Nathaniel J. Himmel, PhD

Curriculum Vitae

EDUCATION

PhD	**Neuroscience**, Georgia State University, Atlanta, GA, USA	Dec 2021
BS	**Biology**, University of Florida**,** Gainesville, FL, USA	April 2013
AA	**Biological Sciences**, Santa Fe College, Gainesville, FL, USA	July 2011

RESEARCH TRAINING & APPOINTMENTS

Postdoctoral Fellow, Université de Lausanne, Lausanne, Switzerland — Feb 2022 –
PI: Richard Benton, PhD FRS

Visiting Scholar, North Carolina State University, Raleigh, NC, USA — Nov 2021
PI: Nicolas Buchler, PhD

Graduate Research, Georgia State University, Atlanta, GA, USA — Aug 2015 – Jan 2022
PI: Daniel Cox, PhD
Rotation with Paul Katz, PhD (2015)
Rotation with Gwen Frishkoff, PhD (2015)

Research Technician, Emory University, Atlanta, GA, USA — April 2013 – Aug 2015
PI: Mitsi Blount, PhD

PUBLICATIONS

[*]co-first author; [†]co-corresponding author; [§]undergraduate mentee

13. **Himmel NJ**, Sakurai A, Letcher JM, Patel AA, Bhattacharjee S, Benson MN[§], Gray TR[§], Cymbalyuk GS, and Cox DN. Chloride-dependent mechanisms of multimodal sensory discrimination and neuropathic sensitization in *Drosophila*. Preprint in *bioRxiv*. 2021.

12. **Himmel NJ**, Letcher JM, Sakurai A, Benson MN[§], Gray TR[§], Donaldson KJ, and Cox DN. Identification of a neural basis for cold acclimation in *Drosophila* larvae. *iScience*. 2021.

11. **Himmel NJ**, Rogers RT, Redd SK, Wang Y[§], and Blount MA. Purinergic signaling is enhanced in the absence of UT-A1 and UT-A3. *Physiological Reports*. 2021.

10. **Himmel NJ**[*], Letcher JM[*], and Cox DN. Dissecting the molecular and neural circuit bases of behavior as an introduction to discovery-driven research: a report on a Course-Based Undergraduate Research Experience. *Journal of Undergraduate Neuroscience Education*. 2020.

9. **Himmel NJ** and Cox DN. Transient Receptor Potential Channels: Current Perspectives on Evolution, Structure, Function, and Nomenclature. Review in *Proceedings of the Royal Society B*. 2020.

8. **Himmel NJ**[†], Gray TR[§], and Cox DN[†]. Phylogenetics identifies two eumetazoan TRPM clades and an eighth TRP family, TRP Soromelastatin (TRPS). *Molecular Biology and Evolution*. 2020.

7. **Himmel NJ**[†], Letcher JM, Sakurai A, Gray TR[§], Benson MN[§], and Cox DN[†]. *Drosophila* menthol sensitivity and the Precambrian origins of TRP-dependent chemosensation. *Philosophical Transactions of the Royal Society B*. 2019.

6. Lopez-Bellido R, **Himmel NJ**, Gutstein HB, Cox DN, and Galko MJ. An assay for chemical nociception in *Drosophila* larvae. *Philosophical Transactions of the Royal Society B*. 2019.

5. **Himmel NJ**, Rodriguez DA[§], Wang Y[§], Sun MA[§], and Blount MA. Chronic lithium treatment induces novel patterns of pendrin localization and expression. *American Journal of Physiology – Renal Physiology*. 2018.

4. **Himmel NJ** and Cox DN. Sensing the Cold: TRP channels in thermal nociception. Commentary in *Channels*. 2017.

3. **Himmel NJ**[*], Patel AA[*], and Cox DN. Invertebrate Nociception. Review in *The Oxford Research Encyclopedia of Neuroscience*. 2017.

2. Turner HN[*], Armengol K[*], Patel AA, **Himmel NJ**, Sullivan L, Iyer SC, Battacharya S, Iyer EPR, Landry C, Galko MJ[†], and Cox DN[†]. The TRP channels Pkd2, NompC, and Trpm mediate unique aversive behaviors to noxious cold in *Drosophila*. *Current Biology*. 2016.

