



Serena G. Lotreck

Computational plant biology researcher

Education

- 2019– **PhD**, *Michigan State University*, East Lansing, MI
Expected 2024 PhD in Plant Biology with 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: Network analysis for desiccation tolerance literature
- 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

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 D Lehti-Shiu, Abigail Seeger, Brianna NI Brown, Thilanka Ranawera, Ally Schumacher, Mohammad Ghassemi, and Shin-Han Shiu. Plant Science Knowledge Graph Corpus: a gold standard entity and relation corpus for the molecular plant sciences. *in silico Plants*, 6(1):diad021, 2024.
- [2] Peipei Wang, Melissa D Lehti-Shiu, **Lotreck, Serena**, Kenia Segura Aba, and Shin-Han Shiu. Prediction of plant complex traits via integration of multi-omics data. *bioRxiv*, pages 2023–11, 2023.
- [3] 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.
- [4] 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.
- [5] 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

- Jan. 2024 **Desiccation Workshop**: *Drying to connect: Exploring hidden links in desiccation tolerance literature across kingdoms with natural language processing*
- Nov. 2023 **MSU Plant Biology Department Seminar Series**: *Towards automated hypothesis generation for desiccation tolerance*
- 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?*
- Aug. 2020 **STEM Village Virtual Sym.**: *Domain-specific knowledge graphs in plant biology*
- July 2018 **Plant Genomics @ MSU Symposium**: *Examining the genetic control of CAM photosynthesis in Sedum*

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:** *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
- 2022-2023 **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
- 2017-2019 **Rock climbing instructor,** Cornell Outdoor Education, Ithaca, NY