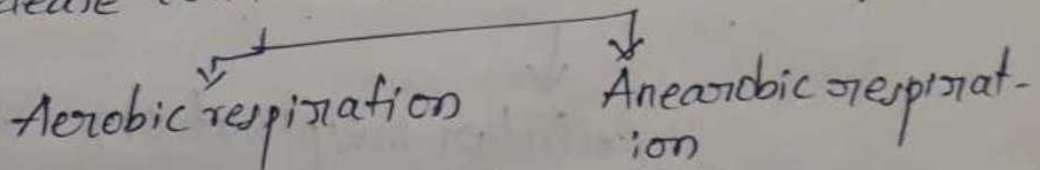


Introduction:-

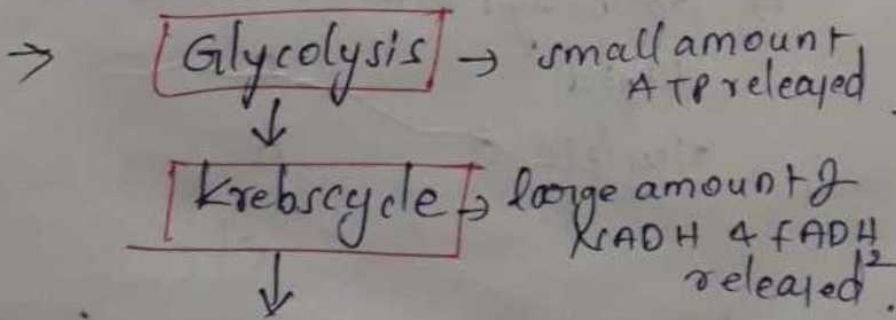
A branch of science concerned with the chemical & physicochemical process & the substance that occur in living organisms.

→ Cellular respiration:-

→ It is a catabolic pathway in which C-C bonds of food materials like carbohydrates, fats, amino acids & organic acids breakdown to release considerable amount of energy.



