

Research Team Name: Clover Cyanide Bombers

- Principal Investigator: Dr. Kenneth Olsen, Associate Professor, Wash U, Dept. of Biology
- Graduate student (main mentor): Sara Wright, PhD candidate, Olsen Lab
- Technician(s): TBD, field assistants will be hired to assist with labor
- <https://pages.wustl.edu/olsen>

Research questions (summer 2017):

1. What is the genetic basis of white clover adaptation across latitudes?
2. Which ecological factors affect the evolution of plant chemical defense (white clover cyanide production) across latitudes?

Skills/techniques/methods:

- Fieldwork: fitness measurements (floral counts, pictures, herbivore leaf damage) on 1500 white clover plants currently growing at Tyson
- Laboratory/genetics work: hydrogen cyanide testing, polymerase chain reaction, potentially more at the Wash U Danforth campus
- Data analysis: picture analysis, R statistical software, genetic mapping of fitness traits

Research conditions:

Clover research will be centered around the experimental gardens and the lab building at Tyson, where the graduate student mentor, Sara Wright, currently has a large experiment in progress. All students should expect to spend 1-2 days per week working outside in the research garden. This will involve a lot of squatting and bending over, sometimes during very hot, sunny days. Ticks are not a problem, but legs and backs will be sore at times. Field workers and SIFTers will be hired specifically for heavy labor days. We will listen to music and enjoy popsicles together!

During non-garden days, students may choose to work more outside, or they may decide to do other tasks indoors, such as laboratory genetics work or data entry/analysis. They might also choose to use this time to work on independent projects.

Team structure and opportunities for independent research:

Our team is a medium-sized group at Tyson, including both undergraduate and TERF students. The primary team leader will be Sara Wright. She will be fairly hands-on and working alongside students. Students will gain more and more independence as the summer progresses. All students will be encouraged to work on independent projects, which may involve an entirely new dataset generated by motivated students or data that has already been collected as part of Sara's work. We have LOTS of data to analyze from last year, including data from replicate, cloned gardens in Minnesota and Florida! An example project might involve comparing levels of herbivory in cyanide-producing vs. non-cyanide-producing white clover plants within and between 3 distinct climates (Minnesota vs. Missouri vs. Florida).