

Tiffany A. Timbers, Ph.D.

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Curriculum vitae

EDUCATION:

Simon Fraser University, Burnaby, British Columbia, 2012 – Current
Banting Postdoctoral Fellow, Supervisor: Michel R. Leroux, Ph.D.
Integrating genomic and phenomic data to identify novel genes critical for cilia and sensory neuron function

University of British Columbia, Vancouver, British Columbia, 2005 – 2012
Ph.D. in Neuroscience, Supervisor: Catharine H. Rankin, Ph.D.
The roles of CREB, CaMK1 and ageing in short- and long-term tap habituation in C. elegans

Carleton University, Ottawa, Ontario, 2001 – 2005
B.Sc. in Biology, with Honours, Concentration in Genetics and Neuroscience
Honors Thesis Supervisor: Jayne E. Yack, Ph.D.
Vibration-mediated spacing in gregarious caterpillars

ADDITIONAL COURSES:

Instructor Training, Software Carpentry, September – December, 2014
Certificate Course in University Teaching, Simon Fraser University, September – December, 2014
Instructional Skills Workshop, Simon Fraser University, August 2014
High-Dimensional Omics Data, Summer Institute of Statistical Genetics, U. Washington, July 2014
Pathway & Network Analysis for Omics, Summer Institute of Statistical Genetics, U. Washington, July 2014
Introduction to Statistical Learning, Harvard University, January – April, 2014
R Bootcamp, Software Carpentry, January 2014

TEACHING EXPERIENCE:

Instructor, Michigan State University, Kellogg Biological Station, Augusta, MI, August 24-28, 2015

Advanced Analysis of Next-Generation Sequencing Data – Intensive one week summer course will introduce attendees with a strong biology background and an intermediate computational background to doing reproducible research using Docker, AWS Cloud Computing, version control with Git/Github and RMarkdown, as well as how to perform genome assembly, differential expression analysis, genome-wide association analysis, and RNAseq pathway analysis.

Mentorship Sub-committee member, Software Carpentry, <http://software-carpentry.org>, March, 2015 – Present

The Software Carpentry Foundation is a non-profit organization whose instructors teach scientists and researchers basic software skills.

- Held post-workshop debriefing for instructors to discuss and learn from what worked and what did not, and how we can improve these workshops in the future.
- Created an additional training step in the Software Carpentry Instructor Certification Program to better prepare new instructors to teach workshops (micro-lessons).

Instructor, Software Carpentry, <http://software-carpentry.org>, January, 2015 – Present

The Software Carpentry Foundation is a non-profit organization whose instructors teach scientists and researchers basic software skills.

- Taught 5 interactive 2-day workshops on automating tasks using the Unix shell, structured programming in Python or R, version control using Git and relational databases and SQL.
- Created new multiple choice lessons to probe student learning during the workshop
- Implemented a new pedagogical approach to teaching version control and collaboration

Instructor, University of British Columbia, Vancouver, BC, January – April, 2011

PSYC 306 – Principles of Animal Behavior (for B.Sc. Psychology Majors - approx. 100 students). Theory of evolution; behavioral genetics; social systems as ecological adaptation; mating and parental strategies; instinct and learning; evolution of human behavior.

- Designed course outline
- Created and taught lectures (three 50 min lectures/week for 13 weeks)
- Made exams and written assignments

Teaching Assistant, University of British Columbia, Vancouver, BC, 2006 – 2011

PSYC 306 – Principles of Animal Behavior, PSYC 363 – Principles of Animal Learning and PSYC 368 – Perceptual Processing

- Marked exams, oral presentations and assignments
- Held office hours for student consultation
- Guest lectured

Teaching Assistant, Marine Biological Laboratory, Woods Hole, MA, July 2008

Neural Systems and Behavior (graduate level course - approx. 25 students). I was the teaching assistant for 2 weeks of an intensive 8-week laboratory and lecture course focusing on the neural basis of behavior, including the cellular and synaptic levels, sensory and motor systems, neurogenetics, and the analysis of complex systems. Intended for graduate students, postdoctoral students, and independent investigators who wish to gain a broad perspective on neural systems and how they produce behavior.

