

- The antibody attached to antigens on the pathogen and destroys them
- Some B cells develop into memory cells.

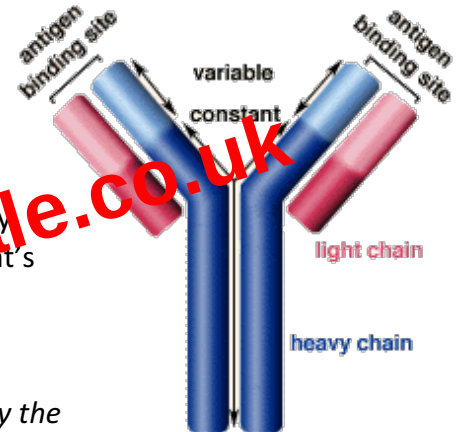
**Explain the role of B-lymphocytes and T-lymphocytes in the defence of the body against a virus infection.**

B lymphocytes produce antibodies/involved in humoral response;  
 T lymphocytes involved in cell mediated immunity;  
 Macrophages present antigens;  
 (specific) B lymphocytes recognise/bind to antigen;  
 increase in numbers by mitosis;  
 produce plasma cells (which make antibodies);  
 antibodies bind to and clump/ agglutinate virus;  
 memory cells produced by 1<sup>st</sup> exposure/cloned on 2<sup>nd</sup> exposure;  
 T lymphocytes(helpers) produce chemicals which aid B lymphocyte cloning;  
 encourages phagocytes to engulf clumped virus;  
 killer T cells kill virus infected cells;

**Antibody:** A protein produced by lymphocytes in response to a pathogen, secreted by plasma cells with specific shaped receptors to bind to a specific antigen.

**Antibody structure:**

- Antibodies are proteins, made of four polypeptide chains with heavy and light chains
- Specificity of antibody depends on its **variable regions** (which form the antigen binding site)
- Each antibody has a **variable region** with a unique tertiary structure (due to different sequences of amino acids) that's complementary to one specific antigen
- All antibodies have the same **constant regions**



Antibodies lead to destruction of the antigen, they do not destroy the antigen themselves. They do this by:

- 1) Causing agglutination – making it easier for phagocytes to locate them as they are less spread-out within the body
- 2) They serve as markers that stimulate phagocytes to engulf the bacterial cells to which they are attached.

**Antibodies are protein molecules. Explain why protein molecules are particularly well suited to carry out the role of antibodies.**

**Cellular response:** The T-cells and other immune system cells e.g. phagocytes that they interact with

**Humoral Response:** B-cells, clonal selection and the production of monoclonal antibodies

Large variety of different molecules;  
 range of shapes;  
 Tertiary shape;  
 locks onto / complements

specific antigen;