1. Sim JH, **Himmel NJ**, Redd SK, Pulous FE, Rogers RT, Black LN, Hong SM, von Bergen TN, and Blount MA. Absence of PKC-alpha attenuates lithium-induced nephrogenic diabetes insipidus. *PLoS ONE*. 2014.

FUNDING and AWARDS

Grants & Funding:

Ruth L. Kirschstein National Research Service Award (F31 NRSA) 2020–2022
National Institute of Neurological Disease and Stroke
Grant ID: F31NS117087

Kenneth W. and Georganne F. Honeycutt Fellowship 2017–2020
Georgia State University, Neuroscience Institute

Brains & Behavior Fellowship 2017–2020
Georgia State University, Brains & Behavior Program
Honorary Fellow, 2020-Present

Other Awards:

Writing Across the Curriculum Pedagogy Award, *Georgia State University* 2021
Neuroscience Institute Outstanding Doctoral Scholar, *Georgia State University* 2020
Neuroscience Institute Outstanding Graduate Student Mentor, *Georgia State University* 2019
Meritorious Research Award, *American Physiological Society* 2016
Meritorious Research Award, *American Physiological Society* 2015

TEACHING EXPERIENCE

Course design/prep:

PERS2002 – Course-Based Undergraduate Research Experience
Co-designers: Daniel N. Cox & Jamin M. Letcher

Teaching assistantships:

PERS2002 - Course-Based Undergraduate Research Experience 2017
Instructor: Daniel N. Cox

NEUR3010/4000 – Neuroscience Laboratory (x2) 2016 & 2018
Instructor: Michael P. Black

Other teaching:

Writing Advisor - **Writing Across the Curriculum Program** 2018–2021
GSU, Center for Excellence in Teaching and Learning

Guest lectures:

GSU's Neuroscience School: *Presenting Data in Different Forms.* 2019
GSU's Neuroscience School: *Neurological Diseases*. 2016
Atlanta Brain Bee Prep Course: *Senses, Perception, and Movement*. 2015
Emory University SUPERR Program: *Techniques in Renal Physiology*. 2015

MENTORING, SERVICE, and OUTREACH

Organized research mentorship:

GSU, Initiative for Maximizing Student Development (IMSD) 2017–2020
Emory, Summer Undergrad Program in Emory Renal Research (SUPERR) 2015
Emory/American Physiological Society, Frontiers in Physiology 2014
Emory, Summer Undergraduate Research Experience (SURE) 2013–2015

Peer review:

Preprint Editorial Team Leader (Physio. & Neuro), *Proceedings of the Royal Society B* 2019–Present

Ad hoc peer review: *The Biological Bulletin* and *Journal of Economic Entomology*

Media coverage:

Weiner S. "Do insects enjoy sex?" *Gizmodo*. June 2017. Web: https://gizmodo.com/doinsects-enjoy-sex-1796376553.

Professional Memberships:

American Association for the Advancement of Science; American Physiological Society; Genetics Society of America; Society for Neuroscience; Society for the Study of Evolution

PRESENTATIONS, POSTERS, and ABSTRACTS

§undergraduate co-author; presenter underlined

Invited seminars & symposia:

3. Invited speaker, North Carlina State University, College of Veterinary Medicine, Fungal Systems Biology Laboratory. November 2021. *Raleigh, NC.*

2. Invited participant, Theo Murphy International Scientific Meeting on the evolution of mechanisms and behaviour important for pain, hosted by The Royal Society. February 2019. *Chicheley, Buckinghamshire, UK*.

