Humoral immunity:

Involves antibodies = these are soluble in blood and tissue fluid of the body. Body fluids can be termed 'humour'. Around 10 million B cells and each starts to produce a specific antibody that responds to one specific antigen.

When an antigen enters the blood or tissue fluid, there will be one B cell that has an antibody on tis surface whose shape exactly fits the antigen (complementary). The antibody attaches to its complementary antigen. This enters the B cell by endocytosis and gets presented on its surface.

T cells bind to these processed antigens and structurate this B cells to divide by mitosis to form and the structurate B cells Thes is clonal selection and accounts for the bodies and the expond rapidly to any of a vast number of antigens.

Some pathogens produce toxins which act like antigens so B cells make clones. As each clone produces one specific antibody these antibodies are referred to as monoclonal antibodies. In each clone, the cells produced develop into one of the two types of cell:

Plasma Cells: secrete antibodies usually into blood plasma. These cells survive only for a few days but can make around 2000 antibodies every second during its brief lifespan. Plasma cells responsible for immediate defence of the body against infection, as well as memory cells, the production of antibodies is known as the primary immune response.

Memory Cells: responsible for secondary immune response. Longer life span/ don't produce antibodies directly but circulate in blood and tissue fluid. When they encounter antigens, they divide rapidly and develop into plasma cells and more memory cells. The plasma cell produced destroys the pathogen whilst the memory cell circulates in readiness for future infection. These provide long term immunity against the original infection. An increased quantity of antibodies is secreted at a faster rate than in the primary response. a B cell.

B-Lymphocytes and humoral

immunity

1.

Role of B-Lymphocytes:

- 2. B cell processes the antigens and presents them on its surface
 - Helper T cells attach to the processed antigens on the B cell thereby activating the B cell.

surface antigens of an invading pathogen are taken up by

- 4. The B cell is now activated to divide by mitosis to give a clone of plasma cells.
- 5. The cloned plasma cells produce and secrete the specific antibody that exactly fits the antigen on the pathogens surface.
- 6. The antibody attaches to antigens on the pathogen and destroys them
- Some B cells develop into memory cells, these can respond to future infections by the same pathogen by dividing rapidly and developing into plasma cells that produce antibodies.

