The purpose of this project is to determine if arboviruses are present in tick species commonly found in western Illinois (in areas within and surrounding Macomb, IL). Ticks carry and can transmit many important infectious agents, including viruses, bacteria and parasites. Some of these agents can be deadly in humans and animals if left untreated. The first goal of our research will to capture different species of ticks from around the Macomb area. We will do this by using a tick drag method. The tick drag method uses a strip of cloth mounted to a pole and is then drug through terrain. We will then identify the adult ticks to the species level visually using tick identification keys. We hypothesize that we will find an abundance of ticks in west-central Illinois, and that some of these ticks will harbor arboviruses.

Arboviruses are a group of viruses that are transmitted through arthropod vectors. We are interested in determining what specific viruses the individual ticks will be carrying. In order to determine viral carriage, we will be utilizing the following methods. First, we will capture ticks by utilizing the tick drag method followed by identification of the ticks to the species level. We will then use place the ticks into a freezer until they freeze and die. We will utilize liquid nitrogen to freeze the ticks completely and then we will pulverize the ticks using a mortar and pestle. We will use a commercially available kit to obtain the RNA from the ticks. RNA will then be converted to cDNA which will then be used for PCR. cDNA is complementary DNA that is a double stranded DNA synthesized from mRNA template. We will look at the segments of DNA generated through PCR to determine if we have found any viruses in the tick sample. We will use primers during the PCR that are specific to the viruses that we are interested in. This will allow us to determine if certain arboviruses are present in local tick specimens.