

Metabolism

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Metabolism is the process through which living systems acquire and use free energy to carry out functions

Metabolism

Metabolism performs 4 functions:

1. Obtain energy for the cell
2. Convert nutrients into macromolecules
3. Assemble macromolecules into cellular structure
4. Degrade macromolecules as required for biological function

I. Energy and Carbon

Chemilolithotrophs

Obtain free energy via the oxidation of inorganic compounds such as NH_3 , H_2S or Fe^{2+}

Photoautotrophs

Obtain free energy from light photons via photosynthesis

Metabolic Pathway

Catabolic pathways lead to the disassembly of complex molecules to form simpler products.

Catabolic pathways serve two functions:

1. Make available raw materials which other molecules can be synthesized
2. Provide chemical energy for many activities of cells

Metabolic Pathway

The four principles

1. Metabolic pathways are irreversible
 - ❖ Metabolic pathways are highly **exergonic** which gives the pathway direction. Consequently if two metabolites are interconvertible, the pathway from the first to the second must be different that the pathway of the second back to the first. This allows to the pathways to be independently regulated

