Brandon M. Lê

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Education

Duke University *August 2018 – Present*

Ph.D. Candidate, University Program in Genetics & Genomics (UPGG) *Durham, NC*

- Courses: Computational Tools for Genomic Analysis, Quantitative Biological Modeling, Statistical Computing
- Professional Development and Certifications: Certificate in College Teaching (expected 2023), Preparing Future Faculty, The Carpentries Instructor

Brown University *August 2014 – May 2018*

A.B. Computer Science, significant coursework in Biology *Providence, RI*

- Courses: Computational Molecular Biology; Biomedical Informatics; Genetics; Evolutionary Biology; Population Genetics; Software Engineering; Statistical Inference; Immunology; Cell and Molecular Biology

Research Experience

Epigenetic Age Acceleration & Symptom Outcomes in SCD *March 2022 – Present*

Advisor: Allison Ashley-Koch, Mitchell Knisely *Duke University, Durham, NC*

- Investigating the epigenetic landscape of sickle cell disease patients
- Calculating epigenetic age based on published epigenetic clocks and discovering associations with chronological age and psychoneurological symptoms

Sickle Cell Disease multi-omics imputation and renal outcome prediction *April 2019 – Present*

Advisor: Allison Ashley-Koch *Duke University, Durham, NC*

- Investigating the genetic modifiers behind SCD pathogenesis to predict clinical outcomes in patients
- Identifying variants associated with renal outcomes in a TOPMed SCD GWAS
- Utilizing machine learning methods to enhance imputation accuracy in individual multi-omics profiles

Exome sequence analysis of Essential Tremor (ET) *August 2019 – October 2019*

Advisor: Allison Ashley-Koch *Duke University, Durham, NC*

- Investigated genetic polymorphisms in several families with a positive ET family history
- Performed variant filtering on exome sequencing data to find candidate SNPs affecting ET outcomes

Visualization of NHEJ-induced open chromatin regions *November 2018 – February 2019*

Advisor: David MacAlpine (rotation project) *Duke University, Durham, NC*

- Investigated how non-homologous end joining (NHEJ) affects chromatin formation in *S. cerevisiae*
- Wrote Python scripts to generate chromatin density plots for lab-cultivated *S. cerevisiae* lines

Alternative spliceoforms of CHD8 *September 2018 – November 2018*

Advisor: Yong-Hui Jiang (rotation project) *Duke University, Durham, NC*

- Investigated the role of CHD8 isoforms in neurodevelopmental disorders
- Extracted RNA from mice and performed PCRs to test for alternatively-spliced exons in CHD8

G-quadruplex detection and annotation in fungi *June 2017 - August 2017*

Advisor: Irina Arkhipova *Marine Biological Laboratory, Woods Hole, MA*

- Developed an annotation pipeline in Python to identify G4 complexes in various fungi
- Worked on methods to efficiently classify G4 complexes for future functional analyses

Transposable element integration in parasitoid wasps *June 2016 - August 2016*

Advisor: Irina Arkhipova *Marine Biological Laboratory, Woods Hole, MA*

- Performed *de novo* detection and annotation of transposable elements in Hymenopteran genomes
- Maintained shell scripts and ran Python programs to identify and annotate transposable elements
- Co-authored publication on genomic signatures of miniaturization in *M. amalphitanum*

Genomic palindrome usage in Mycobacteriophages *February 2015 – June 2015*
Advisor: Benjamin Siranosian *Brown University, Providence, RI*

- Investigated palindromic tetranucleotide sequence usage in bacteriophages for biases
- Wrote Python scripts to generate heatmaps of data compiled with other student collaborators
- Presented research to the HHMI SEA-PHAGES annual symposium

SEA-PHAGES at Brown University *September 2014 – May 2015*
Advisor: Sarah Taylor *Brown University, Providence, RI*

- Isolated a bacteriophage from a soil sample through in-vitro biological laboratory work and extracted its DNA for sequencing and archiving
- Annotated the genome from a colleague's bacteriophage through in-silico analysis

Grants and Awards

Precision Genomics Collaboratory-OBGE Graduate Student Pilot Research Grant *2022*
Precision Genomics Collaboratory, Duke University

NHLBI BioData Catalyst Fellowship *2020 – 2021*
National Heart, Lung, and Blood Institute, National Institutes of Health

Teaching

UPGG Informatics Orientation Bootcamp *2022*
University Program in Genetics & Genomics, Duke University

- Instructed incoming PhD students on computational skills, including bash scripting, Python, R, code design and practices, and automation
- Assisted students with in-class coding activities

