Nicholas A. Johnson

East Lansing, Michigan, U.S.A. | john7932@msu.edu | ORCID: 0000-0001-7272-6474

linkedin.com/in/nick-johnson-b771b01a9 | github.com/Scrumpis

Education

Michigan State University, Ph.D., *dual major*, Genetics and Genome Sciences; Ecology, Evolution, and Behavior	Aug 2021 – Current
Michigan State University, Computational Plant Science Graduate Certificate	Aug 2021 - May 2024
University of Minnesota, Twin-Cities, B.S., Plant Science (Breeding and Genetics)	Aug 2018 – May 2020
Normandale Community College, A.A., Liberal Arts	Aug 2012 – Dec 2017

Research Experience

Graduate Research Assistant, Michigan State University – East Lansing, MI ⸻ Aug 2021 – Current
Principal Investigator: Dr. Eric L. Patterson

- Independently developed comparative genomics hypotheses and computational approaches to investigate evolutionary adaptation in weedy plant species
- Revealed genomic structural variation associated with herbicide resistance evolution in *Eleusine indica*, advancing understanding of weed adaptation
- Authored and maintained containerized, open-source omics research software to enable large-scale, reproducible analyses on HPC systems through integration of Bash, Python, and R-based analytical frameworks, with an emphasis on usability for non-computational biologists
- Frequently communicated results through presentations, open-source software, and publications
- Provided continuous mentorship or collaboration in computational biology for undergraduate and graduate students, faculty, and external researchers across diverse disciplines

Biological Science Technician (GS-7), United States Department of Agriculture ⸻ July 2024 – Feb 2025
(U.S.D.A.) – Logan, UT
Principal Investigator: Dr. Matthew D. Robbins

- Assembled and annotated the genome of *Penstemon fruticosus,* a model genus for floral morphology evolution
- Investigated the evolution of floral morphology among *Penstemon* species with comparative genomics
- Currently writing a manuscript on these findings

Undergraduate Researcher, University of Minnesota – St. Paul, MN ⸻ Dec 2018 – May 2020
Principal Investigator: Dr. Alan G. Smith

- Independently researched abiotic stress and intraspecific competition of *Nicotiana tabacum* (tobacco) pollen
- Developed a Nanodrop Spectrophotometer method for quantifying pollen in a liquid solution
- Propagated, crossed, tissue cultured, regenerated, and transformed tobacco plants
- Collected and tissue cultured invasive plants and discussed management techniques with landowners
- Communicated results through an undergraduate thesis and symposia presentations

Teaching and Mentoring Experience

Graduate Teaching Assistant, Michigan State University – East Lansing, MI ⸻ Jan 2024 – May 2024
IBIO 341 Fundamental Genetics – Instructor: Dr. Jeanette McGuire

- Guided students through course content with two recitation sections and open office hours weekly
- Graded assignments, quizzes, and exams
- Contributed to course refinement through weekly meetings with the instructor and teaching assistants

Mentor, Michigan State University – East Lansing, MI ⸻ May 2023 – July 2023
Research Experience for Undergraduates in Plant Genomics

- Guided a visiting student exploring subgenome evolution in a genus of agronomic weeds and crops
- Helped students develop programming, computational analysis, and presentation skills

Lead Trainer, International Weed Genomics Consortium Meeting, Washington, D.C. Jan 30 2023
Introductory Bioinformatics Workshop
- Led a conference workshop for primarily non-computational or early career scientists
- Guided participants through a full RNA-Seq pipeline using public data
- Helped organize event and develop workshop scripts

Trainer, Michigan State University – East Lansing, MI Oct 15 2022
Ecotek Lab Youth Scientists Visit
- Taught visiting junior scientists about genetics
- Helped junior scientists run P.C.R. and subsequent gel electrophoresis

Mentor, Michigan State University – East Lansing, MI June 2022 – Present
Graduate Recruitment Initiative Team
- Guiding first-year Ph.D. students (assigned one student annually) through professional and general graduate student life decisions to help them acclimate
- Attending group-sponsored meetings to recruit and retain graduate students

