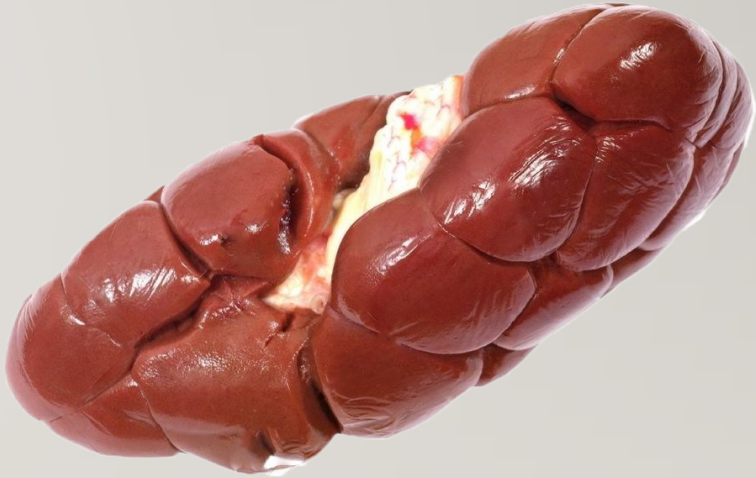
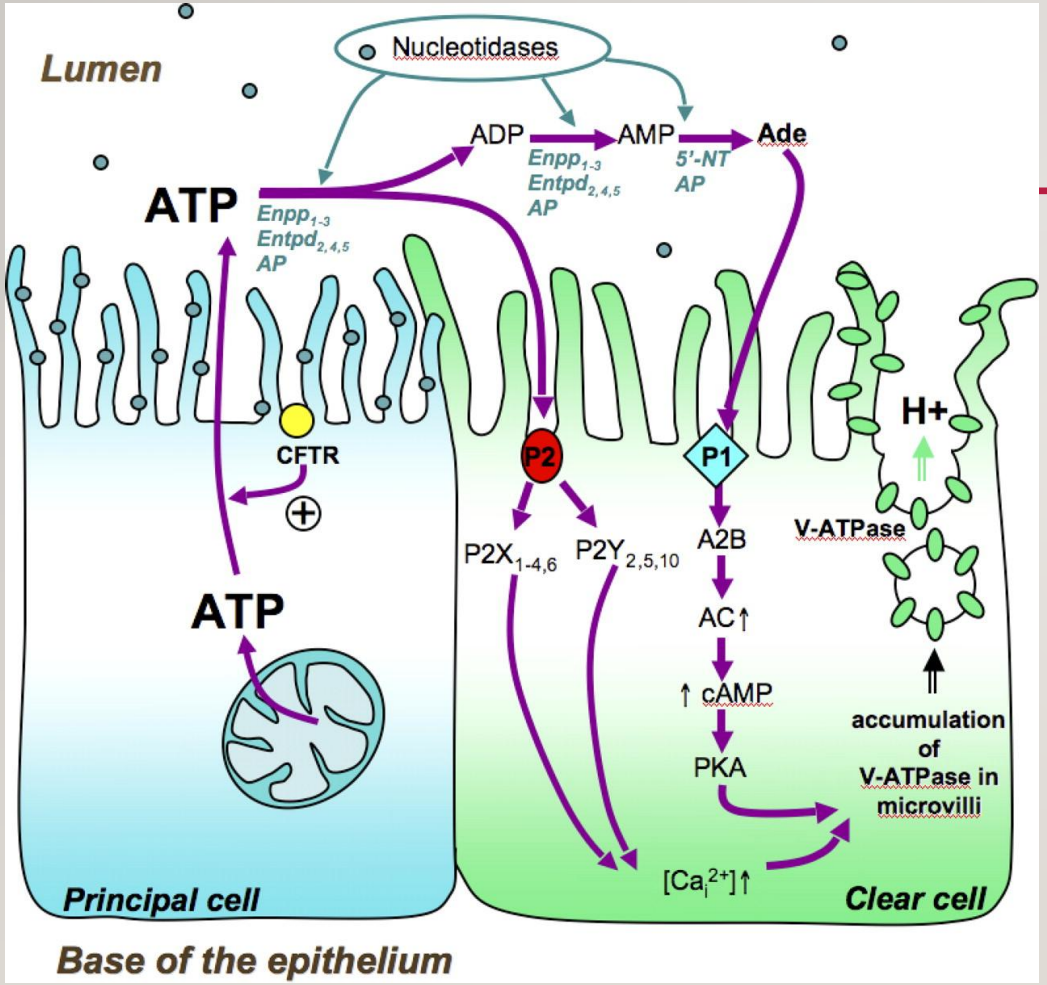
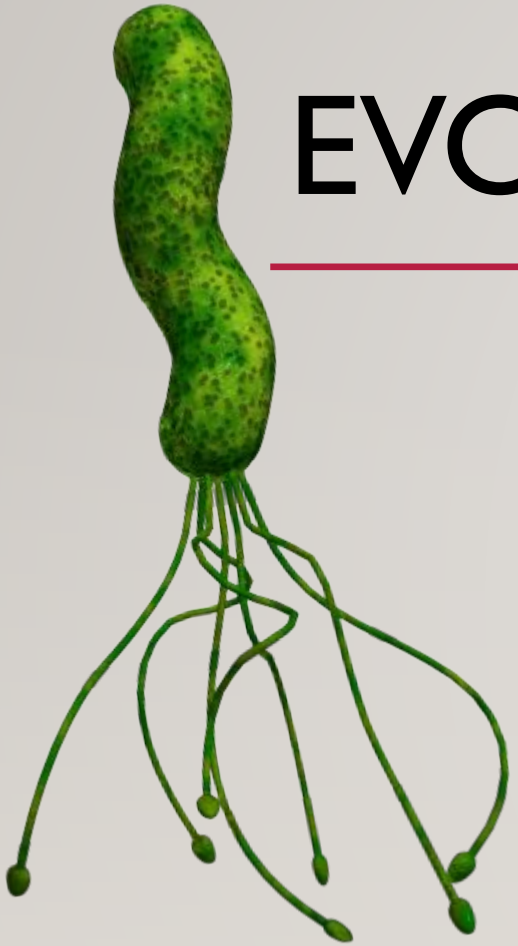
PURINE



