

METABOLIC PATHWAYS



**RAGHAD
ALOBEDI**

**YASIN
ALAA**

**NOOR
ALMUKASABY**

Objectives

Discuss catabolic pathway and their examples

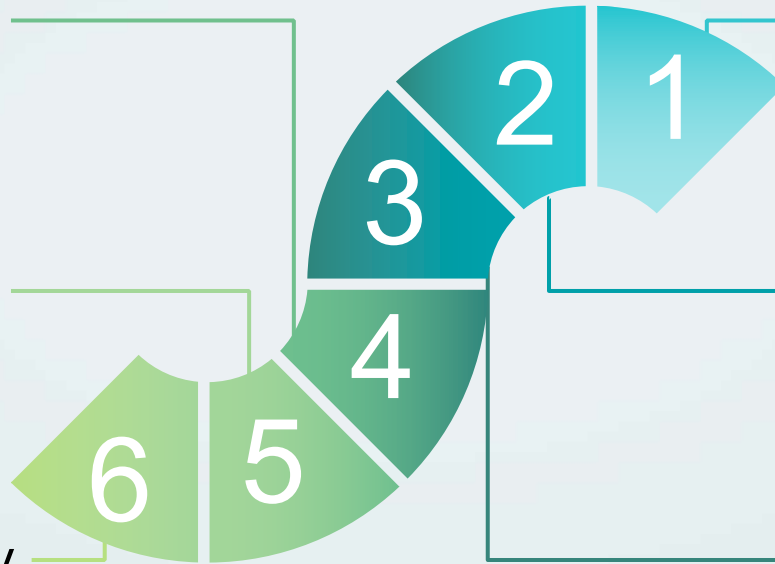
Discuss Amphibolic pathway and their examples

Summary

Introduction

List types of metabolic pathways

Discuss anabolic pathway and their examples





Introduction

The term 'metabolism' comes from the Greek word *metabole*, which means change. It refers to the total of an organism's chemical reactions. A metabolic pathway is a series of steps found in biochemical reactions that help convert molecules or substrates, such as sugar, into different, more readily usable materials.





Types of metabolic pathways

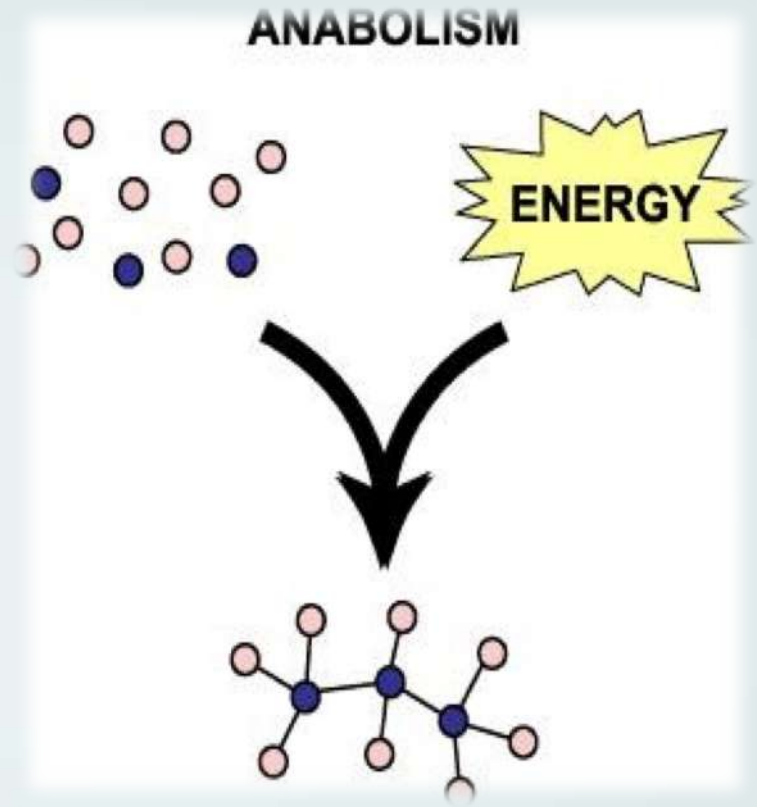
- Anabolic pathway
- Catabolic pathway
- Amphibolic pathway

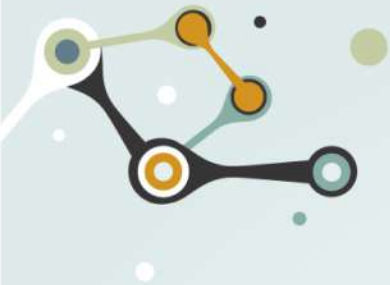




ANABOLIC PATHWAY

Anabolic reactions, or biosynthetic reactions, synthesize larger molecules from smaller constituent parts, using ATP as the energy source for these reactions. Anabolic reactions build bone, muscle mass, and new proteins, fats, and nucleic acids.





The examples of anabolic reactions

Anabolic reactions require an input of energy to synthesize complex molecules from simpler ones.

Synthesizing sugar from CO₂ is one example.

