

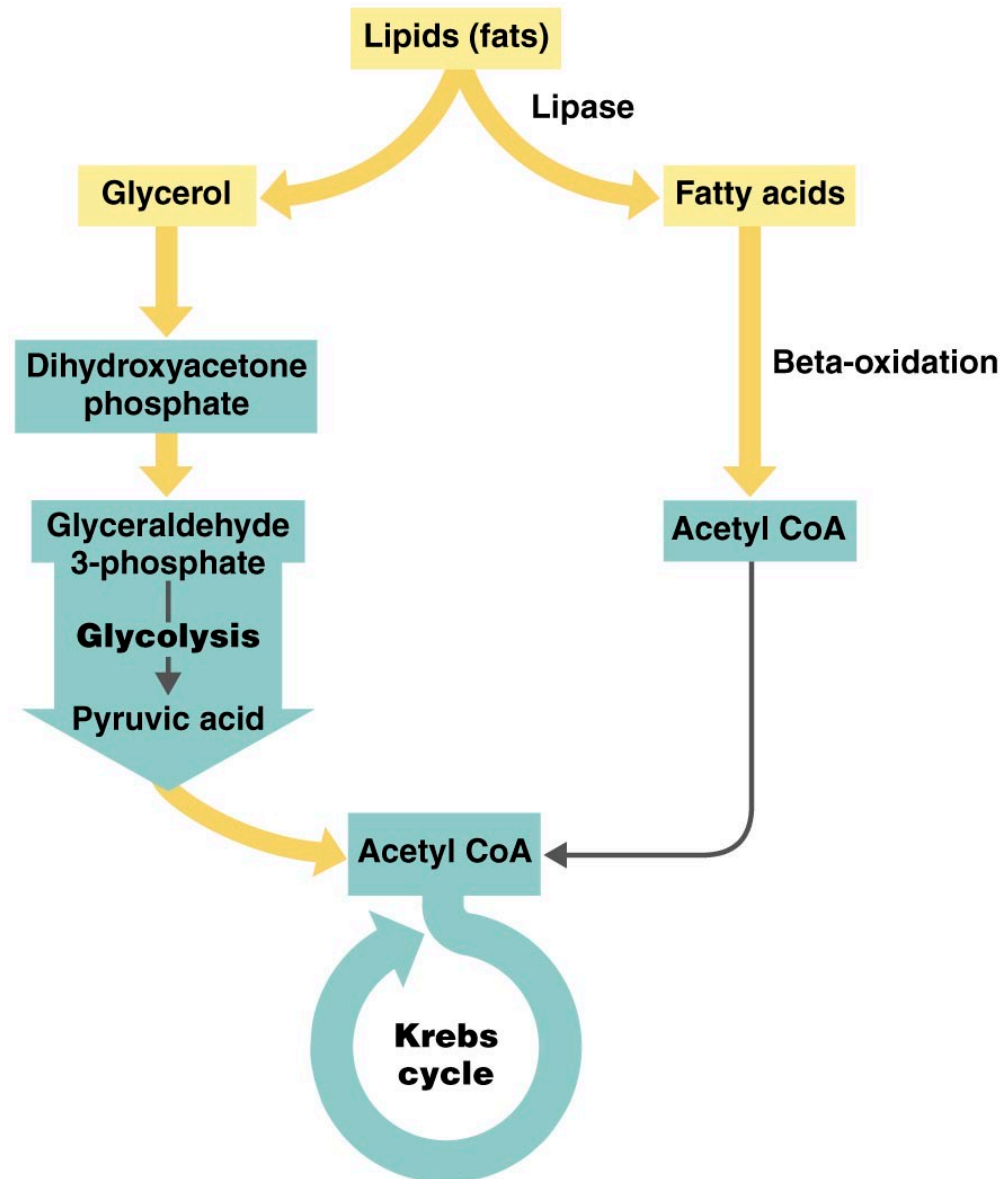
Till now we have discussed about carbohydrate catabolism...

Now we move to other macromolecules catabolism...

