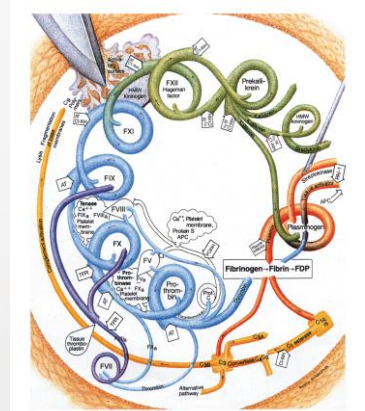


Haemochrom Diagnostica

Competence in Haemostasis Diagnostics and Endotoxin Analytics

BMA Workshop Introduction to Haemostasis



Haemochrom
Diagnostica

Haemochrom Diagnostica
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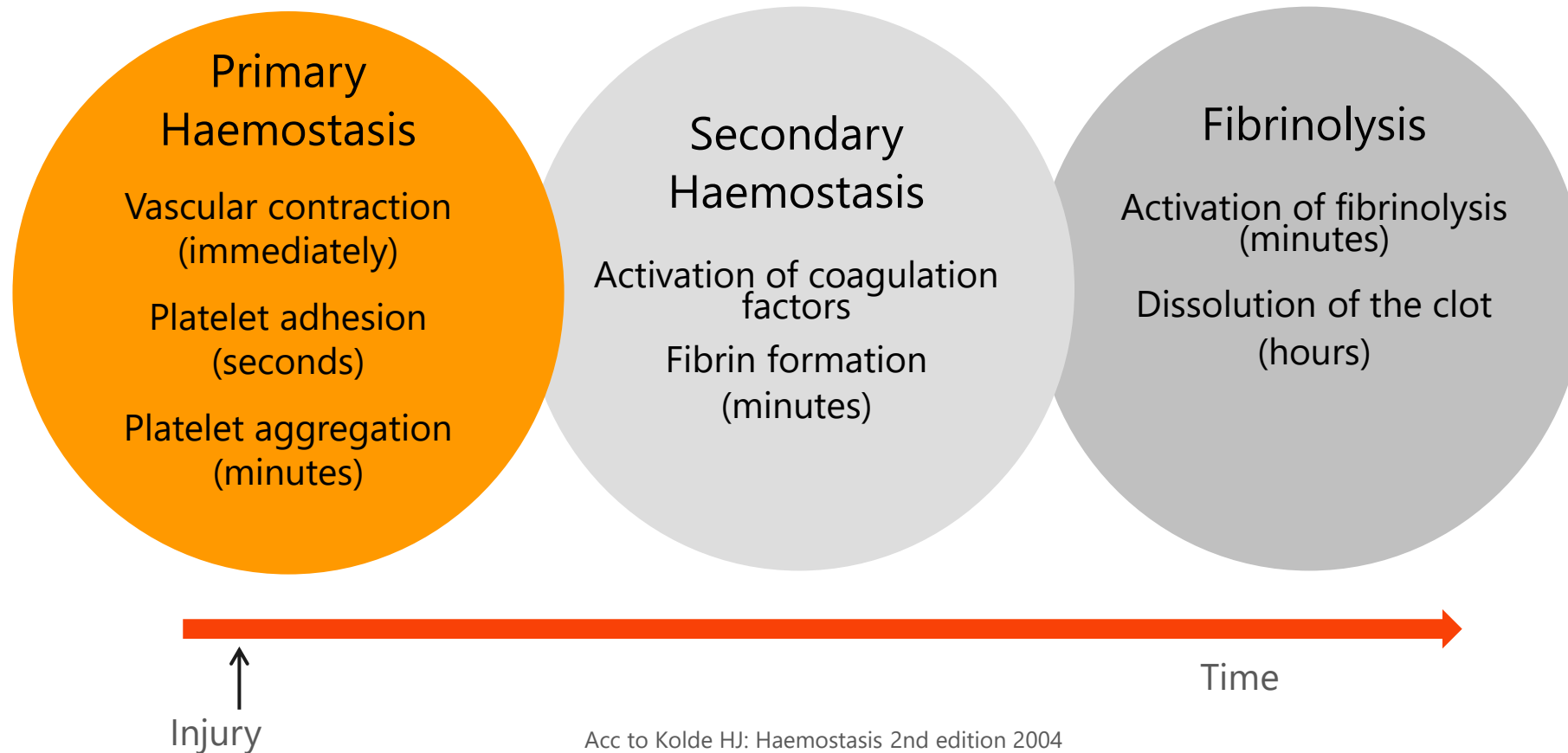
Fundamentals of primary and secondary hemostasis with special reference to F VIII and F IX

