

Faculty Search Committee Chenlu Di, Ph.D.

Department of XXX Ecology and Evolutionary Biology

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XXX, 2025

Dear Search Committee Members,

 I am writing to apply to the Assistant Professor position in the Department of XXX at the University of XXX. I am currently a postdoctoral researcher at the University of California, Los Angeles, under the guidance of Dr. Kirk Lohmueller. Previously, I earned my PhD in the Department of Ecology and Evolutionary Biology at the University of Arizona, where I was advised by Dr. David Enard.

 My research investigates how the evolutionary process of natural selection shapes human health and disease. I combine evolutionary theory, model-based, statistical and machine-learning computational approach, and multi-omic data, including genomes, protein structures, transcription and epigenomics to answer two questions: 1) how does natural selection affect human infectious diseases, particularly on how humans adapt to viruses 2) how does natural selection affect human chronic diseases.

 In prior work, I demonstrated that protein stability is a key mechanism of viral adaptation in human proteins (*[bioRxiv](http://doi.org/10.1101/2022.12.01.518739)*, under review at *Molecular Biology and Evolution*). In future work, I aim to map virus-driven selection in human history and uncover the genetic mechanisms of adaptation, shedding light on the evolution of human immunity and health. In addition, I estimated the distribution of fitness effects of putatively functional noncoding mutations in human genomes and found evidence of changing selection from mammals to primates (*[bioRxiv](http://doi.org/10.1101/2025.05.14.654124)*). In parallel, I showed that Mendelian disease genes lagged response to changing environments (*[eLife](https://elifesciences.org/articles/69026)*, old model). Next, I will investigate how natural selection in noncoding genomic regions changes across human populations and how chronic diseases relate to selection of noncoding genomic regions across evolutionary constraint, and build resources that connect evolutionary history to biomedical research.

 I am enthusiastic about contributing to the Department of Molecular Genetics and Genome Sciences. My expertise in population genetics, coupled with my research on host adaptation to viruses and the evolutionary mechanisms underlying complex diseases, aligns closely with the Department’s focus on **computational genomics** and **translational bioinformatics** for **complex diseases**. By framing human health challenges through the lens of evolutionary medicine, I offer a distinctive perspective that connects **biomedical data science**, **genotype–phenotype mapping**, and **evolutionary** principles. This broad scope enables me to uncover fundamental mechanisms of human evolution while translating them into insights relevant to chronic disease vulnerability, providing a unique complement to the Department’s mission of integrating genomics with human health. Moreover, the Department’s setting within a medical school offers rich opportunities for collaborative studies, particularly on the immune system, where my expertise in host–virus interactions can connect directly with clinical and biomedical research. Research cores such as the CRISPR Whole-Genome Screening Core and the Multiplex Protein Analysis Core also provide opportunities to validate my theoretical studies.

 With over four years of teaching evolution and genetics, I use a student-centered approach that fosters inquiry and critical thinking. At XXX, I would like to teach Population Genetics, Genetics, Evolutionary Medicine, and Evolution, and create a Machine Learning in Biology course with hands-on labs to support the department’s focus on computational genomics and biomedical data science.

 I have mentored graduate and undergraduate students to manuscripts, fostering collaboration while preparing scientists who can bridge genomics, computation, and medicine at XXX.

 I am actively engaged in scientific communities, having organized over 40 symposia and webinars, led graduate study groups, and mentored undergraduates, and at XXX I would build on this by establishing a journal club on evolutionary medicine.

 Given the unique focus and path of my research and shared interests with faculties in the department, I am excited about the opportunity to continue my research and service at XXX. Thank you for considering my application.

Sincerely,

Chenlu Di

University of California, Los Angeles