Maya Lemmon-Kishi

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Education

University of California, Berkeley
Berkeley, California

PH.D. IN COMPUTATIONAL BIOLOGY — *Aug. 2019 - Exp. May 2025*

- Advised by Rasmus Nielsen, Departments of Statistics & Integrative Biology

University of Pittsburgh
Pittsburgh, Pennsylvania

B.S. IN COMPUTER SCIENCE, *magna cum laude* — *Aug. 2014 - Dec. 2018*

- Program Honors in Computer Science
- Minors in Bioengineering and Chemistry

Research Experience

Graduate Researcher
Berkeley, California

NIELSEN LAB — *May 2020 - Present*

- Currently developing methods for population genetic analyses of environmental DNA
- Analyzing environmental DNA for signals of population structure using population genetic summary statistics
- Implementing an algorithm to estimate phylogenetically compatible haplotypes from environmental DNA
- Running simulations to test method on dating ancient environmental samples using DNA

Graduate Rotation Student
Berkeley, California

VARIOUS LABS — *Sept. 2019 - May 2020*

- Implemented a RNA-seq pipeline for custom reference genome generation of sunflowers
- Developed a method to calculate population genetic summary statistics of environmental DNA
- Explored methods to detect non-Brownian phylogenetic signal of leaf chemical composition data

Undergraduate Researcher - PittSmartLiving
Pittsburgh, Pennsylvania

ADVANCED DATA MANAGEMENT TECHNOLOGIES LAB — *Sept. 2018 - May 2019*

- Developed a Flask interactive web application to visualize public transportation connectivity of various U.S. cities
- Produced a Flask web application to visually navigate passenger density data
- Demoed at the Rail-Volution 2018 Mobility Showcase

Undergraduate Researcher
Pittsburgh, Pennsylvania

KOSTKA LAB, UNIVERSITY OF PITTSBURGH — *Jan. 2018 - Dec. 2018*

- Analyzed single cell kidney data in R to determine validity of pipeline through comparison with published results
- Implemented a Nextflow pipeline to process single-cell Drop-Seq data

Undergraduate Researcher and Student Leader (Pittsburgh iGEM)
Pittsburgh, Pennsylvania

DEPARTMENT OF BIOENGINEERING, UNIVERSITY OF PITTSBURGH — *Apr. 2016 - May 2017*

- Developed a Simulink model to predict lead blood level concentration depending on lead water levels
- Designed a lead and thallium biosensor using biological components
- Managed and planned all cloning related activities
- Coordinated outreach events and interviews

Undergraduate Researcher
Pittsburgh, Pennsylvania

BANERJEE LAB, UNIVERSITY OF PITTSBURGH — *Jan. 2016 - May 2016*

- Developed a spheroid analysis macro to analyze pancreatic organoids with ImageJ processing
- Cell culture of fibroblasts and human umbilical vein endothelial cells
- Analyzed islet organoids using qPCR

Industry Experience

Data Engineering Intern
West Sacramento, California

COMPUTATIONAL LIFE SCIENCE, BAYER CROP SCIENCE — *May 2019 - Aug. 2019*

- Developed an R Shiny tool to visualize the data landscape of Biologics discovery pipeline
- Streamlined data upload and developed long term storage for laboratory analysis pipeline

Genotyping Development Scientist Intern
Chesterfield, Missouri

BAYER CROP SCIENCE (FORMERLY MONSANTO) — *Apr. 2018 - Aug. 2018*

- Worked with a diverse team to develop an algorithm in R to generate and process data about differences in genetic maps across germplasm
- Identified several data quality control concerns from genetic inference and developed tools to analyze these issues
- Developed an algorithm in R to impute missing genetic information

Mentorship

Undergraduate Mentor
Berkeley, California

University of California, Berkeley
Sept 2021 - Present

- Chris Dong: Mentored Chris on a project to incorporate environmental variables in population structure analysis of environmental DNA and developed his skills in computational tools.

iGEM Summer Research Fellowship Supervisor (Pittsburgh iGEM)
Pittsburgh, Pennsylvania

Department of Bioengineering, University of Pittsburgh
May. 2017 - Oct. 2017

- Developed laboratory management skills supervising the team on day to day planning and experiments

Fellowships

2021 - Present **NSF Graduate Research Fellow**, University of California, Berkeley *Berkeley, California*

Publications

Candiello, J., Grandhi, T.S.P., Goh, S.K., Vaidya, V., **Lemmon-Kishi, M.**, Eliato K.R., Ros, R., Kumta, P., Rege, K., Banerjee, I. (2018) "3D Heterogeneous Islet Organoid Generation from Human Embryonic Stem Cells Using a Novel Engineered Hydrogel Platform." *Biomaterials*. 177: 27-39.