Platelet function

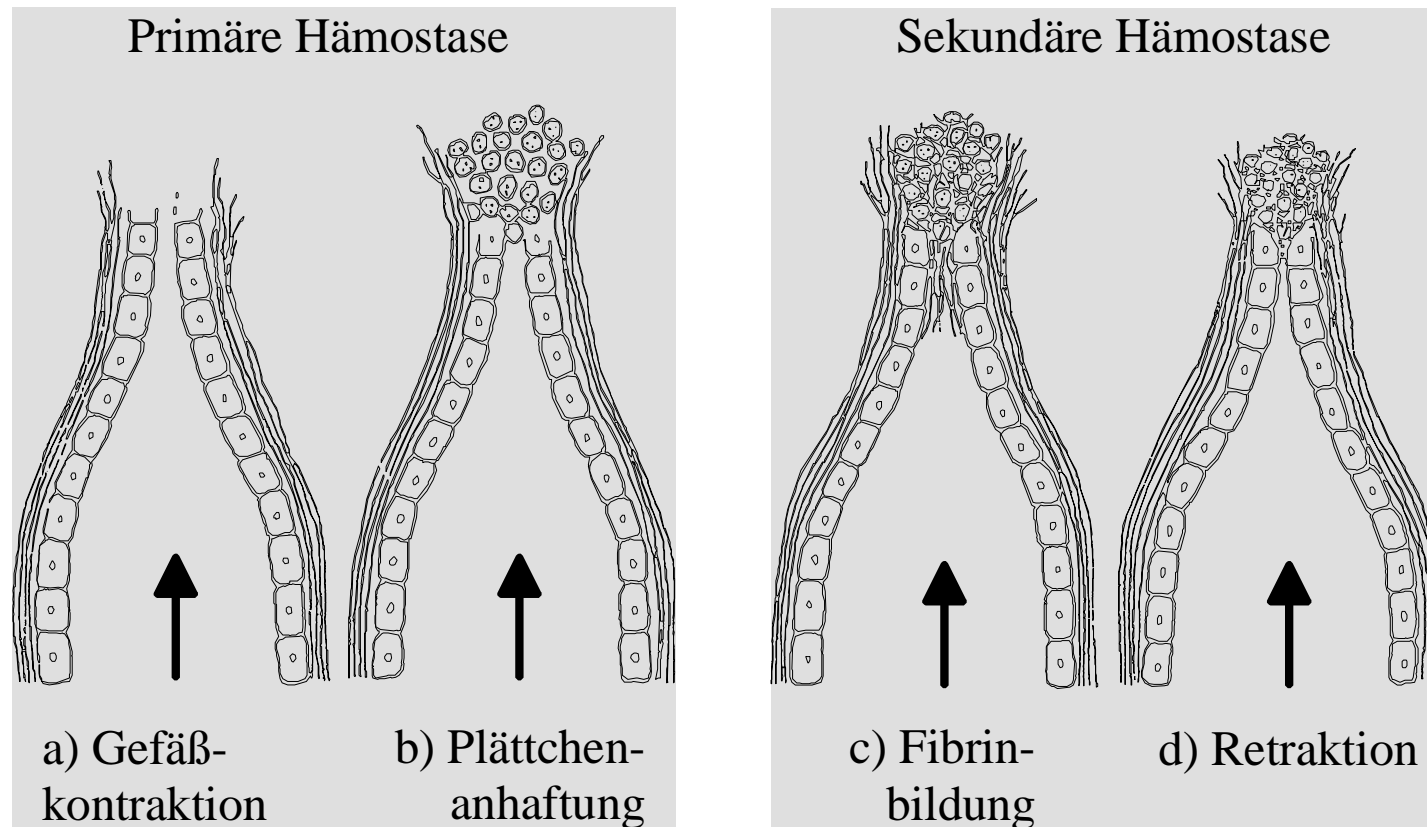
Interaction with coagulation factors



Time course of haemostasis



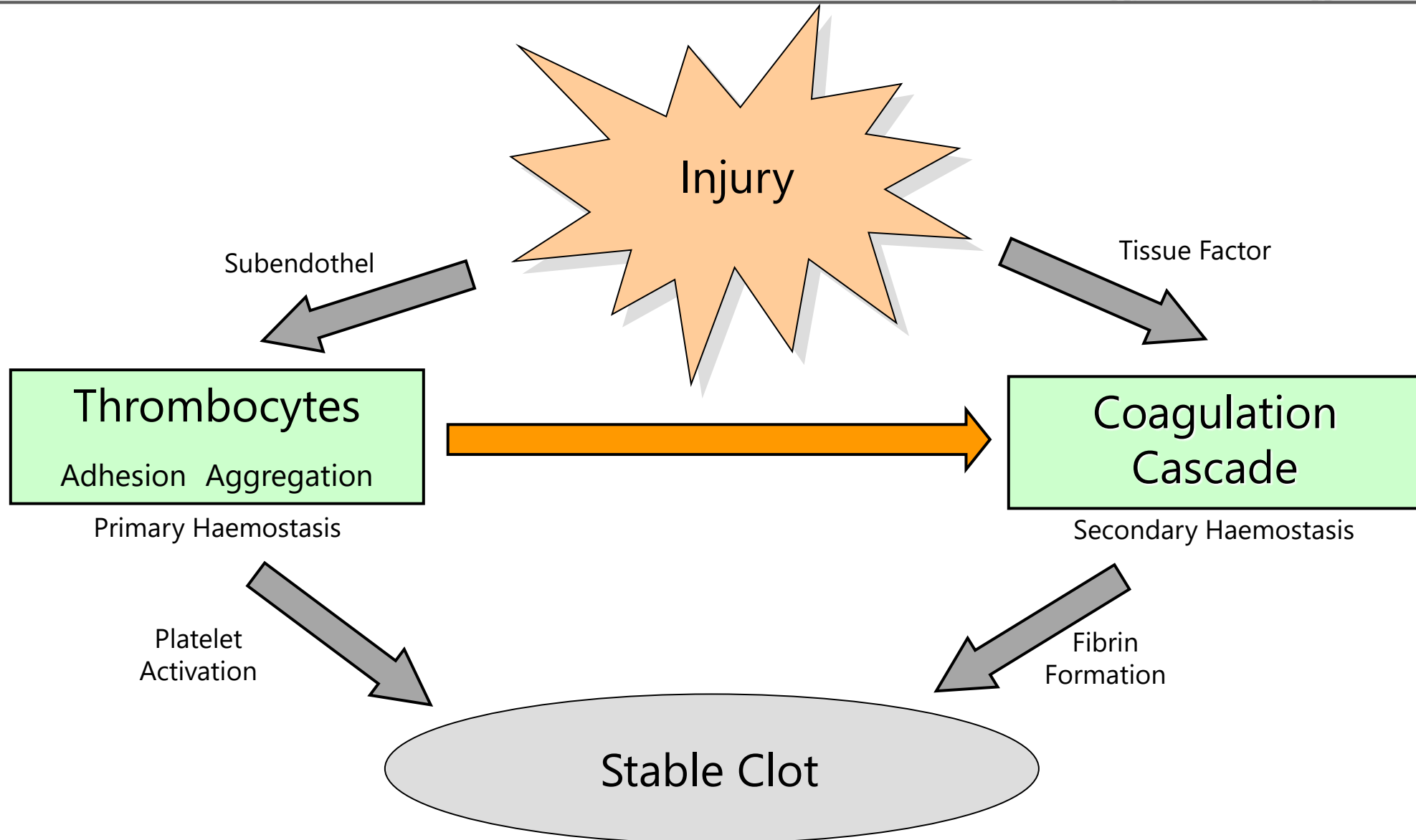
Schematic course of wound closure



