



SNS COLLEGE OF ALLIED HEALTH SCIENCES
SNS Kalvi Nagar, Coimbatore - 35
Affiliated to Dr MGR Medical University, Chennai



DEPARTMENT OF CARDIO PULMONARY PERFUSION CARE
TECHNOLOGY

COURSE NAME : Pharmacology Pathology and Clinical Microbiology

II nd YEAR

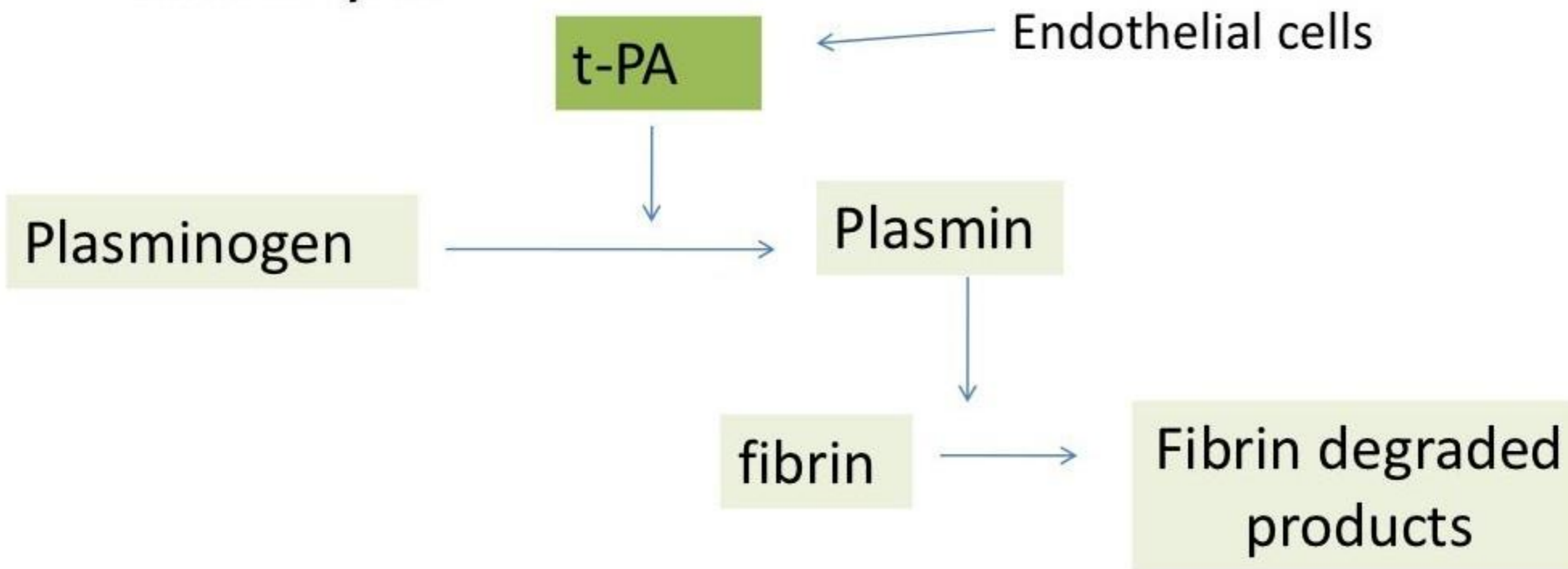
TOPIC : FIBRYNOLYTICS AND ANTI PLATELETS