- Provided hands-on instruction for *C. elegans* culture, behavior and genetics in the laboratory
- Taught a lecture on the topic of my doctoral research in *C. elegans*
- Worked closely with students to guide them through a short research project using *C. elegans*

Teaching Assistant, Carleton University, Ottawa, ON, January – April, 2005

BIOL 3802 – Animal Behavior

- Marked exams, oral presentations and assignments
- Held office hours for student consultation

SUPERVISORY EXPERIENCE:

During my doctoral and postdoctoral training I have supervised 14 undergraduate student projects that ranged from short (2-3 months) volunteer projects to year-long undergraduate theses and co-op projects. I have been responsible for planning projects, training students, holding regular progress report meetings with students, and grading. I have learned to alter my supervisory style to best suit the learning style of each student, to give positive but constructive feedback, and to design projects that are appropriate for the student's skill level and project timeline. Many of the students I supervised have been successful at obtaining further opportunities to accelerate their careers following their work with me. The first student I supervised, Arya Mehran, is now a Ph.D. candidate at UBC studying molecular signaling. A co-op student, Jing (Morgana) Xu, is now a Master's student at the BC Cancer Agency. Mavis Chan is now engaged in a Medical Laboratory Science Advanced Diploma Program at the Michener Institute. Kirsten Lee is now attending Dentistry School at Western University. Joshua Lai is now in Medical School at UBC where he hopes to complete an M.D.-Ph.D.

HONOURS and AWARDS:

Banting Postdoctoral Fellowship, CIHR, \$140 000 (2015 – 2017)
DeLill Nasser Travel Award for Professional Development, Genetics Society of America, \$1 000 (2014)
Best Talk Abstract (Postdoctoral Fellow), Simon Fraser University MBB Colloquium, \$50 (2014)
NSERC Alexander Graham Bell Canada Graduate Scholarship, \$105 000 (2008 – 2011)
Best Oral Presentation, Cell Biology Retreat, \$100 (2007)
University Graduate Fellowship, University of British Columbia, \$52 500 (2006, Declined)
Michael Smith Foundation for Health Research Junior Graduate Scholarship, \$43 000 (2006 – 2008)
CIHR Master's Award, \$17 500 (2005 – 2006)
Carleton University Best Poster Award (Ecology), \$75 (2005)
Carleton University Maxwell M MacOdrum Scholarship, \$2 500 (2004 – 2005)
NSERC Undergraduate Student Research Award, \$4 500 (2003)
Carleton University President's Scholarship, \$4 000 (2001 – 2002)
OSAP Aiming for the Top Tuition Scholarship, \$3 500 (2001 – 2002)

ORIGINAL RESEARCH PUBLICATIONS:

1. Mohan, S., **Timbers, T.A.**, Kennedy, J., Blacque, O., and Leroux, M.R. (2013). Striated and non-filamentous forms of rootletin maintain ciliary function. *Current Biology* 23(20):2016-22.
2. Li, C. *, **Timbers, T.A.***, Rose, J.K., Bozorgmehr, T, McEwan, A., and Rankin, C.H. (2013). The FMRFamide-related neuropeptide FLP-20 is required in the mechanosensory neurons during memory for massed training in *C. elegans*. *Learning & Memory* 20(2):103-108. ***authors contributed equally**
3. Lau, H.L., **Timbers, T.A.**, Mahoumad, R., and Rankin, C.H. (2013). Genetic dissection of memory for associative and non-associative learning in *C. elegans*. *Genes, Brain and Behavior* 12(2):210-23.
4. **Timbers, T.A.***, Giles, A.C.*, Ardiel, E. L., Kerr, R. and Rankin, C. H. (2013). Intensity discrimination deficits cause habituation changes in middle-aged *Caenorhabditis elegans*. *Neurobiology of Aging* 34(2): 621-631. ***authors contributed equally**
5. **Timbers, T.A.** and Rankin, C.H. (2011). Tap withdrawal circuit interneurons require CREB for long-term habituation in *Caenorhabditis elegans*. *Behavioral Neuroscience* 125(4): 560-566.
6. Yack, J. E., **Timbers, T. A.**, Conner, W. E., Aiello, A. and Schroeder, F. C. (2004). Defensive flocculent emissions in a Tiger moth, *Homoeocera stictosoma* (Arctiidae:Arctiinae). *Journal of the Lepidopterists' Society* 58(3): 173-177.

MANUSCRIPTS UNDER REVISION AND/OR SUBMITTED:

1. **Timbers, T.A.**, Ardiel, E.L., Lee, K.C.Y., Safaei, J., Pelech, S.L., and Rankin, C.H. (*under Revision at PNAS*: MS# 2014-07400). CaMK (CMK-1) and O-GlcNAc transferase (OGT-1) modulate mechanosensory responding and learning in *C. elegans*.
2. **Timbers, T.A.**, Garland, S., Mohan, S., Flibotte, S., Edgley, M., Moerman, D., and Leroux, M. (*under Revision at Genome Research*: GENOME/2015/191163). Accelerating gene discovery by phenotyping deep-sequenced multi-mutation strains and using the sequence kernel association test (SKAT).
3. Jensen, V.L. *, Mohan, S. *, **Timbers, T.A.***, Li, C., Sanders, A.W.M., Ishikawa, H., Boldt, K., van Reeuwijk, J., Textier, Y., Mans, D.A., Horn, N., van Beersum, S.E.C., Letteboer, S.J.F., Ueffing, M., Marshall, W.F., Blacque, O.E., Morin, R.M., Roepman, R., and Leroux, M.R. (*under Review at EMBO Reports*: EMBOR-2014-39749V2-Q). Whole-organism developmental expression profiling identifies novel ciliary components, including Wdr60, whose properties reveal a new model for the regulation of retrograde intraflagellar transport. *** authors contributed equally**

