Nicholas C. Guilbeault

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EDUCATION

06/2018 – Present

Ph.D. Candidate, Cell and Systems Biology
University of Toronto, Toronto, Ontario, Canada
- Thesis Topic: Developing tools for functional characterization of neural circuits in the larval zebrafish subpallium
- Supervisor: Dr. Tod Thiele

09/2016 – 06/2018

M.Sc. Candidate, Cell and Systems Biology
University of Toronto, Toronto, Ontario, Canada
- Thesis Topic: Developing tools for functional characterization of neural circuits in the larval zebrafish subpallium
- Supervisor: Dr. Tod Thiele
- Transferred into Ph.D. program

09/2012 – 06/2016

B.Sc. (Honours), Behavior Cognition and Neuroscience
University of Windsor, Windsor, Ontario, Canada
- Graduated with Distinction (Cumulative GPA > 3.7)
- Dean's Honours List (2012 – 2016)
- Thesis Title: A longitudinal study of spatial and nonspatial working memory in mice
- Supervisor: Dr. Jerome Cohen

SCHOLARSHIPS, AWARDS, & FELLOWSHIPS

09/2021

Doctoral Completion Award
Faculty of Arts & Science, University of Toronto
$ 2,200

09/2018 – 08/2021

Alexander Graham Bell Postgraduate Scholarships – Doctoral Award
Natural Sciences and Engineering Research Council of Canada (NSERC)
$ 63,000

01/2021

Vietnamese-Canadian Community Graduate Award In Zoology
Faculty of Arts & Science, University of Toronto
$ 600

04/2019 **Best Poster Presentation Award**
Interdisciplinary Graduate Research & Discovery (IGRAD) Conference, University of Toronto Scarborough
$ 100
- Poster Title: An open-source software platform for relating neural activity to behavior

12/2018 **Yoshio Masui Prize in Developmental, Molecular, or Cellular Biology**
Faculty of Arts & Science, University of Toronto
$ 2,300

07/2018 – 08/2018 **Behavior of Neural Systems (BNS) Course, Advanced Neuroscience Training Program – Stipend**
Federation of European Neuroscience Societies (FENS) CAJAL Program
€ 3,500

09/2017 – 08/2018 **Alexander Graham Bell Canada Graduate Scholarships – Masters Award**
Natural Sciences and Engineering Research Council of Canada (NSERC)
$ 17,500

09/2016 - Present **University of Toronto Graduate Student Fellowship**
Faculty of Arts and Science, University of Toronto

03/2016 **Science Presentation Award**
UWill Discover Conference, University of Windsor
$ 150
- Presentation Title: Ubisol-Q10 treatment prevents substantial memory loss and neurodegeneration in mice with Alzheimer's disease

05/2014 – 08/2015 **Research Assistant Canadian Scholarship**
University of Windsor
$ 6,750
- Project Title: Designing behavioral tasks to study working memory in mice

09/2012 – 04/2016 **University of Windsor Entrance Scholarship**
University of Windsor
$ 6,400

PEER-REVIEWED PUBLICATIONS

Alexander, E., Cai, L. T., Fuchs, S., Hladnik, T. C., Zhang, Y., Subramanian, V., **Guilbeault, N. C.**, Vijayakumar, C., Arunachalam, M., Juntti, S. A., Thiele, T. R., Arrenberg, A. B., Cooper, E. A. Spatial biases in optic-flow sampling for self-motion estimation in natural environments. *Current Biology* Submitted, March 22, 2022.

Guilbeault, N. C., Guerguiev, J., Martin, M., Tate, I., & Thiele, T. R. (2021). BonZeb: Open-source, modular software tools for high-resolution zebrafish tracking and analysis. *Scientific Reports*, *11*(1), 1-21. doi: https://doi.org/10.1038/s41598-021-85896-x

Muthukumaran, K., Kanwar, A., Vegh, C., Marginean, A., Elliot, A., **Guilbeault, N.**, …, & Pandey, S. (2018). Ubisol-Q10 (a nanomicellar water-soluble formulation of CoQ10) treatment inhibits Alzheimer-type behavioral and pathological symptoms in a double transgenic mouse (TgAPEswe, PSEN1dE9) model of Alzheimer's disease. *Journal of Alzheimer's Disease, 61*(1), 221. doi: https://doi.org/10.3233/JAD-170275

CONFERENCE PROCEEDINGS & PRESENTATIONS

** = presenter*

Guilbeault, N.*, Guerguiev, J., Martin, M., Tate, I., & Thiele, T. (2021, July). BonZeb: Open-source, modular software tools for high-resolution zebrafish tracking and analysis. Poster presented at the HFSP Awardees Meeting, virtual.

Cai, L., Alexander, E., Hladnik, T., …, **Guilbeault, N.**, … & Thiele, T.* (2021, July). Investigation of visual circuit adaptations to natural environmental motion in zebrafish and African cichlids. Poster presented at the HFSP Awardees Meeting, virtual.

Westbrook, M., Steighner, J., Sweatt, G., **Guilbeault, N.**, Krishna, V., Thiele, T., & Juntti, S.* (2021, July). Do you see what I see? Developing transgenic tools in cichlid fish to quantify neural activation and visually guided behaviors. Poster presented at the HFSP Awardees Meeting, virtual.

Guilbeault, N.*, Guerguiev, J., Martin, M., Tate, I., & Thiele, T. (2021, June). BonZeb: Open-source, modular software tools for high-resolution zebrafish tracking and analysis. Poster presented at the 16th International Zebrafish Conference, virtual.

Ansari, R.*, Faour, S., **Guilbeault, N.**, Frankland, P., & Thiele, T. (2021, June). Investigating the mechanisms of neurogenesis-based forgetting using zebrafish. Poster presented at the 16th International Zebrafish Conference, virtual.

Guilbeault, N.* (2021, January). BonZeb: A bonsai library for behavioral tracking and stimulation of zebrafish. Talk presented at the Visual Reactive Programming CAJAL Advanced Neuroscience Training Program, Neurokit Series, virtual.

Alexander, E.*, Krishna, V., Hladnik, T., **Guilbeault, N.**, Cai, L., Thiele, T., Arrenberg, A., & Cooper, E. (2020, December). Self-motion cues in the natural habitats of zebrafish support lower visual field bias. Poster presented at the Vision Sciences Society Meeting, virtual.

Cai, L.*, Krishna, V., Hladnik, T., **Guilbeault, N.**, Juntti, S., Thiele, T., Arrenberg, A., & Cooper, E. (2020, November). Visual statistics of aquatic environments in the natural habitats of zebrafish. Poster presented at the Vision Sciences Society Meeting.

Thiele, T.*, Juntti, S., Wang, K., …, **Guilbeault, N.**, …, & Arrenberg, A. (2019, November). Investigation of neural circuit adaptations to natural environmental motion in zebrafish and cichlids. Talk presented at the Zebrafish Neural Circuits and Behavior Meeting, Cold Spring Harbor Laboratory, Laurel Hollow, New York, USA.

Guilbeault, N.*, Guerguiev, J., Martin, M., & Thiele, T. (2019, May). An open-source software platform for relating neural activity to behavior. Poster presented at the Canadian Association for Neuroscience Conference, Toronto, Ontario, Canada.

Guilbeault, N.*, Guerguiev, J., Martin, M., & Thiele, T. (2019, April). An open-source software platform for relating neural activity to behavior. Poster presented at the Interdisciplinary Graduate Research & Discovery (IGRAD) Conference, University of Toronto Scarborough, Toronto, Ontario, Canada.

Guilbeault, N.*, Guerguiev, J., Martin, M., & Thiele, T. (2018, December). A suite of open-source tools for investigating behavioral dynamics and neural activity in zebrafish. Poster presented at the Imaging Structure and Function in the Zebrafish Brain Conference, Brighton, England.

Guilbeault, N.* (2018, July). Analysis of larval zebrafish behavior using visuomotor behavioral feedback. Talk presented at the Behavior of Neural Systems CAJAL Advanced Neuroscience Training Program, Champalimaud Centre for the Unknown (CCU), Lisbon, Portugal.

Guilbeault, N.* (2017, October). Exploring the function of forebrain dopamine type-1 receptor neurons during action-selection in larval zebrafish. Talk presented at the Janelia Junior Scientist Workshop on Neural Circuits and Behavior, Janelia Research Campus, Ashburn, Virginia, USA.

Guilbeault, N.*, Martin, M., Guerguiev, J. & Thiele, T. (2017, May). Developing technologies for whole-brain functional mapping in behaving larval zebrafish. Poster presented at the Canadian Association for Neuroscience Conference, Montreal, Quebec, Canada.

Chasiotis, H., Riadi, I., Martin, M., Aguda, V., **Guilbeault, N.**, & Thiele, T.* (2016, December). Investigation of circuits controlling action-selection in larval zebrafish. Poster presented at the Imaging Structure and Function in the Zebrafish Brain Conference, Munich, Germany.

