# Serena G. Lotreck

*Computational plant biology researcher*

## Education

2019– Expected 2024 — **PhD**, *Michigan State University*, East Lansing, MI
Dual PhD in Plant Biology and Computational Mathematics, Science & Engineering
Dual major in Molecular Plant Science (MPS)
Concentration in computational plant science (IMPACTS)

2015–2019 — **Bachelor of Arts**, *Cornell University*, Ithaca, NY
Major in biology with a concentration in biochemistry. *Magna cum laude.*

Fall 2018 — **Study Abroad**, *La Universidad de Sevilla*, Sevilla, Spain
Language immersion study abroad program, with course focus in history & geography

Summer 2014 — **Russian Summer Program**, *National Security Language Initiative for Youth*, Chisinau, Moldova
Six week Russian-language immersion program sponsored by the US State Department

## Experience

2023–Present — **Graduate Research Assistant**, *Michigan State University*, East Lansing, MI
*Supervisors:* Dr. Robert VanBuren & Dr. Mohammad Ghassemi
*Research focus:* Automated hypothesis generation for plant desiccation tolerance

Sp, Fa '22; Sp '23 — **Graduate Teaching Assistant**, *Michigan State University*, East Lansing, MI
Graduate TA for CMSE 202: Computational Modeling and Data Analysis II (2 semesters) and CMSE 495: Data Science Capstone (1 semester).

2019–2022 — **Graduate Research Assistant**, *Michigan State University*, East Lansing, MI
*Supervisor:* Dr. Shin-han Shiu
*Research focus:* Dataset construction for natural language processing in plant biology

Summer 2022 — **Graduate Research Intern**, *Corteva Agrisciences*, Johnston, IA
Crop growth modeling for sustainable cropping systems

2017-2019 — **Undergraduate Research Intern**, *Cornell University*, Ithaca, NY
*Supervisor:* Dr. Georg Jander
*Research focus:* Neonicotinoid pesticide uptake in maize

Summer 2018 — **REU student**, *Michigan State University*, East Lansing, MI
*Supervisor:* Dr. Robert VanBuren
*Research focus:* Stomatal control in CAM photosynthesis

✉ *lotrecks@msu.edu* • *serenalotreck.github.io* • *serena-lotreck*
*SLotreck* • *serenalotreck*

Summer 2017 **Conservation Intern**, *The Ara Project*, Punta Islita, Costa Rica
Built and installed nest boxes for wild-release Scarlet Macaws, in addition to caring for breeding birds and providing site tours in both English and Spanish

## Publications

[1] **Lotreck, Serena**, Kenia Segura Abá, Melissa Lehti-Shiu, Abigail Seeger, Brianna Brown, Thilanka Ranaweera, Ally Schumacher, Mohammad Ghassemi, and Shin-Han Shiu. In a pickle: Entity and relation annotation guidelines for the molecular plant sciences. *In review*.

[2] Jyothi Kumar, Fabio Gomez-Cano, Seth W. Hunt, **Lotreck, Serena G.**, Davis T. Mathieu, McKena L. Wilson, and Tammy M. Long. Central Dogma, Dictionaries, and Functions: Using Programming Concepts to Simulate Biological Processes. *CourseSource*, 10, 2023.

[3] Siobhan A Cusack, Peipei Wang, **Lotreck, Serena G**, Bethany M Moore, Fanrui Meng, Jeffrey K Conner, Patrick J Krysan, Melissa D Lehti-Shiu, and Shin-Han Shiu. Predictive models of genetic redundancy in Arabidopsis thaliana. *Molecular biology and evolution*, 38(8):3397–3414, 2021.

[4] Abigail E Bryson, (**Serena G Lotreck** author 19 of 36), et al. Composite modeling of leaf shape across shoots discriminates Vitis species better than individual leaves. *Applications in plant sciences*, 8(12):e11404, 2020.

## Research Talks

Sept. 2023 **WALII Symposium:** *Graph it out: Possibilities for automated hypothesis generation for desiccation tolerance mechanisms across life systems*

May 2021 **GLBRC ASM:** *Machine Learning for Plant Biology: what, why and how?*

August 2020 **STEM Village Virtual Sym.:** *Domain-specific knowledge graphs in plant biology*

July 2018 **Plant Genomics @ MSU Symposium:** *Ten minute talk on REU research*

## Poster Presentations

Nov. 2022 **MSU CMSE Student Conference:** *In a PICKLE: Entity and relation annotation guidelines for the molecular plant sciences*

Nov. 2021 **Conferencia Prisma:** *El efecto de la especificidad de los datos de entrenamiento de modelos de grafo de conocimiento: un estudio de biología vegetal molecular*

July 2019 **ASPB Plant Biology 2019:** *Examining the genetic control of CAM photosynthesis in Sedum*

May 2019 **Cornell Biology Honors Thesis Poster Session:** *The uptake of thiamethoxam, a neonicotinoid, and its relationship to genotype in maize*

## Science Communication

Sept. 2023 **ComSciCon MI:** *Hypothesis generation for desiccation tolerance research*

Feb. 2022 ***The SciFiles*:** *Automated Hypothesis Generation for the Plant Sciences*

June 2020 **SciComm Voices:** *Knowledge Graphs* (MSU SciComm's 2020 Blog Contest winner)

## Fellowships & Grants

2023 MSU Outstanding Scholar Fellowship
2023 Fulbright U.S. Student Program Semi-Finalist (Chile Science Initiative)
2020-2021 NSF-NRT IMPACTS Trainee
2019-2020 MPS Fellow
2019 GRFP Honorable Mention
2019 American Society for Plant Biology Travel Grant

## Service

2023-Present **Out 4 Undergrad Mentorship Program**, *Year-round mentor*
2022-Present **Graduate Employees Union**, *Contract Bargaining Team, Leave Plank*
2021-Present **MSU QT-Grad**, *Founding Member*
2021-2022 **MSU QT-Grad**, *President*
2020-2022 **Plant Biology Peer Mentorship Program Committee**, *Founding Member*
2020-2022 **Plant Biology Peer Mentorship Program**, *Mentor*
Sept. 2020 **Out 4 Undergrad Engineering Conference**, *Mentor*

## Skills

**Programming languages**: Python, R
**Software packages**: scikit-learn, spaCy, pandas, matplotlib, git
**Leadership**: CyberAmbassadors Facilitator

## Languages

**Spanish**: Fluent
**Scottish Gaelic**: Intermediate

## Interests

2023-Present **Dancer**, *Grater Lansing Academy of Dance Collegiate Company*
Summer 2021 **Dancer**, *Happendance Velocity Company*, Lansing, MI
June 2021 Wilderness First Aid certification, exp. 06/2023
June 2020 **Trip leader**, *Fieldston Emerging Leaders*, NY, NY (Canceled due to COVID-19)
2017-2019 **Rock climbing instructor**, *Cornell Outdoor Education*, Ithaca, NY