

L. ASHLEY WATSON, PhD

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Curriculum Vitae

## EDUCATION

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### **Western University, Schulich School of Medicine and Dentistry, London, ON, Canada**

Doctor of Philosophy, Biochemistry and Developmental Biology 09/2009 to 06/2015  
Bachelor of Science, Honour Specialization Genetics 09/2005 to 06/2009

## EXPERIENCE

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**Scientist, Business Operations** 09/2018 to present  
STEMCELL Technologies, Inc.

- Lead scientist for the genome editing and molecular tools product portfolio; primary duties include: strategic planning and product line development, product testing and validation, sales and customer support including troubleshooting and training
- Developed and optimized comprehensive protocols for high efficiency genome editing of pluripotent stem cells (ES/iPS), T cells, CD34<sup>+</sup> hematopoietic stem cells, and intestinal stem cells including optimization of pre-/post-editing culture conditions and delivery conditions (electroporation or chemical transfection)

**Product Manager, Pluripotent Stem Cells** 02/2018 to 09/2018  
STEMCELL Technologies, Inc.

- Launched and supported the ArciTect™ CRISPR-Cas9 products with development and implementation of CRISPR-Cas9 training and identification of areas for product line expansion
- Collaborated across multiple departments including RND, sales, process development, QA/QC, planning, marketing, and customer service to support launch of six new products and manage existing product performance, inventory, and education

**Postdoctoral Fellow, Massachusetts Institute of Technology** 07/2015 to 02/2018  
Advisor: Dr. Li-Huei Tsai

- Generated multiple neurodevelopmental and neurodegenerative disease-relevant iPSC lines using CRISPR-Cas9 and differentiated iPSCs to neural progenitors and 3D neural organoids
- Identified that DNA damage is an early phenotypic consequence of tau-mediated neurodegeneration due to defects in DNA repair
- Began work to investigate the consequences of intellectual disability-associated CTCF mutations on neurodevelopment and chromatin organization
- Managed multiple research projects; established and maintained collaboration with multiple research groups and colleagues in the lab

**Doctoral Graduate Student, Western University** 09/2009 to 06/2015  
Advisor: Dr. Nathalie Bérubé

- Identified the chromatin regulators ATRX and CTCF are both essential for correct brain development by safeguarding the genome against the accumulation of DNA damage
- Showed that pituitary-specific DNA damage due to ATRX deficiency during development is associated with premature aging-like phenotypes in the mouse
- Collaborated with Dr. David Gilbert's and Dr. Grant Brown's groups to identify that CTCF is required for correct DNA replication timing and to prevent replication stress in neural progenitor cells

Advisor: Dr. Gregory Thorn

- Performed phylogenetic analysis of fungal diversity using novel primer design and curated a high-quality database of fungal species phenotypic and genetic information

## **PUBLICATIONS**

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Meharena HS, Marco A, Dileep V, Lockshin ER, Kuffner G, Mullahoo J, **Watson LA**, Ko T, Guerin L, Abdurob F, Rengarajan S, Papanastasiou M, Jaffe JD, and Tsai LH. Down Syndrome Induced Senescence Disrupts Nuclear Architecture of Neural Progenitors. (Under Revision at *Cell Stem Cell*)

Morshed N, Ralvenius WT, Nott A, **Watson LA**, Rosriguez FH, Akay LA, Joughin BA, Pao PC, Penney J, LaRocque L, Mastroeni S, Tsai LH, and White FM. (2020). Phosphoproteomics identifies microglial Siglec-F inflammatory response during neurodegeneration. *Mol. Syst. Biol.* **16**, e9819.

Pao PC, Patnaik D, **Watson LA**, Gao F, Pan L, Wang J, Adaikkan C, Penney J, Cam HP, Huang WC, Pantano L, Lee A, Nott A, Phan TX, Gjoneska E, Elmsaouri S, Haggarty SJ, and Tsai LH. (2020). HDAC1 modulates OGG1-initiated oxidative DNA damage repair in the aging brain and Alzheimer's disease. *Nat. Commun.* **11**, 2484.

Seo J, Kritskiy O, **Watson LA**, Barker SJ, Dey D, Raja W, Lin YT, Ko T, Cho S, Penney J, Silva MC, Sheridan S, Lucente D, Gusella J, Dickerson B, Haggarty SJ, and Tsai LH. (2017). Inhibition of p25/Cdk5 attenuates tauopathy in mouse and iPSC models of frontotemporal dementia. *J. Neurosci.* **37**, 9917-9924.

Canter RG, Huang WC, Choi H, Wang J, **Watson LA**, Yao CG, Abdurrob F, Bousleiman SM, Young, JZ, Bennett DA, Delalle I, Chung K, and Tsai LH. (2019). 3D mapping reveals network-specific amyloid progression and subcortical susceptibility in mice. *Commun. Biol.* **2**, 360.

**Watson LA** and Tsai LH. (2017). Local metabolites linked to memory. *Nature* **546**, 361-362.

**Watson LA** and Tsai LH. (2016). In the loop: how chromatin topology links genome structure to function in mechanisms underlying learning and memory. *Curr. Opin. Neurobiol.* **43**, 48-55.

