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Opinion Article

Role of Antigens and Antibodies in Vaccination

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1. Description

Vaccine is an antigenic preparation of microorganisms such as bacteria, viruses administered for prevention treatment of Infectious diseases. Each vaccine contains a dead or weakened form of organism (usually a virus or bacterium) that causes a particular illness. The organisms contained in the vaccine have been modified to prevent disease, but the parts of the organism (antigens) that stimulate and react to the immune system. Vaccines are prepared from the microbial agents on their products responsible for infectious diseases.

Vaccines help develop immunity by infection. However, although this type of infection rarely causes illness, it encourages the immune system to produce T lymphocytes and antibodies. From time to time, after vaccination, minor infections can cause minor symptoms such as fever. These minor symptoms are normal and should be expected as the body boosts its immunity. However, after vaccination, it usually takes several weeks for the body to produce T and B lymphocytes. Therefore, people who get sick just before or after vaccination may develop symptoms and get sick because the vaccine did not have enough time to provide prophylaxis.

Infected turbulent microorganisms and vaccines that must be fought with them have part of a protein called an antigen. These antigens stimulate a series of cells in an immune system comprising macrophages, T cells and B cells. The immune response starts when macrophages occur in the body and take antigens such as proteins that digest in antigen fragments. These indicated antigen fragments are recognized by T cells that stimulate B cells, to secrete antibodies into fragments, and as well as other immune protection. Studies suggest that T cells recognize only antigen fragments of proteins pre-digested by macrophages, and thus cannot distinguish between specific antigen fragments from infecting microorganisms.

Antibody adheres itself to invasive organisms and prevents them from attacking healthy cells. And because the antibody is produced so fast, they can fight with the disease before it becomes sick. This accelerated, stronger immune response produced by Memory B cells is known as the secondary response. Stimulated immune cells secrete a variety of chemicals called cytokines that determine antibody is produced. For example, the cytokine interleukin four can cause B cells to secrete Immunoglobulin E (IgE) antibodies that cause allergic reactions. Other cytokines preferentially cause B cells to secrete IgG, which is predominantly found in blood, or IgA, which is predominantly found in body fluids.

Vaccination responses can differ not only in the short term, but also in the long term if they primarily cause IgE responses. This reaction can cause an allergic reaction to future immunization by the same antigen. In what is known as an autoimmune reaction, immature T cells that react to self-antigens are destroyed in the thymus to prevent the body's immune system from destroying its own tissues known as central immune tolerance, Peripheral tolerance can also occur, which can respond to auto antigens and somehow prevent T cells that are not destroyed in the thymus from an autoimmune response.