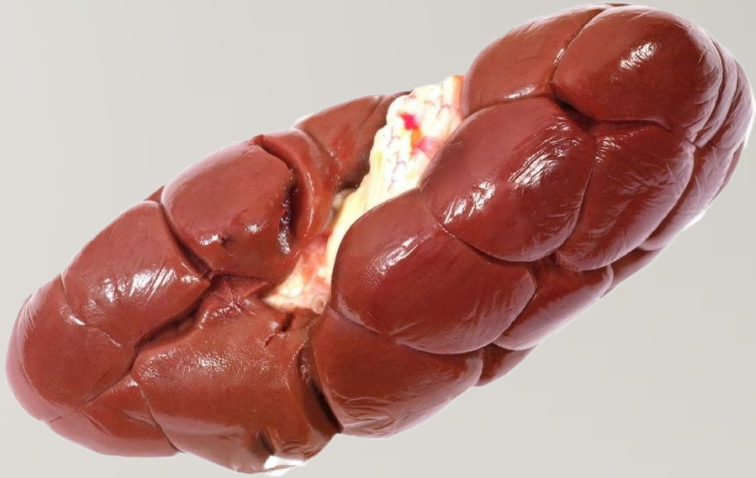
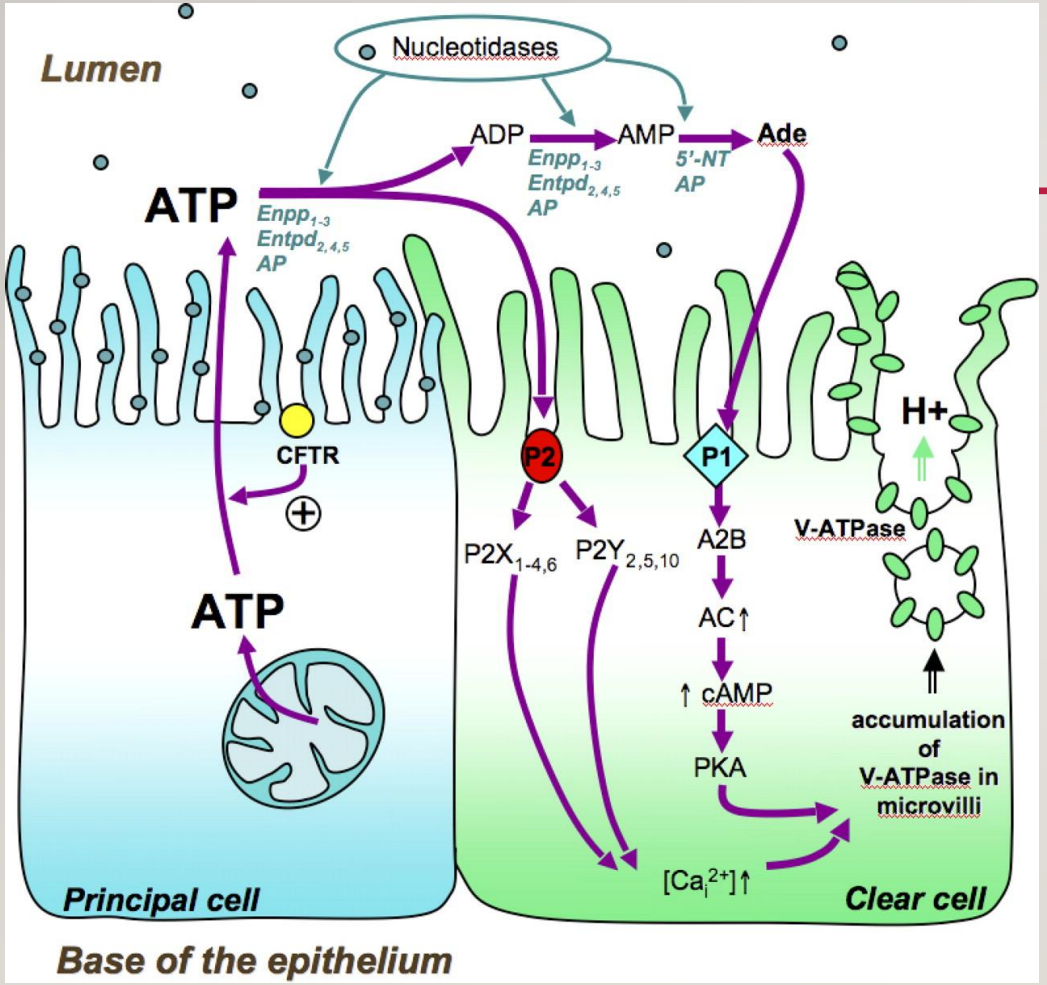
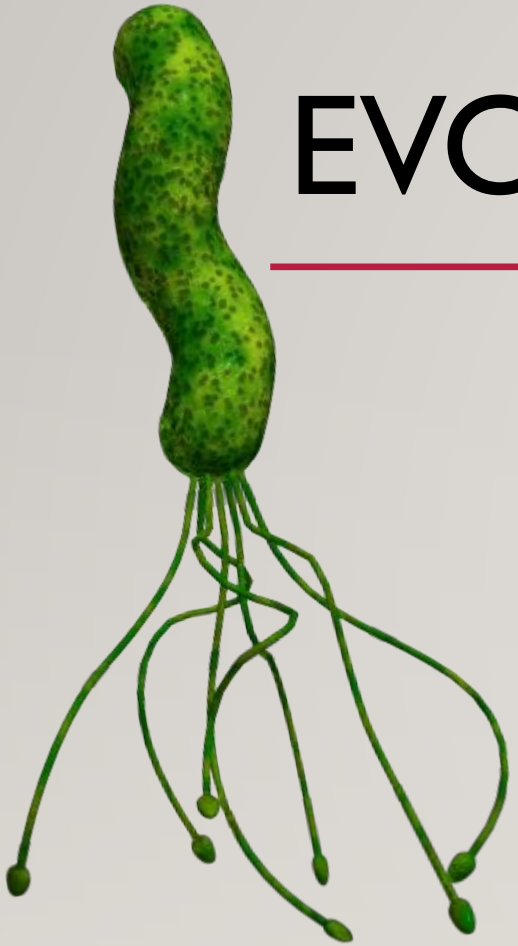
# PURINE



