

Immune System

Introduction

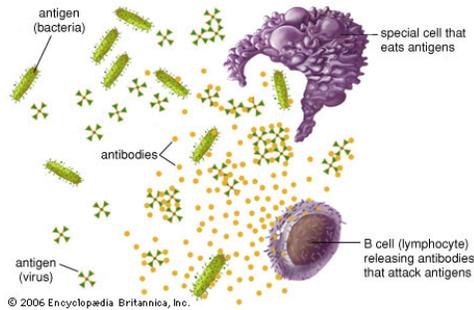


Figure 1: Special cells that eat antigens are a part of natural immunity. B cells that release antibodies are a part of acquired immunity.

Most living things try to protect themselves from harm. Animals have a special protection called the immune system. The immune system protects the body from substances called antigens. Some of the most harmful antigens are germs like viruses and bacteria, which cause illness. Parts of the immune system block antigens from entering the body. Other parts destroy the antigens that do enter.

The protection given by the immune system is called immunity. Humans and some animals have two basic types of immunity: natural and acquired.

Natural Immunity

All animals, including humans, have natural immunity. It works against any antigen that enters or tries to enter the body. Skin is a part of natural immunity. It blocks many things from entering the body. Mucus in the nose also blocks antigens. In addition, most animals produce special chemicals and cells that attack antigens inside the body.

Acquired Immunity

Only human beings and other animals with backbones have acquired immunity. With this kind of immunity, certain cells in the body can “remember” the types of antigens they have attacked in the past. This “memory” allows the acquired immune system to attack these antigens more strongly the next time they enter the body.

Certain white blood cells, called lymphocytes, are important parts of the acquired immune system. There are two different kinds of lymphocytes: B cells and T cells. B cells release products called antibodies, which attack antigens. T cells are divided into helper cells and killer cells. Helper T cells produce substances that help new lymphocytes grow. Killer T cells destroy cells in the body that are infected by antigens.

Because of acquired immunity, people get certain diseases, like chicken pox, only once. Acquired immunity is also what makes vaccines work.

Problems with Immune System

The two types of immunity normally work together to protect the body from harmful invaders. But sometimes the immune system does not work properly. It may spot and try to destroy cells that a doctor has put into the body on purpose. For example, the immune system may attack a healthy kidney that has been transplanted into a patient.

The immune system may also overreact to antigens that are not really harmful to the body. Allergies are an example of this type of problem. When some people breathe in pollen from plants or eat certain foods, the immune system attacks the pollen or food particles. The attack causes sneezing, itching, or other symptoms. Another possible problem with the immune system is called an autoimmune response. This happens when lymphocytes see normal, healthy cells as antigens and attack them. Rheumatoid arthritis is an example of an autoimmune disease. In this disease, lymphocytes attack the joints between bones.

A serious disease of the immune system is AIDS, or acquired immunodeficiency syndrome. It is caused by a virus that attacks the immune system's helper T cells. As the T cells die, the immune system cannot protect the body from other dangerous infections.

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