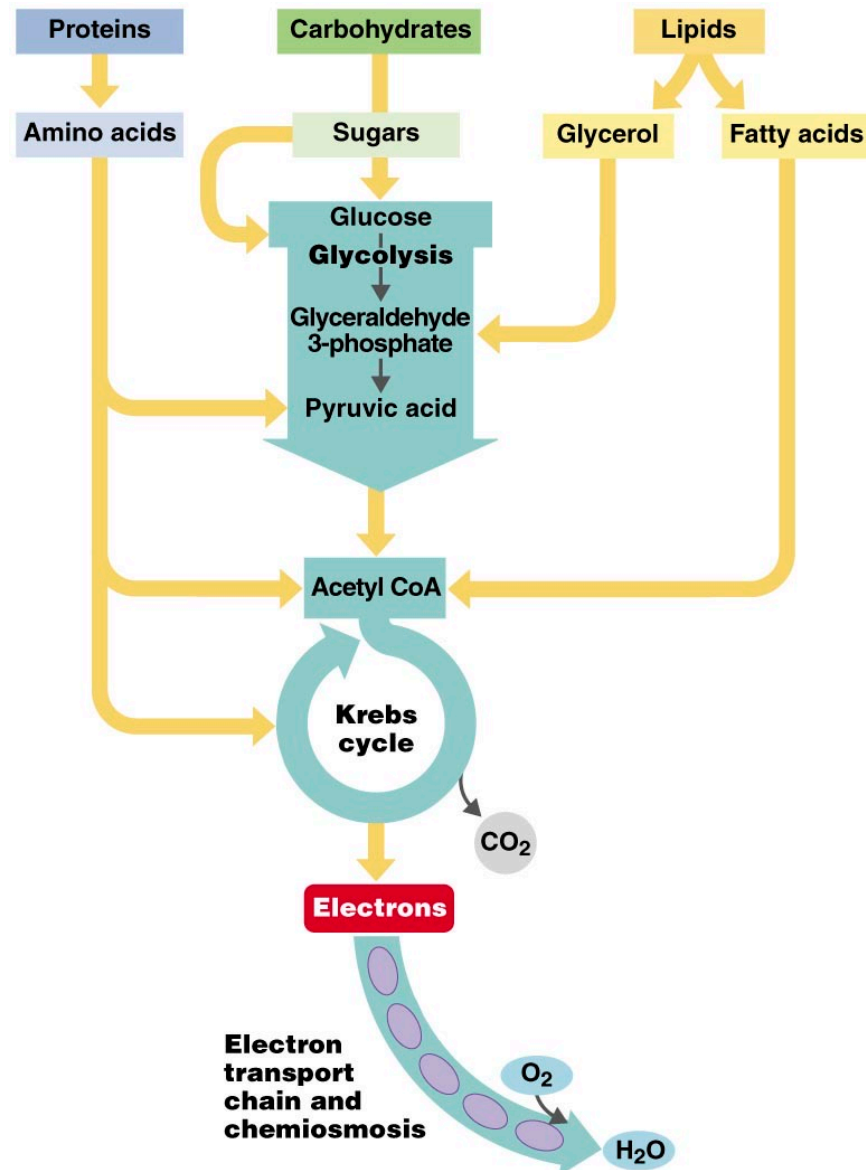
Lecture 15
BT 206
16/02/23

Lipid Catabolism

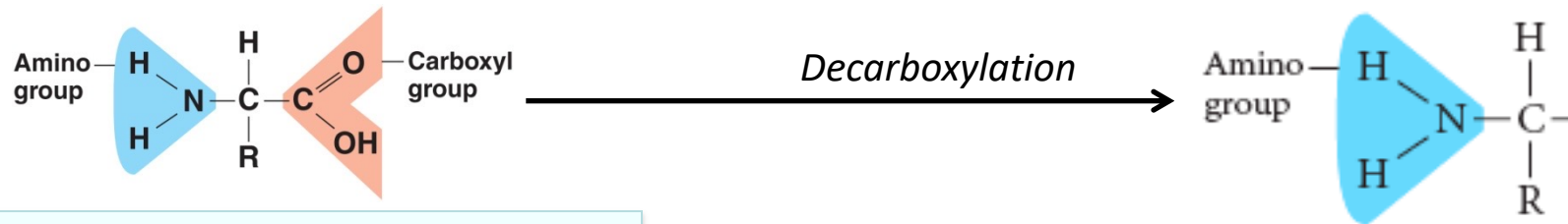
- Lipases hydrolyze lipids into glycerol and fatty acids.
- Catabolic products can be further broken down in glycolysis and the Krebs cycle.