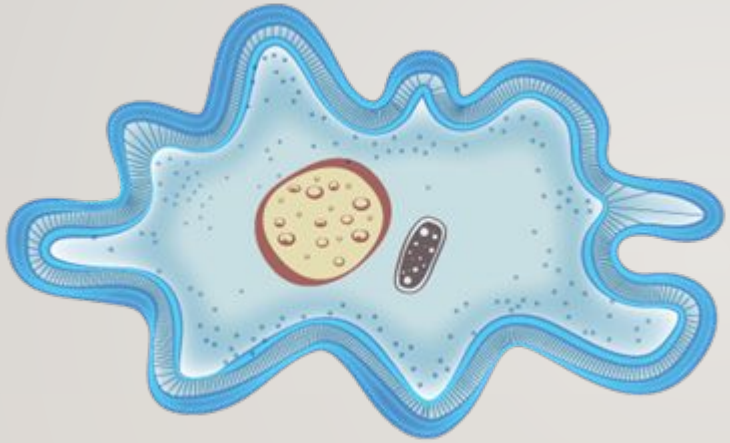


Purinergic signaling - is a form of extracellular signaling mediated by purine nucleotides and nucleosides such as adenosine and ATP. It involves the activation of purinergic receptors in the cell and/or in nearby cells, thereby regulating cellular functions.

