

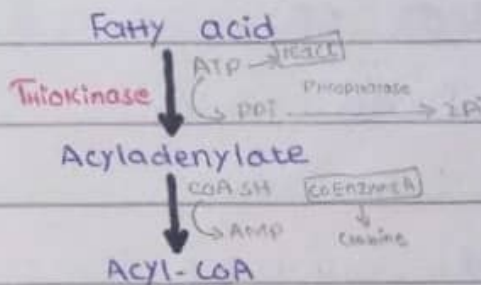
Lipid

B-Oxidation of Fatty acid: β -oxidation is

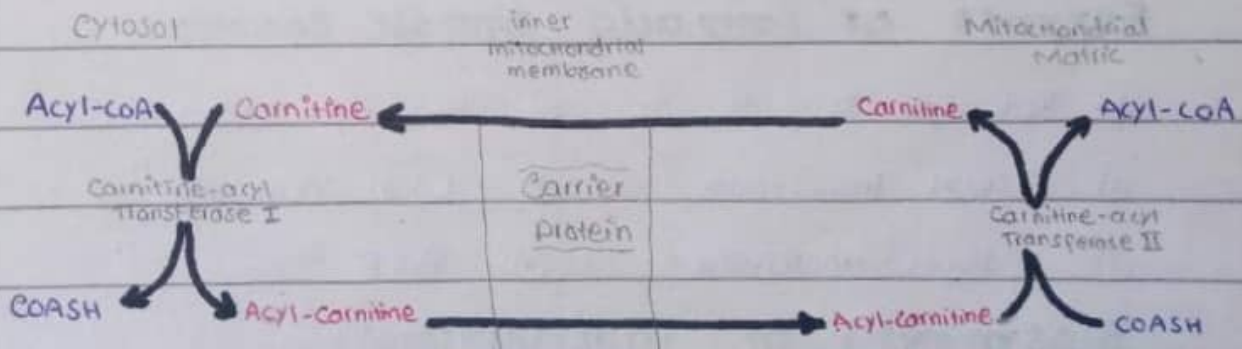
defined as the oxidation of Fatty acid at the Carbon 2. It result in removal of Two Carbon fragment i.e Acetyl-coA & Acyl-coA

→ It take place in mitochondria and does not take place in Brain & RBC.

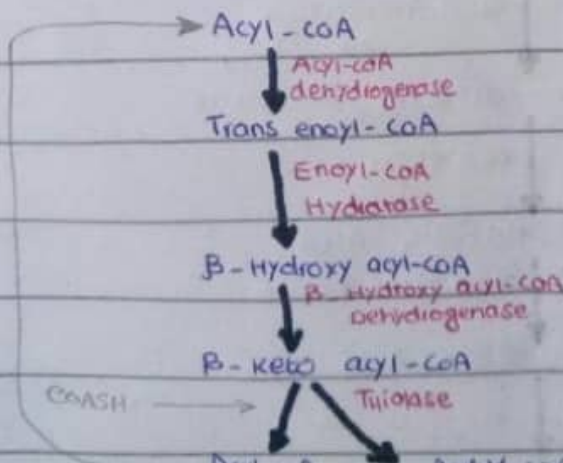
Activation of Fatty acid:



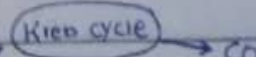
Transport of Acyl-CoA into Mitochondria:



β -Oxidation Proper:



Net yield for one molecule of Palmitate is 106.



Why unsaturated Fatty acid give less energy than Saturated Fatty acid of same carbon:

There are double bond in unsaturated FAs. So they provide less energy. In Saturated Fatty acid more H^+ ion atoms are attach to Carbon atom and they produce more energy.

What are end Products of:

