

Introduction to the immune response

There are two types of immune responses – innate and adaptive. Innate has low specificity, no memory, is the first line of defence, involves phagocytosis and is an all or nothing response. Adaptive immunity is high specificity, higher memory power, and involves a complex process.

Clonal selection

Specific antigen determinants stimulate the lymph to respond. Differentiation occurs, creating effector and memory cells. Effector cells are short lived however take part in the active process of phagocytosis. Memory cells remain in the body acting as patrols providing rapid response if the same antigen enters the body.

Phagocytosis

Phagocytes bind to the pathogens and engulf it to form a phagosome. Lysozyme fuses with the phagosome to create a phago-lysosome complex. The lysosome contains hydrolytic enzymes, which help break down the pathogen. After breaking down, useful materials are absorbed.

Types of Phagocytes

There are two types – B and T

There are three types of T cells – T cytotoxic, T Helper and T Killer.

There are two types of B cells – B plasma and B memory.

T cells are activated by antigen presenting cells. T helper receptor fits to the antigen-binding site, activating the T cell clonal process. The Cloning process will occur by Mitosis. T cells release cytokines, which activates the differentiation of B cells. Cytotoxic T cells bind to the antigens and kill them. They release perforin proteins, which creates pores within membranes. Water diffuses out of the cell causing cell death.

B Cells are also activated by APCs. They differentiate into plasma and memory cells. The plasma cells produce soluble antibodies, which help to form antibody antigen complexes, helping to destroy the pathogen. Phagocytes have receptors to which antibodies combine. During the formation of the antibody antigen complexes, the antibodies agglutinate to the pathogen, bind to its complementary receptor on the Phagocytes, and enable the process of phagocytosis to occur. Antibody agglutination helps to stop spread of infection.