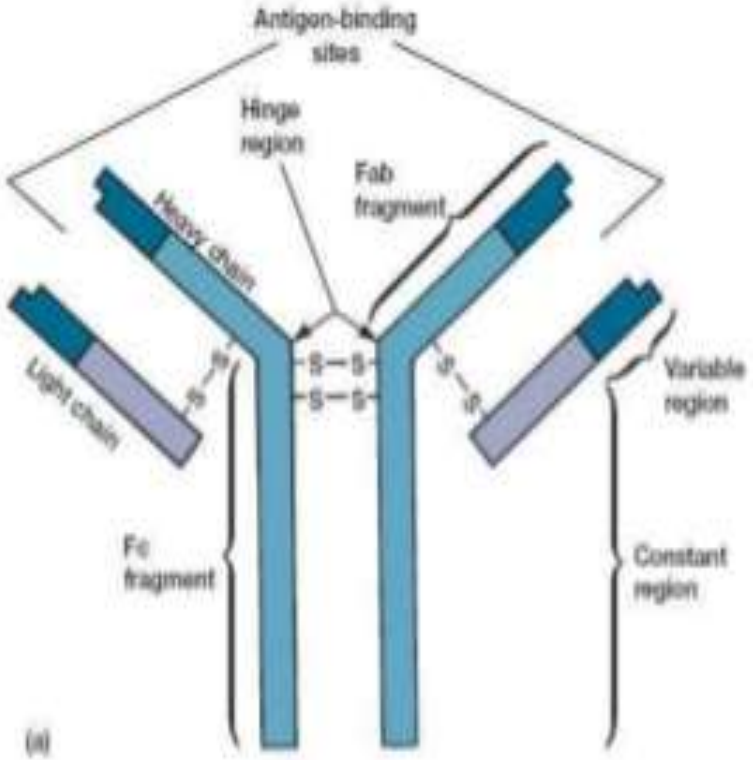
1. Introduction -

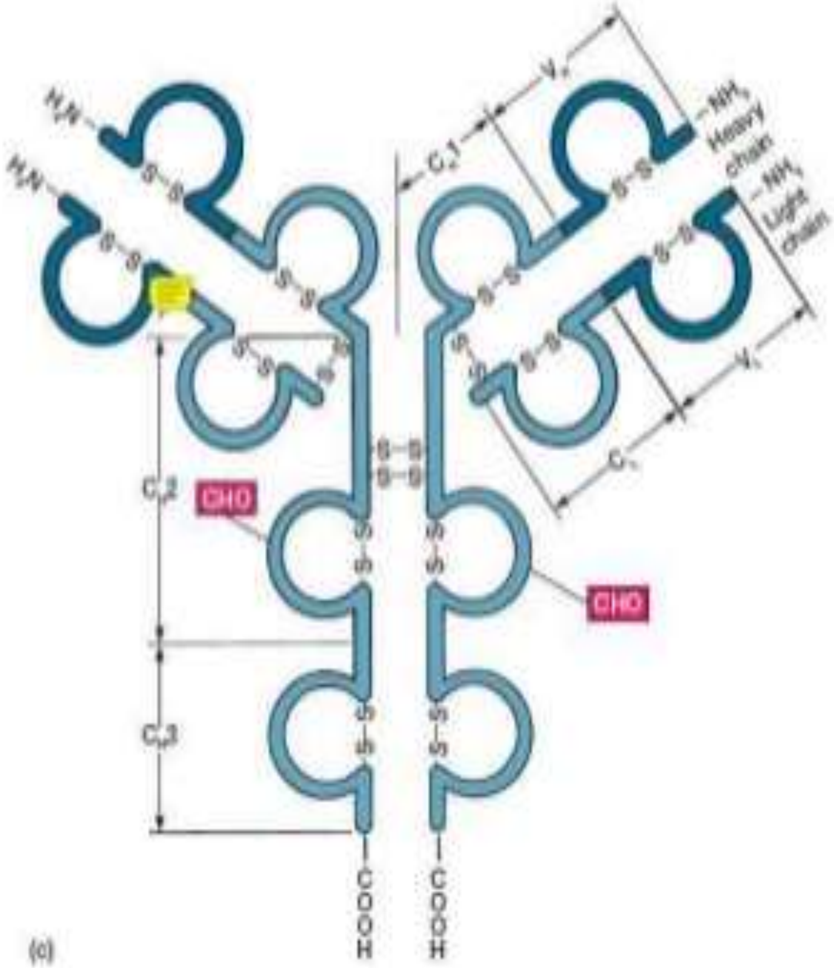
- Antibody is a large protein, constitiutes γ-globulin produced by plasma cells.
- It is used by the immune system to identify and nutralize pathogens such as bacteria and viruses.
- Antibodies are also called Immunogloublins.
- The antibody recognizes a unique molecule of the harmful agent called ANTIGEN, via the variable region.

2. History

- By 1959 Gerald Edelman and Rodney Porter independently published the molecular structure of antibodies for which they were later jointly awarded the Nobel Prize in 1972.
- The first atomic resolution structure of an antibody fragment was published in 1973.

Basic structure of Antibody





H_2N
H_2N
NH_2
Heavy chain
NH_2
Light chain
CHO
CHO
S–S
S–S
COOH
COOH
(c)

HEAVY CHAINS

- Five types of heavy chains are present
- They are;1) alpha (α) 2) gamma (γ) 3) delta (Δ) 4) epsilon 5) mu (μ)

- Each heavy chain has two regions, one constant region and one variable region.

