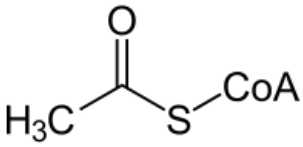
Intermediate products of energy metabolism

In cells, there are metabolic pathways – a kind of crossroads of mutual transformation of nutrients. These include the ``pyruvate dehydrogenase reaction' **(PDH), the ``Krebs cycle** (KC) and the **respiratory chain** (DŘ). Three intermediates, **acetyl-CoA, pyruvate'** and **NADH**, have an important position in energy metabolism.

Acetyl-CoA



Creation

Pyruvate dehydrogenase reaction (PDH)
: The irreversibility of this reaction is the reason that glucose cannot be formed from the vast majority of fatty acids.

Degradation of amino acids
: Lysine and leucine are degraded directly to acetyl-CoA, other amino acids are converted via pyruvate.

β-oxidation of fatty acids and degradation of ketone bodies.

Usage

- The Krebs cycle, which is followed by the respiratory chain (and ATP production).
- Synthesis of fatty acids and ketone bodies (with an excess of acetyl-CoA).
- Cholesterol synthesis.

Pyruvate

Pyruvate

Creation

1. Aerobic glycolysis.
2. Lactate oxidation (catalyzed by lactate dehydrogenase).
3. Degradation of some AKs.

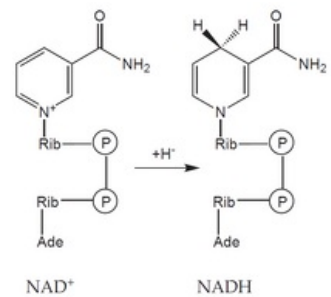
Usage

- Synthesis of acetyl-CoA (PDH).
- Lactate synthesis – takes place during anaerobic glycolysis, the purpose of which is to regenerate reduced coenzymes NADH + H^+ back to NAD^+.
- Alanine synthesis (catalyzed by alanine aminotransferase).
- Synthesis of oxaloacetate (catalyzed by pyruvate carboxylase).
- Gluconeogenesis.

NADH

Creation

1. Aerobic glycolysis
2. Pyruvate dehydrogenase reaction.
3. Beta-oxidation of fatty acids.
4. Krebs cycle.
5. Oxidation of ethanol.



NAD^+ – NADH

Usage

- The respiratory chain and the formation of ATP.
- Conversion of pyruvate to lactate.

Link

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