Lydia J. Borjon, Ph.D.

Biology Department, Gill Institute for Neuroscience, Indiana University
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EDUCATION

Assistant Scientist 2024 - present
Indiana University, Bloomington, IN
Department of Biology
Gill Institute for Neuroscience
Advisor: W. Daniel Tracey

Postdoctoral Fellow 2019 - 2024
Indiana University, Bloomington, IN
Department of Biology
Advisor: W. Daniel Tracey

Ph.D. in Neuroscience 2012 - 2018
Yale University, New Haven, CT
Interdepartmental Neuroscience Program
Advisor: Elena Gracheva
Committee: Slav Bagriantsev, Sulayman Dib-Hajj, Fred Sigworth, Susumu Tomita
Dissertation Title: "The role of voltage-gated sodium channels in somatosensory adaptations of hibernators"

M.Phil. in Neuroscience 2012 - 2016
Yale University, New Haven, CT
Interdepartmental Neuroscience Program
Advisor: Elena Gracheva
Prospectus Title: "Probing the contribution of Nav1.7 to cold and hypoxia tolerance in hibernators"

B.A. in Biological Sciences, and in Philosophy 2008 - 2012
with a concentration in Neurobiology & Behavior
Cornell University, Ithaca, NY
Research advisor: Andrew Bass

RESEARCH GRANTS AND FELLOWSHIPS

NIH/NIAID NRSA F32 Postdoctoral Fellowship, 5F32AI157551 2021 - 2024
NIH Training Grant T32 HG-3198-10, Genomics and Proteomics 2013 - 2015
Honorable Mention NSF Graduate Research Fellowship Program 2014

PUBLICATIONS (formerly published as L.J. Hoffstaetter)

Lindsey A.R.I., Lue C., Davis J.S., **Borjon L.J.**, Mauthner S.E., Fricke L.C., Eads L., Murphy M., Drown M.K., Faulk C., Buffington M.L., Tracey W.D. Genomics and reproductive biology of Leptopilina n. sp. Buffington, Lue, Davis & Tracey sp. nov. (Hymenoptera: Figitidae): An asexual parasitoid of Caribbean Drosophila. bioRxiv 2025.03.28.645512 [Preprint] doi: https://doi.org/10.1101/2025.03.28.645512 (*under review*)

Borjon L.J., de Assis Ferreira L.C., Trinidad J.C., Šašić S., Hohmann A.G., Tracey W.D. Multiple mechanisms of action for an extremely painful venom. *Current Biology*. 2025. doi: 10.1016/j.cub.2024.11.070

Borjon L.J., Mauthner S.E., Tracey W.D. Nociception in *Drosophila* Larvae. *Cold Spring Harb Protoc.* 2024. doi: 10.1101/pdb.top108172

Mauthner S.E., **Borjon L.J.**, Tracey W.D. Assaying Nociception Behaviors in *Drosophila* Larvae During Parasitoid Wasp Attacks. *Cold Spring Harb Protoc.* 2024. doi: 10.1101/pdb.prot108129

He L., **Borjon L.J.**, Tracey W.D. The motor pattern of rolling escape locomotion in *Drosophila* larvae. bioRxiv 2022.11.03.514605. [Preprint] doi: doi.org/10.1101/2022.11.03.514605

Hoffstaetter L.J., Mastrotto M., Merriman D.K., Dib-Hajj S.D., Waxman S.G., Bagriantsev S.N., Gracheva E.O. Somatosensory neurons enter a state of altered excitability during hibernation. *Current Biology* 2018, 28(18):2998-3004

Hoffstaetter L.J., Bagriantsev S.N., Gracheva E.O. TRP's et al.: a molecular toolkit for thermosensory adaptation. *Pflugers Arch – Eur J Physiol* 2018, 470(5):745-759

Laursen W.J., Anderson E.O., **Hoffstaetter L.J.**, Bagriantsev S.N.**,** Gracheva E.O. Species-specific temperature sensitivity of TRPA1. *Temperature* 2015, 2:2 214-226

PRESENTATIONS

Invited Talks

University of Houston, Houston, TX. "Mechanism of nociception in the context of insect parasitism." Mar. 2024

Baylor College of Medicine, Houston, TX. "Mechanisms of Nociception: Comparative biology meets model system." Sep. 2023

Genomics Education Partnership research seminar, virtual, "The link between pain and the immune system in *Drosophila* larvae." Apr. 2022

Indiana University, Bloomington, IN. "Probing the contribution of Nav1.7 and Nav1.8 to noxious cold tolerance in hibernators." Jan. 2017

Oral Presentations

EEB Brown Bag Lunch Seminar, Indiana University, Bloomington, IN. "Understanding the neurobiology of pain through insect arms races." Nov. 2024