From: Barthels M. & Poliwooda H. : Thieme 3. Aufl. [1987] S. 2

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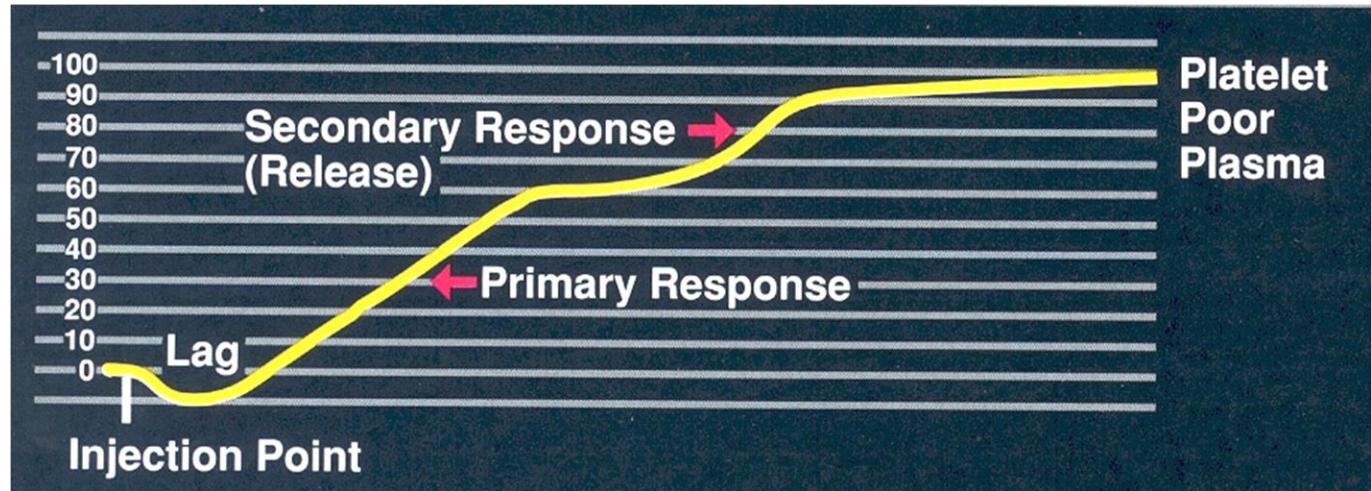
Primary haemostasis

