

NOOR YOUSSEF

nooryoussef03@gmail.com

7050 Biology ◊ Life Science Centre

Dalhousie University ◊ Halifax, NS, Canada

EDUCATION

PhD Candidate

2015 - 2021

Dalhousie University

Title: Evolutionary dynamics under a stability-constrained model.

Research focus: Computational Molecular Evolution

Advisor: Dr. Joseph Bielawski, Dept. Biology and Dept. Mathematics & Statistics

Advisor: Dr. Edward Susko, Dept. Mathematics & Statistics

BSc Combined Honours in Mathematics & Biology

2011 - 2015

Dalhousie University

First Class Honours

PEER-REVIEWED PUBLICATIONS

6. **Youssef N**, Susko E, and Bielawski JP (2020). Consequences of stability-induced epistasis for substitution rates. *Molecular Biology and Evolution*. 37(11): 3131-3148.
5. Jones CT, **Youssef N**, Susko E, and Bielawski JP (2020). A Phenotype–Genotype Codon Model for Detecting Adaptive Evolution. *Systematic Biology*, 69(4): 722-738.
4. Stewart DR, Breton S, Chase EE, Robicheau BM, Bettinazzi S, Pante E, **Youssef N**, and Garrido-Ramos MA (2020). An unusual evolutionary strategy: the origins, genetic repertoire, and implications of doubly uniparental inheritance of mitochondrial DNA in bivalves. In: Pontarotti P (eds) *Evolutionary Biology—A Transdisciplinary Approach*. Springer, Cham.
3. **Youssef N**, Budd A, and Bielawski JP (2019). Introduction to genome biology and diversity. In: Anisimova M. (eds) *Evolutionary Genomics. Methods in Molecular Biology*, vol 1910. Humana, New York, NY.
2. Jones CT, **Youssef N**, Susko E, and Bielawski JP (2018). Phenomenological load on model parameters can lead to false biological conclusions. *Molecular Biology and Evolution*, 35: 1473– 1488.
1. Jones CT, **Youssef N**, Susko E, and Bielawski JP (2017). Shifting balance on a static mutation-selection landscape: a novel scenario of positive selection. *Molecular Biology and Evolution*, 34: 391– 407.

MANUSCRIPTS UNDER REVIEW

3. **Youssef N**, Roger A, Susko E, and Bielawski JP. Shifts in amino acid preferences as proteins evolve: a synthesis of experimental and theoretical work. Under review in *Protein Science* on May 13, 2021.
2. **Youssef N**, Roger A, Susko E, and Bielawski JP. Trajectories of amino acid propensities under stability-mediated epistasis. Under review in *Molecular Biology and Evolution* on May 20, 2021.
1. Stewart DR, Robicheau BM, **Youssef N**, Garrido-Ramos MA, Chase EE, and Breton S. Expanding the search for sperm transmission elements in the mitochondrial genomes of bivalve mollusks. Submitted to *Genes* on June 25, 2021.

TEACHING EXPERIENCE

Course Creator and Instructor Course: Inference of natural selection pressure in protein coding DNA sequences <i>Graduate-Level Course, Dalhousie University.</i>	2018
Guest Lecturer Course: Molecular Evolution <i>Third Year Undergraduate Course, Dalhousie University.</i>	2017
Guest Lecturer Course: Genetics <i>Second Year Undergraduate Course, Dalhousie University.</i>	2017 - 2019
Tutorial Instructor Course: Genetics <i>Second Year Undergraduate Course, Dalhousie University.</i>	2016 - 2020
Lab Teaching Assistant Course: Genetics <i>Second Year Undergraduate Course, Dalhousie University.</i>	2015 - 2016
Lab Teaching Assistant Course: General Chemistry <i>First Year Undergraduate Course, Saint Mary's University.</i>	2012 - 2013

ORAL PRESENTATIONS

- Consequences of stability-induced epistasis on theoretical and inferred substitution rates.** *SMBE*. 2020 [Cancelled due to COVID19].
- The influence of epistasis on substitution rates.** *Center for Comparative Genomics and Evolutionary Bioinformatics*. 2019.
- Implications of Epistasis on Protein Evolution: A Thermodynamically Guided Walk Through Sequence Space.** *Dr. Patrick Lett Research Symposium*. 2019.
- A thermostability-informed model of protein evolution: The Good, the Bad, and the Ugly.** *Center for Comparative Genomics and Evolutionary Bioinformatics*. 2018.
- The implied differences in evolutionary dynamics between intragenic epistasis and site-independence modelling** *Dr. Patrick Lett Research Symposium*. 2018.
- Evolutionary trajectories in protein space.** *Center for Comparative Genomics and Evolutionary Bioinformatics*. 2017.
- Assessing methods for detecting adaptive peak shifts from comparative codon data.** *Dr. Patrick Lett Research Symposium*. 2016.
- Codon Substitution Models are ill-equipped to deal with non-stationary evolution.** *Dr. Patrick Lett Research Symposium*. 2015.
- Analysis of the *Prochlorococcus* *cpe β* gene to determine the effects of non-stationary evolution on the inference of selection pressure.** *Cameron Conference*. 2015.

