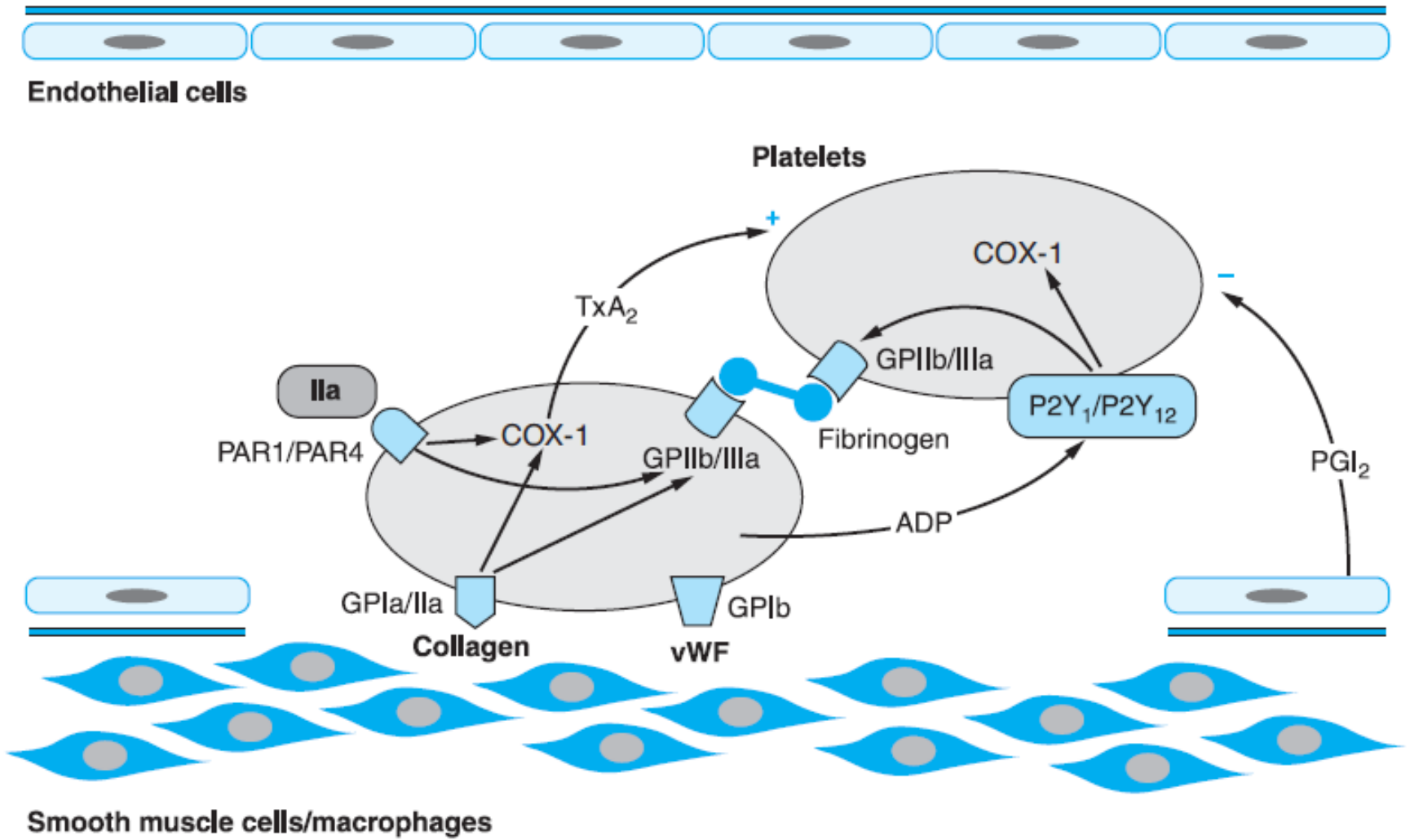




# Antikoagulan, Antitrombotik, Trombolitik, Hemostatik

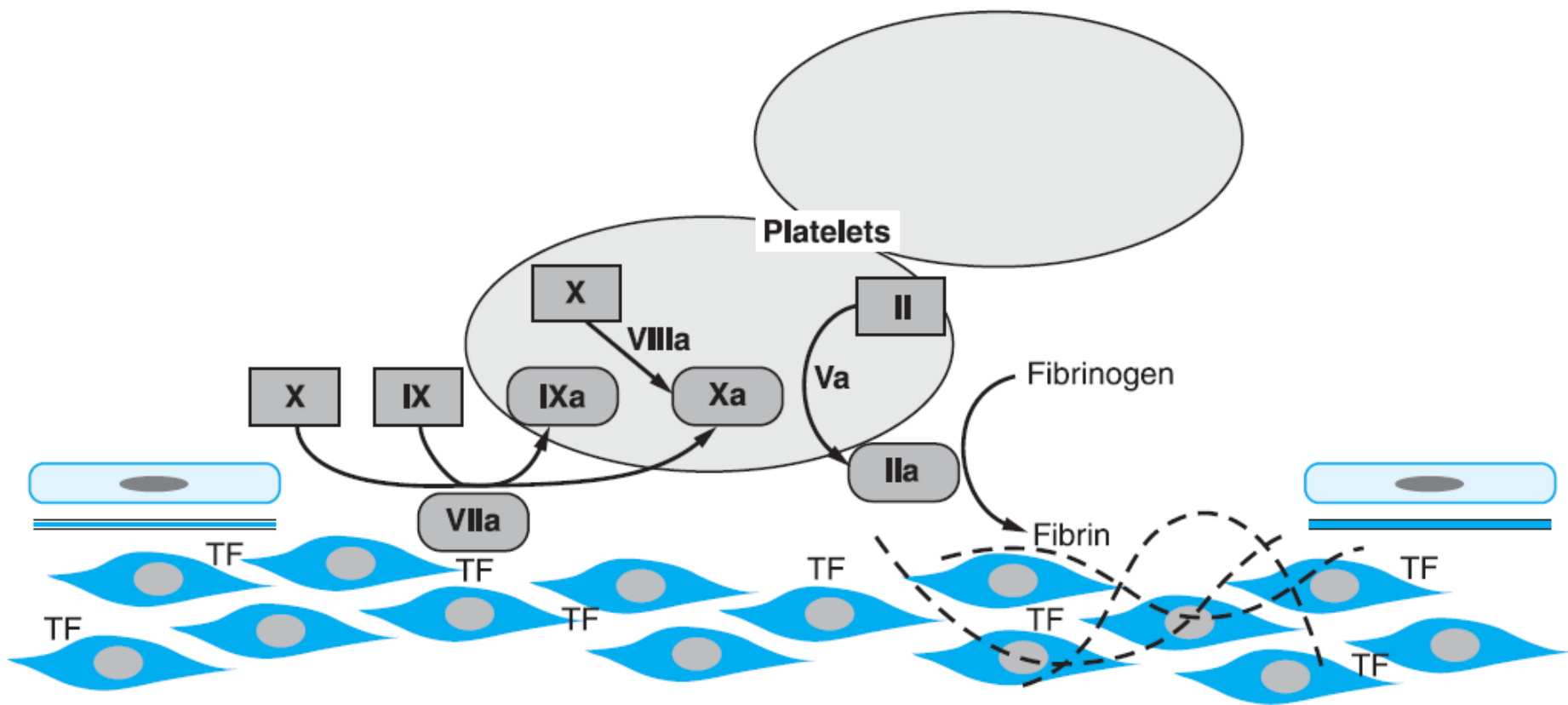
## Beberapa Istilah

- Hemostasis
  - Koagulasi
  - Trombosis
- Antikoagulan
- Antitrombotik
  - Trombolitik
  - Hemostatik

