Serena G. Lotreck

(860) 882-8896 | lotrecks@msu.edu | https://www.linkedin.com/in/serena-lotreck | @SLotreck

EDUCATION

Michigan State University, East Lansing, MI *August 2019 - Present*

- Doctoral Student, Plant Biology Program, Molecular Plant Sciences Program, IMPACTS program
    - Coursework in molecular plant sciences and computational plant biology
- Alliance for Graduate Education and the Professoriate (AGEP) member

Cornell University, Ithaca, NY *August 2015 - May 2019*

- Bachelor of Arts in Biological Sciences with a concentration in Biochemistry; *GPA*: 3.928; Magna Cum Laude
- *Out 4 Undergrad* Engineering Conference at Stanford University, October 2017
    - Selected to represent Cornell University at the 2017 conference. Participated in workshops and panels about careers for engineers in industry and academia, as well as mentorship panels with PhD students and industry sector engineers.
    - Served as the Cornell University O4U Engineering Campus Ambassador for the 2018 application period.

WORK EXPERIENCE

Michigan State University, East Lansing, MI *February 2020 - Present*

Graduate Student, Shiu Lab

- Applying techniques in machine learning interpretability to study genetic redundancy in yeast
- Creating a scientific literature search engine with implementation of a knowledge graph algorithm to connect concepts and biological entities with the references of papers who have established those connections

Michigan State University, East Lansing, MI *August 2019 - February 2020*

Graduate Student, Rotations

- Participated in research as part of 2-month rotations in the Shiu, Ducat, and Shachar-Hill labs.
- Gained skills in computational biology such as data processing and machine learning. Used python and MATLAB for computational analyses.
- Gained wet lab skills such as sterile technique for microbiology and cyanobacterial transformation and cultivation.

Michigan State University, East Lansing, MI *May 2018 - July 2018*

Plant Genomics REU Student, VanBuren Lab

- Performed physiological and genomic analyses on two facultative CAM species of *Sedum*. Physiological phenomenon formulated hypotheses to drive a genomic analysis through RNAseq to identify candidate genes controlling stomatal patterning differences between C_3 and CAM.
- Independently learned to use R and bash for RNAseq analysis from sequencing results to differential expression.

Boyce Thompson Institute, Ithaca, NY *January 2017 - May 2019*

Research Intern, Jander Lab

- Comparison of genotype effect on uptake of the widely-used neonicotinoid pesticide thiamethoxam across the 26 nested association mapping (NAM) founder maize genetic inbred lines using liquid chromatography-mass spectroscopy (LC-MS). Collaborated with the Entomology Department's Core Facility lab technician in order to develop new extraction method for analysis by LC-MS. Completed undergraduate honors thesis on this project.

- Conducted a reverse genetic screen using transposon-mediated targeted mutagenesis with the aim of creating a double knockout allele of the first two genes in the benzoxazinoid biosynthesis pathway. Has isolated 3 putative double knockout alleles in the maize inbred W22 as part of this larger project examining the function of the intermediate molecule indole and its role in chemical defense against insect herbivory.

Cornell Outdoor Education, Ithaca, NY *August 2017 - May 2019*

Rock Climbing Instructor, Special Programs Instructor, Lindseth Climbing Center Staff

- Taught basic indoor rock climbing to Cornell University students. Skills include interactive teaching, course planning and development, and working with a team of instructors.
- Taught private lessons for students, community members, and children. Tailored lesson plans to individual needs.
- Worked as open hours wall staff at the climbing center in addition to teaching. Skills include customer service, administering belay proficiency tests, safety monitoring and guideline development. First aid/CPR certified.