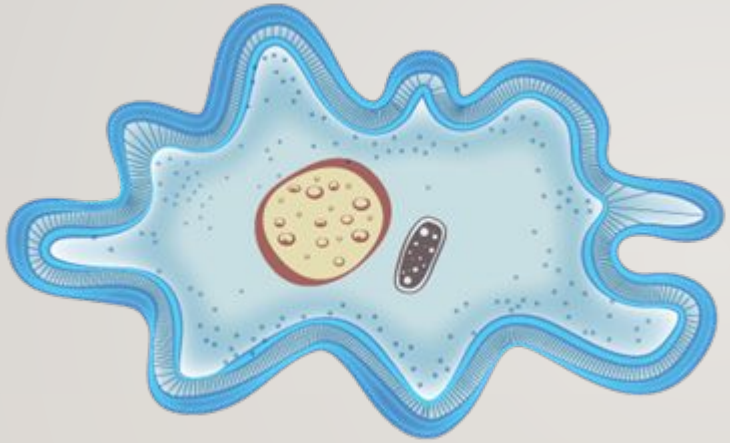



Purinergic signaling - is a form of extracellular signaling mediated by purine nucleotides and nucleosides such as adenosine and ATP. It involves the activation of purinergic receptors in the cell and/or in nearby cells, thereby regulating cellular functions.

