

Samantha M. Surber

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Education

University of Georgia - Athens

Ph.D. in the Department of Plant Biology (*August 2020 - Present*)

- Advisor: Dr. C.J. Tsai
- Entered Candidacy for Ph.D. September 2022
- Expected Graduation: October 2025

University of Nebraska - Lincoln

Bachelor of Science in Biochemistry (*August 2016 - May 2020*)

- Minors: Plant Biology and Chemistry
- Justin Smith Morrill Scholar Graduate
- Graduation May 2020

Key Skills

- Molecular Biology: CRISPR-Cas9, RNA/DNA extraction, qPCR, metabolite analyses(GC/LC), wood chemistry
- Study areas: Plant genetics, molecular and cellular biology, gene editing, functional genomics, plant physiology, stress response analysis, LICOR photosynthesis measurements, tissue culture, and greenhouse management
- Science Communication: Writing, public speaking, mentorship, and outreach

Research Experience

Graduate Research - University of Georgia - Athens

Advisor: Dr. C-J Tsai (*January 2021 - Present*)

- Investigating xylem-biased sulfate transporters (SULTRs) in *Populus* using CRISPR-Cas9 to identify growth and stress response impacts
- Conducting abiotic stress experiments to analyze physiological, metabolic, and genetic responses
- Collaborating with interdisciplinary teams on complex plant genetics projects

Graduate Research Rotations - University of Georgia – Athens

- Soil warming effects on *Acer rubrum* (Dr. Jacqueline Mohan)
- CRISPR validation of *SULTR3* knockouts in *Populus* (Dr. C.J. Tsai)
- Microscopy analysis of *Aspergillus* species (Dr. Michelle Momany)

Undergraduate Research - University of Nebraska - Lincoln

Advisor: Dr. Rebecca Roston (*July 2018-August 2020*)

Mentors: Dr. Allison Barnes and Dr. Zach Shomo

- Performed quantitative lipid analysis using ImageJ

- Developed a pH-colorimetric media assay to visualize proton accumulation and understand cytosolic acidification
- Completed ion leakage experiments to generate cell death curves of *Arabidopsis* mutants under freezing conditions

Publications

- Tuma TT, McInnes H, Pham HD, Bewg WP, Deguchi M, Zhou R, **Surber SM**, Lieb B, Lipzen A, Barry K, Weber-Wyneken D, Haraman-Ware A, Dahlen J, Harding S, Tsai CJ. *In Review*. 2024
- **Surber SM**, Thien Thao NP, Smith CN, Shomo ZD, Barnes AC, Roston RL. Exploring cotton SFR2's conundrum in response to cold stress. *Plant Signal Behav.* 2024 Dec 31;19(1):2362518. doi: 10.1080/15592324.2024.2362518. Epub 2024 Jun 5. PMID: 38836385; PMCID: PMC11155703.
- Barnes AC, Myers JL, **Surber SM**, Liang Z, Mower JP, Schnable JC, Roston RL. Oligogalactolipid production during cold challenge is conserved in early diverging lineages. *J Exp Bot.* 2023 Sep 13;74(17):5405-5417. doi: 10.1093/jxb/erad241. PMID: 37357909.
- "The American chestnut: A new frontier in gene editing" **Surber SM**, ASBMB Today.

Submitted: :

- **Surber SM**, Hsieh C, Harding S, Tsai CJ, An updated sulfate transporter phylogeny uncovers a perennial-specific subgroup associated with lignification, *Tree Physiology* – Submitted March 2025

Awards and Presentations

Awards:

