

Immunoglobulin A (IgA)

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Immunoglobulin A (IgA) is the **first line of defence** in the resistance against infection, via inhibiting bacterial and viral adhesion to epithelial cells and by **neutralisation** of bacterial toxins and virus, both extra- and intracellularly. IgA also eliminates pathogens or antigens via an **IgA-mediated excretory pathway** where binding to IgA is followed by polyimmunoglobulin receptor-mediated transport of immune complexes.

Secretory Immunoglobulin A (SIgA) has an important role in mediating the **adaptive** (antigen specific) **humoral (antibody [Ab]-based)** immune defence at **mucosal surfaces** (gastrointestinal, respiratory and urogenital tracts). Mucosal surfaces are the portal of entry of many pathogens. SIgA is produced excessively at mucosal surfaces and is the predominant class of Ig found in human external secretions and in tears.

IgA are glycoproteins and one of five classes of Ab. Ab classes are defined by (i) the number of Y-like units (comprised of 4 polypeptides, 2 identical **heavy chains** and 2 identical **light chains**) (See **Figure 1**) and (ii) the type of heavy chain (in the case of IgA, an α -chain). IgA can be oligomeric, comprised of 2–4 IgA monomers.

SIgA is always oligomeric in structure, primarily dimeric, and the polymers are linked by additional polypeptide chains, including a 15KD joining chain (**J chain**) and a 70KD **secretory component** chain produced in epithelial cells and involved in the transcellular transport of SIgA (See **Figure 1**).

In humans, following **antigen presentation** to **T helper cells (Th)**, and differentiation of Th to Th2, the cytokines **interleukin (IL)-10**, **IL-4** and **transforming growth factor beta (TGF)- β** are involved in causing the preferential maturation of **B cells** (B-cell Ab class-switching and differentiation) into B cells that are committed to producing IgA. In humans there are two types of IgA, predominantly **IgA1**, found in serum and derived in bone marrow, and **IgA2**, a secretory form of IgA.

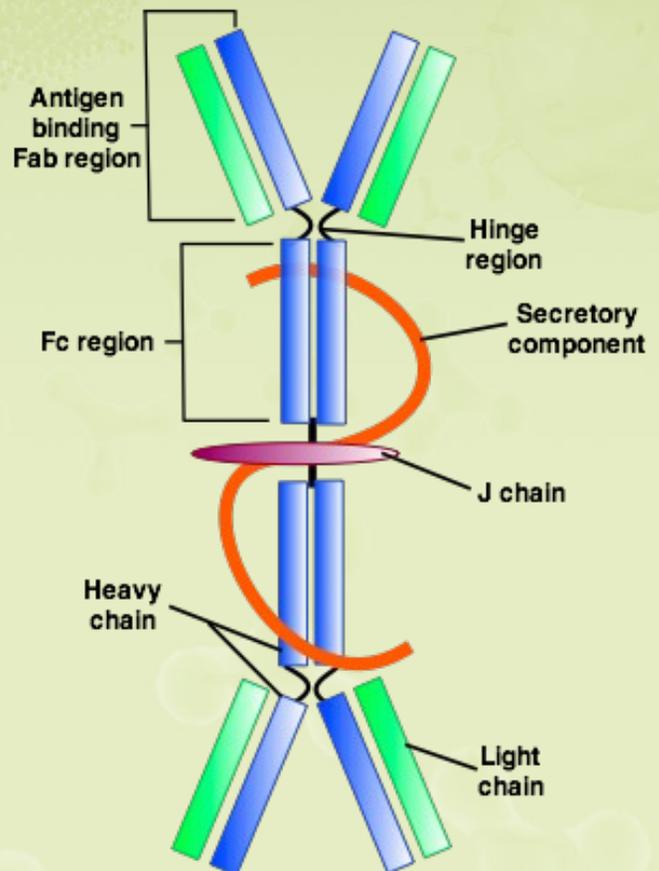


Figure 1: Schematic diagram of the structure of SIgA, showing two IgA molecules covalently linked via the J-chain and the secretory component, added as the Ab crosses the mucosal epithelial cells into the lumen.