

Energy and Metabolism

(A lot of this is review. * Read on your own)

A simplified view of metabolism*

ATP: structure, high-energy bonds, handout

ATP Synthesis by 3 mechanisms
Substrate level phosphorylation
Oxidative phosphorylation
Photophosphorylation

Energy flow in metabolism: fig 8.8*

Structure and function of NAD/NADH; NADP/NADPH: fig 8.9*
Biologically important redox potentials: Figure 8.7*

Catabolism/degradative/exergonic
Overview: fig 9.3
Amphibolic pathways: fig 9.4

Breakdown of glucose to pyruvate: generation of ATP
Glycolysis: fig 9.5, handout
Pentose phosphate pathway: fig 9.6, 9.7

TCA cycle: generation of ATP
Fig 9.12 and handout

Electron transport chain: generation of ATP
Fig 9.13 and handout

Summary of ATP produced from 1 molecule of glucose: handout

Anaerobic respiration: Inorganic electron acceptors Table
9.3

Fermentation: Organic electron acceptors, fig 9.9
Regeneration of NAD and some ATP synthesis

Photophosphorylation: During the light reactions of*
photosynthesis. Formation of ATP and NADP

Biosynthesis

Synthetic / anabolic / endergonic

Construction of cells*

Biosynthesis in *E. coli* Table 10.1

Photosynthesis: Dark/Calvin cycle figs 10.3, 10.4

Photosynthetic fixation of CO₂

Carboxylation phase

Reduction phase

Regeneration phase

Gluconeogenesis: Synthesis of glucose from non-carbohydrate precursors fig 10.5

Organization of anabolism: Fig 10.17