

John Miraszek

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Ph.D. student researching Evolutionary biology, comparative genomics and population genetics using bioinformatic pipelines

Education

University of Missouri, Ph.D. student	2021-Present
Genetics Area Program Supervisor: Dr. Jared Decker	
Temple University, Masters of Science in Biology	2019-2021
Department of Biology Supervisor: Dr. David Liberles	
Penn State Behrend, Bachelors of Science in Biology	2014-2018
College of Science GPA: 3.34/4	

Research Experience

Decker Lab	2021-Present
Modeling evolutionary history using Population genetics, quantitative genetics, and comparative genomics. Projects currently include detecting signals of selection and admixture in cattle and their wild relatives using whole genome level data at large sample sizes over 5000 individual animals representing over 250 unique breeds, utilizing archeological dating as a variable to detect selection in modern and ancient humans worldwide, modeling population dynamics in an endangered minnow species undergoing government conservation efforts.	
Liberles Research Group	2019-2021
Constructed bioinformatic pipelines for comparative genomic research. Projects included analyzing spider genomics, studying molecular evolutionary pathways in salmon, and modeling whole genome duplication of monocots.	
Research assistant Penn State Behrend Genetics Lab	2018

Performed PCR amplification phylogenetic analysis of the highly conserved barcoding gene CO1 from insect DNA samples collected from Behrend campus as part Gruwell Lab's project to catalog the diversity of arthropods on campus

- Scholarship And Research Integrity (SARI) training requirements completed
- Penn State Environmental Health and Safety (EHS) training completed

Publications

Miraszek, John Louis. *Construction of a Spider Comparative Genomic Database for Analyzing the Araneae Tree of Life*. Temple University, 2021.

Henry, C. Nicholas, Kathryn Piper, Amanda E. Wilson, John L. Miraszek, Claire S. Probst, Yuying Rong, and David A. Liberles. "WGDTree: a phylogenetic software tool to examine conditional probabilities of retention following whole genome duplication events." *BMC bioinformatics* 23, no. 1 (2022): 1-15.

Conference Attendance, Oral and Poster Presentations

The Gordon Research Conference (GRC) on Quantitative Genetics and Genomics 2023

Poster first author "Cattle Demography and Evolution"

Tel Aviv, Toronto, Temple (T3) Molecular Evolution Symposium 2021

Attendee

Great lakes Annual Meeting of Evolutionary Genomics (GLAM-evogen) 2020

Attendee

Evolution in Philadelphia Conference (EPIC) 2019

Poster middle author "Whole genome duplication events drive diversification of myostatin in Salmonidae"

Teaching Experience

TA AnSci 4323 Applied Livestock Genetics

January-May 2023

Led lectures presenting new units on historical genetics theories and practical quantitative approaches for over 100 upperclassmen in animal science. met with students to provide feedback, answer questions and concerns, assist with missed classes and explain homework problems. Responsible for reviewing and grading honor section students assigned R programming problems, and providing lessons in syntax, better programming practices, and debugging procedures in

the effort to familiarize with and encourage students to pursue future works in animal science computational research.

Grader AnSci 4323 Applied Livestock Genetics May 2022

Graded and provided feedback on over 50 student end of term project papers where they had to design a breeding program for a species of their choosing and use the lesson material from the course to justify their approaches.

Memberships

Genetics Society of America 2023

Administrative Experience

Liberles Lab Systems Administrator August 2019 - July 2021

Responsible for upkeep over 20 dedicated computing machines, ensured regular data backup, proper compilation of programs essential for each of the lab's research projects, performed data recoveries, reconstructions of computer hardware, operating system reinstallations, maintained remote connectivity to laboratory computers using a secure shell client for each member of the research group.

Public Outreach

Dogwood Elementary School Field Day DNA Demonstration and Activity

May 23 2023

Instructed school children from Kindergarten to 5th grade with a hands-on activity where each student or a pair of students extracted DNA from strawberries. Gave age appropriate information and fun facts about biology, DNA and cells. Provided demonstration of the extraction experiment with easy to follow explanations for what each step is for. Brought supplies and led parent volunteers in distributing and supervising each student's experiment. Encouraged students to consider studying or careers related to science, and to think like a scientist when encountering everyday things like the strawberries in the experiment. Dogwood Elementary School 1400 Cedarwood Pkwy, Kearney, MO 64060

Show-Me Research Week April 18 2023

Presented the genetics of cattle evolution and outlined our designs to uncover selection on polygenic traits to a diverse multidisciplinary community of researchers,

community members, students and educators. Fielded questions on population genetics methods and discussed applications for agricultural, industrial and anthropological studies.

Seminar and Journal Club Presentations

2022

Evolutionary Biology Seminar

Presented on history and development and limitations of GWAS and quantitative genetics, and the biological reasoning and statistical pitfalls of measuring heritability, distributions of selection, complex traits and non-mendelian inheritance. October 25 2022

Selected literature for and presented on utility of different species concepts, elaborated on consideration of population dynamics, and levels of selection. September 6 2022

MUGenomics Journal Club

Led discussion on a comparative genomics study of mammalian lifespan variability GWAS studies of hyper-complex phenotypes, and limitations thereof. February 8 2022

2021

MUGenomics Journal Club

Showcased recent publication on signatures of domestication in the genomes of Chinese Donkeys, for a methodological comparison to work in other domestic species. October 4 2021

Temple Center for Computational Genetics and Genomics (CCGG) Journal Club

Highlighted state of the art sequencing and imaging technologies used to uncover the origin of Monotreme sex chromosomes, and discussed the implications for placental mammals January 19 2021

Brought forward a paper challenging conventional molecular frameworks and delved into considerations for the underexplored realm of microproteins November 3 2020

Additional Activities

WORK EXPERIENCE

Casual Store Associate- ALDI September September 2019- December 2020

- Stock food products and assist customers as well as maintaining food product freshness and cycling inventory

Prep Cook/Grill Cook- Cracker Barrel

May 2017 – July 2019

- Maintained high standard of food preparation efficiently for over 200 customers daily
- Trained new members to perform effectively and reliably
- Awarded Employee of the Month - March 2018

Assistant firework Technician

June 2014 – June 2017

- Prepared and assembled wiring for local firework shows
- Ensured safety standards are met

LEADERSHIP & INVOLVEMENT

Tea Institute at Penn State

January 2015 – December 2016

Director of Research, Penn State University, University Park, PA

- Conducted interdisciplinary research on development of tea material and culture
- Organized and led weekly lessons for groups of 20 students
- Coordinated international exhibitions with tea scholars from overseas.

Languages and Skills

English- Native

Spanish- Proficient (10+ years experience)

Computer Skills

LINUX/UNIX

Python

Microsoft Office

Adobe Photoshop

SolidWorks

Slurm

Plink

VMD

MySQL

R

Minitab

Perl

Eigensoft

TreeMix

AdmixTools