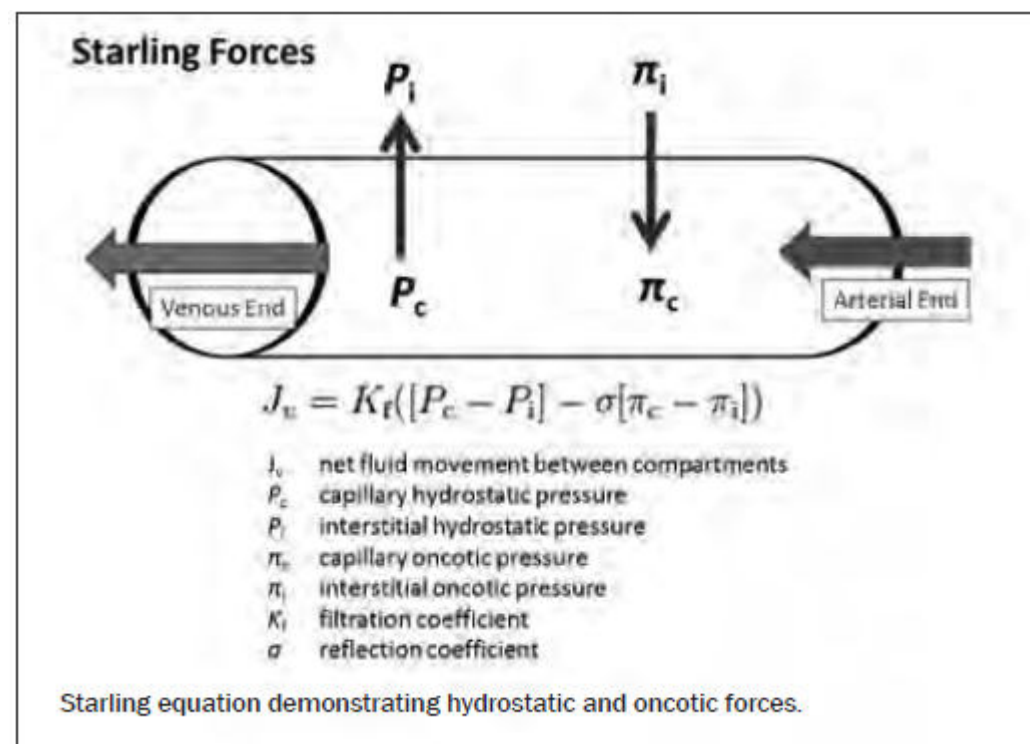


Cont...

Functions of plasma proteins



Learning Objectives:

At the end of this lecture student should be able to describe

- Types of plasma proteins
- Characteristics of plasma proteins
- **Functions of plasma proteins**

Functions of plasma proteins

1. Colloid osmotic pressure in blood
2. Viscosity of blood
3. Buffer action
4. Clotting and fibrinolysis
5. Defense function body
6. Transport function
7. Plasma proteolytic enzyme system
8. Plasma protease inhibitor system
9. Reserve Source

Viscosity of blood

- Blood is a viscous fluid and its viscosity is 4-5 times to water or **3.2 centipoise** (cP).
- Viscosity of blood is contributed equally by blood cells & plasma proteins.

Viscosity of blood

- Among protein classes, the fibrous proteins fibrinogen - major contributors of the viscosity.
- Blood viscosity is important to maintain diastolic blood pressure as it contributes to resistance to blood flow.

