

How do vaccines work?

The human body has the ability to recognize itself as friendly and to recognize things that are not part of itself (foreign) as unfriendly. Thus, the body will not normally attack itself because it "understands" that to do so would cause itself harm. On the other hand, the body is normally able to understand that things that are foreign to itself might pose danger so it needs to destroy them. This ability to recognize self as good and non-self as bad is the basis for our immune system. All cells have proteins called antigens on their surface. It is these proteins that normally awaken our immune system to do its thing. Our immune system recognizes the antigens on the surfaces of our own cells as good and does not try to destroy them. On the other hand, our immune system does not recognize the antigens on the surfaces of cells that are not part of our own bodies and thus tries to destroy them. One of the ways our bodies destroy foreign antigens is to produce another type of protein called antibodies. When our immune system is exposed to foreign antigens, our white blood cells make antibodies to these antigens that are designed to destroy the foreign proteins. This reaction to foreign antigens is called the antigen-antibody reaction.

Pathogens are disease causing organisms. Most pathogens are viruses and bacteria. Viruses and bacteria are single-celled organisms that have antigens on their surfaces just like all other cells do. When our bodies are first exposed to pathogens, the antigens on their surfaces cause our immune system to make antibodies to these foreign proteins. Our bodies are then usually able to destroy the invading antigens with the antibodies they have produced. Once our bodies have produced antibodies to certain antigens, our immune system has the ability to quickly recognize this same antigen at some time in the future if we become exposed to that same antigen again. This ability to recognize the antigens that we were exposed to at a previous time is called "memory."

When we are first exposed to pathogens, our body makes antibodies to them, but it takes several days for our bodies to do this. This is why we stay sick for several days after we are exposed to germs our bodies are not familiar with. Once we make antibodies, the antibodies destroy the pathogens and we become well again. The next time we are exposed to the same pathogen, it doesn't take very long for us to make

antibodies against it because our immune system "recognizes" the pathogen from the previous exposure. It responds very quickly this time because it remembers the germ. We don't get sick this time or any other time in the future because we are now immune to this pathogen. Our immune systems have memory.

When we are vaccinated, foreign antigens from pathogens are purposefully placed into our bodies. Our immune system then produces antibodies to them. Our white blood cells have now "learned" about this foreign antigen and can quickly recognize it the next time it shows up in the form of the real thing. Our bodies are now able to kill it before we ever get sick. This is how vaccines work. Please vaccinate your children. Their lives and the lives of those around them depend on it.