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## Effects of Natural Polymorphisms at Two *Arabidopsis* Flowering Time Loci

Regulation of flowering time in *Arabidopsis thaliana* involves epistatic interactions between two physically unlinked genes, *FRIGIDA* (*FRI*) and *FLOWERING LOCUS C* (*FLC*). In a recent survey, latitudinal variation in flowering time associated with *FRI-FLC* haplotype, suggest that naturally occurring polymorphisms are adaptive. To further investigate the functional ecology of the *FRI-FLC* system, our lab is using experimental populations in which polymorphisms segregate at one or both loci. I have focused on the Bay-0 × Shah recombinant inbred population, in which 420 lines inherited one of two alternate alleles at both loci. Those that inherited a functional *FRI* allele from the Shah parent are significantly under-represented. Those carrying the Bay-0 parent's *FLC<sup>B</sup>* allele are under-represented only when combined with this functional *FRI* allele. These data, consistent with prior inadvertent selection against late flowering, are further supported by my study of flowering time and fecundity in 109 randomly chosen lines grown in three environments. Fecundity was significantly and negatively correlated with date of flowering; lines with the *FRI-FLC<sup>B</sup>* haplotype consistently flowered latest. Lab evidence that delayed flowering of the *FRI-FLC<sup>B</sup>* haplotype is maladaptive may not be relevant in nature, where premature flowering may increase mortality risk. In 2005-2006, a field study will expose lines from this population to over-wintering conditions, scoring viability as well as fecundity and flowering time.