Topic: Blood Clotting mechanism
Class: B.Sc Part –III (Hons.)
Paper- V
Group – B

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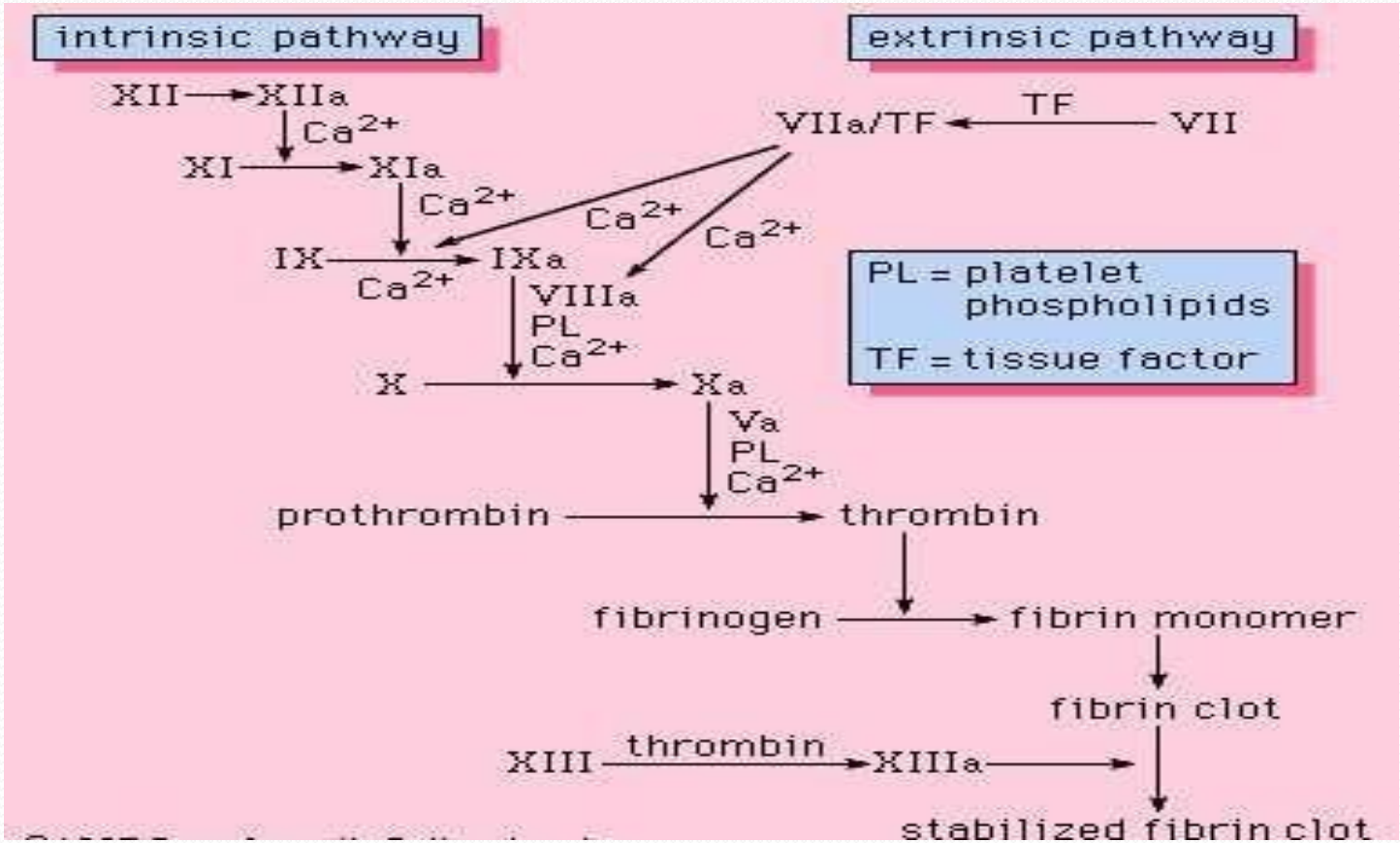
Fig: The blood coagulation cascade is initiated through either the extrinsic or intrinsic pathway.



- The **extrinsic pathway** is generally the first pathway activated in the coagulation process and is stimulated in response to a protein called tissue factor, which is expressed by cells that are normally found external to blood vessels.

- However, when a blood vessel breaks and these cells come into contact with blood, tissue factor activates factor VII, forming factor VIIa, which triggers a cascade of reactions that result in the rapid production of factor X.

- In contrast, the **intrinsic pathway** is activated by injury that occurs within a blood vessel. This pathway begins with the activation of factor XII (Hageman factor), which occurs when blood circulates over injured internal surfaces of vessels.

- Components of the intrinsic pathway also may be activated by the extrinsic pathway; for example, in addition to activating factor X, factor VIIa activates factor IX, a necessary component of the intrinsic pathway.

- The production of factor X results in the cleavage of prothrombin (factor II) to thrombin (factor IIa).

- Thrombin, in turn, catalyzes the conversion of fibrinogen (factor I)—a soluble plasma protein—into long, sticky threads of insoluble fibrin .

- The fibrin threads form a mesh that traps platelets, blood cells, and plasma. Within minutes, the fibrin meshwork begins to contract, squeezing out its fluid contents.

- This process, called **clot retraction**, is the final step in coagulation. It yields a resilient, insoluble clot that can withstand the friction of blood flow.

Clotting Factors:

- **Fibrinogen**
- **Prothrombin**
- **Tissue Factor or Thromboplastin**
- **Calcium ions**
- **Proaccelerin (labile Factor)**
- **Unassigned**
- **Proconvertin(Stable factor)**
- **Antihaemophilic Factor A**
- **Antihaemophilic Factor B**
- **Stuart-Prower Factor**
- **Plasma Thromboplastin Antecedent**
- **Hageman Factor**
- **Fibrin Stabilizing Factor / Laki-Lorand Factor**