# EVOLUTIONARY ORIGINS

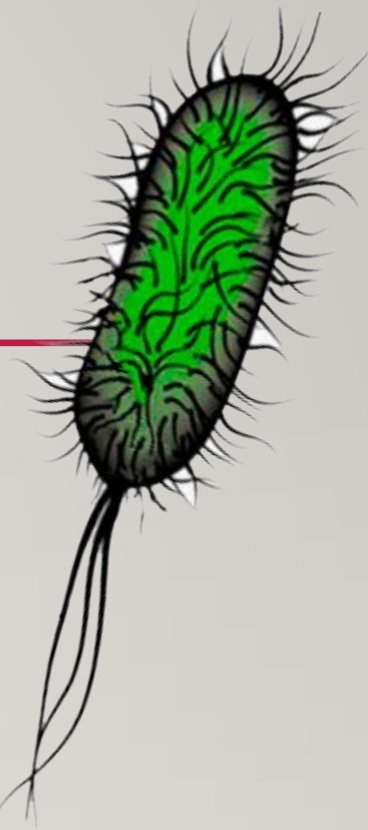


bacteria



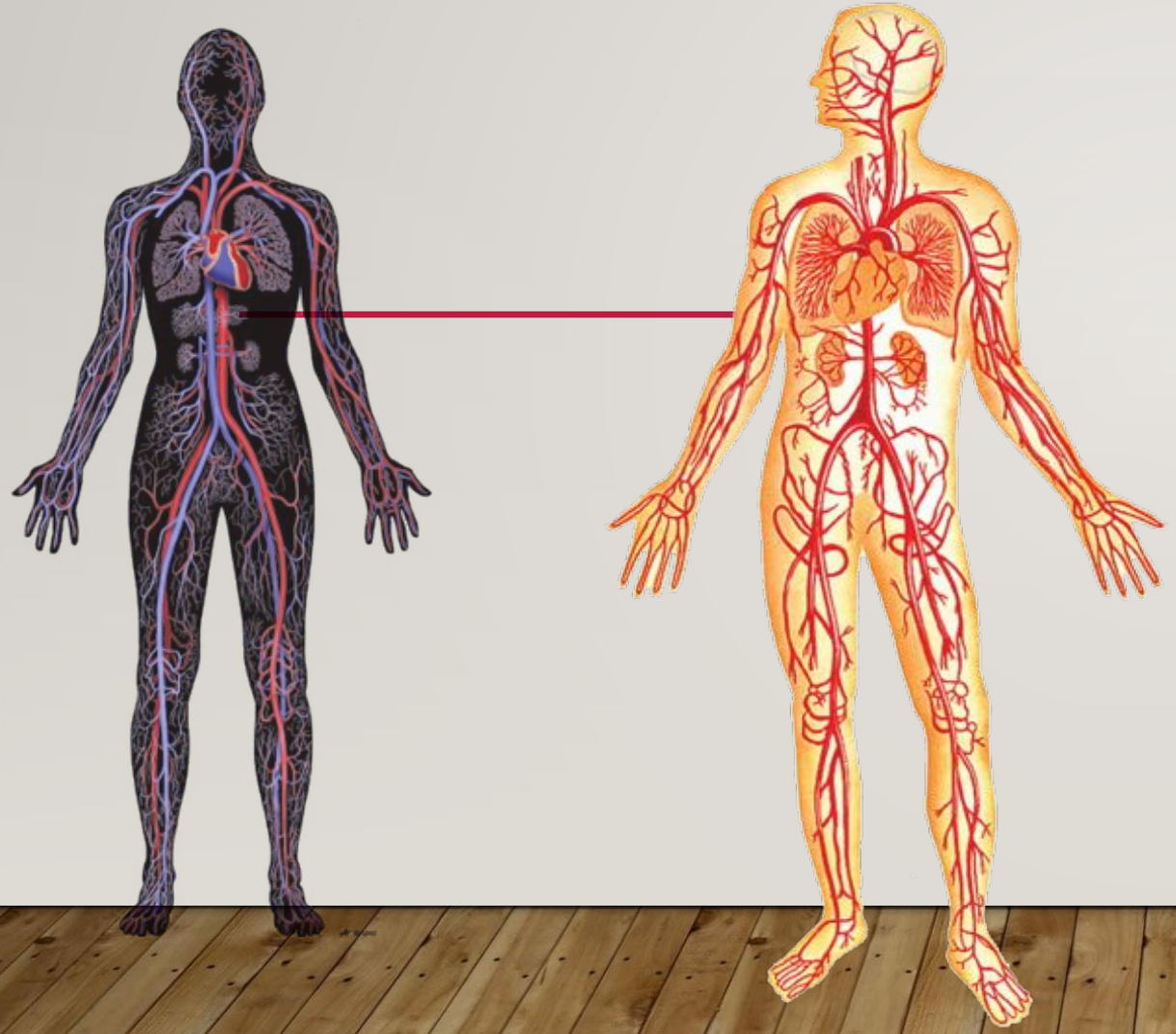
amoeba

ciliates



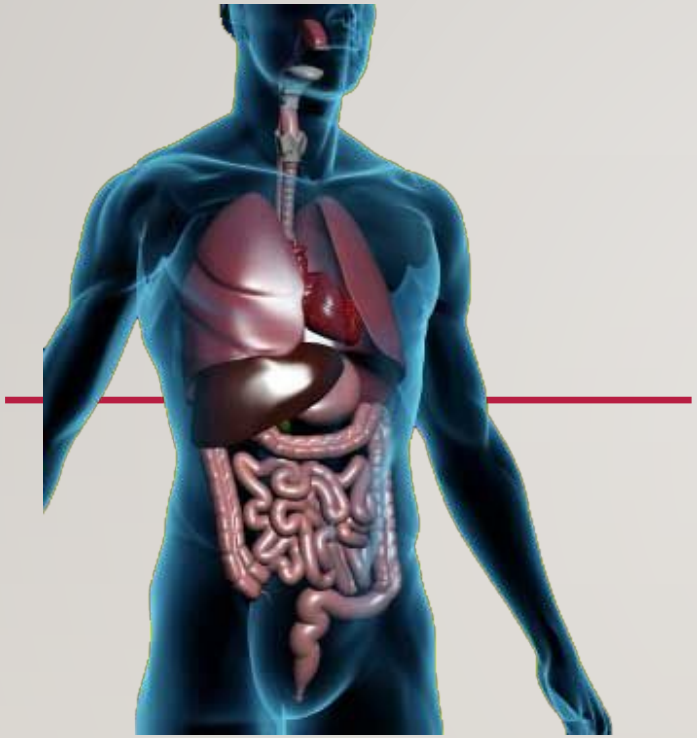
# PURINERGIC SIGNALING IN HUMANS

