

To: Selection Committee, Hall Conservation Genetics Research Award  
From: [REDACTED]  
Re: Support for [REDACTED]  
Date: 7 March 2018

I am pleased to write this letter of enthusiastic support for [REDACTED], an applicant for the Hall Conservation Genetics Research Award. As [REDACTED] dissertation advisor, I can attest that [REDACTED] is a uniquely motivated and gifted researcher, and has incredible potential to contribute towards the field of conservation, particularly in tropical marine ecosystems.

***How does the proposed work augment and exceed what the student is already doing?***

[REDACTED] is already actively studying the community structure of cryptobenthic fishes, which are an ecologically important and spatially/temporally sensitive indicator community of the overall status of a reef. At the time when I first met [REDACTED] had not yet formally started the PhD program at UW, yet [REDACTED] had independently planned, acquired external funding for, and executed two international field sampling trips to Tonga to study cryptobenthic coral reef fishes. [REDACTED] is currently investigating their diversity, abundance, depth, and microhabitat association on healthy and degraded reefs through localized anesthetic stations, and measuring connectivity of fish populations across reefs and archipelagos using population genetics. [REDACTED] initial results from just [REDACTED] first year of research have already revealed interesting trends in community structure that different from patterns observed in other coral reef fishes. However, the study of cryptobenthic fishes is time-intensive, both in the sampling stages but also in the identification steps. However, eDNA analyses – a rapidly advancing tool for conservation geneticists, may provide a fast, easy, and non-destructive way to measure diversity of cryptobenthic reef fishes communities. Because [REDACTED] work has already heavily sampled fishes from Tonga, resulting in a well characterized cryptobenthic community, [REDACTED] existing dataset would serve as an excellent genetic database to compare the eDNA samples to.

***Why are current research funding (e.g., grant funding already supporting the student) not available? Availability of faculty time and complementary lab resources that will be needed for the project?***

As a new assistant professor at UW, I have adequate startup funding and supplies to cover the genetics component of [REDACTED] proposed project. Along with [REDACTED] faculty members [REDACTED] and [REDACTED] (the [REDACTED]), we collectively have five large labs for molecular analyses in the [REDACTED] building, which contain all the necessary space equipment for analysis of eDNA. Moreover, several students in the [REDACTED], along with Dr. [REDACTED] (faculty in [REDACTED], a collaborator with the [REDACTED] also working in the [REDACTED] building) are actively working on eDNA projects, ultimately creating an excellent working environment for [REDACTED] should she need additional mentoring beyond my own. Beyond providing funding for the molecular work, however, I do not have funding to support [REDACTED]'s travel to collect samples, as none of my existing field work is in Tonga. However, through my history of work with molecular taxonomy of Indo-Pacific fishes, and through [REDACTED]'s previous sampling combined with resources on GenBank, we have the most comprehensive DNA barcoding dataset for cryptobenthic fishes in the world, making the eDNA a promising pursuit. The only component missing are the eDNA samples themselves.

***How will the proposed work result in a significant scientific advance?***

It is well known that coral reefs are in a precipitous state of decline worldwide. Recent studies have shown that cryptobenthic reef fishes are extremely sensitive indicators of subtle environmental changes on coral reefs, due to their abundance, diversity, extremely short life spans, tight link with the base of the trophic web, high rates of speciation and evolution, tight association with specific microhabitats on reefs, and their limited dispersal abilities which equates to extremely high levels of endemism. There has only been a single study that I am aware of that uses eDNA to study reef fish diversity, and this study had several limitations, including: (i) they focused largely on bigger reef fishes, not cryptobenthic fishes; (ii) limited sample size; (iii) poor marker choice, resulting in a large number of unmatched genotypes; (iv) occurred in an area with poorly-known fish fauna, so limited database was available for comparison; (v) they did not try multiple sources for eDNA (e.g. surface water, water from within the reef, benthic substrate, etc.). ██████'s proposed project addresses all of these shortcomings, and may serve as a landmark paper on reef ecology and conservation.

### **Does the student have the skills and ability to carry the proposed work to completion?**

██████ did not start the PhD program with a background in genetics, but instead is a gifted ichthyologist and marine biologist, with an exceptionally strong background working on coral reefs and a variety of other marine ecosystems. ██████ has incorporated genetics into several components of ██████ research program because ██████ is deeply interested in all aspects of connectivity, evolution, and conservation of coral reef fishes. Despite this being a new field to ██████, ██████ has shown skills in the molecular lab, and with a small amount of guidance from myself, I am very confident ██████ can accomplish this project. In addition to be in close association with the ██████, ██████ will also be interacting with our two collaborators on this project, ██████ (████████████████████) and ██████ (████████████████████), both of which are excellent molecular ecologists and coral reef biologists that can also provide guidance externally. I have absolutely no doubt that ██████ will be successful collecting the samples, given ██████ extensive experience in the field. As mentioned above, ██████ has already completed two trips to Tonga, and specifically for ██████ second trip, ██████ led ██████ team of new international collaborators in acquiring funding through the Waitt Foundation. During these two pilot studies, ██████ not only collected an impressive series of biological samples, but ██████ also established formal collaborations with the local government, NGOs, and potential funding agencies, engaged in educational outreach with the local community, and developed new sampling methods for surveying reef fishes. In the first six months of me knowing ██████, ██████ successfully completed ██████ two proposed pilot studies and single handedly forged the beginnings of a fruitful collaboration between local groups in Tonga and the University of Washington – an accomplishment that will undoubtedly benefit many researchers in the future.

### **Why is the proposed scholarly product from the work appropriate?**

Coral Reefs is a leading journal for the ecology and conservation of coral reef ecosystems, and is also frequently cited widely in the broader conservation, genetics, ecology and evolution community outside of corals.

In closing, I reaffirm my strong support for ██████ and ██████ proposed project. The Hall Conservation Genetics Award would not only generate an outstanding research product, but also significantly help in ██████'s career development.