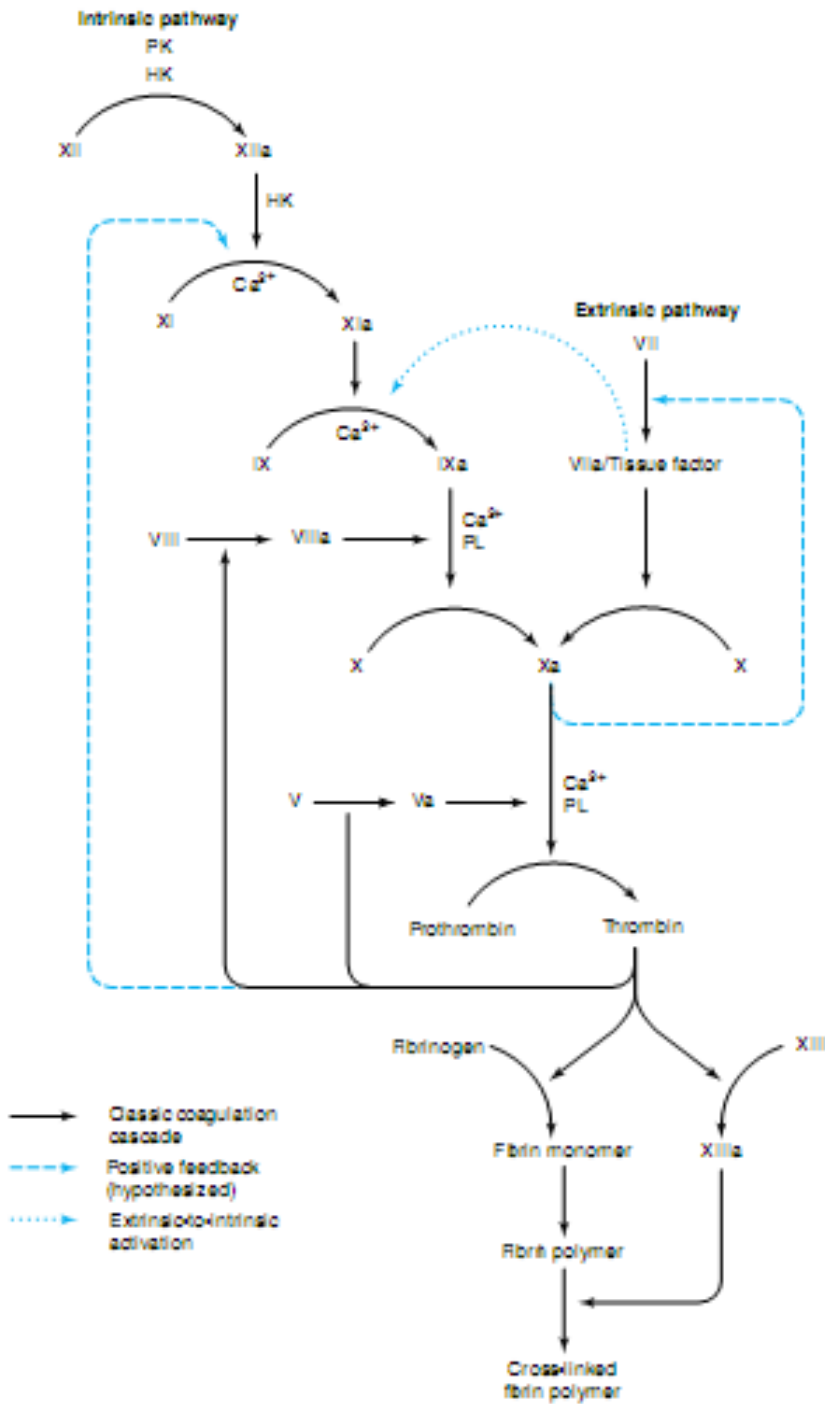


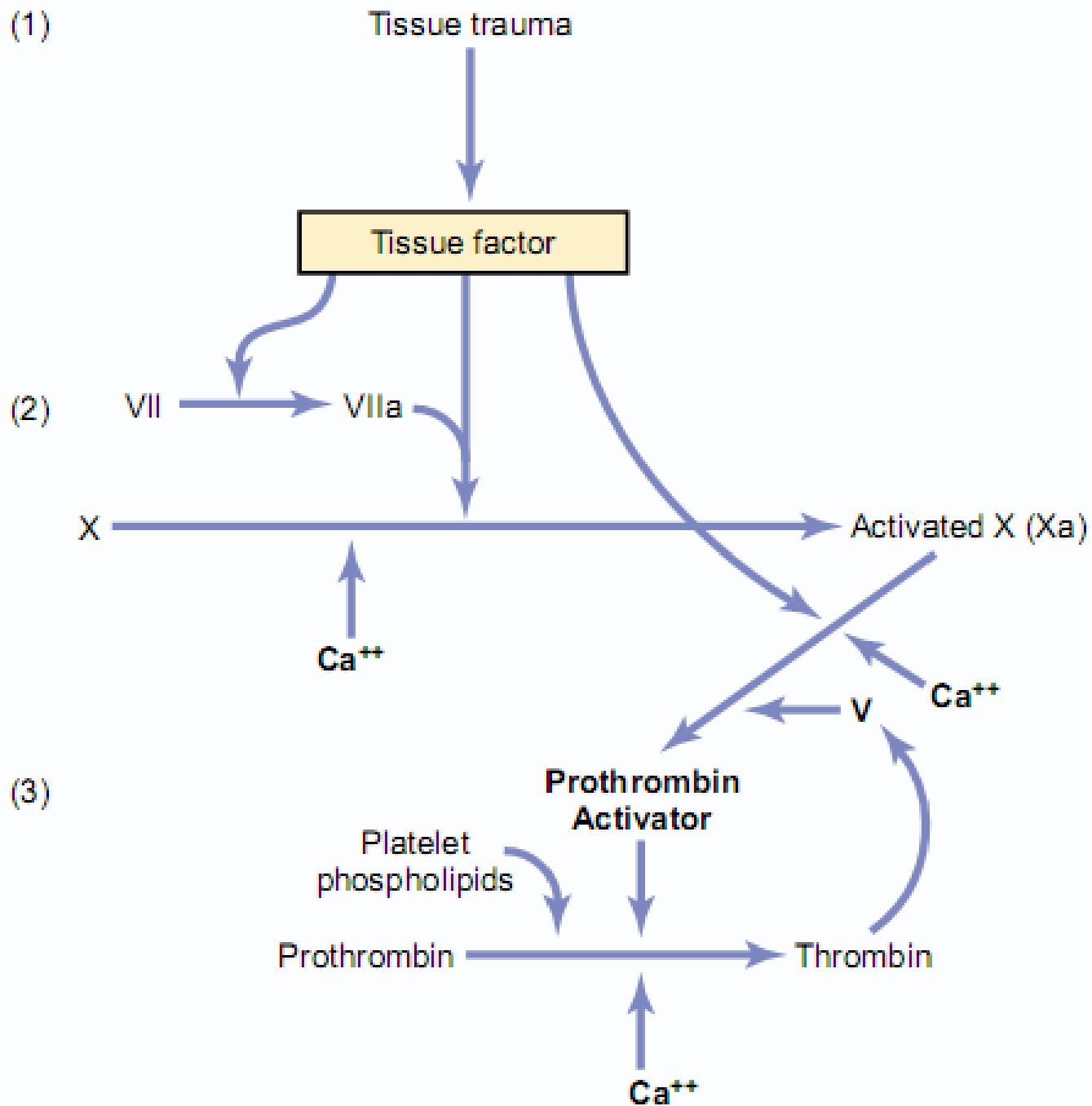


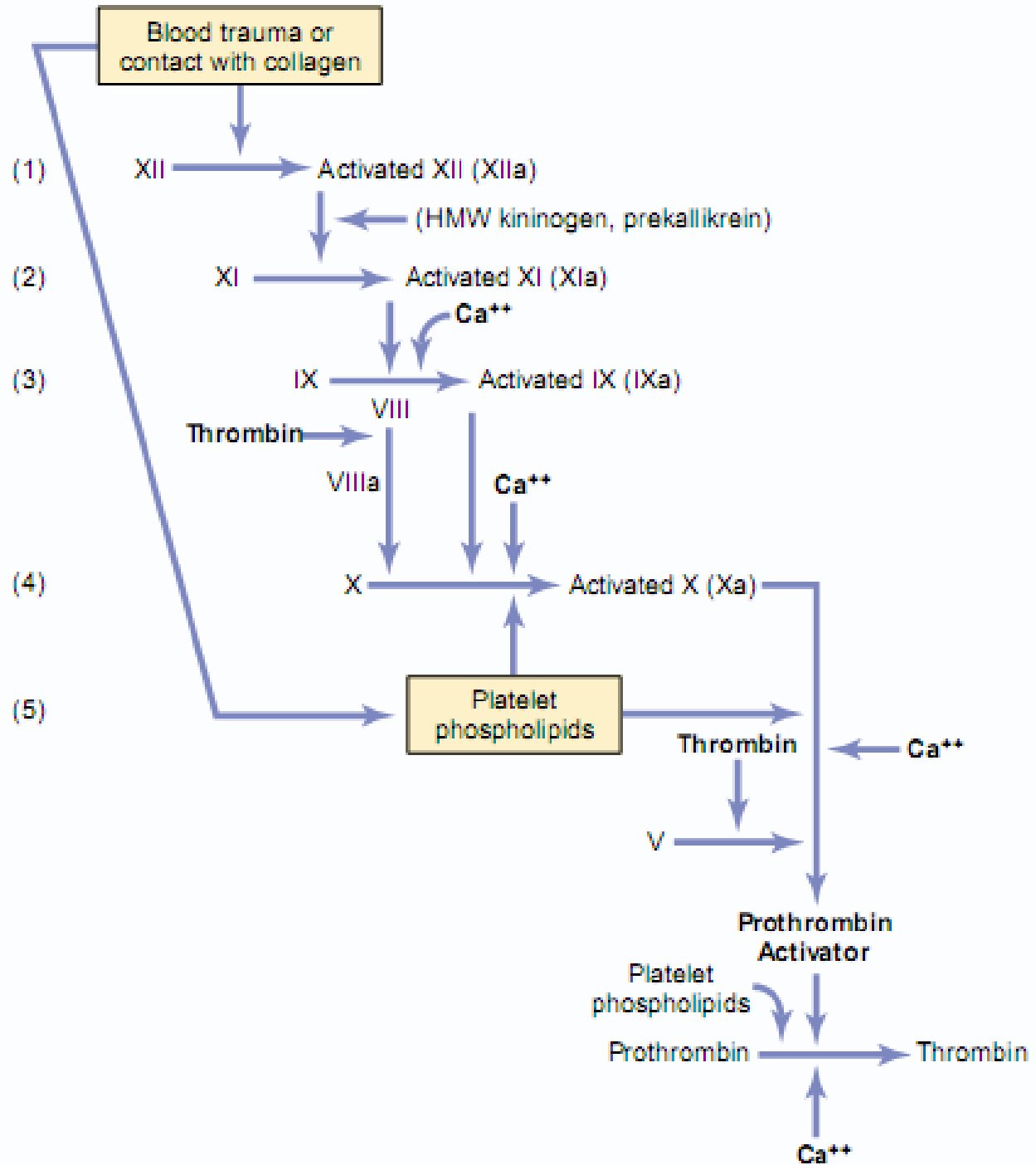
