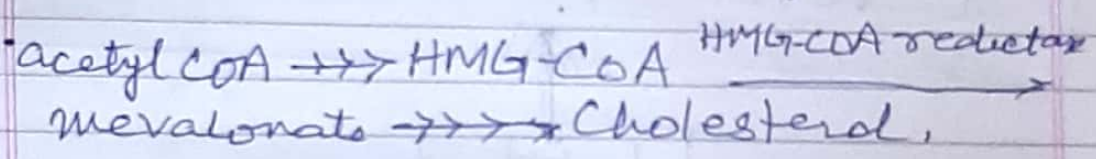


Sources of cholesterol for steroid biosynthesis :-

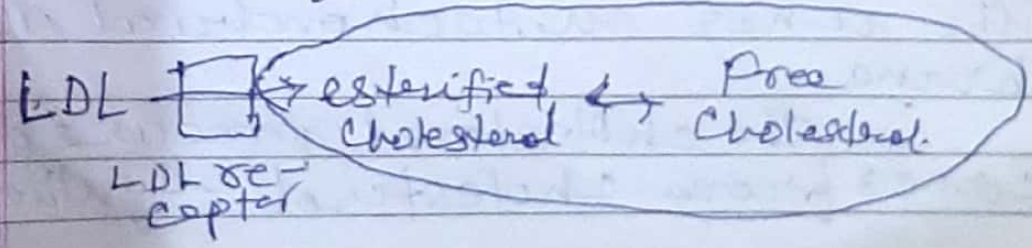
Cholesterol can be made within the cell from acetyl CoA. This is multistep process involving many enzymatic reactions. A key rate-limiting enzyme is HMG-CoA reductase.

There is a negative feedback regulation of HMG-CoA reductase activity by cholesterol, so that high intracellular cholesterol inhibits the de novo synthesis.