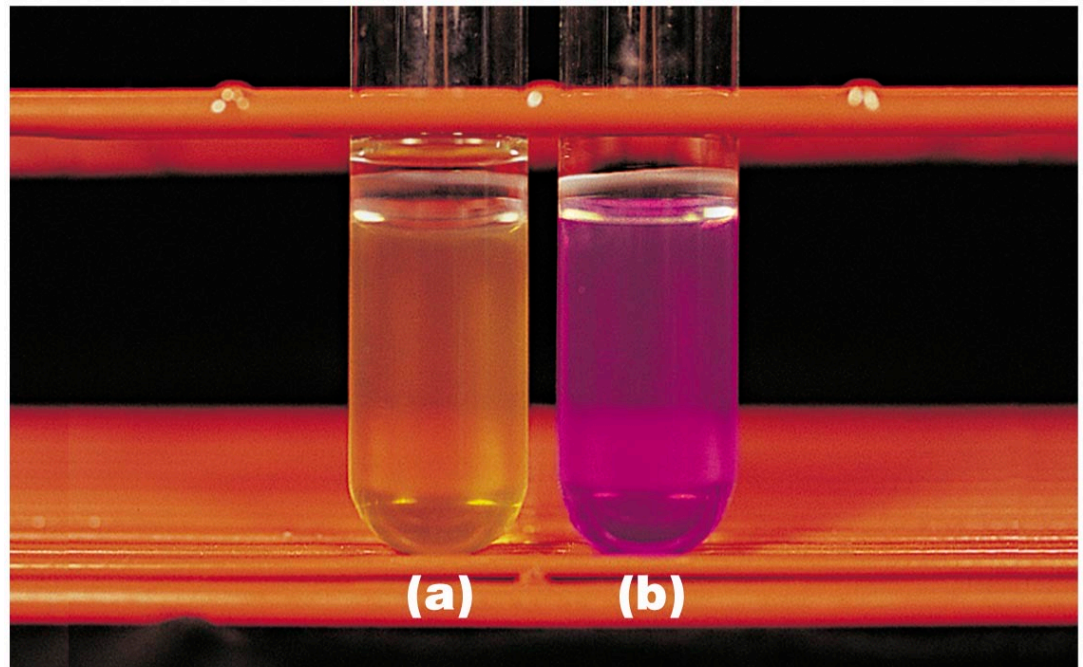
Catabolism of Organic Food Molecules



Protein Catabolism



- Before amino acids can be catabolized, they must be converted to various substances that enter the Krebs cycle.
- Here bacteria is inoculated in tubes containing glucose, pH indicator and specific amino acid.
- a) turns yellow when glucose is utilized
- b) turns purple from decarboxylation of amino acid.

