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<https://www.davison-lab.org/>

EDUCATION

| | | |
|-----------|----------------------------|---|
| 1995-2003 | Ph.D. in Neurobiology | Simon Fraser University, Burnaby, BC, Canada |
| 1990-1994 | B.Sc. in Biology & Physics | St. Francis Xavier University, Antigonish, Canada |

ACADEMIC POSITIONS

2011-present Assistant Professor, Department of Biology
Boston University, Boston, MA

Affiliations at Boston University

2016-present Neurophotonics Center
2016-present National Science Foundation Research Traineeship Program in Neurophotonics
2015-present Center for Systems Neuroscience
2015-2017 Center for Research in Sensory Communication
2013-present Graduate Program in Pharmacology and Experimental Therapeutics,
Boston University School of Medicine, Boston, MA
2011-present Graduate Program in Neuroscience
2011-present Undergraduate Program in Neuroscience

RESEARCH TRAINING

2006-2011 Postdoctoral Fellow with Dr. Michael Ehlers
HHMI / Dept. of Neurobiology, Duke Medical Center, Durham NC
2003-2005 Postdoctoral Fellow with Dr. Larry Katz
HHMI / Dept. of Neurobiology, Duke Medical Center, Durham NC
2003 Grass Fellow in Neuroscience
Marine Biological Laboratory, Woods Hole MA
1995-2003 Ph. D. in Neurobiology with Dr. Kerry Delaney
Biological Sciences, Simon Fraser University, Vancouver, Canada
Dissertation: Dopamine modulates inhibition in olfactory bulb.
1994-1995 Research Assistant, Dr. Edwin DeMont, St. Francis Xavier University, Antigonish, Canada
Biophysics of invertebrate locomotion
1990-1994 B. Sc. Joint Honors in Biology and Physics, St. Francis Xavier University, Antigonish, Canada
Research thesis: Biomechanical properties of invertebrate arteries.

HONORS AND AWARDS

| | |
|------------|---|
| 2013-2016 | Klingenstein Fellow in Neuroscience Joseph and Esther A. Klingenstein Foundation, New York, NY |
| 2003 | Grass Fellowship in Neuroscience Marine Biological Laboratory, Woods Hole, MA |
| 1996-1999 | NSERC Postgraduate Scholarships A & B Simon Fraser University, Burnaby BC Canada |
| 2000, 2002 | Frank A. Linville Scholarship in Olfaction Simon Fraser University, Burnaby BC Canada |
| 1996, 2000 | Graduate Fellowship Simon Fraser University, Burnaby BC Canada |
| 1993 | NSERC Undergraduate Research Scholarship, St. Francis Xavier University. Antigonish NS Canada |
| 1990-1994 | Canada Scholarship St. Francis Xavier University. Antigonish NS Canada |
| 1990-1994 | Dr. J.J. Carrol Memorial Scholarship St. Francis Xavier University. Antigonish NS Canada |

GRANT SUPPORT - ACTIVE

| | |
|-------------------|---|
| 03/2019 - 02/2024 | NIH/NIDCD R01 DC017234 |
| 06/2018 - 01/2021 | NSF/IOS Award # 1755284 |
| 04/2019 - 03/2021 | NIH/NEI R21 EY030016 (co-PI; Lei Tian, PI). |
| 06/2018 - 05/2020 | Dean's Catalyst Award, B.U. Dept. of Biomedical Engineering (co-PI; Lei Tian, PI). |
| 07/2016 - 06/2020 | The Binational Science Foundation, Research Grant # 2015099 (co-PI; with S. Shea and Y. Ben-Shaul) |
| 09/2016 - 07/2019 | NIH/NEI R21EY027549 (co-PI; Jerome Mertz, PI). |
| 08/2016 - 07/2020 | NIH/NINDS R24 NS098536 (co-PI; Tim Gardner, PI). |

PUBLICATIONS – RESEARCH ARTICLES

*Trainees in my laboratory: *graduate student; **undergraduate student; ***high school student; #postdoctoral fellow; ##research assistant*

Witkowski ED*, Gao Y#, Gavsyuk EF, Maor I, DeWalt GJ, Eldred WD, Mizrahi A, and **Davison IG**. (2019) Rapid changes in synaptic strength after mild traumatic brain injury. *Frontiers in Cellular Neuroscience*, in press.