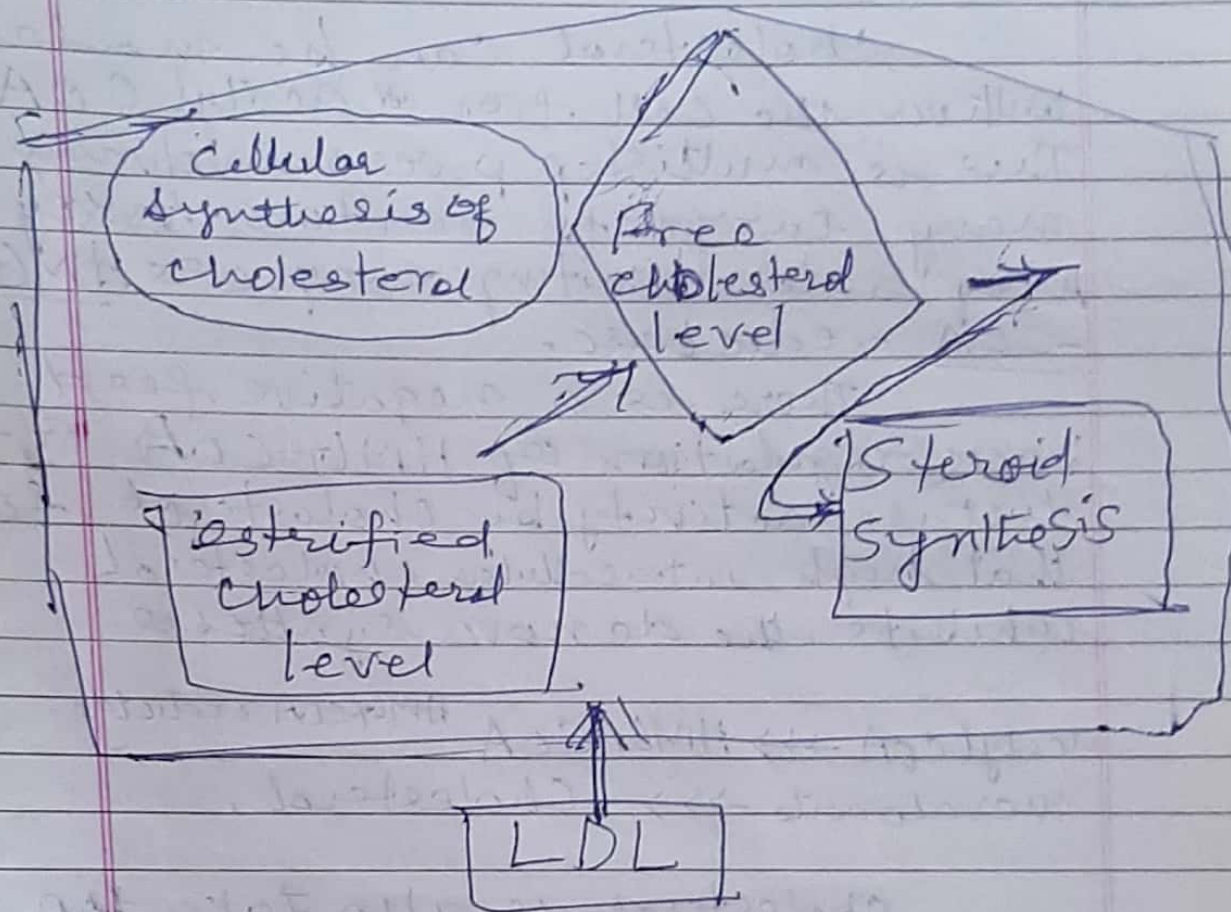


Cholesterol is also taken up by the cell in the form of low density lipoprotein (LDL). LDL is complex composed of cholesterol, phospholipids, triglycerides and proteins.

LDL is taken into the cells via LDL receptors and broken down into esterified cholesterol, and then free cholesterol.



The amount of free cholesterol in the cell is maintained relatively constant.



Steroid Synthesis:

The first enzymatic steps in steroid synthesis is the conversion of cholesterol into Pregnenolone.

The enzyme that catalyze these reaction is located in the inner mitochondrial membrane.

The cholesterol precursor comes from cholesterol synthesized

within the cell from acetate, from cholesterol ester stores in intracellular lipid droplets or from uptake of cholesterol containing low density lipid lipoproteins.

Lipoprotein taken up from plasma are most important when steroidogenic cells are chronically stimulated