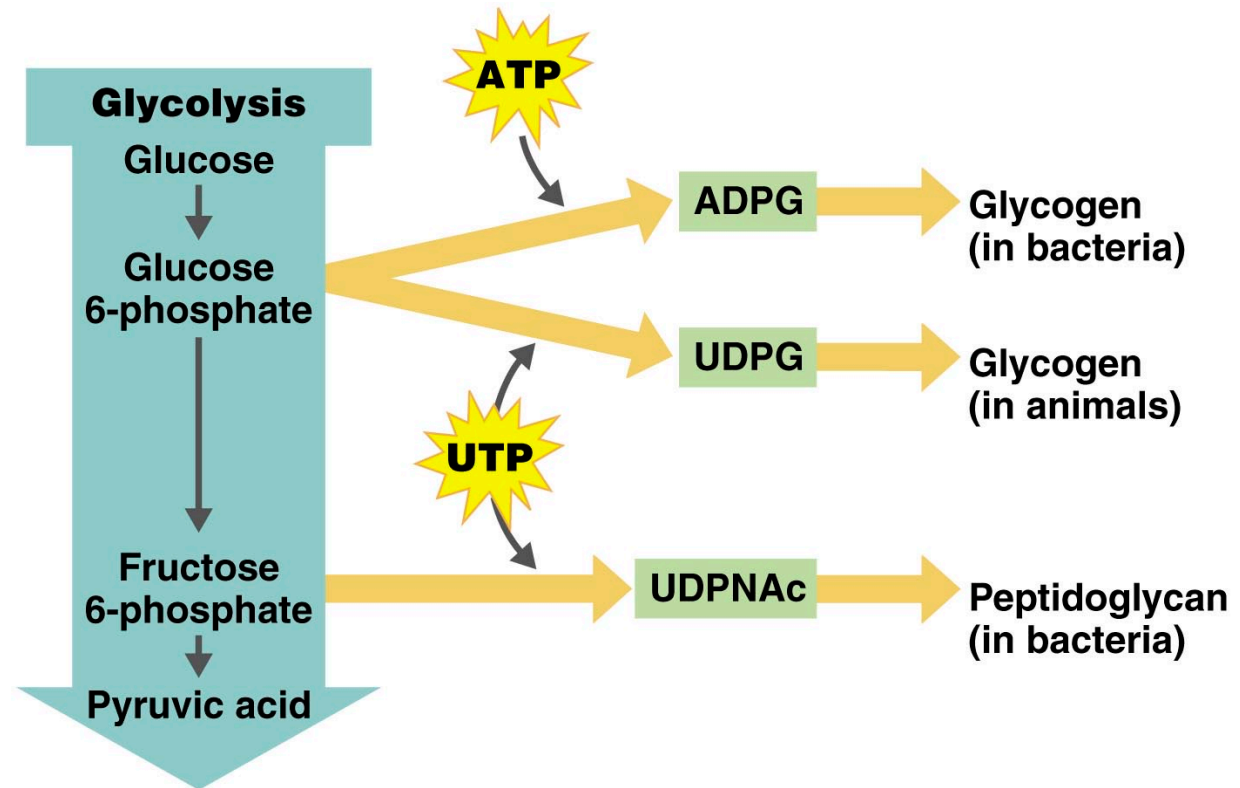


Detecting amino acid catabolizing enzymes

*Now we discuss on anabolism of
selective macromolecules...*

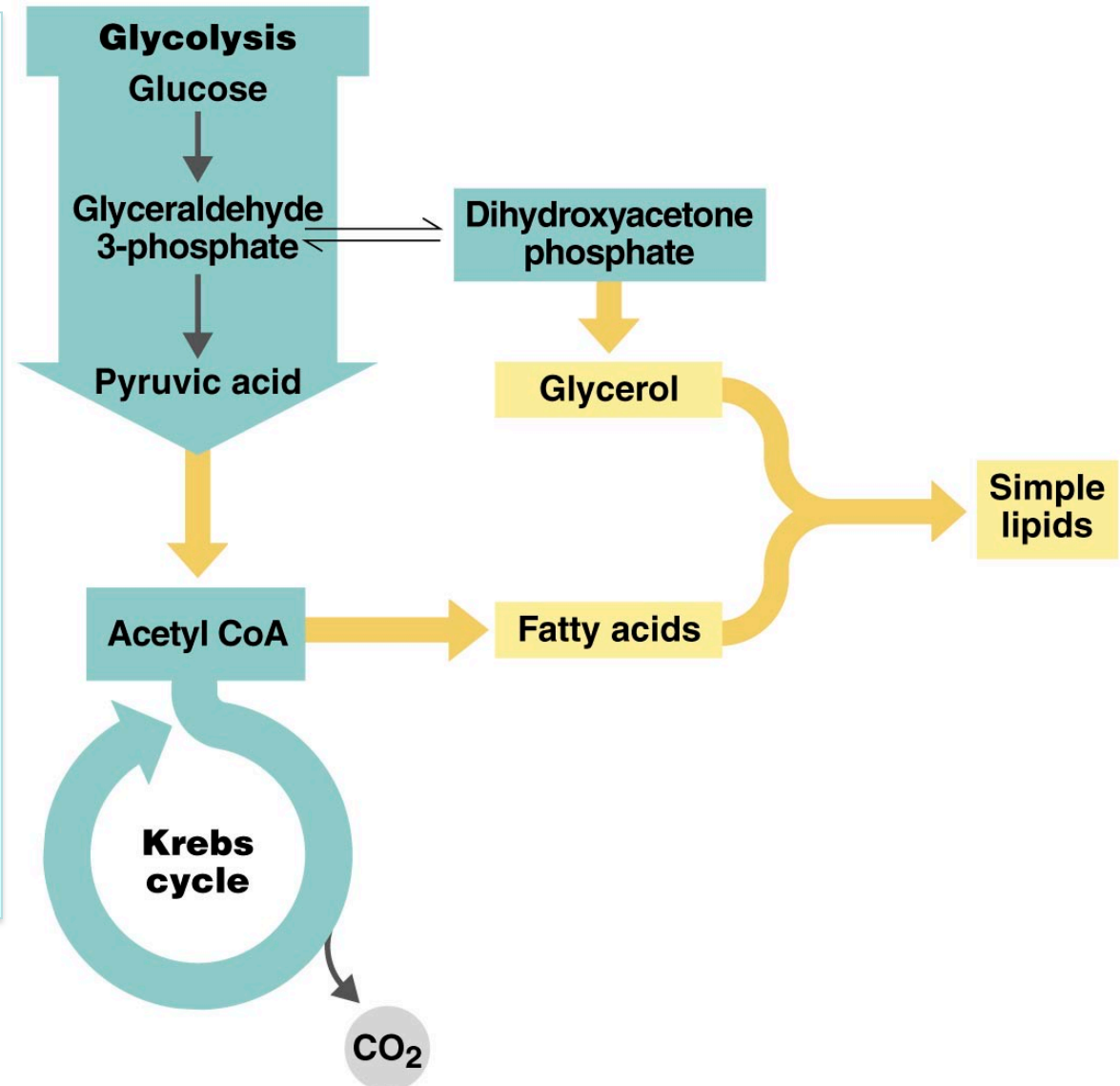
Polysaccharide Biosynthesis

- *Glycogen is formed from ADPG (Adenosine diphosphoglucose)*
- *UDPNAc is the starting material for the biosynthesis of peptidoglycan.*



