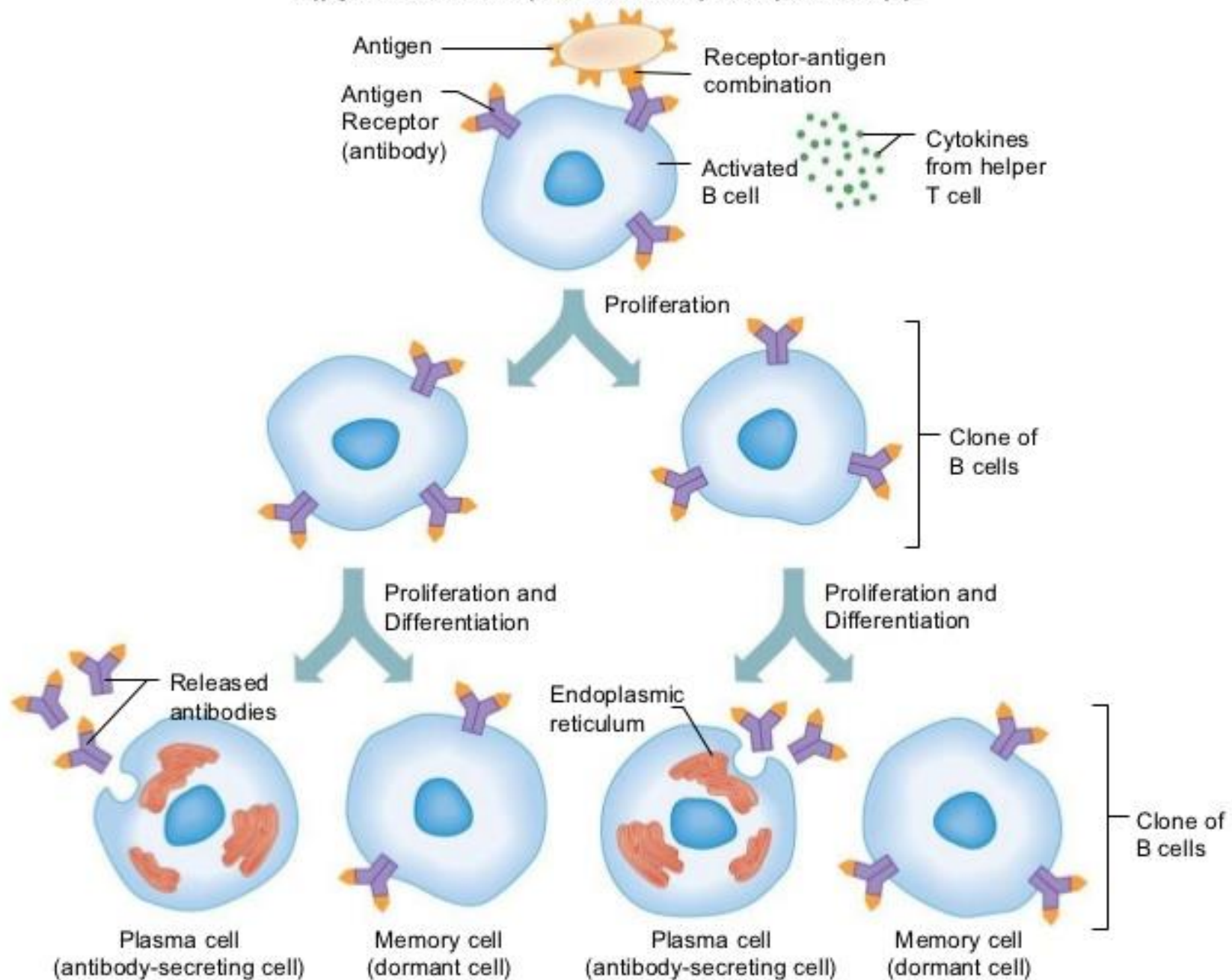


Immunoglobulins

- Immunoglobulins: functions as antibodies
- Antibodies: present on the B cell membrane – membrane bound antibodies
- These membrane bound antibodies provide antigen specificity to the B cells
- When these membrane bound antibodies of B-cells interact with the antigens then proliferation of B-cell clones starts-memory cell and plasma cells
- secretory antibodies produced from plasma cells
- Secreted antibodies then circulate in the blood and play major role in humoral immunity
- They provide humoral immunity by searching and neutralizing antigens.

