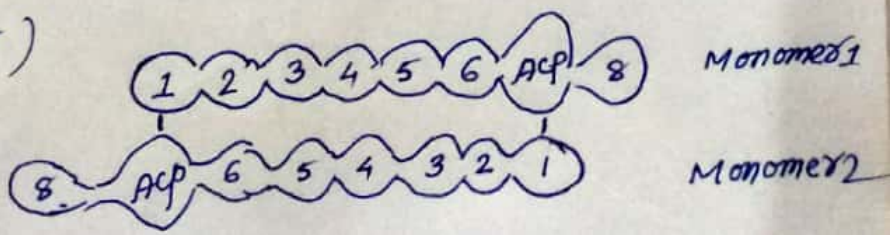
Fatty acid synthesis

- Fatty acids are polyhydrocarbon with a functional group carboxylate.
- There are two types of fatty acids which are saturated fatty acid and unsaturated fatty acid.
- Fatty acids are water insoluble
- Fatty acids help in the formation of diff. type of lipid.

* Fatty acid synthesis take place in cytoplasm.
- Name of hormone: Insulin → (+)
  Glucagon → (−)

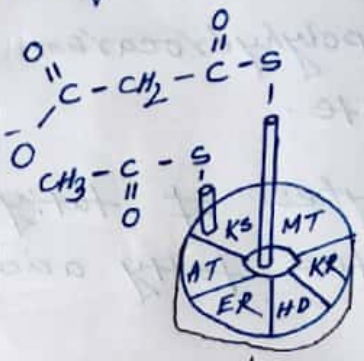
* . Name of Enzyme: Fatty acid synthase
* About Fatty acid synthase: Multimeric enz complex.
* It is homodimer; each of monomer is consist of seven enz.s with one acyl carrier protein.

* . Ketoacyl synthase (1)
  . Acetyl transacylase (2)
  . Malonyl transacylase (3)
  . Hydratase (4)
  . Enoyl reductase (5)
  . Ketoacyl reductase (6)
  ACP (7)
  Thioesterase (8)



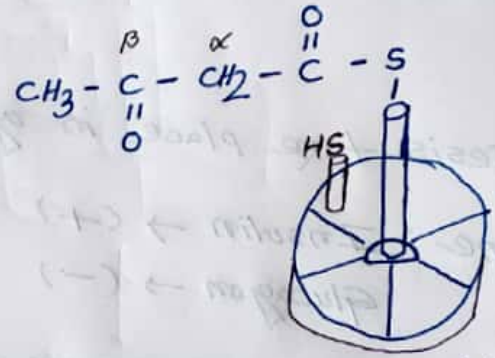
Reaction sequence:

1. Activation of malonyl coA
2. condensation
3. Reduction
4. Dehydration
5. Reduction.



CONDENSATION

CO_2

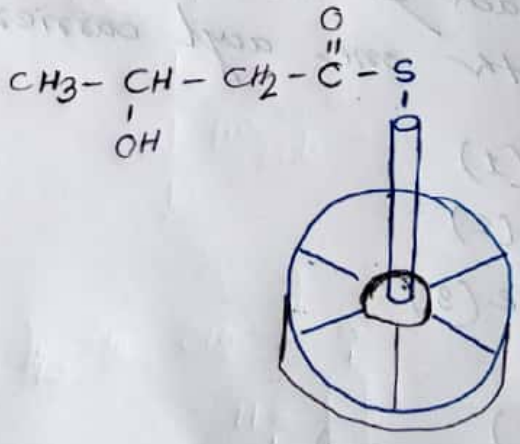


β-Ketobutyryl ACP.

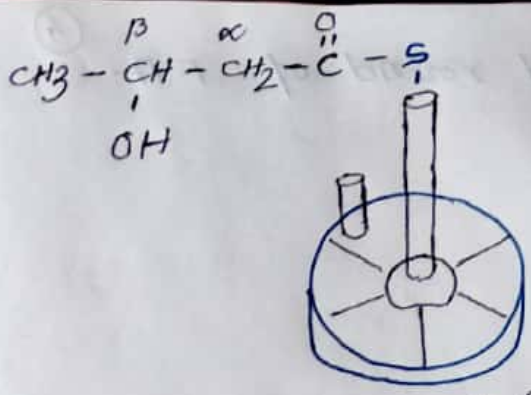
NADPH $+H^+$

$NADP^+$

reduction of β-KCP group.



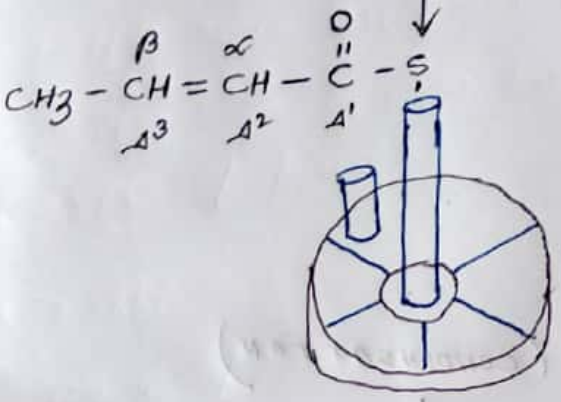
β-Hydroxybutyryl-ACP



β-Hydroxybutyryl-ACP

dehydration

H_2O

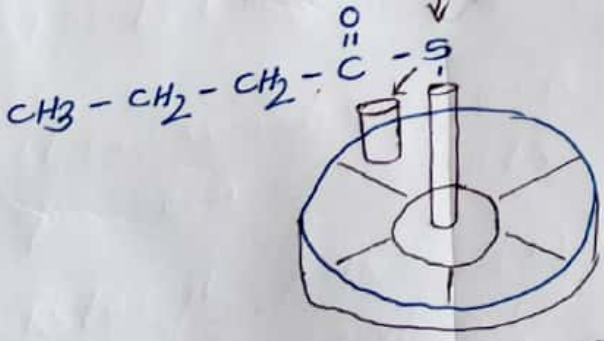


Trans-Δ^2-butenoyl-ACP

$NADPH + H^+$

$NADP^+$

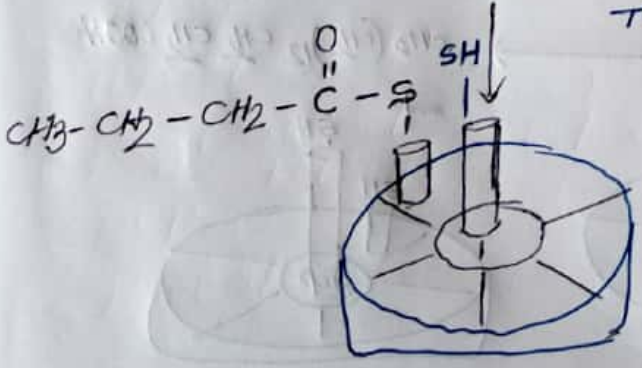
(reduction)



Butyryl-ACP

translocation of butyryl group to cys on β-ketoacyl-ACP-synthase (KS)

SH



Beginning of the second round of FA synthesis cycle: