

# Dr. Michael James Winding

## Personal Information

**Affiliation:** University of Cambridge, Department of Zoology, UK

**Email:** [mjw226@cam.ac.uk](mailto:mjw226@cam.ac.uk)

**Website:** [mwinding.github.io](https://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**<sup>†\*</sup>, Pedigo B\*, Barnes C, [and 14 others], Carey Priebe, Joshua Vogelstein<sup>†</sup>, Marta Zlatic<sup>\*\*†</sup>, Albert Cardona<sup>\*\*†</sup>. *The Connectome of an Insect Brain*. Upcoming Preprint. 2021.  
 \*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

## 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 - Present 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