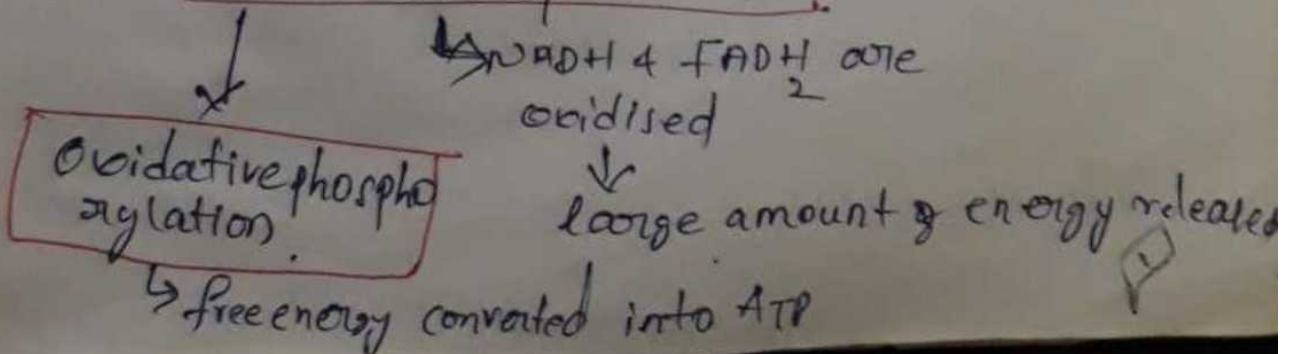
→ Steps of aerobic respiration:-



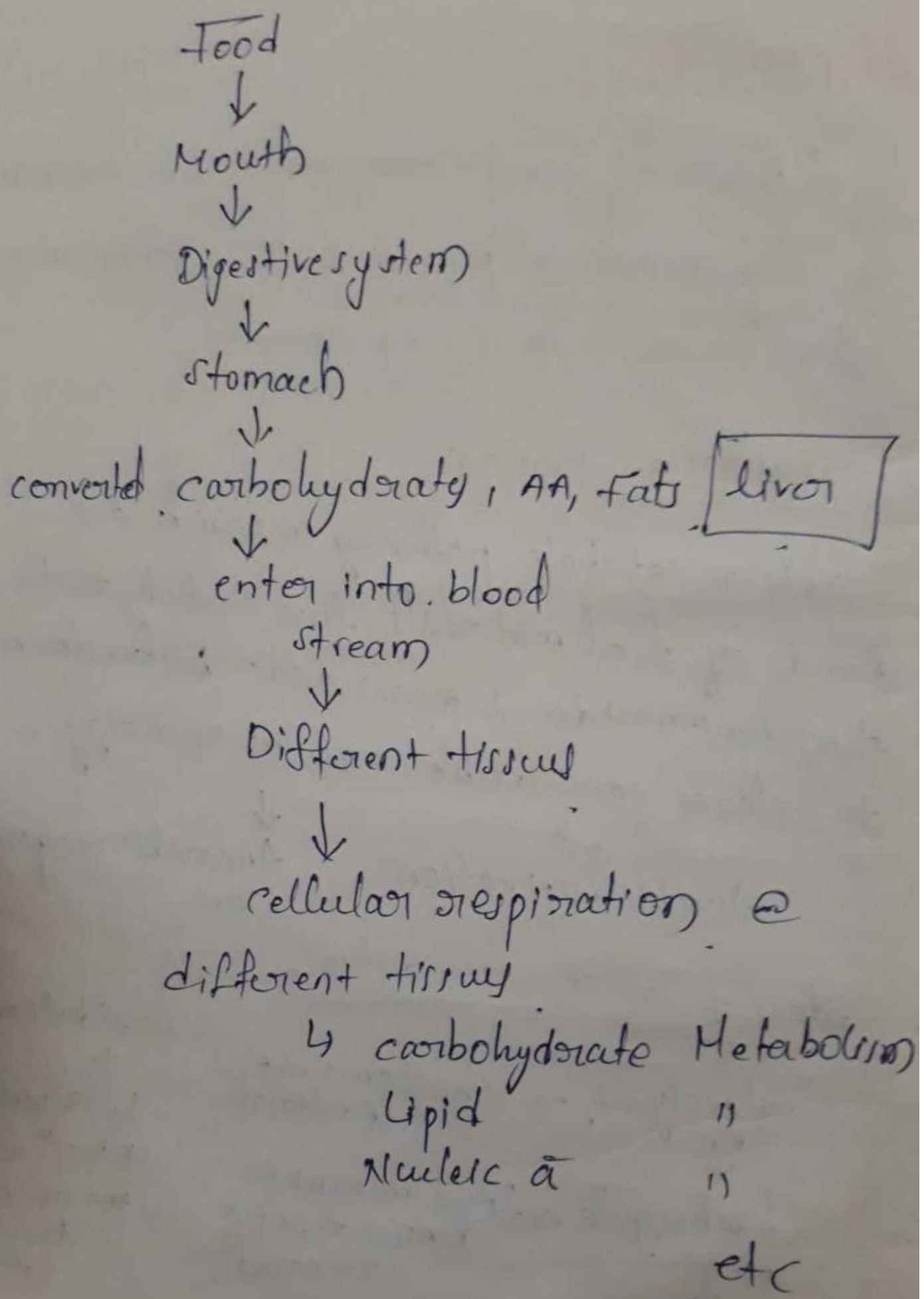
Oxidation

- ↓
- 1 - Glycolysis
- 4 → Citric acid
- oxidative decarboxylation

Electron transport chain



(2)



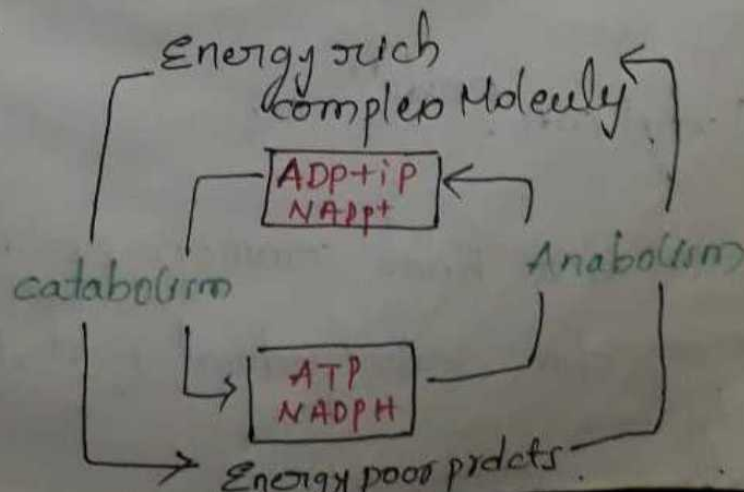
# Carbohydrate Metabolism

## Metabolism:-

A series of enzymatic reactions that occur in the living organism, specifically to breakdown of food & its transformation into energy.

Metabolism broadly divided into two categories.

- ① Catabolism:- The degradative process concerned in the breakdown of complex molecules into simpler ones, & a release of energy. (Exergonic process).
- ② Anabolism:- Biosynthetic reaction involving the formation of complex molecules from simple precursors.





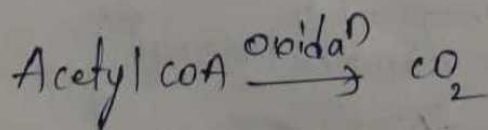
## Metabolism of Carbohydrates

→ Carbohydrate Metabolism is a fundamental biochemical process that ensures a constant supply of energy to living cells. The most important carbohydrate is glucose, which can be broken down via glycolysis, enter into the Krebs cycle & oxidative phosphorylation to generate ATP.

### Major pathways of carbohydrate Metabolism:

The important pathways of carbohydrate metabolism are:

- ① Glycolysis! - (Embden - Meyerhof pathway) :-  
Oxidation of glucose → pyruvate & Lactate
- ② Citric acid cycle! - (Krebs cycle / Tricarboxylic acid cycle)



It is a final common oxidative pathway for carbohydrates, fats, AA + through acetyl CoA.

3. Gluconeogenesis:-

The synthesis of glucose from noncarbo-  
-hydrates precursors. (eg:- Amino acids, glycerol)

4. Glycogenesis:- Breakdown of glycogen from  
glucose <sub>synthesis</sub>

5. Glycogenolysis:- Breakdown of glycogen to  
glucose

6. Hexose Monophosphate shunt:-

also called as pentose phosphate pathway or  
Direct oxidative pathway.

Alternative to glycolysis & TCA for the  
oxidation of glucose. (Directly to CO<sub>2</sub> & H<sub>2</sub>O)

7. Uronic acid pathway:-

Glucose → gluconic acid,  
pentoses  
Ascorbic acid.

This pathway is also alternative oxidative  
pathway for glucose.

Handwritten notes on the right margin: "the way carb... of pentose... of ascorbic acid..."

(6)

(8) Galactose metabolism:-

Galactose  $\xrightarrow{+}$  glucose & lactose

(9) Fructose Metabolism:-

Fructose oxidation  $\rightarrow$  pyruvate

(10) Amino sugar & Mucopolysaccharide Metabolism:-

Synthesis of amino sugars & other sugars  
for the formation of Mucopolysaccharides  
& glycoproteins

sequence of reactions