EVOLUTIONARY ORIGINS

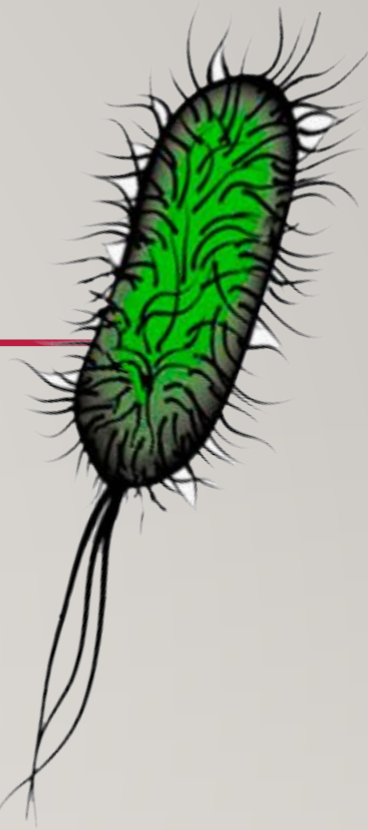


bacteria



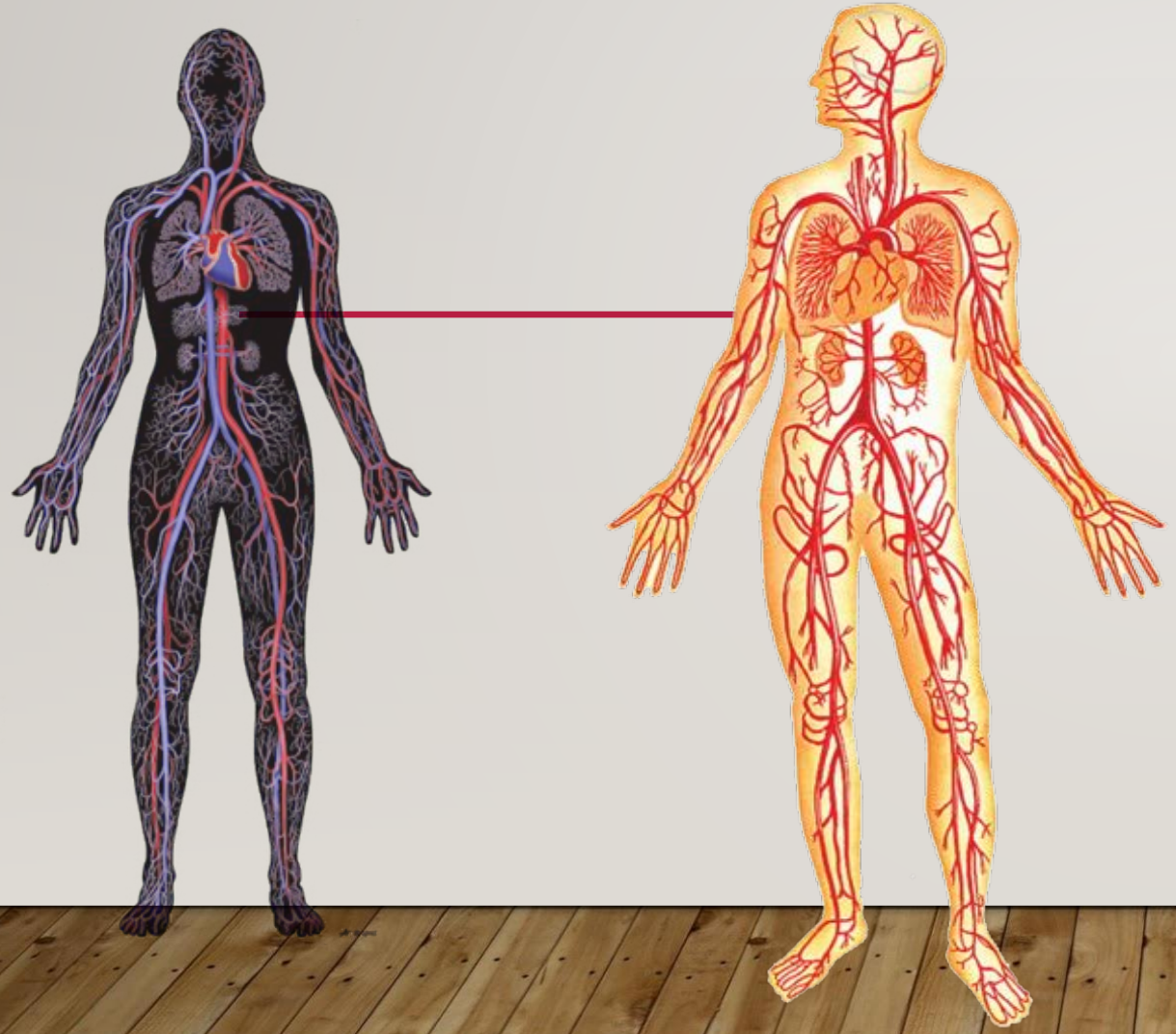
amoeba

ciliates



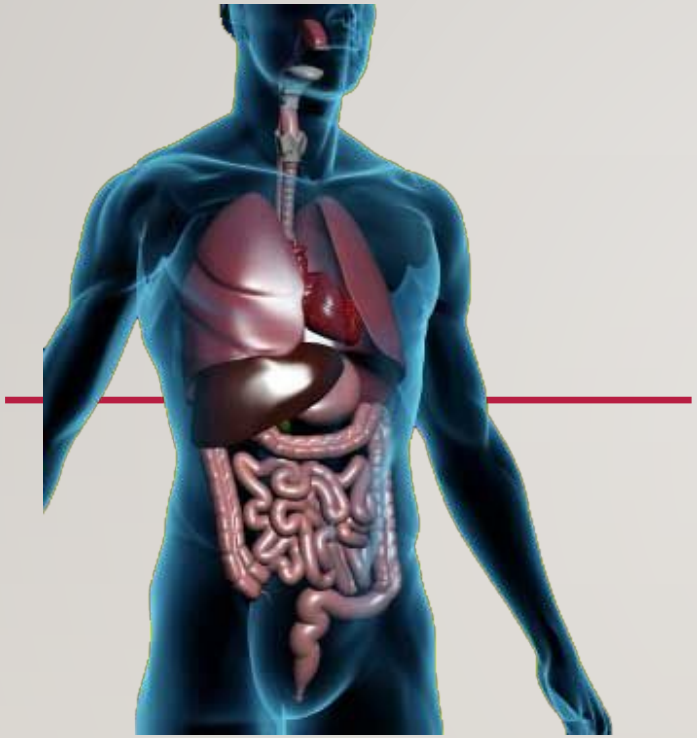
PURINERGIC SIGNALING IN HUMANS