MANUSCRIPTS IN PREPARATION:

1. **Timbers, T.A.**, Ready, B., Baxi, K., Leroux, M.R., and Carvalho, C. (*In preparation for Nature Cell Biology*). Shugoshin: also protecting the centromere and cilia signaling?
2. **Timbers, T.A.***, Loucks, C.*, and Leroux, M.R. (*In preparation for PNAS*). Genetic bases for naturally occurring variations in locomotory and avoidance behaviors in *C. elegans*. * **authors contributed equally**
3. **Timbers, T.A.**, Lee, K., Moerman, D., and Leroux, M.R. (*In preparation for PLoS Genetics*). Genome-wide association for sensory neuron function in *C. elegans* using an automated behavioural tracking system..

PUBLISHED BOOK CHAPTERS:

1. **Timbers, T.A.** and Rankin, C.H. (2008). Learning and memory in invertebrates: *C. elegans*. In: Squire, L., Albright, T., Bloom, F., Gage, F and Spitzer, N. (eds.) *Encyclopedia of Neuroscience*, Volume 5, pp. 413-421. Oxford: Elsevier.
2. **Timbers, T.A.**, Rankin, C.H. (2008). *Caenorhabditis elegans* as a model system in which to study the fundamentals of learning and memory. In Guadagnoli, M. (ed.) *Human Learning: Biology, Brain and Neuroscience*. pp. 227-242. Oxford: Elsevier.

INVITED PRESENTATIONS:

1. **Timbers, T.A.**, Garland, S., Mohan, S., Flibotte, S., Edgley, M., Moerman, D., and Leroux, M. (2014). Accelerating genetic screens using the sequence kernel association test (SKAT) and deep-sequenced multi-mutation strains. *Centre for Cell Biology, Development & Disease, Simon Fraser University* (Burnaby, BC, Canada)
2. **Timbers, T.A.**, Jensen, V., Garland, S., Moerman, D., and Leroux, M.R. (2012). Screening a million mutations to identify novel ciliary proteins. *Dept. of Biology, University of Saskatchewan* (Saskatoon, SK, Canada)
3. **Timbers, T.A.**, Jensen, V., Garland, S., Moerman, D., and Leroux, M.R. (2012). Screening a million mutations to identify novel ciliary proteins. *CIFAR Genetic Networks Meeting* (Toronto, ON, Canada)

CONFERENCE PRESENTATIONS:

1. **Timbers, T.A.** Jensen, V., Garland, S., Lee, K., Edgley, M., Moerman, D., and Leroux, M.R. (2014). High-content screening of a deep-sequenced Metazoan mutant library to reveal novel factors for sensory neuron function. *Dept. of Molecular Biology and Biochemistry Colloquium* (Burnaby, BC) Oral
2. **Timbers, T.A.**, Jensen, V., Garland, S., Edgley, M., Moerman, D., and Leroux, M.R. (2013). Screening a million mutations to identify novel ciliary proteins. *Genes, Circuits and Behavior Cell Symposia* (Toronto, ON) Poster
3. **Timbers, T.A.**, Jensen, V., Lee, K., Garland, S., Edgley, M., Moerman, D., and Leroux, M.R. (2013). Screening a million mutations to identify novel ciliary proteins. *19th International C. elegans Meeting* (Los Angeles, CA, USA) Poster
4. Ready, B.*, **Timbers, T.A.***, Baxi, K., Leroux, M.R. and Carvalho, C. (2013). The role of the *C. elegans* Shugoshin homolog in sensory neurons. *19th International C. elegans Meeting* (Los Angeles, CA, USA) Poster ***These authors contributed equally to this manuscript.**
5. **Timbers, T.A.**, Jensen, V., Lee, K., Garland, S., Edgley, M., Moerman, D., and Leroux, M.R. (2012). Screening a million mutations to identify novel ciliary proteins. *Annual Meeting of the American Society for Cell Biology* (San Francisco, CA, USA) Poster
6. Mohan, S., **Timbers, T.A.**, Leroux, M.R. (2012). Rootletin is required for intraflagellar transport and ciliary maintenance. *Annual Meeting of the American Society for Cell Biology* (San Francisco, CA, USA) Poster

