MATTHEW CAPEK

Harvard University
Dept. of Molecular and Cellular Biology
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RESEARCH

Postdoctoral Fellow October 2025 – present	Harvard University Advisor: Dr. Nicholas Bellono
Graduate Student Fellow August 2019 – November 2025	Northwestern University Advisor: Dr. Marco Gallio
Post-Baccalaureate Fellow July 2017 – July 2019	Northwestern University Advisor: Dr. Chad Mirkin
Undergraduate Researcher January 2015 – June 2017	Purdue University Advisor: Dr. David H. Thompson

EDUCATION

Ph.D. — Biological Sciences, Northwestern University, Evanston, IL 2019 – 2025
Interdisciplinary Biological Sciences (IBiS) Graduate Program

Post-Bac Certificate – Biological Sciences, Northwestern University, Evanston, IL 2017 – 2019

B.S. — Chemistry (Honors), Purdue University, West Lafayette, IN 2013 – 2017

PUBLICATIONS

Matthew Capek, Richard Suhendra, …, John Tuthill, …, William Kath, Alessia Para, Marcus C. Stensmyr, Marco Gallio. (**2025**). "Comparative genomics reveals mechanisms of adaptation to extreme cold temperature in the snow fly *Chionea alexandriana"*. **In preparation.**

Matthew Capek, Oscar M. Arenas, Michael H. Alpert, Emanuela E. Zaharieva, Iván D. Méndez-González, José Miguel Simões, Hamin Gil, Aldair Acosta, Yuqing Su, Alessia Para, Marco Gallio. (**2025**). "Evolution of temperature preference in flies of the genus *Drosophila"*. ***Nature***. https://doi.org/10.1038/s41586-025-08682-z.

Nadia Melo, **Matthew Capek**, Oscar M. Arenas, Ali Afify, Ayse Yilmaz-Heusinger, Chris Potter, Peter J. Laminette, Alessia Para, Marco Gallio, and Marcus C. Stensmyr. (**2021**). "The irritant receptor TRPA1 mediates the mosquito repellent effect of catnip". ***Current Biology***. 31 (9), 1988-1994. https://doi.org/10.1016/j.cub.2021.02.010.

Adam Ponedal, Shengshuang Zhu, Anthony J Sprangers, Xiao-Qi Wang, David C Yeo, Daniel CS Lio, Mengjia Zheng, **Matthew Capek**, Suguna P Narayan, Brian Meckes, Amy S Paller, Chenjie Xu, and Chad A Mirkin (**2020**). "Attenuation of Abnormal Scarring Using Spherical Nucleic Acids Targeting Transforming

Growth Factor Beta 1". ***ACS Applied Bio Materials***. 3, 8603-8610. https://doi.org/10.1021/acsabm.0c00990.

GRANTS & AWARDS

2024 **Rappaport Award for Research Excellence**
Interdisciplinary Biological Sciences (IBiS) Graduate Program, Northwestern University

2023 – 2026 **Individual NRSA Predoctoral Fellowship** – NIH/NINDS F31 NS129270
Comparative Approaches for the Study of Somatosensory Processing in Drosophila

2021 – 2023 **T32 Institutional Training Grant** – NIH/NIGMS T32 GM008061
Cellular and Molecular Basis of Disease (CMBD) Training Program

2016 Undergraduate Research Summer Award, Dept. of Chemistry, Purdue University
2016 Summer Undergraduate Research Fellowship (SURF), Purdue University
2013 Alpha Lambda Delta / Phi Eta Sigma Honors Society

PRESENTATIONS

Talks

Jul 2024 15th International Congress of Neuroethology (ICN 2024) – Berlin, Germany
Sep 2024 Rappaport Award Seminar – Northwestern University, Evanston, IL
Apr 2023 Neurobiology Data Talk, Dept. of Neurobiology – Northwestern University, Evanston, IL
Sep 2022 Interdisciplinary Biological Sciences Retreat – Northwestern University, Delavan, WI
Sep 2021 Interdisciplinary Biological Sciences Retreat – Northwestern University, Delavan, WI

