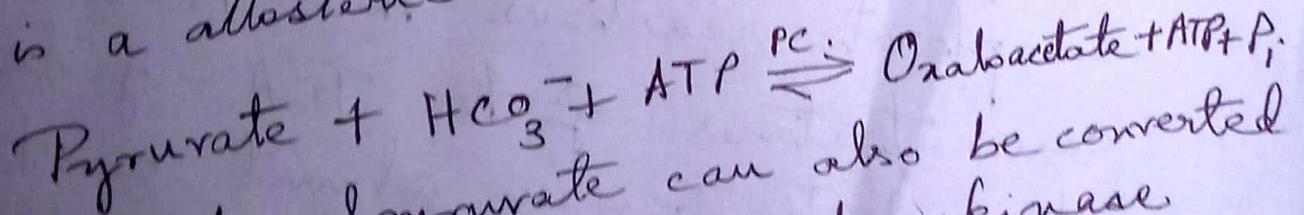


Anaplerotic reactions.

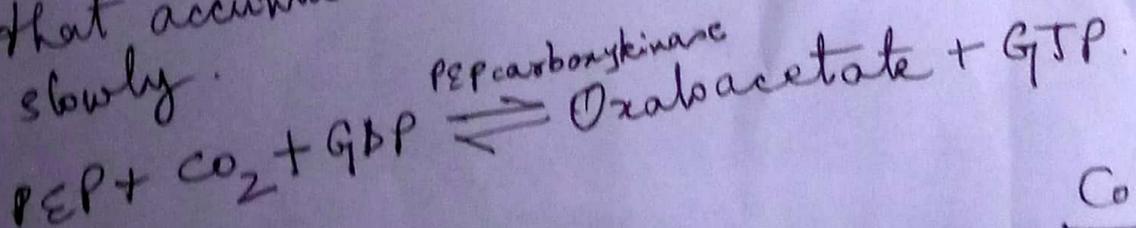
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Anaplerotic reactions serve to replenish the intermediates of the TCA cycle so that the cycle, which forms the final common pathway for the oxidation of lipids, carbohydrates & proteins, is not disturbed. As all intermediates of the cycle can give rise to oxaloacetate, the availability of oxaloacetate is ensured by the following reactions :-

i) Most important of all is the formation of oxaloacetate by the carboxylation of pyruvate, catalysed by pyruvate carboxylase. Pyruvate carboxylase requires ATP and biotin as cofactor. Acetyl CoA is a allosteric activator of this enzyme -



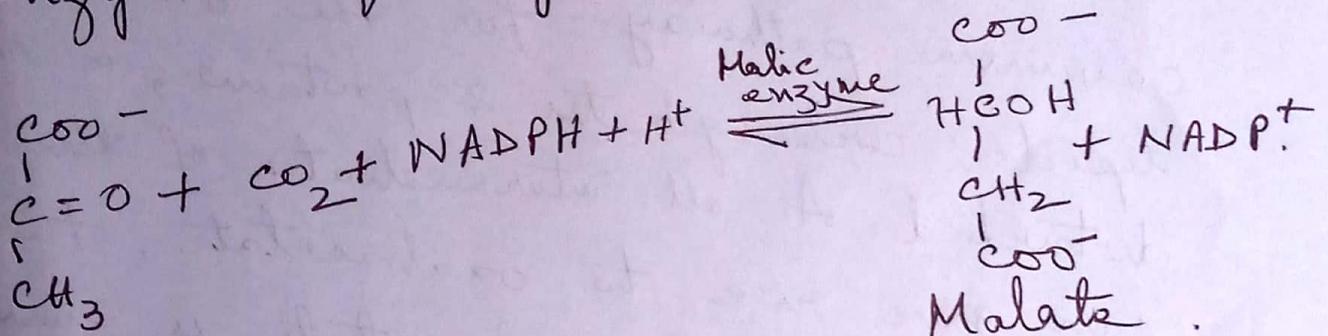
ii) Phosphoenolpyruvate can also be converted to oxaloacetate by PEP carboxykinase which is activated by Fructose-1,6 bis P₄ that accumulates when TCA cycle operates slowly.



Contd.

iii) Pyruvate

Pyruvate is carboxylated and reduced to malate in the presence of malic enzyme requiring NADPH.



Pyruvate

Importance of Anaplerotic Reactions:-

As intermediates of the TCA cycle are withdrawn as biosynthetic precursors, (as shown in the diagram given below) they are replenished by the anaplerotic reactions thus the concentrations of the TCA cycle intermediates remain almost constant.