

[Susan Swensen](#) Section 07

## INTRODUCTION

My research addresses evolutionary questions about a variety of organisms, but focusing on plants and the evolution of plant interactions with other organisms (e.g. bacteria, insects). Much of the work involves DNA analysis in the lab, including extracting DNA from plants and insects, amplifying genes of interest using the polymerase chain reaction (PCR), DNA sequencing, computer-based analysis of data, and phylogeny reconstruction.

I am always open to students who would like to design their own research questions, but most of the time, students choose to work on a project that is part of my research. If you have a specific project you would like to pursue, please see me and we can work on your idea for a project. The following are the projects I have already defined for students:

### PHYLOGENETIC ANALYSIS OF CUCURBITACEAE AND THEIR FRUIT FLY PARASITES

Current possible projects in my lab address evolutionary questions about the squash family (Cucurbitaceae) and its parasites. These projects are focused specifically on two genera of tropical cucumbers (*Gurania* & *Psiguria*) that have bright red or orange flowers that are parasitized by fruit flies in the genus *Blepharoneura*. I am involved in reconstructing the phylogeny of the plant hosts as well as the insect parasites to better understand how these group diversified.

- \* How does the phylogeny of host plants compare to the phylogeny of flies that live on the plants?
- \* Do the currently defined species of plants form distinct groups in DNA-based phylogenies?
- \* What genes will be useful in reconstructing phylogeny in closely-related plant hosts?

This work is in collaboration with Dr. Marty Condon, a biologist from Cornell College (Iowa) who has studied this system for many years. If funding is available, there may be opportunities for travel to the tropics for collecting, or to Iowa to meet with collaborators.

### DIVERSITY IN FLY PARASITES OF HELIANTHUS

Another project in my lab involves looking at the diversity of flies in the genus *Strauzia* that parasitize plants in the genus *Helianthus* (sunflowers). Also in collaboration with Marty Condon at Cornell College, we are interesting in discovering the diversity of flies hosted by these plants and to think about what might drive diversification in this system. This project can make use of local populations of *Helianthus* and *Strauzia*.

### PROJECTS IN SUSTAINABILITY

Several projects are available (for credit) that focus on a variety of issues relating to sustainability. In the past, students have worked on projects involving energy use in our building, a pilot green roof for CNS, and a greenhouse gas inventory for Ithaca College. If research of this type interests you, please make an appointment to see me and we can discuss possible projects. For more information see [www.ithaca.edu/cnsus](http://www.ithaca.edu/cnsus).