

Samantha Snodgrass

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Education

Iowa State University

Ames, IA

Ph. D. Candidate in Plant Biology

ABD, est. 2023

Major Professor: Dr. Matthew Hufford

- GPA 3.97 | 4.00 (2017-current)
- Promoted to candidate Nov. 2019

My thesis work centers on the genetic models of hybrid vigor and genome evolution across the genus *Zea*. By understanding how evolutionary and population dynamics have affected the genome structure of maize and its wild relatives, and then relate those processes to phenotype, this research will provide important foundational information to plant domestication, which can be used to improve existing crops or accelerate domestication of wild plants or orphan crops.

NSF Research Traineeship Program: Predictive Plant Phenomics (2018-current)

- Joined by competitive invitation

Interdisciplinary training in plant biology, data science, and engineering with a specialization added to graduate transcript.

Grinnell College

Grinnell, IA

Bachelor of Arts in Biology, Environmental Studies

May 2016

- GPA 3.823 | 4.000, 160.0 credit hours
- Phi Beta Kappa
- Departmental Honors

Fellowships, Scholarships, Awards

Preparing Future Faculty Associate (May 2021)

- Nationally recognized training program for teaching and professional development

Predictive Plant Phenomics Peer Mentoring Award (May 2020) Iowa State University [\$100]

- Nominated by peers for exceptional peer mentorship

2020 ASPB Conviron Scholar (Jan. 2020 – May 2020) American Society of Plant Biologists

- Professional development for up-and-coming plant scientists
- Competitive application and invitation

F. Wendell Miller Scholarship (Aug. 2017 – Aug. 2020) [\$15,000]

Research Experience

Graduate Research Assistant, Iowa State University (Aug. 2017 –)

- Performed research with labs on rotation in maize, fig wasp, and cotton systems
- Member of Dr. Matthew Hufford's research group (Apr. 2018 –)
- Trained two undergraduate research assistants (Aug. 2019 –)
- Mentored four undergraduate research assistants (Jan. 2019 –)

Undergraduate Research Assistant, Wendel Lab, Iowa State University (June – Aug. 2015)

- Conducted research on *Gossypium* cell size
- Maintained greenhouse plant collection

Mentored Advanced Project (MAP) on Sustainability in Grinnell (Jan. 2015- May 2016)

- Focused on storm water management and landscaping, with extensive literature review
- Designed survey to collect local opinions about water and landscaping
- Interviewed members of the community for opinions and management ideas

Teaching Experience

Guest Lecture on Plant Anatomy, Iowa State University (Sept 20, 2021)

- Uploaded to Coursera as part of the Introduction to Predictive Plant Phenomics Class

Partners in Education Post-Baccalaureate Fellow, Grinnell College (Jan. 2017 – May 2017)

- Provided tutoring and support for at-risk first year undergraduate students
- Engaged participants through outreach and connected students with campus resources

Undergraduate Biology Mentor

- Biology: Molecules, Cells, and Organisms [soph. level] (Fall semester 2014, 2015)
- Biology: Organisms, Evolution and Ecology [soph. level] (Spring semester 2016)
 - Led twice weekly, hour long mentor sessions with a flipped learning model
 - Facilitated discussion, serving as a bridge between students and professor
 - Advised biology/biochemistry majors on subsequent advanced courses

Work Experience

Conservation and Land Management Internship Program (Chicago Botanic Garden)

Bureau of Land Management Anchorage, AK, Supervisor: Eric Geisler (June 2016- Nov. 2016)

- Seeds of Success program
 - Identified plants in the field and lab
 - Collected and cleaned seed for research and restoration
 - Mapped collection areas using ArcGIS
- Conducted AIM protocol on placer gold mines for the AIM monitoring project
- ANSEP Outreach
 - Introduced forestry careers to low income and minority middle school students as part of a long-term program to increase diversity in the STEM fields, particularly focused on Native Alaskans

Grants

NSF Graduate Research Fellowship Program Fellow (May 2019-May 2022) *Awarded*

- \$138,000 anticipated funding available
- Covers tuition, stipend, and educational fees for three years
- Nationally competitive application