**Endothelial cells**

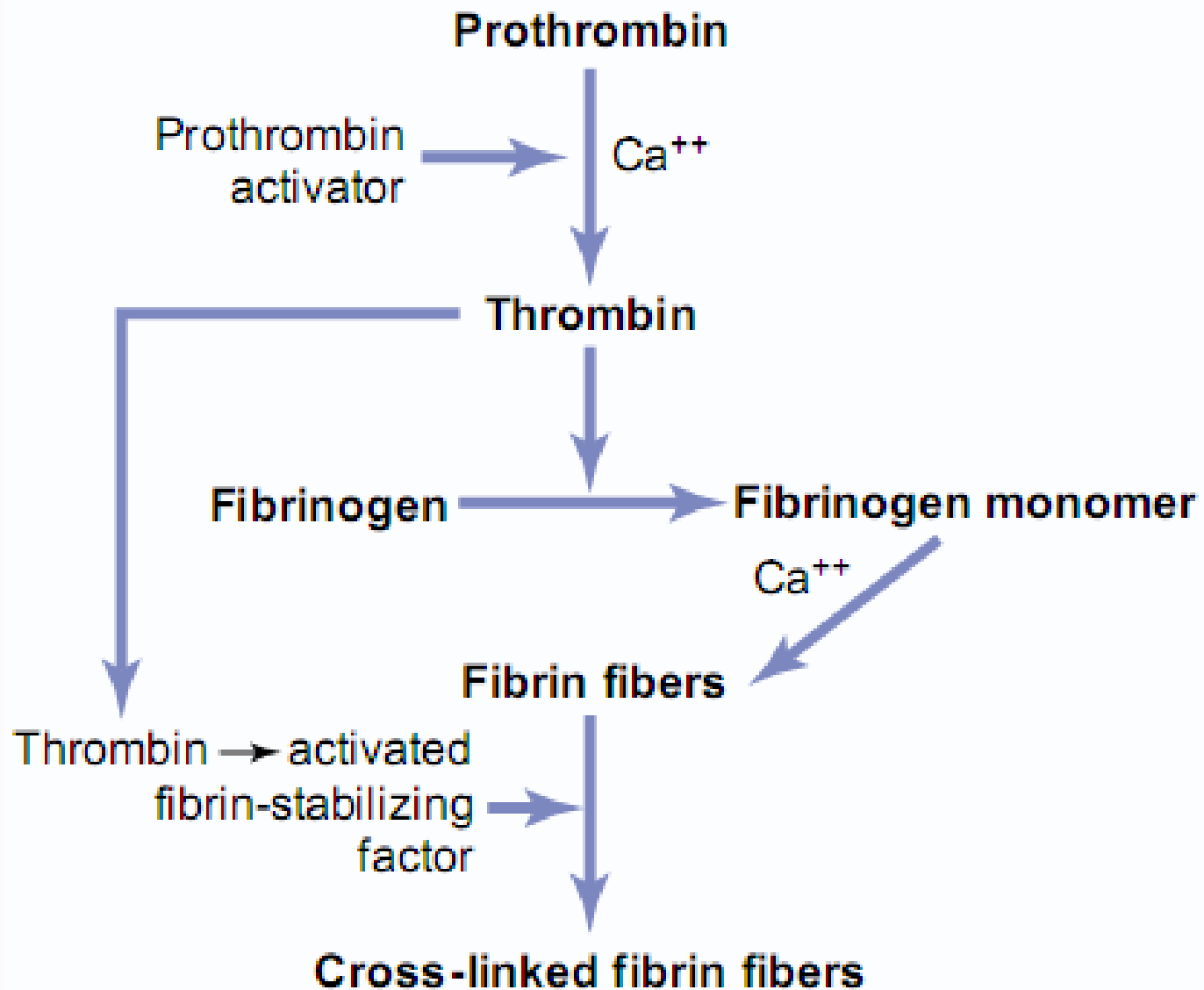


**Smooth muscle cells/macrophages**











**Endothelial cells**

PAI-1  
PAI-2

