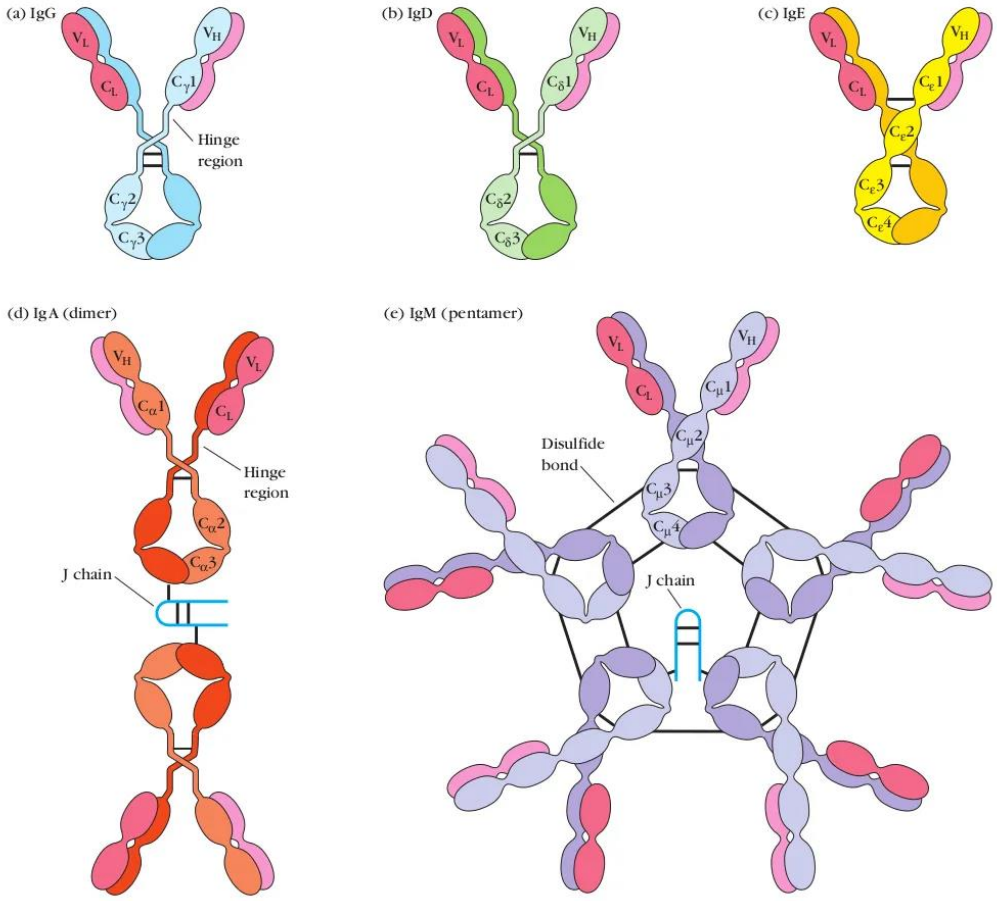
DIFFERENT CLASSES OF IMMUNOGLOBULINS

5 CLASSES
They are named on the nature if heavy chain they have

Name of Ig	*nature of heavy chain*
Immunoglobulin G.	Gamma
Immunoglobulin A	Alpha
Immunoglobulin M.	Mu
Immunoglobulin D.	Delta
Immunoglobulin E.	Epsilon



Immunoglobulin G

It is a monomer.It is the major immunoglobulin constitutes about 80%of total serum.
It has the molecular wt of 150000 and sedimentation coefficient of 7S and exist in polymerised form. They have half life approx. 23 days. It is the only maternal Ig that transported across placenta and provide natural immunity in newborn. Ig G binds to the microorganism and enhance their phagocytosis .Four substances of Ig G is identified ie Ig G1,G2,G3,G4.

Structure

Ig A is a four polypeptide chained molecule formed of 2 light chains and two heavy chains of gamma.

