

# Nicholas A. Johnson

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

Website: scrumpis.github.io | linkedin.com/in/nick-johnson-b771b01a9 | github.com/Scrumpis

## Education

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

## Research Experience

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<b>Graduate Research Assistant</b> , Michigan State University – East Lansing, MI <i>Principal Investigator: Dr. Eric L. Patterson</i>	Aug 2021 – Current
<ul style="list-style-type: none"><li>Investigating genomic patterns associated with adaptation in weedy plants through comparative genomics</li><li>Developing assorted genomic and evolutionary analysis tools to reduce barriers of analysis for non-computational biologists</li><li>Revealed genomic structural variation associated with herbicide resistance evolution in the agronomic weed <i>Eleusine indica</i> using comparative genomics approaches</li><li>Automated a computational gene annotation pipeline with BASH wrapper scripts</li></ul>	
<b>Biological Science Technician (GS-7)</b> , United States Department of Agriculture (U.S.D.A.) – Logan, UT <i>Principal Investigator: Dr. Matthew D. Robbins</i>	July 2024 – Feb 2025
<ul style="list-style-type: none"><li>Assembled and annotated the genome of <i>Penstemon fruticosus</i>, a model genus for floral morphology evolution</li><li>Investigated the evolution of floral morphology among <i>Penstemon</i> species with comparative genomics</li><li>Currently writing a manuscript on these findings</li></ul>	
<b>Undergraduate Researcher</b> , University of Minnesota – St. Paul, MN <i>Principal Investigator: Dr. Alan G. Smith</i>	Dec 2018 – May 2020
<ul style="list-style-type: none"><li>Independently researched abiotic stress and intraspecific competition of <i>Nicotiana tabacum</i> (tobacco) pollen</li><li>Developed a Nanodrop Spectrophotometer method for quantifying pollen in a liquid solution</li><li>Propagated, crossed, tissue cultured, regenerated, and transformed tobacco plants</li><li>Collected and tissue cultured invasive plants and discussed management techniques with landowners</li><li>Communicated results through an undergraduate thesis and symposia presentations</li></ul>	

## Teaching and Mentoring Experience

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<b>Graduate Teaching Assistant</b> , Michigan State University – East Lansing, MI <i>IBIO 341 Fundamental Genetics – Instructor: Dr. Jeanette McGuire</i>	Jan 2024 – May 2024
<ul style="list-style-type: none"><li>Guided students through course content with two recitation sections and open office hours weekly</li><li>Graded assignments, quizzes, and exams</li><li>Contributed to course refinement through weekly meetings with the instructor and teaching assistants</li></ul>	
<b>Mentor</b> , Michigan State University – East Lansing, MI <i>Research Experience for Undergraduates in Plant Genomics</i>	May 2023 – July 2023
<ul style="list-style-type: none"><li>Guided a visiting student exploring subgenome evolution in a genus of agronomic weeds and crops</li><li>Helped students develop programming, computational analysis, and presentation skills</li></ul>	
<b>Lead Trainer</b> , International Weed Genomics Consortium Meeting, Washington, D.C. <i>Introductory Bioinformatics Workshop</i>	Jan 30 2023
<ul style="list-style-type: none"><li>Led a conference workshop for primarily non-computational or early career scientists</li></ul>	

