

# Madeleine Oman

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@MadeleineOman



## PUBLICATIONS

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- 2025      **Genetics**  
Comparing the predictors of mutability among healthy human tissues inferred from mutations in single cell genome data  
**Oman, M.\***, Ness, R.  
<https://academic.oup.com/genetics/article-abstract/229/3/iya215/8015402?redirectedFrom=fulltext&login=true>
- 2024      **Nature Ecology and Evolution**  
Effects of urban-induced mutations on ecology, evolution and health  
Johnson, M.\*, Arif, I., Marchetti, F., Munshi-South, J., Ness, R., Szullin, M., Verrelli, B., Yauk, C., Anstett, D., Booth, W., Caizergues, A., Carlen, E., Dant, A., González, J., **Oman, M.**, Phifer-Rixey, M., Rennison, D., Rosenberg, M., Winchell, K.  
<https://www.nature.com/articles/s41559-024-02401-z>
- 2022      **Genome Biology and Evolution (GBE)**  
How sequence context-dependent mutability drives mutation rate variation in the genome  
**Oman, M.\***, Alam, A., Ness, R.  
<https://academic.oup.com/gbe/article/14/3/evac032/6537538?login=true>

AWARDS : total funding = \$129,310

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- 2024      [\*\*Professional Development Travel Award\*\*](#) - \$1,500 (USD)  
Heath and Environmental Science Institute (HESI)  
  - Merit based award for travel abroad assessed on research potential and ability to contribute to the genetic toxicology field
- 2023      [\*\*Research Mobility Award\*\*](#) - \$6,000  
Emerging & Pandemic Infections Consortium (EPIC), University of Toronto  
  - Competitive merit based award for travel abroad
- 2023      [\*\*Global Link Research Award\*\*](#)— \$6,000  
Mathematics of Information Technology and Complex Systems (MITACs), Canada  
  - Competitive merit based award for travel abroad

- 2022 [Postgraduate Scholarships – Doctoral \(PGS D\) Program](#) – \$82,000  
Natural Sciences and Engineering Research Council (NSERC), Canada
- Competitive merit based award based on research potential.
- 2021 [Ontario Graduate Scholarship \(OGS\) Program](#) - \$15,000  
Ontario Student Assistance Program (OSAP), Canada
- Competitive merit based award based on research potential.
- 2020 [Canadian Graduate Scholarship Master's \(CGS-M\) Program](#) – \$17,500  
Natural Sciences and Engineering Research Council (NSERC), Canada
- Competitive merit based award based on research potential.
- 2020 **Human of Biology Award**  
Biology department, University of Toronto Mississauga
- Departmental recognition award for organizing, sewing, and distributing over 300 homemade covid-19 masks to the department.
- 2019 **Brenda and Gary Mooney Award** - \$1510  
Robert Gillespie Academic Skills Centre, University of Toronto Mississauga
- Merit-based award for considerable contributions to the RGASC student service.

## TALKS

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- 2025 **Environmental Mutagenesis and Genomic Society - Genomic and Data science special interest group (invited)**  
Lessons from AI: Predicting mutability in healthy human tissues Using Single Cell Data  
**Oman, M.\***, Ness, R.
- 2024 **Environmental Mutagenesis and Genomic Society**  
Exogenous and Endogenous Predictors of Mutation in Healthy Human Tissues  
**Oman, M.\***, Ness, R.
- 2023 **University of Toronto Biology departmental seminar**  
Modelling the predictors of mutability variation  
**Oman, M.\***, Ness, R.
- 2022 **Evolution**  
The predictors of mutation rate variation  
**Oman, M.\***, Ness, R.

- 2022 **International Centre for Supplemental instruction**  
Mapping: Providing High Quality Feedback to S.I. Leaders in In-Person and Online Sessions  
**Oman, M\***, Salim, H.
- 2022 **International Centre for Supplemental instruction**  
Going beyond lecture announcements: Social media advertising strategies for supplemental instruction leaders  
**Oman, M\***, Salim, H.
- 2022 **International Centre for Supplemental instruction**  
The Great Unscramble: A Panel Discussion on the Future of Hybrid Supplemental Instruction in Canada  
Klubi, T., Martin, K., O'Neil, A., Stypka, A., Gibson, D., Sidhu, N., Jaworski, J., **Oman, M\***, Salim, H., Mawari, T., Alvarenga, B.

#### POSTER PRESENTATIONS

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- 2023 **Society for Molecular Biology and Evolution (SMBE)**  
Predictors of mutation in healthy human tissue  
**Oman, M.\***, Ness, R.
- 2021 **Society for Molecular Biology and Evolution (SMBE)**  
How selection and sequence context drive the evolution of mutation rate variation.  
**Oman, M.\***, Aqsa, A., Ness, R.
- 2019 **International Association for Landscape Ecology (IALE) World Congress**  
Demo-genetic modeling of the effect of forest fragmentation on plant population viability: parameterizing a HexSim model with 10 years of field data.  
Hadley, A.\*, **Oman, M.**, Betts, M., Wagner, H.
- 2019 **47<sup>th</sup> Southern Ontario Undergraduate Student Chemistry Conference**  
Design of an anaerobic chamber with multi-sensor chemical monitoring to investigate soft-tissue decay and mineralization  
**Oman, M.\***, Azzopardi, A.\*, Daka, M.\*, Osminin, A.\*, Tymczak, A.\*, Steven Chatfield, Ulrich Krull, Mark Laflamme, Paul Piunno
- 2018 **Canadian Society for Ecology and Evolution**  
Simulating the effects of deforestation on a keystone plant with HexSim  
**Oman, M.\***, Wagner, H.