Guilbeault, N.*, Badour, A., & Cohen, J. (2016, April). Longitudinal study of spatial and non-spatial working memory in mice. Talk presented at the Tri-state (Plus) Conference on Animal Learning and Behavior, Albion College, Albion, Michigan, USA.

Guilbeault, N.*, Muthukumaran, K., Pandey, S., & Cohen, J. (2016, March). Ubisol-Q10 treatment prevents substantial memory loss and neurodegeneration in mice with Alzheimer's disease. Talk presented at the UWill Discover Conference, University of Windsor, Windsor, Ontario, Canada.

Guilbeault, N.*, Muthukumaran, K., Pandey, S., & Cohen, J. (2016, March). Ubisol-Q10 treatment prevents substantial memory loss and neurodegeneration in a double transgenic mouse model of Alzheimer's disease. Talk presented at the Ontario Biology Day Conference, Toronto, Ontario, Canada.

Guilbeault, N.*, Badour, A., & Cohen, J. (2015, August). Orally administered Ubisol-Q10 preserves long-term memory and spatial working memory in a double transgenic mouse model of Alzheimer's disease. Talk presented at the American Psychological Association Convention, Toronto, Ontario, Canada.

Muthukumaran, K.*, Elliot, A., **Guilbeault, N.**, Marginean, A., Cohen, J., & Pandey, S. (2015, August). Ubisol-Q10 as a treatment for Alzheimer's disease in a transgenic mouse model. Poster presented at the National Health Products Research Society Annual Conference, London, Ontario, Canada.

Guilbeault, N.*, Badour, A., & Cohen, J. (2015, May). Testing a transgenic mouse model of Alzheimer's disease on spontaneous alternation and habituation of fear in the Y-maze. Talk presented at the Tri-state (Plus) Conference on Animal Learning and Behavior, University of Kentucky, Lexington, Kentucky, USA.

Guilbeault, N.*, Badour, A., & Cohen, J. Treatment with Ubisol-Q10 prevents substantial memory deficits in a double transgenic mouse model of Alzheimer's disease. Poster presented at the International Conference on Comparative Cognition, Melbourne, Florida, USA.

ARTICLE REVIEWS

10/2018 | Assisted Dr. Tod Thiele in reviewing article for *Frontiers in Behavioral Neuroscience*

04/2018 | Assisted Dr. Tod Thiele in reviewing article for *Current Biology*

RESEARCH EXPERIENCE

01/2021 – Present | **Research Technician, Koyama Lab**
University of Toronto Scarborough
- Maintained transgenic zebrafish lines

06/2016 – Present | **Graduate Research Assistant, Thiele Lab**
University of Toronto Scarborough
- Developed novel software called BonZeb for online tracking of behavior and closed-loop stimulation
- Designed and implemented behavioral assays, optogenetic stimulation protocols, calcium imaging setups, and data analysis pipelines
- Experience with Python, C#, MatLab, R, G Code

03/2014 – 05/2016 | **Undergraduate Research Assistant, Cohen Lab**
University of Windsor
- Examined the effects of Ubisol-Q10 in rodent models of Parkinson's disease and Alzheimer's disease
- Honors thesis project focused on developing a longitudinal working memory task in mice

TEACHING EXPERIENCE

09/2016 – Present | **Teaching Assistant, Department of Biological Sciences**
University of Toronto Scarborough
- Graduate course: "Advanced Microscopy and Imaging"
- Undergraduate courses: "Pathologies of the Nervous System" (BIO D65), "Advanced Topics and Methods in Neural Circuit Analysis" (BIO D07), "Neuroethology" (NRO C34), "Human Physiology II" (BIO C34), "Genes, Environment, & Behavior" (BIO C14), Life on Earth: Form, Function and Interaction" (BIO A01), "Life on Earth: Unifying Principles" (BIO A02)

07/2021 **Project TA, Summer School on Computational Neuroscience**
Neuromatch Academy
- Managed 12 different groups to develop a unique modelling/analysis project in the span of 3 weeks
- Analyzed human EEG, human ECoG, and mouse behavioral data

01/2021 **Course Instructor, Visual Reactive Programming – Bonsai**
CAJAL Advanced Neuroscience Training Program, Neurokit Series (Virtual)
- Helped organize, develop, and deliver course content material related to data processing, computer vision techniques, and deep learning
- Delivered lecture on behavioral tracking and stimulation with BonZeb
- Teaching occurred over a virtual platform
- Audience included graduate students, post-docs, junior faculty

