

# MICROBIOLOGY

## METABOLISM II

7. FERMENTATIONS
    - a. SUGARS (OR OTHER ORGANICS)
    - b. NO OXYGEN
    - c. AN ORGANIC MOLECULE AS ELECTRON ACCEPTOR
      - 1) LACTIC ACID FERMENTATION
      - 2) ALCOHOLIC FERMENTATION
      - 3) MIXED ACID FERMENTATION
      - 4) OTHERS (EG. ACETIC ACID FERMENTATION)
  8. ENERGETICS OF CATABOLISM
    - a. FERMENTATIONS vs. RESPIRATION
    - b. TYPES OF ATP PRODUCTION
    - c. 2 vs. about 30 ATPs
- B. ANABOLISM
1. GENERAL CONSIDERATIONS
    - a. BIOSYNTHETIC PATHWAYS
    - b. REQUIRE ENERGY (ATP) AND REDUCING POWER (NADPH)
    - c. SYNTHESIS OF METABOLITES (EG. HISTIDINE)
    - d. SYNTHESIS OF BIOPOLYMERS (EG. PROTEINS)
  2. SUGAR METABOLISM
    - a. CENTRAL PATHWAY
    - b. ACTIVATION OF SUGARS (EG. UDP-GLUCOSE)
    - c. GLUCONEOGENESIS
    - d. SYNTHESIS OF POLYSACCHARIDES
  3. AMINO ACID METABOLISM
    - a. KEY INTERMEDIATES & CARBON SKELETONS
    - b. AMMONIA FIXATION AND GLUTAMATE DHASE
    - c. TRANSAMINATION
    - d. THE AMINO ACID FAMILIES
      - 1) SERINE AND THE AROMATICS - GLYCOLYSIS
      - 2) ALANINE, VALINE & LEUCINE - PYRUVATE
      - 3) ASPARTATE & GLUTAMATE - TCA CYCLE
      - 4) HISTIDINE
    - e. PROTEIN SYNTHESIS
  4. PURINES AND PYRIMIDINES
- III. INTEGRATION OF METABOLISM
- A. CATABOLIC & ANABOLIC PATHWAYS
  - B. AMPHIBOLIC PATHWAYS
  - C. REGULATION AT THE ENZYME LEVEL
    1. REGULATION OF ACTIVITY (NOT AMOUNT OF ENZYME)
    2. PRODUCT INHIBITION
    3. FEEDBACK INHIBITION
      - a. PATHWAYS & KEY STEPS
      - b. GENERALLY FIRST (OR COMMITTED) STEP
      - c. ALLOSTERISM
      - d. ISOZYMES
    4. COVALENT ENZYME MODIFICATION
      - a. AMP OR ADP ADDITION
      - b. PHOSPHORYLATION