

Title - Identification of Anti-fungal Probiotics from Amphibian Skin Microbiome to Mitigate the Effects of Chytridiomycosis

Program of Study – Biomedical Science

Presentation Type – Choose one of the following: Oral Presentation

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Mentor(s) and Mentor Email - Dr. Matthew Becker (mbecker5@liberty.edu)

Student name(s) and email(s) – Catherine Read (cetwomey@liberty.edu) and Magdalene Lederer (mrlederer@liberty.edu)

Abstract example: In recent years, amphibian populations worldwide have seen unprecedented declines. These declines have been associated with a dramatic increase in incidence of chytridiomycosis. This disease is caused by two fungal pathogens, *Batrachochytrium dendrobatidis* (*Bd*) and *B. salamandrivorans* (*Bsal*), which infect the skin of amphibian species. *Bd* is a unique pathogen because it infects organisms across three different orders of vertebrates (Anura, Caudata, and Gymnophiona). *Bd* is present in amphibian species of the southeastern United States, with widespread distribution and low levels of occurrence, suggesting that this fungus is endemic. *Bsal* has dramatically affected salamander populations in some European countries and has not been detected in the United States. There is great concern the pathogen could spread to the US. Previous research suggests that the symbiotic microbial community associated with the skin of some amphibians protects them from *Bd* and *Bsal*. This study seeks to characterize the microbial communities of the dusky salamander, *Desmognathus fuscus*, and to identify interactions between host symbiotic microbes and the pathogens *Bd* and *Bsal*. We completed this by culturing the cutaneous bacteria of *D. fuscus* (n=17) and identifying these isolates through Sanger sequencing of the 16S ribosomal RNA gene. The isolates were primarily from the phyla proteobacteria, actinobacteria, firmicutes, and bacterioides. These same isolates will be co-cultured with *Bd* and *Bsal* to determine if they inhibit or promote the growth of the fungi *in vitro*. *Desmognathus fuscus* individuals will also be tested for *Bd* and *Bsal* through skin swabs and quantitative PCR assays. We expect that the resident microbes isolated from *D. fuscus* will have diverse interactions with *Bd* and *Bsal*. Antifungal isolates could potentially be used as probiotics to mitigate chytridiomycosis in susceptible amphibian species.