- » Platelet/Thrombocyte adhesion
- » Platelet/Thrombocyte aggregation



From: www.plateletpage.com

Course of aggregation curves



» Primary aggregation

- Reversible aggregation of platelets

» Sekundary aggregation

- Irreversible aggregation of platelets
- Result of enhancement of initial aggregation by release of endogenous ADP and formation of thromboxane A2

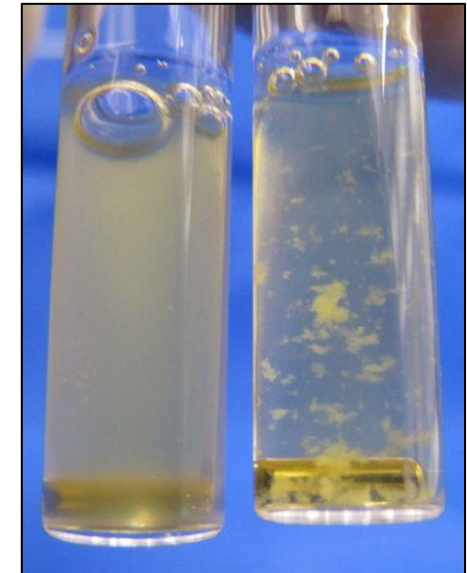
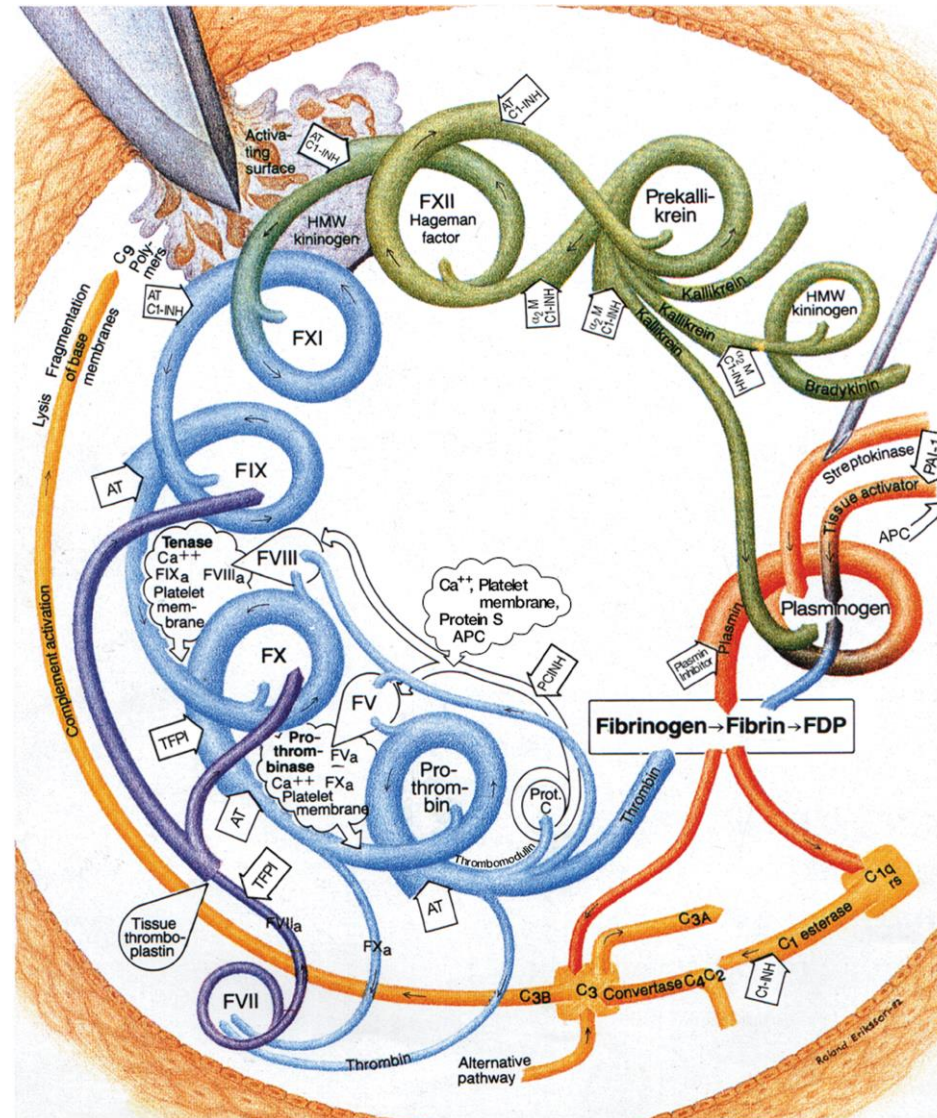


