I am applying for the Professional Development Grant for funds to test backlegged ticks for disease agents using quantitative polymerase chain reaction (qPCR) techniques. Quantitative PCR allows a researcher to test for and amplify specific DNA codes within an organism. This technique is the gold standard for disease ecology and utilizing qPCR in addition to other molecular methods will help advance my training and make me an attractive post-doctoral candidate.

My dissertation focuses on the relationship between fat reserves and the level of infection in the backlogged tick, *Ixodes scapularis*. This tick feeds on the blood of animals three times during its lifecycle, once at each life stage: larva, nymph, and adult. The tick then digests this blood meal and stores the fat for the next life stage. The fat reserves are the only source of energy this tick has until it obtains its next blood meal. The backlogged tick is also the primary vector of Lyme disease, anaplasmosis, and babesiosis; all of which can cause disease in humans (Heyman et al. 2010, Dantas-Torres et al. 2012, Chan et al. 2013). Lyme disease is the most prevalent vector-borne disease in the United States, infecting more than 30,000 people each year (CDC, 2013).

Recent studies on a similar tick species in Europe, *Ixodes ricinus*, have shown that disease agents can influence both the survival and behavior of the tick (Hermann and Gern 2010, Gassner 2010, Herrmann et al. 2013). These studies suggest that it may be beneficial for *Ixodes ricinus* ticks to harbor these disease agents. However, the literature for the relationship between fat content and infection status in blacklegged ticks in the United States is lacking.

This project is the first to directly study the relationship between blacklegged tick fat content and infection with the agents that cause Lyme disease, anaplasmosis, and babesiosis, all of which pose a serious risk to human health. The results from this study will help determine

whether or not being infected is beneficial for the backlogged tick. Knowledge about the role that disease agents have in tick survival will help us understand how vector-borne disease cycles are maintained in nature and, consequently, provide insight into factors affecting human risk of infection. My preliminary results indicate that these analyses will provide noteworthy information about the role disease agents play in the survival of the blacklegged tick. While I have been fairly successful at obtaining funding for this part of my doctoral research, qPCR has a high price tag and this grant will allow me to increase my sample size to be more competitive for publication.

The funds form this grant will allow me to test more ticks for the final two chapters of my dissertation. This will enhance my ability to publish these chapters in high impact-factor journals. Likewise, the results form this project will be presented at future scientific conferences which, in turn, will foster professional relationships with the researchers that can lead to future employment opportunities as a postdoctoral researcher or research scientist.

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