Intellectual Merit Criterion

Overall Assessment of Intellectual Merit

Excellent

Explanation to Applicant

The applicant's scholastic record is good. She has 2 Masters degrees; one in Life Sciences and the other in Environmental Resources Management. The applicant has won awards and scholarships for academic excellence. She has 4 publications and 1 book chapter to her credit. Additionally, she presented her research as oral and poster presentations in meetings. Her proposed research deals with low salinity induced stress in ascidians as reflected by altered host-microbiome responses. It is not known whether physiological responses of the organisms as a result of environmental stressors occur because of the effect of stressor on the host itself, or on the resident microbiome or the host modulated by its microbiome. This is an interesting aspect that is worth exploring. The applicant is planning to study 3 species of tunicates from 3 different coastal habitats of the US (the species representing native, non-native and alien ascidians) in responding to salinity stress. She will be employing shotgun metagenomics sequencing to identify microbial species. She is also planning to study the mechanisms that underlie immune-related functions and response of holobionts to stress. This proposal has intellectual merit as tunicate ascidians share many similarities with higher vertebrates (including humans) and serve as an ideal model to study the host-microbiome interactions. The research strategy is well-thought out. The applicant is well suited to handle this project. Her experiences as a Peace Corps Volunteer in Micronesia, Shoreline restoration project in Florida, custom designing a cDNA Microarray to monitor transcription-level responses of corals to environmental stressors, bioinformatics manager etc. indicate her passion towards environmental conservation and ability to use most advanced molecular biology/bioinformatics techniques to seek answers to the questions that have a bearing on marine ecology. Having equipped with these skills, the applicant is the right candidate to pursue the proposed research. The letters of recommendation endorse her skills and abilities. The letters present her as an exceptionally motivated and talented student, a well-rounded researcher, a great communicator and an excellent teacher as well.

Broader Impacts Criterion

Overall Assessment of Broader Impacts

Excellent

Explanation to Applicant

The broader impacts of this study are great. The findings of this study will establish species-specific biomarkers for monitoring sentinel species in response to environmental stressors. As regards outreach, the applicant serves as a volunteer for Girls WhoCode, teaching K-8 students in Sacramento. She will present the results to Environmental Club in high schools. She has plans to share her bioinformatics knowledge towards conservation purposes and willing to engage federal agencies, naval shipyards, and fisheries industry in her efforts towards environmental conservation and habitat preservation against anthropogenic inputs into the coastal environment.

Summary Comments

The applicant possess excellent credentials to succeed in her objectives. The applicant's academic record, the proposal's intellectual merit and broader impacts are impressive. Her outreach activities deserve commendation. Overall, it is an excellent application and worthy of funding.

Intellectual Merit Criterion

Overall Assessment of Intellectual Merit

Very Good

Explanation to Applicant
The applicant has a good academic record which is significantly bolstered by her work experience, numerous publications and presentations and academic awards. Her previous research, work and life experiences have given the applicant necessary knowledge, collaborations and experience to complete the proposed future work successfully. The proposed graduate research follows on previous experience and provides a solid research plan. Finally, the Letters of Recommendation from advisors and mentors attest to the applicant's technical ability, enthusiasm, leadership ability, creativity and communication skills.

Broader Impacts Criterion

Overall Assessment of Broader Impacts
Excellent

Explanation to Applicant
The applicant seems committed to broader impacts not only by completing research to better understand how the microbiome interacts with sea species in their living environment, information that will have significant impact on the wildlife service and fishing industry, but also through her commitment to teaching, science education and outreach as shown by her Peace Corps service, past work experience and blog activity. In addition the applicant's future plans for outreach work include working with Girls Who Code, to introduce K-8 students to computing skills.

Summary Comments
The applicant plans to conduct research to better understand how the microbiome interacts with sea species in their living environment, to both elucidate specific mechanisms of immune response to microbiome colonization and also open up many avenues of investigation for host-microbe interactions in the environment under changing condition. Intellectual merit of this application is very good and the broader impact aspect is excellent. Recommendations from advisors and mentors give confidence that this applicant has the experience and ability to be a very successful graduate student.

Intellectual Merit Criterion

Overall Assessment of Intellectual Merit
Very Good

Explanation to Applicant
The applicant has a good background in biochemistry, physiology, and environmental resource management. Her experience in Peace Corps is unique. She also has a few publications. The research proposal is well developed with detailed hypotheses, aims, and methods. It would be better is expected outcomes of proposed experiments are also discussed.

Broader Impacts Criterion

Overall Assessment of Broader Impacts
Very Good

Explanation to Applicant
Details are provided for broader impacts.

Summary Comments
Overall the applicant has very good potentials.