

Metabolic Pathways Overview

Glycolysis

- Glucose → 2 Pyruvate
- Net: 2 ATP, 2 NADH
- Cytoplasmic pathway
- Aerobic and anaerobic

TCA Cycle

- Acetyl-CoA oxidation
- Produces NADH, FADH₂
- Mitochondrial matrix
- Central metabolic hub

Oxidative Phosphorylation

- Electron transport chain
- Proton gradient formation
- ATP synthase
- ~30-32 ATP per glucose

Pathway Integration

- Metabolic flux control
- Allosteric regulation
- Hormonal control
- Compartmentalization