10/2019, 01/2020, 01/2022 **Invited Lecturer, Department of Biological Sciences**
University of Toronto Scarborough
- Delivered lecture on Quantitative Behavioral Analysis for Advanced Topics and Methods in Neural Circuit Analysis course (BIO D07, 01/2020, 01/2022)
- Delivered lecture on Alzheimer's Disease for Pathologies of the Nervous System course (BIO D65, 10/2019)

07/2020 **Teaching Assistant, Summer School on Computational Neuroscience**
Neuromatch Academy
- Led tutorials with Python programming exercises
- Teaching occurred over a virtual platform (Zoom, Crowdcast)
- Audience included graduate students, post-docs, and junior professors

01/2019 – 04-2019 **Teaching Assistant, Department of Psychology**
University of Toronto Scarborough
- Undergraduate course: "Learning and Motivation" (NRO C61)

11/2017 – 12/2017 **Course Instructor, Department of Biological Sciences**
University of Toronto Scarborough
- Undergraduate course: "Pathologies of the Nervous System" (BIO D65)

05/2015 – 04/2016 **Teaching Assistant, Department of Psychology**
University of Windsor
- Undergraduate course: "Learning and Behavior" (PSYCH 353)

WORKSHOPS, SUMMER SCHOOLS, & COURSES ATTENDED

07/2021 **Neuromatch Academy (NMA) – Online Summer School on Computational Neuroscience**
Virtual, Worldwide

01/2021 **CAJAL Advanced Neuroscience Training Program, Neurokit Series – Visual Reactive Programming**
Virtual, Worldwide

07/2020 **Neuromatch Academy (NMA) – Online Summer School on Computational Neuroscience**
Virtual, Worldwide

05/2019 **Canadian Association for Neuroscience – Satellite Workshop on Neural Signal and Image Processing: Quantitative Analysis of Neural Activity**
Toronto, Ontario, Canada

07/2018 – 08/2018 **CAJAL Advanced Neuroscience Training Program – Summer Course on Behavior of Neural Systems (BNS)**
Champalimaud Centre for the Unknown (CCU), Lisbon, Portugal

10/2017 **Janelia Junior Scientist Workshop on Neural Circuits and Behavior**
Janelia Research Campus, Ashburn, Virginia, USA

MEDIA

Guilbeault, N. (2017). Changing the Gain. *Interstellate Neuroscience Magazine, 2*, 59.

OTHER EMPLOYMENT

09/2018 – 12/2020 **Biology and Psychology Tutor, Oneclass Easyke Online Education**
Toronto, Ontario, Canada

10/2016 – 07/2017 **Doping Control Assistant, Canadian Centre for Ethics in Sport**
Toronto, Ontario, Canada

09/2012 – 11/2015 **Vehicle Assembler, Fiat Chrysler Automobiles Canada**
Windsor, Ontario, Canada

VOLUNTEER ACTIVITIES

02-2019 – 05/2019 **Graduate Student Representative, Faculty Search Committee for Assistant Professor in Zebrafish Development**
University of Toronto Scarborough, Toronto, Ontario, Canada

05/2019 **Science Rendezvous**
University of Toronto, Toronto, Ontario, Canada

11/2018 – 05/2019 **Cell and Systems Biology Research Day (CSBRD) Committee**
University of Toronto, Toronto, Ontario, Canada

10/2018 – 04/2019 **Collaborative Program in Neuroscience (CPIN) Undergraduate Mentorship Program**
University of Toronto, Toronto, Ontario, Canada

08/2016 – 08/2019 **Graduate Student Representative, University Animal Care Committee (UACC)**
University of Toronto, Toronto, Ontario, Canada

08/2016 – 08/2018	**Graduate Student Representative, Local Animal Care Committee (LACC)** *University of Toronto Scarborough, Toronto, Ontario, Canada*
05/2018	**Science Rendezvous** *Toronto Zoo, Toronto, Ontario, Canada*
09/2015 – 04/2016	**Mental Health Awareness Club** *University of Windsor, Windsor, Ontario, Canada*
05/2015 – 08/2015	**University of Windsor Campus Community Garden** *University of Windsor, Windsor, Ontario, Canada*
03/2015	**Judge, Windsor Regional Science, Technology, and Engineering Fair** *St. Claire College, Windsor, Ontario, Canada*
09/2014 – 04/2016	**Best Buddies Organization** *University of Windsor, Windsor, Ontario, Canada*