t-PA

Plasminogen

Plasmin

$\alpha_2$ -AP

Fibrin

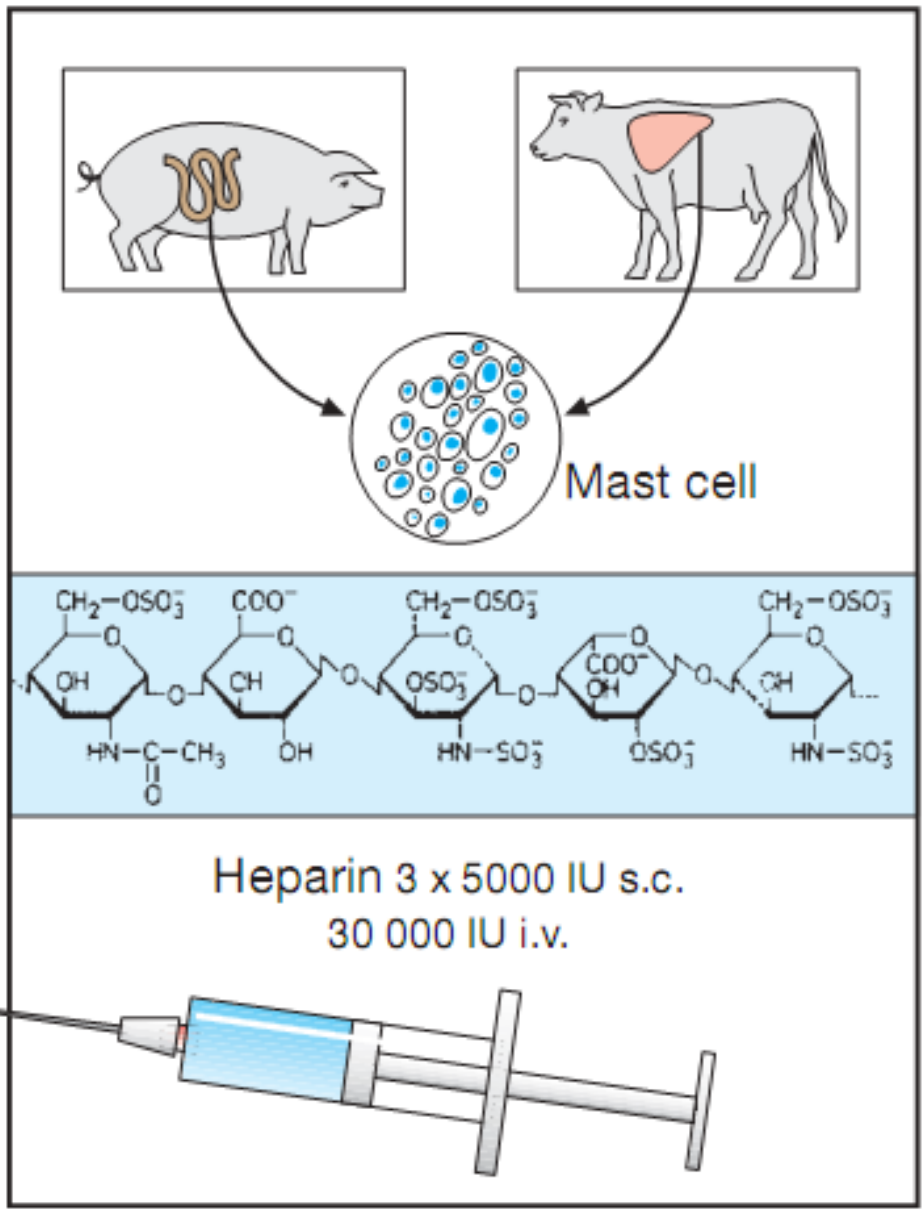
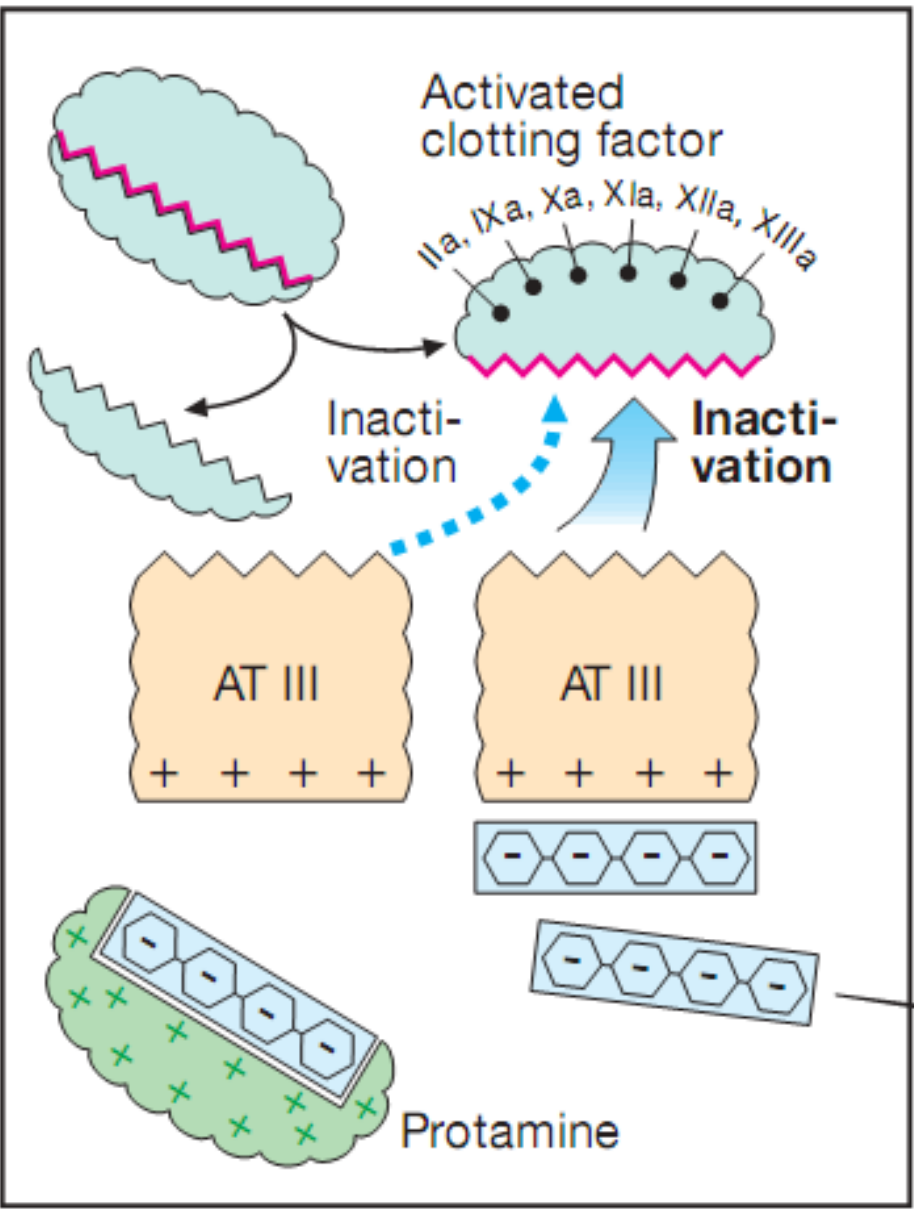