7. **Timbers, T.A.**, Ardiel, E.L., and Rankin, C.H. (2012). Calcium/Calmodulin-dependent protein kinase I is required for short-term habituation. *Sixth Annual Canadian Association of Neuroscience Meeting* (Vancouver, BC) Poster
8. **Timbers, T.A.**, Xu, J., Rankin, C.H. (2011) Ca²⁺-CaM-dependent protein kinase I is required for short- and long-term mechanosensory habituation. *18th International C. elegans Meeting* (Los Angeles, CA, USA) Poster
9. **Timbers, T.A.**, Jing Xu, Andrew C. Giles and Rankin, C.H. (2010). Ca²⁺-CaM-dependent protein kinase I is required for short- and long-term mechanosensory habituation. *C. elegans. Neuronal Development, Synaptic Function, and Behavior Topic Meeting*. (Madison, WI, USA) Poster
10. **Timbers, T.A.** and Rankin, C.H. (2009). The Role of the Calcium/Calmodulin-dependent protein kinase cascade in mechanosensory habituation. *17th International C. elegans Meeting*. (Los Angeles, CA) Oral
11. **Timbers, T.A.** and Rankin, C.H. (2008). Molecular mechanisms that contribute to the induction of long-term memory for mechanosensory habituation in *C. elegans*. *Society for Neuroscience Annual Meeting*. (Washington, DC, USA) Poster
12. **Timbers, T.A.** and Rankin, C.H. (2008). Long-term mechanosensory habituation is dependent upon CMK-1 and CRH-1 in *Caenorhabditis elegans*. *C. elegans Neuronal Development, Synaptic Function, and Behavior Topic Meeting*. (Madison, WI, USA) Oral
13. **Timbers, T.A.** and Rankin, C.H. (2008). A CaMK/CREB-dependent pathway contributes to the molecular mechanisms for long-term habituation in *Caenorhabditis elegans*. *2nd Annual Canadian Association of Neuroscience Meeting*. (Montreal, QC, Canada) Poster
14. **Timbers, T.A.** and Rankin, C.H. (2008). A CaMK/CREB-dependent pathway contributes to the molecular mechanisms for long-term habituation in *Caenorhabditis elegans*. *Symposium on Biological Complexity: Genes, Circuits and Behavior*. (La Jolla, CA, USA) Poster
15. **Timbers, T.A.** and Rankin, C.H. (2007). CREB is necessary for long-term memory for habituation and for memory associated changes in glutamate receptor subunit expression in *Caenorhabditis elegans*. *The International Behavioral Neuroscience Society's 16th Annual Meeting*. (Rio de Janeiro, Brazil) Oral
16. **Timbers, T.A.** and Rankin, C.H. (2007). CREB is necessary for long-term memory of habituation in *C. elegans*. *Eighth International Congress of Neuroethology*. (Vancouver, BC, Canada) Poster
17. **Timbers, T.A.** and Rankin, C.H. (2007). A mutation in CREB disrupts long-term memory for habituation and blocks memory associated changes in glutamate receptor subunit expression. *1st Annual Canadian Association of Neuroscience Meeting*. (Toronto, ON, Canada) Poster
18. **Timbers, T.A.**, Rose, J.K., Rankin, C.H. (2006). Reconsolidation of long-term memory in *Caenorhabditis elegans*. *Neuronal Development, Synaptic Function & Behavior C. elegans Topic Meeting #2*. (Madison, WI, USA) Poster
19. **Timbers, T.A.**, Rose, J.K., Rankin, C.H. (2006). Long-term memory in *C. elegans* is subject to reconsolidation. *The International Behavioral Neuroscience Society's 15th Annual Meeting*. (Whistler, BC, Canada) Poster
20. **Timbers, T.A.**, Rose, J.K., Rankin, C.H. (2006). Long-term memory in *C. elegans* is subject to reconsolidation. *The 8th Annual International Behavior and Neural Genetics Society*. (Vancouver, BC, Canada) Poster
21. **Timbers, T.A.** and Yack, J.E. (2005). Vibration as a means of creating personal space in the hook-tip moth caterpillar (Lepidoptera:Drepanidae). *The Ontario Ecology & Ethology Colloquium*. (Ottawa, ON, Canada) Poster

VOLUNTEER EXPERIENCE:

- *Instructor and Mentorship Sub-committee:* Software Carpentry, 2014 - 2015
- *Executive Member:* Simon Fraser University Postdoctoral Fellow Association, 2014 - 2015
- *Organizer:* Canadian Association of Neuroscience Satellite Symposium, 2014 - 2015
- *Organizer:* UBC Graduate Program in Neuroscience Student Summer Seminar Series, 2011
- *Vice-Chair:* VanWoRM Organizing Committee, 2008 - 2010
- *General Member:* VanWoRM Organizing Committee, 2006 - 2007
- *Mentor:* Making Contact Mentorship Program, Vancouver School Board, 2007
- *Volunteer Scientist:* Lets Talk Science, University of British Columbia, 2006 - 2007