## Circulatory system



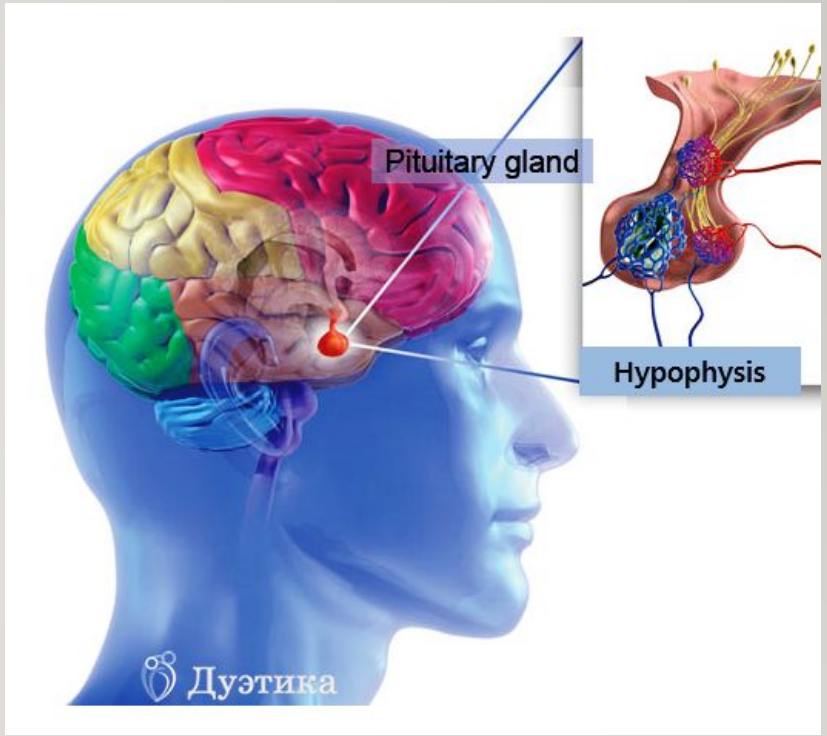
In the human heart, adenosine functions as an autacoid in the regulation of various cardiac functions such as heart rate, contractility, and coronary flow.

