Abstract

Ticks are a type of arachnid with species found on six continents around the world. There are over 800 species of ticks worldwide, but only a few of those species are capable of transmitting disease to humans. One of those species is *Ixodes scapularis*, the black-legged tick, which is native to the eastern half of the United States. The species is responsible for the transmission of several severe illnesses, including Lyme disease. The Centers for Disease Control estimates that over 400,000 people are diagnosed and treated for Lyme disease each year in the United States. The ticks attach themselves to a host to consume and store blood using a tube-like mouth; this allows ticks to spread disease to a new host from a previous host’s blood. In the past decade, tick populations and tick-borne diseases have spiked around the world due to increasing global temperatures and precipitation from climate change. Our goal for this project is to create a bio-friendly super-spray that includes the fungal enzymes from *Beauveria bassiana*. The fungal enzymes allow a breakdown of the *I. scapularis’s* cuticle, and toxins are subsequently released by the fungus which increases the tick’s mortality rate. People can then spray their clothes or other areas that are susceptible to ticks to control the *I. scapularis* population and reduce the spread of tick-borne diseases.