Mentor, Michigan State University – East Lansing, MI May 2022 – July 2022
Research Experience for Undergraduates in Plant Genomics
- Guided a visiting student through comparative genomics of agronomic weeds and crops to find genomic patterns associated with domestication
- Helped students develop programming, computational analysis, and presentation skills

Graduate Teaching Assistant, Michigan State University – East Lansing, MI May 2022 – July 2022
CSS 126 Introduction to Weed Management – Instructor: Dr. Erin Hill
- Graded and provided feedback on a semester-long project on agronomic weed identification, biology, and management throughout the course

Fellowships, Grants, and Awards

Deep Learning Cis-Regulation Research Grant (Renewal), BASF Germany Jan 2025 - Aug 2026

Dissertation Completion Fellowship, College of Natural Sciences, Michigan State University Jan 2025 - May 2026

Outstanding Student Award, Genetics and Genome Sciences Program, Michigan State University May 2025

Outstanding Scholar Fellowship, College of Natural Sciences, Michigan State University May 2025 - Aug 2025

Deep Learning Cis-Regulation Research Grant, BASF Germany Jan 2025 - Dec 2025

Agricultural Genome to Phenome Initiative Travel Award, United States Department of Agriculture and Iowa State University July 2024

NSF Research Trainee Travel Award, National Science Foundation and Michigan State University July 2024

NSF Integrated Training Model in Computational Plant Sciences Fellowship, National Science Foundation and Michigan State University Aug 2022 – Aug 2023

Plant Biotechnology for Health and Sustainability Fellowship, National Institutes of Health and Michigan State University May 2022 – May 2025

Collegiate Scholars Award, American Society of Horticultural Science May 2020

Undergraduate Research Opportunity Program, University of Minnesota, Twin-Cities Jan 2019 – May 2019

Edward Hartwig Undergraduate Scholarship, University of Minnesota, Twin-Cities — Aug 2018 – May 2020

Dr. Laddie Elling Outstanding Achievement Scholarship, University of Minnesota, Twin-Cities — Aug 2018 – May 2020

Conference Presentations

Gene regulatory sequence annotation in plants using deep learning — Dec 2025

Johnson, N. A., Filho, D., Bernhofer, M., Islamovic, E., Murphy, B., & Patterson, E. L.

North Central Weed Science Society Annual Meeting: Oral presentation

Subgenome- and region-specific patterns of molecular evolution in the allohexaploid weed *Chenopodium album* L. — Dec 2025

Johnson, N. A., Cutti, L., Abdollahi, F., Fengler, K., Nelson, D. R., Llaca, V., MacGregor, D. R., Maughan, P. J., Gaines, T. A., & Patterson, E. L.

North Central Weed Science Society Annual Meeting: Poster presentation

Gene regulatory sequence annotation in plants using deep learning — Oct 2025

Johnson, N. A., Filho, D., Bernhofer, M., Islamovic, E., Murphy, B., & Patterson, E. L.

BASF Bioinformatics Seminar: Oral presentation

Annotating cis-regulatory elements in plants via deep learning — July 2025

Johnson, N. A., Filho, D., Bernhofer, M., Islamovic, E., Murphy, B., & Patterson, E. L.

BASF North American Open Research Alliance 2025: Oral presentation

A high-throughput pipeline for measuring selection pressure during comparative genomic analysis — Feb 2025

Johnson, N. A., Cutti, L., Gaines, T. A., & Patterson, E. L.

Weed Science Society of America 2025: Oral presentation

Chromosome-level assembly of the allohexaploid *Chenopodium album* L. genome reveals selection pressures on genes associated with adaptation — June 2024

Johnson, N. A., Cutti, L., Abdollahi, F., Fengler, K., Nelson, D. R., Llaca, V., MacGregor, D. R., Maughan, P. J., Gaines, T. A., & Patterson, E. L.

Plant Biology 2024: Poster presentation

Subtelomeric *EPSPS* duplications confer glyphosate resistance in *Eleusine indica* — Jan 2024

Johnson, N. A., Hall, N., Zhang, C., Yu, Q., & Patterson, E. L.