1. Invited panelist, NIDDK/KUH Researcher Panel, Summer Student Symposium. July 2015. *Atlanta, GA.*

Platform talks:

2. **Himmel NJ**, Letcher JM, Sakurai A, Gray TR[§], Benson MN[§], Cox DN. Menthol elicits *Trpm*- and *TrpA1*-dependent rolling in *Drosophila* larvae, suggesting Precambrian origins for TRP-dependent menthol sensing. October 2019. *Platform talk at Neurobiology of Drosophila Meeting, Cold Spring Harbor, NY.*

1. **Himmel NJ,** Rodriguez DA[§], Blount MA. Chronic lithium treatment induces β-intercalated cell expression in the renal inner medulla. March 2015. *Platform talk at Experimental Biology, Boston, MA.*

Posters (first-authored only) & published abstracts:

22. **Himmel NJ,** Sakurai A, Letcher JM, Patel AA, Benson MN[§], Bhattacharjee S, Gray TR[§], Cymbalyuk GS, and Cox DN. Chloride-dependent mechanisms of multimodal sensory discrimination: roles for *subdued*, *koozie*, and excitatory chloride physiology in *Drosophila* cold nociception. October 2021. *Neurobiology of Drosophila Meeting, Cold Spring Harbor Lab, virtual.*

21. **Himmel NJ**, Letcher JM, Sakurai A, Benson MN[§], Gray TR[§], Donaldson KJ, and Cox DN. How The Fly Youth Chill. March 2021. *Annual GSU Brains & Behavior Retreat, virtual.*

20. **Himmel NJ**, Letcher JM, Sakurai A, Benson MN[§], Gray TR[§], Donaldson KJ, and Cox DN. How The Fly Youth Chill: The evolution of cold nociception in drosophilid larvae and identification of a neural basis for cold acclimation. March 2021. *Animal Behavior Conference*, *hosted by Indiana University—Bloomington, virtual.*

19. **Himmel NJ**, Sakurai A, Letcher JM, Benson MA, Gray TR, and Cox DN. Excitatory chloride physiology discriminately encodes noxious cold in a multimodal sensory neuron. January 2021. *Annual meeting of the Society for Neuroscience, virtual*.

18. Maksymchuk N, Sakurai A, Patel AA, **Himmel NJ**, Cox DN, Cymbalyuk G. Mechanisms of cold temperatures rate coding by *Drosophila* CIII neurons. October 2019. *Annual meeting of the Society for Neuroscience, San Diego, CA*. Abstract online.

17. Letcher JM, **Himmel NJ**, Sakurai A, Holgiun-Lopez M, Cox DN. TrpA1 mediates cold nociception in *Drosophila melanogaster* larvae. October 2019. *Neurobiology of Drosophila Meeting, Cold Spring Harbor Lab, Cold Spring Harbor, NY.*

16. Maksymchuk N, Sakurai A, Patel AA, **Himmel NJ**, Cox DN, Cymbalyuk G. Role of TRP channels in temperature rate coding by *Drosophila* noxious cold sensitive neurons. *Conference abstract in BMC Neuroscience*, 20:56, July 2019. doi: 10.1186/s12868-019-0538-0

15. **Himmel NJ**, Letcher JM, Gray TR[§], Benson MN[§], Cox DN. TRP-dependent chemical sensing: the Precambrian hypothesis. May 2019. *Annual GSU Brains & Behavior Retreat, Atlanta, GA.*

14. **Himmel NJ**, Letcher JM, Gray TR[§], Benson MN[§], Cox DN. Menthol elicits a *Trpm*- and *TrpA1*-dependent nocifensive response in *Drosophila melanogaster* larvae. February 2019. *Theo Murphy International Scientific Meeting on the evolution of mechanisms and behaviour important for pain, hosted by The Royal Society, Chicheley, Buckinghamshire, UK*.

13. Patel AA, **Himmel NJ**, Cox DN. Calcium induced calcium release mechanisms in cold nociception. February 2019. *Theo Murphy International Scientific Meeting on the evolution of mechanisms and behaviour important for pain, hosted by The Royal Society, Chicheley, Buckinghamshire, UK*.

12. Patel AA, **Himmel NJ**, Yang JJ, Cox DN. Cellular and behavioral requirements for calcium release mechanisms in cold nociception. October 2018. *Annual meeting of the Society for Neuroscience, San Diego, CA.* Abstract online.

