Introduction
Autoimmune disease prevalence is estimated to be at 8% of the U.S. population. It is currently unknown what leads to the development of autoimmune disease, but different environmental risk factors are quickly becoming popular in literature as primary causes (1). One such environmental factor, pesticide exposure, has come to the forefront of environmental exposures increasing the risk for autoimmune disease development. Over the past several decades, controversy surrounding the use of pesticides for agriculture and their associated effect on the environment, acute human toxicity, and human disease progression has been elevated to unprecedented levels. One particular area that has very little data available is the assessment of geographically chronic disease states in heavy areas of pesticide exposure. Pesticides ability to alter hormones has been particularly interesting as research is uncovering that endocrine disrupting properties of pesticides in animal and human cells have interfered with the production of cytokines, immunoglobulins, mediators of inflammation, and alteration in the activation and survival of immune cells (2). These changes have been hypothesized to cause the immune system to enter into a hyper reactive state, potentially leading to autoimmune diseases.

The Midwest is one area of the country that has a substantial amount of pesticide use, especially Illinois. Illinois is one of the top 5 states in total and total value of real estate that is directly related to agriculture in the country (3). Illinois is one of 4 states with the highest annual agricultural pesticide use measured in pounds per square inch in the country (4). Individual communities surrounded by rural agricultural land could possibly have increased risk of pesticide exposure for all members of that particular community, potentially resulting in a higher prevalence of autoimmune disease.

Methods
The prevalence of 10 of the most universally common autoimmune diseases was studied in Fulton County, Illinois. Fulton County is one of the 75 counties in the state of Illinois and is a rural agricultural community, utilizing a single EMR system across 6 different clinics in the county, representing a population of roughly 45,000. Fulton County is a suburban/urban area with an estimated 30,000 farms and 10,000 farming families. This data was collected using an electronic medical record system that allows for the easy extraction of patient demographic information. A literature review was done based on age groups and gender. Comparisons were made to the most current epidemiological data in the United States.

Conclusion
This data shows a higher prevalence of almost all of the autoimmune diseases studied in addition to a higher prevalence over several of the immune response diseases when compared to current national data. These findings support these results; one of the earliest studies found a statistically significant relationship between long term mixing of pesticides and the prevalence of systemic lupus erythematosus within this population of workers (7). Over half a decade later, in a landmark study, long term application of pesticides was linked to increased risk of both rheumatoid arthritis and systemic lupus erythematosus in postmenopausal women (8). One recent study found associations between pesticide exposure and an increased risk of developing autoimmune diseases (9). Disappointingly, another recent study has shown that occupationally exposed communities have increased annual risk of death from autoimmune disease in addition to increased risk of exposure to pesticides (10).

One literature review found several studies supporting significantly greater pesticide prevalence in residential dust at farm homes compared to non-farm homes (11). Another study found that urban dwellers had significantly increased in residence present within 200 ft of farm crop with the frequency of detection increasing by 6% for every 10 acre increase of crop (12). This data lends support that agricultural communities are at much greater risk for pesticide exposure and furthermore, potentially increased risk for autoimmune disease. In fact, of all the pesticides used agriculturally in Illinois, atrazine is one of the most commonly applied pesticides having the highest detection rates across the country (13). This is particularly concerning due to growing evidence that atrazine has endocrine disrupting properties featuring hormone exposure to a variety of species (14). As discussed, evidence is suggestive of a potential link to autoimmune disease. In addition, another study linked atrazine exposure in mice to immunomodulatory effects suitable for hypersensitivity states and autoimmune disease (15). In 2010 the Natural Resources Defense Council published results evaluating treated drinking water in the Midwest and identified 67 sites that exceeded the lower concentration set forth by the EPA, with Illinois being one of two states with the most prevalent source (14). Considering the widespread use of atrazine and its continued presence in drinking water, the agricultural heavy state of Illinois could place rural communities at a potentially increased prevalence of autoimmune disease.