

Sept 2011  
QUESTION 20

Describe the structure and function of platelets (50% marks). Outline the pharmacology of clopidogrel (50% marks).

### Platelets

Originate from haematopoietic stem cells - myeloid progenitor - megakaryocytes - fragmentation  
Are formed in the bone marrow  
Normal half life is around 1 week  
It is consumed by macrophages in the spleen  
Concentration in the plasma is 150000 - 450000 platelets per microlitre

### Structure

Are irregularly shaped cells  
Within the cytoplasm  
No nucleus  
Actin and myosin structure  
Machinery includes  
golgi apparatus  
endoplasmic reticulum  
mitochondria  
Proteins  
growth factor  
fibrin stabilising factor  
On the cell surface  
glycoproteins important in adhesion and activation  
phospholipids which activate clotting cascades

### Function

Primary mediator of haemostasis  
forms haemostatic plug  
causes vasoconstriction via release of mediators  
activates the clotting cascade and forms a platform for coagulation to take place

### Clopidogrel

Is a thienopyridine derivative anti platelet drug  
It is used to prevent thrombotic events in ischaemic heart disease and valve replacement

#### Presentation

As tablets 75mg tablets. Trade name plavix. Acts as a prodrug

#### Pharmacodynamics

##### Mechanism

non competitive antagonist to ADP receptors on platelet surface,  
stops the activation of glycoprotein IIb/IIIa, prevents aggregation

##### Side effects

May cause GI irritation, associated with bleeding events, may cause neutropenia

#### Pharmacokinetics

A well absorbed  
D highly protein bound  
M extensively via hepatic esterases active metabolite, half life 6hrs  
E in urine and faeces 50:50