UTILIZING A HYBRID SWARM APPROACH TO ASSESS THE PHENOTYPIC CONTRIBUTIONS OF THE INVERSION IN(2L)T IN DROSOPHILA MELANOGASTER. Abigail M. Hayes, Grace Miller & Alan O Bergland, Dept. of Biol., Univ. of Virginia. *Drosophila melanogaster* has a chromosomal inversion – In(2L)T – that has been shown to impact a suite of traits that in turn affect overwinter survival in this species. In this study we use a hybrid swarm approach in which five independent Drosophila Genetic Reference Panel (DGRP) lines were hybridized over several generations in two independent swarms homozygous for inversion or standard genotypes (four swarms total, two standard, two inverted). These hybrid swarms were in turn used to assess the combinatorial impacts of inversion status, rearing temperature and temperature fluctuation on freeze tolerance. Eggs were collected from the hybrid swarms in 24 hour intervals and reared at 25C. Within 24 hours of adult eclosion the flies were placed in 15 female: 15 male groups and either returned to 25C or placed at 15C for five days, and exposed to three hours of -5C temperatures at the end of the five day period. Percent survival was measured after three days. Here we present results that the predicted impacts of inversion status and rearing temperature hold true – stated simply flies homozygous for the inversion, and flies exposed to 15C before the -5C freeze tolerance assay survived better than standard and un-cold hardened flies. This work was supported by an NSF CAREER grant awarded to AOB. Author contact: Abigailhayesphd@gmail.com