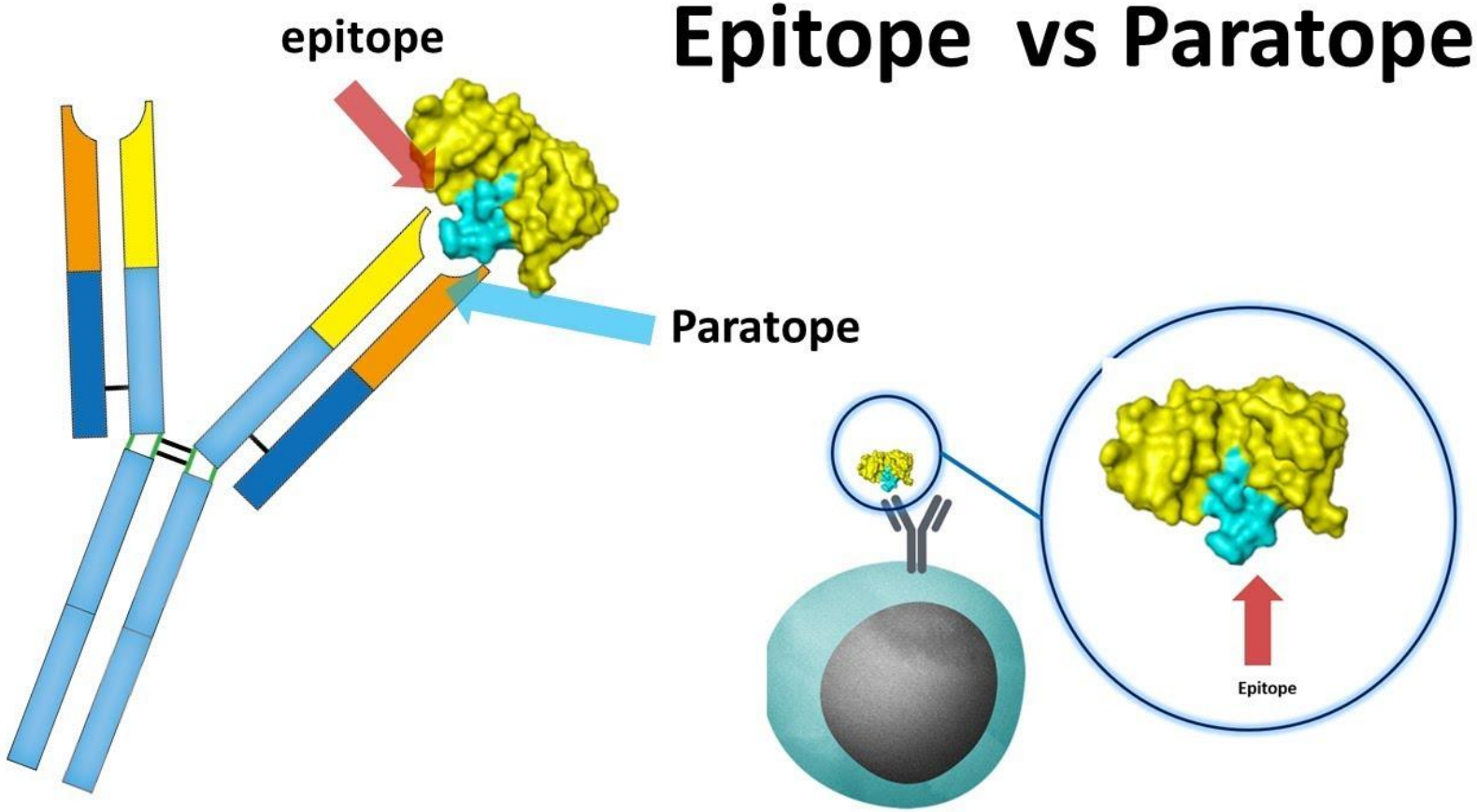
Epitope

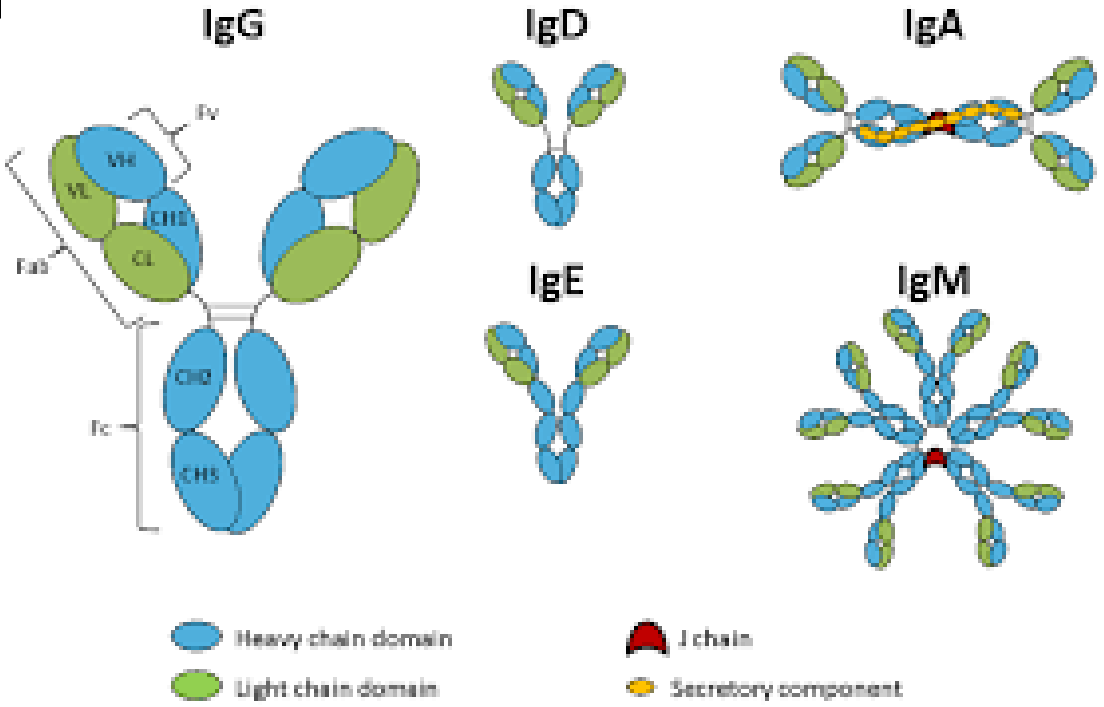
- **Epitope or antigenic determinant-** is a portion of a foreign protein, or antigen, that is capable of stimulating an immune response.
- An epitope is the part of the antigen that binds to a specific antigen receptor on the surface of a B cell (BCR).
- Binding between the receptor and epitope occurs only if their structures are complementary.
- If they are, epitope and receptor fit together like lock and key. This binding is necessary to activate B-cell for the production of antibodies.
- The antibodies produced by B cells are targeted specifically to the epitopes that bind to the cells' antigen receptors.
- Thus, the epitope also is the region of the antigen that is recognized by specific antibodies, which bind to and remove the antigen from the body.