Biological properties

- IgG1,G3,G4 are readily cross the placenta and helps protection of foetus
- Ig G3 is the most effective complement activator. G2 Is the leaset and G4 is not able to activate complement at all.
- G1 and G3 bind with Fc receptor and mediate opsonization
- Ig G neutralize toxins and viruses.

Immunoglobulin A

Exist as moner,dimer,trimer. It is the second most abundant class,constituting about 10-13% of serum . Half life ud 6-8 days. Ig A is 7S molecule with molecular wt about 16000.It is the predominant Ig class in external secretions such as breast milk,saliva,tears and mucus of bronchial,genitourinary and digestive tract. Ig A is exist in two isotypes IgA1 and IgA2.

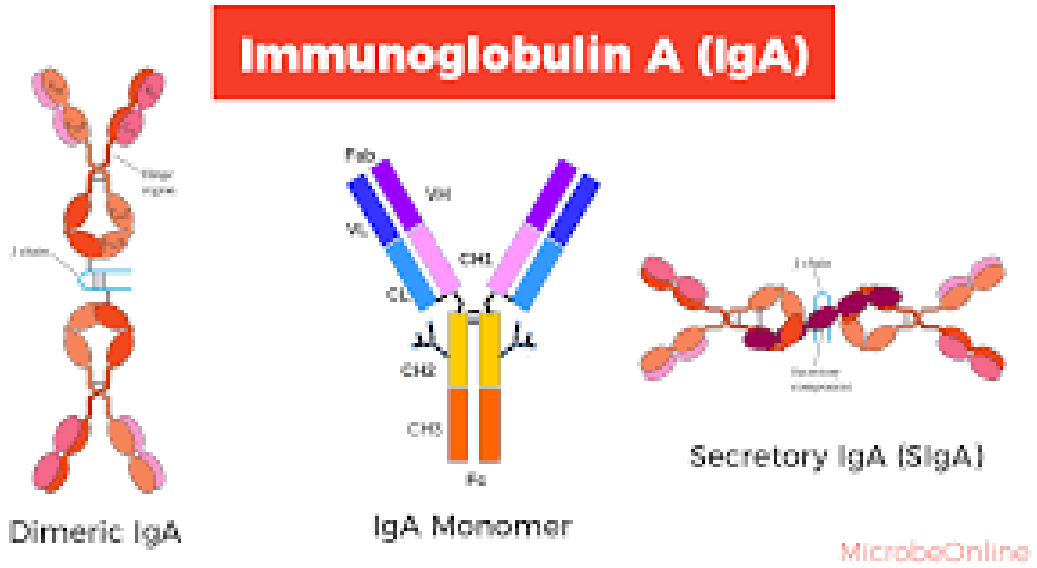
Structure

It is a monomer and having 2 light chain and 2 heavy chains. The light chains are either kappa ot lamba type. The heavey chain is alpha type.

Biological properties

- Ig A is termed as mucosal paint or antiseptic paint. It inhibit the adherence of microbes to the mucosa of respiratory,gastro intestinal and urinogenital tract.

- They can activate the alternate complement pathyway thereby neutralize toxin.
- They can produce immunity against tapeworm
- Ig A present in colustrum