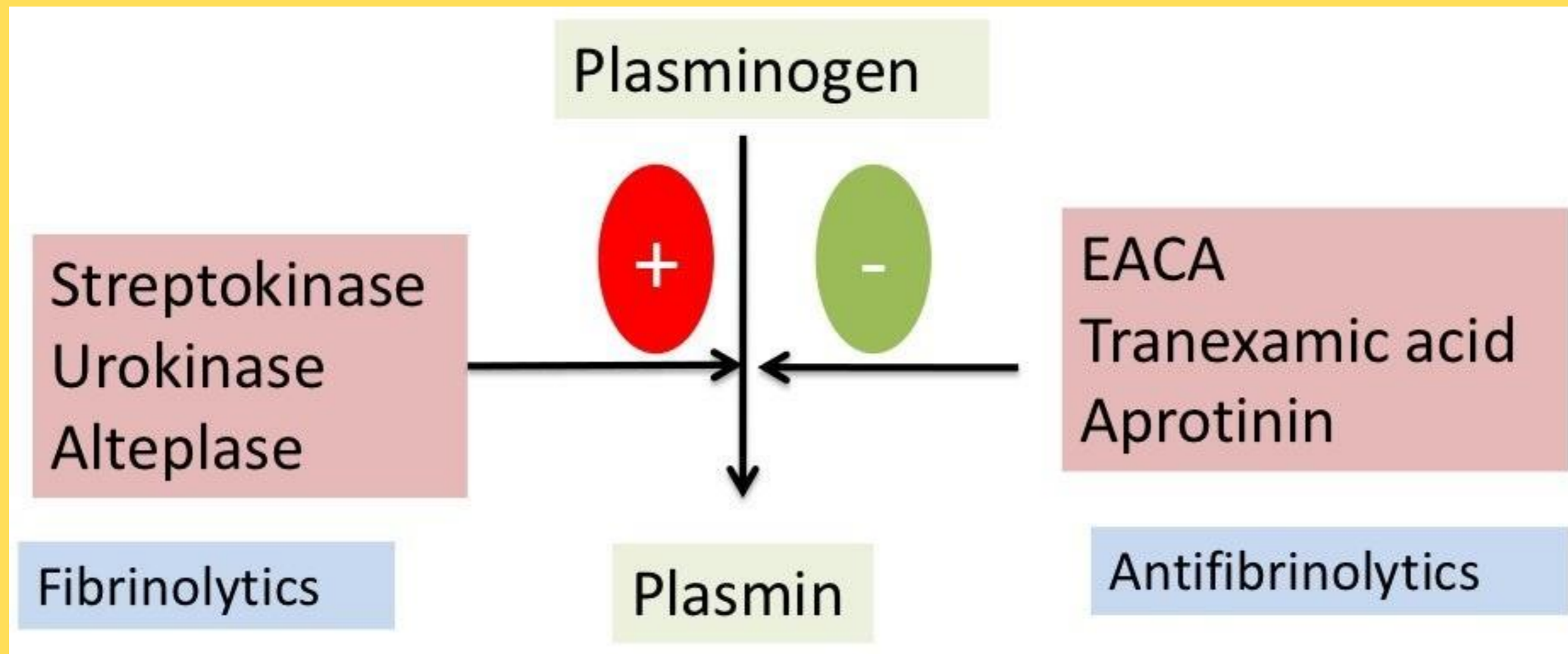


Fibrinolytics & Antiplatelets

Fibrinolytic system

- The process of dissolution of clot is called fibrinolysis





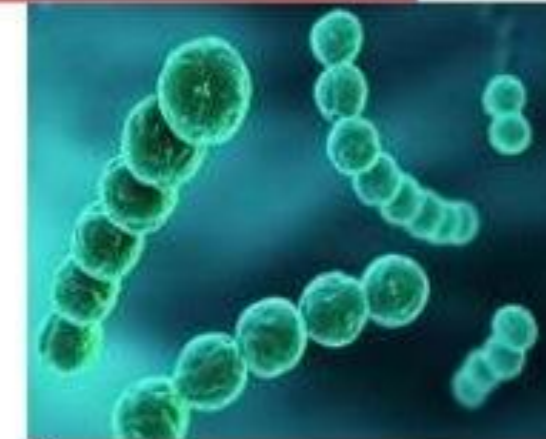


FIBRINOLYTICS

- Used to lyse the thrombi / clot to recanalize the occluded blood vessel (mainly coronary artery)
- Work by **activating the Fibrinolytic system**
 - **STREPTOKINASE**
 - **UROKINASE**
 - **RETEPLASE** (analogue of alteplase)
 - **ALTEPLASE (t- PA)**
 - **TENECTEPLASE**

Streptokinase

- Obtained from β -hemolytic streptococci
- Binds with circulating plasminogen to form complex that activates plasminogen to plasmin
- $t_{1/2} = 30 - 80$ min
- Antigenic ,Pyrogenic
- Destroyed by circulating antistreptococcal Antibodies
- Hypotension & arrhythmia can occur





Streptokinase



Uses

- Acute myocardial infarction
 - 7.5 to 15 lac IU; I.V over 1 hr period
- Deep vein thrombosis , Pulmonary embolism

Adverse effects

- Bleeding, hypotension, allergic reactions, fever, arrhythmias

Contraindications

- Recent trauma, surgery, abortion, stroke, severe hypertension, peptic ulcer, bleeding disorders



Urokinase

- Enzyme isolated from human urine, now prepared from cultured human kidney cells
- **Direct plasminogen activator**
- $t_{1/2}$ of 10 to 15 min
- **Non antigenic, Non allergenic**
- Fever can occur but hypotension rare
- Indicated in patients in whom streptokinase has been for an earlier episode



Alteplase

- recombinant tissue Plasminogen Activator(rt-PA)
- Selectively activates plasminogen bound to fibrin
- Non antigenic ,not destroyed by antibodies
- Rapid acting, more potent
- Superior in dissolving old clots
- Short half life 4-8 min
- Nausea, mild hypotension, fever may occur
- Expensive



Newer recombinant tissue plasminogen activators



- **Retepase :**
 - Modified rt-PA
 - Longer half life 15 -20 min, but less specific for fibrin bound plasminogen
- **Tenecteplase:**
 - **Genetically engineered** mutant form of alteplase
 - Higher fibrin selectivity and longer half life – 2 hrs
 - Single bolus dose 0.5 mg/kg sufficient
 - Very expensive



