**Abstract**.

Research in my lab works to address the importance of fluctuating selection as a force that generates and maintains genetic variation. We address this basic topic by studying the temporal dynamics of evolution across seasons in two groups of species, *Drosophila* and *Daphnia*. These species have rapid generation times and show phenotypic and genomic signals of cyclic evolution in response to seasonally varying selection pressures. My lab has worked to link genetic variation associated with traits that are subject to seasonal selection with temporal fluctuations in allele frequency. The primary goal for the next five years is to address the questions: What is the strength of fluctuating selection? Does fluctuating selection stabilize polymorphism and promote its persistence? We will address these questions through genomic analysis of time-series data and estimation of the genetic architecture of ecologically-relevant traits, in both the lab and the field. The overall vision of my research program is to study the nature of balancing selection, with a particular focus on the role of balancing selection in maintaining quantitative variation in fitness related life-history traits. By examining this topic in two genetic model systems, we can also gain insight into the basic genetics and biology of overwintering, reproduction, and developmental plasticity.