Alpha oxidation: Phytanic Acid

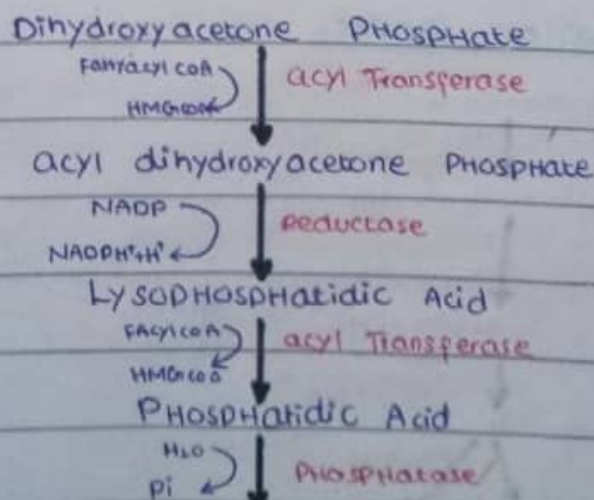
Beta oxidation: Carboxylic Acid

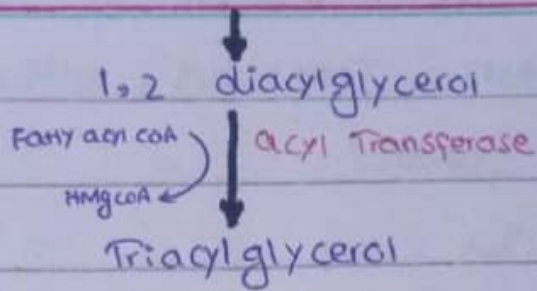
odd chain Fatty acid: Succinyl-CoA

Enzymes of Fatty acid Synthase Complex:

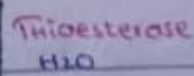
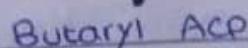
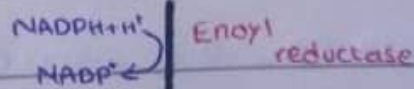
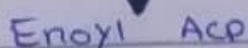
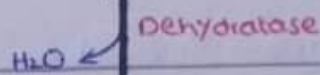
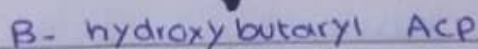
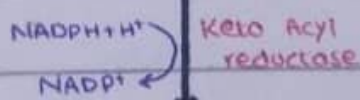
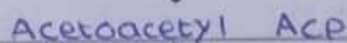
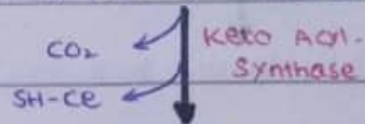
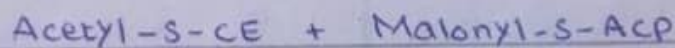
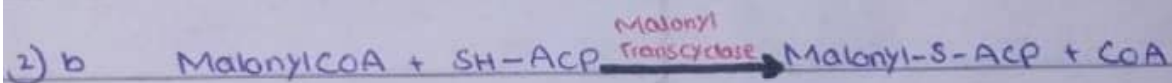
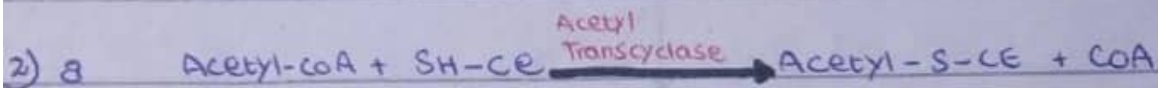
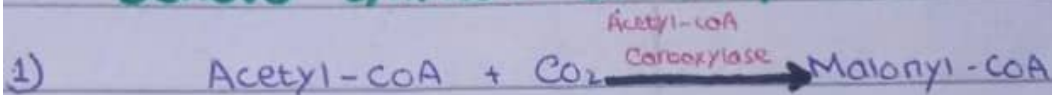
- 1) Ketoacyl Synthase
- 2) Acetyl transacylase
- 3) Malonyl transacylase
- 4) Ketoacyl reductase
- 5) Enoyl reductase
- 6) ACP

Biosynthesis of Triacylglycerol:



