Grace Carey

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Personal Profile

I am a graduate student who is passionate about improving sustainable agriculture through soil and environmental microbiology. I have completed a B.S. in environmental horticulture at Virginia Tech, and am currently pursuing a PhD in microbiology at Iowa State University. My research focuses on the transfer of antimicrobial resistance genes from manure associated bacteria to plant rhizosphere and endosphere microbial communities.

Skills

- DNA extraction
- PCR and qPCR
- Root endophyte infection quantification
- Microbial culture and plating
- Bacterial colonization assay design
- Phenotypic testing for antimicrobial resistance
- Seedling management
- Public speaking
- Research poster design
- Outreach and mentoring

Education

Iowa State University, Ames Ia - PhD, Microbiology, August 2020 - Present

- Current research focuses on transfer of antimicrobial resistance indicators from manure to plant root endophytes.
- Member of Genomics and Environmental Research in Microbial Systems laboratory, under Dr Adina Howe

Virginia Tech, Blacksburg Va - Bachelors of Science, Environmental Horticulture, August 2018 - May 2020

- Horticultural Science concentration
- Two semesters of undergraduate research
- Graduate level course in Soil Microbiology
- Four semesters as an undergraduate research assistant in a Soil Microbiology laboratory
- 3.75 GPA

Southwest Virginia Community College, Richlands Va - Associates of Science, August 2016 - May 2018

- Associates of Science, Pre-med
- Conducted one semester of independent research describing AMF infection of clover
- Awarded "Best Student Research Project" spring 2018

Professional Activities

Microbiology Graduate Student Organization Industry Fair planner- October 2022

- Worked with other members of MGSO to manage and plan an industry fair tailored forwards graduate students in the biological sciences

WISE Go Further symposium facilitator- Spring 2022, Fall 2022

- In Spring 2022, presented "Soil Microbial Ecology- the Hidden Beasts and How We Find Them" with other MGSO members to high school and middle school students at Iowa State in collaboration with the Women in Science and Engineering (WISE) program

- In fall 2022, assisted other MGSO members in a hands-on activity and presentation to high school students and middle school students teaching the basics of fermentation

Biotechnology Outreach and Education Center (BOEC) collaborator- Summer 2022

- Partnered with Eric Hall at the Biotechnology Outreach and Education Center (BOEC) at Iowa State to write an outreach booklet titled "Exploring the NGSS Crosscutting Concepts through the work of Dr. Adina Howe and her team at Iowa State University".

Awards

Alpha Epsilon Honor Society Pi Chapter, Honorary Member- Spring 2023

Brown Graduate Fellowship- Fall 2022- Spring 2023

Council for Agricultural Science and Technology (CAST) Science Communication Scholarship- Fall 2022

Experience

Iowa State Interdepartmental Microbiology Graduate Program- Webmaster, August 2022 - July 2023

- Redesigned MGSO's website, including updating graphics and rewriting content
- Updated MGSO's website regularly through the year

Virginia Tech School of Plant and Environmental Sciences, Mark Williams' Laboratory- Undergraduate Research Assistant, August 2018 - July 2020

- Assisted in graduate student projects involving DNA extraction, root cleaning and measurement, nodule counting, and other soil microbiology procedures
- Was responsible for troubleshooting equipment
- Assisted in lab organization and maintenance

3Bar Biologics, Columbus OH- Summer Intern, May 2019 - August 2019

- Selected and optimized a procedure for quantification of bacterial infection of plant roots
- Assisted in standard microbiology laboratory tasks

Multicultural Academic Opportunities Program, Virginia Tech -Undergraduate Research Intern, May 2018 - August 2018

- Conducted independent undergraduate research
- Optimized DNA extraction techniques
- Identified primers for use in PCR and sequencing

Multicultural Academic Opportunities Program, Virginia Tech - Undergraduate Research Intern, May 2017 - August 2017

- Conducted independent undergraduate research
- Quantified AMF infection using microscopy and a modified line-intersect method
- Created and presented oral and poster presentations summarizing research

Presentations

Carey, G (2022) - “Phenotypic erythromycin resistance of root endophytes after manure exposure”, poster presented at ASM North Central Branch conference, ASABE Iowa meeting at Iowa State, **Interdepartmental Microbiology Annual Retreat “People’s Choice” award winner Spring 2023**

Carey, G (2022)- “Prairie STRIPS Stakeholders Meeting: Water Quality and Antimicrobial Resistance” Interactive workshop

Carey, G (2022)- “Innovative Practices Workshop, Antimicrobial Resistance in Agriculture” virtual meetings with rural educators interested in teaching applied science concepts. This meeting was coordinated by Eric Hall of the BOEC at Iowa State.

Carey, G (2022)- “Soil Microbial Ecology- the Hidden Beasts and How We Find Them”- presentation at the WISE Go Further Symposium in cooperation with MGSO

Carey, G (2019)- “DNA Extraction from Mycorrhizae-infected Soybean Root”. Poster presented at the Translational Plant Sciences Mini-Symposium at Virginia Tech.

Carey, G (2019)- “Endophyte Infection in Soybean Root”. Poster presented at Dennis Dean Undergraduate Research Symposium at Virginia Tech.

Carey, G (2018)- “Mycorrhizal Fungi in Clover”. Oral presentation at Southwest Virginia Community College Student Research Series competition at SWCC.

Carey, G (2017)- “Fungal Root Endophyte Infection in Soybean Roots”. Oral presentation and poster presented at 2017 MAOP symposium at Virginia Tech.