Dr. Michael James Winding

Personal Information

Affiliation: University of Cambridge, Department of Zoology, UK
Email: mjw226@cam.ac.uk
Website: mwinding.github.io
Languages: Native English, Intermediate German (B1 certification)

Programming Languages: Python, R, Java
Tools: Machine Learning (Sklearn, TensorFlow), Blender, Adobe Illustrator, Adobe Photoshop, Git

Professional Experience

2019.09.16 - current
Research Associate, University of Cambridge, Department of Zoology
Advisors: Dr. Marta Zlatic and Dr. Albert Cardona
Project: Complete connectome of the *Drosophila* larva brain

2016.10.01 - 2019.09.13
Postdoctoral Associate, HHMI/Janelia Research Campus, USA
Advisor: Dr. Marta Zlatic
Project: Integration of conflicting valence signals during action selection

2011.08.01 - 2016.09.01
Graduate Student, Northwestern University, USA
Advisor: Dr. Vladimir I. Gelfand
Project: Cytoskeleton rearrangement in neurodevelopment and oogenesis

2009.01.13 - 2011.05.04
Undergraduate Researcher/REU Fellow, University Notre Dame, USA
Advisor: Dr. Kevin T. Vaughan
Project: Dynein's role in the mitotic spindle assembly checkpoint

Education

2011.09.01 - 2016.09.01
Ph.D. in the Field of Life Sciences (Cell and Molecular Biology)
Northwestern University, Chicago, IL, USA
Advisor: Dr. Vladimir I. Gelfand

2007.08.28 - 2011.08.10
Bachelor of Science in Biology
University of Notre Dame, Notre Dame, IN, USA

2007.08.28 - 2011.08.10
Bachelor of Arts in Studio Art
University of Notre Dame, Notre Dame, IN, USA

Preprints [5]

1. **Winding M**†,* , Pedigo B*, Barnes C, [and 14 others], Carey Priebe, Joshua Vogelstein†, Marta Zlatic**,†, Albert Cardona**,†. *The Connectome of an Insect Brain.* In preparation. 2022.
*co-first, **joint supervision, †co-corresponding authors

2. Klein KT*, Croteau-Chonka EC*, Narayan L, **Winding M**, Masson JB, Zlatic M. *Serotonergic Neurons Mediate Operant Conditioning in Drosophila Larvae*. bioRxiv. 2021.
doi**:** https://doi.org/10.1101/2021.06.14.448341 *co-first

3. Helm HS, Basu A, Athreya A, Youngser P, Vogelstein JT, **Winding M**, Zlatic M, Cardona A, Bourke P, Larson J, White C, Priebe CE. *Learning to rank via combining representations.* arXiv**.** 2020. doi: https://arxiv.org/abs/2005.10700

4. Eschbach C*, Fushiki A*, **Winding M**, Afonso B, Andrade IV, Cocanougher BT, Eichler K, Gepner R, Si G, Valdes-Aleman J, Gershow M, Jefferis GSXE, Truman JW, Fetter RG, Samuel A, Cardona A, Zlatic M. *Circuits for integrating learnt and innate valences in the fly brain*. bioRxiv. 2020. doi: https://doi.org/10.1101/2020.04.23.058339 *co-first

5. Eschbach C*, Fushiki A*, **Winding M**, Schneider-Mizell CM, Shao M, Arruda R, Eichler K, Valdes-Aleman J, Ohyama T, Thum AS, Gerber B, Fetter RD, Truman JW, Litwin-Kumar A, Cardona A**, Zlatic M**. *Multilevel feedback architecture for adaptive regulation of learning in the insect brain.* bioRxiv. 2019. doi: https://doi.org/10.1101/649731 *co-first, **joint supervision

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Publications [12]

1. Eschbach C*, Fushiki A*, **Winding M**, Afonso B, Andrade IV, Cocanougher BT, Eichler K, Gepner R, Si G, Valdes-Aleman J, Gershow M, Jefferis GSXE, Truman JW, Fetter RG, Samuel A, Cardona A, Zlatic M. *Circuits for integrating learned and innate valences in the insect brain.* eLife. 2021. doi**:** https://doi.org/10.7554/ELIFE.62567 *co-first

2. Eschbach C*, Fushiki A*, **Winding M**, Schneider-Mizell CM, Shao M, Arruda R, Eichler K, Valdes-Aleman J, Ohyama T, Thum AS, Gerber B, Fetter RD, Truman JW, Litwin-Kumar A, Cardona A**, Zlatic M**. *Recurrent architecture for adaptive regulation of learning in the insect brain*. Nat Neurosci. 2020. doi: https://doi.org/10.1038/s41593-020-0607-9
*co-first, **joint supervision

3. Jovanic T, **Winding M**, Cardona A, Truman JW, Gershow M, Zlatic M. *Neural Substrates of Drosophila Larval Anemotaxis.* Current Biology. 2019.
doi: https://doi.org/10.1016/j.cub.2019.01.009

4. **Winding M**, Kelliher MT, Lu W, Wildonger J, Gelfand VI. *Role of kinesin-1-based microtubule sliding in Drosophila nervous system development.* PNAS. 2016. 113(34).
doi: https://doi.org/10.1073/pnas.1522416113

5. Lu W*, **Winding M***, Lakonishok M, Wildonger J, Gelfand VI. *Microtubule-microtubule sliding by kinesin-1 is essential for normal cytoplasmic streaming in Drosophila oocytes*. PNAS. 2016. 113(34). doi: https://doi.org/10.1073/pnas.1522424113
***co-first**

