

Microbial Metabolism

Chapter 5

Student Required Vocabulary

Phototrophs
Chemotrophs
Autotrophs
Heterotrophs

Now put the terms together

Chemoheterotroph
Chemoautotroph
Photoheterotroph
Photoautotroph

Lecture Outline

I. Reactions

A. Metabolism

1. anabolism
2. catabolism
3. exchange reaction

II. Enzymes

A. Collision theory

1. activation E

B. Catalyst

C. Enzyme structure

1. substrates
2. active site
3. products

D. Naming

E. Cofactors

1. apoenzyme
2. holoenzyme
3. cofactors
 - a. coenzyme
 - 1) NAD⁺, NADP⁺, FAD, coenzyme A

F. Activity

G. Inhibitors

1. competitive
2. noncompetitive
 - a. allosteric
3. feedback inhibition

III. Energy Use Comparison

IV. Exchange Reaction Energy

A. Energy-carrier molecules

1. ATP
2. electron carriers

B. Pathways

V. Carbohydrate Catabolism

A. Cellular respiration

B. Fermentation

VI. Glycolysis

A. Notes

B. Glucose activation

- a. fructose 1,6 *bis*phosphate

C. Energy harvest

- a. glyceraldehyde 3-phosphate
1. pyruvate

VII. Cellular Respiration

A. Decarboxylation - Hub reaction

- a. acetyl CoA

B. Krebs cycle

1. Notes
2. Process
3. Krebs Totals

C. Electron transport chain

1. notes
2. process
3. chemiosmosis
 - a. proton motive force
4. ATP synthase
5. Subtotals
6. etc Totals

VIII. Final totals

A. Substrate-level phosphorylation

B. Oxidative phosphorylation

IX. Anaerobic fermentation

A. Overview

B. Glycolysis

C. pyruvate

1. regenerate NAD⁺ from NADH

D. Fermentation products

1. Alcohol
2. Acids
 - a. Butyric acid
 - b. Propionic acid
 - c. Lactic acid

X. Photosynthesis



1. C fixation