Fernan Rodrigo PÉREZ-GÁLVEZ, PhD

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Biotechnology researcher with 7 years of experience in genetic engineering, specializing in risk assessment of genetically modified insects for pest management.

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1. *Academic Degrees & Research Positions*

I. Postdoctoral Associate (2023 – present)
   i. *Development of experimental protocol for gene editing of the Caribbean fruit fly Anastrepha suspensa with CRISPR-Cas9 technology.*
   ii. Center for Medical, Agricultural and Veterinary Entomology, Agricultural Research Service, US Department of Agriculture in agreement with University of Florida, Gainesville, FL, USA

II. PhD, Zoology: Entomology (2018 – 2023)
   i. *Establishing biological assays for environmental risk assessment of transgenic insects in the model organism Drosophila melanogaster, the common fruit fly.*
   ii. University of Kentucky, Lexington, KY, USA

III. MSc Plant Biotechnology (2015 – 2017)
   i. *Population genetics of migratory and nonmigratory populations of the Monarch butterfly, Danaus plexippus, in Mexico.*
   ii. Unidad de Genómica Avanzada, Centro de Investigaciones y Estudios Avanzados, Guanajuato, México

IV. BSc Biotechnology: Bioprocess engineering (2011 – 2014)
   i. *Whey fermentation for ethanol biosynthesis in yeast and bacteria co-culture.*
   ii. Instituto Tecnológico y de Estudios Superiores de Monterrey, Querétaro, México

2. *Technical Proficiency*

I. Molecular biology
   i. Molecular design for CRISPR-Cas9 gene editing system
   ii. Design and troubleshooting of conventional and quantitative PCR

II. Data analysis
   i. Experimental design of
   ii. Generalized Linear Models
   iii. Computational automatization of visually scored bioassays
   iv. Classical population genetics

v. Population genomics of pool-sequencing experiments

III. Bioassays
   i. Microinjection of fruit flies for gene editing
   ii. Genetic segregation analysis with animal husbandry schemes
   iii. Continuous culture of insects for long term experimental evolution assays
   iv. Thermal sensitivity of small invertebrates

IV. Leadership
   i. Project management of compact teams
   ii. Goal oriented mentoring
   iii. Effective verbal and written communication

3. *Academic Publications*

I. Accepted in The Proceedings of the Royal Society B. DOI: 10.21203/rs.3.rs-5183317/v1
   i. *Abiotic environments can modify the penetrance of a transgene-based lethality system for genetic biocontrol of insect populations.*
   ii. Fernan R. Perez-Galvez, Alfred M. Handler, Daniel A. Hahn, Justin P. Bredlau, Nicholas M. Teets. (2024)

II. Journal of Experimental Biology 226(22) DOI: 10.1242/jeb.246548
   i. *Scoring thermal limits in small insects using open-source, computer-assisted motion detection.*
   ii. Fernan R. Perez-Galvez, Sophia Zhou, Annabelle C. Wilson, Catherine L. Cornwell, David N. Awde, Nicholas M. Teets (2023)

III. University of Kentucky Libraries DOI: 10.13023/etd.2023.147
   i. *Ecological risk assessment of transgenic conditional lethality systems for genetic biocontrol strategies.*
   ii. Fernan R. Perez-Galvez & PhD Thesis Advisor: Nick Teets. (2023)

IV. Journal of Visualized Experiments. DOI: 10.3791/61186-v
   i. *High-Throughput Assays of Critical Thermal Limits in Insects.*
   ii. David N. Awde, Tatum E. Fowler, Fernan Pérez-Gálvez, Mark J. Garcia, Nicholas M. Teets (2020)

V. Journal of Heredity, Volume 108(2) DOI:10.1093/jhered/esw071
   i. *Population Genetics of Overwintering Monarch Butterflies, Danaus plexippus (Linnaeus), from Central Mexico Inferred from Mitochondrial DNA and Microsatellite Markers.*
   ii. Edward Pfeiler, Nestor O Nazario-Yepiz, Fernan Pérez-Gálvez, Cristina A. Chávez-Mora, Mariana Ramírez Loustalot-Laclette, Eduardo Rendón-Salinas, Therese A. Markow (2016)

4. *Conference Presentations*

I. Target genes for male sterility, sexing and visible markers in *Drosophila suzukii* and *Anastrepha suspensa* (team presentation)
   i. Fourth Research Coordination Meeting of the Joint FAO/IAEA Programme of Nuclear Techniques in Food and Agriculture “Generic approach for the development of genetic sexing

strains for SIT applications". Vienna, Austria (virtual). *December 2024*

II. Ecological risk assessment of transgenic conditional lethality systems for genetic biocontrol strategies
   i. Seminar series at the Center for Medical, Agricultural and Veterinary Entomology of the United States Department of Agriculture. Gainesville, FL, USA. *August 2023*

III. Evolutionary response to genetic biocontrol using embryonic conditional lethality in continuous populations of *Drosophila melanogaster*
   i. Genetic Biocontrol: a Gordon Research Conference. Ventura, CA, USA *June 2022*

IV. Computational estimation of biological activity in thermal performance bioassays
   i. Entomological Society of America. Denver, CO, USA. *November 2021*

