

## **Cyanogenesis and the genetics of local climatic adaptation in white clover**

White clover (*Trifolium repens*) is polymorphic for cyanogenesis, the release of hydrogen cyanide following tissue damage. First documented more than a century ago, this chemical defense polymorphism has been the subject of dozens of ecological genetic studies assessing the environmental factors that maintain it. Those studies have provided a foundation for research in my lab that examines the molecular basis of the cyanogenesis polymorphism and the population genetic processes that govern its evolution. Our work to date has revealed evidence for adaptation through recurrent gene deletions, gene copy number variation (CNVs), and repeated loss of a metabolic gene cluster. We find that herbivore defense, abiotic stress adaptation, and energetic costs of cyanogenesis are all likely to interact in maintaining this adaptive variation. I discuss these insights in the broader context of plant evolutionary genetics and the genetic basis of adaptation.