CATABOLISM

as it relates to CHEMOTROPHIC organisms

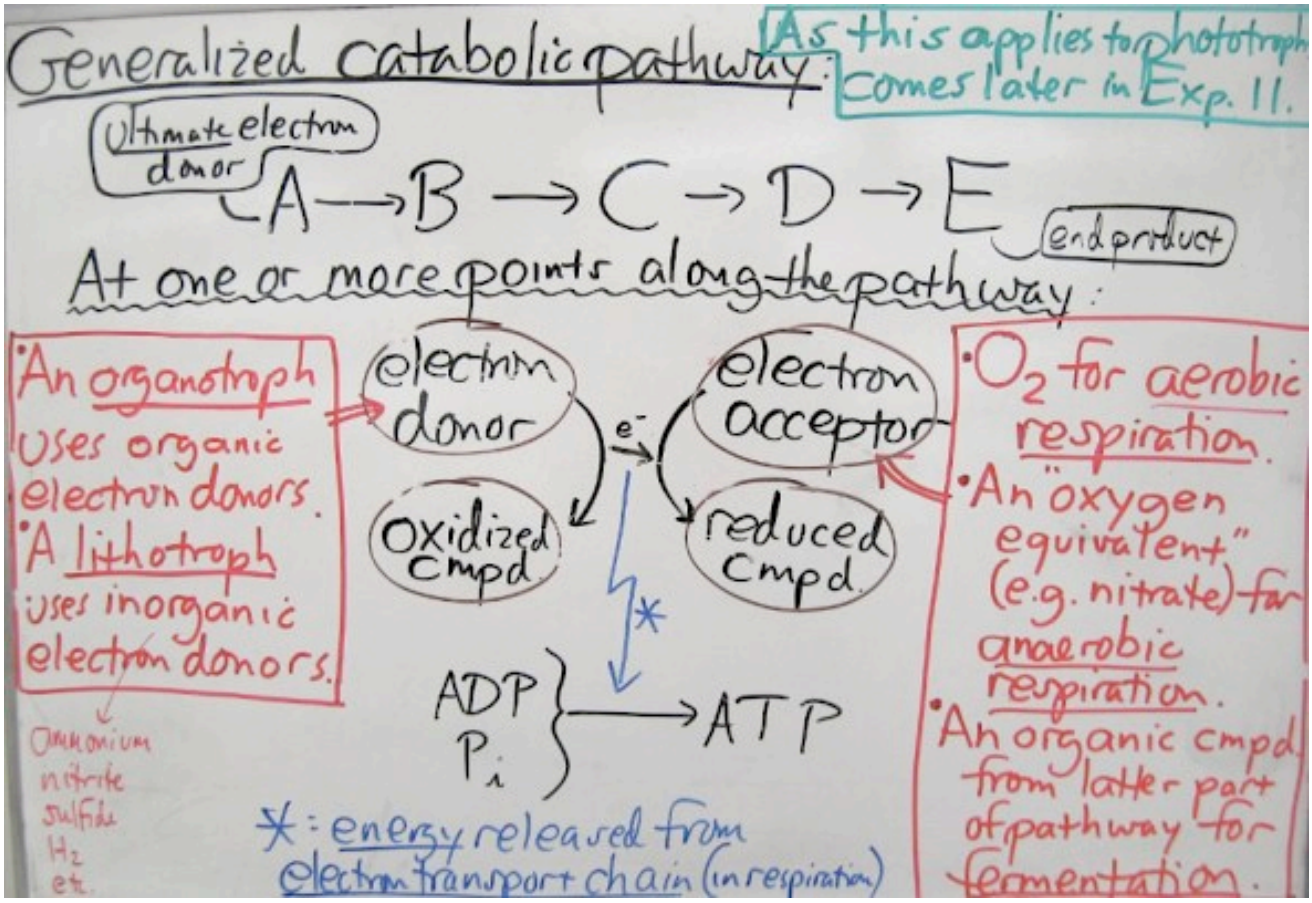
For any given chemotrophic organism, this is accomplished by one or more of the following processes:

- AEROBIC RESPIRATION
- ANAEROBIC RESPIRATION
- FERMENTATION

The following ultra-generalized diagram (intermediates are not shown) shows "electron transfer" which can occur at various points along a **catabolic pathway** which is where a compound is sequentially broken down by an organism's metabolic enzymes with the release of electrons.

The nature and role of the final electron acceptor is indicated which helps to differentiate the processes of **aerobic respiration**, **anaerobic respiration** and **fermentation**; note that for respiration, an "outside" electron acceptor is utilized as the ultimate electron acceptor (either oxygen or an equivalent compound).

This diagram also helps to differentiate the terms **organotroph** and **lithotroph** – each of which can be combined with "chemo" to form the terms "chemoorganotroph" and "chemolithotroph" which would thus be specific for chemotrophic organisms.



More about catabolism (utilizing ultra-generalized figures) can be found on our catabolism page at http://www.jlindquist.net/generalmicro/102catabolism.html , and certainly one gets into details about these processes for different organisms in textbooks and lecture material.

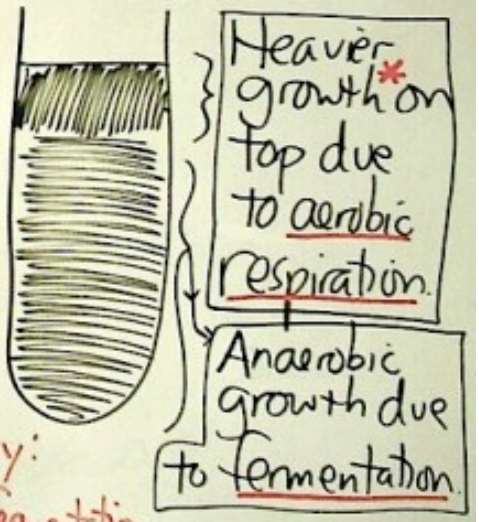
Associated with aerobic respiration and fermentation is the test for "oxygen relationships" whose use **and limitations** are explained in Experiment 5A (with the associated virtual experiment) and also on our page at http://www.jlindquist.net/generalmicro/dfthiognf . A summary diagram follows:

3 things that determine oxygen relationships when tested with Thioglycollate Medium:

1. Oxygen tolerance?
2. Ability to respire (with O_2)?
3. Ability to ferment?

Example:

"Facultative Anaerobe"



* efficiency: respiration > fermentation

(updated 4/11/11)