Circulatory system



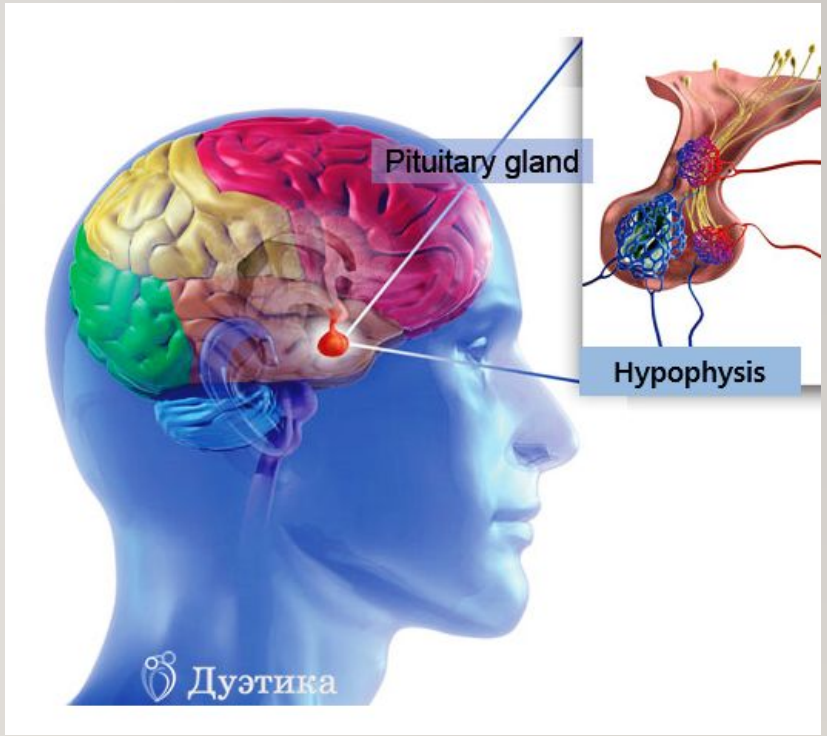
In the human heart, adenosine functions as an autacoid in the regulation of various cardiac functions such as heart rate, contractility, and coronary flow.