Posters

Apr 2025 Neurobiology in Changing Environments (Kavli Foundation & Allen Institute) – Seattle, WA
Oct 2024 Society for Neuroscience (SfN) Conference – Chicago, IL
Mar 2023 64th Annual Drosophila Research Conference – Chicago, IL
Jun 2022 Cellular and Molecular Basis for Disease Symposium – Chicago, IL
Nov 2021 50th Annual Society for Neuroscience (SfN) Conference – Virtual
Jul 2016 Summer Undergraduate Research Fellowship (SURF) Symposium – West Lafayette, IN

TEACHING, MENTORING, & OUTREACH

Laboratory Mentorship

2023-present Yuqing Su – Masters Student – Gallio Lab
2022-2023 Leonardo Pinzón – Post-Baccalaureate Fellow – Gallio Lab
Currently: PhD student, Northwestern University
Daniel Bennett – Technician – Gallio Lab
Currently: PhD student, Northwestern University
Blair Li – Masters Student – Gallio Lab
Currently: Clinical Research Assistant
Cindy & Sherry Song – High School Students – Gallio Lab
2021-2022 Sumiran Kher – Masters Student – Gallio Lab
Currently: Quality Manager at Epic Systems
Ethan Mesina – High School Student – Gallio Lab

Currently: Undergraduate, Vanderbilt University

Teaching

Teaching Assistant, Cellular & Molecular Processes Laboratory (NU BIO233) Winter 2022

- Lead two laboratory sections of 24 undergraduate students each, guiding students in *C. elegans* cellular and molecular biology research techniques, how to be rigorous in research, logically interpret and communicate results, and write an NRSA-like research proposal. Received excellent teaching evaluations (5.42/6).

Teaching Assistant, Molecular Biology (NU BIO201) Spring 2021

- Assisted in teaching a large lecture class in molecular biology, as part of an entirely new curriculum and instruction team under pandemic restrictions to more than 500 undergraduate students. Received excellent teaching evaluations (4.87/6).

Leadership & Outreach

- Organized the annual student-led symposium for the Cellular and Molecular Basis of Disease (CMBD) Training Grant at Northwestern University. (Northwestern, June 2021 and June 2022).
- Volunteered at various recruitment events hosted by the Interdisciplinary Biological Sciences (IBiS) Program, engaging with prospective students and sharing my insights about the PhD program and how to prepare for a career in academic research. Volunteered in the Peer Mentor program for incoming 1st year graduate students (Northwestern, 2021-2023).
- National Chemistry Week, American Chemical Society: taught basic science concepts and gave chemistry demonstrations in multiple elementary school classrooms in the Lafayatte, IN area (Purdue, 2015-2016).
- Served as the Vice President & Vice Master of Ceremonies of Alpha Chi Sigma Professional Chemistry Fraternity, Beta Nu Chapter (Purdue, 2016-2017) and the Service & Fundraising Chair of Purdue University Geological Society (Purdue, 2013-2014).

TECHNICAL SKILLS

Cell culture	*insect cell culture, mammalian cell culture, sterile technique, transfections, cell viability assays*
Physiology	*in vitro whole-cell patch clamp electrophysiology with HEK293, CHO, and S2R+ cell lines*
Microscopy/ Histology	*light, fluorescence, and confocal microscopy, 2-photon imaging, immunohistochemistry, fluorescence in situ hybridization (FISH)*
Behavior	*Drosophila 2-choice temperature preference assays, optogenetic behavioral assays*
Surgery	*adult and larval Drosophila dissection (brain, VNC, antennae, imaginal discs, etc), Drosophila embryo microinjenction, Drosophila brain circuit mapping via electroporation*
Molecular Biology/ Genetics	*PCR genotyping, agarose gel electrophoresis, SDS-PAGE, molecular cloning, DNA & RNA extraction, qPCR, in vitro reverse transcription, Drosophila genetics/husbandry, CRISPR, attP/attB transgenesis, piggyBac transgenesis*
Chemistry	*solid-phase organic synthesis, HPLC, mass spectrometry, UV/Vis spectrophotometry, click chemistry, dynamic light scattering, microfluidic devices*
Computational/ Software	*MATLAB, Python, R, Adobe CC, ImageJ/FIJI, Geneious, Endnote, Cluster Computing, RNAseq analysis, Neural circuit reconstructions, Genome annotation*