Cloning of B cells

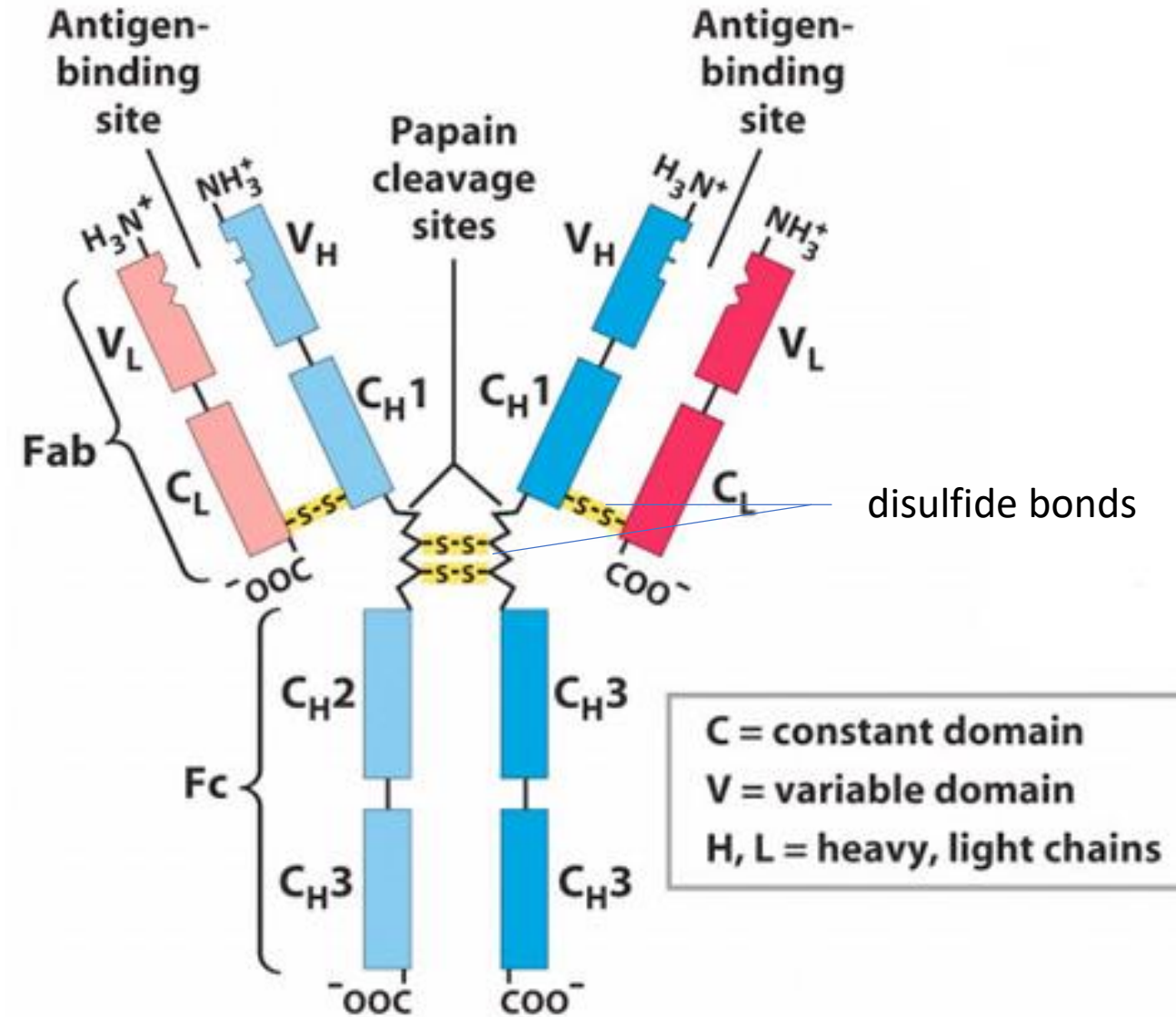


Serum antibodies

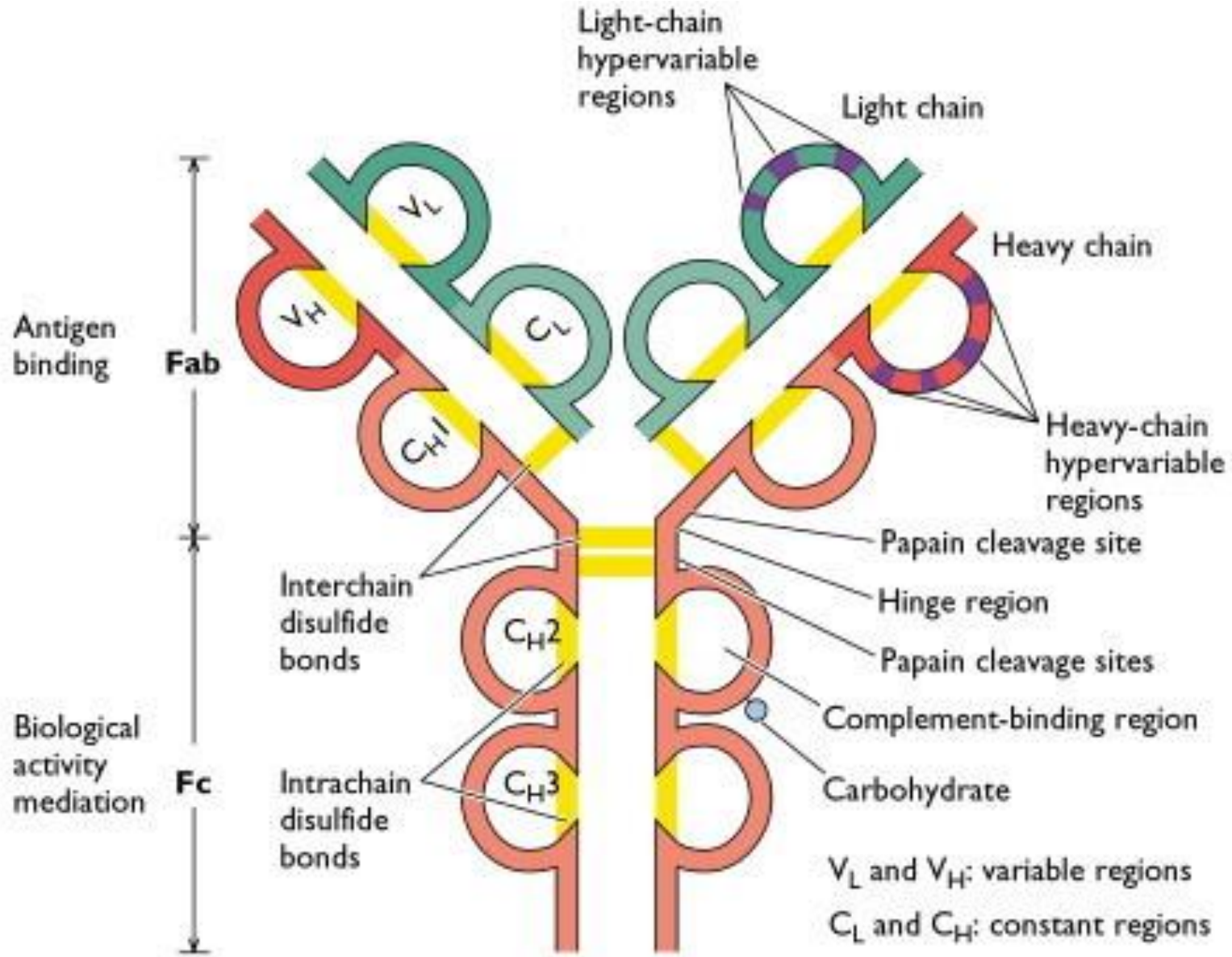
- Serum antibodies: produced in response to a particular antigen
- Having heterogenous and polyclonal antibodies
- The antigens are mostly complex and have many different antigenic determinant
- So, several clones of B cells produce several monoclonal antibodies for each or many antigenic determinant.
- Each monoclonal antibody can bind to its specific antigen
- In serum presence of these several monoclonal antibodies makes this a pool of polyclonal and heterogenous serum.

- Antibodies are heavy (~150 kDa) globular plasma proteins.
- An antibody, also known as an immunoglobulin, is a Y-shaped structure which consists of four polypeptides — two heavy chains and two light chains.
- These four polypeptide chains: two identical **heavy chains** and two identical **light chains** connected by disulfide bonds.
- Light Chain (L) consists polypeptides of about 22,000 Da and Heavy Chain (H) consists larger polypeptides of around 50,000 Da or more.
- There are five types of Ig **heavy chain** (in mammal) denoted by the Greek letters: α , δ , ϵ , γ , and μ .
- There are two types of Ig **light chain** (in mammal), which are called lambda (λ) and kappa (κ).
- [Fab fragment](#) is a region on an antibody that binds to antigens. It is composed of one constant and one variable domain of each of the heavy and the light chain.
- Fc region is the tail region of an antibody that interacts with cell surface receptors called [Fc receptors](#) and some proteins of the complement system





Structure of antibody



Structure of antibody



Types of immunoglobulins

Name	Properties	Structure
IgA	Found in mucous, saliva, tears, and breast milk. Protects against pathogens.	
IgD	Part of the B cell receptor. Activates basophils and mast cells.	
IgE	Protects against parasitic worms. Responsible for allergic reactions.	
IgG	Secreted by plasma cells in the blood. Able to cross the placenta into the fetus.	
IgM	May be attached to the surface of a B cell or secreted into the blood. Responsible for early stages of immunity.	