DIGESTIVE SYSTEM



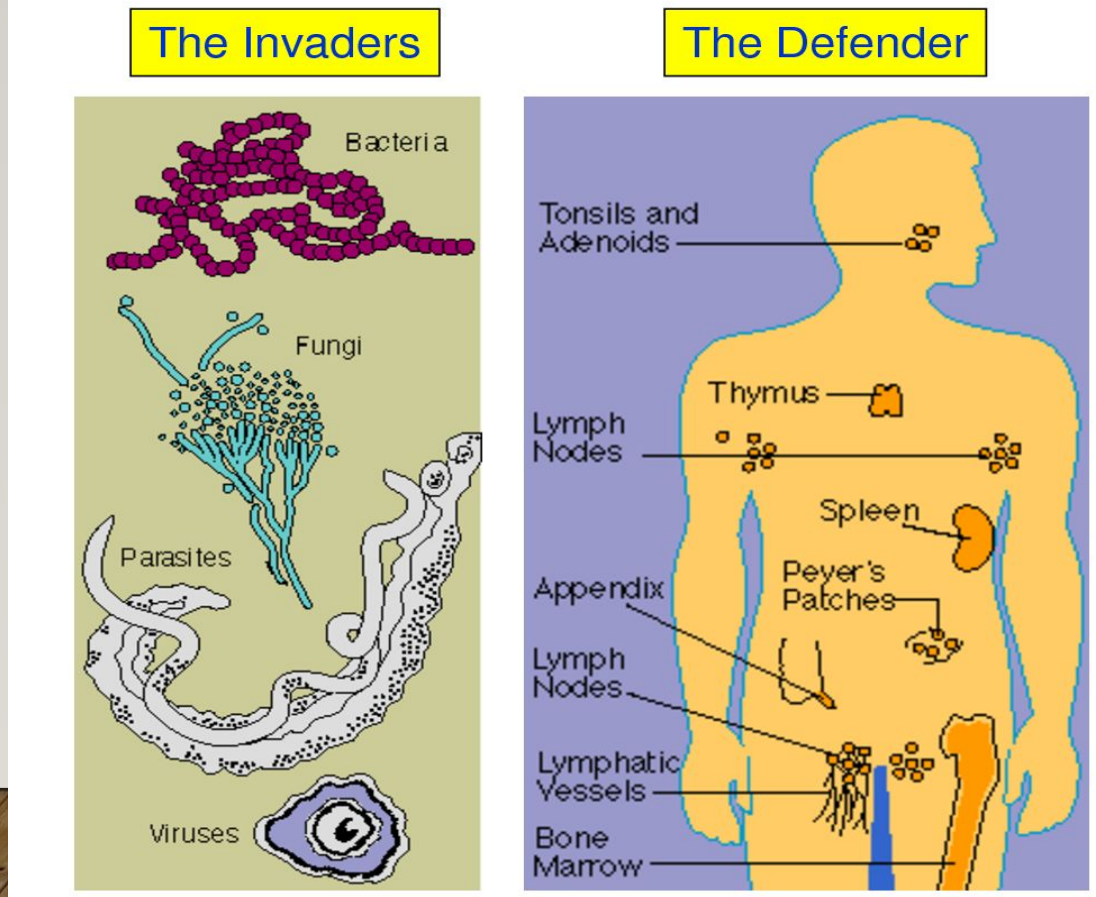
ATP signaling via P2 receptors influences bile secretion as well as metabolism and regeneration

ENDOCRINE SYSTEM

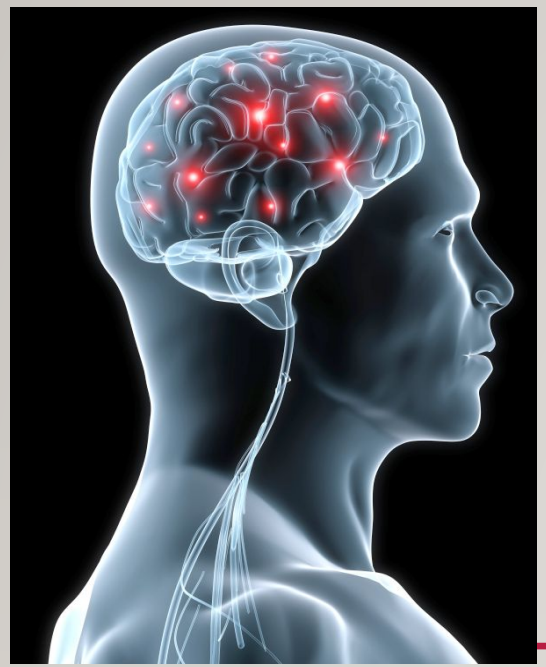


Cells of the pituitary gland secrete ATP, which acts on P2Y and P2X purinoreceptors