Bild: www.wikipedia.org/wiki/Haemostase

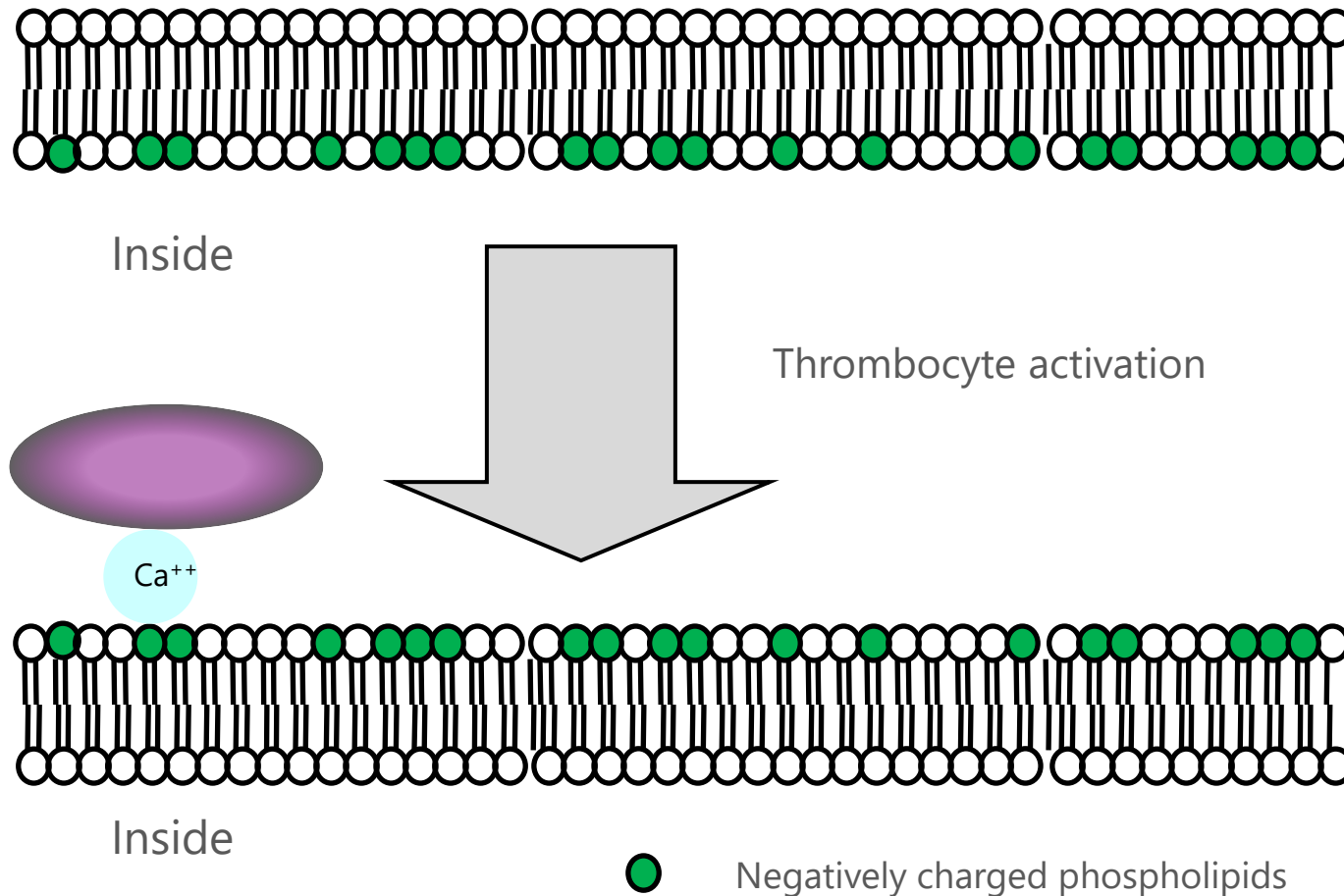
After addition of inducers, e.g. ADP to platelet-rich plasma (PRP), the platelets aggregate and form "white flakes"

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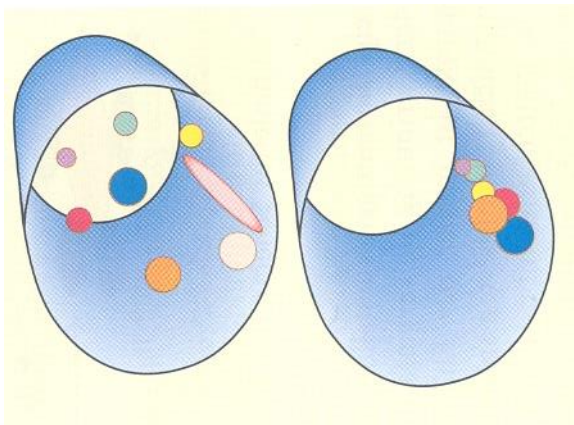
Flip-Flop mechanism of phospholipids