Uses of fibrinolytics

- Acute myocardial infarction
- Deep vein thrombosis
- Pulmonary embolism
- Peripheral arterial occlusion
- Ischemic Stroke

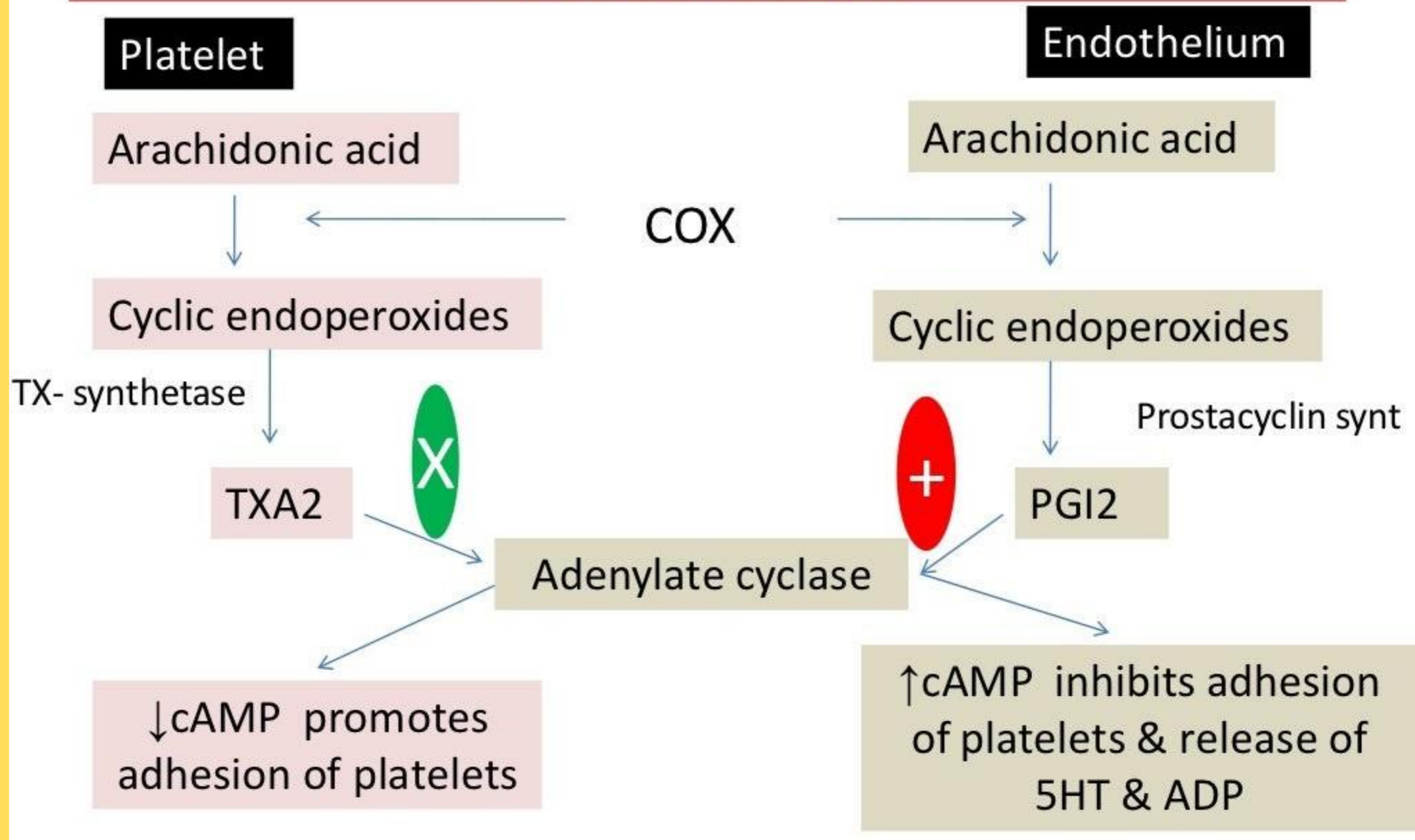