Besnard A, Gao Y#, TaeWoo Kim M, Twarkowski H, Reed AK, Langberg T, Feng W, Xu X, Saur D, Zweifel LS, **Davison IG**, Sahay A. (2019) Dorsolateral septum somatostatin interneurons gate mobility to calibrate context-specific behavioral fear responses. *Nature Neuroscience* 22: 436-446.
doi: 10.1038/s41593-018-0330-y

Shlomai Y, Vinograd A, Mukherjee D, Gao Y#, Citri A, **Davison IG**, and Mizrahi A. (2017) Functional plasticity in the mouse olfactory bulb following motherhood. *Cell Reports* 21: 1-15. doi: 10.1016/j.celrep.2017.09.038.

Gao Y#, Budlong C##, Durlacher E**, and **Davison I.G.** (2017) Neural mechanisms of social learning in the female mouse. *eLife* 6:e25421. doi: 10.7554/eLife.25421

Yang R, Weber T, Witkowski ED*, **Davison IG**, and Mertz J. (2017) Neuronal imaging with ultrahigh dynamic range multiphoton microscopy. *Scientific Reports* 7(1): 5817. doi: 10.1038/s41598-017-06065-7.

Mertz J, Gasecka A, Daradich A, **Davison I**, and Coté D (2014) Phase-gradient contrast in thick tissue with a scanning microscope. *Biomedical Optics Express* 5:407-416. doi: 10.1364/BOE.5.000407.

Gao Y and **Davison IG** (2014) Hippocampal neurons wait their turn. *eLife* 3:e02590.

Sharma R, Ishimaru Y, **Davison I**, Ikegami K, Chien M-S, You H, Chi Q, Kubota M, Yohda M, Ehlers M, and Matsunami H. (2017) Olfactory receptor accessory proteins play crucial roles in receptor function and gene choice. *eLife* 6: e21895. doi: 10.7554/eLife.21895

Dai R, Rossello R, Chen CC, Kessler J, **Davison I**, Hochgeschwender U, Jarvis ED. (2014) Maintenance and neuronal differentiation of chicken induced pluripotent stem-like cells. *Stem Cells International* 2014:182737. doi: 10.1155/2014/182737.

Davison IG and Ehlers MD (2011) Neural circuit mechanisms for pattern detection and feature combination in olfactory cortex. *Neuron* 70: 82-94 (previewed in *Neuron* 70: 1-2). doi: 10.1016/j.neuron.2011.02.047.

Kennedy MJ, **Davison IG**, Robinson CG, and Ehlers MD (2010) Syntaxin-4 defines a domain for activity-dependent exocytosis in dendritic spines. *Cell* 141: 524-535. doi: 10.1016/j.cell.2010.02.042.

Wang Z, Edwards JG, Riley N, Provance DW Jr, Karcher R, Li XD, **Davison IG**, Ikebe M, Mercer JA, Kauer JA, and Ehlers MD (2008) Myosin Vb mobilizes recycling endosomes and AMPA receptors for postsynaptic plasticity. *Cell* 135: 535-48. doi: 10.1016/j.cell.2008.09.057.

Arenkiel BR, Klein ME, **Davison IG**, Katz LC, and Ehlers MD (2008) Genetic control of neuronal activity in mice conditionally expressing TRPV1. *Nature Methods* 5(4): 299-302. doi: 10.1038/nmeth.1190.

