

## **ATP Energy and Enzymes**

What is catabolism in reference to metabolism? What about anabolism?

Catabolism: break down of large molecules to small molecules; releasing energy (Heat)

Anabolism: building more complex molecules from smaller molecules; requires energy

Metabolism: Encompassing both the build up and break down of molecules, all chemical reactions within an organism

What is an enzyme?

Protein that acts as a biological catalyst; accelerating chemical reactions/allowing chemical reaction to proceed by lowering activation energy

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Enzyme- enzyme substrate complex-transition state- products

What are the two laws of thermodynamics?

1. Energy is neither created or destroyed
2. Entropy (disorder) can never decrease; constant only if all processes are reversible

What is Gibbs free energy? What is activation energy? What is their relation to enzymes?

Gibbs Free energy defines

Exergonic Reactions: release energy (less than 0)

Endergonic Reactions: require energy input (greater than 0)

What are metallic cofactors? What is their significance?

Metallic Cofactors:  $Mg^{2+}$ ,  $Fe^{2+}$ ,  $Zn^{2+}$ ,  $Mn^{2+}$  INORGANIC

Assist enzymes in carrying catalytic function by changing binding product and allowing substrates to bind

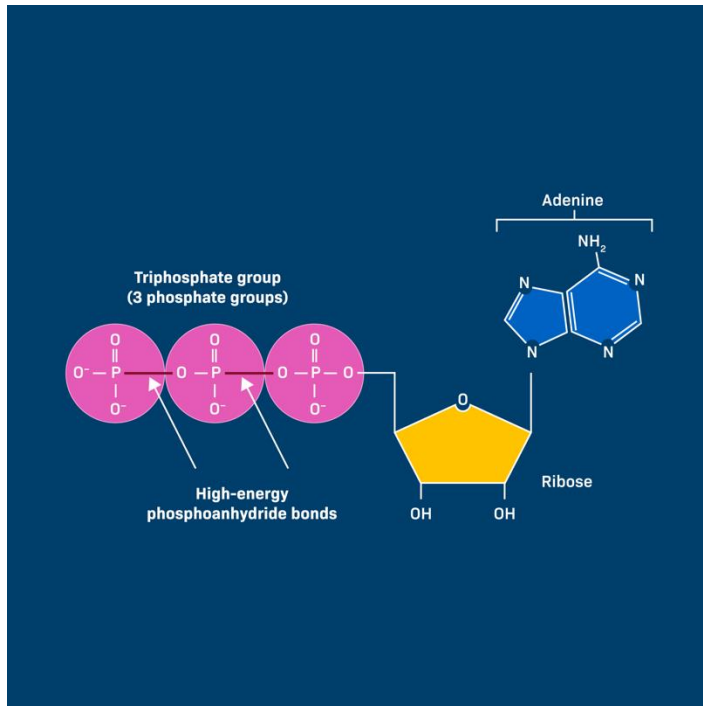
What are their organic coenzymes? What is their significance?

Organic Coenzymes: Vitamins

Assist enzymes in carrying catalytic function by changing binding product and allowing substrates to bind

What is ATP? Adenosine Tri Phosphate

Energy carrying molecule, energy within the TRI PHOSPHATE, specifically the bonds (phosphoanhydride bonds), b/c 3 negatively charged molecules, thus UNSTABLE



What is substrate level phosphorylation? Krebs (TCA, Citric Acid Cycle) and Glycolysis

Glycolysis breaks down glucose , WHICH CAN LEAD INTO THE krebs cycle, which utilizes those products to create ATP, or glycolysis can lead to fermentation.

What is oxidative phosphorylation? Relies on Electron Transport Train

What is photophosphorylation? Otherwise known as photosynthesis, creation of energy through sunlight

Define: TROPH MEANS LOVE

Chemoheterotroph: OBTAINS ENERGY THROUGH CHEMICAL PROCESSES WITH ORGANIC MOLECULES

Photoautotroph: OBTAINS ENERGY THROUGH LIGHT VIA INORGANIC MOLECULES

The mitochondria and cell membrane are the location of what process?

MITOCHONDRIA: Eukaryotes, CANT HAVE  $O_2$ , anaerobic process, ETC

CELL MEMBRANE: Prokaryotes, Aerobic, requires  $O_2$ , ETC

Define Redox reactions and their role within energy creation?

Deals with an electron acceptor and electron donor (Think periodic table)

OILRIG:

OXIDATION is LOSING ELECTRONS

REDUCTION IS GAINING ELECTRONS