Service and Leadership

Duke Graduate and Professional Student Government (GPSG) *August 2020 – Present*
President *(May 2022 – Present)* *Duke University, Durham, NC*
Director of Logistics & Operations *(August 2021 – May 2022)*
General Assembly Representative *(August 2020 – August 2021)*

- Oversee the advocacy and student affairs needs of 10,000 Duke University graduate and professional students
- Operate the student government through organizing general body meetings, leadership meetings, and managing advocacy and student affairs portfolios
- Establish direct working relationships with university administrators
- Serve ex-officio on the University Priorities Committee and the Graduate and Professional Education and Research standing committee of the Board of Trustees
- Negotiated a $5,000 increase in Ph.D. stipends for all Duke University Ph.D. students

Duke F1RSTS *September 2018 – Present*
Co-President *(May 2022 – Present)* *Duke University, Durham, NC*

President (*May 2021 – May 2022)*
Treasurer *(May 2020 – May 2021)*

- Cultivating a community for first-generation and low-income graduate students at Duke University
- As part of the Executive Board, hosting events around professional development, career guidance, mentoring, and first-generation student-relevant topics

Duke Information Technology Advisory Council (ITAC) *September 2019 – Present*
Graduate Student Representative *Duke University, Durham, NC*

- Advise on best IT practices for university-wide IT projects from a graduate student perspective
- Survey the graduate and professional student body on the state of IT services

AREA 27 – FIRST Robotics Competition, Team 6496 *January 2019 – August 2021*
Mentor *Duke University, Durham, NC*

- Hosted a community-based robotics team that competes in the FIRST Robotics Competition
- Assisted high school students with robot engineering, as well as personal and professional development

Duke Graduate and Professional Library Advisory Board *September 2018 – May 2020*
Graduate Student Representative *Duke University, Durham, NC*

- Advised the Duke University Libraries on services and resources from a graduate student perspective

Brown-RISD Vietnamese Students Association *September 2014 – May 2018*
Co-President, Webmaster *Brown University, Providence, RI*

- Led the Executive Board in planning and hosting events pertaining to Vietnamese culture and heritage for the Providence, RI community
- Maintained and updated content for the VSA website, written in HTML, CSS, and JavaScript

First-Generation, Low-Income College Students at Brown University *March 2015 – May 2018*
Project Lead *Brown University, Providence, RI*

- Led a project among the first-generation community to crowdsource a guidebook about life at Brown
- Built a website for the First-Gens@Brown student group, written in HTML, CSS, and JavaScript

Publications and Presentations

8. **Lê BM**, Garrett ME, Telen MJ, Ashley-Koch AE**.** Genome-wide association studies of renal outcomes in the TOPMed sickle cell disease cohorts. Duke Molecular Physiology Institute 2022 Retreat; 2022 October; Beaufort, NC.

7. **Lê BM.** NHLBI BioData Catalyst Community Hours on Sickle Cell Disease Datasets and Research. NHLBI BioData Catalyst; 2022 July; virtual.

6. **Lê BM.** NHLBI BioData Catalyst Fellows presentation on sickle cell disease. PRIDE-Functional and Translational Genomics of Blood Disorders meeting; 2022 July; virtual.

5. **Lê BM**. Genome-wide association studies of renal outcomes in the TOPMed sickle cell disease cohorts. NHLBI BioData Catalyst Virtual Quarterly Meeting; 2021 December; virtual.

4. **Lê BM**. Genome-wide association studies of renal outcomes in the TOPMed sickle cell disease cohorts. Duke University Precision Genomics Collaboratory Symposium; 2021 December; Durham, NC.

3. Sharko FS, Nedoluzhko AV, **Lê BM**, Tsygankova SV, Boulygina ES, Rastorguev SM, Sokolov AS, Rodriguez F, Mazur AM, Polilov AA, Benton R, Evgen'ev MB, Arkhipova IR, Prokhortchouk EB, Skryabin KG. A partial genome assembly of the miniature parasitoid wasp, Megaphragma amalphitanum. PLoS One. 2019 Dec 23;14(12):e0226485. doi: 10.1371/journal.pone.0226485. PMID: 31869362; PMCID: PMC6927652.

2. **Lê BM**, Rodriguez F, Arkhipova IR. Transposon element dynamics and nervous system reduction in a tiny parasitoid wasp. Mobile Genetic Elements Conference; 2017 August; Woods Hole, MA.

1. Gross J, Alexander K, **Lê BM**, Ricca Z, Tung HR, Siranosian B, Zhou Y, Taylor S, de Graffenried C. Characterization of palindrome usage in mycobacteriophage genomes. HHMI SEA-PHAGES Symposium; 2015 June; Ashburn, VA.