# DIGESTIVE SYSTEM



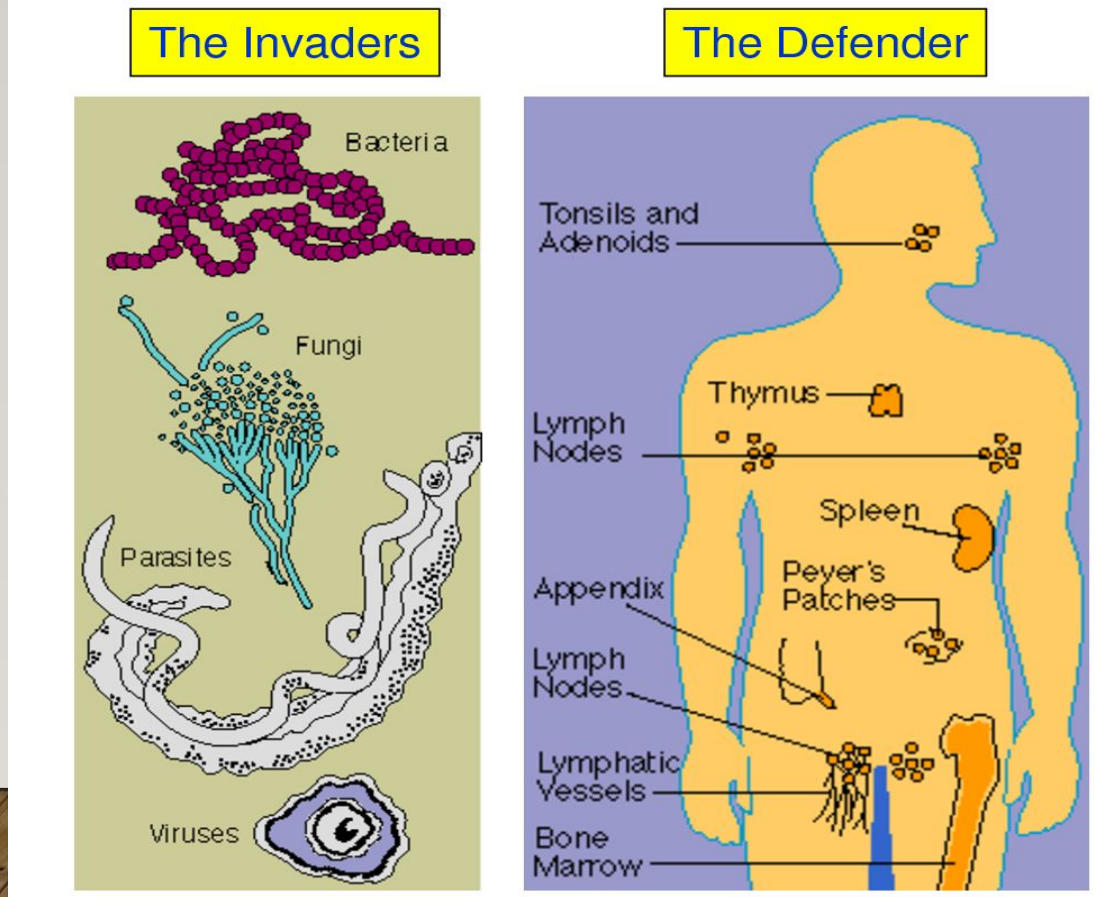
ATP signaling via P2 receptors influences bile secretion as well as metabolism and regeneration

# ENDOCRINE SYSTEM

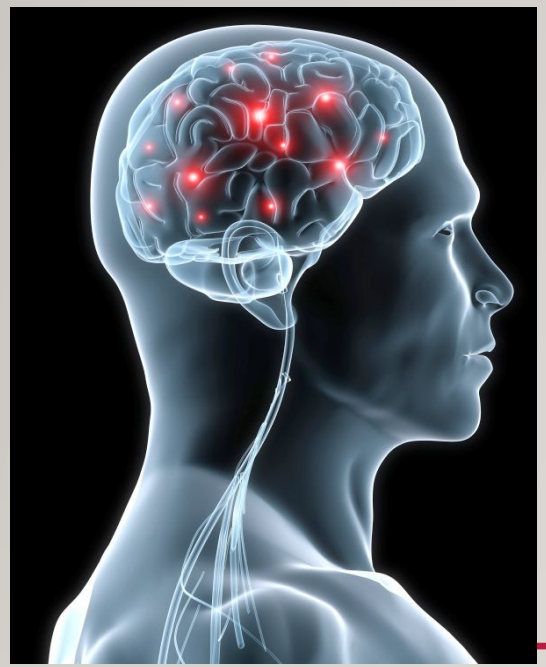



Cells of the pituitary gland secrete ATP, which acts on P2Y and P2X purinoreceptors

