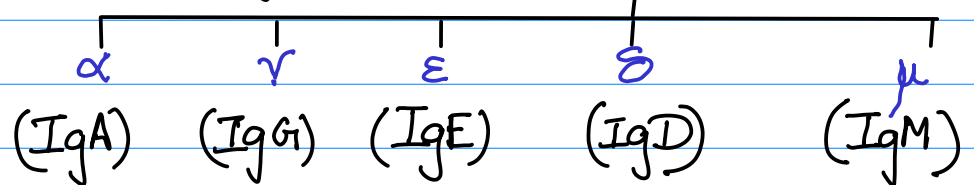


Immunology - Antibody Isotypes

- Light chains (only one kind on a single molecule) $\xrightarrow{\text{amino acid variation}}$
 - kappa (κ) (60%)
 - lambda (λ) (40%)

◦ Different light chains \rightarrow different antigenic specificities

- Variable C-regions (heavy chains) \rightarrow Isotypes



Further variability \rightarrow leads to subclasses

Important points

- ① Antibodies belonging to same isotype can have different specificities
- ② Isotype switch - antibody with same specificity can maintain or change isotypes

IgG (Immunoglobulin G)

- most abundant in serum (80%)
- 2 ν heavy chains + 2 κ or λ light chains
- 4 sub-isotypes - IgG₁, IgG₂, IgG₃, IgG₄ → based on serum conc.
 - encoded by 4 different C_H genes, (90-95% homology)
 - differentiated by size of hinge region & no. of & position of S-S disulphide bonds between heavy chains

Activity:

- ① IgG₁, IgG₃, IgG₄ - protect developing foetus
- ② IgG₃ > IgG₁ > IgG₂ >> IgG₄ → complement activation
- ③ IgG₁ & IgG₃ > IgG₄ > IgG₂ → affinity for F_c receptors and mediating opsonisation

IgM (Immunoglobulin M)

- 5-10% of total serum antibody
- pentamer-forming - held by disulfide bonds
- expressed as membrane-bound antibody on B cells
- first to be produced in primary response to antigen
 - ↳ higher valency due to 10 antigen binding sites

↓
more efficient in binding antigens with many repeating epitopes (viral particles & RBCs)

(agglutination)

- more efficient at activating complement than IgG; because F_c regions are in closer proximity due to complement activation
- does not diffuse well because of ↑ size ⇒ very ↓ conc. in ICF
- Additional joining chain (J-chain) bound to 2 F_c regions → allows IgM to bind to receptors on secretory cells

↓
carried across epithelial barriers to external secretions that bathe mucosal surfaces

- secretory immunoglobulin
- first to be secreted by the neonate.