

Philip J. Freda Jr.

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Education

Kansas State University, Manhattan, Kansas, 2014 – Present

- ❖ Graduate Studies (Ph.D.) in Entomology, 2014 – Present, Areas of specialization: genomics, genetics, and evolutionary biology.

Saint Joseph's University, Philadelphia, Pennsylvania, 2008 – 2014

- ❖ Graduate Studies (M.S.) in biology, 2012 – Present, Areas of specialization: evolutionary biology, bioinformatics, population genetics, and ecology. Cumulative GPA: 4.00
- ❖ Post baccalaureate studies in biology, 2009 – 2012. Cumulative GPA: 3.73

Pennsylvania State University, Abington, Pennsylvania, 2001 – 2005

- ❖ B.S. in Administration of Justice
- ❖ Minor in Sociology

Research Interests

- ❖ Speciation and genomic differentiation in sympatric species.
- ❖ Differences in gene expression across life history stages in holometabolous insects.
- ❖ The effects of global climate change on DNA sequence variation and ecological systems.
- ❖ Species migration, adaptation, and extinction in areas affected by environmental change.
- ❖ Population genetics and adaptation of migrating and invasive species.
- ❖ Changes in levels of phenotypic plasticity and DNA sequence variation across environmental gradients.

Research Experience

Graduate thesis research: Department of Biology, Saint Joseph's University, 2012 – 2014 (research advisor: Fr. John Braverman, S.J., Ph.D.)

- ❖ Estimation of temporal variation at microsatellite loci in wild-caught specimens of *Drosophila simulans*.
- ❖ Identification and analysis of DNA sequence variation temporally and geographically in *cytochrome oxidase subunit I (COI)* in wild-caught specimens of the invasive pest species *Drosophila suzukii* to understand its range expansion and local adaptation.

Post baccalaureate research: Department of Biology, Saint Joseph's University, 2010 – 2012 (research advisor: Fr. John Braverman, S.J., Ph.D.)

- ❖ Developed and implemented collection and classification protocols for wild-caught *Drosophila* species.
- ❖ Collected data on *Drosophila* species in the local area to formulate a profile of biodiversity and local adaptation.

Post baccalaureate research: Department of Biology, Saint Joseph's University, 2010 – Present (research advisor: Dr. Clint Springer, Ph.D.)

- ❖ Developed computational and analytical studies of flowering time genetics in recombinant inbred lines of *Arabidopsis thaliana* using bioinformatics tools.
- ❖ Identified and examined quantitative trait loci involved with variation observed in flowering time, in both ambient and elevated carbon dioxide levels, to assess future impacts of global climate change.
- ❖ Determined that quantitative effect varies in different environmental conditions.

Research Techniques

Molecular: PCR ❖ Gel electrophoresis ❖ Primer design ❖ DNA extraction ❖ DNA quantification ❖ DNA purification ❖ Pulsed-field gel electrophoresis ❖ Restriction digest ❖ RNAi

Bioinformatics: Sequence alignment ❖ Sequence assembly ❖ Gene annotation ❖ NCBI: BLAST ❖ Sequence variation statistical analysis ❖ QTL mapping

Ecological and Organismic: Organism collection and trapping (*Drosophila*) ❖ *Drosophila* rearing and maintenance

Teaching Experience

GK-12 Teaching Fellow: Wagner Free Institute of Science, Philadelphia, PA, 2012-Present

- ❖ Instruction of hands-on science lessons in Philadelphia school district elementary classrooms and on educational field trips.
- ❖ Preparation of classroom materials, experiments, and lesson plans.
- ❖ Collaboration with classroom teachers, full-time museum staff, and other graduate fellows to facilitate activities, field trips, and learning.

Laboratory Research Assistant: Department of Biology, Saint Joseph's University, 2012-Present

- ❖ Instruction of laboratory protocols and experimentation procedures to undergraduate researchers.
- ❖ Preparation and instruction of laboratory discussions and workshops.
- ❖ Drafting of laboratory protocols and notebooks.

Intern: Noyce Scholarship Program, Philadelphia School District's Summer Bridge Program, summer 2010.

- ❖ Taught lectures on evolution, general biology, physics, ecology, and astronomy.
- ❖ Collaborated with teachers and fellow interns on pedagogical approaches and lesson plans.
- ❖ Instilled appreciation of the sciences and of nature in students entering high school.

Teacher's Assistant: Biology I – Cells Lab: Department of Biology, Saint Joseph's University, 2010

- ❖ Assisted in laboratory maintenance, grading, and conceptual ideas.
- ❖ Aided students in understanding concepts and goals of the curriculum.

Publications and Presentations

Freda, P. and Braverman, J. 2013. *Drosophila suzukii*, or Spotted Wing Drosophila, Recorded in Southeastern Pennsylvania, U.S.A. *Entomological News*, 123(1), 71-75.

