Mitchell Grey Lokey

PhD candidate at Cornell University

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KEY ACHIEVEMENTS

Developed and implemented novel approaches for annotating and summarizing putatively deleterious/pathogenic genetic variation from whole-genome sequences of non-model organisms.

Developed a framework to predict genetic outcomes of management plans in the Florida scrub-jay using demographic inference and coalescent and forward genetic simulations.

SKILL SETS

Bioinformatics: VCFs, bedtools, BLAST, LiftOver, multiple genome alignments, PLINK

Genome Annotation: GFFs, StringTie, BRAKER, VEP, SnpEff, PhyloP, CADD, etc.

Population Genomic Datasets: 1000 Genomes, UK BioBank, ExAC / gnomAD

Genetic Simulation: SLiM, msprime, tskit, fastsimcoal

Programming: Bash, R, Python, Conda, Jupyter

Data Science: Linear models, GWAS, EBV/PGS, dimension reduction, network analysis

Computing: HPCs, Slurm, Docker

EDUCATION

PhD - Cornell University 2018-April 2025 (Estimated)
Genetics, Genomics, & Development
Advisors: Profs Andrew G. Clark, Philipp W. Messer

BS - University of Utah 2012 - 2016
Anthropology, Minor in Integrative Human Biology
Advisor: Prof Alan R. Rogers

RESEARCH EXPERIENCE

Graduate Research Assistant, Molecular Biology and Genetics Dept., Cornell University
Advisors: Profs Andrew G. Clark, Philipp W. Messer 2018 - present

- Explored novel approaches for identifying putatively deleterious variants and summarizing their genome-wide impact in non-model organisms. Sought to improve methods for conservation management and complex trait prediction using estimates of genetic load and genomics-informed simulations.

Graduate Teaching Assistant, College of Agriculture and Life Sciences, Cornell University
Advisors: Profs Andrew G. Clark, Jason Mezey, Megan Greischer 2021 - 2024

- Supported faculty in the courses of computational biology, quantitative genetics, human genomics, and biodiversity Facilitated discussion sections, course administration, creation of class-work, grading, and student mentoring.

Research Assistant, Lab Manager, Molecular Biology and Genetics Dept., Cornell University
Advisors: Prof Cedric Feschotte, Dr Clement Goubert 2017 - 2018

- Quantified variation in selection pressures across primate transposable element subfamilies using population genetic models and integration of multi-omics data.

Research Assistant, Lab Technician, Eccles Institute of Human Genetics, University of Utah
Advisors: Prof Cedric Feschotte, Dr Clement Goubert 2016 - 2017

- Identified and validated the role of polymorphic transposable elements in human gene regulation via TE-eQTL and qPCR analyses (Paper).

Undergraduate Researcher, Population Genetics Lab, Anthropology Dept., University of Utah
Advisor: Prof Alan R. Rogers 2016 - 2017

- Estimated demographic parameters and rates of admixture for archaic and modern humans using site pattern statistics and coalescent simulations (Paper).

PUBLICATIONS

2025 **Lokey MG**, Nguyen TN, Cosgrove EJ, Chen N, Beaudry FEG, Fitzpatrick J, Messer PW, Clark AG, Deleterious variant evolution across semi-isolated sub-populations of the threatened Florida scrub-jay dominated by recent demographic collapse, (*In prep*).

2024 Nguyen TN, Cosgrove EJ, Chen N, Lehr N, **Lokey MG**, Beaudry FEG, Fitzpatrick SW, Bowman R, Miller K, Fitzpatrick J, Clark AG, Whole-genome sequencing across space and time reveals impact of population decline and reduced gene flow in Florida Scrub-Jays, Current Biology (*In review*) (2024).

2023 Stanhope MJ, Ceres KM, Sun Q, Wang M, Zehr JD, Marra NJ, Wilder AP, Zou C, Bernard AM, Pavinski-Bitar P, **Lokey MG**, Shivji MS, Genomes of endangered great hammerhead and shortfin mako sharks reveal historic population declines and high levels of inbreeding in great hammerhead, iScience 26, 1 (2023).

PRESENTATIONS

Oral

2024 The Allied Genetics Conference - Contemporary Evolution Session
Lokey M, *et al.* "Recent population collapse shapes deleterious variation across subpopulations of the federally threatened Florida scrub-jay."

Posters

2023 Society for Molecular Biology & Evolution ; New York Population Genomics Meeting
Lokey M, *et al*. "Exploring the evolution of deleterious variation across subpopulations of the federally threatened Florida scrub-jay."

2022 Population, Evolutionary, and Quantitative Genetics
Lokey M, *et al.* "Estimating genetic load in the Florida scrub-jay."

2021 Great Lakes Annual Meeting in Evolutionary Genetics
Lokey M, *et al*. "Consequences of an extreme bottleneck in the extinct-in-the-wild Spix's Macaw."

2020 The Allied Genetics Conference
Lokey M, *et al.* "Population Genetic Attributes of Variants That Disrupt Protein-Protein Interactions"

2019 Great Lakes Annual Meeting in Evolutionary Genetics
Lokey M & Hare M "Using Forward Genetic Simulations to Test Genetic Contribution to Phenotype Environment Mismatch"
2017 Utah Conference of Undergraduate Research
Lokey M & Rogers A "Timing and Rate of Archaic Admixture in Extant Eurasians"

HONORS AND AWARDS

Graduate School Dean's Scholar - Cornell University	2024
Provost Diversity Fellowship - Cornell University	2024
Center for Vertebrate Genomics Scholar Award - Cornell University	2022
Graduate School Travel Award - Cornell University	2022 - 2024
Dean's List - University of Utah	2015 - 2016
Transfer Achievement Scholarship - University of Utah	2014
Honors Associate of Science - Salt Lake Community College	2014
Federal Pell Grant - Salt Lake Community College	2012

ACTIVITIES & GROUPS

Member - Genetics Society of America	2020-present
Member - Society for Molecular Biology & Evolution	2019-present
Volunteer - First-Generation & Low-Income Student Support Group	2019-2023
Organizer & volunteer - MBG Diversity Council & Climate Committee	2019-present
Attendee & presenter - RCN: Evolution in Changing Seas discussion group	2019-present
Attendee - Cornell Statistics Seminar Series	2019-present

MENTORING

Year	Name	Role	Institution	Program
2024	Computational Biology	Teaching Assistant	Cornell University	Comp Bio
2023-2024	Mohamed Abdelrahman	Honors Thesis Mentor	Cornell University	Biometry
2023	Intro to CompBio	Teaching Assistant	Cornell University	Comp Bio
2023	Quantitative Genetics	Teaching Assistant	Cornell University	Biometry
2022	Sarah McMorrow	Undergrad Mentor	Cornell University	Comp Sci
2022	Evo & Biodiversity	Teaching Assistant	Cornell University	Biology
2022	Kayla Lloyd & Jana Le	High School Mentor	Cornell University	PCRi
2021-2022	Jing Sun	Undergrad Mentor	Cornell University	Biometry
2021	Human Genomics	Teaching Assistant	Cornell University	Biometry

OUTREACH

Pre-College Research Initiative (PCRi), research mentor	2022
Expanding Your Horizons, demonstration organizer	2019-2021
Free Science Workshop, demonstration organizer	2019
Science-on-the-Go, demonstration organizer	2019