Durak O, Gao F, Kaeser-Woo YJ, Rueda R, Martorel AJ, Nott A, Liu CY, **Watson LA**, and Tsai LH. (2016). Chd8 mediates cortical neurogenesis through transcriptional regulation of cell cycle and Wnt signalling genes. *Nat. Neurosci.* **19**, 1477-88.

**Watson LA**, Goldberg H, and Bérubé NG. (2015). Emerging roles of ATRX in cancer. *Epigenomics.* **7**, 1365-78.

\*Ritchie K, \***Watson LA**, Davidson B, Jiang Y, and Bérubé NG. (2014). ATRX is required for maintenance of the neuroprogenitor cell pool in the embryonic mouse brain. *Biol. Open*, **3**, 1158-63.

**Watson LA**, Wang X, Elbert A, Kernohan K, Galjart N, and Bérubé NG. (2014). Dual effect of CTCF loss on neuroprogenitor differentiation and survival. *J. Neurosci.* **34**, 2860-70.

Solomon LA, Russell BA, **Watson LA**, Beier F, and Bérubé NG. (2013). Targeted loss of the ATR-X syndrome protein in the limb mesenchyme of mice causes brachydactyly. *Hum. Mol. Genet.* **22**, 5015-25.

**Watson LA**, Solomon LA, Li JR, Jiang Y, Edwards M, Shin-ya K, Beier F, and Bérubé NG. (2013). *Atrx* deficiency induces telomere dysfunction, endocrine defects, and reduced life span. *J. Clin. Invest.* **123**, 2049-63.

- Featured by Faculty of 1000, doi: 10.3410/f.718000597.793474964.

- Winner of the CIHR Age<sup>+</sup> Publication Award (10/2013), the Dr. Joseph Gilbert Research Contribution of the Year Award (05/2014), and the Drs. Madge and Charles Macklin Fellowship for Publication (06/2014).

## **SELECT HONORS AND AWARDS**

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### Academic Fellowships:

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| Simons Postdoctoral Fellowship                         | 11/2015 to 11/2017 |
| NSERC Postdoctoral Fellowship                          | 07/2015 to 07/2017 |
| NSERC Canada Graduate Scholarship, Doctoral            | 05/2013 to 05/2015 |
| Queen Elizabeth II Scholarship in Science & Technology | 09/2011 to 09/2012 |
| Curtis Cadman Studentship                              | 09/2010 to 09/2011 |
| Paediatrics Graduate Studentship                       | 09/2009 to 09/2011 |

### Academic Honors/Prizes:

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|--|---------|
| MIT Infinite Kilometer Award                               | 01/2018 |
| Dr. William Zaharia Award for top PhD thesis               | 06/2015 |
| Drs. Madge and Charles Macklin Fellowship for Publication  | 06/2014 |
| NeuroDevNet-ISDN Travel Award                              | 07/2014 |
| CIHR Institute of Aging Age <sup>+</sup> Publication Prize | 10/2013 |

### Communication Awards:

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|--|-----------------------------|
| Best Poster Award, Poster Presentation                                 | 07/2014                     |
| ISDN 2014: Development, Functions, and Disorders of the Nervous System |                             |
| First Place Award, Oral Presentation                                   | 05/2010, 05/2012, & 05/2014 |
| Department of Paediatrics Research Day, Western University             |                             |
| First Place, Poster Presentation                                       | 01/2014                     |
| Miami Winter Symposium: Molecular Basis of Brain Disorders             |                             |

### Community Leadership Awards:

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|---|---------|
| MIT Infinite Kilometer Award                | 01/2018 |
| CHIR Deb Comuzzi Trainee of the Year        | 09/2015 |
| LHRI Lawson Impact Awards: Leadership Award | 05/2014 |

## **TEACHING ACTIVITIES AND CERTIFICATES**

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| <b>Conflict Management Training, Massachusetts Institute of Technology</b> | 08/2017            |
| <b>Instructor, Massachusetts Institute of Technology</b>                   | 01/2017 to 05/2017 |
| Molecular and Cellular Neuroscience II, 12 students                        |                    |
| <b>Student Mentor, Massachusetts Institute of Technology</b>               |                    |
| Undergraduate Research Opportunities Program                               | 01/2016 to 01/2018 |
| MIT Summer Research Program  | 06/2016 to 08/2016 |
| <b>Student Mentor, Western University</b>                                  |                    |
| Undergraduate Summer Research Program                                      | 2013 & 2014        |
| Summer Research Medical Student  | 06/2012 to 09/2013 |
| Thesis Student Mentorship  | 09/2010 to 05/2013 |
| <b>Teaching Assistant, Western University, Department of Biochemistry</b>  |                    |
| Biochemistry 2288A: Biochemistry and Molecular Biology, 100 students       | 09/2012 to 12/2013 |
| Biochemistry 4463G: Biochemistry of Genetic Disease, 52 students           | 01/2010 to 05/2010 |