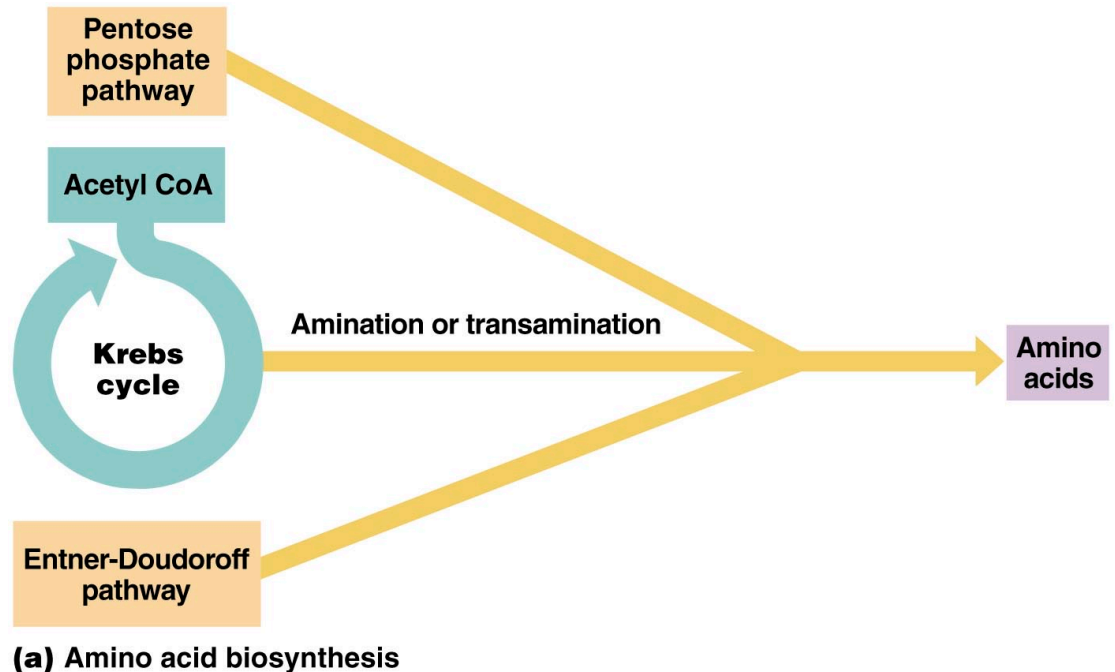
Lipid Biosynthesis

- Lipids are synthesized from fatty acids and glycerol.
- Glycerol is derived from dihydroxyacetone phosphate, and fatty acids are built from acetyl CoA.