Freda, P. and Braverman, J. 2013. An efficient, practical, and reliable *Drosophila* trap. *Drosophila Information Service*, 96, 199-201.

Freda, P. and Braverman, J. 2013. Temporal Study of Genetic Variation at *COI* in a Wild Population of *Drosophila suzukii*. Unpublished manuscript in preparation.

Springer, C. J., Freda, P. J., Healy, B. E., Ward, J. K. and Braverman, J. M. 2013. QTL Analysis Reveals Novel Loci for Plant Development and Reproductive Traits under Elevated CO₂ in *Arabidopsis thaliana*. Unpublished manuscript in preparation.

Gene annotation research project: Genomics Education Partnership (GEP), Saint Joseph's University, 2012

- ❖ Participated in a collaborative effort including a growing number of institutions and the Biology Department and Genome Center of Washington University in St. Louis.
- ❖ The project's goal, using a wide range of bioinformatics tools, is to annotate *Drosophila erecta* genes using the genome of *D. melanogaster* as a reference.
- ❖ Personally submitted annotation reports for three *D. erecta* protein coding genes to the GEP.
- ❖ Publication in preparation.

Meghan M. M., London, S. C., Angelucci, V. C., Burke, S. M., Del Buono, M., Dell'Arciprete, A. M., Eastman, J. M., Freda, P. J., Giacobbo, A. J., Harrison, J. N., Leconey, B. A., Martino, V. L., Mengel, T. A., Patel, C. V., Puetz, W. J., Robinson, L. M., Senss, A. M., Southwell, M. J., Thelmo, F. L., Turro, K. N., Vilbert, A. C., Weiss, W., King-Smith, C., Braverman, J. and Lee-Soety, J. Y. Estimating Phage Genome Sizes by Pulsed-Field Gel Electrophoresis for Preliminary Cluster Identification. Poster presentation. Fifth Annual SEA-PHAGES Symposium. Janelia Farm Research Campus, Ashburn, VA. June 7-9, 2013.

Castro, R., DiMeglio, M., Freda, P. and Braverman, J. 2013. *Drosophila* Biodiversity on the Campus of Saint Joseph's University. Sigma Xi Research Symposium Poster, Saint Joseph's University, April 19th, 2013.

Freda, P. and Braverman, J. 2012. *Drosophila* Biodiversity on the Campus of Saint Joseph's University. Sigma Xi Research Symposium Poster, Saint Joseph's University, April 13th, 2012.

Freda, P., Springer, C. and Braverman, J. 2011. Computational Study of Flowering Time Genetics with QTL Cartographer. Sigma Xi Research Symposium Poster, Saint Joseph's University, April 8th, 2011.

Columnist, "Practical Science with Phil Freda" - Patch.com, Upper Moreland-Willow Grove Patch, 2010-2012: uppermoreland.patch.com/users/philip-freda

- ❖ *Articles available upon request*

Grants and Fellowships

- ❖ HHMI funding for graduate assistantship
- ❖ HHMI funding for GeoKids LINKS (GK-12) Fellowship

Relevant Coursework

Evolution

Bioinformatics

Organismal Biology

Cell Biology

Genetics

General Chemistry I and II

General Physics I and II

Graduate Seminar*

Microbiology

Research Techniques

Global Climate Change and Disease

Biology of Insects

Molecular Genetics

Organic Chemistry I and II

Applied Calculus

*Topics: Interspecific chemical communication ❖ Biological structures ❖ Biotechnology ❖ Foundational papers

Awards/Honors

- ❖ Kansas State University – Timothy R. Donoghue Graduate Scholarship, June 2014
- ❖ Saint Joseph's University – Biology Graduate Award Recipient, May 2014

Professional Memberships

- ❖ Alpha Epsilon Lambda: Graduate Students Honor Society: Lifetime Member, 2014 – Present
- ❖ Sigma Xi: The Scientific Research Society: Associate Member, 2013 – Present

Extracurricular Activities

- ❖ Review Service: Journal of Pest Science, 2014
- ❖ Member of Saint Joseph's University's 2014 Commencement Speaker Committee
- ❖ Participant in the Northeast Spotted Wing Drosophila Working Group Meeting, 2013
- ❖ Recruitment Representative for Saint Joseph's University's Graduate Arts and Sciences Program (Loyola University Maryland - Biology Career Workshop and Fair, 2013)

Technical Proficiencies

- ❖ Proficient in most operating systems including Windows 2000/XP/Vista/7/8, Mac OSX, and LINUX/UNIX (Ubuntu).
- ❖ Bioinformatics software knowledge includes QTL Cartographer, Mesquite, Geneious, MEGA, DnaSP, Arlequin, STRUCTURE, NCBI Blast, and Flybase.
- ❖ General software knowledge includes MS Office, SPSS statistical software, and SigmaPlot statistical software.

References available upon request