

The logo of Galgotias University is a circular emblem with three curved, overlapping bands in shades of yellow, blue, and red, creating a sense of motion or a stylized 'G'.

Basic Circuit of metabolism-II

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Introduction:

- **Metabolism**, the sum of all the chemical transformations taking place in a cell or organism, occurs through a series of enzyme-catalyzed reactions that constitute **metabolic pathways**.
- Each of the consecutive steps in a metabolic pathway brings about a specific, small chemical change, usually the removal, transfer, or addition of a particular atom or functional group.
- The precursor is converted into a product through a series of metabolic intermediates called metabolites.

METABOLISM

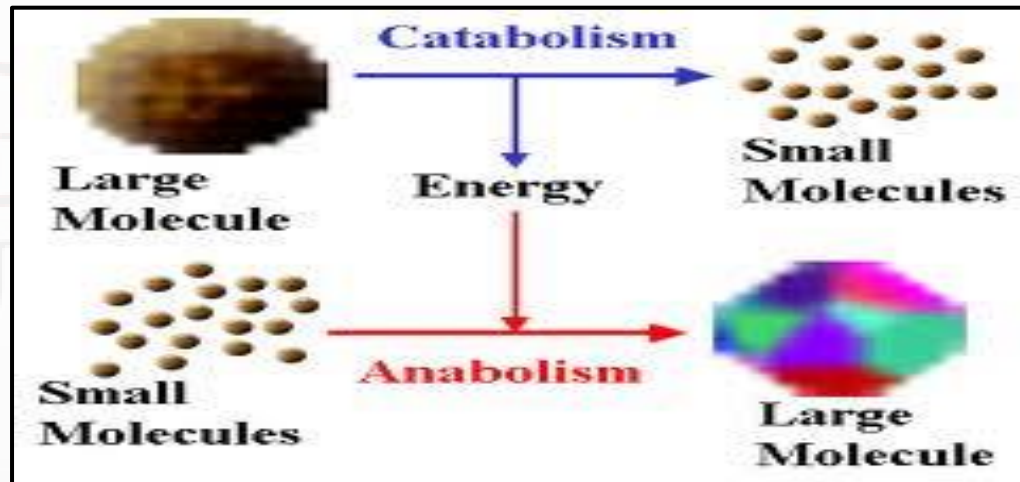


CATABOLISM

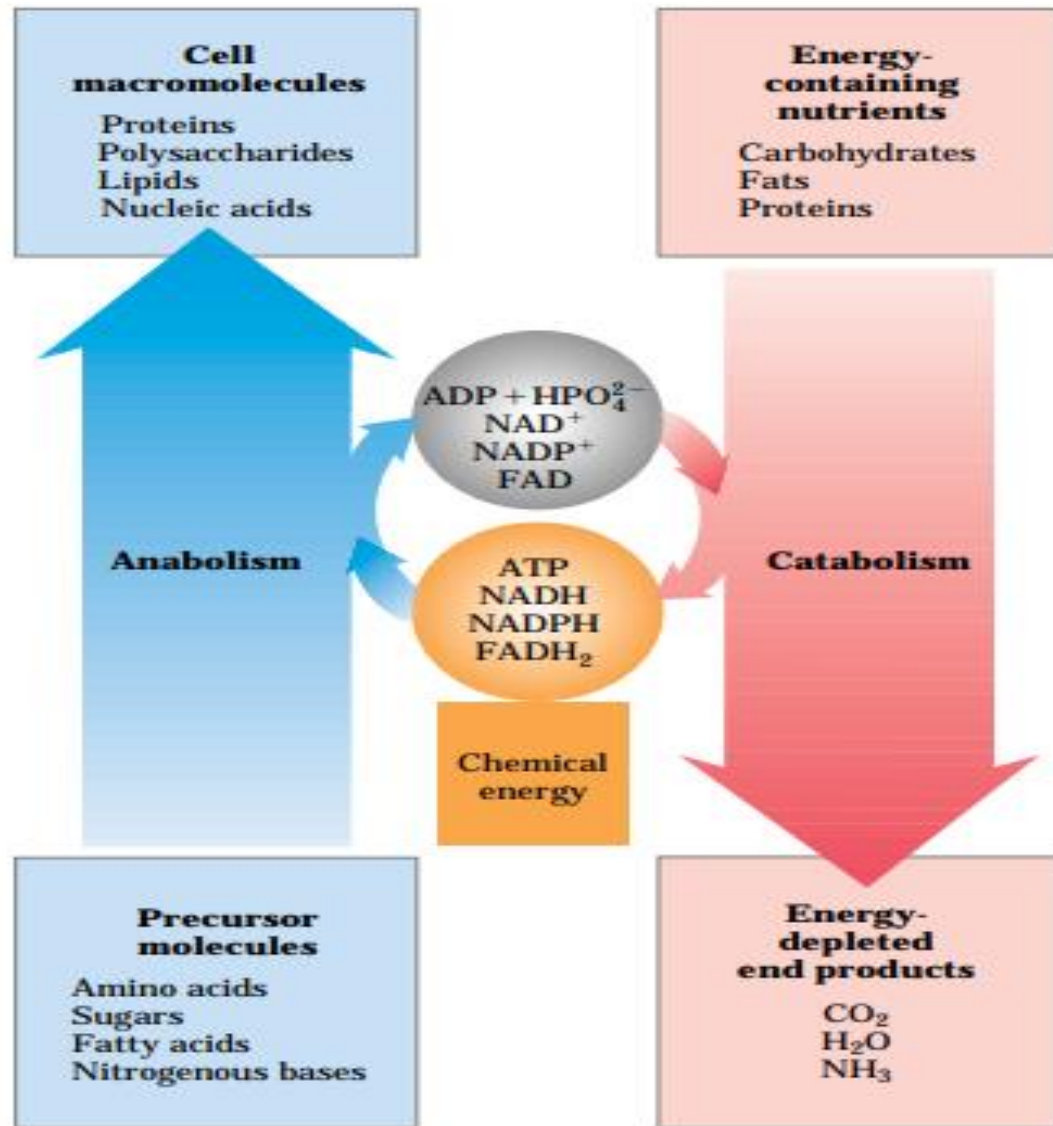
Catabolism is the degradative phase of metabolism in which organic nutrient molecules (carbohydrates, fats, and proteins) are converted into smaller, simpler end products (such as lactic acid, CO₂, NH₃).

ANABOLISM

In anabolism, also called biosynthesis, small, simple precursors are built up into larger and more complex molecules, including lipids, polysaccharides, proteins, and nucleic acids.



Energy relationships between catabolic and anabolic pathways.



- Catabolic pathways release energy, some of which is conserved in the formation of ATP and reduced electron carriers (NADH, NADPH, and FADH₂)

- Anabolic reactions require an input of energy, generally in the form of ATP and the reducing power of NADH, NADPH, and FADH₂

- Some metabolic pathways are linear, and some are branched, yielding multiple useful end products from a single precursor or converting several starting materials into a single product.