- *IUFRO 2024 Tree Biotechnology Conference Travel Grant*, International Union of Forest Research Organizations (Summer 2024)
- *FFAR Fellowship*, Foundation for Food and Agriculture Research (Cohort 2022-2025)
- *Palfrey Student Research Grant*, UGA Department of Plant Biology (Summer 2022)
- *3rd Place Southern Forest Tree Improvement Conference Lightning Presentation Competition*, Southern Forest Tree Improvement Conference (Summer 2021)
- *2021 Summer Research Grant*, by Graduate School at the University of Georgia (Summer 2021)
- *RTOA Research Funding*, by Plant Biology Graduate Student Association (Spring 2021)
- *Summer Undergraduate Research Fellowship*, by the American Society of Plant Biologists (Summer 2019)
- *Travel Award*, by the American Society of Plant Biologists (2019)
- *Best Poster Presentation*, by the University of Nebraska Plant Sciences Retreat (October 2018)
- *James Canfield Scholar*, by the University of Nebraska-Lincoln (2016-2017)

- *George C. McGinnis Scholar*, by the University of Nebraska-Lincoln (2016-2017)

Presentations:

- **Surber, SM**; Summer 2024 “Exploring the Multifaceted Roles of Xylem-Biased SULTR3s in *Populus*” - IUFRO Tree Biotechnology 2024 Talk (August 2024)
- **Surber, SM**; Bewg WP; Chen, M.; Harding, S; Tsai, CJ. Summer 2023. “Impact of xylem-specific *SULTR3* gene mutations in *Populus tremula x alba* drought response” – ASPB 2023 & Southern Section ASPB – (Savannah, GA, August 2023 & Dauphin Island, AL, March 2024).
- **Surber, SM**; Bewg WP; Chen, M.; Tsai, CJ. Winter 2022 “Perturbation of xylem-specific sulfate transporters in poplar drought response” - University of Georgia, Plant Center Retreat - (Brasstown, GA, December 2022)
- **Surber, SM**; Bewg WP; Chen, M.; Tsai, CJ. Fall 2022 “Role of xylem-biased SULTR3 genes during drought and wood formation in *Populus*” - University of Georgia - (Athens, GA, September 2022)
- **Surber, SM**; Bewg WP; Chen, M.; Tsai, CJ. 2021 “Transgenic perturbation of Sulfate Transporter genes (*SULTR3.2* and *SULTR3.4*) in *Populus*” - University of Georgia Plant Center Retreat - (Brasstown, GA, December 2021)
- **Surber, SM**; Bewg WP; Chen, M.; McMillan, H; Tsai, CJ. 2021 “Uncovering the mystery of Sulfate Transport genes *SULTR3;2* and *SULTR3;4* in *Populus*” - Plant Functional Genomics Seminar - (Athens, GA, September 2021)
- **Surber, SM**; Bewg WP; Chen, M.; Tsai, CJ. 2021 “Exploring functional discrepancies in sulfate transport genes and their role in stress response in *Populus*” - American Society of Plant Biologists Annual Conference 2021 (Online, July 2021)
- **Surber, SM**; Bewg WP; Chen, M; McMillan, H.; Tsai, CJ. 2021 “A Delve into the Unknown of Sulfate Transporters’ Role in Elemental Movement and Stress Response in Poplar” - Southern Forest Tree Improvement Conference (Online, June 2021)
- **Surber, SM**; Barnes AC; Roston, RL. 2019 “SENSITIVE to FREEZING 2 activation among multiple species through freezing, proton pump inhibition and cell leakage” - Plant Sciences Institute Symposium 2019 (Lincoln, NE, Spring 2019)
- **Surber, SM**; Barnes AC; Roston, RL. 2019 “SENSITIVE to FREEZING 2 activation among multiple species through freezing, proton pump inhibition and cell leakage” - UPDATED - American Society of Plant Biologists Annual Conference 2019 (San Jose, CA, Summer 2019)
- **Surber, SM**; Barnes AC; Roston, RL. 2018 “SENSITIVE to FREEZING 2 activation among multiple species through freezing, proton pump inhibition and cell leakage” UNL Plant Sciences Retreat 2018 (Nebraska City, NE, Winter 2018)

Outreach and Communication

Branching Out Fellow - University of Georgia, Athens, GA (2024)

- Shared my journey from rural America to my current role as a plant biologist with undergraduates across Georgia
- Served as a resource for students interested in agricultural sciences