Antiplatelet drugs



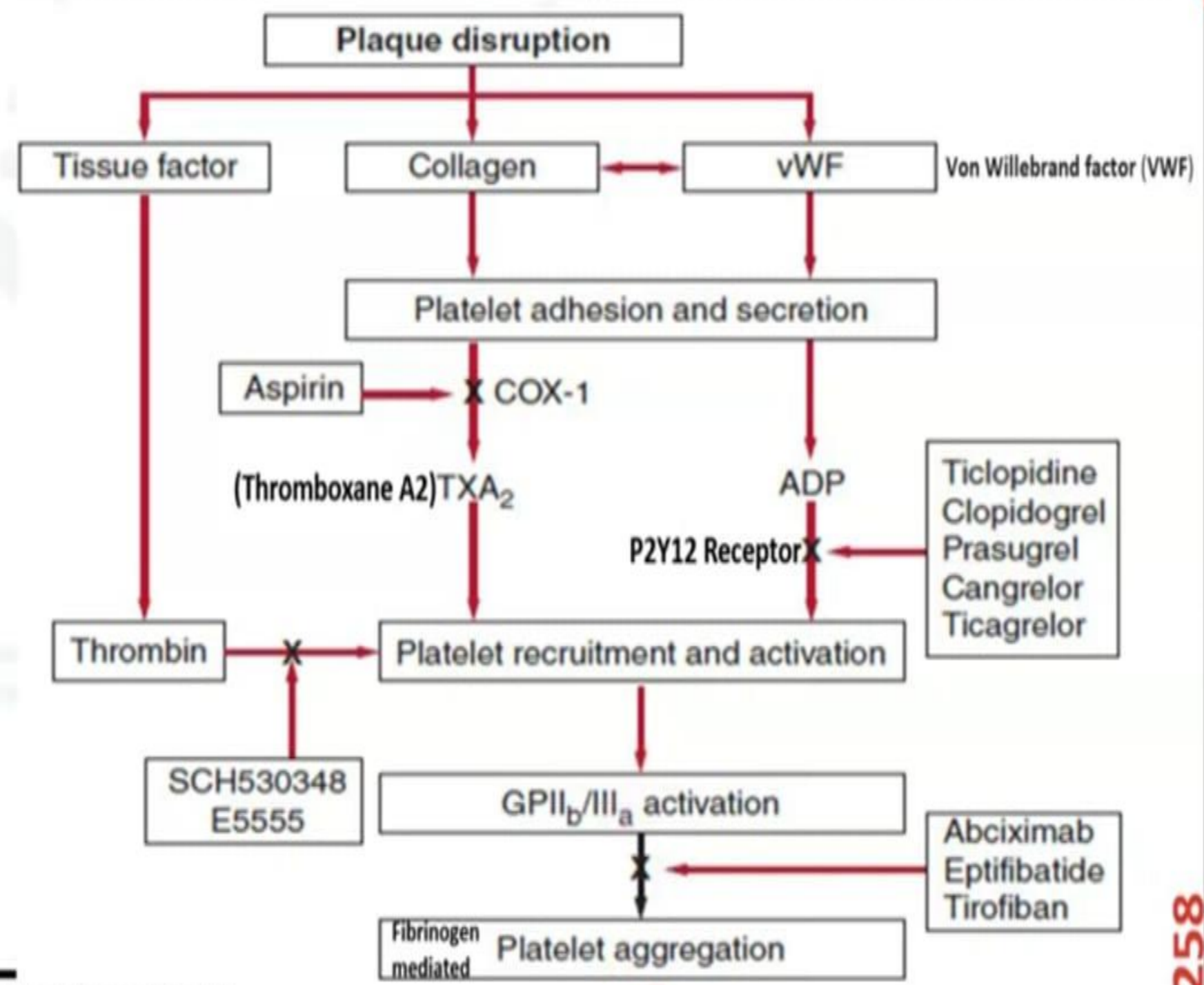


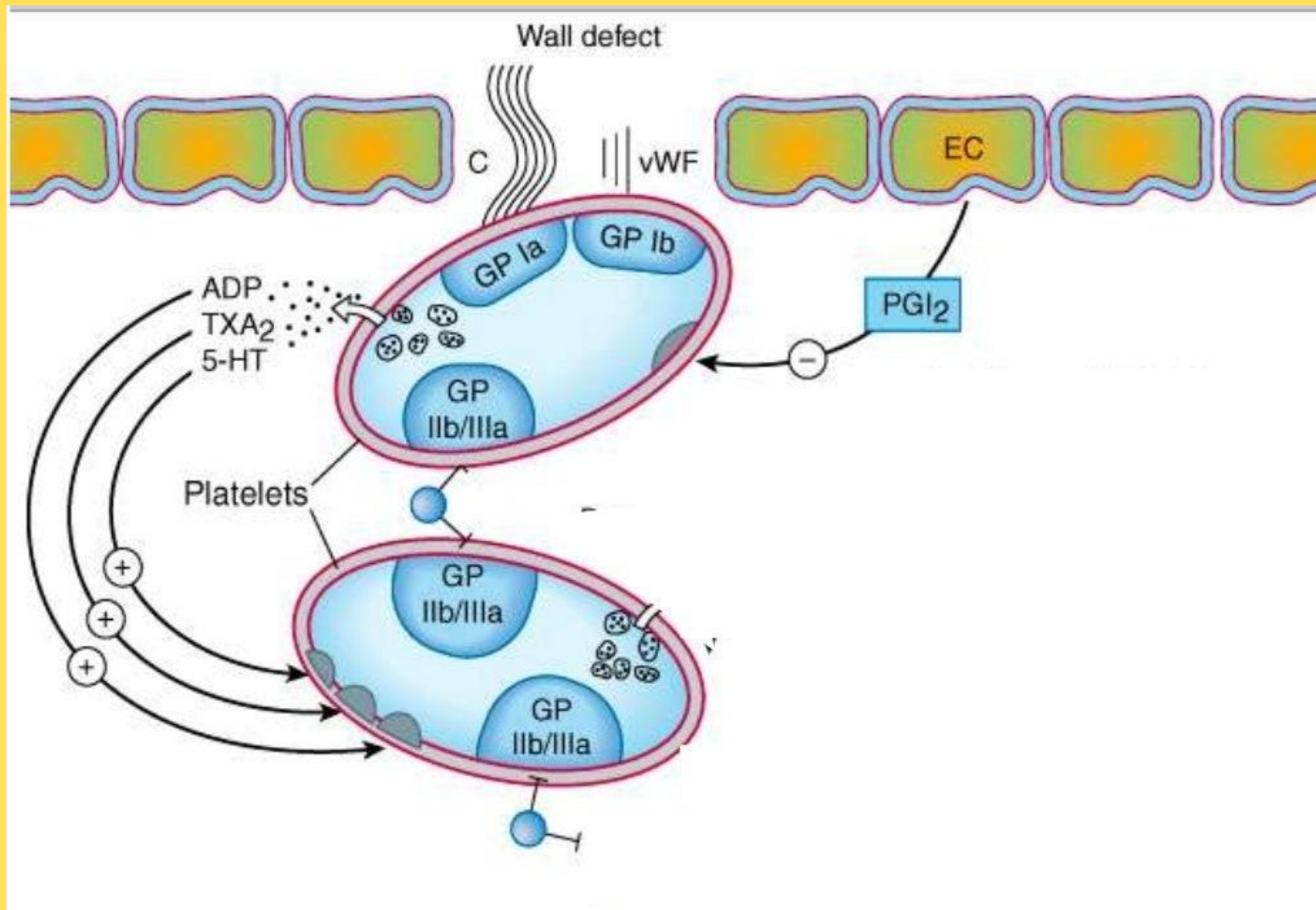
Mechanism of platelet aggregation and inhibition