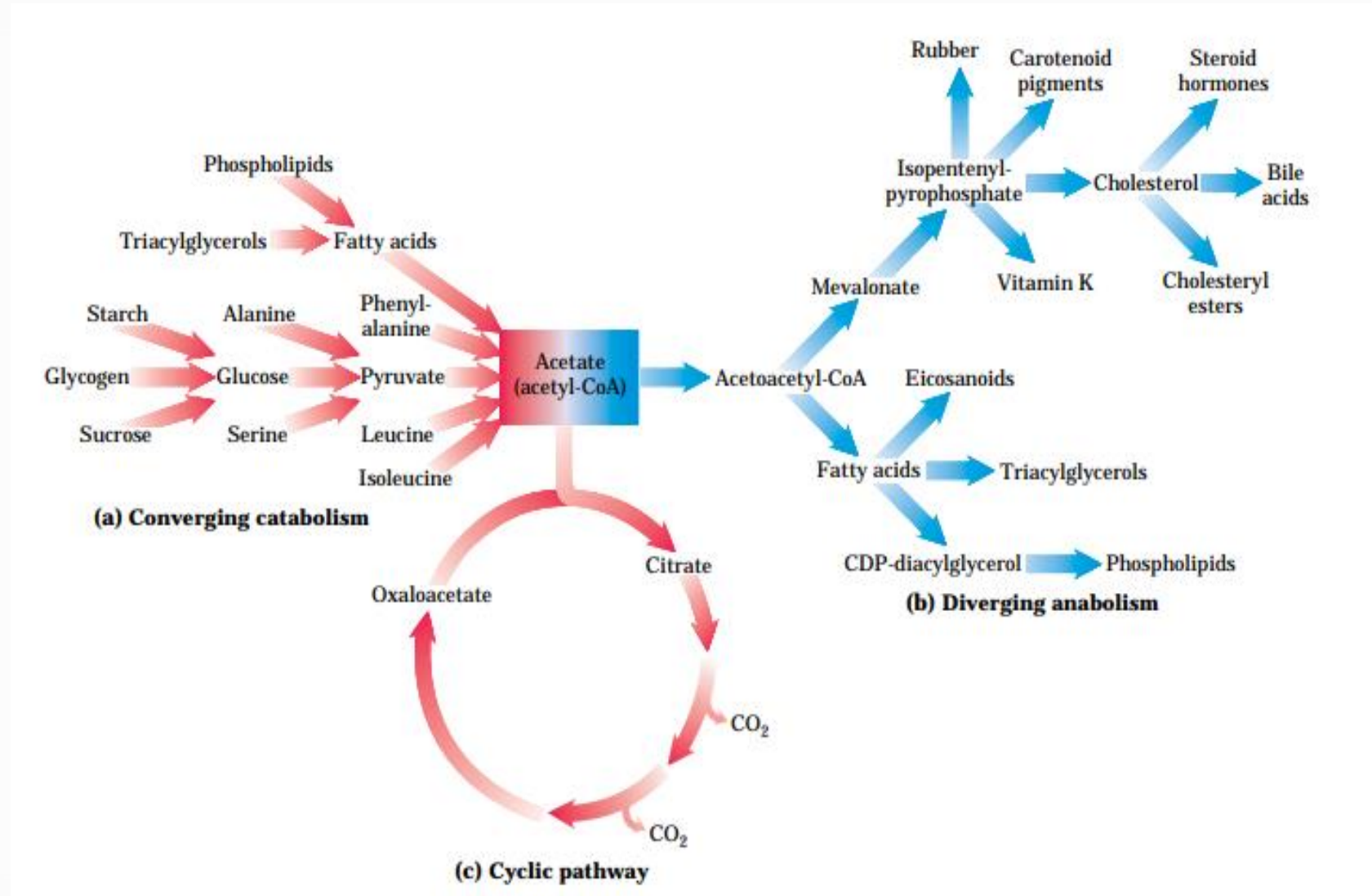
- Catabolic pathways are convergent

- Anabolic pathways divergent.

- Cyclic pathway: one starting component of the pathway is regenerated in a series of reactions that converts another starting component into a product.

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Three types of nonlinear metabolic pathways



(a) Converging, catabolic: Acetate, a key metabolic intermediate, is the breakdown product of a variety of fuels

(a) Diverging anabolism: Acetate serves as the precursor for an array of products.

(a) Cyclic pathway: is consumed in the catabolic pathway known as the citric acid cycle.

Reference:

Lehninger, Albert L., Cox, Michael M.Nelson, David L.**Lehninger** Principles Of Biochemistry. New York : W.H. Freeman, 2008.



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