Publications and Presentations

Publications

1. *In Review*: Gates, D.J., D. Runcie, G.M. Janzen, A. Romero-Navarro, M. Willcox, K. Sonder, **S.J. Snodgrass**, F. Rodríguez-Zapata, R.J.H. Sawers, R. Rellán-Álvarez, E.S. Buckler, S. Hearne, M.B. Hufford, J. Ross-Ibarra. Single-gene resolution of locally adaptive genetic variation in Mexican maize. [[preprint](#)]
2. Matthew B. Hufford, Arun S. Seetharam, Margaret R. Woodhouse, Kapeel M. Chougule, Shujun Ou, Jianing Liu, William A. Ricci, Tingting Guo, Andrew Olson, Yinjie Qiu, Rafael Della Coletta, Silas Tittes, Asher I. Hudson, Alexandre P. Marand, Sharon Wei, Zhenyuan Lu, Bo Wang, Marcela K. Tello-Ruiz, Rebecca D. Piri, Na Wang, Dong won Kim, Yibing Zeng, Christine H. O'Connor, Xianran Li, Amanda M. Gilbert, Erin Baggs, Ksenia V. Krasileva, John L. Portwood II, Ethalinda K.S. Cannon, Carson M. Andorf, Nancy Manchanda, **Samantha J. Snodgrass**, David E. Hufnagle, Qiuhan Jiang, Sarah Pedersen, Michael L. Syring, David A. Kudrna, Victor Llaca, Kevin Fengler, Robert J. Schmitz, Jeffrey Ross-Ibarra, Jianming Yu, Jonathan I. Gent, Candice N. Hirsch, Doreen Ware, R. Kelly Dawe. **2021 [accepted 24 June]**. "De novo assembly, annotation, and comparative analysis of 26 diverse maize genomes" *Science*
3. Ou, S., J. Liu, K.M. Chougule, A. Functammasan, A.S. Seetharam, J. Stein, V. Llaca, N. Manchanda, A.M. Gilbert, X. Wei, C. Chin, D.E. Hufnagle, S. Pedersen, **S. Snodgrass**, K. Fengler, M. Woodhouse, B.P. Walenz, S. Koren, A.M. Phillippy, B. Hannigan, R.K. Dawe, C.N. Hirsch, M.B. Hufford, Doreen Ware. **2020**. Effect of sequence depth and length in long-read assembly of the maize inbred NC358. *Nature Communications* 11(1):2288. doi: [10.1038/s41467-020-16037-7](https://doi.org/10.1038/s41467-020-16037-7)
4. **Snodgrass, S.J.**, M.B. Hufford. **2018**. "Domestication Genomics: untangling the complex history of African rice". *Current Biology*. 28: R786-R788
5. Manchanda, N., **S.J. Snodgrass**, J. Ross-Ibarra, M.B. Hufford. **2018**. Evolution and adaptation in the maize genome. In *The Zea mays Genome*, Bennetzen, Flint-Garcia, Hirsch, Tuberosa (Eds.), Springer Nature Publishing
6. **Snodgrass, S.**, Jareczek, J., Wendel, J. F. **2017**. "An examination of nucleotypic effects in diploid and polyploid cotton" *Annals of Botany* **9**: plw082; doi:10.1093/aobpla/plw082

Presentations

1. **ASPB July 18, 2021** "Enhancing Plant Science Education through the NSF National Research Traineeships (NRT)" Organizer: Julie A. Dickerson Instructors: Julia Bailey-Serres, Michael J. Scanlon, Shin-Han Shiu, Diane Jofuku Okamuro Panelist: **Samantha J. Snodgrass**
2. **Evolution June 23, 2021** "Variance Component Analysis of MOA-seq identified transcription factor binding sites for 143 maize traits" Given by **Samantha J. Snodgrass**. Authors: **Samantha J. Snodgrass**, Julia Engelhorn, Arun Seetharam, Merritt Khaiphoburch, Jeffrey Ross-Ibarra, Thomas Hartwig, Matthew B. Hufford.
3. **Virtual Maize Genetics Conference March 9, 2021** "FIND-CIS: High-resolution mapping of functional cis-elements in the maize drought response" Given by Thomas Hartwig. Authors: Englehorn, Julia; Blank, Max; Seetharam, Arun; **Snodgrass, Samantha J.**; Kiwit,

- Tatjana; Weizel, Sergius; Bass, Hank W.; Ross-Ibarra, Jeffrey; Hufford, Matthew B.; Frommer, Wolf B.; Hartwig, Thomas.
4. *Plant and Animal Genome Conference* **January 14, 2020** “Heterosis in the Genomics Era: Single Parent Expression” [Invited presentation]
 5. *P3 Symposium* **November 9, 2018** “Hybrid Maize in the Genomics Era: Single Parent Expression, Complementation, and Heterosis”
 6. *Iowa State Interdepartmental Plant Biology Student Seminar* **August 29, 2018** “Exploring Hybrid Maize in the Genomics Era: single parent expression, complementation, and heterosis”
 7. *Iowa State Interdepartmental Plant Biology Student Seminar Series* **December 6, 2017** “Nucleotypic effects on guard cells, epidermal pavement cells, and pollen grains in *Gossypium*”
 8. *Research, Scholarship, and Creative Activity Symposium at Grinnell College* **April 12, 2016** “Stormwater and Landscaping on Grinnell College's Campus”
 - ◇ Admitted into the digital archive of student scholarship of the Grinnell College Library (<https://digital.grinnell.edu/islandora/object/grinnell%3A13258>)
 9. *Grinnell College Biology Department Student Seminar* **February 23, 2016** “Nucleotypic effects on guard cells, epidermal pavement cells, and pollen grains in *Gossypium*”