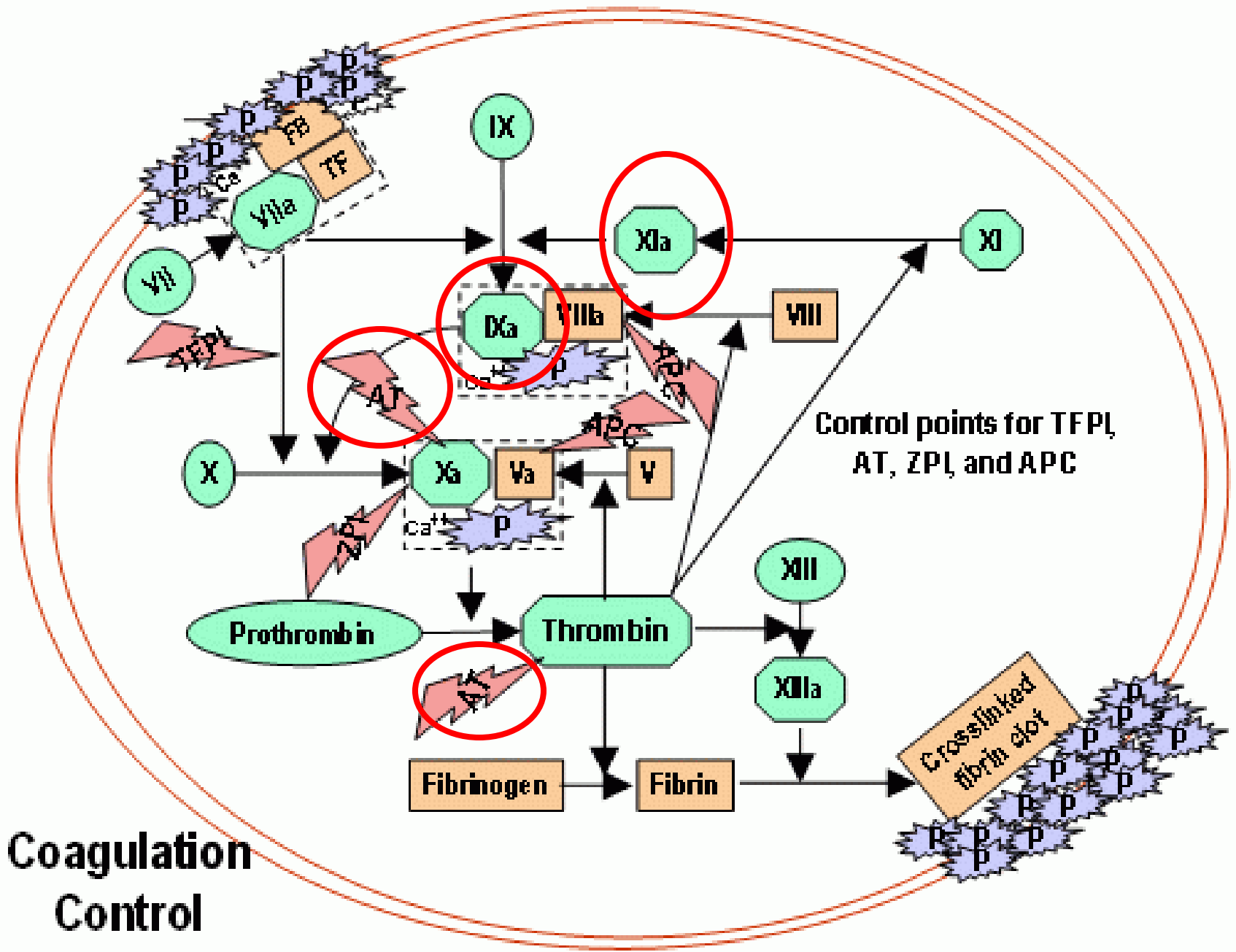
**Smooth muscle cells/macrophages**

# Antikoagulan

- Heparin
- Warfarin





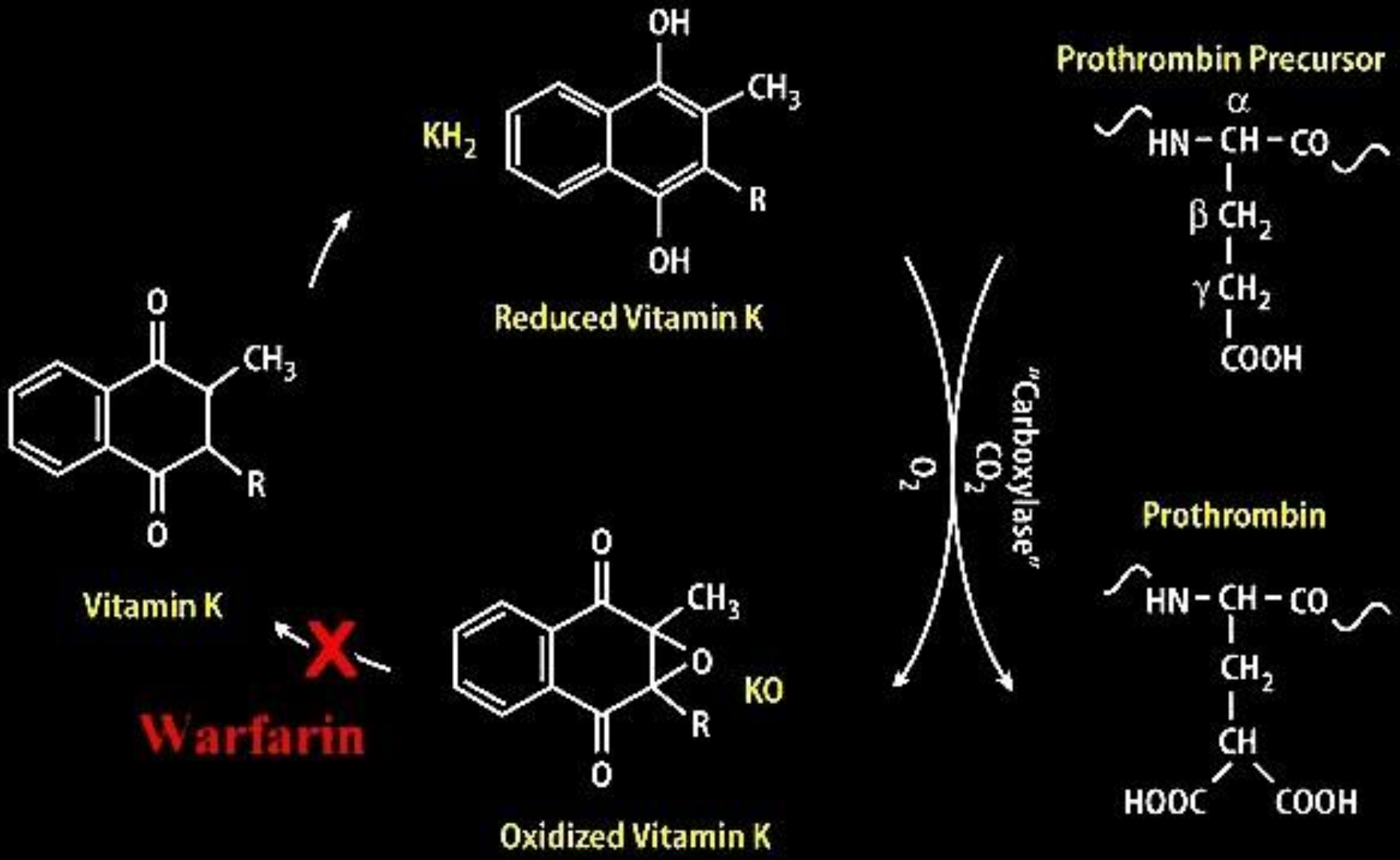




## Antikoagulan

- LMWH
- Bemiparin, dalteparin, enoxaparin, reviparin
- *Monitoring* pemeriksaan darah
- Indikasi: trombosis vena, emboli paru, PJR, penyakit jantung iskemik

