

Fatty Acid Metabolism

I. Background

- A. Structure
- B. Physiological roles
- C. Digestion and transport
 - 1. lipase
 - 2. serum albumin
- D. Glycerol fate
 - a. Phosphorylated
 - 1) glycerol kinase
 - b. oxidized
 - 1) glycerol 3-phosphate dehydrogenase
 - c. isomerized
 - 1) triose phosphate isomerase

II. Activation and Transport

- A. Activation
 - 1. acyl-CoA synthase
 - 2. Two step reaction
 - 3. Carnitine Shuttle
 - 4. carnitine acyltransferase I
 - 5. acyl-carnitine/carnitine transporter
 - 6. carnitine acyltransferase II
 - 7. Reasoning

III. FA nomenclature

IV. Beta Oxidation

- A. Saturated, even number C FA
 - 1. dehydrogenation
 - a. acyl-CoA dehydrogenase (AD)
 - 2. hydration
 - a. enol-CoA hydratase (EH)
 - 3. dehydrogenation
 - a. β -hydroxyacyl-CoA dehydrogenase
 - 4. thiolysis
 - a. acyl-CoA acetyltransferase
 - 5. Energy
- B. Unsaturated FA chains
 - 1. structure
 - 2. Monounsaturated FAs
 - a. enoyl-CoA isomerase
 - 3. Polyunsaturated FA
 - a. 2,4-dienol-CoA reductase

C. Odd numbered FA chains

- a. propionate
- 1. propionyl-CoA
- 2. 3 additional enzymes
 - a. carboxylated
 - 1) methylmalonyl-CoA
 - 2) propionyl-CoA carboxylase
 - b. epimerized
 - 1) methylmalonyl-CoA epimerase
 - c. intrameolecular rearrangement
 - 1) succinyl-CoA
 - 2) methylmalonyl-CoA mutase

V. Ketone bodies

- 1. acetone
- 2. acetoacetate
- 3. D- β -hydroxybuterate