

LUKE M GREGORY

Owego, NY • l-gregory.github.io

EDUCATION

Ph.D., Plant Biology & Molecular Plant Sciences June 2024
Michigan State University, East Lansing, MI
Advisor: Berkley J. Walker
Dissertation Title: From adaptation and acclimation to engineering: investigating how photorespiratory mechanisms control photosynthetic net carbon fixation

Bachelor of Science, Biology (*cum laude*) May 2019
Slippery Rock University, Slippery Rock, PA
Minors: Chemistry and Leadership Studies

RESEARCH & PROFESSIONAL POSITIONS

Postdoctoral Associate July 2024 – Present
Cornell University, Ithaca, NY

Graduate Research Assistant January 2019 – June 2024
Michigan State University, East Lansing, MI

Crop Environmental Physiology Intern May 2023 – August 2023
Bayer, Jerseyville, IL

Undergraduate Research Assistant February 2017 – May 2019
Slippery Rock University, Slippery Rock, PA

TECHNICAL EXPERTISE

Plant Physiology: Leaf-Level Gas Exchange, Carbon Isotope Exchange, Chlorophyll Fluorescence, Leaf Area Index, Remote Sensing with LiDAR

Biochemistry: Enzyme Activity Assays, Spectrophotometry, Oxygen Electrode

Isotope Techniques: Tunable Infrared Laser Direct Absorption Spectroscopy

Computation: R, Data Wrangling, Analytics & Visualization, Modeling, ShinyApp Deployment

TEACHING & MENTORING EXPERIENCE

Future Academic Scholars of Teaching (FAST) Fellow 2023-2024
College of Natural Science, Michigan State University, East Lansing, MI

Teaching Assistant Spring Semester 2023
Plant Physiology Lecture/Lab, Michigan State University, East Lansing, MI

NSF-REU Mentor Summer 2022
Plant Genomics Program, Michigan State University, East Lansing, MI

PUBLICATIONS

1. **Gregory, L.M.**, Scott, K.F., Sharpe, L.A., Roze, L.V., Schmiede, S.C., Way D.A., & Walker, B.J. Rubisco activity and activation state dictate photorespiratory plasticity in *Betula papyrifera* acclimated to future climate conditions. (Submitted)
2. **Gregory, L.M.**, Tejera-Nieves M.D., & Walker, B.J. "Measuring and Quantifying Characteristics of the Post-Illumination CO₂ Burst". (Submitted)
3. Roze, L.V., Johnson, A., **Gregory, L.M.**, Tejera-Nieves M.D., & Walker, B.J. "High throughput phosphoglycolate phosphatase activity assay using crude leaf extract and recombinant enzyme to determine kinetic parameters K_m and V_{max} using a microplate reader" (Submitted)
4. **Gregory, L.M.**, Roze, L.V., & Walker, B. J. (2023) "Increased activity of key photorespiratory enzymes and adapted CO₂ transfer conductance are associated with more optimal photosynthetic performance under elevated temperatures in *Rhazya stricta*". *Plant, Cell, & Environment*, 1-17.
5. Fu, X., **Gregory, L.M.**, Weise, S.E. & Walker, B. J. (2023). Integrated flux and pool size analysis in plant central metabolism reveals unique roles of glycine and serine during photorespiration. *Nat. Plants*9, 169–178
6. Fu, X., Smith, K., **Gregory, L.**, Roze, L., & Walker, B. J. (2023) "Modify photorespiration to optimize crop performance". Chapter in *Understanding and Improving Crop Photosynthesis*, Robert Sharwood Editor, Burleigh Dodds Publishing
7. **Gregory, L. M.**, McClain, A. M., Kramer, D. M., Pardo, J. D., Smith, K. E., Tessmer, O. L., Walker, B. J., Ziccardi, L. G., & Sharkey, T. D. (2021). The triose phosphate utilization limitation of photosynthetic rate: Out of global models but important for leaf models. *Plant, Cell & Environment*, 1– 4.
8. Bryson, A. E., Wilson Brown, M., Mullins, J., Dong, W., Bahmani, K., Bornowski, N., Chiu, C., **et al.** (2020). Composite modeling of leaf shape along shoots discriminates *Vitis* species better than individual leaves. *Applications in Plant Sciences* 8(12): e11404.

SELECT PRESENTATIONS

Gregory L.M., "Cultivating Quantitative Reasoning: Evaluating the impact of an instructor-led intervention on quantitative reasoning ability and confidence" FAST Symposium, April 22nd, 2024. (oral)

Gregory L.M., "How does photorespiration beat the heat and maintain photosynthesis at elevated temperatures" Gordon Research Seminar/Conference, May 6th, 2023. (invited speaker)

Gregory L.M., "Increased activity of key photorespiratory enzymes and adapted CO₂ transfer conductance are associated with more optimal photosynthetic performance under elevated temperatures in *Rhazya stricta*" Rubisco Oxygenase: 50 Years in Progress Looking and Looking into the Future. 2022, August 19th, 2022. (poster)

LEADERSHIP, SERVICE, & OUTREACH

Vice President & President

Association of Molecular Plant Sciences Students, East Lansing, MI

August 2021 – April 2023

Plant Science Fellowship Recruiter

Michigan State University, East Lansing, MI

August 2019 – April 2024

MPS Seminar Committee Member Association of Molecular Plant Sciences Students, East Lansing, MI	August 2020 – August 2021
Graduate Committee Member Plant Biology Department, East Lansing, MI	August 2019 – August 2021
Project Director “Fight the Blight,” Slippery Rock, PA	August 2018 – May 2019

CERTIFICATIONS & WORKSHOPS

Teaching College Science and Mathematics (<i>certification</i>) Michigan State University, East Lansing, MI	Spring 2022 – 2024
IsoCamp – Stable Isotope Biogeochemistry and Ecology (<i>certification</i>) University of New Mexico, Albuquerque, NM	August 2021
Leadership Summit (<i>workshop</i>) Leadership Institute, East Lansing, MI	September 2019

FELLOWSHIPS, AWARDS, & HONORS

Bessey Award for the Outstanding Research Publication	Spring 2024
Dissertation Completion Fellowship	Spring 2024
Future Academic Scholars of Teaching (FAST) fellowship	2023-2024
Paul Taylor Travel Award	Spring 2023
Graduate School Travel Fellowship	Spring 2023
College of Natural Science Recruiting Fellowship	2019-2020
Early Start Fellowship	Summer 2019