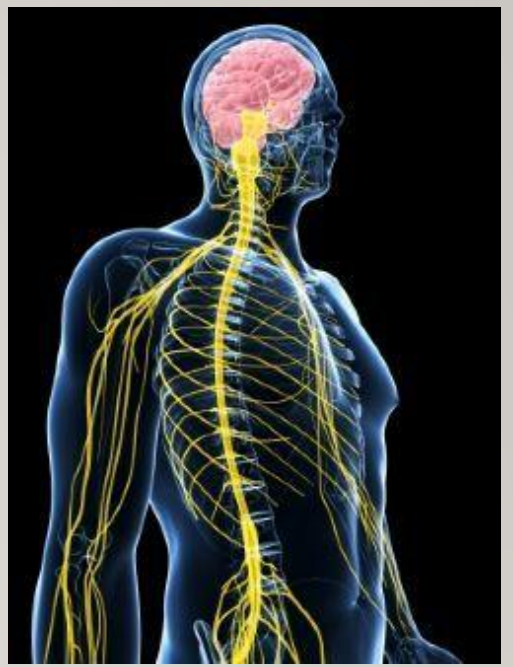
IMMUNE SYSTEM



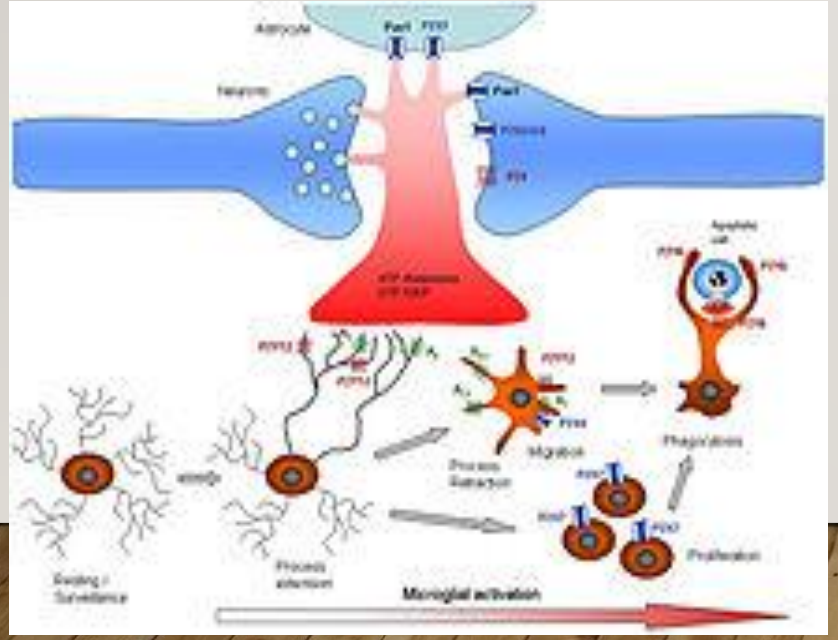
Like most immunomodulating agents, ATP can act either as an immunosuppressive or an immunostimulatory factor, depending on the cytokine microenviroment and the type of cell receptor



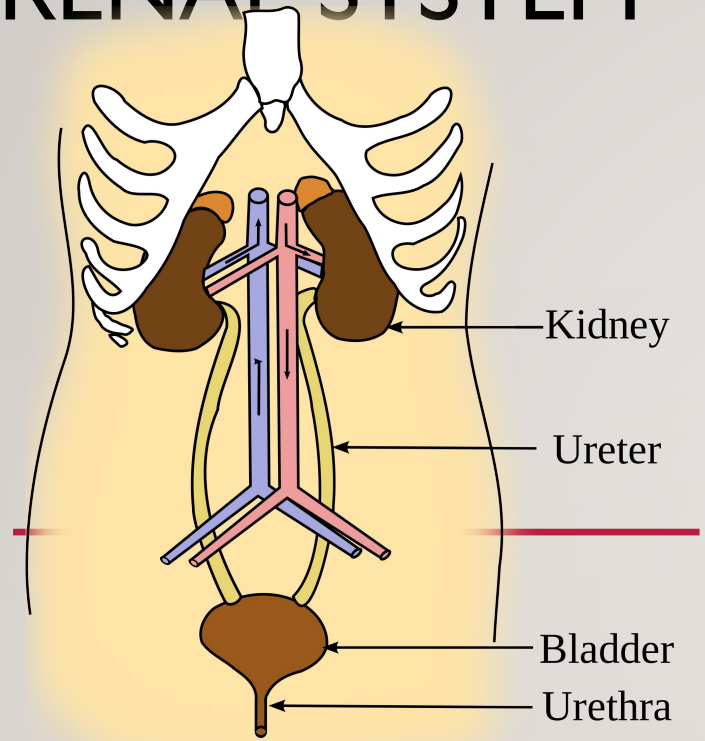
NERVOUS SYSTEM



In the central nervous system, ATP is released from synaptic terminals and binds to a plethora of ionotropic and metabotropicreceptors. It has an excitatory effect on neurones, and acts as a mediator in neuronal–glial communications.