Gill Institute for Neuroscience Mini Symposium, Indiana University, Bloomington, IN. "Multiple mechanisms of action of an extremely painful venom." Sep. 2024

The Allied Genetics Conference, National Harbor, MD. "Velvet ant venom activates both insect and mammalian pain sensors through distinct mechanisms." Mar. 2024

Neurobiology of *Drosophila*. Cold Spring Harbor Labs, NY. "Elucidating the mechanism of action of an extremely painful venom using *Drosophila* larvae." Oct. 2023

Gill Center Retreat, New Harmony, IN. "The mechanism of action of an extremely painful venom." Aug. 2023

Drosophila Neurobiology: Genes, Circuits, and Behavior Course, Cold Spring Harbor Labs, NY. Lesson and lab module on nociception in *Drosophila* larvae. Jul. 2023

Midwest Drosophila Conference, Monticello, IL. "Velvet ant venom activates pain-sensing neurons through Pickpocket and Balboa, homologs of DEG/ENaC and ASIC channels." **Received Best Oral Presentation award, 1st place** Oct. 2022

Joint Drosophila Group Meeting research seminar, Indiana University, Bloomington, IN. "Velvet ant venom activates pain-sensing neurons through Pickpocket and Balboa, homologs of DEG/ENaC and ASIC channels." Oct. 2022

Gordon Research Symposium: Venom Evolution, Function, and Biomedical Applications, Mount Snow, VT. "Neuromodulatory effects of parasitoid wasp venoms."	Aug.	2022
Joint Drosophila Group Meeting research seminar, Indiana University, Bloomington, IN. "The link between pain and immunity in *Drosophila* larvae."	Feb.	2022
EEB Brown Bag Lunch Seminar, Indiana University, Bloomington, IN. "Effects of parasitoid wasp venoms on the fly larval nervous system."	Nov.	2021
Gill Symposium, Indiana University, Bloomington, IN. "Parasitoid wasp venom effects on the larval nervous system."	Sep.	2021
Joint *Drosophila* Group Meeting research seminar, Indiana University, Bloomington, IN. "The link between pain and immunity in *Drosophila* larvae."	Oct.	2020
IU College of Arts and Sciences Bicentennial Public Science Symposium, Indiana University, Bloomington, IN. "Learning about pain from parasitoid wasps."	Jun.	2020
International Congress for Neuroethology, Brisbane, Australia. "The contribution of voltage-gated sodium channels to sensory neuronal excitability during hibernation."	Jul.	2018
Research in Progress, Neuroscience Department, Yale University	Mar.	2018
Research in Progress, Cellular and Molecular Physiology Department, Yale University	Jan.	2017
Student Research Talk, 5th year, Interdepartmental Neuroscience Program, Yale University	Oct.	2016
Research in Progress, Program for Cellular Neuroscience, Neurodegeneration and Repair, Yale University	May	2016
Student Research Talk, 4th year, Interdepartmental Neuroscience Program, Yale University	Jan.	2016
Data blitz, NeuroDay retreat, Yale University	Aug.	2015
Student Research Talk, 3rd year, Interdepartmental Neuroscience Program, Yale University	May	2015
Student Research Talk, 2nd year, Interdepartmental Neuroscience Program, Yale University	May	2014
Student Research Talk, 1st year, Interdepartmental Neuroscience Program, Yale University	Jul.	2013

Posters (*undergraduate mentee poster presenter)

Borjon L.J., de Assis Ferreira L.C., Trinidad J.C., Šašić S., Hohmann, A.G., Tracey W.D. "Multiple mechanisms of action for an extremely painful venom." Poster presented at Annual *Drosophila* Research Conference (Mar 2025), San Diego, CA

Borjon L.J., de Assis Ferreira L.C., Trinidad J.C., Šašić S., Hohmann, A.G., Tracey W.D. "Multiple mechanisms of action of an extremely painful venom." Poster presented at QCB Retreat (Aug 2024), Gill Symposium (Sep 2024), Indiana University, Bloomington, IN; Midwest *Drosophila* Conference (Nov 2024), Monticello, IL. **Received Best Postdoc/Staff Poster award, 1st Place**

Borjon L.J., Tracey W.D. "Velvet ant venom activates pain-sensing neurons through Pickpocket and Balboa, homologs of DEG/ENaC and ASIC channels." Poster presented at Annual *Drosophila* Research Conference (Mar 2023), Chicago, IL

Borjon L.J., Armstrong N.S., Frank C.A., Tracey W.D. "Neuromodulatory effects of parasitoid wasp venoms." Poster presented at the Gordon Research Symposium and Conference: Venom Evolution, Function, and Biomedical Applications (Aug 2022), Mount Snow, VT, and Gill Symposium (Sep 2022), Indiana University, Bloomington, IN