Weed Science Society of America Annual Meeting: Single-slide oral presentation

Subtelomeric *5-enolpyruvylshikimate-3-phosphate synthase* copy number variation confers glyphosate resistance in *Eleusine indica* — Dec 2023

Johnson, N. A., Hall, N., Zhang, C., Yu, Q., & Patterson, E. L.

North Central Weed Science Society Annual Meeting: Poster presentation

Weeds, genomics, and evolution — Jan 2023

Johnson, N. A.

Weed Science Society of America Annual Meeting: Three-minute thesis oral presentation

FHY3/FAR1 transposable elements generate adaptive genetic variation in the *Bassia scoparia* genome — Jan 2023

Johnson, N. A.

Plant and Animal Genome Conference 30: Oral presentation

Subtelomeric *5-enolpyruvylshikimate-3-phosphate synthase* copy number variation confers glyphosate resistance in *Eleusine indica* — Jan 2023

Johnson, N. A., Hall, N., Zhang, C., Yu, Q., & Patterson, E. L.

Plant and Animal Genome Conference 30: Poster presentation

Subtelomeric rearrangements cause glyphosate resistance in *Eleusine indica* Dec 2022

Johnson, N. A., Hall, N., Zhang, C., Yu, Q., & Patterson, E. L.

North Central Weed Science Society Annual Meeting: Oral presentation

Additional Volunteer Positions

Peer Reviewer, Scientific Data – One article	Aug 2025 – Present
Peer Reviewer, Chromosome Research – One article	Feb 2025 – Present
Peer Reviewer, Plant Communications – Two articles	July 2024 – Present
Genetics and Genome Sciences Program Representative, Michigan State University	May 2024 – May 2025
Peer Reviewer, Plant Physiology – One article	Sept 2023 – Present

Software

dndsR Aug 2025

Johnson, N. A.

R library for scalable calculation and analysis of evolutionary selection pressures

https://github.com/Scrumpis/dndsR

iwgc-circos Aug 2025

Johnson, N. A.

Bash pipeline to quickly and easily produce Circos plots for commonly visualized genomic features

https://github.com/Scrumpis/iwgc-circos

Publications

Assembly and annotation of the tetraploid *Salsola tragus* (Russian thistle) genome Jan 2025

Lemas, J., *et al.*

Genome Biology and Evolution – 10.1093/gbe/evaf014

Genomic structural variation and herbicide resistance Dec 2024

Johnson, N. A., Lemas, J., Montgomery, J., Gaines, T., & Patterson, E. L.

Canadian Journal of Plant Science – 10.1139/cjps-2024-0199

Expression-based machine learning models for predicting plant tissue identity Jan 2024

Palande, S., *et al.*

Applications in Plant Sciences – 10.1002/aps3.11621

Subtelomeric *5-enolpyruvylshikimate-3-phosphate synthase* copy number variation confers glyphosate resistance in *Eleusine indica* Aug 2023

Zhang, C.* & **Johnson, N. A.***, Hall, N., Tian, X., Yu, Q., & Patterson, E. L.

*Co-first authors

Nature Communications – 10.1038/s41467-023-40407-6

Additional Employment History

Technical Sales Representative, TubeWriter – Fremont, CA	Dec 2020 – Aug 2021
In-House Sales Representative, Gardenworld, Inc. – Cottage Grove, MN	Aug 2020 – Dec 2020
Server, Simon & Seafort's – Anchorage, AK	May 2018 – Aug 2018
Server, Al Vento – Minneapolis, MN	Apr 2016 – May 2018

Wait Assistant/Food Runner, Al Vento – Minneapolis, MN   Apr 2015 – Apr 2016

Valet, Meritage – St. Paul, MN   Feb 2014 – Apr 2015

Valet/Bellman, Hotel Zetta – San Francisco, CA   May 2013 – Feb 2014

Valet, The W, Foshay Tower – Minneapolis, MN   Jan 2012 – May 2013

Package Handler, United Parcel Service – M.S.P. International Airport, MN   Nov 2011 – Feb 2013