

## Intellectual Merit Criterion

### Overall Assessment of Intellectual Merit

Excellent

### Explanation to Applicant

The applicant has a stellar academic record, has one manuscript in review from a largely independent undergraduate thesis, and has actively disseminated research results at local and national meetings. All of the letters indicate a student with very high potential to be a leader in evolutionary biology. The proposed research is novel, and addresses longstanding questions in evolutionary biology (the evolution of phenotypic plasticity). The applicant already has a large amount of preliminary data, and has presented a clear plan to investigate the genetic basis and ecological drivers of plasticity. This is an exciting project.

## Broader Impacts Criterion

### Overall Assessment of Broader Impacts

Excellent

### Explanation to Applicant

This is a student that is clearly dedicated to engaging diverse audiences in science - mostly through mentoring and education. She has already developed a summer research course for marginalized high school students, and will continue to do so. In addition, she has very mature thoughts on the scientific community and what it takes to build a productive work environment, and importantly, she is actively contributing to creating that environment (e.g., Women in Science group, coding workshops, etc.). This is the mark of a true leader.

## Summary Comments

This is a very strong applicant with the clear potential to make significant contributions to the evolutionary biology, to the training and engagement of diverse audiences - specifically marginalized students that may not see themselves as scientists - and as a role model for women in science. The research proposal is solid, and it is clear that they have a strong grasp of the types of evolutionary questions and approaches that are of broad interest.

## Intellectual Merit Criterion

### Overall Assessment of Intellectual Merit

Excellent

### Explanation to Applicant

The applicant had a single, albeit long, undergraduate research experience that allowed them to advance a project from question, through experimentation and data analysis, and into publication. The project also provided opportunities to advance skills in presenting via talks and posters at local and national meetings. The applicant's PhD program required rotations, thereby allowing exposure to additional research experiences. The dissertation research is at a different university from the undergraduate, which is a strength. The proposed research will investigate trade offs between dispersal and fecundity in aphids, a strong system for studying phenotypic plasticity. The applicant will use a multitude of approaches to identify genomic regions and/or specific genes involved in the phenotype; they will also study the ecology of the aphids and have proposed an interesting hypothesis regarding farming systems that they will test. Thus, the project has potential to better understand the plasticity within aphids.

## Broader Impacts Criterion

## Overall Assessment of Broader Impacts

Very Good

### Explanation to Applicant

The applicant has participated in several K-12 outreach programs, mentors undergraduates assisting with research projects, taught an R workshop for graduate peers, and started a women in science organization.

### Summary Comments

The applicant has a strong background in both experimental biology, analysis, and writing. The application is well written and understandable. The letters of reference make clear that the applicant has a strong foundation in biology and is a leader able to take initiative with diverse aspects of being a working scientist.

## Intellectual Merit Criterion

### Overall Assessment of Intellectual Merit

Excellent

### Explanation to Applicant

This applicant has an outstanding academic record and an impressive record of research accomplishments. The applicant has received multiple awards, scholarships and fellowships from both Reed College as an undergraduate and University of Rochester. The applicant has presented research at national meetings (SICB and Animal Behavior Society) based on research involving the aromatase gene promoter methylation influencing sex determination in the cichlid *Pelvicachromis pulcher*. In addition, the research led to a manuscript under review in which the applicant is a coauthor. The research proposed by the applicant focuses on the evolution of phenotypic plasticity in the pea aphid (*Acyrtosiphon pisum*). Females exhibit a polyphenism involving a dispersal versus reproductive morph. The goal of the project involves 1) identifying the genes involved in the wing polyphenism and their functional role, 2) estimate the genetic architecture of plasticity, and 3) determine the ecological context of wing induction. The experiments described in the project are ambitious, but based on the applicant's track record, should result in several high impact manuscripts. The reference letters enthusiastically support the research project developed by the applicant.

## Broader Impacts Criterion

### Overall Assessment of Broader Impacts

Excellent

### Explanation to Applicant

The applicant has a sustained track record of public outreach and mentorship as an undergraduate at Reed and currently at Rochester. As mentioned by the applicant, a good mentor can enhance a student's experience in scientific research. The applicant participated in outreach to middle and high school students to consider studying science. The applicant was involved in the design and implementation of a weeklong "Upward Bound" program to provide hands on research opportunities for students from marginalized backgrounds. The applicant also exhibits an enthusiasm for teaching and demonstrated multiple examples of peer mentoring as well as TA experiences as a graduate student. A sense of community was mentioned as an important aspect of being a scientist. The founding of Women in Biological Sciences shows a commitment to support of colleagues as well as the desire to foster an atmosphere of inclusion.

### Summary Comments

The passion for research and teaching displayed by the applicant is evident in the application. The applicant has a demonstrated capacity to engage in independent research and has the persistence and drive to complete experiments. This attribute was

conveyed by the reference letters. In short, the applicant has the training and talent to become a successful research and inspirational mentor.