PLATELET AGGREGATION AND INHIBITION: MOA



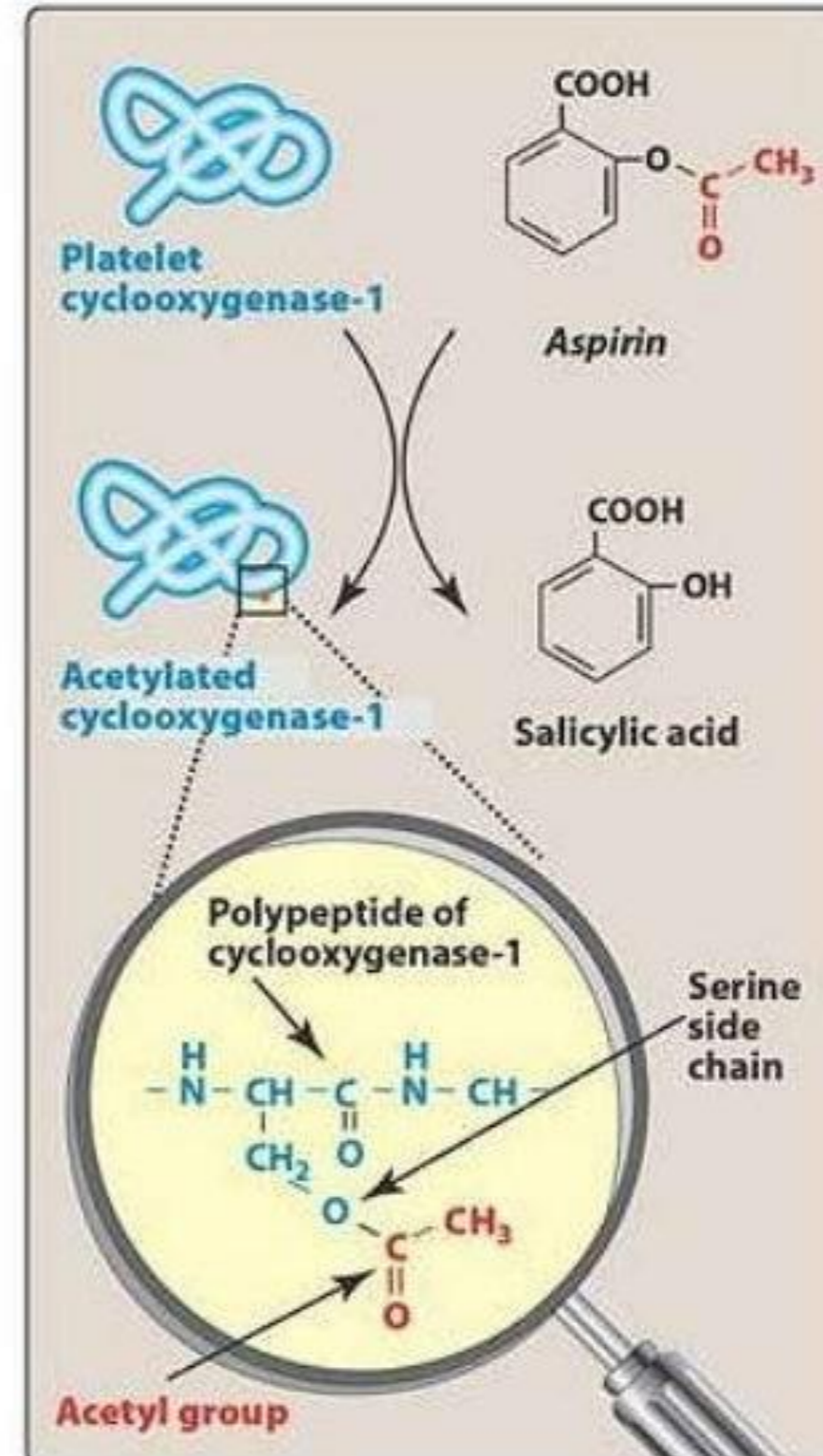
