

Principles of coagulation of the blood

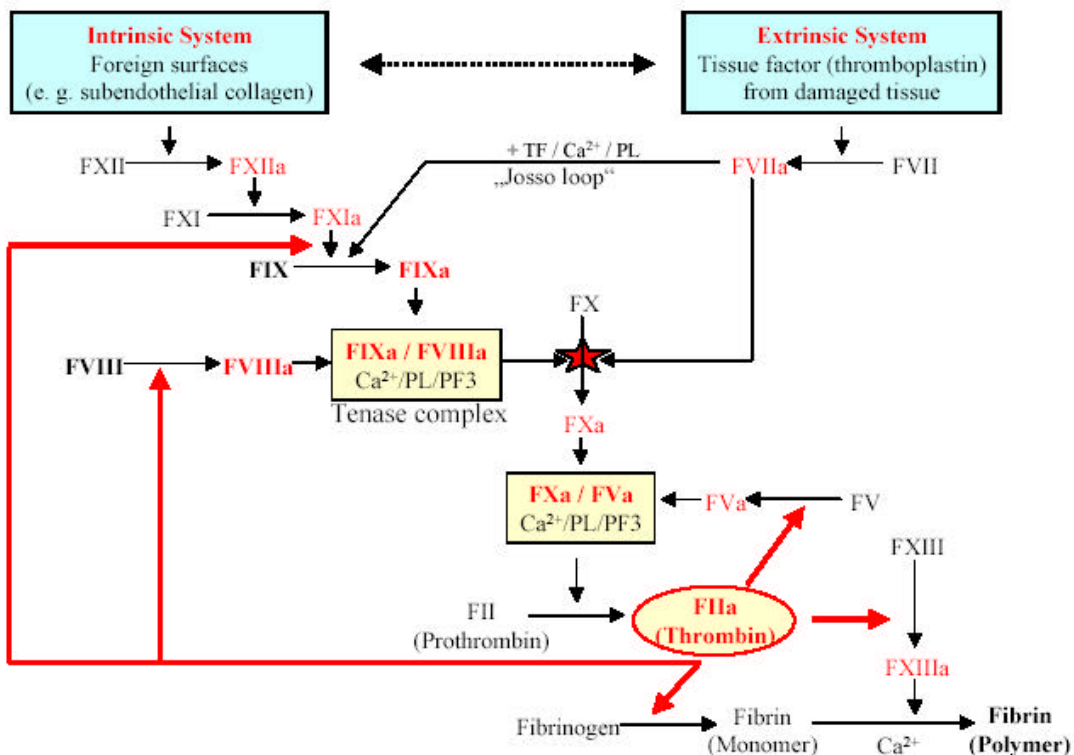
Coagulation of the blood is of fundamental importance to induce haemostasis in the event of injuries and damage to the endothelium of blood vessels affected. Three stages are recognised:

- **Primary haemostasis** (Platelets adhere to the subendothelial collagen with the involvement of von Willebrand Factor [VWF]).
- **Secondary haemostasis** (A complex interaction between various coagulation factors to form a three-dimensional adhesive matrix = polymerised fibrin).
- **Fibrinolysis** (A corrective mechanism to prevent unlimited growth of the blood clot).

The processes of secondary haemostasis are also grouped under the collective term plasmatic coagulation. Characteristic of this cascade are enzymatic processes which in turn activate enzymatically active proteins. Co-factors play a decisive role in accelerating the reaction, and positive feedback mechanisms amplify the coagulation process. The pattern of local charges on the surface of activated platelets leads, firstly, to the accumulation of activated coagulation factors, and secondly, they confine the coagulation process to the injured areas of tissue.

Figure 1 is a diagrammatic representation of the sequence of reactions in the coagulation process, which, starting with the induction signals of the endogenous and exogenous systems, leads to polymerised fibrin.

Fig. 1: Coagulation cascade



Functions of Factors VIII and IX in coagulation

Factors VIII and IX are partners in the reaction at an important junction point in the coagulation cascade, which is described as the **Tenase Complex**. The purpose of this junction point is to activate factor X, which in turn, in its activated form, occupies another partial step in the coagulation cascade.

Fig. 2: Tenase complex