WORKSHOPS AND EXTRA-CURRICULAR COURSEWORK

Parallel Computing Summer School. *Compute Canada.* 2020.

Programming Numerical Methods in Python. *Udemy.* 2020.

Online Synchronous Teaching workshop *The Centre for Learning and Teaching, Dalhousie University.* 2020.

Darwinizing Gaia. *Center for Comparative Genomics and Evolutionary Bioinformatics, Dalhousie University.* 2019.

Evolutionary Roles of Transposable Elements and ‘non-coding’ DNA: the Science and the Philosophy Workshop. *Dalhousie University.* 2018.

Philosophy of Biology Workshop. *Dalhousie University.* 2018.

RELEVANT COURSEWORK

Graduate Courses:

Stochastic Processes. Bioinformatics. Algorithms in Bioinformatics. Communication Skills-Scientist.

Biology Undergraduate Courses:

Evolution. Genetics. Molecular Evolution.

Mathematics Undergraduate Courses:

Matrix Theory/Linear Algebra (I and II). Cryptography. Theory of Numbers. Combinatorial Game Theory.

PROGRAMMING SKILLS

◦ Python ◦ R ◦ Matlab ◦ Shell ◦ L^AT_EX

RECOGNITIONS AND AWARDS

Best Oral Presentation Award- Symposium 2019

12th Annual Dr. Patrick Lett Research Symposium.

Best Oral Presentation Award - Session 2019

12th Annual Dr. Patrick Lett Research Symposium.

Featured Scientist 2018 - 2019

Center for Comparative Genomics and Evolutionary Bioinformatics

Featured Scientist in-lecture interview 2019

Cell Biology

Graduate Student Travel Award 2017

Center for Comparative Genomics and Evolutionary Bioinformatics

Student Travel Grant 2017

Dalhousie Association of Graduate Students, Dalhousie University

Student Travel Grant 2017

Dalhousie Student Union, Dalhousie University

Biology Graduate A- Fellowship 2016 - 2020

Dalhousie University

ACADEMIC SERVICE

Organiser, Evolution and Philosophy Discussion Group <i>Dalhousie University</i>	2018 - 2020
Search Committee for the Jarislowsky Chair in Marine Ecosystem Forecasting <i>Dalhousie University</i>	2019
Vice-President <i>Biology Organization of Graduate Students, Dalhousie University</i>	2019 - 2020
Event Coordinator, BioBall <i>Biology Organization of Graduate Students, Dalhousie University</i>	2019 - 2020
Trainee <i>Center for Comparative Genomics and Evolutionary Bioinformatics</i>	2015 - present
Member, Evolutionary Studies Group <i>Dalhousie University</i>	2016 - present
Social Coordinator <i>Biology Organization of Graduate Students, Dalhousie University</i>	2017 - 2019
Volunteer, Lett Symposium <i>Dalhousie University</i>	2016- 2018
Treasurer <i>Biology Organization of Graduate Students, Dalhousie University</i>	2016 - 2017
Peer-Reviewer <i>BMC Evolutionary Biology</i>	
Member, Society for Molecular Biology and Evolution	
Member, The Protein Society	

STUDENT COMMENTS

Teaching Evaluations from 2nd-year Genetics Tutorial	2016 - 2020
“The best TA I have had in university. She explained things extremely clearly and offered different approaches to problems. Attending this tutorial with Noor was a critical part of doing well in this course and grasping material.”	
“Noor was amazing! So knowledgeable on the subject, amazing at explaining everything. I can really tell that the subject matter really resonates with Noor. Great at answering questions and checking in if we all understand. Very personable and approachable”	
“Noor was clearly very well prepared for each genetics tutorial. She would make a really great professor or lab instructor one day!”	
“Noor was very knowledgeable and I was impressed with how prepared she was for tutorial every week and really taught the material well. I did a lot better on the quizzes because of how well Noor could explain the subject.”	
“I was lucky to have such an awesome and helpful TA!”	

REFERENCES

Dr. Joseph Bielawski

j.bielawski@dal.ca

Department of Biology

Department of Mathematics & Statistics

Dalhousie University

Dr. Edward Susko

edward.susko@dal.ca

Department of Mathematics & Statistics

Dalhousie University

Prof. Debra Grantham

grantham@dal.ca

Department of Biology

Dalhousie University