# Mechanism of Action





## Antitrombotik

Aspirin

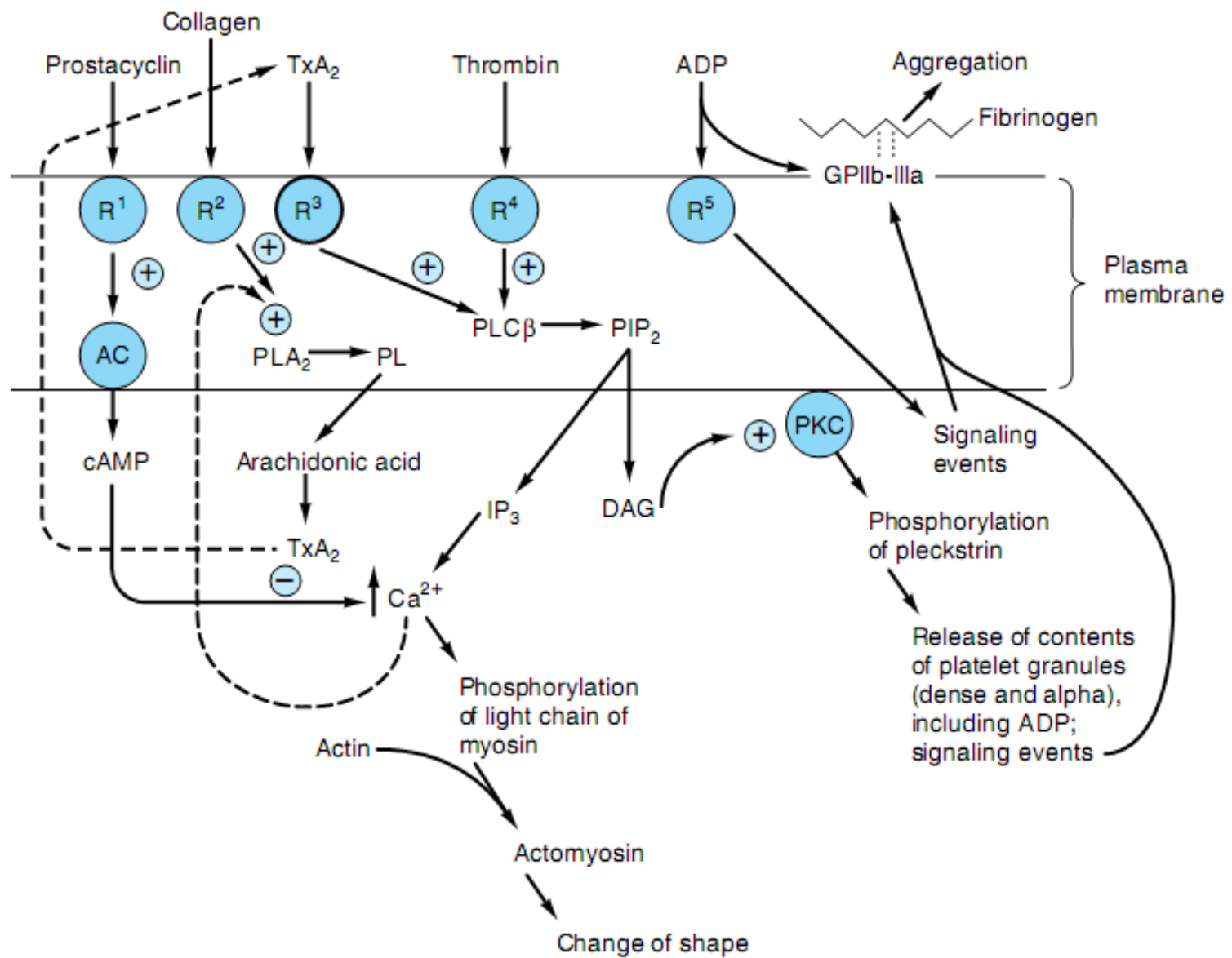
Dipiridamol

Tiklopidin

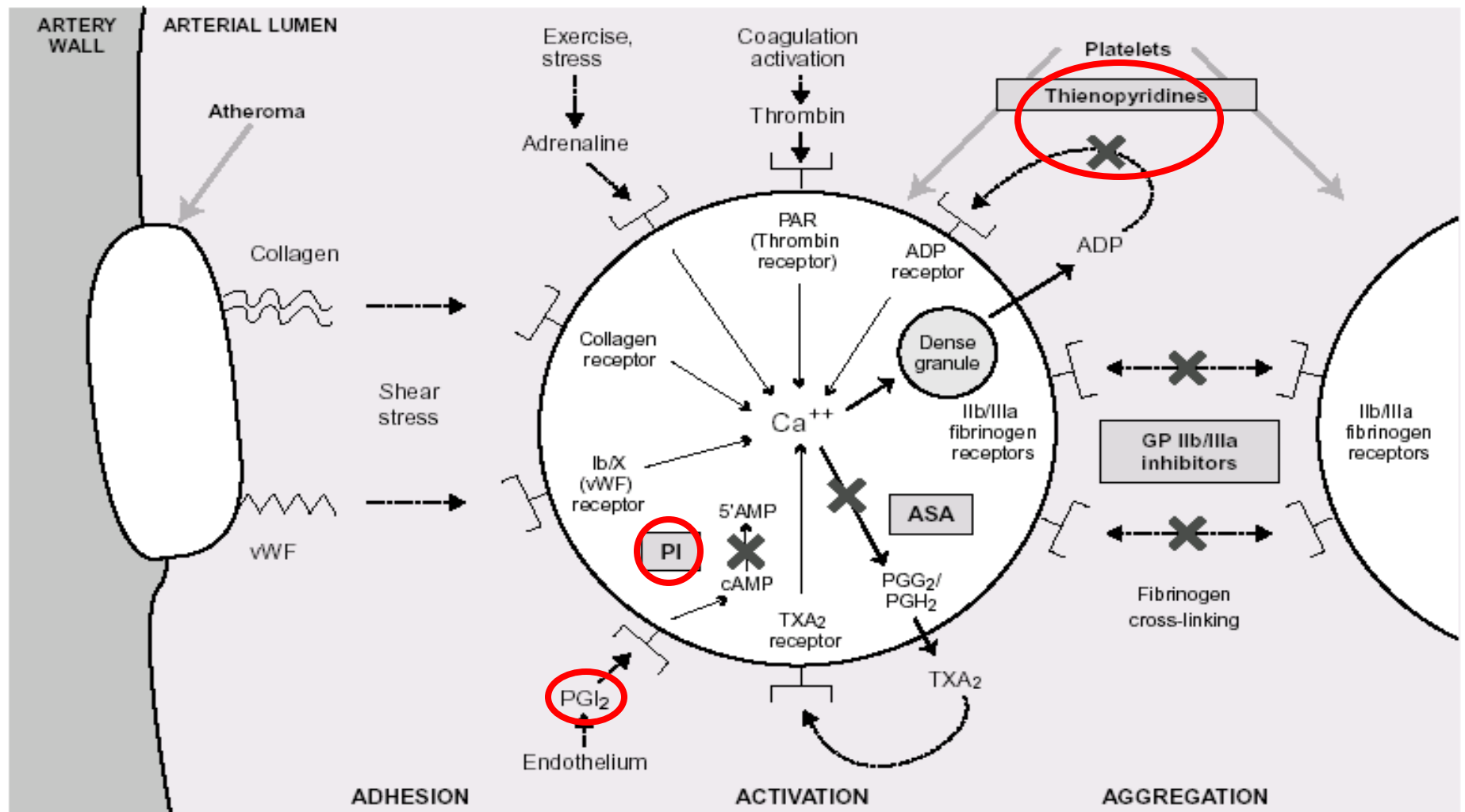
Klopidogrel

Epoprostenol



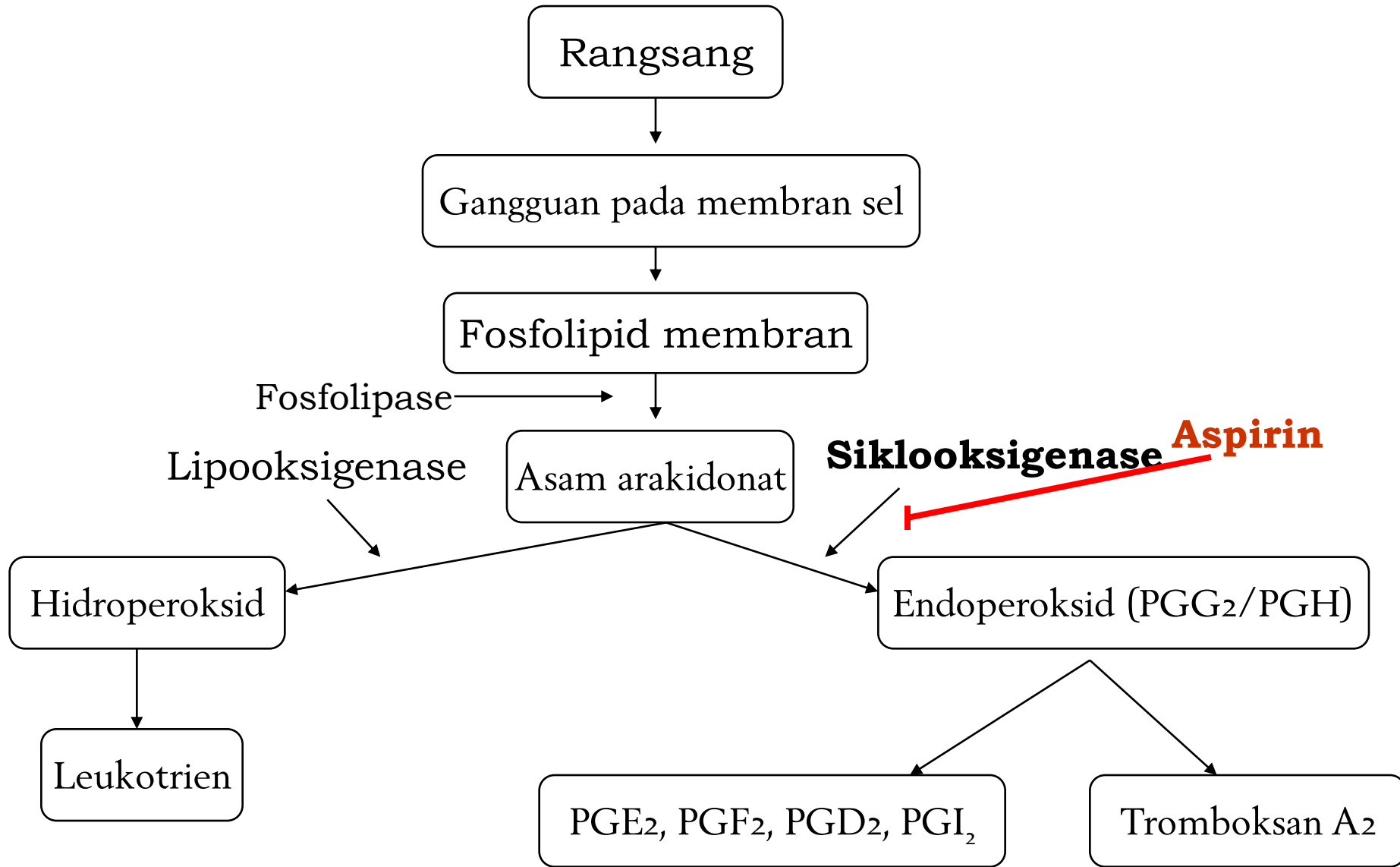


# 1: Pivotal role of platelets in thrombosis and the sites of action of currently approved antiplatelet drugs



Adhesion of platelets to proteins (collagen, von Willebrand factor), particularly under conditions of high shear stress, and the action of platelet agonists (adrenaline, thrombin, ADP, thromboxane A<sub>2</sub>) leads to the mobilisation of calcium ion (Ca<sup>++</sup>), which functions as a mediator of platelet activation. Aspirin inhibits thromboxane A<sub>2</sub> synthesis by irreversibly acetylating