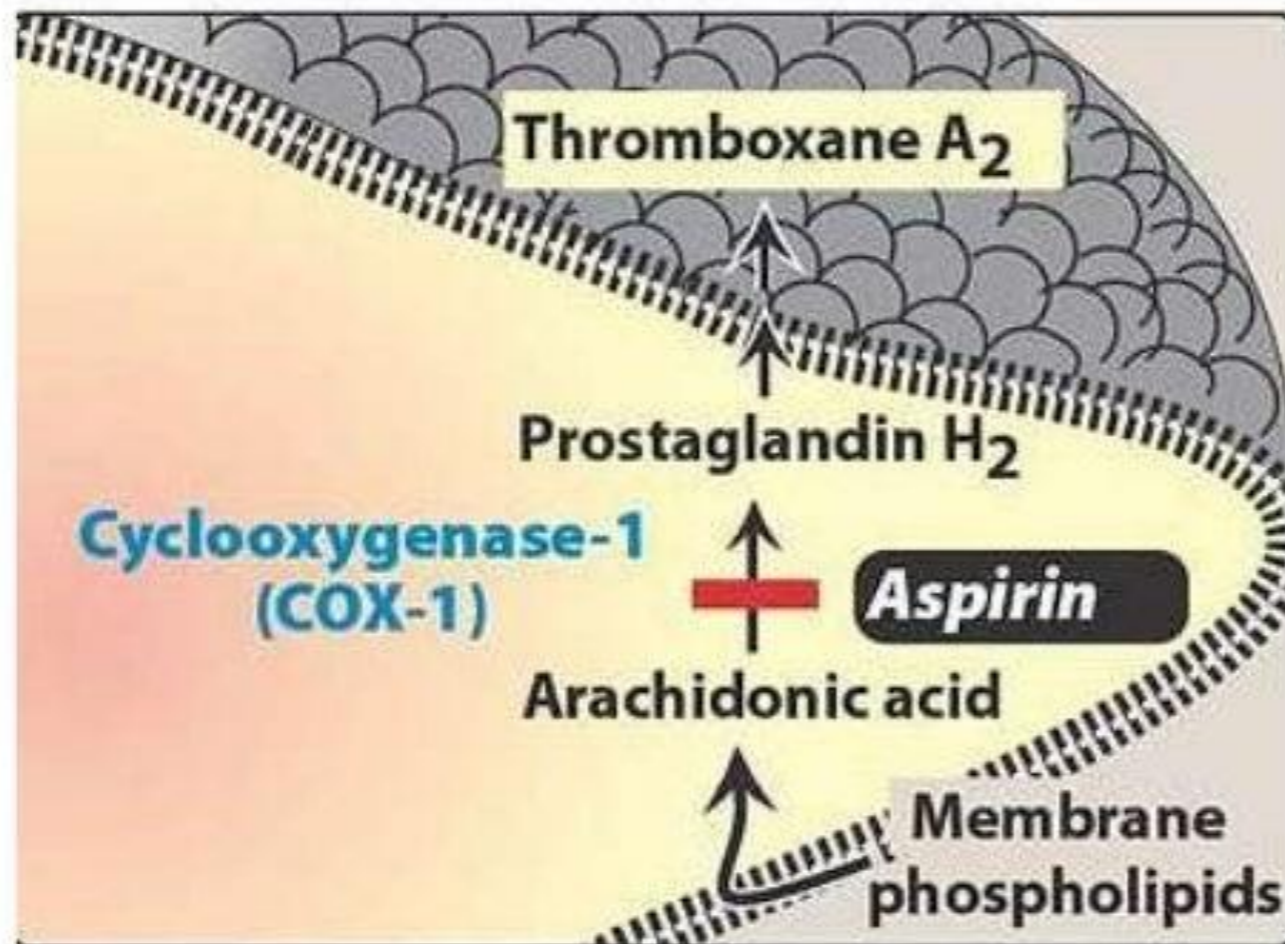