Poster Sessions

1. *Virtual Maize Genetics Conference*, **March 8-12, 2021**, Online, “Variance component analysis of MOA-seq identified transcription factor binding sites for 143 maize traits” **Snodgrass, Samantha J.**; Engelhorn, Julia; Seetharam, Arun; Khaipho-Burch, Merritt; Ross-Ibarra, Jeffrey; Hartwig, Thomas; Hufford, Matthew B.
2. *Virtual Maize Genetics Conference*, **March 8-12, 2021**, Online, “Analysis of plant height in *Zea mays*. Krug, Chase J.; Hufford, Matthew B.; **Snodgrass, Samantha J.**
3. *Virtual Maize Genetics Conference*, **June 25-26, 2020**, Online, “Diverse Hybrids Demonstrate Heterosis Beyond Heterotic Groups” **Snodgrass, Samantha J.** and Hufford, Matthew B.
4. *Annual Maize Genetics Conference*, **March 14-17, 2019**, St. Louis, MO, “Hybrid maize in the genomics era: single parent expression, complementation and heterosis” **Snodgrass, Samantha J.** and Hufford, Matthew B.
5. *Midstates Consortium Conference for Physical Science*, **November 13, 2015**, Chicago, IL, “Water and Landscape Management on Grinnell College Campus” **Snodgrass, Samantha J.**
6. *AASHE Conference* **October 27, 2015**, Minneapolis, MN, “Lessons from Germany to the US 2: Water” **Snodgrass, Samantha J.**
7. *Grinnell College Family Weekend* **September 23, 2015**, Grinnell, IA, “Lessons from Germany to the US 2: Water” **Snodgrass, Samantha J.**

Professional Development

Professional Society Memberships

- American Society of Plant Biologists (ASPB), Jan. 2020 – present
- Maize Genetics Cooperative (MGC), Jan. 2020 – present
- Society for the Study of Evolution (SSE), Jan. 2021 – present

Workshops

Preparing Future Faculty (Aug. 2020 –May 2021) Iowa State University

- Multiple-semester program to prepare graduate students and post-doctoral fellows for careers in academia

P3 Data Carpentry Boot Camp (Aug. 2018) Iowa State University

- Introduction to Unix, Python, and R languages

Summer Institute of Statistical Genetics (July 2018) University of Washington

- Computational and advanced population genetics workshop

Service

Professional

Iowa State University, Ames, IA

- Seminar Chair of Ecology Evolution and Organismal Biology GSO (**May 2021 –**)
 - Representative in organizing departmental seminar series
- Vice President of Ecology Evolution and Organismal Biology GSO (**May 2020 –**)
 - Organize and run annual native plant sale fundraiser
 - Volunteered for the native plant sale annually since 2019
- Social Media Chair of P3 GSO Board, (**May 2019 – May 2020**)
 - Maintained and grew P3 social media presences on Twitter, Facebook, and Instagram
- President of Interdepartmental Plant Biology GSO, (**Jan. – Dec. 2019**)
 - Organized weekly program seminars
- Vice President of Interdepartmental Plant Biology GSO, (**Jan. – Dec. 2018**)
 - Facilitated weekly program seminars

MaizeGDB Editorial Board, Online

- Editorial Contributor (**Jan. 2020 – Dec. 2021**)
 - Summarized significant and recent articles for the maize community
 - Published monthly on MaizeGDB webpage

Maize Genetics Meeting Steering Committee, Online

- Graduate Student Representative (**Mar. 2021 – Mar 2022**)
 - Elected by graduate student members of the Maize Genetics Cooperative

Miscellaneous

- Panelist on “Navigating Your Fellowship Application” hosted by ASPB ECPS DEI committee (**Sep. 17, 2021**)

Community

Central Iowa Orchid Society, Des Moines, IA

- Dues paying member (**Mar. 2017 –**)

- Volunteer at information and plant sales booths for two separate shows annually
 - Orchid Festival, Reiman Gardens (annually held in Feb.)
 - Des Moines Home and Garden Show (annually held in Mar.)