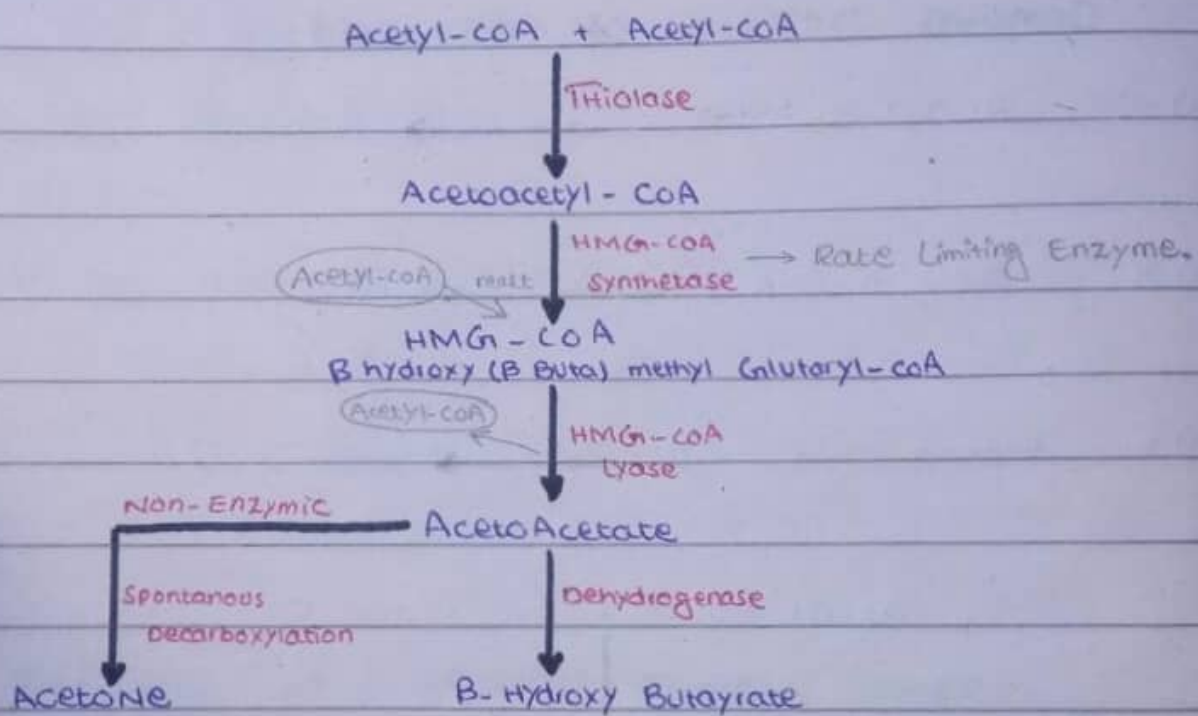


Denovo synthesis of fatty acid:



Mention synthesis, Transport, utilization & Excretion of ketone bodies:

Synthesis: The ketone body synthesis occurs in the liver. Enzyme present in Mitochondrial matrix.



Transport:

The ketone bodies being water soluble easily transported from liver to various tissues.

The two ketone bodies Acetoacetone and Alpha ketobutyrate are important source of energy for peripheral tissues.

- Such as:
- 1) Renal tissue
 - 2) Cardiac tissue
 - 3) Skeletal muscle

WHAT are ketone bodies ? Explain Ketonemia, Ketosis & ketone breath;

& ketone breath;

ketone bodies; ketone bodies are metabolic products that are produced by excess during excessive breakdown of fatty acid.

Acetone, Acetoacetate & β -hydroxybutyrate are called ketone bodies.

Ketonemia; \uparrow amount of ketone bodies in blood.

Ketonuria; \uparrow amount of ketone bodies in urine.

ketone breath;

Ketosis is mostly associated with smell of ketone during breath is ketone breath.

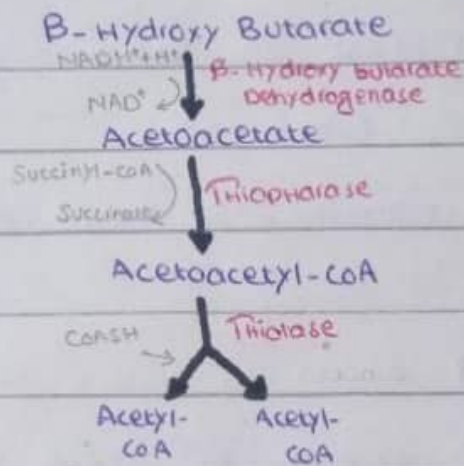
Causes: 1) starvation

2) DM;

Causes of ketoacidosis;

- 1) use of medicine such as diuretics & corticosteroid
- 2) physical or mental trauma
- 3) Alcohol
- 4) Heart Attack

Utilization: Thiophorase is absent in Liver so it is not utilized by the liver.



Write down Composition, site of synthesis and Biological role of Chylomicron:

Composition:

They are contain 2% protein

Lipids Content 98%

88% Triglyceroids

4% Cholesterol

8% Phospholipids

Site: They are synthesized in small intestine during course of fat absorption

Function: 1) Deliver cholesterol → liver

2) Carry lipid from intestine → peripheral tissue

3) Deliver dietary triglyceroid → " "

Eicosanoids : Eicosanoids are 20 Carbon Compound which is derived from Arachidonic Acid.