6. Engelke MF, **Winding M**, Yue Y, Shastry S, Teloni F, Reddy S, Blasius TL, Soppina P, Hancock WO, Gelfand VI, Verhey KJ. *Engineered kinesin motor proteins amenable to small-molecule inhibition*. Nat Commun**.** 2016 Apr 5; 7:11159. doi: https://doi.org/10.1038/ncomms11159

7. del Castillo U, **Winding M**, Lu W, Gelfand VI. *Interplay between kinesin-1 and cortical dynein during axonal outgrowth and microtubule organization in Drosophila neurons*. eLife. 2015.
doi: https://doi.org/10.7554/eLife.10140

8. Jolly A, Luan C, Dusel B, Dunne S, **Winding M**, Dixit V, Robins C, Saluk J, Logan D, Carpenter A, Cohen A, Gelfand VI. *A Genome-wide RNAi screen for Microtubule Bundle Formation and Lysosome Motility Regulation in Drosophila S2 Cells.* Cell Rep**.** 2016. 14(3):611-20.
doi: https://doi.org/10.1016/j.celrep.2015.12.051

9. del Castillo U, Lu W, **Winding M**, Lakonishok M, Gelfand VI. *Pavarotti/MKLP1 regulates microtubule sliding and neurite outgrowth in Drosophila neurons.* Curr Biol. 2015. 25(2):200-5.
doi: https://doi.org/10.1016/j.cub.2014.11.008

10. **Winding M**, Gelfand VI. *Breaking up isn't easy: myosin V and its cargoes need Dma1 ubiquitin ligase's help.* Dev Cell**.** 2014. 28(5): 479-480.
doi: https://doi.org/10.1016/j.devcel.2014.02.016

11. Kasuboski JM, Bader JR, Vaughan PS, Tauhata SB, **Winding M**, Morrissey MA, Joyce MV, Boggess W, Vos L, Chan GK, Hinchcliffe EH, Vaughan KT. *Zwint-1 is a novel Aurora B substrate required for the assembly of a dynein-binding platform on kinetochores.* Mol Bio Cell. 2011. 22(18): 3318-30. doi: https://doi.org/10.1091/mbc.e11-03-0213

12. Bader JR, Kasuboski JM, **Winding M**, Vaughan PS, Hinchcliffe EH, Vaughan KT. 2011. *Polo-like kinase1 is required for recruitment of dynein to kinetochores during mitosis.* J Biol Chem. 2011. 286(23): 20769-77. doi: https://doi.org/10.1074/jbc.m111.226605

Workshops

2020.12.01-2 Led workshop '*Collaborative neuron tracing, analysis and data sharing with CATMAID*' From Images to Knowledge (I2K) Virtual Conference, Janelia HHMI, USA.

Talks

2021.12.02 Neuromatch Conference, USA
2021.10.20 Plenary Speaker, Neurogenetics of *Drosophila* Larva, Bloomington, IN, USA
2021.05.10 Monthly Maggot Meeting (international seminar series), Cambridge, UK
2021.05.05 NeuroFly Conference, Madrid, Spain
2019.04.14 Max Planck / HHMI Connectomics Meeting, Berlin, Germany
2016.04.22 Chicago Cytoskeleton, Chicago, IL, USA

Posters

2018.10.08 Behavioral Neurogenetics of *Drosophila* Larva, Edinburgh, UK
2016.03.18 Chicago Cytoskeleton, Chicago, IL
2015.10.24 Midwest *Drosophila* Conference, Monticello, IL
2015.03.20 Chicago Cytoskeleton, Chicago, IL
2014.12.09 American Society for Cell Biology Meeting, Philadelphia, PA
2014.03.14 Chicago Cytoskeleton, Chicago, IL
2010.12.13 American Society for Cell Biology Meeting, Philadelphia, PA
2010.08.06 REU Symposium, University of Notre Dame, IN

Awards and Distinctions

2016.07.22 **Driskill Research Award** (for Exceptional PhD), Northwestern University, Chicago, IL
2015.10.24 **Best Poster Award**, Midwest *Drosophila* Conference, Monticello, IL
2015.09.09 Invited to review a manuscript for *PLOS ONE*
2011.05.21 Best of Show, B.A. Studio Art Thesis Exhibit

Funding

2019.09.01 ERC-2018-COG: *Principles of Learning in a Recurrent Neural Network* (PI: Marta Zlatic)*
***Role**: contributed data
2015.09.15 NIH R01: *Microtubule motors and generation of cell polarity* (PI: Vladimir Gelfand)*
***Role:** writing and figure generation
2014.10.24 Northwestern Conference Travel Grant (CTG)
2010.06.21 NSF Research Experience for Undergraduates (REU) Fellowship
2010.12.11 Center for Undergraduate Scholarly Engagement (CUSE) Travel Award

Supervisory and Mentoring

2020.10.28 - 2020.11.03 Led CATMAID Tracing Workshop, University of Cambridge, UK
2020.03.24 - 2021.01.20 Led team of tracers reconstructing the brain, University of Cambridge, UK
2019.10.11 - 2019.10.18 Demonstrator for Cell Microscopy Course, University of Cambridge, UK
2019.02.04 - 2019.04.05 Completed "*Scientists Teaching Scientists"* Course (Certificate)
2018.10.24 - 2020.11.03 Train visiting scientists and new hires in EM reconstruction
2018.07.18 - 2019.09.16 Supervised research specialist in split-GAL4 screening project
2012.09.01 - 2014.05.01 Mentored high-school student during RNAi project (IMSA SIR program)
2013.01.07 - 2013.03.16 Assisted in a graduate-level Cell Biology course, including a lecture
2010.08.24 - 2010.12.09 Assisted in a Cellular Biology Laboratory course (BIOS 31341)
2010.01.12 - 2010.04.28 Mentored undergraduates throughout a semester-long research project