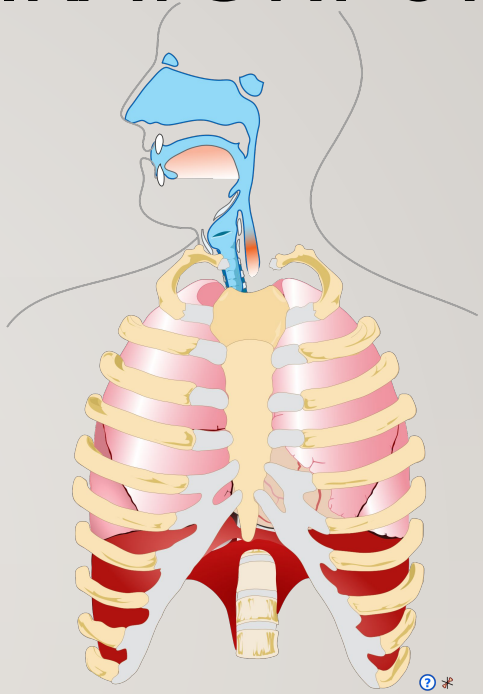


RENAL SYSTEM



In the kidneys, the glomerular filtration rate (GFR) is regulated by several mechanisms including tubuloglomerular feedback (TGF)

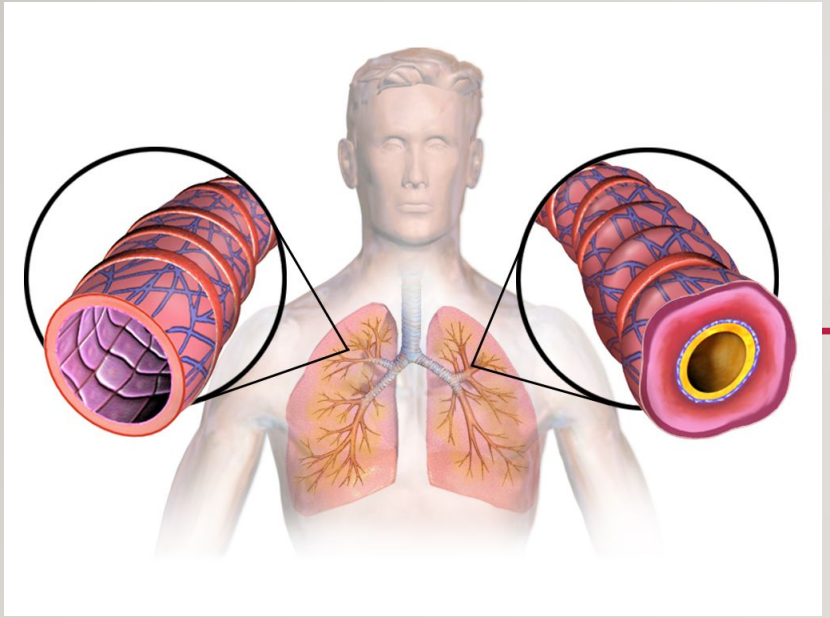
RESPIRATORY SYSTEM



ATP and adenosine are crucial regulators of mucociliary clearance. The secretion of mucin involves P2RY2 receptors found on the apical membrane of goblet cells.