- » Change of phospholipid composition after activation of platelets
- » Negatively charged phospholipids (especially phosphatidylserine) are presented on the outer surface
- » Binding sites for coagulation proteins are formed on the surface of activated platelets and separated microparticles

Function of phospholipids

- » Matrix for negatively charged coagulation factors with Ca^{2+} as linker
- » Localization of coagulation factors
 - Prevention of excessive or systemic coagulation
- » Concentration enrichment

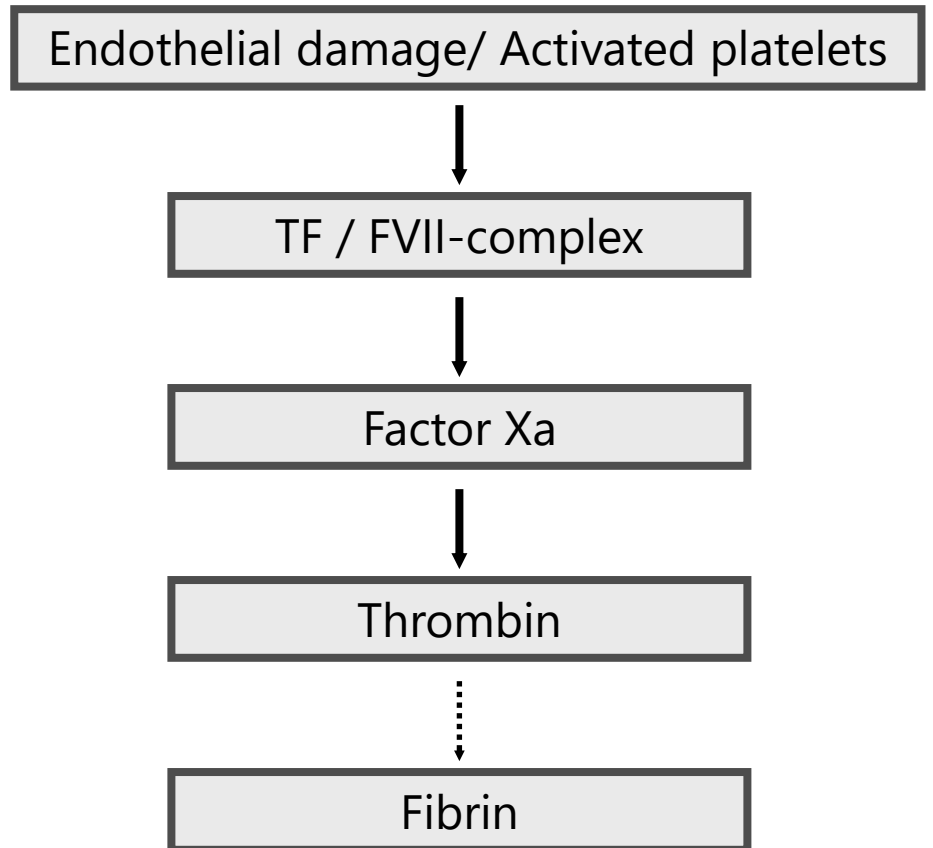


Factors in reaction Mixture	Relative rate of thrombin activation
Factor Xa	1
Factor Xa, Va und Ca^{2+}	300
Factor Xa, Va, Ca^{2+} und PL (prothrombinase complex)	300.000

