference on Environmental Nanotechnology, Manchester, NH, May 29 – June 3, **2011**. *Poster Presentation*
25. **Jessica R. Ray,** Barry Williams, Hiro Mukai, "A Lesson in Water Chemistry: Encouraging Middle School Students to Pursue a Future in Engineering." 2010 NSF GK-12 Annual Meeting, Washington, D.C., March 26-28, **2010**. *Poster Presentation*
26. **Jessica R. Ray**, Wei Wan, and Young-Shin Jun, "Effects of Fe^{3+} Injection Rate, Cooling and Drying Method on Particle Size, Morphology and Mineral Phase of Iron Oxide Nanoparticles." 239th ACS National Meeting & Exposition, San Francisco, CA, March 21-25, **2010**. *Poster Presentation*

TEACHING EXPERIENCE

Instructor – **CEE 357: Environmental Engineering (5 credits)**, University of Washington, Spring Quarters; full instructor responsibilities (preparing lectures, writing exams and homework, coordinated lab demos and discussion section instruction with the teaching assistant)

Instructor – **CEWA 549A: Advanced Topics in Environmental Engineering, Chemistry and Biology (3 credits)**, University of Washington, Winter Quarters; full instructor responsibilities (preparing lectures, writing exams and homework, coordinated lab demos and discussion section instruction with the teaching assistant)

Guest Lecturer – **CEE 115: Water Chemistry** (Instructor: Dr. David Sedlak), University California, Berkeley, Fall Semester 2017

Guest Lecturer – **EECE 505: Water Chemistry** (Instructor: Dr. Young-Shin Jun), Washington University in St. Louis, Fall Semester 2013

Guest Laboratory Assistant – **EECE 534/443: Environmental Nanochemistry** (Instructor: Dr. Young-Shin Jun), Washington University in St. Louis, Spring Semester 2011, 2012, 2013; led teams of students in synthesizing iron oxide nanoparticles and visualizing nanoparticles with atomic force microscopy

Teaching Assistant – **EECE 534/443: Environmental Nanochemistry** (Instructor: Dr. Young-Shin Jun), Washington University in St. Louis, Spring Semester 2011; attended lectures, graded homeworks and exams, led laboratory lecture, held office hours (70 h total)

Teaching Assistant – **ChE 473A: Chemical Engineering Laboratory** (Instructor: Dr. Robert Heider), Washington University in St. Louis, Fall Semester 2011; worked with teams of students to conduct a 5-h distillation lab, graded lab reports (150 h total)

Guest Lecturer – **ChE 351, Engineering Analysis of Chemical Systems** (Instructor: Dr. Young-Shin Jun), Washington University in St. Louis, Fall Semester 2010

Teaching Assistant – **ChE 351: Engineering Analysis of Chemical Systems** (Instructor: Dr. Young-Shin Jun), Washington University in St. Louis, Fall Semester 2010; attended lectures, graded homework and exams, prepared discussion section material, held office hours (140 h total)

SERVICE

Professional

Environmental Chemistry Division Session Chair — San Francisco, CA
American Chemical Society Meeting — Fall 2020
Session Title: (Dr. William Tarpeh, co-chair)

Peer Reviewing – Environmental Science: Nano (Royal Society of Chemistry Journal); Environmental Science & Technology (American Chemical Society Journal); Langmuir (American Chemical Society Journal)

University

Undergraduate Research Scholars Summer Program, University of Washington — Seattle, WA
Speaker — July 17, 2019

- Presented my research interests and engaged with University of Washington undergraduate students participating in the Undergraduate Research Scholars Program

NextProf Nexus 2018, UC Berkeley — Berkeley, CA
Panelist – "The Faculty Search Process" — September 12, 2018

- Spoke to NextProf Nexus 2018 participants about my experience during the faculty search process providing tips and lessons to future applicants

Miller Institute for Basic Science in Research, UC Berkeley — Berkeley, CA
Job Seminar Workshop Panelist — September 27, 2018

- Answered questions of current Miller Institute postdoctoral fellow about the faculty search, job interviews, and application materials

School of Engineering Dean Search Committee, WUStL* — St. Louis, MO
Graduate Student Representative — January – March 2015

- Represented the voice and concerns of Washington University in St. Louis, School of Engineering graduate students with regard to the leadership and future directions of the engineering school
- Coordinated meetings with graduate student among all five engineering departments with School of Engineering dean candidates
- Worked closely with Washington University in St. Louis leadership (including the chancellor and provost), faculty, and staff to select and nominate dean candidates