Science Policy & Advocacy Certificate Program for STEM Scientists, Online (Summer 2024)

- Wrote various policy pieces to gain experience in this format of writing
- Networked with scientists across multiple fields

Alliance for Science Communication Workshop: *genome editing and value-based*, Washington D.C. (November 2023)

- Built a metaphorical toolkit on how to discuss gene editing using shared values
- Networked and brainstormed with an array of scientists on how we will tackle the growing challenges in the face of climate change
- Practiced public speaking skills through sharing my ideas on how to get the general public excited about gene editing and agriculture

Art of Science Communication 2023, Online, (September 2023)

- Participated in weekly discussions on science communication techniques
- Polished my pitch about myself and my research to be digestible by both scientists and general public

Athens Science Observer, Athens, GA, UGA (Writer: January 2021-Present, Co-editor-in-chief: October 2023-February 2025)

- Revamped the program from the ground up and shifted the blog to be more fluid when it comes to science communication
- Provided editing support and wrote articles on my interests such as protecting prairies spaces and rural STEM education

SPEAR (Science, Policy, Education, Advocacy, and Research), Athens, GA, UGA (August 2022-August 2024)

- Led education initiatives, including career panels and science engagement

Learning by Leading Student, Athens, GA, State Botanical Garden of Georgia (August 2020-January 2022)

- Wrote and compiled documents over a span of 22 years on the endangered species, Smooth Coneflower

Leadership

FFAR Fellow (Cohort 2022-2025) Raleigh, NC (August 2022-February 2025)

- Crafted professional development plans with my three mentors to prepare for a career in science communication and policy
- Attended yearly professional development and networking training sessions
- Completed crucial conversation training and strengths coaching

Athens Science Observer Editor, Athens, GA, UGA (September 2023-February 2025)

- Expanded group involvement to include scientists at multiple career stages to enhance public science communication
- Organized social and in-person communication events

Mentor to UGA Research Undergraduate, Athens, GA (Fall 2023-Spring 2024)

- Practiced reading, annotating, and analyzing scientific papers
- Supervised the development and execution of the student's independent research project (producing overexpression trees)

ASPB Ambassador, (2023-Present)

- Volunteering at ASPB conferences to assist with session organization

- Building a writing team within the Ambassador group to highlight plant biologists and their research on various topics

SPEAR Education Chair, Athens, GA (*August 2022-May 2023*)

- Organized a virtual career panel featuring professionals in science policy and engaged over 30 participants across multiple institutions

Plant Biology Lecture Teaching Assistant, UGA (*August 2022-Present*)

- Assisted with in-class knowledge testing questions for students to ensure full understanding of subject information
- Facilitated virtual and in-person meetings with students for the purpose of reviewing topics or exploring plant biology further

USDA Research and Extension Experiences for Undergraduates Mentor, Athens, GA (*Summer of 2021 and 2022*)

- Taught lab techniques, experimental design, and scientific article synthesis
- Guided my students in managing research projects and data analysis and synthesis in a 9-week time span

Plant Biology Graduate Student Association (PBGSA) Treasurer, Athens, GA (*May 2021-May 2022*)

- Managed PBGSA funds to support social events, research, and networking

Plant Biology Lab Teaching Assistant, UGA (*August 2021-December 2021*)

- Prepared materials weekly for lab lectures
- Instructed students on experimental design and scientific methods

Botany Teaching Assistant, University of Nebraska-Lincoln

(*January 2020-May 2020*) *Second half online due to COVID-19*

- Executed lab procedures to properly train students how to use a microscope, to understand the anatomical differences and similarities of plants
- Scheduled and arranged time for students to meet with me via ZOOM during COVID-19 Pandemic to finish the semester despite limited access to laboratory

Nebraska Corn Board Leadership Delegate, Washington D.C. (*July 17th-20th, 2017*)

- Attend National Corn Growers Association meeting and discuss topics such as the Farm Bill, NAFTA, and Biotechnology with agricultural leaders

References available upon request