

MASTER'S THESIS PRESENTATION

Genetic interactions underlie time to flowering in a worldwide collection of *Arabidopsis thaliana*

WHEN

July 12, 2022

11:00 AM

WHERE

Zoom Meeting

For ZOOM presentations, details will be provided in an email announcement for this seminar.

**Peter Laurin, MS candidate**

While GWAS have primarily considered the marginal effects of variants on traits or joint effects with high-penetrance variants, large-scale joint analyses and interactions between variants have been neglected in association models, perhaps due to the fact that many complex traits exhibit mostly-additive variance. However, interactions between genes and their variants may account for non-negligible variance in many traits, help account for missing heritability, and reveal biological mechanisms of disease and evolution. We capitalize on recently-developed interactions-focused methodology developed in the McPeckgroup to associate flowering time in *Arabidopsis thaliana*, a perennial plant, with genomic variants from a worldwide collection of 931 *Arabidopsis* accessions. We recapitulate the findings found in previous GWAS of significant marginal effects of genes influencing plant development and flower development, and in addition find evidence for interactions between genes with large marginal effects and several other genomic regions, many of which have not been implicated or widely replicated in flowering time variation before. We show the potential utility of the newly developed methods in discovery of novel interactions between genes, and draw future implications for other interactions between quantitative variables, e.g. gene x environment interactions.

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