- 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 and Awards

**Agricultural Genome to Phenome Initiative Travel Award**, United States

July 2024

Department of Agriculture and Iowa State University

**NSF Research Trainee Travel Award**, National Science Foundation and Michigan

July 2024

State University

**NSF Integrated Training Model in Computational Plant Sciences Fellowship**,

Aug 2022 – Aug 2023

National Science Foundation and Michigan State University

**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

**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.

<i>Weed Science Society of America Annual Meeting</i> : Single-slide oral presentation	
<b>Subtelomeric 5-enolpyruvylshikimate-3-phosphate synthase copy number variation confers glyphosate resistance in <i>Eleusine indica</i></b>	Dec 2023
Johnson, N. A., Hall, N., Zhang, C., Yu, Q., & Patterson, E. L.	
<i>North Central Weed Science Society Annual Meeting</i> : Poster presentation	
<b>Weeds, genomics, and evolution</b>	Jan 2023
Johnson, N. A.	
<i>Weed Science Society of America Annual Meeting</i> : Three-minute thesis oral presentation	
<b>FHY3/FAR1 transposable elements generate adaptive genetic variation in the <i>Bassia scoparia</i> genome</b>	Jan 2023
Johnson, N. A.	
<i>Plant and Animal Genome Conference 30</i> : Oral presentation	
<b>Subtelomeric 5-enolpyruvylshikimate-3-phosphate synthase copy number variation confers glyphosate resistance in <i>Eleusine indica</i></b>	Jan 2023
Johnson, N. A., Hall, N., Zhang, C., Yu, Q., & Patterson, E. L.	
<i>Plant and Animal Genome Conference 30</i> : Poster presentation	
<b>Subtelomeric rearrangements cause glyphosate resistance in <i>Eleusine indica</i></b>	Dec 2022
Johnson, N. A., Hall, N., Zhang, C., Yu, Q., & Patterson, E. L.	
<i>North Central Weed Science Society Annual Meeting</i> : Oral presentation	
<b>Certificates</b>	
<b>Computational Plant Science Graduate Certificate</b> , Michigan State University	May 2024
<b>Additional Volunteer Positions</b>	
<b>Peer Reviewer</b> , Plant Communications – One article	July 2024 – Present
<b>Genetics and Genome Sciences Program Representative</b> , Michigan State University	May 2024 – Present
<b>Peer Reviewer</b> , Plant Physiology – One article	Sept 2023 – Present
<b>Publications</b>	
<b>Assembly and annotation of the tetraploid <i>Salsola tragus</i> (Russian thistle) genome</b>	Jan 2025
Lemas, J., <i>et al.</i>	
<i>Genome Biology and Evolution</i> – 10.1093/gbe/evaf014	
<b>Genomic structural variation and herbicide resistance</b>	Dec 2024
Johnson, N. A., Lemas, J., Montgomery, J., Gaines, T., & Patterson, E. L.	
<i>Canadian Journal of Plant Science</i> – 10.1139/cjps-2024-0199	
<b>Expression-based machine learning models for predicting plant tissue identity</b>	Jan 2024
Palande, S., <i>et al.</i>	
<i>Applications in Plant Sciences</i> – 10.1002/aps3.11621	
<b>Subtelomeric 5-enolpyruvylshikimate-3-phosphate synthase copy number variation confers glyphosate resistance in <i>Eleusine indica</i></b>	Aug 2023
Zhang, C. & Johnson, N. A., Hall, N., Tian, X., Yu, Q., & Patterson, E. L.	
<i>Nature Communications</i> – 10.1038/s41467-023-40407-6	

## Additional Employment History

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<b>Technical Sales Representative</b> , TubeWriter – Fremont, CA	Dec 2020 – Aug 2021
<b>In-House Sales Representative</b> , Gardenworld, Inc. – Cottage Grove, MN	Aug 2020 – Dec 2020
<b>Server</b> , Simon & Seafort's – Anchorage, AK	May 2018 – Aug 2018
<b>Server</b> , Al Vento – Minneapolis, MN	Apr 2016 – May 2018
<b>Wait Assistant/Food Runner</b> , Al Vento – Minneapolis, MN	Apr 2015 – Apr 2016
<b>Valet</b> , Meritage – St. Paul, MN	Feb 2014 – Apr 2015
<b>Valet/Bellman</b> , Hotel Zetta – San Francisco, CA	May 2013 – Feb 2014
<b>Valet</b> , The W, Foshay Tower – Minneapolis, MN	Jan 2012 – May 2013
<b>Package Handler</b> , United Parcel Service – M.S.P. International Airport, MN	Nov 2011 – Feb 2013