

BIOL 098 Spring 2017 Proposal  
Sarah Cuprewich, to be advised by ...[omitted]...

### **Background**

Ranaviruses are DNA viruses with an ever-expanding global reach, and affect over 175 species of ectothermic vertebrates on every continent except Antarctica. These viruses produce different symptoms in populations, ranging from almost immediate die-offs to benign infections (Gray and Chinchir 2015)<sup>1</sup>. It is important to study ranaviruses because they are linked to the vast declines of species populations worldwide, and because the virus's growing range and occasional lack of symptoms make it increasingly dangerous in our globalized world (Rollins-Smith 2009)<sup>2</sup>. It is currently unclear whether the virus found in the Northeastern US is one widespread virus, or several strains of a virus, which makes this study even more important (Brunner et al. 2011). The general goal of this research is to better understand the distribution of ranaviruses, especially in the Vermont frog populations. Essentially, is ranavirus found in Vermont frog populations?<sup>3</sup>

### **Specific Project<sup>4</sup>**

The undergraduate student, Sarah Cuprewich, will be working under ...[omitted]..., a Ph.D. student, mentored by ...[omitted]... in the Department of Biology. Sarah's specific role will be aiding ...[omitted]... with laboratory procedures, including cleaning and organizing the lab, data entry, and observing and aiding with lab techniques such as qPCR, small computational tasks, and DNA isolation. The research will focus on determining if ranavirus is found in Vermont.<sup>5</sup>

### **Skills to be Developed<sup>6</sup>**

- ❖ Observing the creation of a thesis/hypothesis that can be tested and analyzed.
- ❖ Creating a set of methods to test a thesis, and determining what supports and does not support the hypothesis.
- ❖ Devising a plan for gathering needed information and appropriate sources.

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<sup>1</sup> Here I introduce the "problem" (ranaviruses) and hint at its complexity. You should start from the beginning by explaining the study system, or subject of the research, so the reader can appreciate the "problem" more.

<sup>2</sup> Then I state why exactly it is important to study the general field of ranaviruses in the first place. This should be a convincing statement, as it is the main purpose of this document. The field of study is usually too broad to experiment with, so a more narrow focus should be taken (which is the specific goal of the research).

<sup>3</sup> The goal of the research is stated, as well as the main question to be answered, so that the reader understands why the research is being conducted.

<sup>4</sup> Here I describe my role in the specific project that I plan to work on, with as much detail as is known at the time.

<sup>5</sup> I restate the main goal of the research project.

<sup>6</sup> Here I list some skills that I think I will develop during the course of the semester. These were determined after conversing with my advisor and discussing some roles I may play in the lab.

- ❖ Using advanced search techniques (truncation, subject/thesaurus indexing, specific field searching).
- ❖ How to keep a laboratory area clean and organized.
- ❖ Data entry practice and tips.
- ❖ DNA isolation.
- ❖ Permit writing and acquisition.
- ❖ qPCR techniques.
- ❖ Practice and familiarity with RStudio software.

### **Relevant Literature<sup>7</sup>**

- Brunner, Jesse L., K. E. Barnett, C. J. Gosier, S. A. McNulty, M. J. Rubbo, and M. B. Kolozsvary. 2011. Ranavirus Infection in Die-offs of Vernal Pool Amphibians in New York, USA. *Herpetological Review* **42**: 76-79.
- Gray, Matthew J. and V. G. Chinchar. 2015. *Ranaviruses: Lethal Pathogens of Ectothermic Vertebrates*. Springer, New York, New York, USA.
- Rollins-Smith, Louise A. 2009. The role of amphibian antimicrobial peptides in protection of amphibians from pathogens linked to global amphibian declines. *Biochimica et Biophysica Acta – Biomembranes* **1788**: 1593-1599.

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<sup>7</sup> Here I cite the sources used in the introduction.