Families : Prostanoids & Eicosanoids

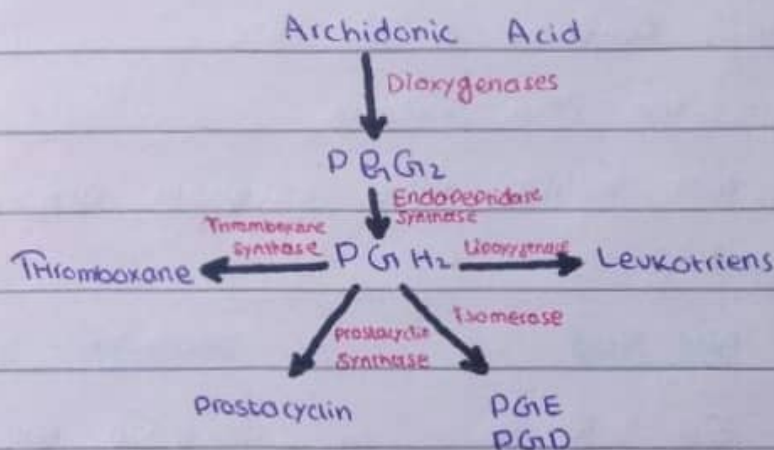
Cyclic Eicosanoids

- 1) Prostacyclin
- 2) Thromboxanes

Non-cyclic Eicosanoid

- 1) leukotrienes
- 2) lipoxanes

Synthesis OF PGI_2 :

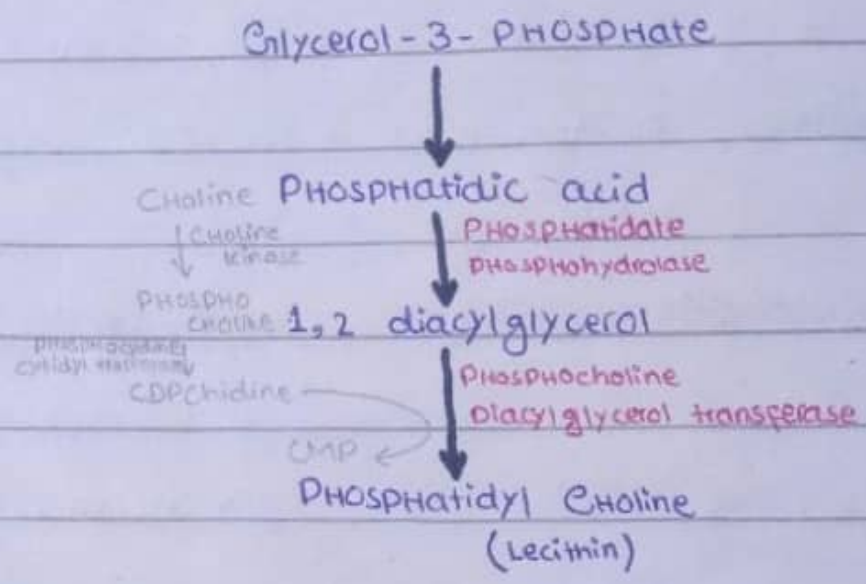


Aspirin inhibit synthesis of Eicosanoids.

Functions OF Prostaglandins :

- 1) induce Blood Clotting
- 2) Prevent Blood Clotting
- 3) vasoconstriction / vasodilation
- 4) Bronchoconstriction / Bronchodilation
- 5) Platelet Aggregation
- 6) Control inflammation
- 7) Regulate menstruation & Fertility

Biological synthesis and function of Lecithin:



Function:

- 1) Maintain conformation of ETC
- 2) Absorb fat from intestine
- 3) Dipalmitoyl lecithin have surfactant action

Bile Acid:

Primary Bile Acid

Primary Bile acid are synthesized in liver

- 1) Cholic Acid
- 2) Chenodeoxycholic Acid

Secondary Bile Acid

Secondary Bile Acid are synthesized small intestine

- 1) Lithocholic Acid
- 2) Deoxycholic Acid

Function of Bile Acid:

- 1) Digestion of lipid and lipid soluble nutrients in intestine
- 2) Active regulator of cellular processes e.g cell Transduction
- 3) Important for removal of excess cholesterol from blood
- 4) Facilitate absorption of fat soluble vitamins particularly vit. D from intestine.