cyclooxygenase-1; the thienopyridines (clopidogrel, ticlopidine) irreversibly block the ADP receptor; and glycoprotein IIb/IIIa inhibitors block the final common pathway of platelet activation leading to fibrinogen cross-linking of platelets and platelet aggregation. Phosphodiesterase inhibitors (dipyridamole, cilostazol) elevate intracellular cyclic AMP levels and thereby inhibit platelet function.

ADP = adenosine diphosphate; ASA = aspirin; cAMP = cyclic adenosine monophosphate; GP = glycoprotein; PGG<sub>2</sub> = prostaglandin G<sub>2</sub>; PAR = Protease activated receptor; PGH<sub>2</sub> = prostaglandin H<sub>2</sub>; PGI<sub>2</sub> = prostacyclin; PI = phosphodiesterase inhibitor; TXA<sub>2</sub> = thromboxane A<sub>2</sub>; vWF = von Willebrand factor.



A photograph of a doctor in a white lab coat attending to a patient lying in a hospital bed. The doctor is leaning over the patient, and the patient is looking up at the doctor. The background is slightly blurred, showing a hospital room setting.

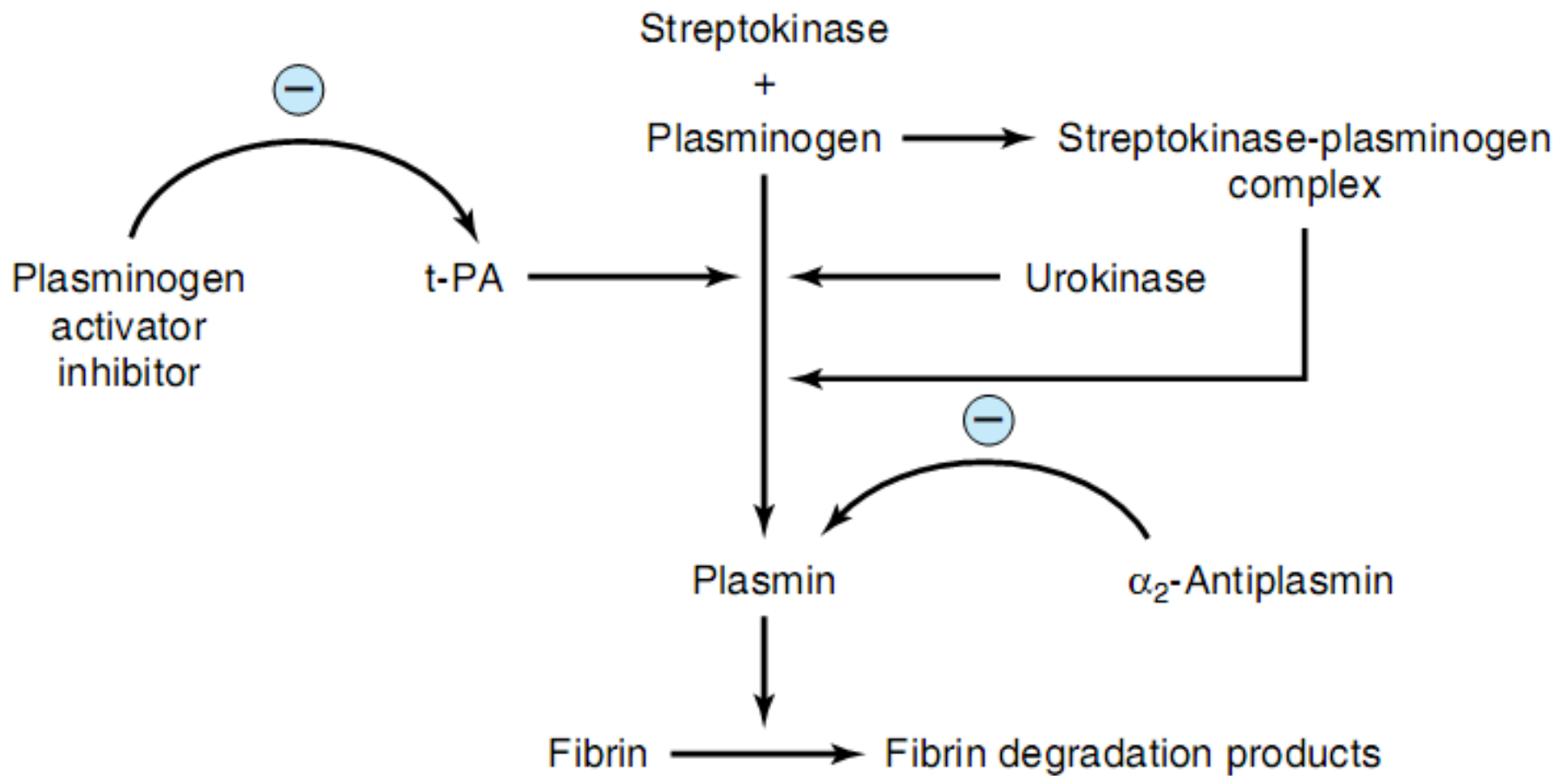
## Antitrombotik

- Indikasi: cegah trombosis pada TIA/stroke, infark miokard, bedah kardiovaskuler, Raynaud's phenomen

# Trombolitik

- Streptokinase
- Urokinase
- *Plasminogen activator*  
(u-PA, t-PA)





# Trombolitik

- Indikasi: infark, emboli paru, trombosis vena/arteri
- Mahal





## Hemostatik

- Transfusi
- Faktor VIII
- Kompleks faktor II, V, IX, X
- Fibrinogen
- Vitamin K
- Asam aminokaproat
- Asam traneksamat
- Karbazokrom