**Lesson 13 – Metabolism of ketone bodies and cholesterol. Lipoproteins**

**1. Ketone bodies**

What is ketone bodies?

What is the function of ketone bodies?

Where are ketone bodies formed?

What tissues can use ketone bodies?

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 |
| Synthesis | | | | | | |
| Thiolase |  |  |  |  |  |  |
| HMG-CoA synthase |  |  |  |  |  |  |
| HMG-CoA lyase |  |  |  |  |  |  |
| β-hydroxybutyrate dehydrogenase |  |  |  |  |  |  |
| Acetoacetate decarboxylase (or nonenzymatic decarboxylation) |  |  |  |  |  |  |
| Breakdown | | | | | | |
| β-hydroxybutyrate dehydrogenase |  |  |  |  |  |  |
| Succinyl CoA:acetoacetyl CoA transferase |  |  |  |  |  |  |
| Acetoacetyl CoA thiolase (thiolase) |  |  |  |  |  |  |

**2. Cholesterol**

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 |
| Synthesis | | | | | | |
| Thiolase |  |  |  |  |  |  |
| HMG-CoA synthase |  |  |  |  |  |  |
| HMG-CoA reductase |  |  |  |  |  |  |

What structure does cholesterol have?

What is synthesized in the body from cholesterol?

What role does cholesterol play in cell membranes?

How is excess cholesterol excreted from the body?

**3. Lipoproteins**

Fill in the table

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Type of LP | Chylomicrons | VLDL | IDL | LDL | HDL |
| Name |  |  |  |  |  |
| Where are they formed? |  |  |  |  |  |
| Function |  |  |  |  |  |
| Structure:  % of proteins  % of TAGs  % of phospholipids  % of cholesterol / cholesterol ester |  |  |  |  |  |