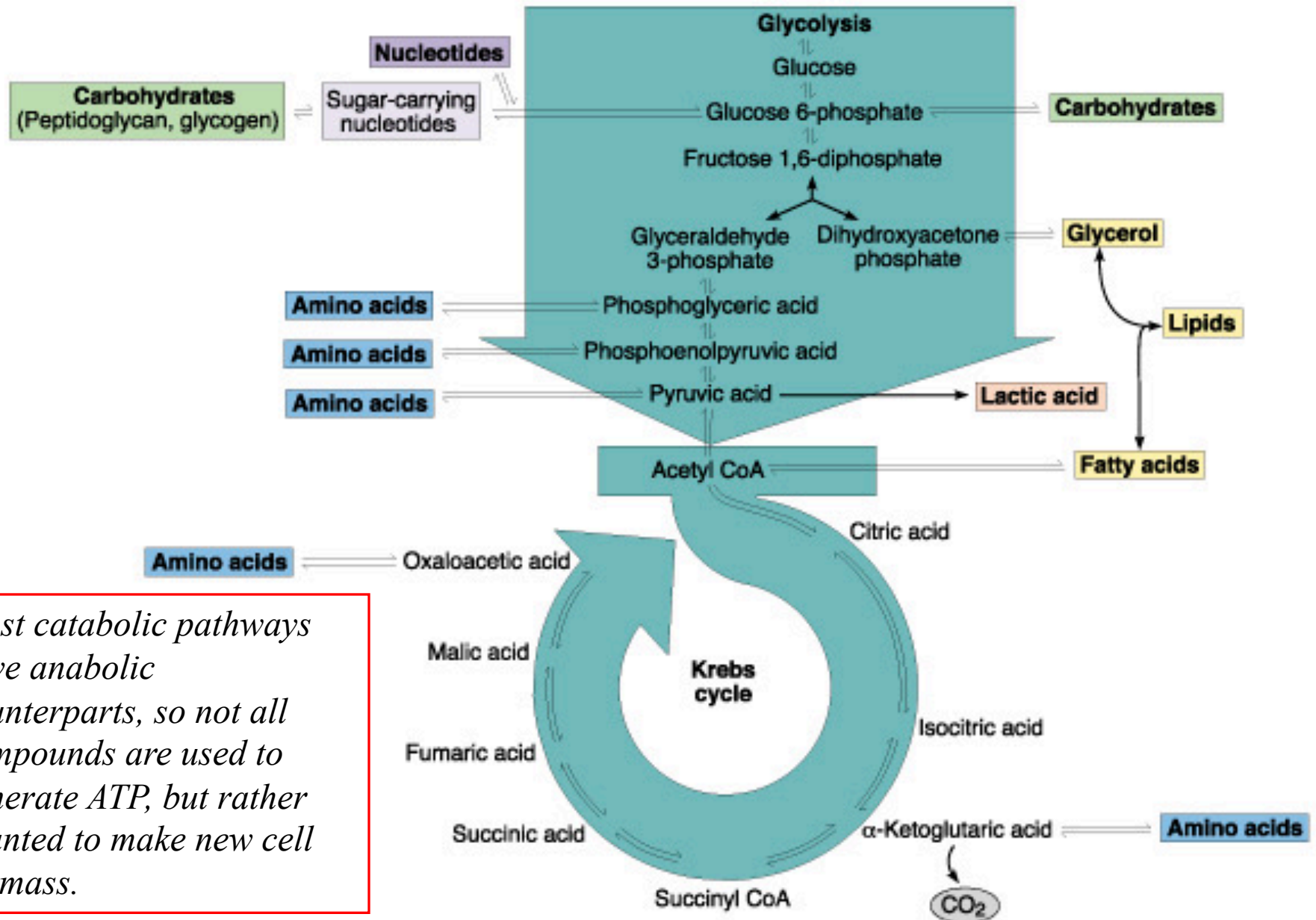


Pathways of Amino Acid Biosynthesis

- *Amino acids are required for protein biosynthesis.*
- *All amino acids can be synthesized either directly or indirectly from intermediates of carbohydrate metabolism, particularly from the Krebs cycle.*