Exogenous coagulation activation

Initiation

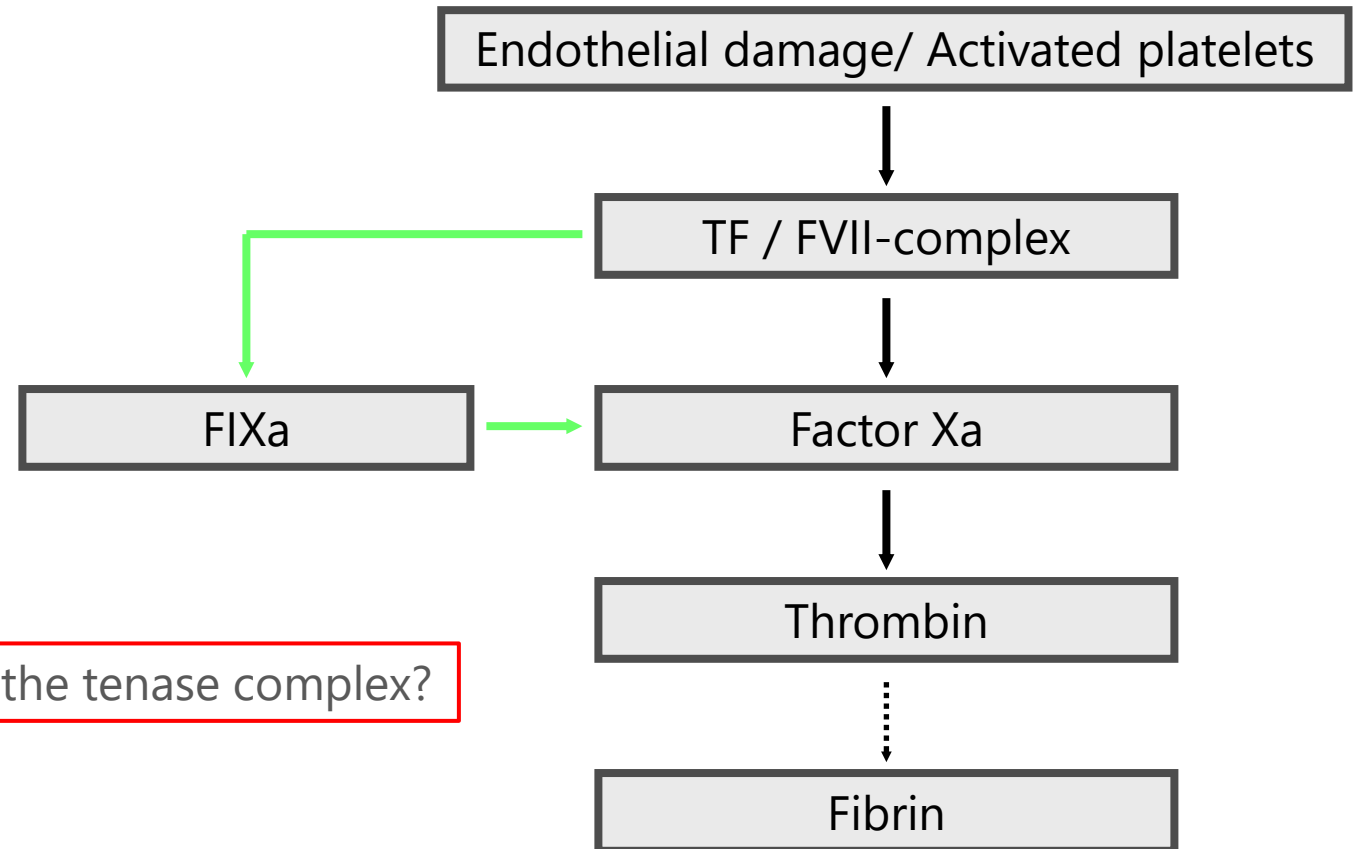
- » Trigger: damage of endothelial matrix
- » Release of tissue factor
- » Formation of TF/FVII complex
- » Activation of FVII in complex to FVIIa
- » Formation of FXa
- » Formation of thrombin

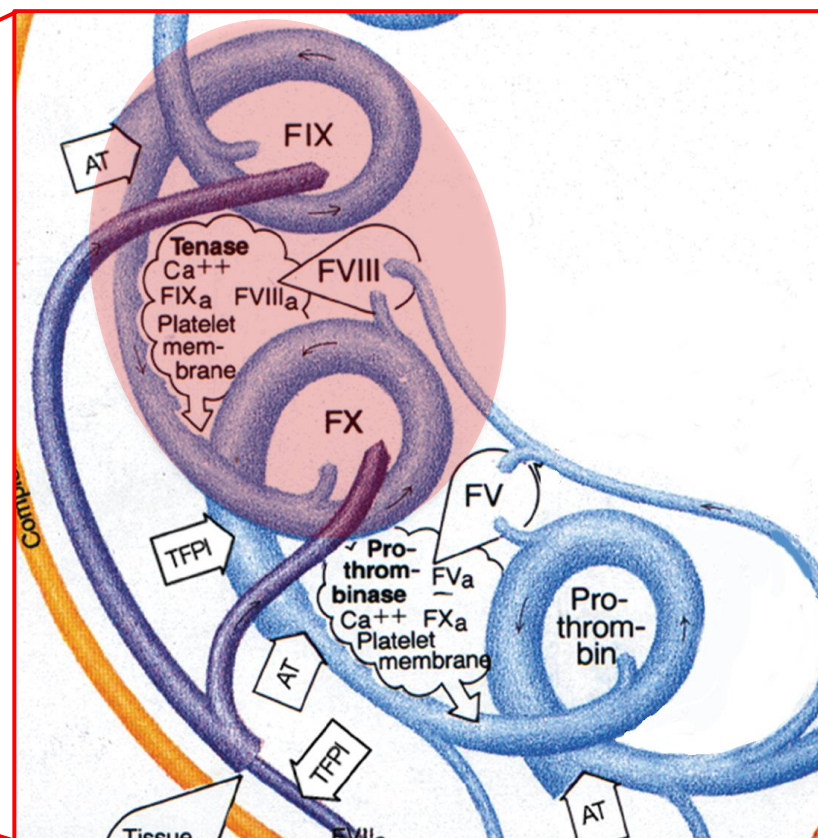


Exogenous Coagulation Activation

Amplification

- » Activation of FIX by TF/FVII complex (Josso loop)
- » Formation of tenase complex
- » Additional generation of thrombin





