Keeping the Hamster Moving…
Microbial Metabolism
Part II

Fermentation

- Releases energy from oxidation of organic molecules
- Does not require oxygen
- Does not use the Krebs cycle or ETC
- Uses an organic molecule as the final electron acceptor
- Alcohol fermentation. Produces ethyl alcohol + CO_2
- Lactic acid fermentation. Produces lactic acid.
    - Homolactic fermentation. Produces lactic acid only.
    - Heterolactic fermentation. Produces lactic acid and other compounds.

Types of fermenters

- Facultative anaerobes
    - Fermentation in the absence of oxygen
    - Respiration in the presence of oxygen
    - Ex. *Escherichia coli*
- Strict fermenters
    - No respiration
    - Ex. yeast

Photosynthesis

- Photo: Conversion of light energy into chemical energy (ATP)
    - Light-dependent (light) reactions
- Synthesis: Fixing carbon into organic molecules
    - Light-independent (dark) reaction, Calvin-Benson cycle
- Oxygenic:
  $6\ CO_2 + 12\ H_2O + \text{Light energy} \rightarrow C_6H_{12}O_6 + 6\ O_2 + 6\ H_2O$
- Anoxygenic:
  $CO_2 + 2\ H_2S + \text{Light energy} \rightarrow [CH_2O] + 2\ A + H_2O$