Daniella F. Lato

HBSc, PhD Candidate

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EDUCATION

McMaster University, Hamilton, ON

Doctor of Philosophy Candidate in Bioinformatics Sep 2015 - Present

Supervisors: Professor G. Brian Golding

Thesis Title: Spatial Patterns of Molecular Trends in Bacterial Genomes

Honours Bachelor of Science in Mathematics and Biology Sep 2011 - Apr 2015

Supervisors: Professor G. Brian Golding

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

RESEARCH/WORK EXPERIENCE

PhD in Bioinformatics and Bacterial Genomics Sep 2015 - Present

McMaster University, Hamilton, ON

- Development and innovative application of advanced `R` and `Python` algorithms, analysis pipelines and other computational techniques to research phenomenon in molecular evolution and genomics.
- Familiarization with bioinformatics tools and experimental design related to data visualization, statistics, genomic data analysis, genetics, sequence annotation, molecular evolution, gene expression, and genome assembly.
- Create detailed documentation on operating procedures for computational pipelines.
- Considerable training in implementing Bayesian methods in high performance computing and programming (`Unix/Linux`), data visualization, statistical analysis, big data storage, and software tool development (`Bio-Conductor` libraries) and version control (`Git`).
- Independently designed and implemented experimental tools for bio-statistical testing and analytical processes using `R`, `Python`, and `Perl`, resulting in two first author publications [2, 1].
- Collaborated with students, professors and other academics from the Anthropology, Health Sciences, Mathematics, and Statistics departments to complete complex projects related to microbial evolution, infectious disease, and ancient DNA in a timely and reliable manner.
- Managed undergraduate student research projects by providing vision and direction regarding experimental design, research, and task distribution resulting in a successful projects.
- Concisely communicated scientific research to field specific, public audiences, and funding agencies of up to 230 people at 4 international conferences, culminating in overwhelming positive oral and poster presentation feedback.
- Awarded National and local funding for research by editing and writing grants outlining the proposed and completed research on bacterial genomic evolution.
- Generated progress reports for funding agencies tracking research projects, cost and inventory of research materials, and summary of the investigation, resulting in renewal of grants.

Department of Biology May - Aug 2014

McMaster University, Hamilton, ON

- Comprehensive training in bioinformatic software and high performance computing such as `Python`, `R`, and Unix command line.
- Conducted computational research on the molecular evolution of mutations in the bacteria *Sinorhizobium* using sequence analysis and phylogenetics.
- Presented research, methods, and results to 250 people at a Biology Symposium at McMaster University,

Surgical Oncology May - Aug 2013

University of Toronto, Toronto, ON

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

Motherisk May - Aug 2012
The Hospital for Sick Children, Toronto, ON

- Acquisition and analysis of clinical/health administrative data from Primary Care Electronic Medical Record, datasets, and surveys to determine the impacts of maternal genetic testing and adverse infant effects resulting in a publication [3].

PUBLICATIONS

[1] Lato, D. F. and Golding, G. B. (2020a). Spatial Patterns of Gene Expression in Bacterial Genomes. *J Mol Evol*, 88:510–520.

[2] Lato, D. F. and Golding, G. B. (2020b). The Location of Substitutions and Bacterial Genome Arrangements. *In Review: Genome Biol Evol*.

[3] 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*.

CODING AND HIGH PERFORMANCE COMPUTING

R	**Git/GitHub**	**Perl**
R-shiny	**Unix/Linux**	**tcsh**
Python	**Bio-Conductor**	**bash**
BioPython	**LaTeX**	**zcsh**

TEACHING

Teaching Assistant Sep 2015-Present
Department of Biology, McMaster University
Introduction to Bioinformatics

Teaching Assistant Sep 2015-Present
Department of Biology, McMaster University
Genetics

Guest Lecture Mar 2018
McMaster University, Hamilton
Molecular Evolution

Workshop Leader *McMaster University, Hamilton* Mar 2017

High School Plant Molecular Biology Lab Workshop Mar 2017
Department of Biology

Software Carpentry Leader Mar 2017
Command line, `Git`, and `R`

Teaching Assistant May 2014 - Aug 2014
Department of Mathematics and Statistics, McMaster University
Differential Equations

CONFERENCES/PANEL DISCUSSIONS

Poster Presentation Manchester, UK 2019
Mutation Rate Evolution
Society for Molecular Biology and Evolution Conference

Oral Presentation 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 Hamilton, ON 2018

EngSci Girl

Women In Science and Engineering (WISE), McMaster University

HONORS AND AWARDS

Dr. Edna Guest Award for Graduating Athlete of the Year 2020

Annual Athletic Awards, McMaster University

$1,000 CAD

McMaster Marauder Athlete Scholar 2012 - 2020

McMaster Univeristy Department of Athletics

All Canadian Award for Outstanding Average While on a Competitive University Sports Team 2012 - 2020

Canadian University Synchronized Swimming League (CUSSL)

Therese Quigley Award of Excellence for Graduate Student Leadership in Athletics 2018 - 2019

Graduate Student Recognition Awards, McMaster University

$200CAD

Biology Travel Scholarship 2018-2019

Department of Biology, McMaster University

$500 CAD

GSA Travel Assistance Award 2019

School of Graduate Studies, McMaster University

$500 CAD

Monica Scarabello Memorial Bursary 2016 - 2018

McMaster University

$500 CAD

Evolution and Comparative Genomics Subsidy 2018

International Society for Computational Biology

$475 USD

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

Dean's Honor List 2012 - 2015

McMaster University

Dr. Joachim Sparkuhl Undergraduate Research Award in Genomics, Genetics and Other Biological Sciences 2014

McMaster University

$7,680 CAD

Undergraduate Entrance Scholarship 2011

McMaster University

$750CAD

SELECT VOLUNTEER EXPERIENCE

Let's Talk Science Sep 2017 - Present

McMaster University, Hamilton

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

McMaster Synchronized Swimming Varsity Team Sep 2014 - Apr 2020

McMaster University, Hamilton

Novice Program Coach Sep 2019 - Apr 2020

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.

Vice President Sep 2014 - Sep 2015, Sep 2018 - Sep 2019

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

President Sep 2015 - Sep 2018

Responsible 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, diligent record-keeping, travel and accommodations, practices, uniforms, and club budget.

Meet Manager Nov 2016

Organized, scheduled, 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.

SNAP (Special Needs Assistance Program) Sep 2016 - Apr 2019

McMaster University, Hamilton

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

Judge for Biology Undergraduate Symposium (BUS) Sep 2017 - Sep 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.

BGSS (Biology Graduate Student Society) Sep 2016 - Aug 2017

Department of Biology, McMaster University, Hamilton

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

McMaster Arts for Children Sep 2014 - Sep 2015

McMaster University, Hamilton

Promote the arts and inspire creativity among children by instructing arts and crafts programs that teach appreciation for and expose children to various aspects of the arts in the Hamilton Community.

McMaster Athletes Care Sep 2013 - Sep 2014

McMaster Synchronized Swimming Club, McMaster University, Hamilton

Create a space for vulnerable Hamilton youth to engage in sport activities by mentally supporting participants and focusing on local community development.