Antiplatelet drugs (Classification)

- TXA₂ synthesis inhibitor:
 - Low dose **aspirin**
- Phosphodiesterase inhibitor:
 - **Dipyridamole**, cilostazole
- Thienopyridine derivatives (ADP antagonists):
 - **Ticlopidine, clopidogrel**
- Gp-IIb/IIIa receptor antagonists
 - **Abciximab**, eptifibatide, tirofiban
- Others
 - PGI₂, daltroban, dazoxiben, clofibrate

Aspirin





Dipyridamole

- Coronary vasodilator and relatively weak antiplatelet drug
- Mechanism of action
 - Potentiates effect of endogenous prostacycline
 - In high conc inhibits Phosphodiesterase, so \uparrow cAMP
- Dose = 100 mg BD/TDS
- used with aspirin to prevent ischemic stroke in patients of TIA



Ticlopidipine & clopidogrel



- **ADP antagonists**, inhibit binding of ADP to its receptors **irreversibly**
- Also Inhibit fibrinogen induced platelet aggregation with out modifying GPIIb/IIIa
- Synergistic action with aspirin
- Both are prodrugs have long duration of antiplatelet effect
- Clopidogrel a congener of ticlodipine is safer and better tolerated

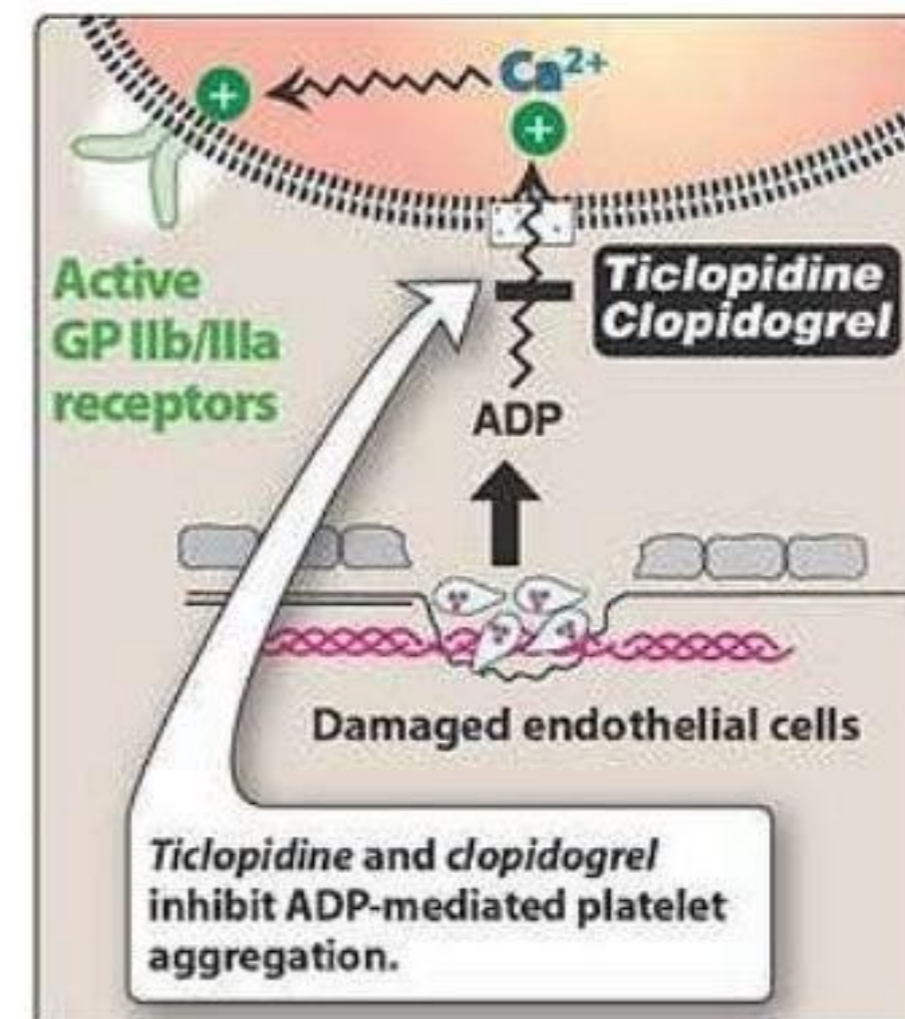
Ticlopidine Vs clopidogrel

