

John A. Lynch Lecture Series

The Nature of Quantitative Genetic Variation: Lessons from *Drosophila*



WEDNESDAY, OCTOBER 14, 4:00 PM

101 DEBARTOLO HALL

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Abstract:

Quantitative traits are affected by multiple interacting loci with individually small and environmentally sensitive effects. Knowledge of the detailed genetic architecture of quantitative traits is important from the perspectives of evolutionary biology, human health, and plant and animal breeding. Understanding the genetic architecture of quantitative traits begins with identifying the genes regulating these traits, mapping the subset of genetically varying quantitative trait loci (QTLs) in natural populations, and pinpointing the molecular polymorphisms defining QTL alleles. *Drosophila* brings an impressive toolkit to the challenge of genetically dissecting quantitative traits.

In this talk, Prof. Mackay will discuss insights into the complex genetic architecture of organismal and gene expression quantitative traits obtained from analyses of new mutations and genome wide association mapping in the *Drosophila melanogaster* Genetic Reference Panel (DGRP), which consists of 205 sequenced inbred lines derived from the Raleigh, USA population. These studies indicate that epistatic gene action is common, and additivity can be an emergent property of underlying genetic interaction networks. Epistasis causes hidden quantitative genetic variation in natural populations, the potential for rapid speciation, and negatively impacts the predictive ability of additive models. These observations offer valuable lessons for understanding the genetic basis of variation for quantitative traits in other organisms.

This lecture is sponsored by the Department of Biological Sciences.

