

Sophie De Respino, EIT

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Education

The University of Texas at Austin, Austin, TX

Ph.D. student, Environmental Engineering

July 2021 – present

Thesis title: Sustainable plant-based materials for microbial and chemical contamination removal

Advisor: Prof. Manish Kumar

The University of Texas at Austin, Austin, TX

Master of Science, Environmental Engineering

August 2019 – May 2021

GPA: 4.0/4.0

The University of Alabama, Tuscaloosa, AL

Bachelor of Science, Environmental Engineering

August 2015 – May 2019

GPA: 4.0/4.0

Research Experience

Kumar Research Group, The University of Texas at Austin

August 2019 – Present

Graduate Research Assistant: Evaluating sustainable plant-based proteins for applications in water treatment, including pathogen removal, oil/water separation and PFAS treatment.

- Quantifying PFOS and PFOA with triple quadrupole LC/MS
- Analysis of protein-ligand interactions through NMR and molecular docking
- Quantifying oil concentrations in water using fatty acid methyl ester derivatization and GC-MS
- Analyzing pathogen concentrations (*E.coli*, MS2) via plate counting and plaque assays
- Purifying *M. oleifera* cationic proteins for water treatment applications in coagulation and filtration

Terry Research Lab, The University of Alabama

August 2018 – May 2019

Research Assistant: Collected and analyzed samples from Lake Tuscaloosa for manganese and organic matter characterization.

Wetland Ecosystem Ecology Lab, Arizona State University

July 2018

Field Work Volunteer: Measured biomass in the Tres Rios Wetland to determine effectiveness of the City of Phoenix's wastewater treatment. Input and analyzed data to send to the City of Phoenix.

Honors and Activities

The University of Texas at Austin

Office of Innovation and Economic Impact "Proof of Concept" Grant

NSF INFEWs Fellow

HDR One Water Institute Scholarship, 2020

Environmental Engineering and Science Foundation Scholarship, 2020

Cockrell School of Engineering Fellowship, 2019 – 2020
Clean Water Science Network Mentor, 2019 – present

The University of Alabama

College of Engineering Mentor, 2017 – 2019
George J. Davis Most Outstanding Civil Engineering Senior, May 2019
Golden Key International Honor Society, 2016 – 2019, President, 2018 – 2019
Departmental Academic Honors, 2017
Presidential Scholarship, 2015 – 2019
College of Engineering Scholarship, 2015 – 2019

Posters and Presentations

The University of Texas at Austin

June 2022 AEESP poster presentation. “Simultaneous removal of oil and bacteria in a natural fiber filter” St. Louis, MO.
March 2022 ACS Conference, Division of Environmental Chemistry presentation. “Simultaneous removal of oil and bacteria in a natural fiber filter” San Diego, CA.
April 2021 CAEE Graduate Student Symposium poster presentation: “Sustainable Plant-based Filters for Simultaneous Oil and Bacteria Removal” Austin, TX. 1st place and “People’s Choice” award

Publications

S. De Respino, L. Samineni, Y. Tu, H. Oh, and M. Kumar. “Simultaneous removal of oil and bacteria in a natural fiber filter” *Environmental Science & Technology Letters* 2022 9(1), 77-83. DOI: 10.1021/acs.estlett.1c00733
L. Samineni, **S. De Respino**, *et al.* “Effective pathogen removal in sustainable natural fiber Moringa filters” *npj Clean Water* 5, 27 (2022). <https://doi.org/10.1038/s41545-022-00170-5>
M. DePaolis*, **S. De Respino***, *et al.* “Cottonseed extract as a coagulant for water treatment” (2023). *Environmental Sciences: Advances* 2023, DOI: 10.1039/D2VA00205A
H. Oh, Y. Tu, L. Samineni, **S. De Respino**, B.D. Freeman, and M. Kumar. “Breathable protective fabrics with skin-like structure and function” (2023). *Nature Materials* (submitted).
S. De Respino, M. Kumar, *et al.* “Plant-based proteins for enhanced PFAS treatment” (2023). *Nature Water*, in preparation.
W. Bai, **S. De Respino**, *et al.* “Home RO filters can serve as passive samplers to assess presence and diversity of microorganisms in distribution systems”. *Water Research*, in preparation.
L. Samineni, **S. De Respino**, *et al.* “Nanoparticle removal using functionalized plant-based filtration media” (2023). *Environmental Sciences: Advances* (invited, In preparation).

* co-first authors

Patents

Provisional patent: SYSTEM AND DEVICES FOR REMOVAL OF DISPERSED OILS AND/OR MICROBIALS FROM CONTAMINATED SOLUTIONS (2021). Application number 63/273,825

Outreach and Education Experience

CE 342 Teaching Assistant

January 2023-present Teaching Assistant: Work with undergraduate students to learn water and wastewater coursework. Occasionally lead lectures.

Clean Water Science Network

August 2019-present

Graduate Student Mentor: Mentoring an undergraduate student from Central America with monthly meetings and assignments.

UT Girl Day

February 2020

Research Booth Volunteer: Work with young students to facilitate understanding of basic research principles unique to our research group.

Global Vision International, Silana Village, Fiji

Summer 2018

Environmental Development Volunteer: Constructed recycling points, greenhouses, and kitchen gardens. Presented workshops on recycling to schools.

Summer 2017

Education Volunteer: Assisted an elementary school with teaching English to young students through phonetics, reading, and writing.