PUBLICATIONS

Pre-prints

- A. E. Bryson et al., "Composite modeling of leaf shape across shoots discriminates Vitis species better than individual leaves," bioRxiv, p. 2020.06.22.163899, Jun. 2020, doi: 10.1101/2020.06.22.163899.
    - Submitted to *Applications in Plant Sciences*

Science Communication

- "Knowledge Graphs", MSU SciComm's *SciComm Voices Blog*, June 2020

FELLOWSHIPS, GRANTS AND AWARDS

- *Michigan State University SciComm* 2020 Blog Contest Winner (2020)
- *Michigan State University/National Science Foundation* Integrated training Model in Plant And Compu-Tational Sciences (IMPACTS) Trainee (2020-2021)
- *Michigan State University* Paul Taylor Endowment Fund Recipient (2020)
- *Michigan State University* Molecular Plant Sciences Fellow (2019-20)
- *American Society for Plant Biologists* Plant Biology 2019 Travel Award Recipient (2019)
- *National Science Foundation* Graduate Research Fellowships Program Honorable Mention (2019)
- *Cornell University* Office of Undergraduate Biology Summer Internship Program grant (2017)

PRESENTATIONS

Poster Sessions

- *American Society for Plant Biologists, Plant Biology 2019,* August 2019: Presented results from Plant Genomics at MSU REU program research
- *Cornell Office of Undergraduate Biology Honors Thesis Poster Session,* May 2019: Presented results from thiamethoxam honors project
- *Mid-Michigan Summer Undergraduate Research Experiences (MidSURE),* July 2018: Presented results from Plant Genomics at MSU REU program research
- *Cornell Undergraduate Research Board (CURB) Fall Forum*, November 2017: Presented results from targeted mutagenesis screen in the Jander Lab

Research Talks

- *Plant Genomics @ MSU Symposium*, 2018: Ten-minute talk on REU program research. Link: https://mediaspace.msu.edu/media/t/1_1h2nrq4p

OUTREACH AND SERVICE

Volunteer Opportunities

- *Girls Math and Science Day,* February 2020: Assisted in running an activity teaching girls the basic logic of programming

Committees

- *Plant Biology GSO,* Peer Mentorship Committee (Chair), Spring 2020: Chair of a committee designing a peer mentorship program for graduate students in the Plant Biology program. Drafted program aims, guidelines, and matching questionnaires in a team of three. Focused specifically on crafting a mentorship program capable of supporting and fulfilling the needs of students from underrepresented and minoritized (URM) groups with the aim of increasing retention and promoting the inclusion of all students.
- *Fascination of Plants Day,* Sponsorship Committee, Spring 2020: Began recruiting sponsors for a day-long outreach event to the greater East Lansing community, before its cancellation due to COVID-19 pandemic.

Panels

- *AGEP Student Success Conference,* November 2019: Served on a panel for undergraduates of underrepresented minorities interested in graduate school about the graduate experience at MSU.
- *MSU AIMS-B*, July 2018: Spoke to bilingual high school students interested in careers in the agricultural sciences about the challenges and rewards of pursuing a bachelor's degree in STEM

SKILLS

- *Programming languages:* Proficient in Python and R.
    - Learned R independently in order to perform analysis of RNA-seq data during REU at Michigan State.
    - Learned and refined Python skills through coursework and application in PhD research.
        - Cornell: CS 1110, Introduction to Programming in Python
        - Michigan State: HRT 891A-001, Foundations in Computational Plant Sciences, CSS 893-001, Frontiers in Computational Plant Sciences
- *Languages:* Fluency in Spanish. Immersive classroom training in addition to study and work experiences in Spanish-speaking countries.
    - Fall 2018: Study abroad at Universidad de Sevilla, Sevilla, Spain. Language immersion homestay program. Lived with a host family and took five university courses in Spanish.
    - January 2018: 2 week intensive course in Santiago, Chile. Focus on scientific vocabulary through participation in collaborative research on grapevine disease at Pontificia Universidad Católica de Chile.
    - Fall 2017 - Spring 2019: Member of the Cornell University Spanish Language House, involved in program and community events conducted in Spanish on a weekly basis.
    - Summer 2017: Internship in Costa Rica. Paired with only non-English speaking team member as a result of Spanish proficiency.
- *Public Speaking:* Competent and comfortable preparing and delivering presentations to large audiences.
    - Fall 2019: Spanish-language presentations in university-level courses at Universidad de Sevilla.
    - Summer 2017: Tour Guide, Ara Project, 2017, Spanish and English tours.
    - Spring 2017: Cornell University Speech and Debate Society, second place in NY/NJ State Tournament.
- *Written Communication:* Skilled in written communication for the sciences and the humanities. Training through courses in English, history, critical theory, and scientific writing, as well as writing an undergraduate honors thesis (available at https://hdl.handle.net/1813/66656).