

Mobile (416) 806-3264  
E-Mail [latodf@mcmaster.ca](mailto:latodf@mcmaster.ca)

GitHub [www.github.com/dlato](https://www.github.com/dlato)  
LinkedIn [daniella-lato](https://www.linkedin.com/in/daniella-lato)

## EDUCATION

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### Doctor of Philosophy Candidate in Bioinformatics and Bacterial Genomics

2015-Present

*McMaster University, Hamilton, ON*

Supervisors: Professor G. Brian Golding

Thesis Title: Spatial Patterns of Molecular Trends in Bacterial Genomes

### Honours Bachelor of Science in Mathematics and Biology

2011-2015

*McMaster University, Hamilton, ON*

Supervisors: Professor G. Brian Golding

Honours Thesis Title: Substitution Rates in Relation to Position on the Replicons of *Sinorhizobium*

## CODING AND HIGH PERFORMANCE COMPUTING

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R	L <sup>A</sup> T <sub>E</sub> X	tcsh
R-shiny	Perl	
Python	GitHub	bash
BioPython	Unix command line	zcsch

## RESEARCH EXPERIENCE

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### PhD in Bioinformatics and Bacterial Genomic

2015-Present

*McMaster University, Hamilton, ON*

- Development and innovative application of advanced simulation, data analysis, visual analytics and other computational techniques to research problems in molecular evolution and bacterial genomics.
- Familiarization with bioinformatics tools and pipelines related to sequence annotation, phylogenetics, molecular evolution, gene expression, genome assembly, and data visualization.
- Considerable training in high performance computing and programming, data visualization, statistical analysis, big data storage, and software tool development.
- Modified and developed precise research methodology for bio-statistical analytic techniques using R and Python, resulting in a first author publication [1].
- Grant and paper writing knowledge and involvement.
- Interdisciplinary collaboration.
- Independent research and managing undergraduate student research projects.
- Communicating scientific research to field specific and the general public of up to 230 people.

## PROFESSIONAL EXPERIENCE

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### Research Assistant

2014

*Biology, McMaster University, Hamilton, ON*

Supervisor: Dr. G. Brian Golding

Comprehensive training in bioinformatic software and high performance computing. Computational research

on the molecular evolution of mutations in the bacteria *Sinorhizobium* using sequence analysis and phylogenetics.

**Research Assistant**

2013

*Surgical Oncology, University of Toronto, Toronto, ON*

Supervisor: Dr. Usmaan Hameed

Completed extensive clinical/health data and literature reviews in the surgical oncology field. Experience in clinical setting and data.

**Research Assistant**

2012

*Motherisk, The Hospital for Sick Children, Toronto, ON*

Supervisor: Dr. Myla E. Moretti

Review patient chart information and extract data needed for literature review. Performed research and data analysis on the impacts of maternal genetic testing and adverse infant effects [2]. Experience with clinical/health administrative data acquisition from medical charts, datasets, and surveys as well as analyzing such data.

## **PUBLICATIONS**

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- [1] Lato, D. F. and Golding, G. B. (2020). Spatial Patterns of Gene Expression in Bacterial Genomes. *J Mol Evol*.
- [2] Moretti, M. E., Lato, D. F., Berger, H., Koren, G., Ito, S., and Ungar, W. J. (2017). A cost-effectiveness analysis of maternal CYP2D6 genetic testing to guide treatment for postpartum pain and avert infant adverse events. *Pharmacogenomics J*.

