Detecting the Elusive Lyme Disease: Creating a Novel Lateral Flow Test for Detection of Borrelia burgdorferi in Ticks

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Lyme disease is the most common tick-borne illness affecting nearly 300,000 people each year. The debilitating symptoms are largely unspecific save for a bulls-eye rash that only appears in about 60-80% of patients. Current diagnostic methods can be faulty, cumbersome, and expensive as they rely detecting antibodies against the disease in the body, which are not always present. This project hopes to aid in the diagnostic process by creating a novel device paired with a lateral flow test to detect Lyme disease in ticks. This test would allow a person to test a tick for Lyme disease as soon as they find one on themselves and the results would aid a doctor in diagnosis if symptoms were to appear. In this project, a lateral flow test was created that is specific to the outer surface protein A of Borrelia burgdorferi, allowing it to detect the spirochetes that cause Lyme disease. A companion device was also created that allows one to crush the tick and easily apply the sample to the lateral flow test. Both components of the test were found to be functional and give accurate results. The creation of this test system will aid in the rapid diagnosis of Lyme disease and heighten the possibility of stopping it before it does major damage. This test will be able to aid doctors in their diagnosis of Lyme disease, having immediate results for the presence of Lyme disease in the tick, and doing so cost effectively.

Awards Won:

Fourth Award of $500

Arizona State University: Arizona State University Intel ISEF Scholarship