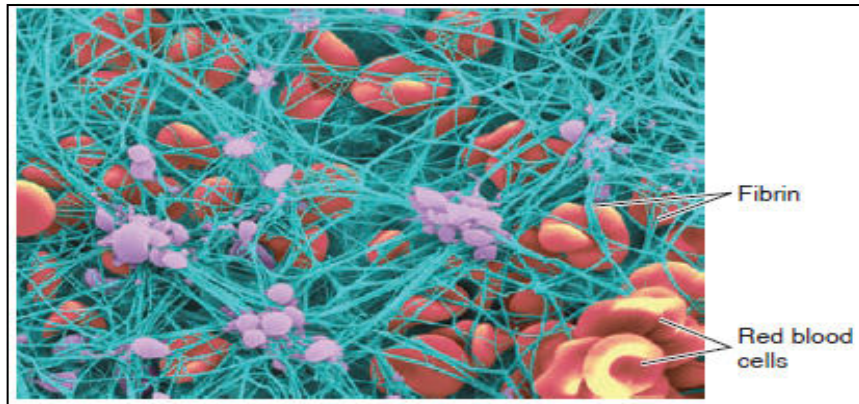
Acid Base Buffer



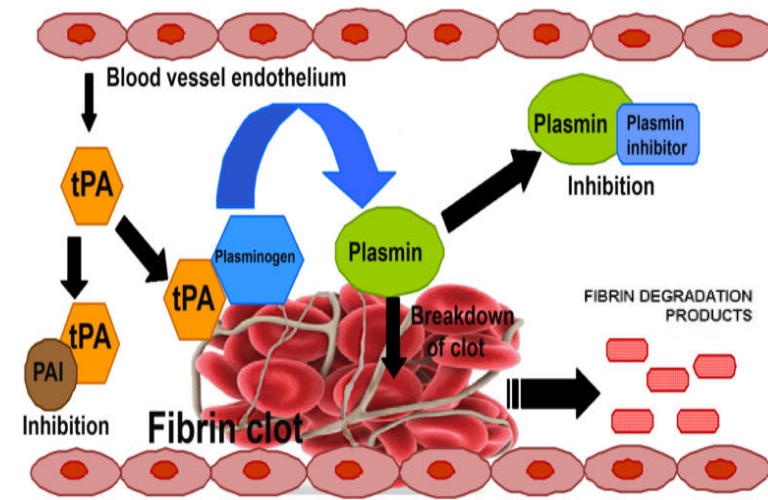
PPs provide 15 %buffering capacity of blood. It is possible because of their amphoteric nature.

