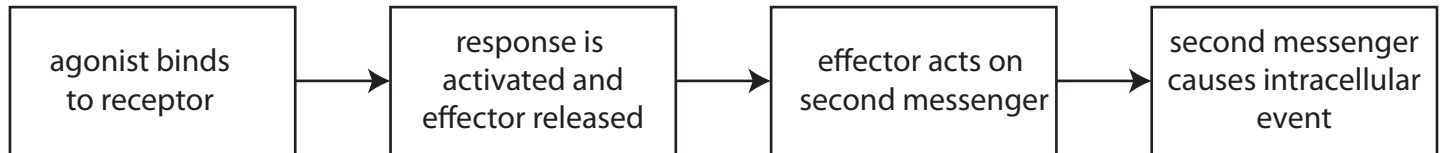


JULY 2007  
QUESTION 13

Describe the term second messenger. Give an example of a drug which manifests its action via a second messenger

Second Messengers are a component of the signal transduction cascade which occurs following the combination of a receptor and an agonist (drug or hormone)



Second messengers systems usually act via phosphorylation and provide amplification (increasing responses and continuing effect after dissociation of drug-receptor) flexibility (they provide branch points in signalling pathways enabling more variability)

Types of second messengers include;

Calcium and Inositol 1,4,5 triphosphate (IP3)

Noradrenaline at alpha 1 receptors (GqPCR) increase IP3 and Calcium  
Causing smooth muscle contraction

Cyclic Guanosine MonoPhosphate cGMP

Nitric Oxide, ANP

Cyclic Adenosine MonoPhosphate cAMP

Drug example is salbutamol (beta adrenergic amine) - others glucagon, histamine, 5-HT  
Mechanism shown below

Gs Protein Coupled Receptor - Salbutamol

Adenylyl Cyclase is an effector