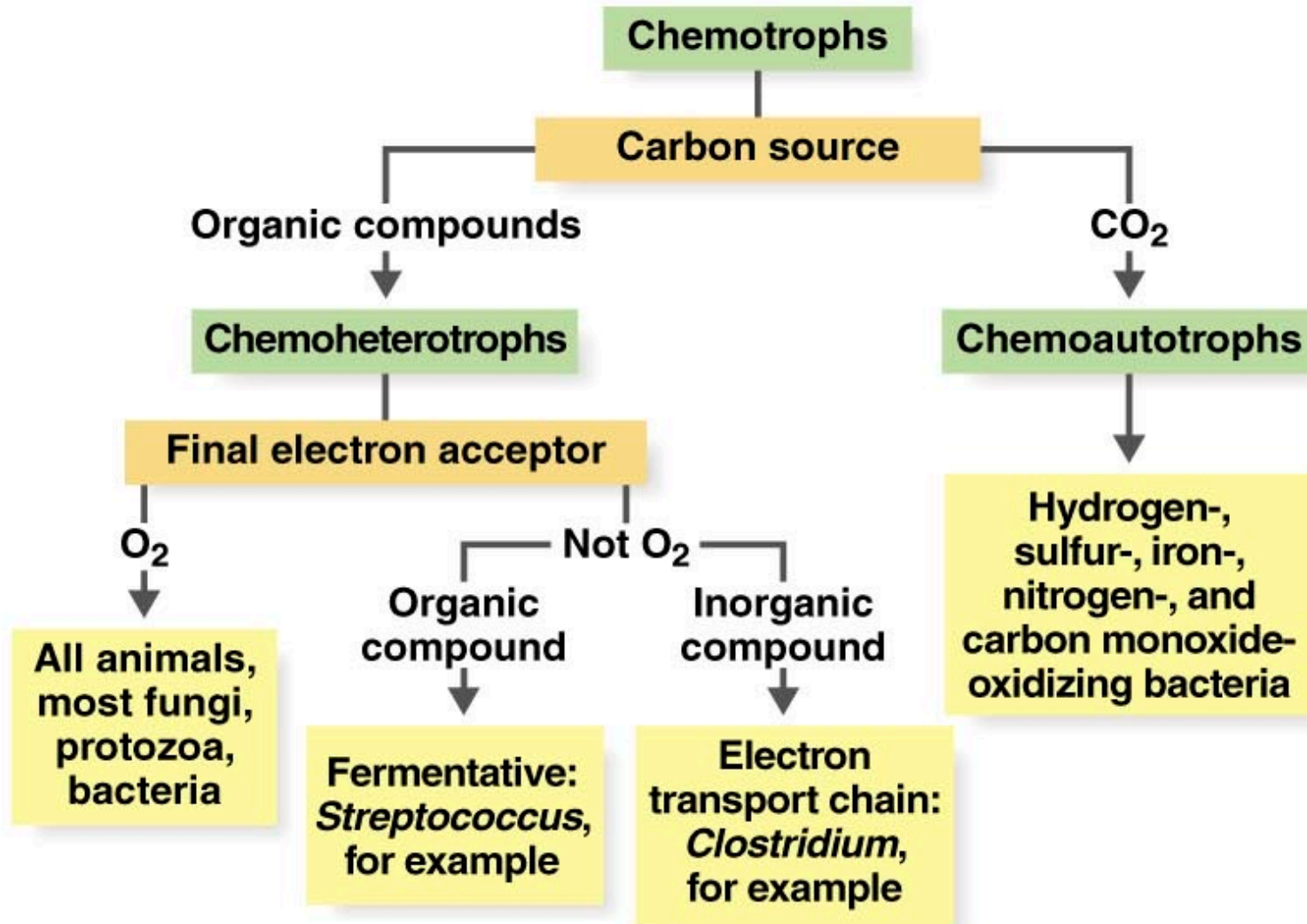


Amphibolic Nature of Metabolism

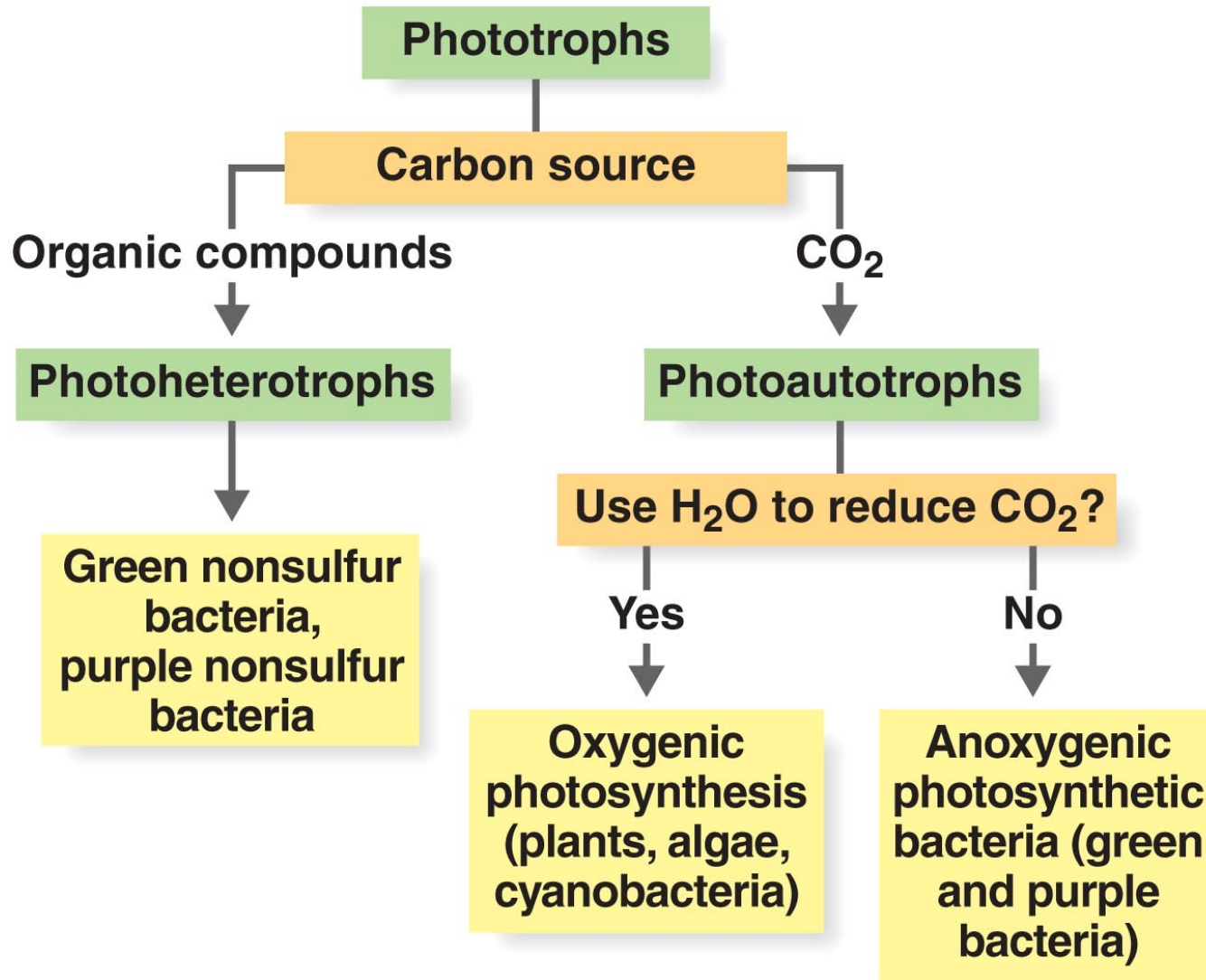


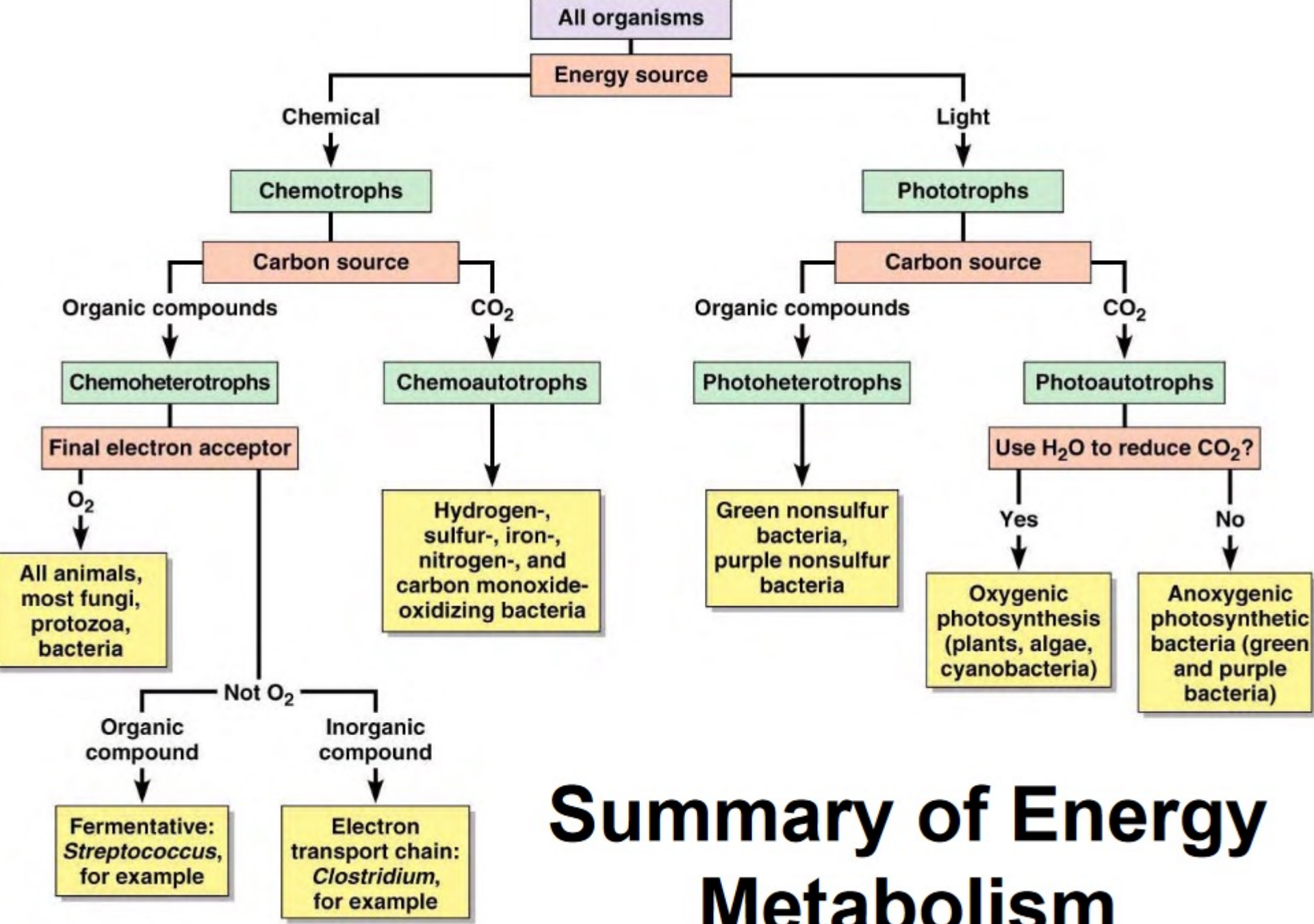
A Nutritional Classification of Organisms:

Metabolic diversity



A Nutritional Classification of Organisms





Metabolic Diversity among Organisms

Nutritional Type	Energy Source	Carbon Source	Example
Photoautotroph	Light	CO ₂	Oxygenic: Cyanobacteria plants Anoxygenic: Green, purple bacteria
Photoheterotroph	Light	Organic compounds	Green, purple nonsulfur bacteria
Chemoautotroph	Chemical	CO ₂	Iron-oxidizing bacteria
Chemoheterotroph	Chemical	Organic compounds (glucose)	Fermentative bacteria Animals, protozoa, fungi, bacteria.

Energy Source Overview:

- In addition to organisms feeding on organic carbon for energy (chemoorganotrophs).
- There are chemolithotrophs, which gain energy from reduced inorganic compounds (litho = rock).
- There are phototrophs that yield energy from sunlight and do not depend on any chemical energy sources.
- Also note how the terminal (final) electron acceptor determines which respiration type or fermentation.