11. Maksymchuk N, Patel AA, **Himmel NJ**, Cox DN, Cymbalyuk G. Modeling of TRP channel mediated noxious cold sensation in *Drosophila* sensory neurons. *Conference abstract in BMC Neuroscience*, 19(Suppl 2):64, July 2018. doi: 10.1186/s12868-018-0452-x

10. **Himmel NJ**, Letcher JM, Gray TR[§], Cox DN. The evolution of cold nociception in drosophilid larvae. May 2018. *Annual GSU Brains & Behavior Retreat.*

9. **Himmel NJ**, Gray TR[§], Cox DN. Anoctamins are required for cold nociception in *Drosophila.* April 2018. A*nnual Georgia Collegiate Neuroscience Symposium*, *Athens, GA.*

8. **Himmel NJ**, Gray TR[§], Cox DN. Calcium-activated chloride channels are required for distinguishing between noxious and innocuous stimuli in multimodal sensory neurons. April 2018. A*nnual meeting of the Genetics Society of America, Philadelphia, PA.* Abstract online.

7. Maksymchuk N, Patel AA, **Himmel NJ**, Cox DN, Cymbalyuk G. Modeling cellular noxious cold sensation in *Drosophila* sensory neurons. October 2017A*annual meeting of the Society for Neuroscience, Washington, DC.* Abstract online.

6. Kronk TA, **Himmel NJ**, Mehran NA[§], Blount MA. Lithium administration can attenuate the progression of polycystic kidney disease. *Conference abstract in The FASEB Journal*, 31(Suppl 1):1032.4, April 2017. doi: 10.1096/fasebj.31.1_supplement.1032.4

5. Patel AA, Moon D[§], **Himmel NJ**, Cox DN. Cellular and molecular dissection of noxious cold nociception in *Drosophila*. March 2017. *58th Annual Drosophila Research Conference, San Diego, CA.* Abstract.

4. Patel AA, Turner HN, Armengol K, **Himmel NJ**, Galko MJ, Cox DN. Cellular and molecular dissection of noxious cold nociception in *Drosophila*. July 2016. *The Allied Genetics Conference, Orlando, FL*. Abstract online.

3. **Himmel NJ**, Rodriguez DA[§], Wang Y[§], Sun MA[§], Blount MA. Chronic lithium treatment induces novel patterns of pendrin localization and expression in the kidney. *Conference abstract in The FASEB Journal*, 30(Suppl1):968.14, April 2016. doi: 10.1096/fasebj.30.1_supplement.968.14

2. **Himmel NJ**, Rogers RT**,** Redd SK, Blount MA. Purinergic signaling is enhanced in the absence of UT-A1 and UT-A3. October 2014. *Emory Department of Medicine Research Day, Atlanta, GA.*

1. Rogers RT, **Himmel NJ,** Redd SK, Blount MA. Purinergic signaling is enhanced in the absence of UT-A1 and UT-A3. *Conference abstract in The FASEB Journal*, 38(Suppl 1): 969.17, April 2014. doi: 10.1096/fasebj.28.1_supplement.1137.10

Institutional oral presentations:

5. **Himmel NJ**, Letcher JM, Sakurai A, Benson MN[§], Gray TR[§], Donaldson KJ, and Cox DN. How The Fly Youth Chill: The protective role of cold nociception in *Drosophila* larvae. June 2021. *Neuroscience Institute Breakfast and Lecture Series, Atlanta, GA.*

4. **Himmel NJ**, Gray TR[§], Cox DN. Insects and vertebrates are the odd ones out: Unexpected findings in the evolution of TRP channels. September 2019. *Neuroscience Institute Breakfast and Lecture Series, Atlanta, GA.*

3. **Himmel NJ,** Gray TR[§], Cox DN. Multimodality in *Drosophila melanogaster* sensory neurons. February 2018. *Neurogenomics Forum, Atlanta, GA.*

2. **Himmel NJ,** Gray TR[§], Cox DN. Calcium-activated chloride channels play a role in the function of multimodal sensory neurons. August 2017. *Neuroscience Institute Breakfast and Lecture Series, Atlanta, GA.*

1. **Himmel NJ**, Blount MA. Chronic lithium treatment induces renal β-intercalated cell expression in the inner medulla. October 2014. *Emory TSWU Seminar, Atlanta, GA.*