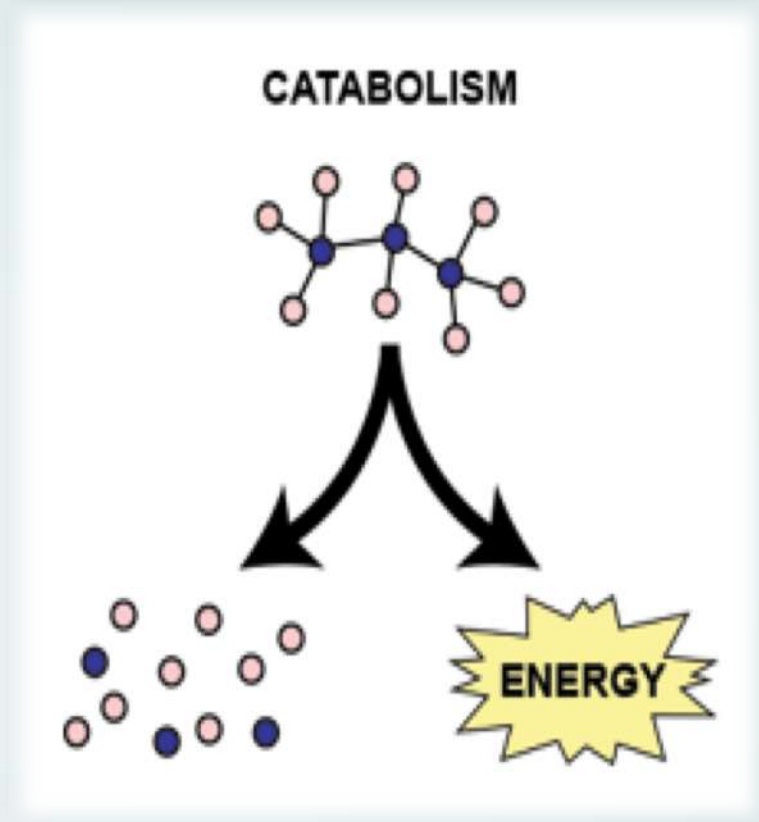
Other examples are the synthesis of large proteins from amino acid building blocks, and the synthesis of new DNA strands from nucleic acid building blocks.



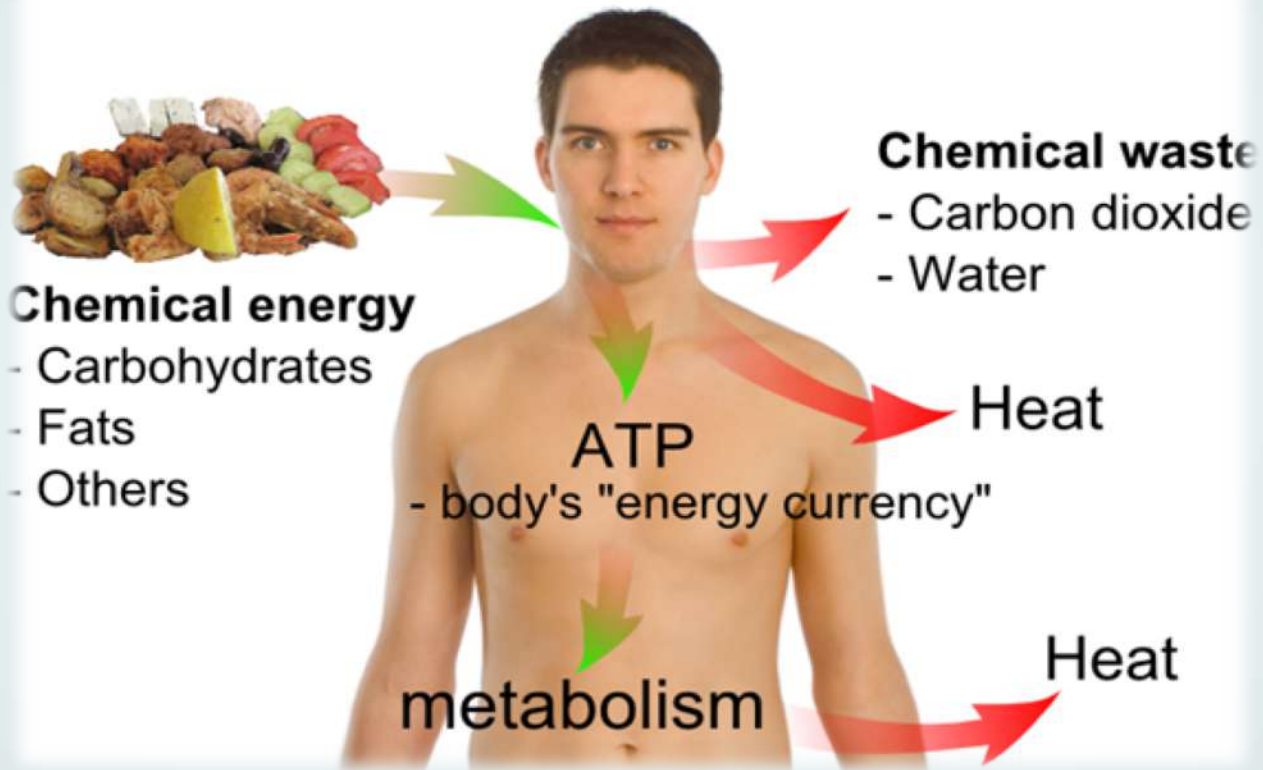
CATABOLIC PATHWAY



catabolic this type of pathway releases energy and is used to break down large molecules into smaller ones (degradation).