Arenkiel BR, Peca J, **Davison IG**, Feliciano C, Deisseroth K, Augustine GJ, Ehlers MD, and Feng G (2007) In vivo light-induced activation of neuroal circuitry in transgenic mice expressing channelrhodopsin-2. *Neuron* 54: 205-18. doi: 10.1016/j.neuron.2007.03.005

Davison IG and Katz LC (2007) Sparse and selective odor coding by mitral/tufted neurons in the main olfactory bulb. *Journal of Neuroscience* 24 (3): 8057-8067. doi: 10.1523/JNEUROSCI.3779-06.2007

Davison IG, Boyd JD, and Delaney KR (2004). Dopamine inhibits mitral/tufted to granule cell synapses in the frog olfactory bulb. *Journal of Neuroscience* 24(3): 8057-8067. doi: 10.1523/JNEUROSCI.2138-04.2004

Delaney KR, **Davison IG**, and Denk W. (2001). Odour-evoked [Ca²⁺] transients in mitral cell dendrites of frog olfactory glomeruli. *European Journal of Neuroscience* 13(9): 658-72.

Mulligan SJ, **Davison IG**, and Delaney KR (2001). Mitral cell presynaptic Ca^{2+} influx and synaptic transmission in frog amygdala. *Neuroscience* 104(1):137-51.

Cheng J-Y, **Davison IG**, and DeMont ME (1996). Dynamics and energetics of scallop locomotion. *Journal of Experimental Biology* 199: 1931-19461

Davison IG, Wright GM, and DeMont ME (1995). The structure and mechanical properties of invertebrate and primitive vertebrate arteries. *Journal of Experimental Biology* 198: 2185-2196

Joshi YN, Tauheed A, and **Davison IG** (1992). The analysis of the $5s^25p^2$, $5s5p^3$, $5s^25p5d$, and $5s^25p6s$ configurations of Te III. *Canadian Journal of Physics* 70: 740-744

CONFERENCE PRESENTATIONS

*Trainees in my laboratory: *graduate student; **undergraduate student; ***high school student; #postdoctoral fellow; ##research assistant*

Leman DP##, Chen IA, Yen WW, Perkins LN, Liberti III WA, Kilic K, Cruz-Martin A, Gardner TJ, Otchy TM, **Davison IG**. Imaging during odor-guided behavior with a novel wide field-of-view miniature fluorescence microscope. Association for Chemoreception Sciences, 4/2019, Bonita Springs FL

Witkowski ED*, Erdener SE, Kiliç K, Kura S, Tang J, Boas D, and **Davison IG**. Chronic *in vivo* imaging of neural activity and vascular changes in the cortex after mild traumatic brain injury. Society for Neuroscience Annual Meeting, 11/2018, San Diego CA

Leman DP##, Yen WW, Chen IA, Nguyen TP, Otchy TM, Gardner TJ, Cruz-Martin A, and **Davison IG**. An expanded open-source toolbox for widefield calcium imaging in freely behaving animals. Society for Neuroscience Annual Meeting, 11/2018, San Diego CA

Witkowski ED*, DeWalt G, Eldred W, and **Davison IG**. Microglial immunoreactivity and hyperexcitability in piriform cortex after repeated TBI. Society for Neuroscience Annual Meeting, 11/2017, Washington DC

Davison IG and Gao Y#. Imaging sensory representations in the accessory olfactory bulb during behavior. Society for Neuroscience Annual Meeting, 11/2017, Washington DC

Davison IG and Gao Y#. Sensory representations in the accessory olfactory bulb during social interactions. Association for Chemoreception Sciences, 4/2017, Bonita Springs FL

Ganga A***, Gao Y#, and **Davison IG**. Influence of farnesene on male aggression in rodents: a behavioral and mapping study. Experimental Biology, 4/2017, Chicago IL

Gao Y#, Budlong C##, and **Davison IG**. Neuronal mechanisms underlying mating-induced pheromonal memory in the female mouse. Society for Neuroscience, 11/2015, Chicago IL

Shlomei Y, Vinograd A, Mukherjee D, Gao Y#, Citri A, **Davison I**, and Mizrahi A. Functional plasticity in the mouse olfactory bulb following motherhood. Society for Neuroscience, 11/2015, Chicago IL