Epitope vs Paratope



Isotype

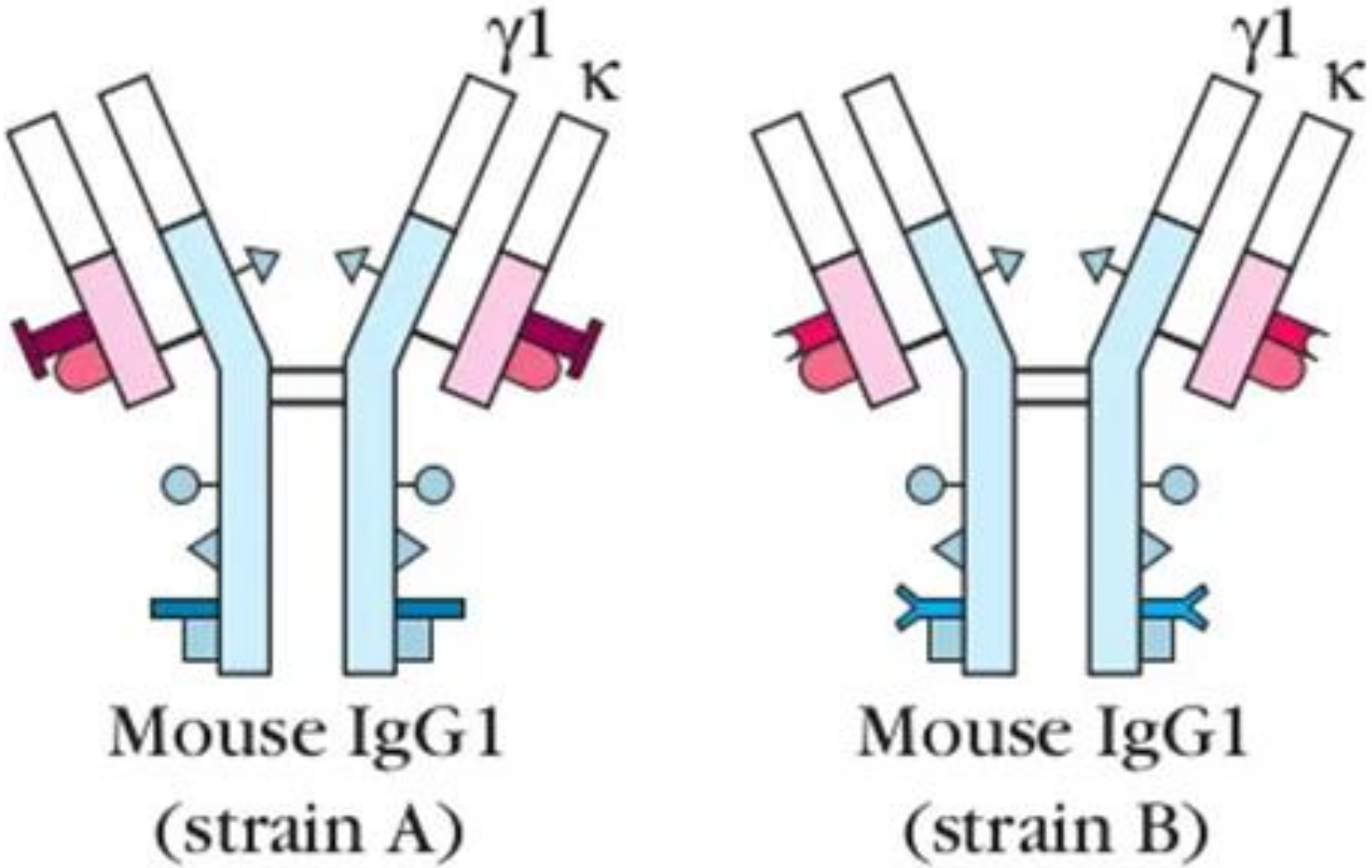
- Each antibody has only one type of (γ, or α, or μ, or ε, or δ) heavy chain and one type of (k or λ) light chain.
- The structural differences in the constant region of a heavy chain or light chain determine immunoglobulin (Ig) class and sub-class, types and subtypes within a species.
- These constant region determinants are called isotypic determinants or isotypes.



Allotype

- Based on the genetic difference among individuals.
- Although all members of a species inherit the same set of isotype genes, **multiple alleles exist for some of the genes**.
- These alleles encode minor amino acid differences, known as allotypic determinants.
- Occurs in some but not all members of a species.
- The sum of the individual allotypic determinants displayed by an antibody determines its allotype.

Allotypic determinants



Idiotype

- VH and VL domains of an antibody constitute an antigen-binding site. To recognize the vast array of antigens that a human can encounter in its lifetime, this variable region has different structural conformation owing to the presence of different amino acids. There are millions of such antibodies in the human body specific for each antigen.
- These unique amino acid sequences present in the VH and VL domains of a given antibody also serves as a set of antigenic determinants. Each individual **antigenic determinant of the variable region is referred to as an idiotope**. Each antibody will present multiple idiotopes; the sum of the individual idiotopes is called the idiotype of the antibody.

Idiotypes

Immunoglobulin idiotype, the antigenic determinant that distinguish variable region of Immunoglobulin from other variable region of other immunoglobulins.