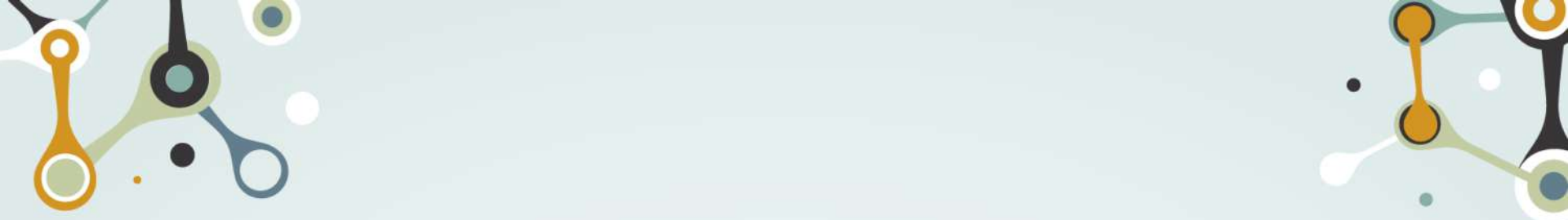


Basic overview of
Energy and human life



AMPHIBOLIC PATHWAY

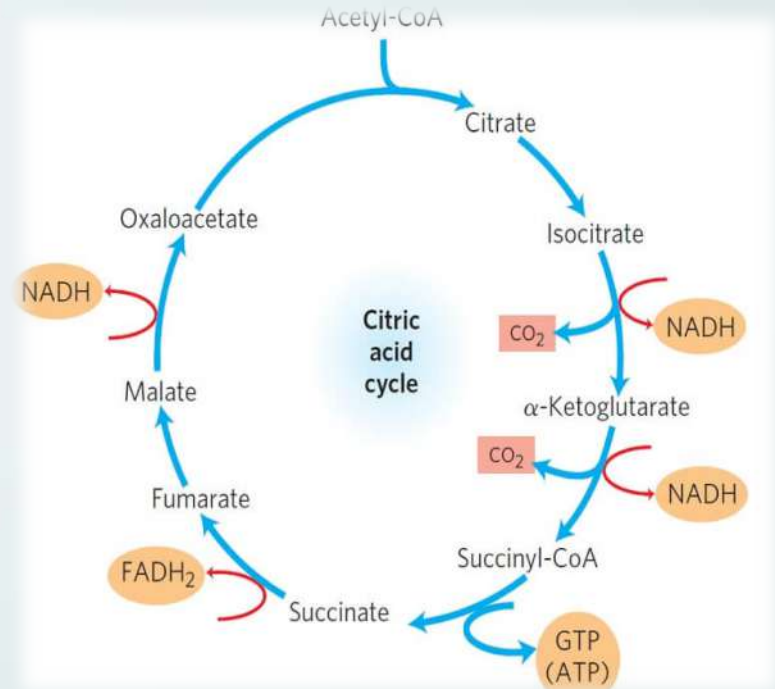




Amphibolic pathways are seen at cross-roads of metabolism, where both anabolic and catabolic pathways are linked.

The examples of amphibolic reactions

An important example of an amphibolic pathway is the Krebs cycle, which involves both the catabolism of carbohydrates and fatty acids and the synthesis of anabolic precursors for amino-acid synthesis (e.g. α -ketoglutarate and oxaloacetate).



SUMMARY

Metabolic pathways

Anabolic: Small molecules are assembled into large ones. *Energy is required.*



Catabolic: Large molecules are broken down into small ones. *Energy is released.*



Amphibolic pathways are seen at cross-roads of metabolism, where both anabolic and catabolic pathways are linked.

References

1

<https://courses.lumenlearning.com/wmbiology1/chapter/reading-anabolic-and-catabolic-pathways-2/>

2

<https://www.bbc.co.uk/bitesize/guides/zm6j47h/revision/1>

3

<https://www.oxfordreference.com/view/10.1093/oi/authority.20110803095409505>

4

A dugna S.,(2004). Medical biochemistry. 4th ed: USAID.

The image features a light blue background with a central, faint circular glow. The word "THANKS!" is written in a bold, orange, sans-serif font in the center. The background is decorated with abstract, stylized shapes and lines in various colors: teal, orange, white, and black. These shapes resemble interconnected nodes or droplets, some with circular centers and others with elongated, teardrop-like forms. Scattered throughout the background are small, solid circles in white, black, and teal. The overall aesthetic is clean, modern, and celebratory.

THANKS!