**Lesson 12 – Metabolism of fatty acids and glycerol**

**1. β-oxidation**

What is β-oxidation?

What is the function of β-oxidation?

Where doesn't the β-oxidation take place? Why?

Fill in the table

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Enzyme | Enzyme class | Substrates | Products | What happens in the reaction? | How many ATP molecules are produced/used in the reaction? | Regulation |
| Transport into mitochondria |
| Carnitine palmitoyltransferase I |  |  |  |  |  |  |
| Carnitine-acylcarnitine translocase |  |  |  |  |  |  |
| Carnitine palmitoyltransferase II |  |  |  |  |  |  |
| β -oxidation |
| acyl CoA dehydrogenase |  |  |  |  |  |  |
| enoyl CoA hydratase |  |  |  |  |  |  |
| β -hydroxyacyl-CoA dehydrogenase |  |  |  |  |  |  |
| β-ketothiolase (thiolase) |  |  |  |  |  |  |

What is the difference between the oxidation of saturated and unsaturated fatty acids?

**2. Synthesis of fatty acids**

Fill in the table

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Enzyme | Enzyme class | Substrates | Products | What happens in the reaction? | How many ATP molecules are produced/used in the reaction? | Regulation |
| Acetyl-CoA carboxylase |  |  |  |  |  |  |
| Fatty acid synthetase |  |
| Malonyl CoA:ACP transacylase |  |  |  |  |  |  |
| β -ketoacyl-ACP synthase |  |  |  |  |  |  |
| β -ketoacyl-ACP reductase |  |  |  |  |  |  |
| β -Hydroxyacyl ACP dehydrase |  |  |  |  |  |  |
| Enoyl-ACP reductase |  |  |  |  |  |  |

**3. Glycerol metabolism**

Fill in the table

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Enzyme | Enzyme class | Substrates | Products | What happens in the reaction? | How many ATP molecules are produced/used in the reaction? | Regulation |
| Glycerol breakdown |
| Glycerol kinase |  |  |  |  |  |  |
| Glycerol phosphate dehydrogenase |  |  |  |  |  |  |
| Reaction of glycolysis |  |  |  |  |  |  |
| Glycerol synthesis |
| Reaction of glycolysis |  |  |  |  |  |  |
| Glycerol phosphate dehydrogenase |  |  |  |  |  |  |
| Glycerol-3-phosphatase |  |  |  |  |  |  |