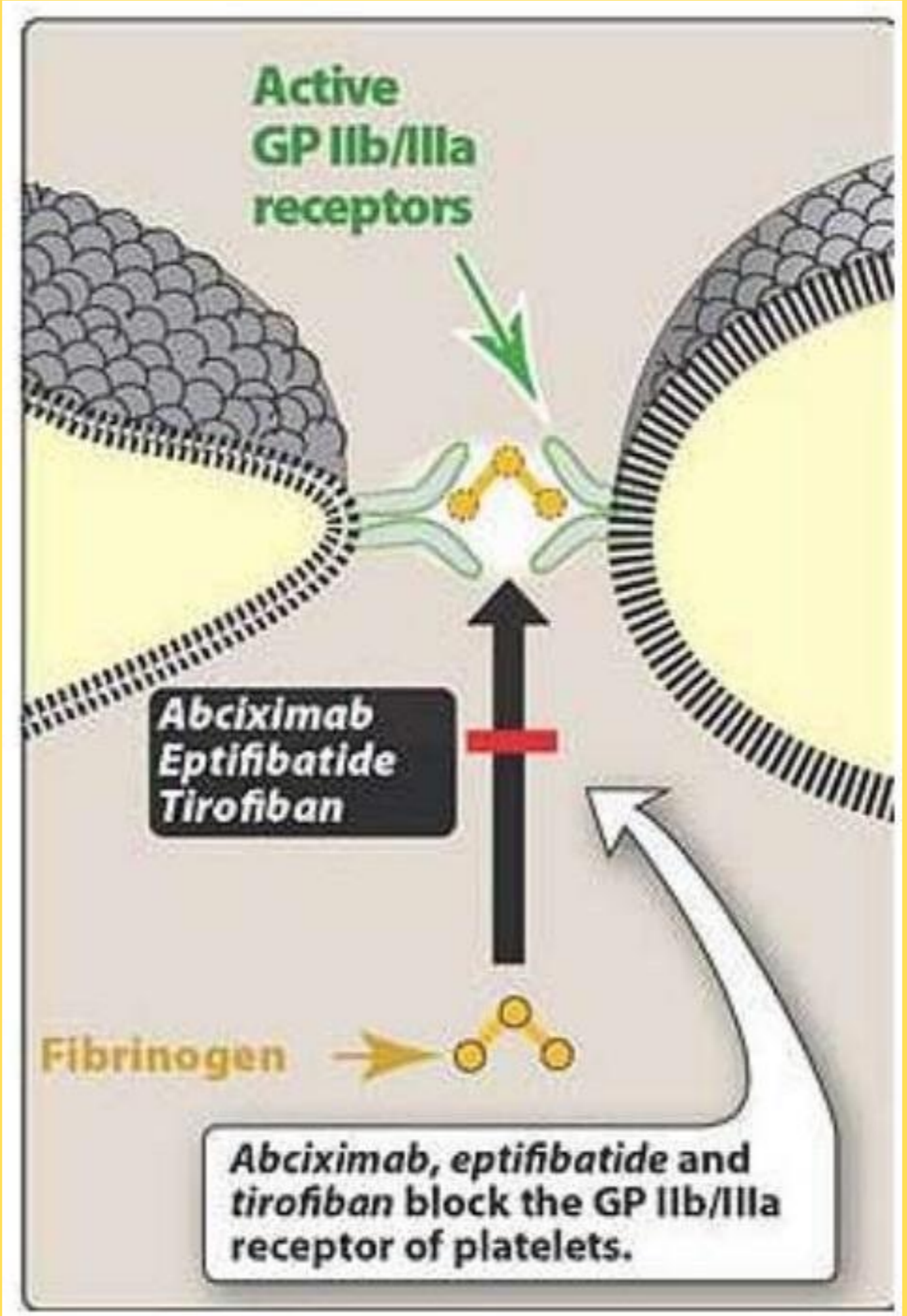
Ticlopidine

- Adverse effects:
 - Diarrhoea, vomiting, abdominal pain
 - Headache, tinnitus, skin rash
 - **Bleeding, neutropenia, thrombocytopenia**
- dose= 250 mg BD

Clopidogrel

- Adverse effects
 - Bleeding most IMP
 - Less bone marrow toxicity
 - Diarrhoea, epigastric pain, rashes
- Dose = 75 mg OD







Abciximab



- Fab fragment of Chimeric monoclonal antibody against GP-IIb/IIIa.
- Used to prevent platelet aggregation in patients having PCI, administered along with aspirin & heparin or LMW heparin
- Most common A/E is bleeding
- May cause thrombocytopenia, hypotension, bradycardia
- Non antigenic
- Dose: 0.25 mg/kg IV before PCI followed by 10 µg/min for 12 hrs



Uses of antiplatelet drugs

- **P**rosthetic heart valves & A-V shunts
- **P**eripheral vascular disease
- **C**oronary artery diseases
 - Myocardial infarction
 - Unstable angina
 - Primary & secondary prevention of MI
- **C**oronary angioplasty, stents, bypass implants
- **C**erebrovascular transient Ischemic attacks
- **V**enous thrombo-embolism



THANK YOU