Sasic S.*, **Borjon L.J.,** Tracey W.D. "Species Identification of Velvet Ants through DNA Barcoding." STARS Research Symposium (Apr 2022), Indiana University, Bloomington, IN

Rimawi A.*, **Hoffstaetter L.J.**, Tracey W.D. "Does the fly immune response protect it from parasitization?" Gill Center Undergraduate Poster Session (Dec 2021), Indiana University, Bloomington, IN

Sasic S.*, **Hoffstaetter L.J.,** Tracey W.D. "Identification of Potential Pain-Modulating Agents in *Leptopilina* wasp venom." STARS Research Symposium (Apr 2021), Indiana University, Bloomington, IN

Duro E.*, **Hoffstaetter L.J.,** Tracey W.D. "Painting Wings: Investigating the Role of Calcium Signaling in Butterfly Wing Phenotypic Plasticity." STARS Research Symposium (Apr 2021), Indiana University, Bloomington, IN

Duro E.*, **Hoffstaetter L.J.,** Tracey W.D. "Calcium Signaling Role in Molecular Pigmentation and Structure Coordination Systems in *Vanessa cardui*." IU Undergraduate Summer Research Symposium (Jul 2020), Indiana University, Bloomington, IN

Hoffstaetter L.J., Armstrong N.S., Frank C.A., Tracey W.D. "Investigating potential pain modulating components of parasitoid wasp venom." Poster presented at Midwest *Drosophila* Meeting (Nov 2019), Monticello, IL

Hoffstaetter L.J., Mastrotto M., Merriman D.K., Dib-Hajj S.D., Waxman S.G., Bagriantsev S.N., Gracheva E.O. "Somatosensory Neurons enter a state of altered excitability during hibernation." Poster presented at Physiology Retreat (Oct 2018), Yale University, New Haven, CT, and Gill Symposium (Sep 2019), Indiana University, Bloomington, IN

Hoffstaetter L.J., Tonsfeldt K.J., Matos-Cruz V., Bagriantsev S.N., Gracheva E.O. "Probing the contribution of Nav1.7 and Nav1.8 to cold tolerance in hibernators. "Poster presented at Neuroscience retreat (Apr 2017), Jiminy Peak, MA, and Physiology Retreat (Sep 2017), Yale University, New Haven, CT. **Received Best Senior Graduate Student Poster award**

Hoffstaetter L.J., Tonsfeldt K.J., Matos-Cruz V., Bagriantsev S.N., and Gracheva E.O. "Probing the Contribution of Nav1.7 and Nav1.8 to Cold Tolerance in Hibernators." (Mar 2016) *Biophysical Journal* 110(3): 318a. Poster presented at Biophysical Society meeting, Los Angeles, CA.

Hoffstaetter L.J., Tonsfeldt K.J., Matos-Cruz V., Schneider E.R., Bagriantsev S.N., Gracheva E.O. "Probing the contribution of Nav1.7 and Nav1.8 to cold tolerance in hibernators." Poster presented at NeuroDay retreat (Aug 2015, 2016), Physiology retreat (Oct 2015, 2016), Yale University, New Haven, CT; CNNR retreat (Apr 2016), Woods Hole, MA.

Hoffstaetter L.J., Matos-Cruz V., Bagriantsev S.N., Gracheva E.O. "Probing the contribution of Nav1.7 to cold and hypoxia tolerance in hibernators." Poster presented at NeuroDay retreat (Aug 2014), Physiology retreat (Sep 2014), Yale University, New Haven, CT, and CNNR retreat (Apr 2015), Woods Hole, MA.

Hoffstaetter L.J., Strittmatter S.M., Cafferty W.B. "An *in vivo* model to screen for novel enhancers of axon regeneration." (2013) Program no. 419.06, 2013 Neuroscience Meeting Planner. Society for Neuroscience, San Diego, CA

ACADEMIC HONORS AND AWARDS

Best Postdoc/Staff Poster, 1st Place, Midwest *Drosophila* Conference	2024
Best Oral Presentation, 1st Place, Midwest *Drosophila* Conference	2022
Drosophila Neurobiology: Genes, Circuits, and Behavior Course, Cold Spring Harbor Labs	2022
IU College of Arts and Sciences Bicentennial Public Science Symposium	2020
Conference Travel Fellowship, Yale Graduate School of Arts and Sciences	2018
3-Minute Thesis Competition, Yale University, 2nd Place and Audience Choice in STEM	2018
Best Senior Graduate Student Poster, Yale Neuroscience Retreat	2017
Editor-in-Chief Award for best article (2nd Place), *Temperature*	2015
Dean's List of Arts & Sciences for Excellent Scholarship, Cornell University	2009 - 2012
Golden Key International Honor Society Membership (by invitation)	2009