Presentations

Oral

Lemmon-Kishi, M. and Nielsen, R. A Penalized Likelihood Approach to Estimating Haplotypes from Environmental DNA. Evolution 2022. Cleveland, Ohio. June 24-28, 2022.

Lemmon-Kishi, M. and Nielsen, R. Estimating haplotypes for environmental DNA. Evolution 2021. Virtual. June 21-25, 2021.

Lemmon-Kishi, M. and Nielsen, R. A Computationally Efficient Method to Estimate Phylogenetically Compatible Haplotypes from eDNA. 2021 NHGRI Research Training and Career Development. Virtual. April 19–21, 2021.

Lemmon-Kishi, M., Chu, C., Peddada, V., et. al. Hot Metal Switch: Synthetic in vitro gene circuit for the detection of metal ions. iGEM Jamboree 2017. Boston, Massachusetts. October 27-31, 2016.

Poster

Lemmon-Kishi, M. and Nielsen, R. A Penalized Likelihood Approach to Estimating Haplotypes from Environmental DNA. Biology of Genomes. Cold Spring Harbor Laboratories, New York. May 10-14, 2022.

Lemmon-Kishi, M. and Nielsen, R. A Penalized Likelihood Approach to Estimating Haplotypes from Environmental DNA. Center for Computational Biology Retreat. Berkeley, California. October 21-22, 2021.

Lemmon-Kishi, M. and Nielsen, R. A Computationally Efficient Method to Estimate Phylogenetically Compatible Haplotypes from eDNA. Center for Computational Biology Retreat. Virtual. March 3-5, 2021.

Lemmon-Kishi, M., Chu, C., Peddada, V., et. al. Thallium and Lead Detection Using Cell-Free Circuitry. Biomedical Engineering Society Conference 2016. Minneapolis, MN. October 8, 2016.

Teaching Experience

Berkeley Connect Teaching Fellow
Berkeley, California

Center for Computational Biology, University of California, Berkeley
Aug. 2022 - present

- Design curriculum to introduce and teach skills for computational biology
- Mentoring students from various backgrounds and experience interested in computational biology

Python Bioinformatics Bootcamp Lecturer
Berkeley, California

Center for Computational Biology, University of California, Berkeley
June 2021, Jan. 2022, June 2022

- Taught students (both academic and industry, ranging from undergraduates to faculty) fundamental programming skills such as logic, control flow, and data structures in Python.
- Updated the curriculum to incorporate more biologically relevant examples and problems.

Python Bioinformatics Bootcamp Teaching Assistant
Berkeley, California

Center for Computational Biology, University of California, Berkeley
Jan. 2021, June 2021, Jan. 2022

- Supported the lecturer by answering questions and helped students work through practice problems.

Undergraduate Teaching Assistant - Cell and Molecular Biology *Pittsburgh, Pennsylvania*

Department of Bioengineering, University of Pittsburgh *Aug. 2017 - Apr. 2018*

- Taught weekly recitation of Cellular Biology to bioengineering students
- Wrote and graded weekly quizzes and presentations

Undergraduate Teaching Assistant - General Chemistry *Pittsburgh, Pennsylvania*

Department of Chemistry, University of Pittsburgh *Aug. 2015-May 2016*

- Held additional offices hours for general chemistry students

Honors & Awards

Academic

2017 - 2018	**Dean's List**, Dietrich School of Arts and Sciences	*Pittsburgh, Pennsylvania*
2015 - 2016	**Dean's List**, Swanson School of Engineering	*Pittsburgh, Pennsylvania*
2014	**Term List**, Swanson School of Engineering	*Pittsburgh, Pennsylvania*

Extracurricular

2018	**2nd Place**, SheInnovates Hackathon	*Pittsburgh, Pennsylvania*
2018	**Most Creative Hack**, SheInnovates Hackathon	*Pittsburgh, Pennsylvania*
2016	**Nomination for Best Environmental Project**, iGEM 2016	*Boston, Massachusetts*
2016	**Gold Medal**, iGEM 2016	*Boston, Massachusetts*

Skills

Programming	C, R, Python, Bash, SQL
Operating Systems	Linux/Unix, Windows
Tools	Git, Conda, Snakemake, LaTeX, R Shiny

Relevant Coursework

Computer Science	Data Science, Algorithm Design and Implementation, Data Structures, Parallel Computing, Machine Learning
Biology	Computational Biology, Population Genetics, Genetics, Statistical Phylogenetics, Cell and Molecular Biology
Statistics	Probability, Statistics, Stochastic Processes