

# Oxidative phase of the pentose cycle

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Last update: Wednesday, 15 Feb 2023 at 1.54 am.

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In addition to AcCoA, **propionyl-CoA** is also formed by oxidation of odd-chain fatty acids. This is first **carboxylated to methylmalonyl-CoA**, which is converted to **succinyl-CoA** - an intermediate of the **Krebs cycle**. Through conversion to oxaloacetate, it can participate in **gluconeogenesis** - glucose can be synthesized from these fatty acids. However, very few fatty acids with an odd number of carbon atoms are found in the body.

## Links

### Related Articles

- Oxidation of very long chain fatty acids
- Oxidation of unsaturated fatty acids
- Regulation of beta-oxidation of fatty acids
- Lipid breakdown and ketone body metabolism

### Source

Fontana J., Trnka J., Maďa P., Ivák P. et al.: Transformation of substances and energy in the cell. In: Functions of cells and the human body : Multimedia scripts. Available online from: [1] (<http://fbt.cz/skripta/ii-premena-latek-a-energie-v-bunce/>)

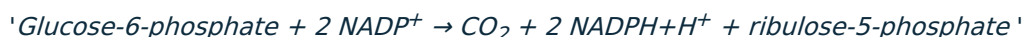
The **pentose cycle** is a catabolic event that provides reduced cofactors NADPH and five-carbon saccharides, or pentoses. It is a metabolic conversion of glucose, the goal of which is not the creation of ATP.

## Course of the oxidative phase of the pentose cycle

During the *oxidative phase* of the pentose cycle, the glucose-6-P molecule is oxidized to the ribulose-5-P molecule. At the same time, CO<sub>2</sub> is released and two NADPH + H<sup>+</sup> molecules are obtained.

File:Oxidation.jpg  
Scheme of the oxidative phase of the pentose cycle

Its course is summarized by the following equations:



Of the reactions of the first phase, the initial reaction catalyzed by *glucose-6-phosphate dehydrogenase* is important. This **irreversible reaction is the main regulatory step of the pentose cycle**.

## The rate of the oxidative phase of the pentose cycle

The **speed** of the entire metabolic pathway depends on the activity of two dehydrogenation reactions, which depend on the availability of NADP<sup>+</sup> (i.e. the oxidized form of the coenzyme). With a lack of NADP<sup>+</sup>, the rate of the pentose cycle decreases, in other words: an excess of NADPH "slows down" the oxidative phase of the pentose cycle.

## Links

### Related Articles

- Pentose cycle
- NADPH

## External links

- Pentose cycle (Czech Wikipedia) ([https://cs.wikipedia.org/wiki/Pent%C3%B3zofosf%C3%A1tov%C3%BD\\_cyklus%7C](https://cs.wikipedia.org/wiki/Pent%C3%B3zofosf%C3%A1tov%C3%BD_cyklus%7C))