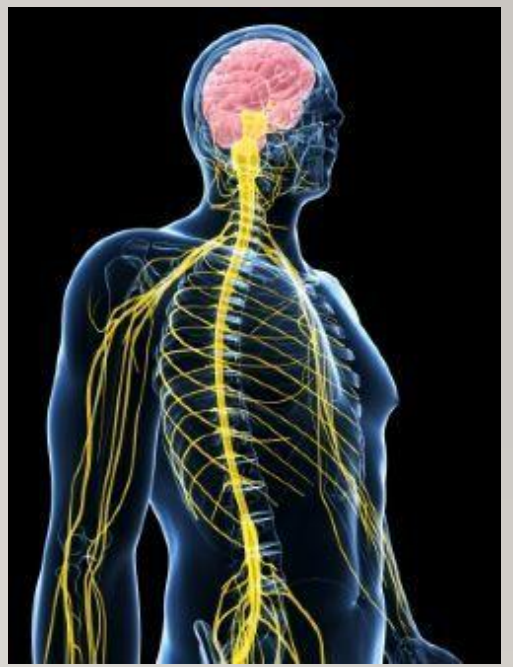
# IMMUNE SYSTEM



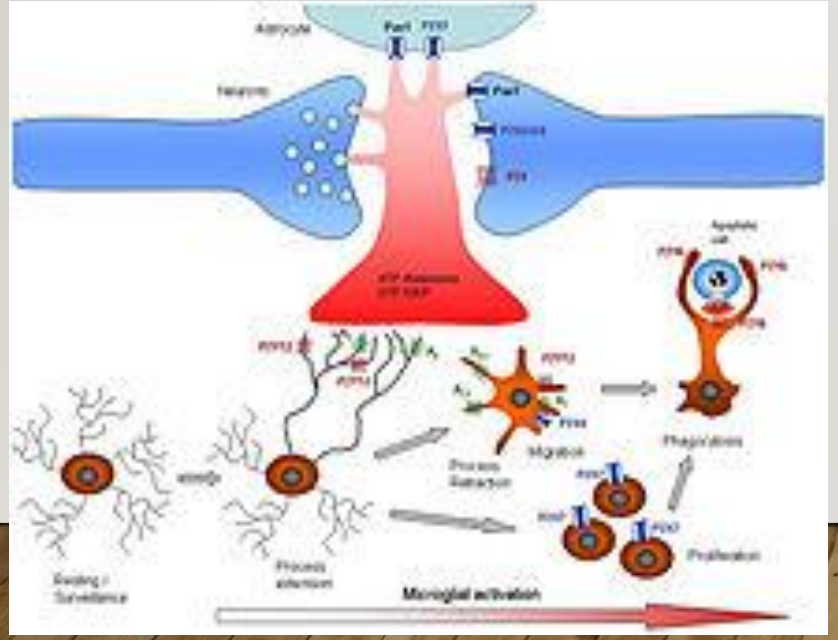

Like most immunomodulating agents, ATP can act either as an immunosuppressive or an immunostimulatory factor, depending on the cytokine microenviroment and the type of cell receptor



