

Undergraduate Research Proposal Format
for the Miller Lab
April 5, 2016

Use these headers for each section of your proposal. Use your own words and don't get too flowery; there is no need to use too much scientific jargon. And, there is no excuse for plagiarism, ever. A good proposal can focus your work, prevent later confusion, and serve as a template for your final report to Dr. Miller.

- 1 **Research Question:** ~ 1 paragraph: Provide a statement of the objective(s) and the anticipated significance of the work to other ecologists or evolutionary biologists. What problems will be investigated? What hypothesis will be tested?
- 2 **Background:** ~ 3-5 paragraphs. Provide a brief review of the work that has been done in the project area together with complete references in appropriate professional style. The first paragraph should start off really big (e.g., "flying is an important mechanism for dispersal"), gradually narrow down ("larger wings are often associated with species that disperse further"), and finally end up near your hypotheses ("Individual ladybugs with larger wings per body size are better able to find isolated patches of aphids").

You should include a minimum 3 references from the scientific literature, using a consistent citation style, such as found in *Ecology* or *American Naturalist*. For example:

Previous studies have shown that protozoa evolve to become better competitors over the age of individual leaves (Miller et al. 2014).

You need to actually read these papers and cite them in the proper context to support concept or question.

- 3 **Methods:** Provide a detailed description of the research methods that you plan to use in the project. Where necessary, this should include a justification for the specific approach that you will use. This should include any physical methods you use in the field or lab, as well as the statistical methods you plan on using to test your hypothesis. Provide references if any special or unique methods are proposed.
- 4 **Timeline:** Provide dates for the initiation and completion of each phase of the project. Attempt to lay out a reasonable schedule taking into consideration all phases of the research and include at last two weeks at the end for analysis and writing for your final report.
- 5 **Other possible products (optional section – all others are required).** This might include plant guides, maps, voucher specimens for the herbarium, or entries into databases such as GenBank.
- 6 **References Cited:** Include a list of all literature that you have cited in the proposal. Again, use a consistent format, such as used in a major journal in ecology or evolution.

Miller, T. E., E. Moran, and C. P. terHorst. 2014. Rethinking niche evolution: experiments with natural communities of protozoa in pitcher plants. *American Naturalist* 184:277-283.