

What are antibodies?

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An illustration of antibodies responding to an infection with the new coronavirus that causes the disease COVID-19. Antibodies bind to specific antigens, for instance viral proteins, marking them for destruction by other immune cells. Graphic: Kateryna Kon/Science Photo Library/Getty Images Graphic: Kateryna Kon/Science Photo Library/Getty Images

A world of germs is trying to invade your body and make you sick. These microscopic invaders are known as pathogens. They cause disease or illness. Pathogens include viruses, bacteria and fungi. Luckily, your body's immune system can protect you from them. The immune system is the collection of cells and their responses that helps your body fight off infections. It also deals with foreign substances that may provoke allergies.

Think of your immune system as a team of superheroes keeping you safe. Antibodies are among their strongest weapons. An antibody is also called an immunoglobulin, or Ig. Antibodies are proteins, which are large molecules found in all living things. Your body uses proteins to build and repair cells.

Antibodies And Antigens

An antibody's main job is to locate and attack any foreign proteins. The foreign proteins are also known as antigens. An antigen is a protein that doesn't appear to belong in your body. Bacteria, viruses and other tiny invaders have antigens. Peanuts and other substances that cause allergies can have antigens, too.

Antigens attach to the outside of your white blood cells. These cells are also known as B cells. They are part of the immune system. B cells are found in your blood and in the lymph, which is a clear fluid that travels throughout your body. Lymph fluid brings white blood cells to different parts of your body.

When antigens bind to B cells, they trigger the B cells to divide. This causes them to transform into plasma cells. A plasma cell is a type of immune cell that makes large numbers of antibodies. In fact, plasma cells can produce millions of antibodies for a specific antigen. Those antibodies then travel throughout the body. They hunt for the invaders that carry that antigen. When an antibody spots that antigen, it binds to it. The antibody then sets up a chain of events that will destroy the antigen.

Types Of Antibodies

There are different types of antibodies, and each has a different job. For example, IgM antibodies are made as soon as immune cells recognize an antigen. They are the first to visit the site of infection and offer some protection for your body. They don't hang around long, though. They trigger the body to make a new type of antibody: IgG antibodies.

IgG antibodies stick around during the attack. They circulate in the blood and continue to fight off the infection.

IgA antibodies are found in bodily fluids such as sweat, saliva and tears. They grab antigens to stop invaders before they cause illness.

IgE antibodies are typically triggered by antigens or allergens. An allergen is a substance that triggers the immune system to go into overdrive. Certain proteins in pollen and peanuts can be allergens. IgE antibodies respond quickly to allergens. They can make your nose run or your skin itch when you have an allergic reaction.

Antibodies And Vaccines

Memory cells are part of the immune system. They are a type of white blood cell that remains in your body after you recover from an infection. They keep track of antigens they've seen before. If they see those antigens in your body again, they can quickly mount a defense so you won't get sick again. Your body will make more antibodies, and much faster than before.

Vaccines make this process quicker. They give you only a tiny harmless part or a weakened version of a pathogen. This causes your body to start producing antibodies without getting sick. Vaccines

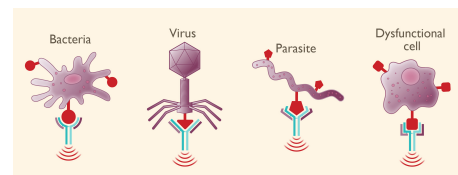


Image 1. Antibodies, shown in blue, can recognize antigens, shown in red, from a variety of pathogens, although each antibody is specific for one particular antigen. Antibodies can recognize bacterial antigens, viral antigens, parasitic antigens, and antigens on altered cells such as tumor cells. Graphic: MedicalWriters/Science Source

help your immune system learn to recognize the invader before you're exposed to it in a form that can cause disease.

There's no vaccine yet for the new coronavirus disease, COVID-19. But people who survive the disease have antibodies for it. Researchers are treating some people with antibodies that a survivor has already made. Scientists think this could prevent the disease in some people or help treat those who are already sick.

Sometimes, certain germs have ways of fooling antibodies. Some viruses, like the ones that cause flu, change very often. The immune system can't keep up. That's why scientists have to develop a new flu vaccine each year. But in most cases, your immune system works pretty well. It can spot and destroy germs that threaten your health every single day.