*WUStL = Washington University in St. Louis

Association of Graduate Engineering Students, WUStL St. Louis, MO
President August 2013 – August 2015

- Organized meetings and delegated responsibilities to faculty advisors and graduate student board members
- Coordinated monthly social and professional development programming events for the Washington University engineering graduate student body

Campus YMCA Executive Council, WUStL St. Louis, MO
Fundraising and Special Events Director September 2007 – May 2009

- Coordinated and supervised annual Campus YMCA events and fundraisers such as Safe Trick or Treat
- Initiated and administered a community service program for Washington University Freshman Orientation
- Helped plan and facilitate monthly leadership and program development workshops for Campus YMCA program leaders
- Advised individual programs on logistics and planning for program-specific events and fundraising campaigns

Departmental

Diversity, Equity, Inclusion, and Climate Committee, University of Washington Seattle, WA
Faculty Member January 2019 – Present

- Implemented structural, departmental initiatives to help faculty and staff increase inclusivity (e.g., including gender pronouns in email signatures and class syllabi)
- Worked with student committee members to create a student-peer mentoring program to facilitate mentoring of younger undergraduate students by upper-level undergraduate students
- Coordinated with UC Berkeley and University of Washington staff to institute a formalized diversity, equity and inclusion training for Civil & Environmental Engineering faculty, staff and students

ReNUWIt ERC Student Committee on Diversity & Inclusion, UC Berkeley Berkeley, CA
Committee Member – Internal & External Affairs Subcommittees May 2017 – Present

- Facilitated discussions, workshops, and seminar events across four campuses on topics of promoting diversity within each campus and creating an inclusive climate within the engineering research center
- Engaged faculty, staff, undergraduate, graduate, and postdoctoral students within the research center on topics relating to diversity and inclusion
- Planned partnerships with local K–12 schools to bring underrepresented minority students to UC Berkeley to learn about water treatment research and careers in engineering

Department Faculty Student Search Committee, WUStL St. Louis, MO
Graduate Student Member January 2012, 2014

- Conferred with a group of my peers to interview and nominate tenure-track faculty candidates for the Energy, Environmental and Chemical Engineering Department

OUTREACH

Black Lives Matter Week Interview Seattle, WA
Interviewee February 1, 2019

- Recorded a 10 min interview describing my experiences as a black female professor and scientist to be shared with Adrian Dowst – a Chemistry teacher at Garfield High School (Seattle, WA) – to present to students during the Black Lives Matter Week

Bay Area Scientists in Schools (BASIS), UC Berkeley Berkeley, CA
Volunteer September – November 2018

- Worked with local San Francisco Bay Area 3rd – 6th grade educators to perform water filtration lessons and demonstrations with students in the classroom

Girls in Engineering, UC Berkeley Berkeley, CA
Volunteer June 22, 2018

- Facilitated a "Something's in the Water" lesson and water filtration demonstration for middle school girls teaching them about environmental engineering and water treatment

Expand Your Horizons, UC Berkeley Berkeley, CA
Volunteer March 17, 2018

- Led a "Clean Water" water filtration lesson and laboratory activity for 5th – 8th grade girls in the San Francisco Bay Area educating them about environmental engineering and the importance of clean water

Brittany Woods Middle School Workshop St. Louis, MO
Graduate Student Volunteer May 2014

- Guided middle school students in a water filtration and purification lab activity, which was an outreach program initiated by the Environmental Chemistry Lab and the Institute for School Partnership

"Moving and Shaking: An Introduction to Engineering", WUStL* St. Louis, MO
Graduate Student Volunteer February 2010, 2011, 2012, 2013, 2014, 2015

- Led a lab demonstration for the St. Louis Area Gifted Resource Council "Moving and Shaking" day which encourages talented, 6th-8th grade students in the St. Louis metro area to pursue STEM careers

Women in Engineering Day, WUStL* St. Louis, MO
Graduate Student Volunteer February 2010, 2011, 2012, 2013, 2014, 2015

- Directed a hands-on environmental engineering workshop and lab demonstration for the Washington University in St. Louis Chapter of the Society of Women Engineers Women in Engineering Day promoting STEM careers for female high school students in the St. Louis metro area

SUPERVISED RESEARCH & ADVISING

Postdoctoral Scholars

Katya Cherukumilli, Ph.D. – served as PI for Global Water Labs, provided input for experiments, proposals and manuscripts; University of Washington, **January 2019 – Present**