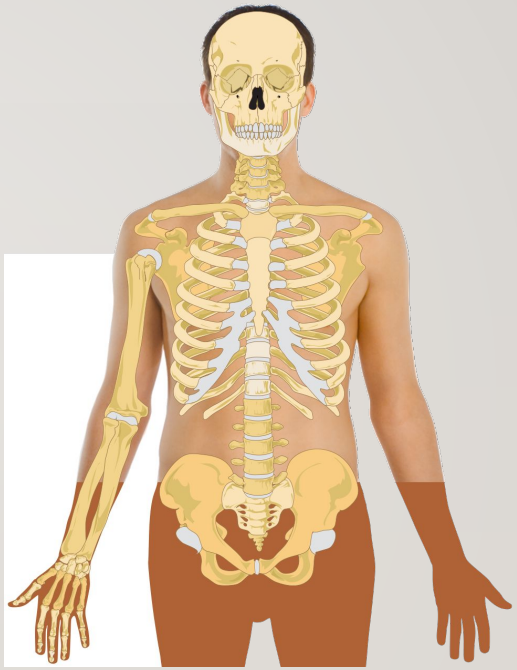
PURINERGIC ASPECTS

Asthma



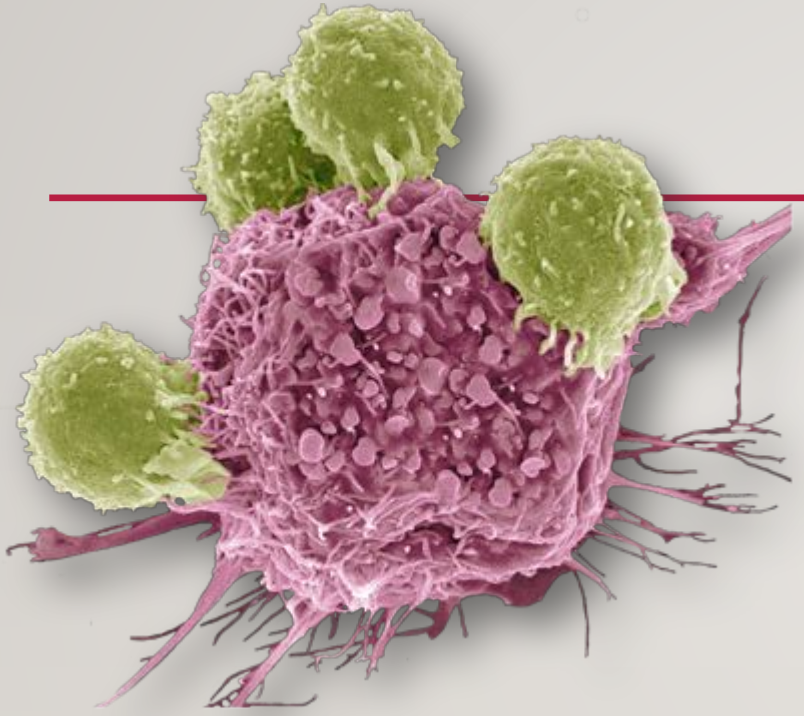
Adenosine receptors affect bronchial reactivity, endothelial permeability, fibrosis, angiogenesis and mucus production.

Bone diseases



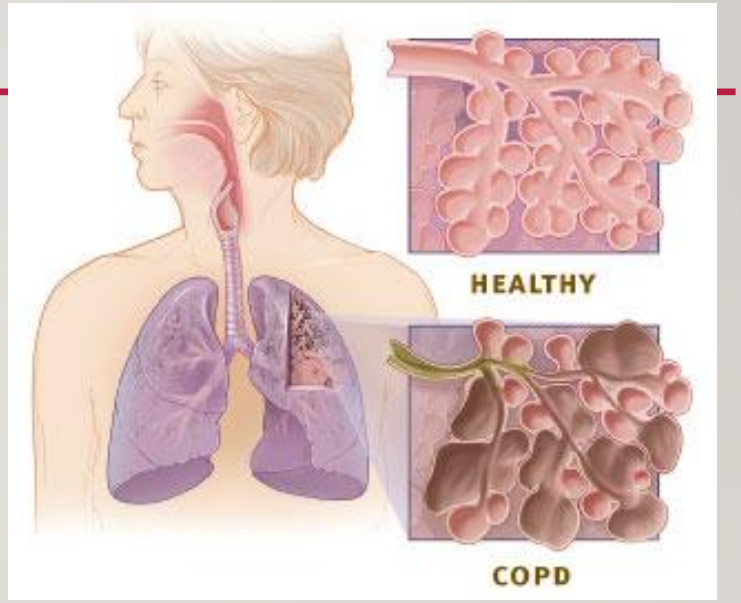
Purinergic signalling is involved in the pathophysiology of several bone and cartilage diseases such as osteoarthritis, rheumatoid arthritis, and osteoporosis.

CANCER



P2RX7 receptor is overexpressed in most malignant tumors.

CHRONIC OBSTRUCTIVE PULMONARY DISEASE



Abnormal levels of ATP and adenosine are present in the airways of patients with chronic obstructive pulmonary disease.

THANK YOU
FOR
YOUR ATTENTION