



# Serena G. Lotreck

*Computational research facilitator*

## Education

- 2019–2024 **PhD**, *Michigan State University*, East Lansing, MI  
PhD in Plant Biology with dual major in Molecular Plant Science ([MPS](#))  
Concentration in computational plant science ([NRT-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

- 2025–present **Postdoctoral Research Associate**, *Michigan State University*, East Lansing, MI  
*Supervisors:* Dr. Berkley Walker & Dr. Eva Farre  
*Research Focus:* Omics and metabolic flux analysis of photorespiration; computational research facilitation for 7 lab members
- 2019–2024 **Graduate Research Assistant**, *Michigan State University*, East Lansing, MI  
*Supervisors:* Dr. Robert VanBuren & Dr. Mohammad Ghassemi  
*Research focus:* Computational network analysis for desiccation tolerance literature, using natural language processing to generate biological hypotheses
- Sp, Fa '22; **Graduate Teaching Assistant**, *Michigan State University*, East Lansing, MI  
Sp '23 Graduate TA for CMSE 202: Computational Modeling and Data Analysis II (2 semesters) and CMSE 495: Data Science Capstone (1 semester).
- 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] **Serena G Lotreck**, Mohammad Ghassemi, and Robert T VanBuren. [Unifying the Research Landscape of Desiccation Tolerance to Identify Trends, Gaps, and Opportunities](#). *bioRxiv*, pages 2024–06, 2024.
- [2] **Serena Lotreck**, Kenia Segura Abá, Melissa D Lehti-Shiu, Abigail Seeger, Brianna NI Brown, Thilanka Ranaweera, 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.
- [3] Peipei Wang, Melissa D Lehti-Shiu, **Serena Lotreck**, Kenia Segura Aba, and Shin-Han Shiu. [Prediction of plant complex traits via integration of multi-omics data](#). *bioRxiv*, pages 2023–11, 2023.
- [4] Jyothi Kumar, Fabio Gomez-Cano, Seth W. Hunt, **Serena G. Lotreck**, 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.
- [5] Siobhan A Cusack, Peipei Wang, **Serena G Lotreck**, 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.
- [6] 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

- Apr. 2025 **Plant Research Laboratory Tuesday Noon**: *Acclimation of photosynthesis to changing oxygen involves transcriptional and translational responses in wild-type *Arabidopsis thaliana**
- Aug. 2024 **Dissertation Defense Seminar**: *Hypotheses for a New Generation: Leveraging natural language processing to bridge gaps and generate novel hypotheses for desiccation tolerance research*
- 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

- Apr. 2024 **IMPACTS Program Wrap-Up:** *Drying to connect: Bibliometric analysis of disciplinary and geographic connectedness in desiccation tolerance research*
- 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

- Jan. 2025 **Walker Lab,** *Metabolic flux analysis workshop organizer*
- Sum. 2024 **Plant Genomics @ MSU,** *REU student mentor*
- 2024 **CyberAmbassadors,** *Program Materials Translation Team (Spanish)*
- 2023-2024 **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*

## Trainings and Certifications

**Trainings:** OSG School 2025 (*accepted*)

**Leadership:** CyberAmbassadors Facilitator

**Communities of Practice:** MSU AI Community of Practice, MSU Research Facilitation Network

**Professional Societies:** Campus Research Computing Consortium (CaRCC)

## Languages

**Spanish** *Fluent*

**Scottish Gaelic** *Intermediate*