

Tara Furstenau, Ph.D.

Contact

The School of Informatics,
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Website 🌐
tfursten.github.io

Github:
github.com/tfursten

Bitbucket:
bitbucket.org/TaraFurstenau

Skills

Programming Languages

Proficient: C++, Python, R

Familiar: Julia, Mathematica,
Rust, SQL

Visualization

Matplotlib, Seaborn, Lattice,
ggplot2, ggtree, Graphviz

Markup & Typesetting

HTML, Markdown, \LaTeX

Systems

Unix, Linux, Windows,
Macintosh OS X

Other

Version Control Systems: Git,
Github, Bitbucket

Research Experience

2018–Present	Assistant Research Professor The School of Informatics, Computing, and Cyber Systems Northern Arizona University · Flagstaff, AZ
2016–2017	Postdoctoral Scholar in Viacheslav Fofanov's lab The School of Informatics, Computing, and Cyber Systems Northern Arizona University · Flagstaff, AZ
2013–2016	Graduate Student in Reed Cartwright's Lab Center for Human and Comparative Genomics · The Biodesign Institute Arizona State University · Tempe, AZ
2010–2013	Research Associate in Roberto Gaxiola's Lab School of Life Sciences · Arizona State University · Tempe, AZ
2009–2010	Undergraduate Student Researcher in Lei Lei's Lab School of Life Sciences · Arizona State University · Tempe, AZ

Education

2010–2016	Ph.D. Molecular and Cellular Biology Arizona State University Advisor: Reed Cartwright Dissertation: Spatial Genetic Structure under Limited Dispersal: Theory, Methods and Consequences of Isolation-by-Distance
2008–2010	B.S. Bioinformatics and Genomics Arizona State University Dean's List · <i>magna cum laude</i>

Publications

Hepp, CM, Cocking, JH, Valentine, M, Young, SJ, Damian, D, Sheridan-Crow, K, Fofanov, VY, **Furstenau, TN**, Busch JD, Erickson DE, Lancione, RC, Smith, K, Will, J, Townsend, J, Keim, PS, Engelthaler, DM. (2018). **Phylogenetic analysis of West Nile Virus in Maricopa County, Arizona: Evidence of endemic and ephemeral circulation of strains in two major lineages.** *PLOS ONE*. 13(11): e0205801. doi:10.1371/journal.pone.0205801

Furstenau, TN*, Cocking, J, Sahl, JW, and VY Fofanov. (2018). **Variant Site Strain Typer (VaST): Efficient strain typing using a minimal number of variant genomic sites.** *BMC Bioinformatics*. 10:222:1-13. doi:10.1186/s12859-018-2225-z

Fofanov, VY, **Furstenau, TN***, Sanchez, D, Hepp, CM, Cocking, J, Sobek, C, Pagel, N, Walker, F, and CL Chambers. (2018). **Guano Exposed: Impact of aerobic conditions on bat fecal microbiota.** *Ecology and Evolution*. doi:10.1002/ece3.4084

Furstenau, TN*, and RA Cartwright (2017). **The role of self-incompatibility systems in the prevention of bi-parental inbreeding.** *PeerJ Preprints*. doi:10.7287/peerj.preprints.3042v1

Furstenau, TN*, and RA Cartwright (2016). **The effect of the dispersal kernel on isolation-by-distance in a continuous population.** *PeerJ* 4:e1848. doi:10.7717/peerj.1848

Pizzio GA, Paez-Valencia J, Khadilkar AS, Regmi K, Patron-Soberano A, Zhang S, Sanchez-Lares J, **Furstenau T**, Li J, Sanchez-Gomez C, Valencia-Mayoral P, Yadav UP, Ayre BG and RA Gaxiola (2015). **Arabidopsis proton-pumping pyrophosphatase AVP1 expresses strongly in phloem where it is required for PPI metabolism and photosynthate partitioning.** *Plant Physiology* 167:1541-1553. doi:10.1104/pp.114.254342

Presentations

Talks

- May 2017 **Strain-level pathogen identification using targeted PCR amplicon sequencing**
The Biodefense and Disease Ecology Center Meeting
The Pathogen and Microbiome Institute · Flagstaff, AZ
- Dec 2015 **Spatial genetic structure under limited dispersal**
Informatics and Computing Program · Flagstaff, AZ
- Sep 2015 **Bayesian estimation of neighborhood size using composite marginal likelihoods**
Molecular and Cellular Biology Colloquium · The Biodesign Institute · Tempe, AZ
- July 2015 **Bayesian estimation of neighborhood size using composite marginal likelihoods**
Society for Molecular Biology and Evolution · Vienna, Austria
- Sep 2014 **Evolution of Self-Incompatibility: Investigating the role of self-incompatibility systems in the prevention of biparental inbreeding**
Molecular and Cellular Biology Colloquium · The Biodesign Institute · Tempe, AZ
- Oct 2013 **Evolution of Self-Incompatibility: Investigating the role of self-incompatibility systems in the prevention of biparental inbreeding**
Molecular and Cellular Biology Colloquium · Arizona State University · Tempe, AZ
- March 2012 **The roll of the H⁺-pyrophosphatase in the regulation of sucrose transport in plants**
Molecular and Cellular Biology Colloquium · Arizona State University · Tempe, AZ