Witkowski E*, DeWalt G, Foster A, Eldred W, and **Davison IG**. Chronic in vivo imaging of synaptic reorganization after traumatic brain injury. Society for Neuroscience, 11/16/2014, Washington DC

Sharma R, Ishimaru Y, **Davison IG**, Ehlers MD, and Matsunami H. Crucial role of olfactory receptor accessory proteins RTP1 and RTP2 in receptor gene choice, development, and odor detection. Society for Neuroscience, 11/18/2014, Washington DC

Gao Y# and **Davison IG**. Neuronal mechanisms of mating-induced pheromonal memory in the female mouse accessory olfactory bulb. Association for Chemoreception Sciences, 04/10/2014, Bonita Springs FL

Herzog L## and **Davison IG**. Innate odor avoidance for spoiled food categories in the mouse. Association for Chemoreception Sciences, 04/10/2014, Bonita Springs FL

TEACHING CONTRIBUTIONS, BOSTON UNIVERSITY

| | |
|----------------|--|
| 2012 - present | Biology BI 520 – Sensory Neurobiology (Undergraduate; cross-listed as Neuroscience NE 520). |
| 2016 - present | Biology BI 741 – Neural Systems I: Functional Circuit Analysis (Graduate; cross-listed as Neuroscience NE 741. Curriculum for Graduate Program in Neuroscience). |
| 2019 Summer | Neurobiology: Mechanisms & Advanced Approaches Marine Biological Laboratory, Woods Hole, MA |

MENTORING

Postdoctoral advisees

| | |
|----------------|--|
| 2017 - present | Dr. Brett DiBenedictis (Postdoctoral Faculty Fellow) |
| 2012 - 2017 | Dr. Yuan Gao |

Ph.D. advisees

| | |
|----------------|-----------------|
| 2019 - present | Spencer Byers |
| 2012 - 2019 | Ellen Witkowski |

Masters advisees

| | |
|-------------|------------------|
| 2015 - 2016 | Kelsey Williford |
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Research Assistants

| | |
|-------------|--|
| 2012 - 2014 | Linnea Herzog (currently Ph.D. candidate, Brandeis University) |
| 2015 - 2016 | Carl Budlong |
| 2017 - 2019 | Dan Leman (entering Ph.D. program 2019, Brandeis University) |

Undergraduate advisees

| | |
|----------------|---|
| 2019 - present | Sunnie Kong, Biology |
| 2018 - present | Simran Shah, Biology • UROP funding, fall 2018 |
| 2018 - present | Alex Gavszyuk, Biology |
| 2018 - present | Esther Lee, Biology |

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|-------------|--|
| 2016 - 2017 | Jessica Lin, Biomedical Engineering Paul (Shuoyi) Yao, Biomedical Engineering |
| 2015 - 2016 | Brian Cotten, Biology |
| 2015 - 2016 | Bobby Schulze, Biology |
| 2013 | Cory Dubois, Biology |
| 2012 - 2013 | Anya Golkowski, Biology • UROP summer funding, summer 2013 |
| 2012 | Jacob Gruber, Biology |

High School Students

| | |
|-------------------|--|
| Arjun Ganga | Research in Science & Engineering (RISE) program |
| Delaney Griffiths | Greater Boston Research Opportunities for Young Women (GROW) program |

Journal referee

Cerebral Cortex
Chemical Senses
eLife
eNeuro
Frontiers in Neurosciences
Frontiers in Neuroinformatics
Journal of Neuroscience
Journal of Neurophysiology
Journal of Visualized Experiments
Nature Communications
Neuroscience Letters
PLoS One
Science

Grant reviewer

National Science Foundation
German-Israeli Science Foundation
Binational Science Foundation
Israeli Science Foundation
Agence nationale de recherches, France

Professional associations

Society for Neuroscience
Association for Chemoreception Sciences
European Chemoreception Sciences
Canadian Association for Neuroscience