

# Nicholas A. Johnson

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## Education

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- Michigan State University**, Ph.D., *dual major*, Genetics and Genome Sciences; Ecology, Evolution, and Behavior Aug 2021 – Current
- 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

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**Biological Science Technician (GS-7)**, United States Department of Agriculture (U.S.D.A.) – Logan, UT July 2024 – Current

*Principal Investigator: Dr. Matthew D. Robins*

- Assembling and annotating the genome of *Penstemon fruticosus*, a model genus for floral morphology evolution
- Re-sequencing five additional *Penstemon* species
- Investigating evolutionary relationships of floral morphology among *Penstemon* spp. with comparative genomics

**Graduate Research Assistant**, Michigan State University – East Lansing, MI Aug 2021 – Current

*Principal Investigator: Dr. Eric L. Patterson*

- Investigating genomic patterns associated with adaptation in weedy plants through comparative genomics
- Developing assorted genomic and evolutionary analysis tools to reduce barriers of analysis for non-computational biologists
- Revealed genomic structural variation associated with herbicide resistance evolution in the agronomic weed *Eleusine indica* using comparative genomics approaches
- Automated a computational gene annotation pipeline with BASH wrapper scripts

**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 plant samples and discussed management techniques with landowners
- Communicated results through an undergraduate thesis and symposia presentations

## Teaching and Mentoring Experience

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**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

## Select Fellowships and Awards

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- 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 State University July 2024
- 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

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- 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	

## Certificates

Computational Plant Science Graduate Certificate, Michigan State University	May 2024
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## Additional Volunteer Positions

Peer Reviewer, Plant Communications – One article	July 2024 – Present
Genetics and Genome Sciences Program Representative, Michigan State University	May 2024 – Present
Peer Reviewer, Plant Physiology – One article	Sept 2023 – Present

## Publications

<b>Expression-based machine learning models for predicting plant tissue identity</b>	Jan 2024
Palande, S., <i>et al.</i>	
<i>bioRxiv</i> : 10.1101/2023.08.20.554029	
<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	
<b>Undergraduate Thesis: Intraspecific salt tolerance variation in <i>Nicotiana tabacum</i> pollen germination and pollen tube growth</b>	Aug 2019
Johnson, N. A., Smith, K. P., & Smith, A. G.	
<i>UMN Digital Conservancy</i> : <a href="https://hdl.handle.net/11299/206480">https://hdl.handle.net/11299/206480</a> (not peer-reviewed)	

## 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

<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