## **SELECT HONORS AND AWARDS**

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**Dr. Edna Guest Award**

2020

*Annual Athletic Awards, McMaster University*

\$1,000 CAD

**All Canadian Award for Outstanding Average**

**While on a Competitive University Sports Team**

2012-2020

*Canadian University Synchronized Swimming League (CUSSL)*

**McMaster Marauder Scholar**

2012 - 2020

*McMaster University Athletics Department*

**Therese Quigley Award of Excellence for**

**Graduate Student Leadership in Athletics**

2018-2019

*Graduate Student Recognition Awards, McMaster University*

\$200 CAD

**Monica Scarabello Memorial Bursary**

2016 and 2018

*McMaster University*

\$1,000 CAD

**RTO/ERO Scholarship**

2017

*Retired Teachers of Ontario (RTO)*

\$1,500 CAD

**Robert John Morris Graduate Studies Bursary**

2016

*McMaster University*

\$1,500 CAD

**McMaster Synchronized Swimming Club VIP**

2016

*McMaster University*

## CONFERENCES/PANEL DISCUSSIONS

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### Poster Presentation

Manchester, UK 2019

*Mutation Rate Evolution*

Society for Molecular Biology and Evolution Conference

### Oral Presentation

McMaster University, Hamilton, ON 2019

*Evolutionary Biology / Molecular Evolution*

Ontario Ecology, Ethology, and Evolution Colloquium

### Oral Presentation

Chicago, IL 2018

*Evolution and Comparative Genomics COSI*

Intelligent Systems for Molecular Biology Conference

### Panellist

EngSci Girl

*McMaster University, Hamilton, ON 2018*

Women In Science and Engineering (WISE)

## SELECT VOLUNTEER EXPERIENCE

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### Let's Talk Science

2017 - Present

*McMaster University, Let's Talk Science, Hamilton*

Educate students aged 4-18 in science, technology, engineering, and math (STEM) by delivering interactive experiments and activities accessibly to the Hamilton youth.

### Novice Program Coach

2019 - 2020

*McMaster Synchronized Swimming Club, McMaster University, Hamilton*

Assist swimmers in establishing individual goals, prepare them for competition and foster a positive environment by developing and facilitating practice plans, workouts and comprehensive competition packages for a range of swimming abilities, including those who are new to the sport. The team is ranked 2nd in Eastern Canada and 6th Nationally.

### SNAP (Special Needs Assistance Program)

2016 - 2019

*McMaster University, Hamilton*

Assist community members who have cognitive and/or physical disabilities complete physical exercise by providing physical assistance, personalized workout plans, and emotional support which resulted in a 77% increase in gross motor capabilities.

### Vice President

2014 - 2015, 2018 - 2019

*McMaster Synchronized Swimming Club, McMaster University, Hamilton*

Assist and advise President on organizing competition registration, travel and accommodations, practices, uniforms, and participation fees by researching and completing administrative tasks.

### Judge for Biology Undergraduate Symposium (BUS)

2017 - 2018

*Department of Biology, McMaster University, Hamilton, ON*

Critically judge final year Theses and Projects of undergraduate STEM students by reviewing the literature and asking thought provoking questions of the participants, analyzing a total of 187 studies.

### President

2015 - 2018

*McMaster Synchronized Swimming Club, McMaster University, Hamilton*

Unassisted responsibility for 84 competitive athletes and 8 coaches resulting in a successful and healthy 4 years as an varsity organization which can be seen by the steady registration rate and over 20 medals and podium finishes. This was implemented through the organization of competition registration, travel and accommodations, practices, uniforms, and club budget.

### BGSS (Biology Graduate Student Society)

2016 - 2017

*Department of Biology, McMaster University, Hamilton*

Assisted with planning, organizing, and running 15 social and academic events for the Biology students at McMaster.

**Meet Manager**

2016

*McMaster Synchronized Swimming Club, McMaster University, Hamilton*

Organized and executed the Canadian University Synchronized Swimming League National Competition at McMaster University, with a total of 22 Universities and 450 athletes and coaches from all over Canada in attendance.

## **OTHER WORK EXPERIENCE**

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**Tour Guide**

2017 - Present

*McMaster University, Hamilton*

**Teaching Assistant**

2015-Present

*Department of Biology, McMaster University*

Introduction to Bioinformatics

**Teaching Assistant**

2015-Present

*Department of Biology, McMaster University*

Genetics

**Guest Lecture**

2018

*Department of Biology, McMaster University*

Molecular Evolution

**Workshop Leader**

2017

*Department of Biology, McMaster University*

High School Plant Molecular Biology Lab Workshop

**Software Carpentry Leader**

2017

*McMaster University, Hamilton*

Command line, Git, and R

**Teaching Assistant**

2014

*Department of Mathematics and Statistics, McMaster University*

Differential Equations