TEACHING

Guest instructor, "Quantitative and Chemical Biology Journal Club" Chem-C689, Indiana University. Three-week section on ion channel physiology	2024
Instructor of record, "Advances in *Drosophila* Genetics Research (Special topics in Zoology)" Biol-Z620, Indiana University	2023
Teaching Assistant for *Drosophila* Neurobiology: Genes, Circuits, and Behavior Course, Cold Spring Harbor Labs. Lesson and lab module on nociception in *Drosophila* larvae	2022, 2023
Volunteer Lecturer, Research showcase and lab tour, Yale Young Global Scholars	2018
Volunteer Lecturer, Science Café with Open Labs	2016
Teaching Fellow for "Introduction to Cognitive Science" Psyc130, Yale	2015
Teaching Fellow for "The Human Brain" Psyc160, Yale	2014
Volunteer Lecturer, Sensory Physiology Club, Yale Pathways to Science	2014 - 2018
Yale Brain Education Day volunteer	2013 - 2017

SERVICE

University Service

Co-organizer of Joint *Drosophila* Group Meeting, Indiana University	2023
Co-organizer of Physiology Retreat, Yale West Campus	2014, 2016
Co-organizer of Genomics and Proteomics Training Grant Outreach event, Seminar, Yale	2014, 2015
Co-organizer of Student-Faculty Lunches, Yale	2013 - 2014

Public Service

Poster Judge, Midwest *Drosophila* Conference	2022
Executive Co-chair, Postdoc Association at Indiana University Bloomington (PAIUB)	2020 - 2022
Judge for final round of 3-Minute Thesis Competition, Indiana University	2022, 2023
Judge for preliminary round of 3-Minute Thesis Competition, Indiana University	2020, 2021
Founding board member, Governance Committee Leader, PAIUB	2019 - 2020
President, Career Network for Student scientists and Postdocs at Yale (CNSPY)	2017 - 2018
Director of Communications, CNSPY	2016 - 2017
Student Representative, INP Curriculum Committee	2016
Science Fair Judge Volunteer, Southern Connecticut Science & Engineering Fair and New Haven Public School Science Fair	2013
Volunteer, Ithaca Sciencenter, Ithaca NY	2011

Peer Review

Genetic Society of America (GSA) Early Career Reviewer for *GENETICS*	2022 - 2024
Indiana Clinical and Translational Science Institute (CTSI) Postdoc Challenge	2021

MENTORING

Mentor, Women in Science at Yale (WISAY)	2016 - 2017

Undergraduate Students

Grace Terceira, undergraduate, IU	F 2024 - S 2025
Nicole Nguyen, undergraduate, IU	F 2022 - S 2024
Amin Rimawi, undergraduate, Wells Scholar, IU Now: Medical Student, IU Indianapolis	S 2020 - S 2023
Suki Sasic, undergraduate, STARS, IU; awarded Fleischer Research Scholarship Now: Medical Student, IU Bloomington	F 2019 - S 2023

Sage Hamm, undergraduate, Wells Scholar, IU Now: Fulbright Fellow in Music Studies, Japan	F 2019 - S 2023
Eduardo Duro, undergraduate, STARS, IU; awarded Advanced Summer Research Scholarship, awarded Goldwater Scholars Award, undergraduate honors thesis Now: Medical Student, IU Indianapolis	F 2019 - S 2022
Maggie Kovalan, undergraduate, Hutton Honors College, IU Now: Medical Student, IU Notre Dame	F 2019 - S 2020
Katie Dongoski, undergraduate, IU Now: Master's Student, Medical Nutrition, Arizona State University	S 2019
Nadia Irwanto, WISAY undergraduate mentee, Yale Now: Software Engineer	2016 - 2017

LANGUAGES

Fluent in English and German. Basic proficiency in French.

REFERENCES

W. Daniel Tracey
Professor of Biology
Linda and Jack Gill Chair of Neuroscience
Multidisciplinary Science Building II
702 N. Walnut Grove St
Indiana University
Bloomington, IN 47405
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Elena Gracheva
Associate Professor of Cellular & Molecular Physiology, and of Neuroscience
Yale School of Medicine
333 Cedar Street
New Haven, CT 06510
203-785-3992
elena.gracheva@yale.edu

C. Andrew Frank
Associate Professor of Anatomy and Cell Biology
Carver College of Medicine, University of Iowa
Bowen Science Building
Iowa City, IA 52242
319-384-1193
andy-frank@uiowa.edu