

## **What is Happening in My Body?**

### *A Brief Explanation of the Immune System and Autoimmune Diseases*

The immune system defends people against infectious organisms and disease. It keeps people healthy and is necessary for life. Sometimes, though, there are problems with the immune system, which then lead to infection and illness.

#### **Components of the Immune System**

The immune system has two parts: the innate immune system and the adaptive immune system.

The innate immune system is a nonspecific response to foreign materials, (also known as pathogens or antigens.) The innate immune system can be thought of as the “first line of defense”. This system includes defenses that we have when we are born, such as the skin, mucous membranes, and our ability to cough and sneeze. The innate immune system also includes white blood cells (phagocytes) and their ability to destroy antigens that get through other outer defenses. It will be the first responder to signs of infection and will attack all foreign materials in the same, generalized way.

The adaptive immune system is the second branch of the immune system. The adaptive immune system is a specific response to antigens. It organizes a specific attack to an invading pathogen. It also organizes the end of the attack. The adaptive immune system has special white blood cells called B cells and T cells. B cells produce antibodies. T cells then attack antigens marked by these antibodies. T cells also signal when the attacks should stop. The adaptive immune system is special because it “remembers” antigens that it has previously encountered and can react more quickly and efficiently when the next time the antigen is found.

#### **Autoimmune Diseases**

An autoimmune disease is a case when the immune system mistakes some part of the body as a foreign pathogen and attacks the body’s own healthy cells and tissues. It causes inflammation in the attacked areas. This can be limited to tissues in certain places (such as a particular joint), specific organs (such as the kidneys), or it can be throughout the body (systemic).

The adaptive immune system has been the greatest focus in research on autoimmune diseases. It has been established that B cells create antibodies that attach to the body’s own tissues, and which results in T cells attacking these marked tissues. However, the innate immune system may also be involved in autoimmune diseases.