Coagulation and Fibrinolysis

Process of Coagulation



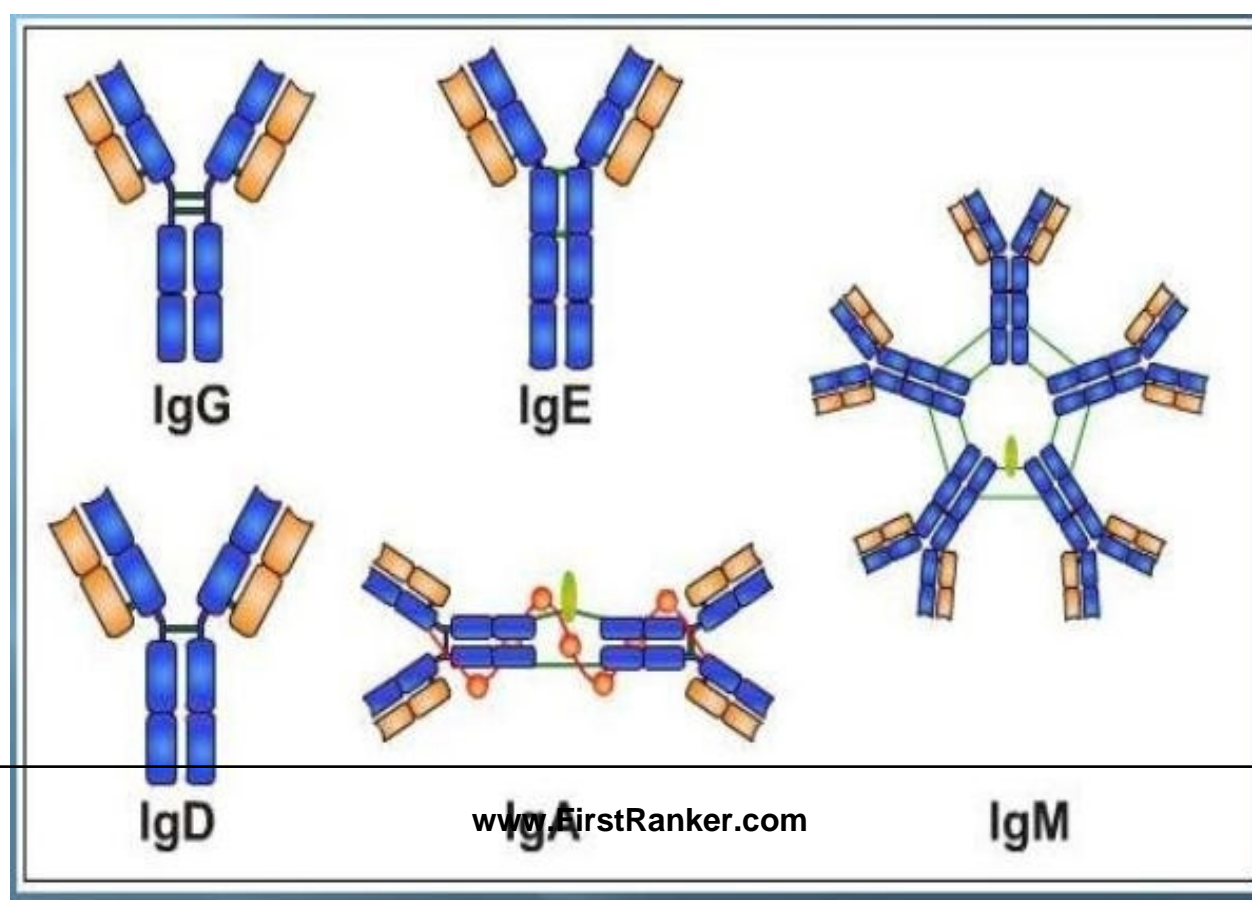
Process of Anticlotting



Body Defense function

Immunoglobulins – IMMUNITY

Five distinct classes of immunoglobulins



Carrier or Transport Function

- The bound portion may act as a reservoir or depot from which the drug is slowly released as the unbound form.
- Unbound form is filtered, excreted and metabolized much faster.
- Examples-

Plasma proteolytic enzyme system

There are three important proteolytic enzyme system-

1. Complement system
2. Fibrinolytic system
3. Kinin system

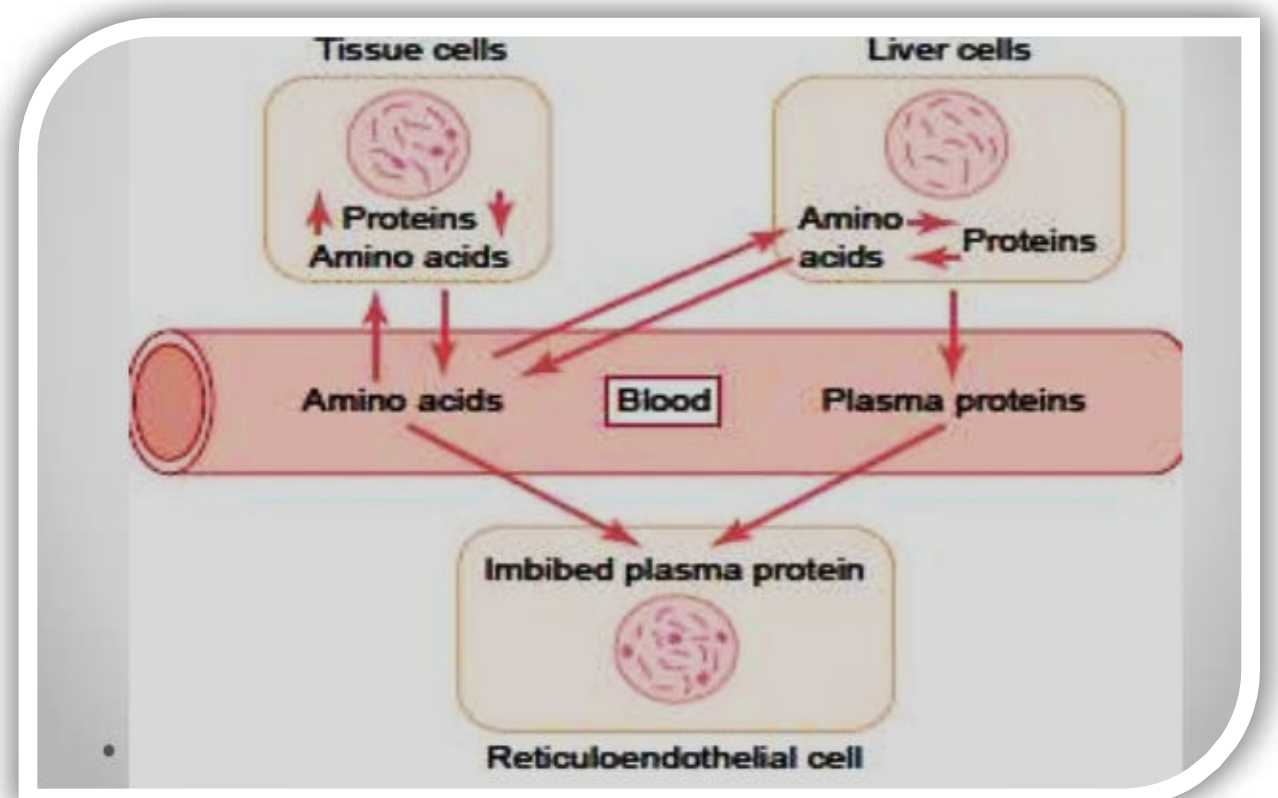
Plasma protease inhibitor system

There is a family of proteins which **inactivate/ Inhibit** the various activated enzymatic proteins to regulate many processes:

