

## Lecture 9

2/16/2021

Fermentation:

Acetoacetate decarboxylase; story of Israel

Pyruvate Oxidation Overview

- I. Pyruvate Oxidation: Acetyl CoA production
- II. Acetyl CoA oxidation: CO<sub>2</sub> production
- III. Electron Transfer and Oxidative Phosphorylation (H<sub>2</sub>O production)

Compartmentation: mitochondria

Pyruvate Dehydrogenase COMPLEX

pyruvate dehydrogenase (E1)  
dihydrolipoyltransacetylase(E2)  
dihydrolipoyldehydrogenase (E3)-reoxidizes lipoic acid  
Cryo electron microscopy

Structure: box in a box (E1 subunit is bigger, E2 subunit is smaller.  
Outside is composed of E1 and E3 subunits and E2 subunits-alpha trimers- are inside.)

- I. pyruvate dehydrogenase (E1)
  1. TPP - carbon dioxide formed
  2. Lipoic acid acylation/reduction
- II. dihydrolipoyltransacetylase (E2)
  3. Disulfide exchange with CoASH  
acetyl-CoA formed
- III. dihydrolipoyldehydrogenase (E3)
  4. Re-oxidation of lipoic acid through FAD/2Cys to NAD<sup>+</sup> to make NADH