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 current research focuses on the transfer of antimicrobial resistance from manure associated bacteria to plant rhizosphere and endosphere microbial communities.

Skills

- DNA extraction
- PCR
- Trypan blue staining
- Endophyte infection quantification
- Microbial culture and plating
- Bacterial colonization assay design
- Public speaking
- Experimental design
- Research poster composition
- Root cleaning and measurement
- Seedling management
- Field crop management

Education

August 2020 - Present

Iowa State University, Ames Ia - *PhD Microbiology, Department of Agriculture and Biosystems Engineering*

- Member of Genomics and Environmental Research in Microbial Systems laboratory, under Dr Adina Howe
- Researching changes in antimicrobial resistance of soil and root associated bacteria after manure application

August 2018 - May 2020

Virginia Tech, Blacksburg Va - *Bachelors of Science, Environmental Horticulture*

- Horticultural Science concentration
- Two semesters of undergraduate research
- Four semesters as an undergraduate research assistant in a Soil Microbiology laboratory

August 2016 - May 2018

Southwest Virginia Community College, Richlands Va - *Associates of Science*

- Associates of Science
- Conducted one semester of independent research describing AMF infection of clover
- Awarded “Best Student Research Project” spring 2018

Experience

August 2018 - August 2020

Virginia Tech School of Plant and Environmental Sciences, Mark Williams’ Laboratory - *Undergraduate Research Assistant*

- Assisted in graduate student projects involving DNA extraction, root cleaning and measurement, nodule counting, and other soil microbiology procedures

- Trained students in laboratory procedures and equipment use
- Was responsible for troubleshooting equipment
- Assisted in lab organization and maintenance
- Delegated tasks to other assistants as instructed by PI and grad students

May 2019 - August 2019

3Bar Biologics, Columbus OH- *Summer Intern*

- Selected and arranged grow-light setup for indoor corn growth
- Selected and optimized a procedure for quantification of bacterial infection of plant roots using MgSO4 rinses and serial dilution
- Assisted in standard microbiology laboratory tasks

May 2018 - August 2018

Multicultural Academic Opportunities Program, Virginia Tech *-Undergraduate Research Intern*

- Conducted independent undergraduate research
- Optimized CTAB DNA extraction techniques
- Quantified DNA extracted from variously processed roots
- Designed and presented oral and poster presentations summarizing research

May 2017 - August 2017

Multicultural Academic Opportunities Program, Virginia Tech *- Undergraduate Research Intern*

- Conducted independent undergraduate research
- Used Phillips and Hayman's staining procedure to visualize AMF infection in soybean root
- Quantified AMF infection using microscopy and a modified line-intersect method
- Created and presented oral and poster presentations summarizing research

Presentations

"Transfer of antibiotic resistance from manure-amended soils to vegetable microbiomes". Journal club presentation for Spring semester of Interdepartmental Microbiology Graduate Program Seminar. (2021)

"Changes in soil microbial communities due to biological invasions can reduce allelopathic effects". Journal club presentation for Fall semester of Interdepartmental Microbiology Graduate Program Seminar. (2020)

"DNA Extraction from Mycorrhizae-infected Soybean Root". Poster presented at the Translational Plant Sciences Mini-Symposium and at MAOP Symposium at Virginia Tech. (2019)

"Endophyte Infection in Soybean Root". Poster presented at Dennis Dean Undergraduate Research Symposium at Virginia Tech. (2019)

"Mycorrhizal Fungi in Clover". Oral presentation presented at Southwest Virginia Community College Student Research Series competition at SWCC. (2018)

"Fungal Root Endophyte Infection in Soybean Roots". Oral presentation and poster presented at 2017 MAOP symposium at Virginia Tech. (2017)