Posters

- June 2018 **Strain level characterization of select pathogens from complex shotgun metagenomic sequence data**
American Society for Microbiology Microbe · Atlanta, GA
- June 2018 **Efficient bacterial strain typing using highly multiplexed amplicon sequencing panels**
American Society for Microbiology Microbe · Atlanta, GA
- April 2018 **Tracing lineages of *Staphylococcus aureus* using minority variant approaches**
Arizona/Southern Nevada Chapter of the American Society for Microbiology Annual Meeting
Las Vegas, NV
Presented by Undergraduate Mentee, Ryan Lancione
- April 2018 **Tracing lineages of *Staphylococcus aureus* using minority variant approaches**
College of Engineering, Forestry, and Natural Sciences Undergraduate Research and Design Symposium
Flagstaff, AZ
Presented by Undergraduate Mentee, Ryan Lancione
- April 2018 **Culturing and Sequencing Causative Agents of Early Childhood Caries**
College of Engineering, Forestry, and Natural Sciences Undergraduate Research and Design Symposium
Flagstaff, AZ
Presented by Undergraduate Mentee, Daryn Erickson
- June 2017 **Effects of Exposure on Bat Guano Microbiome**
Microbiome Bioinformatics with QIIME 2 Workshop · Las Vegas, NV
- June 2017 **Preemptive establishment of baseline bat microbiome diversity before White-Nose Syndrome strikes the Southwest**
Microbiome Bioinformatics with QIIME 2 Workshop · Las Vegas, NV
Presented by Graduate Student Mentee, Nicole Pagel
- June 2014 **The effect of the dispersal distribution on isolation-by-distance in a continuous population**
Society for the Study of Evolution · Raleigh, NC
- March 2014 **Characterization of Transgenic *Arabidopsis thaliana* overexpressing AVP1 and PLAFP**
Arizona State University Undergraduate Research Poster Symposium · Tempe, AZ
Presented by undergraduate mentee, Sean Wilson

Aug 2012	H⁺-PPase AVP1 is necessary for phloem development in <i>Arabidopsis thaliana</i> Molecular and Cellular Biology Graduate Student Retreat · Tempe, AZ
July 2012	H⁺-PPase AVP1 is necessary for phloem development in <i>Arabidopsis thaliana</i> American Society of Plant Biologists Annual Meeting · Austin, TX

Teaching Experience

Courses:

Arizona State University

Fall 2014	BIO340 General Genetics	Head Teaching Associate
Spring 2014	BIO355 Introduction to Computational Molecular Biology	Innovative Teaching Associate
Fall 2013	PLB108 Concepts in Plant Biology iCourse	Instructor
Spring 2013	BIO340 General Genetics	Teaching Associate
Fall 2012	BIO340 General Genetics	Teaching Associate
Spring 2012	BIO340 General Genetics	Teaching Associate
Fall 2011	BIO340 General Genetics	Teaching Associate
Summer 2011	BIO181 General Biology I Laboratory	Teaching Associate
Spring 2011	BIO182 General Biology II Laboratory	Teaching Associate
Fall 2010	MBB343 Genetic Engineering and Society Laboratory	Teaching Associate

Northern Arizona University

Spring 2017	INF503 Large-Scale Data Structures and Organization	Guest Lecture
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Workshops:

May 2016	Software Carpentry Instructor	Biodesign Institute · ASU · Tempe, AZ
June 2015	Software Carpentry Helper	Wrigley Institute of Sustainability · ASU · Tempe, AZ

Mentoring:

2011–2013	Honor's Thesis Mentor Sean Wilson Thesis: Wilson S, Furstenau T , and R Gaxiola. Characterization of Transgenic <i>Arabidopsis thaliana</i> Over-expressing a Type I H ⁺ -Pyrophosphatase and the Phloem Lipid-Associated Family Protein.
2018	Honor's Thesis Committee Member Shelby Prestwich Thesis: A Review of the Human Vermiform Appendix and its Proposed Function

Service and Outreach

- Software Carpentry Certified Instructor
- Night of the Open Door Volunteer
- Ask-A-Biologist Volunteer Correspondent
- Green Labs Initiative Coordinator and Promoter
- Phosphorus Sustainability Research Coordination Network Core Participant
- Obama Scholars Mentor

Professional Development

April 2018	AnacondaCon Anaconda, Inc. · Austin, TX
June 2017	Microbiome Bioinformatics with QIIME 2 Workshop QIIME Development Team · Las Vegas, NV
July 2013	Next Generation Population Genomics for Non-model Taxa Workshop American Genetics Association · Cornell University · Ithaca, NY
Dec 2011	Univector Plasmid-Fusion System training with Kendal Hirschi Childrens Nutritional Research Center · Baylor College of Medicine · Houston, TX

Society Memberships

- Society for the Study of Evolution
- Society for Molecular Biology and Evolution
- Central Arizona Chapter of the Association for Women in Science