What are hypocholesteremic drug what are their mode of Action & at which site they act:

Those drugs which decrease blood Cholesterol level are called **HYPOCHOLESTEREMIC** drug.

Levostatin: inhibit HMG-CoA reductase

which decrease Cholesterol synthesis

Clofibrate: ↑ Activity of Lipoprotein Lipase &

↓ Plasma Cholesterol & Triglycerids

Cholestyramine: ↓ intestinal Absorption.

Why HDL good & LDL is Bad:

Because HDL carries Cholesterol from peripheral tissues to liver and ↓ Blood Cholesterol

LDL is bad because it deliver Hepatic Cholesterol to peripheral tissues through receptor mediate mechanism

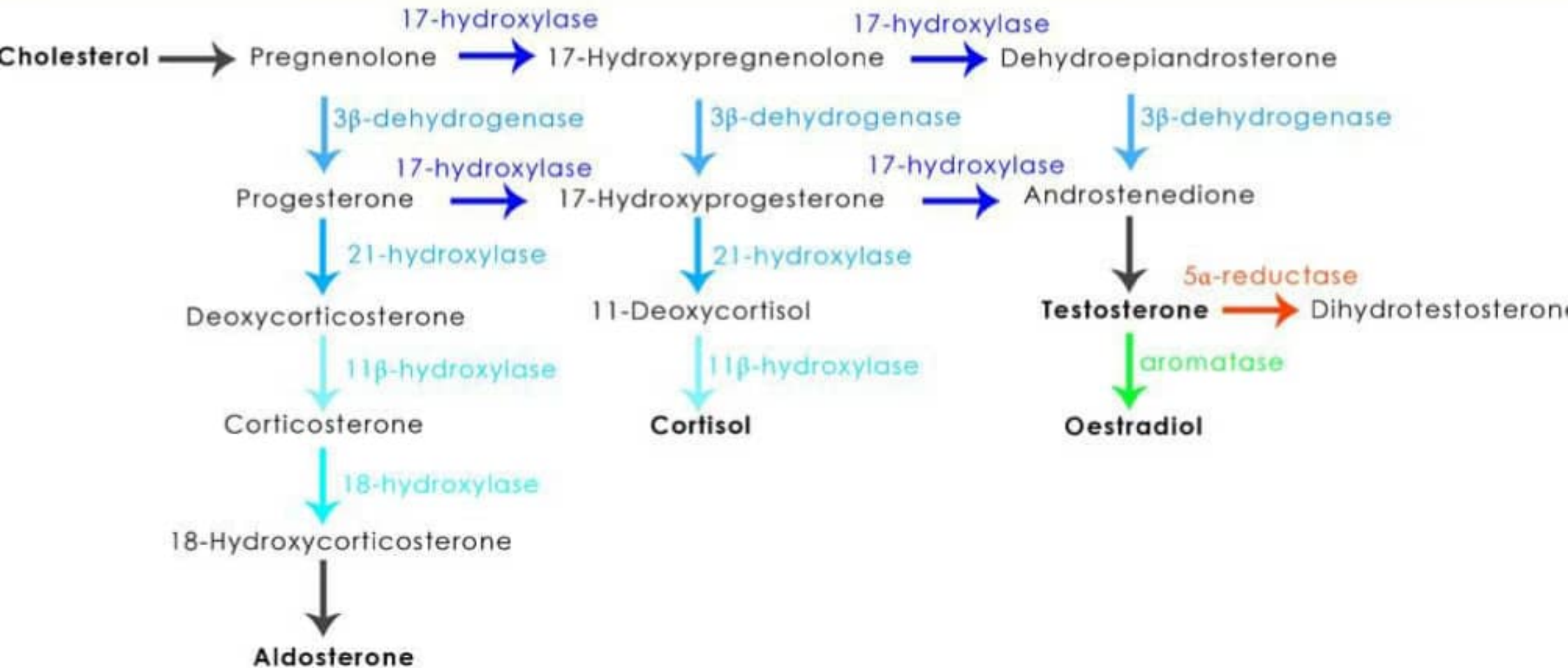
Fatty Liver: Triacylglycerol accumulate excessively in Liver

Normally Kuffer cell contain lipids in form of lipid droplet but in Fatty Liver droplet of Triglycerol are found in Hepatic cell of entire cytoplasm.

Causes: 1) Starvation, Alcoholism, DM

2) High Fat in Diet

SYNTHESIS OF STEROID HORMONES



In black are hormones, in colour are enzymes.