V. Computer assisted analysis to improve throughput and precision of knockdown time assays
   i. Society for Integrative and Comparative Biology. Virtual meeting. *January 2020*

VI. Efficacy of transgenic conditional lethality under environmental stress in *Drosophila melanogaster*
   i. Entomological Society of America. St. Louis, MO, USA November 2019

VII. Population genetics of the monarch butterfly, *Danaus plexippus*, in México
   i. 1st Mexico Population Genomics Meeting. Irapuato, Guanajuato, Mexico. *January 2015*

5. *Poster Sessions*

I. Computer Assisted analysis to improve throughput and precision of knockdown time assays.
   i. Entomological Society of America. Virtual meeting. 2020

II. Genetic and Environmental Factors Influencing the Efficacy of Transgenic Sterile Insect Technique.
   i. Society for Integrative and Comparative Biology. Tampa, FL, USA. 2019

III. Population genetics of mitochondrial and nuclear genes in migratory and nonmigratory populations of the Monarch Butterfly, *Danaus plexippus*, in Mexico.
   i. Días académicos. Irapuato, Guanajuato, Mexico. 2017

IV. Population genetics of the monarch butterfly, *Danaus plexippus*, in Mexico.
   i. Genetic Society of America. Orlando, FL, USA. 2016

6. *Teaching*

I. Guest lecture: Gene editing and gene drives.
   i. ABT 460 Fall 2022, University of Kentucky

II. Teaching Assistant in Laboratory: Experimental Methods in Biotechnology.
   i. Faculty observer Dr. Tonja Fisher
   ii. ABT 495 Fall 2021, University of Kentucky

III. Guest lecture: Molecular genetics and agriculture.
   i. ABT 460 Fall 2020, University of Kentucky

7. Mentoring

I. Sophia Zhou
   i. *Computational estimation of critical thermal maxima along a diverse panel of arthropods.*
   ii. Math, Science and Technology Center (2022-2023) Dunbar High School, KY

II. Cisco Hadden
   i. *Introgression of genomic background to a conditional lethal transgenic fruit fly.*
   ii. Pre-Engineering Program 2021-2022, Lafayette High School, KY

III. Catherine Cornwell
   i. *Portable Observation Station for Biological Activity Estimation.*
   ii. ENT 395 Undergraduate Research Project Spring 2022, University of Kentucky

IV. Annabelle Wilson
   i. *A Computational Approach to Thermal Tolerance Measurements*
   ii. ABT 395 Undergraduate Research Project Fall 2021, University of Kentucky

V. Kaitlin Donlon
   i. *Design of small insect observation arena.*
   ii. Summer Research ThermoFly Summer 2021, University of Kentucky

VI. Angelica Garza
   i. *Influence of temperature on mating competitiveness of transgenic flies.*
   ii. ABT 395 Undergraduate Research Project Spring 2021, University of Kentucky

VII. Katelyn Collins
   i. *Protocol development of continuous culture of Drosophila melanogaster*
   ii. Undergraduate Research mentoring Spring-Fall 2020, University of Kentucky

VIII. Taylor Sturgill
   i. *Protocol development of continuous culture of Drosophila melanogaster*
   ii. Undergraduate Research mentoring Fall 2019, University of Kentucky

IX. Tutoring of High School Chemistry
   i. 2015 - 2017 Math Kü. Irapuato, Guanajuato.

8. Awards

I. Pillar Award for Belonging and Engagement (*April 2021*)
   i. University of Kentucky Graduate Student Congress

II. Travel Award (*July 2016*)
   i. Genetics Society of America

9. *Student Leadership & Involvement*

I. Representative of GPSO Entomology (2022-2023)
   i. Graduate Student Congress at the University of Kentucky

II. Treasurer (2020-2022)
   i. Garman H. Entomology Club at the University of Kentucky

III. Lead Editor, project manager of *International Student Handbook (2020-2021)*
   i. International Students Concerns Committee from the Graduate Student Congress at the University of Kentucky

IV. Representative at the Inclusion, diversity, and equity committee (2020-2021)
   i. Department of Entomology, University of Kentucky

10. *Science Communication*

I. Script writing & Spanish Translation
   i. Infographic May Bugs and Plant Health May 2020.
   ii. Department of Plant Pathology. University of Kentucky

II. TED Education Lesson Do we really need pesticides?
   i. Co-authored with TedEd developing team and animation studio MightyOak
   ii. https://ed.ted.com/lessons/do-we-really-need-pesticides-fernan-perez-galvez

III. Public engagement
   i. Paleo genómica y microbiología. Día Abierto CINVESTAV-Irapuato. 23° Semana Nacional de Ciencia y Tecnología.

IV. Online translator
   i. Coursera Global Translator Community
   ii. English to Spanish of +1400 strings of educational material.

11. *Languages*

I. Spanish (native)

II. English (TOEFL iBT 107/120)

REFERENCES

Alfred Handler	Postdoctoral appointment supervisor	ahandler@ufl.edu
Nicholas Teets	Doctoral dissertation advisor, mentor	n.teets@uky.edu
Tonja Fisher	ABT495 Teaching assistant faculty observer	Tonja.Fisher@uky.edu