1. Alpha1-protease inhibitor
2. Alpha 2-macroglobulins
3. Anti thrombin III
4. Alpha 2 antiplasmin

Reserve Source of Proteins - Act as a source of Amino acids for body tissues at the time of need.

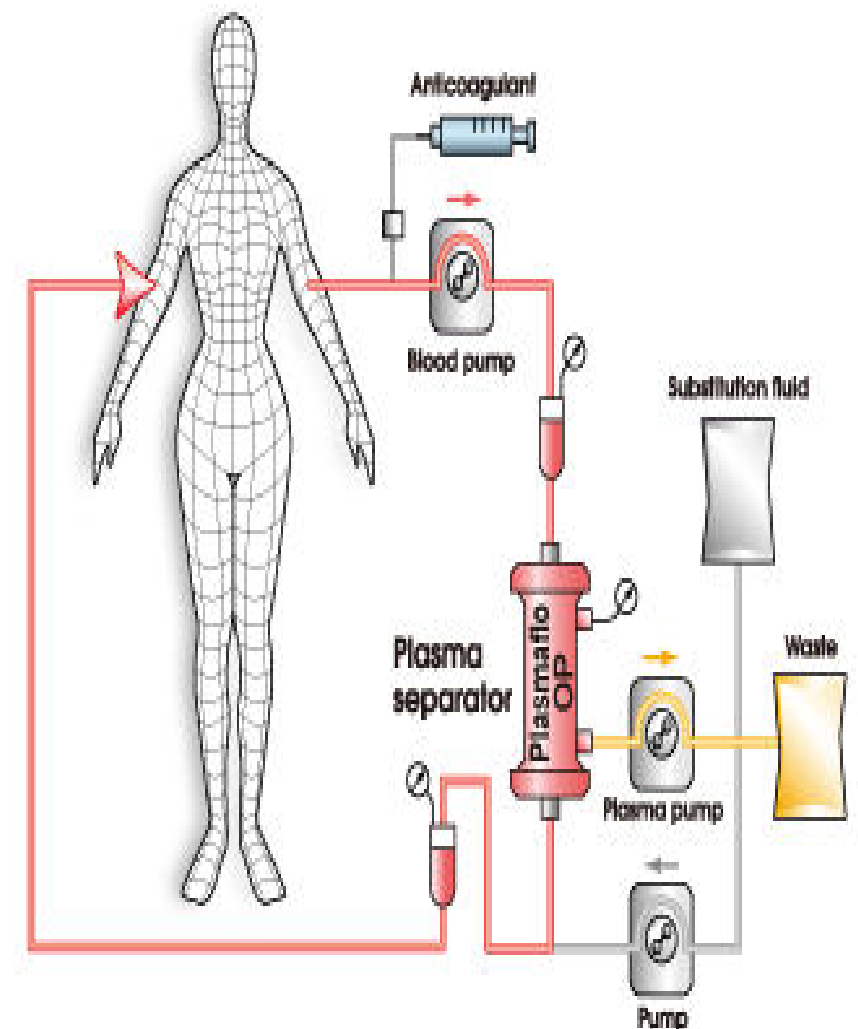
▪ Plasma protein serves 'Reserve Proteins'



Factors affecting synthesis of plasma proteins- Plasmapheresis (Whipple's Experiment)

Plasma Exchange (PE) treatment diagram

- Plasmapheresis: a method of removing blood plasma from the body by withdrawing blood, separating it into plasma and cells, and transfusing the cells back into the bloodstream.
(Clinical use-It is performed especially to remove antibodies in treating autoimmune conditions).



Self Assessment

- The person whose hematocrit is equal to 60 %with reference to normal has viscosity of blood.
- Normal total plasma protein ranges from
- Which component of protein contribute to maximum percentage to total plasma protein.....
- Normal serum albumin level is
- Normal A/G ratio in blood is
- Viscosity of blood increased with rise in.....and.....
- Plasma proteins act as buffers because of
- Buffering capacity of plasma proteins isof total buffering capacity .

Thank you

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