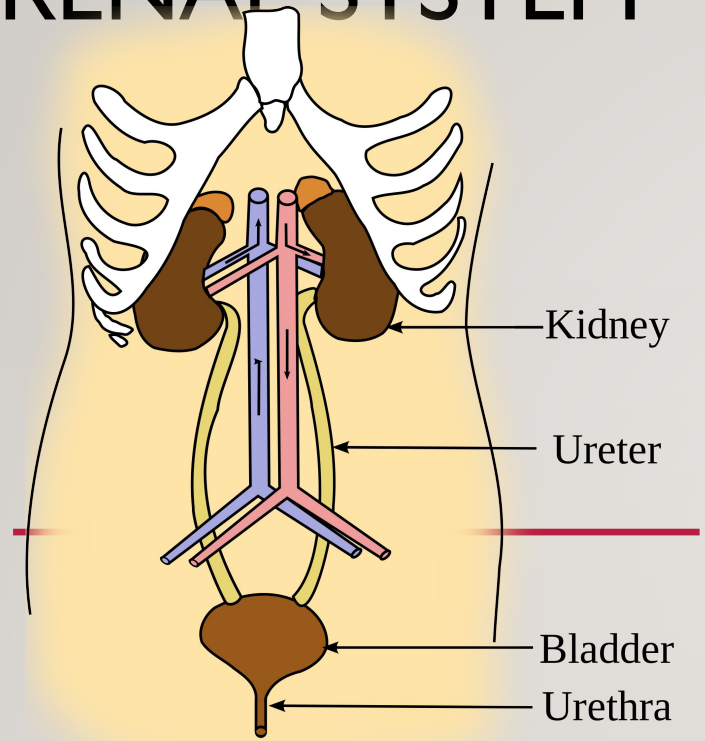
# NERVOUS SYSTEM



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.