- Alpha and gamma chains contains approximately 450 aminoacids, where as mu and epsilon chains have approximately 550 aminoacids.

5. DIFFERENT CLASSES AND FUNCTION OF ANTIBODIES

- There are five classes of antibodies are present
- They are; 1) IgG 2) IgM 3) IgA
  4) IgD 5) IgE
- The antibody classes are named as correspond to their heavy chain types

2)IgM

- They makes up approximately 13% of the serum antibodies
- They has a half-life of about 5 days
- Most of the IgM are pentamer and has 10 - epitope binding sites. some are monomer
- It is the first immunoglobulin class produced in a primary response to antigen

functions

i. Activation of classical pathway
ii. Defence against multivalent antigens
iii. Act as Opsonin

3)IgA

- They makes up approximately 6% of the serum antibodies
- They has a half-life of approximately 5 days
- IgA is a dimer and has 4-epitope binding sites
- They found mainly in body secretions such as saliva, mucous, tears, colostrum and milk

Functions

i. It as a Secretory antibody
ii. Effective against virus that causing Influnza
iii. Production to Infant gut

4)IgD

- They makes up approximately 0.2% of the serum antibodies
- IgD is a monomer and has 2-epitope binding sites
- This class antibodies are found on the surface of B-lymphocytes

Function

i. B cell activation.
ii. Act a receptor for antigen binding

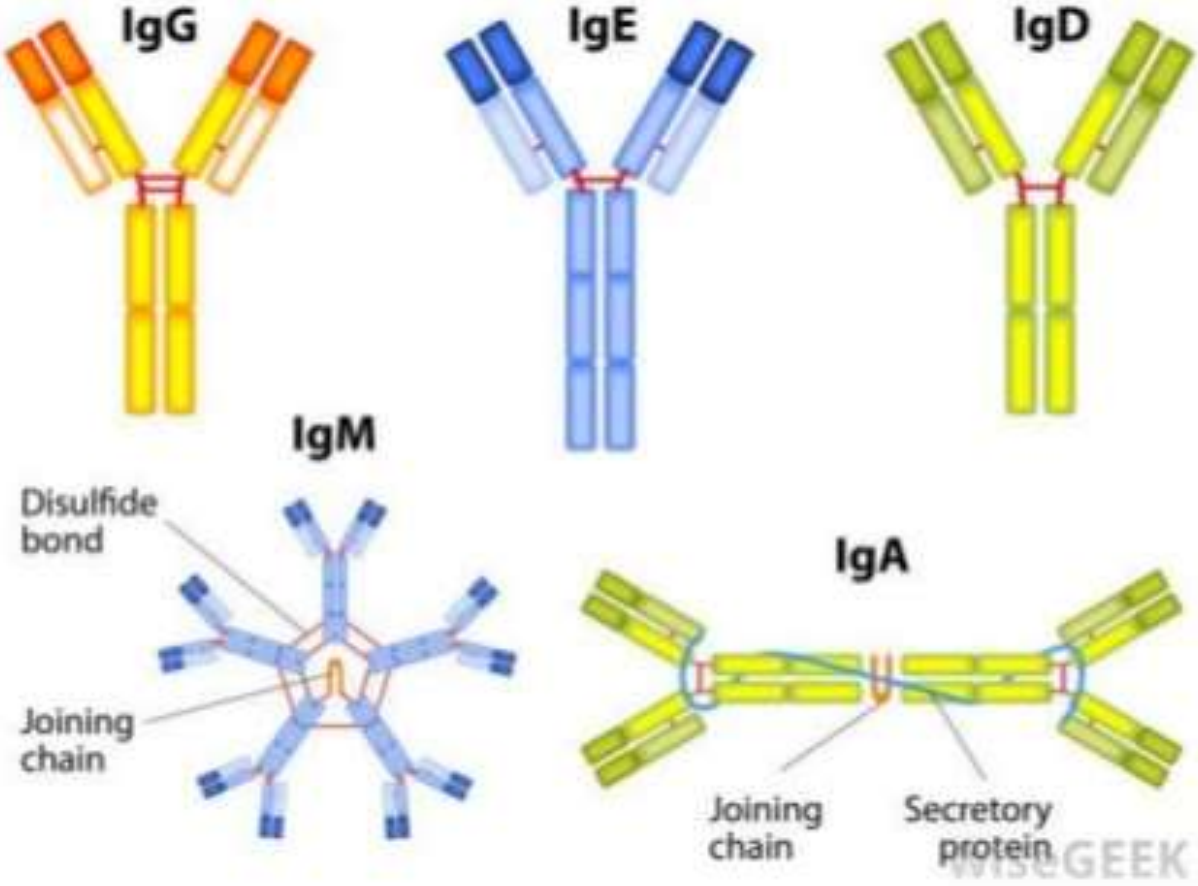
5)IgE

- It was discovered in 1966 by K. Ishizaka.
- It is very low concentration in blood(17-450ng/ml)
- It contain small percentage of Lympocytes

Functions

i. Responsible for Immediate hypersensitivity
ii. Binds to Fc receptor on basophils and mast cells
iii. Release of substance like histamine ,vasoactive mediators

Structures of Antibodies



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PRITHA MONDAL

ASSISTANT PROFESSOR ZOOLOGY.