Yuemei Ye, Ph.D. – managed per- and polyfluoroalkyl substance adsorption and degradation research; University of Washington, **April 2019 – Present**

Graduate Students

Nicole Redden, Professional Masters Program student – served as faculty advisor; University Washington, **September 2019 – September 2020**

Yeunook Bae, doctoral research rotation student – graduate student mentor, provided input on research directions to examine the stability of nanoparticle coatings on reverse osmosis membranes; Washington University in St. Louis, **November 2014 – December 2014**

Wei Yang, doctoral research rotation student – graduate student mentor, provided input on research directions and trained student to synthesize nanoparticles; Washington University in St. Louis, **November 2014 – December 2014**

*WUStL = Washington University in St. Louis

Changwoo Kim, doctoral research rotation student – graduate student mentor, provided input on research directions to detect mineral scaling on reverse osmosis membranes; Washington University in St. Louis, **September 2014 – October 2014**

Yutong Liu, doctoral research rotation student, Institute of Materials Science & Engineering – graduate student mentor, provided research direction and instruction for iron oxide nanoparticle synthesis and characterization, "Nanoparticle Formation in Aluminum Oxide Nanopore Structures"; Washington University in St. Louis, **September 2013 – December 2013**

Joohee Kim, visiting graduate student, Department of Nano Science and Technology, Seoul National University, South Korea, PI: Youn Sang Kim – graduate student mentor; Washington University in St. Louis, **April 2011-July 2011**

Undergraduate Students
Samantha Burrell,

Kaylie Dennehy, volunteer – summer researcher working with Dr. Ye to degrade perfluoroalkyl substances; University of Washington, **June 2019 – September 2019**.

Daaniya Iyaz, 2019 Summer Undergraduate Research Scholars – summer scholar working with Dr. Cherukumilli on wastewater heavy metal remediation; University of Washington, **June 2019 – August 2019**.

Max Steiner, 2019 Summer Undergraduate Research Scholars – summer scholar working with Dr. Cherukumilli on groundwater fluoride remediation; University of Washington, **June 2019 – August 2019**.

Daniel Ocasio, NNIN ReNUWIt REU program, University of Maryland, Baltimore County – postdoctoral fellow mentor, "Modified Fenton In Situ Chemical Oxidation using Calcium Peroxide for Stormwater Treatment Applications"; UC Berkeley, **June 2016 – August 2016.** Daniel is now a Ph.D. student in the Civil and Environmental Engineering Department.

Yanzhe Zhu, independent study – graduate student mentor, stability and dissolution of cerium oxide nanoparticles, "Oxidative Transformation and Adsorption of Fluoroquinolones in the Presence of Hematite Nanoparticles"; Washington University in St. Louis, **May 2014 – May 2016**

Justin Nauman, NNIN REU program, Purdue University – graduate student mentor, "Effect of Hydrophilic Membrane Modifications and Natural Organic Matter Fouling on Reverse Osmosis Membrane Performance"; Washington University in St. Louis, **June 2013 – August 2013**

James Cooper, independent study – graduate student mentor, "The Effects of Particle Deposition and Polymer Grafting on the Efficiency and Flux of Reverse Osmosis Thin Film Composite Membranes"; Washington University, **January 2012 – May 2013**

Whitney Wong, NNIN REU program, University of Texas-Austin – graduate student mentor, "Effects of Membrane Surface Modification on Calcium Carbonate Fouling and Membrane Efficiency"; Washington University in St. Louis, **June 2012 – August 2012**

Rachel Mudd, NSF-NUE-REU program, Washington University in St. Louis (Biomedical Engineering) – graduate student mentor, "Oxidative Transformation and Adsorption of Fluoroquinolones in the Presence of Hematite Nanoparticles", Washington University in St. Louis, **June 2011 – August 2011**

Alexandra Rutz, NNIN REU program, University of Illinois Urbana-Champaign – graduate student mentor, "Synthesis, Properties, and Antimicrobial Activities of Manganese Oxide Nanoparticles"; Washington University in St. Louis, **June 2009 – August 2009**

High School Student

Eric Hsu, STARS program, Marquette High School, MO (junior) – graduate student mentor, instructed student to measure pH, perform kinetic experiments and synthesize nanoparticles; Washington University in St. Louis, **June 2010 – August 2010**. Eric graduated from Washington University in St. Louis in 2016.

PROFESSIONAL ASSOCIATIONS

Association of Environmental Engineering and Science Professors	2014 – Present
American Chemical Society	2009 – Present