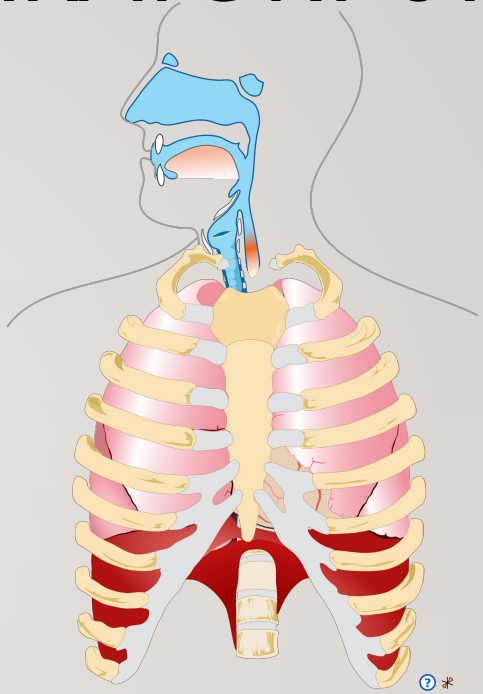


# RENAL SYSTEM




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

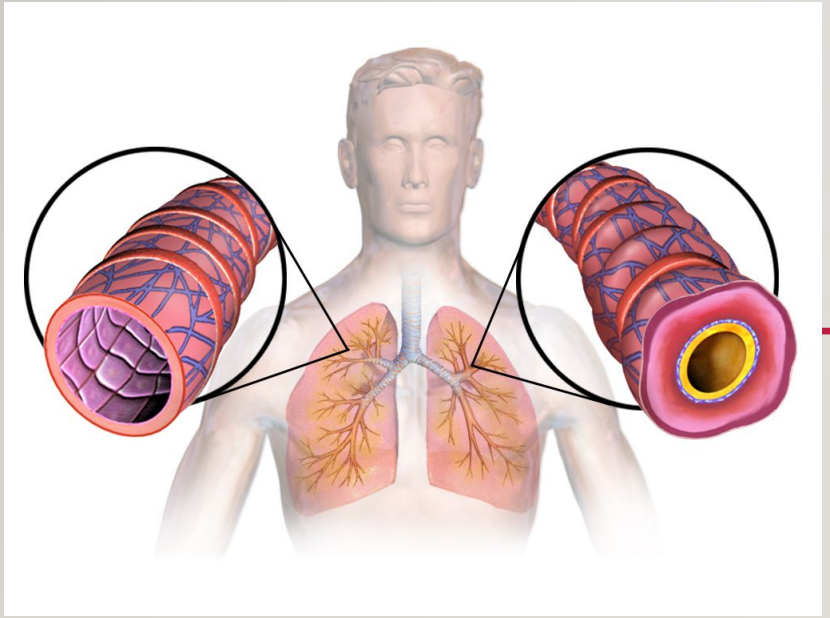
# RESPIRATORY SYSTEM



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

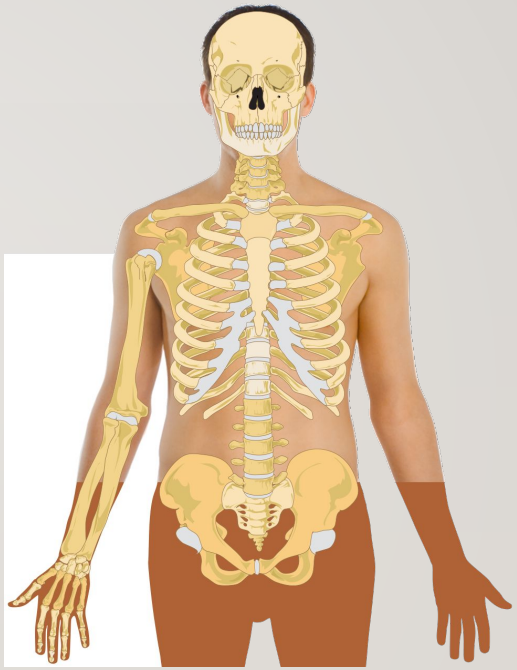
# PURINERGIC ASPECTS

## Asthma



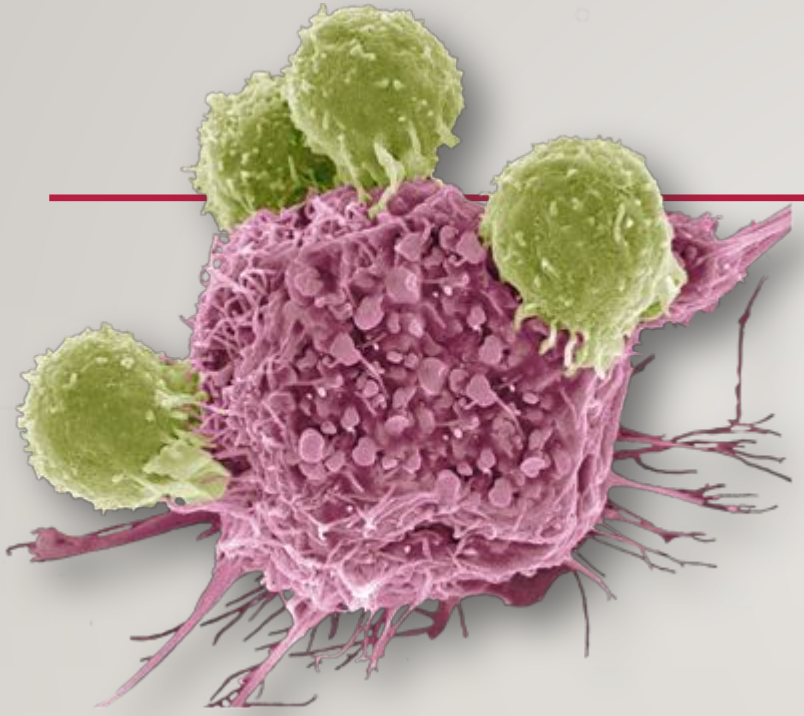
Adenosine receptors affect bronchial reactivity, endothelial permeability, fibrosis, angiogenesis and mucus production.

## Bone diseases



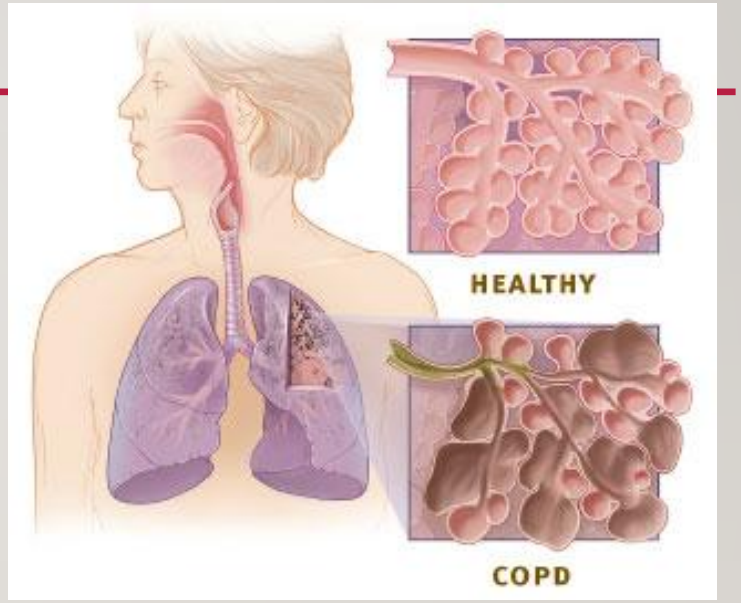
Purinergic signalling is involved in the pathophysiology of several bone and cartilage diseases such as osteoarthritis, rheumatoid arthritis, and osteoporosis.

# 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