Immunoglobulin M

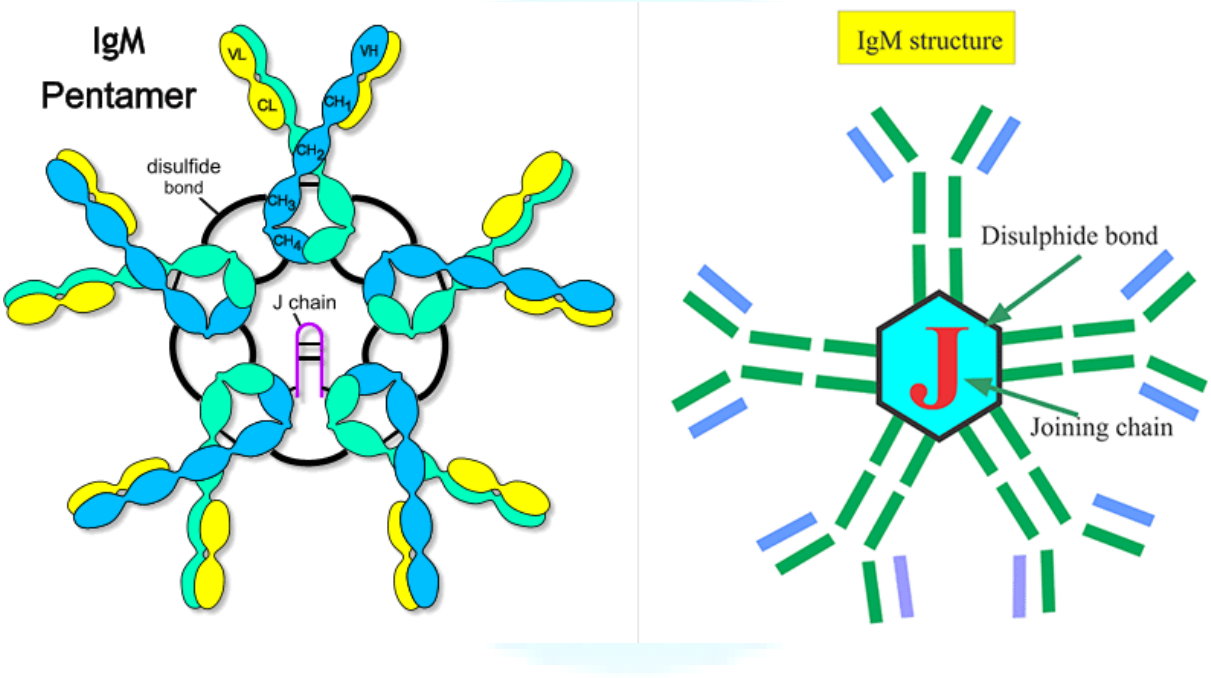
Pentamer.
5-8% of serum.
Half life is 5 days.
It is heavy molecule with 7S and 900000-1000000 molecular wt. Hence it called millionaire molecule.It is the earliest immunoglobulin produced by foetus.

Structure

Formed by the polymeration of 5molecule is by joining chain. The J chain is holding the five subunits at Fc region and stabilizes the Fc sulfhydyryl group.

Biological properties

- ❖ It is the first antibody to appear in the primary immune response . Hence useful indicator of recent infection.
- ❖ Most antibody such as ABO blood group isoagglutinins and heterophilic antibodies are of IgM class.
- ❖ By having multiple antigen binding sites Ig M has a high function affinity for multivalent antigen
- ❖ Shows opsonization,cytosis,agglutination etc



Immunoglobulin D

Half life 3 days.
Molecular wt of 18000.
It is present a concentration about 3mg per ml.
Sedimentation coefficient 7S.

Structure

Having 2 light chains of kappa or lambda type. The 2 heavy chains are delta type

Biological properties

- Ig D is found associated with surface of B lymphocytes along with Ig M is found to act as an antigen receptor.

Immunoglobulin E

Monomer .
Molecular wt about 190000.
Half-life is 2 days.
Sedimentation coefficient is 8s.
It is the only Ig without a hinge.
It is heat labile.
It mediate hypersensitivity reactions that are responsible for symptoms of hay fever, asthma, hives and anaphylatic shock

Structure

Monomer having 2 light chains and 2 heavy chains. The light chain is kappa or lambda type. The heavy chain of epsilon type.

Biological properties

- High level of Ig E in children with worm infestation seems to have a protective role. It is either by IgE acting directly on the parasites or by producing vaso amines.

- The Ig E antigen interaction on most cells results in degranulation of most cells with the release of vasoactive amines. It binds with high affinity mast cells and stimulate the mast cells to release a number of factors like histamines to kill various type of particles,thus causing immediate hyper sensitivity