» Phospholipids

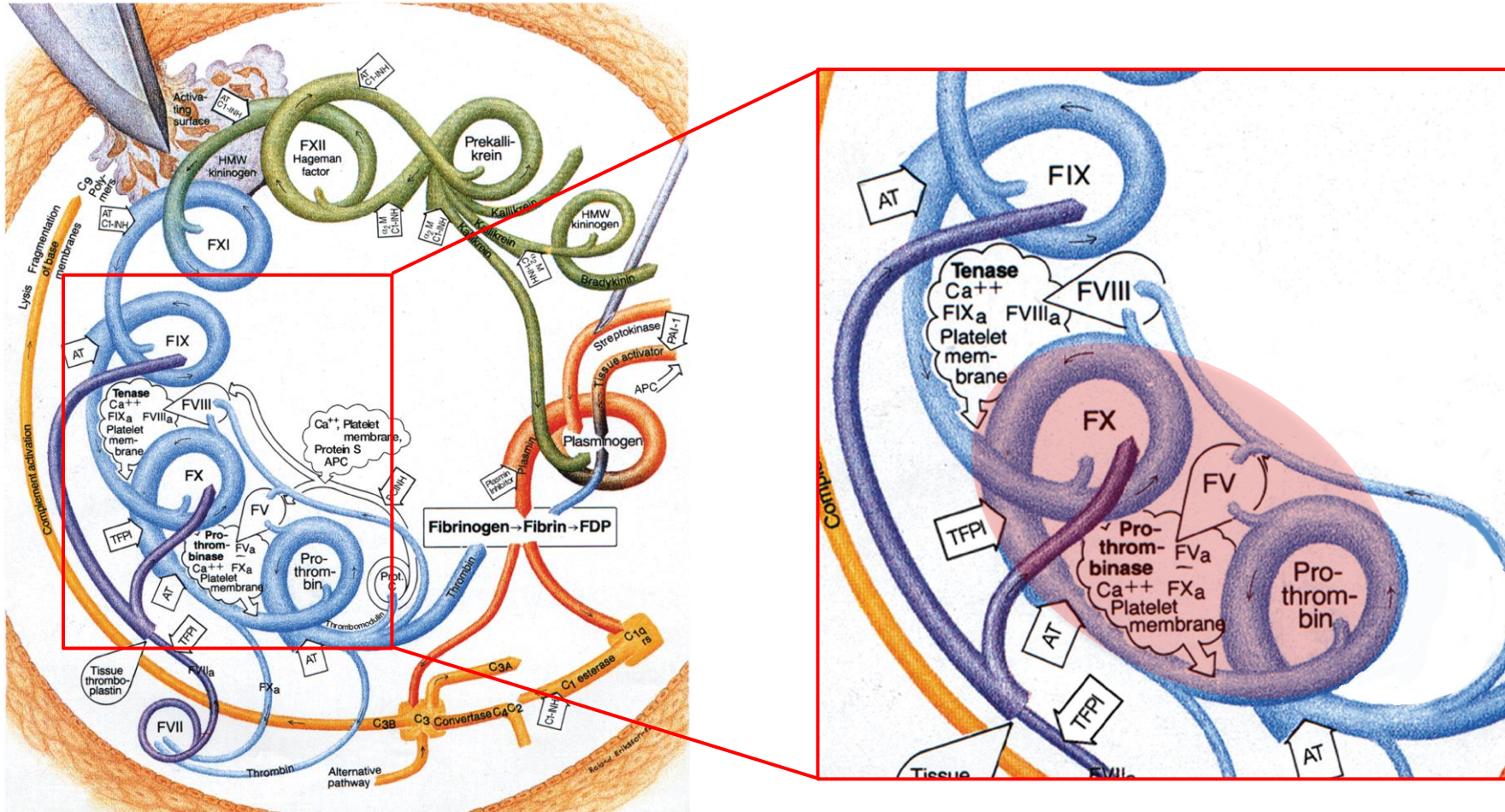
» F IXa Enzyme

» F VIIIa Cofactor

FX Substrate

» Ca^{2+}

Prothrombinase complex



Co-Players:

- » Phospholipids
- » F Xa Enzyme
- » F Va Cofactor
- » F II Substrate
- » Ca²⁺

Exogenous coagulation activation

Propagation

- » Formed thrombin activates FXI to FXIa
- » Generation of further tenase
- » Enhanced formation of thrombin („thrombin burst“)
- » Additional provision of clot-active surfaces by thrombin as platelet activator.
- » Formation of large amounts of fibrin

