AMPHIBOLIC PATHWAY

The preferred substrate for respiration is glucose, and in most cases, carbohydrates are initially converted into glucose before being utilized for respiration. While other substrates can also undergo respiration, they do not enter the respiratory pathway at the initial step. For instance, fats are first broken down into glycerol and fatty acids, with the fatty acids subsequently degraded into acetyl CoA to enter the respiratory pathway. Glycerol, on the other hand, would join the pathway after its conversion to phosphoglyceraldehyde (PGAL). Proteins are broken down by proteases into amino acids, and depending on their structure, they may enter the pathway at various stages, potentially within the Krebs cycle or even as pyruvate or acetyl CoA.

Catabolism refers to the breaking down processes within a living organism, while anabolism involves the synthesis of molecules within the organism. The respiratory pathway primarily serves as a catabolic process, providing energy to run the living system. However, it also produces various intermediates that act as precursors for the synthesis of different compounds. For instance:

- Acetyl CoA serves as raw material for the synthesis of carotenoids, terpenes, gibberellins, and other compounds.
- Succinyl CoA acts as a raw material for the synthesis of chlorophyll and cytochrome.
- Oxaloacetic acid serves as a raw material for the synthesis of alkaloids and pyrimidines.
- α-ketoglutaric acid acts as a raw material for the synthesis of amino acids.

Considering the dual role of the respiratory pathway in both anabolism and catabolism, it is more accurate to categorize it as an Amphibolic Pathway rather than exclusively as a catabolic one. This term emphasizes the pathway's involvement in both the breakdown of complex molecules for energy release and the synthesis of essential biomolecules, highlighting its versatile and central role in cellular metabolism.

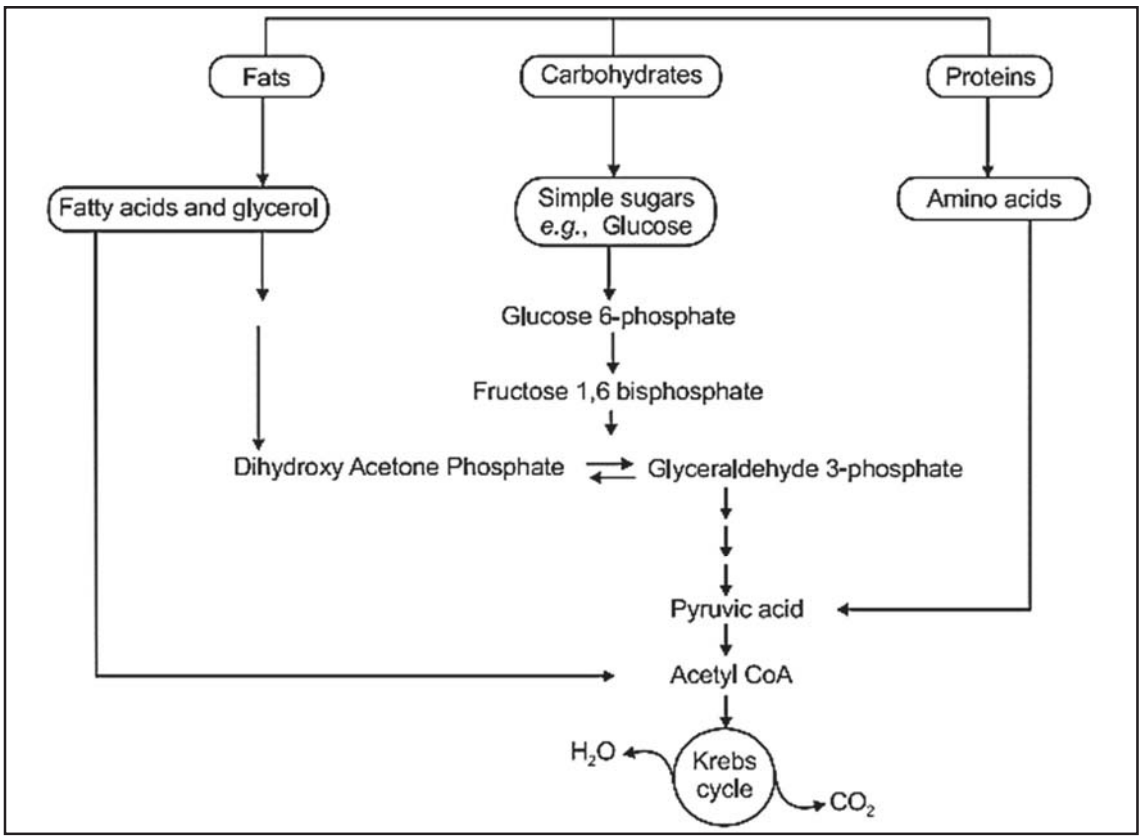

Fig.: Interrelationship among metabolic pathways showing respiration mediated breakdown of different organic molecules to CO, and H_2O