

Patrick François Reilly

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802.310.6977

Education

- **Princeton University – Princeton, NJ, USA** **Sept. 2014 – Jan. 2020**
 - PhD in Quantitative and Computational Biology
- **Johns Hopkins University – Baltimore, MD, USA** **Sept. 2013 – May 2014**
 - Online candidate for Master of Science in Bioinformatics
- **University of Michigan-Dearborn – Dearborn, MI, USA** **Sept. 2010 – April 2013**
 - Bachelor of Science in Biological Sciences, Minors in Chemistry, History, Physics
- **Henry Ford Community College – Dearborn, MI, USA** **Jan. 2010 – May 2010**
 - Courses: Medical Terminology, Medical Pharmacology, Anatomy and Physiology
- **University of Michigan-Dearborn – Dearborn, MI, USA** **Sept. 2009 – April 2010**
 - Candidate for Bachelor of Science in Software Engineering

Work Experience

- **Yale University – New Haven, CT, USA** **Sept. 2020 – Present**
Postdoctoral Associate in Human Evolutionary Genomics
PI: Serena Tucci
 - Ongoing project examining population structure, demographic inference, and identification of introgression from archaic hominins in hundreds of whole genomes from diverse populations across Oceania
 - Ongoing project looking at the distribution and function of structural variation in the genomes of Oceanic individuals
 - Collaboration identifying tracts of archaic introgression in a high-coverage whole genome sequence of an ancient human
- **Princeton University – Princeton, NJ, USA** **Sept. 2014 – Jan. 2020**
Doctorate in Quantitative and Computational Biology
Advisor: Peter Andolfatto
 - Produced highly-contiguous genome assemblies for *Drosophila santomea*, *D. simulans*, *D. teissieri*, *D. yakuba*, and *Papilio glaucus* from PacBio® libraries, revealing the extent and age of genome rearrangement among closely-related species
 - Analyzed the variation in genetic diversity and evolutionary constraint between *Drosophila* species with widely varying population sizes using large whole genome resequencing datasets
 - Collaborated on demographic modeling of *D. santomea*, an island endemic species that follows a “microenvironment” model of many small isolated subpopulations
 - Identified and characterized four segregating inversions in *D. yakuba*, and examined their effects on the structuring of nucleotide variation as well as gene expression variation across chromosomal arrangements
 - Collaborated on projects involving morphological trait variation between the domestic silkworm *Bombyx mori* and its wild progenitor *B. mandarina*, including generating a de novo assembly of *B. mandarina*
 - Other collaborations on mapping ecologically-important traits (diapause and female color morph) in *P. glaucus* and *P. canadensis*, as well as the genomic patterns of differentiation between the species (notably a bias in differentiation toward the sex chromosome relative to the autosomes)
- **University of Michigan-Dearborn – Dearborn, MI, USA** **Feb. 2012 – June 2013**
Research Lab Assistant (non-remunerated)
Advisor: Emily Saarinen
 - Performed DNA extractions, DNA replication, computational microsatellite detection, primer design, and analysis of microsatellite data from a variety of Lepidopterans for conservation genetics purposes

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- Collaborated with computer cluster facility staff to mine microsatellites from the sequence data of 13 species and optimize the speed of the mining program
- Notable species analyzed: *Oarisma poweshiek* (Poweshiek skipperling) and *Lycaeides melissa samuelis* (Kamer Blue butterfly)

Publications

- **Review article** – PF Reilly, A Tjahjadi, SL Miller, JM Akey, S Tucci (2022) “The contribution of Neanderthal introgression to modern human traits” *Current Biology*
- **Journal article** – DL Powell, M Garcia, M Keegan, P Reilly, K Du, AP Diaz-Loyo, S Banerjee, D Blakkan, DE Reich, P Andolfatto, GG Rosenthal, M Scharl, M Schumer (2020) “Natural hybridization reveals incompatible alleles that cause melanoma in swordtail fish” *Science*
- **Journal article** – Y Liu, M Ramos-Womack, C Han, P Reilly, K LaRue-Brackett, W Rogers, TM Williams, P Andolfatto, DL Stern, M Rebeiz (2019) “Changes throughout a genetic network mask the contribution of Hox gene evolution” *Current Biology*
- **Journal article** – L Gu, PF Reilly, JJ Lewis, RD Reed, P Andolfatto, JR Walters (2019) “Dichotomy of dosage compensation along the neo-Z chromosome of the monarch butterfly” *Current Biology*
- **Journal article** – EV Saarinen, PF Reilly, JD Austin (2016) “Conservation genetics of an endangered grassland butterfly (*Oarisma poweshiek*) reveals historically high gene flow despite recent and rapid range loss” *Insect Conservation and Diversity*

In Prep

- **Article in prep** – PF Reilly, M Chakraborty, C Han, JJ Emerson, P Andolfatto (in prep) “Inversions structuring genetic variation in *Drosophila yakuba*”
- **Article in prep** – PF Reilly, C Han, P Andolfatto (in prep) “Variant calling error rate estimation for non-model organisms”
- **Article in prep** – PF Reilly, KC Deitz, M Chakraborty, JJ Emerson, P Andolfatto (in prep) “Chromosome scale de novo assemblies of the *Drosophila yakuba* group”
- **Article in prep** – C Han, PF Reilly, KC Deitz, DR Matute, P Andolfatto (in prep) “Revealing subtleties of population structure and demographic history through tracts of identity-by-descent: a case study of *Drosophila santomea*”
- **Article in prep** – M Aardema, PF Reilly, JM Scriber, P Andolfatto (in prep) “Genomic patterns underlying the genetic and phenotypic differentiation of the parapatric hybridizing butterflies: *Papilio canadensis* and *P. glaucus*”
- **Article in prep** – M Gutin, AM Taverner, T Kiuchi, PF Reilly, T Shimada, P Andolfatto (in prep) “Genetic architecture of caudal horn evolution in silkworm”

Teaching

- **Co-Instructor, Yale Undergraduate Workshop on Ancient DNA and Bioinformatics Methods**
Yale University, Summer 2021
- **Teaching Assistant, Introduction to Genomics and Computational Biology (QCB 455)**
- **Teaching Assistant and Guest Lecturer, Human Genomics (ISC 326)**
- **Teaching Assistant, Research Topics in QCB (QCB 302)**
Princeton University, Fall 2016 – Fall 2018
- **Lecturer and Section Instructor (Math and Biology courses)**
Princeton Teaching Initiative, June 2015 – January 2018

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Fellowships, Grants, Awards

- **Endowed Postdoctoral Fellowship in the Biological Sciences** – Yale University – 2021
- **Rosemary Grant Award** – Society for the Study of Evolution – March 2016
- **The G. Wallace Ruckert '30 Fellowship** – Princeton University – Sept. 2015

Memberships

- American Society for Human Genetics (since 2022)
- Society for Molecular Biology and Evolution (since 2017)
- Society for the Study of Evolution (since 2015)
- Genetics Society of America (since 2015)