#### SERVICE & LEADERSHIP

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2022-Present	<b>Treasurer</b> , Uft Coders, UfT <ul style="list-style-type: none"> <li>Developed and ran coding workshops for graduate students.</li> </ul>
2022	<b>Reviewer</b> , Genome
2021	<b>Organizer</b> , Atwood Conference, UfT
2020-2021	<b>Secretary</b> , Biology Graduate Student Society, UfT <ul style="list-style-type: none"> <li>Student group organizing events and advocating for graduate students.</li> </ul>

#### MENTORSHIP

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2022	<b>Jimmy Issa</b> , Undergraduate thesis student
2021-2022	<b>Karis Kungsamutr</b> , Undergraduate thesis student
2020-2021	<b>Danny Huong</b> , Undergraduate thesis student
2019-2020	<b>Aqsa Alam</b> , Undergraduate thesis student

#### EDUCATION

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2019-Present	<b>PhD of Ecology and Evolutionary Biology</b> , UfT Dr. Rob Ness <ul style="list-style-type: none"> <li>Using machine learning algorithms to model the predictors of mutation rate</li> </ul> Courses: <ul style="list-style-type: none"> <li>EEB1450 Introduction to Statistical Learning: A</li> <li>EEB1456 Bias in STEM: History, Data and process : A+</li> </ul>
2014-2019	<b>Honors Bachelor Science</b> , UfT <ul style="list-style-type: none"> <li>Graduated with High Distinction</li> <li>Biology Specialist, Math Minor</li> </ul>

#### UNDERGRADUATE RESEARCH EXPERIENCE

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2019	<b>Research technician</b> , UfT Dr. Helene Wagner <ul style="list-style-type: none"> <li>Working with <i>H. tortuosa</i> specialist Adam Hadley to improve ecological models and test deforestation regimes in the tropics</li> </ul>
2018- 2019	<b>Research assistant</b> , Advanced Interdisciplinary Research (AIR) lab Dr. Steven Chatfield, Dr. Paul Piunno, Dr. Mark LaFlamme, Dr. Ulrich Krull <ul style="list-style-type: none"> <li>Student led research project exploring soft tissue mineralization</li> <li>AGILE management strategy</li> <li>\$6000 budget management</li> </ul>

- 2018                      **Research assistant**, Thesis course BIO481  
 Dr. Helene Wagner
- Developed an ecological model for a keystone tropical plant species *H. tortuosa*
- 2017                      **Research assistant**, Research opportunity program  
 Dr. Katharina Braeutigam
- Assisted in research focusing on epigenetic changes during plant stress
  - Performed basic lab techniques including processing tissue samples

## TEACHING EXPERIENCE

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- 2022 - Present                      **Graduate Education developer, UfT**  
 Teaching Assistant Training Program
- Train hundreds of Teaching Assistants
  - Develop learning modules to promote the professional development of TAs
  - Create and run workshops build teaching skills
- 2020                      **Guest lecturer**  
 Introductory Genetics (Bio207), UfT
- Created online video series (Covid-19 alternative) on applications in genetics
  - <https://www.youtube.com/watch?v=ddhM3ElfZ7Y&list=PLLh2sOkgbpigvQTiAALCUM7-dEHtiGCHs&index=1>.
- 2020                      **Lesson design**  
 Plant development (Bio353), UfT
- Developed interactive tutorial lesson that employs active learning techniques
  - Students develop their own research questions and are trained on how to investigate them using scientific rigor.
  - Improves bioinformatic competency with contemporary tools
    - <http://blast.ncbi.nlm.nih.gov/Blast.cgi>
    - <http://bar.utoronto.ca>
    - [www.arabidopsis.org](http://www.arabidopsis.org)
- 2019 - Present                      **Teaching Assistant**  
 Biology department, UfT
- Bio153 Diversity of Organisms
  - Bio202 Introductory Animal Physiology
  - Bio203 Introductory Plant Physiology
  - Bio207 Introductory Genetics
  - Bio209 Fundamentals of Human Anatomy and Physiology II
  - Bio341 Advanced Genetics

- Bio353 Plant development
  - Bio434 Social determinants of Human Health
- 2018 - Present      **Program Assistant**, Facilitated study group (FSG) program  
Robert Gillespie Academic Skills Centre
- Responsible for managing 30+ FSG leaders and overseeing the implementation of active learning techniques in weekly FSG sessions
  - Designed and administered training
  - Work with senior staff to design Covid-19 mitigation strategies and optimize FSG program operations
- 2019      **Program Assistant**, Academic Culture and English (ACE) program  
Robert Gillespie Academic Skills Centre
- Taught weekly 3h sessions to groups of 30 new international students about integrating into university life
  - Responsible for lesson content creation
- 2018      **Guest Lecturer**  
Bio311 Landscape Ecology, UfT
- Presented my work in ecological modelling to convey the importance of spatially-explicit models on spatially structured populations
- 2017-2019      **Facilitated Study Group (FSG) leader**, UTM
- The FSG program offers weekly sessions for select 1<sup>st</sup> and 2<sup>nd</sup> year courses led by past students (leaders)
  - Volunteer leaders are trained in active learning techniques to optimize student learning
  - Volunteer leaders manage students and employ active learning techniques to optimize learning in weekly course-specific study sessions
  - Regularly developed academic content for introductory mathematics and genetics courses

#### INTERESTS AND SKILLS

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Proficient with Microsoft office and multiple coding languages (R, python, bash, Arduino)  
 French speaking and writing proficiency, conversational Russian  
 Math Olympiad member  
 Volleyball, rock climbing  
 Sewing, embroidery and crafting