Schuyler D. Smith

Ph.D. Student in Bioinformatics and Computational Biology
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Education

Ph.D. **Bioinformatics and Computational Biology** 2017 - pres.
Iowa State University of Science and Technology, Ames, IA
Specialization: Predictive Plant Phenomics.
Research focus: microbiome community analysis, microbial ecology.

M.S. **Quantitative Genetics and Plant Breeding** 2013 - 2015
Texas A&M University, College Station, TX
Thesis: *Molecular Characterization of the Texas Maize Breeding Program.*
Research focus: quantitative genetics, marker analysis, NIR phenotyping.

B.S. **Genetics** 2008 - 2012
Iowa State University of Science and Technology, Ames, IA

Experience

Iowa State University of Science and Technology January, 2017 - pres.
Genomics and Environmental Research in Microbial Systems Lab, Ames, Iowa
Graduate Research Assistant - Ph.D.
Identifying microbial interactions in complex systems.

University of Wisconsin-Madison June, 2015 - August, 2016
Potato Breeding and Genetics Laboratory, Madison, Wisconsin
Graduate Research Assistant - Ph.D.
Development of workflows and pipelines to automate and scale genotyping-by-sequencing and genomic prediction of quantitative traits.

United States Department of Agriculture - ARS June, 2014 - December, 2014
Arid-Land Agricultural Research Center. Maricopa, Arizona
Biological Science Technician (Internship)
Developed high-throughput phenotyping platforms for crop traits such as canopy cover, plant height, and seed counting.

Texas A&M University January, 2013 - May, 2015
Maize Breeding and Genetics Program, College Station, Texas
Graduate Research Assistant - M.S.
Developed a molecular characterization of the Texas maize germplasm and oleic-acid screening using near-infrared spectroscopy.

Monsanto Company May, 2012 - November, 2012
Huxley Research Station. Huxley, Iowa

Maize Plant Breeding Intern

Conducted research project on optimizing a high-throughput phenotyping platform looking at seed characteristics. Led crews in pollinating nurseries, and harvest.

DuPont Pioneer May, 2011 - December, 2011

Willmar Research Station. Willmar, Minnesota

Maize Product Trait Development Intern - 6 month

Conducted a QTL study for important problematic proprietary trait. Led crews for data collection in yield trials, pollination in nurseries, and harvesting.

United States Department of Agriculture - ARS January, 2010 - May, 2011

Soybean Genomics Laboratory - Graham Lab. Ames, Iowa

Student Undergraduate Research Assistant

Assisted post-doctorate researcher via PCRs, DNA extractions and preparations, gel-imaging, among other laboratory procedures.

Publications

Schuyler D. Smith, P Colgan, F Yang, EL Rieke, ML Soupir, TB Moorman, HK Allen, A Howe. *Investigating the dispersal of antibiotic resistance associated genes from manure application to soil and drainage waters in simulated agricultural farmland systems.* July, 2019. In Submission to PLOS One.

Schuyler D. Smith *phylosmith: an R-package for reproducible and efficient microbiome analysis with phyloseq-objects.* June, 2019. Journal of Open Source Software. 4(38), 1442. 10.21105/joss.01442

J Choi, EL Rieke, TB Moorman, ML Soupir, HK Allen, **SD Smith**, A Howe. *Practical implications of erythromycin resistance gene diversity on surveillance and monitoring of resistance.* January, 2018. FEMS microbiology ecology. 10.1093/femsec/fiy006

Schuyler D. Smith, E Heffner, SC Murray. *Molecular analysis of genetic diversity in a Texas maize breeding program.* 2015. Maydica. 60. cabdirect.org/abstract/201

Posters

Smith, S.D. *phylosmith: an R-package for reproducible and efficient microbiome analysis with phyloseq-objects.* Presented at the 27th ISMB/18th ECCB. 2019, July 21-25. Basel, Switzerland.

Smith, S.D., Villanueva, P.E., Fukami, T., Howe, A. *Co-Occurrence Networks Reveal Key OTUs in Flower Nectar Microbiomes Across Dispersal Treatments.* Presented at the 17th ISME. 2018, August 12-17. Leipzig, Germany & the NSF Research Traineeship (NRT) Annual Meeting. 2018, September 27-28. Arlington, Virginia.

Smith, S.D., Howe, A. *Examining Antibiotic Resistance Gene (ARG) horizontal transfer and introduction through farmland soil microbiomes as a result of modern farming practices.* Presented at the 3rd Annual Front Rang Computational & Systems Biology Symposium: Microbiome. 2017, June 12-13. Fort Collins, Colorado.

Smith, S.D., Endelman, J.B. *Genotyping by Sequencing for Autotetraploid Species.* Presented at

the 5th International Conference on Quantitative Genetics. 2016, June 12-17. Madison, Wisconsin. & the 11th Annual National Association of Plant Breeders Meeting. 2016, August 15-18. Raleigh, North Carolina.

Software

phylosmith : an R-package for reproducible and efficient microbiome analysis with phyloseq-objects.

Awards, Fellowships, Honors, & Recognitions

Iowa State University of Science and Technology

- Selected P3 representative for 2018 NSF-NRT Annual Meeting 2018
- College of Engineering Interdepartmental Research Fellow 2017 - pres.
- NSF-NRT Predictive Plant Phenomics Fellow 2017 - 2018
- Academic Recognition Award 2008 - 2012

Texas A&M University

- Willie May Harris Fellow 2013 - 2014

Certifications

Data Carpentry - Course Instructor

Workshops Taught

Developer / Instructor

- Introduction to Data Analysis for Biology Graduate Students. 2018
  Developer and Instructor for Tutorial: R Basic

Teaching Assistant

- EDAMAME *Explorations in Data Analyses for Metagenomic Advances in Microbial Ecology.* 2017 & 2018
- Introduction to Data Analysis for Biology Graduate Students. 2017
- BCB Data Analysis Language Workshops
  Introduction to Unix 2017 & 2018
  Introduction to Python 2017

Applicable Skills

- R
- C++
- Python
- Shell (BASH)
- html
- LaTeX
- Markdown
- RMarkdown
- Git
- Linux
- Windows
- MacOS

Graduate Coursework Completed

M.S. Plant Breeding and Quantitative Genetics:

- Quantitative Genetics
- Statistics in Research I
- Statistics in Research II
- Plant Breeding I
- Plant Breeding II
- Experimental Design
- Molecular and Quantitative Genetics in Plant Breeding
- Host-Plant Resistance

Ph.D. Bioinformatics and Computational Biology:

- Bioinformatic Algorithms
- Statistical Bioinformatics
- Bioinformatic Systems
- Genomic Sciences
- Linear Mixed Models
- Fundamentals of Predictive Plant Phenomics
- Plant Genetics
- Biometric Procedures in Plant Breeding
- Advanced Plant Breeding
- Selection Theory
- Tools for Reproducible Research