



Price Lab

Project Name: Decoding Human Aging: Using Multi-Omics and Computational Biology to Understand Health and Disease

Project Description:

Why do some people remain healthy well into old age while others develop age-related diseases much earlier? Although chronological age is one of the strongest predictors of disease risk, individuals age at remarkably different rates. In the Price Lab, we use computational biology and large-scale molecular datasets to understand the biological processes underlying these differences. By studying thousands of proteins, metabolites, and other molecular features measured in human blood, we aim to identify biomarkers that reveal how the body is aging and predict disease risk before symptoms appear.

Our research combines multiple types of biological data, an approach known as *multi-omics*, with clinical information to better understand the complex relationships between molecular pathways, aging, and health. We use statistical modeling, machine learning, and bioinformatics to identify patterns in these datasets and investigate how biological systems change across the lifespan. By connecting molecular signatures to physiological health and disease outcomes, we hope to develop tools for earlier detection of age-related decline and identify opportunities for interventions that promote healthy aging.

We are seeking enthusiastic undergraduate student researchers interested in computational biology, bioinformatics, and the biology of aging. Selected interns will contribute to ongoing research projects by assisting with data processing, visualization, statistical analysis, and interpretation of biological datasets. Students will gain hands-on experience working with real-world human molecular data while learning how computational approaches can address important questions in aging research.

Desired Skills or Experience:

Prior programming experience in R or Python is required, including the ability to write and modify code for data processing and analysis. Coursework in biology, bioinformatics, statistics, computer science, or related fields is desirable. Familiarity with data visualization, statistical analysis, or working with large datasets is a plus. We seek students who are curious, motivated to learn, and interested in applying quantitative approaches to biological questions.