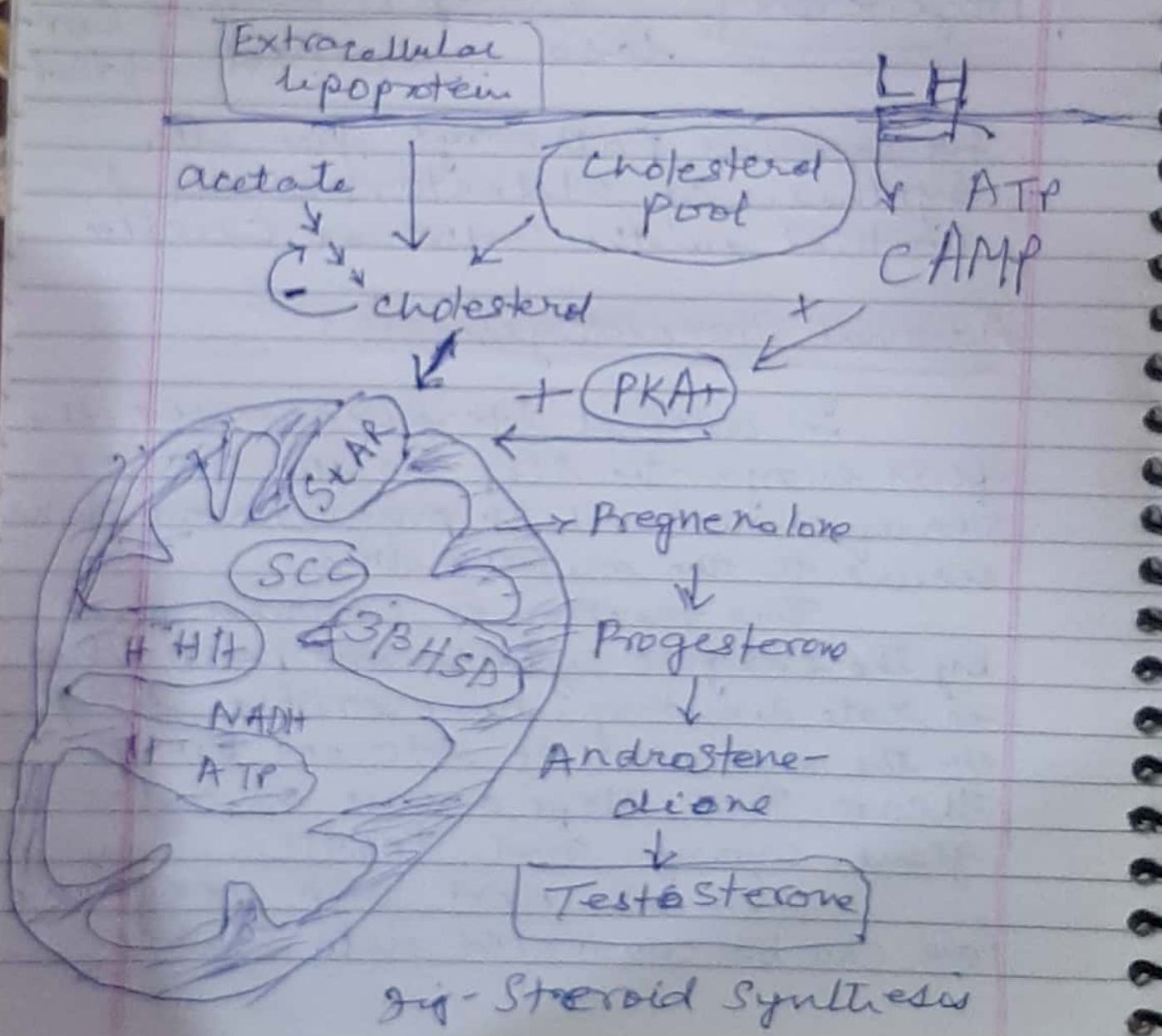


Fig - Steroid Synthesis

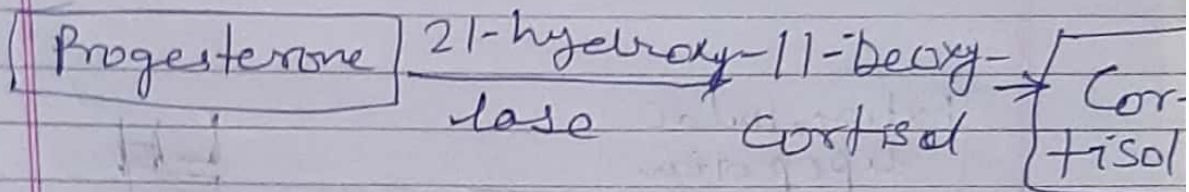
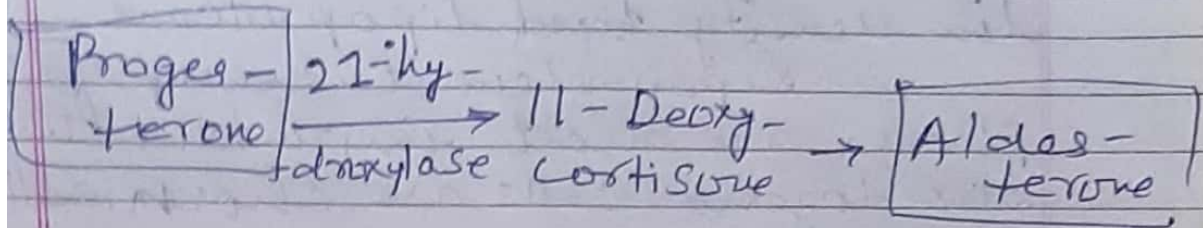
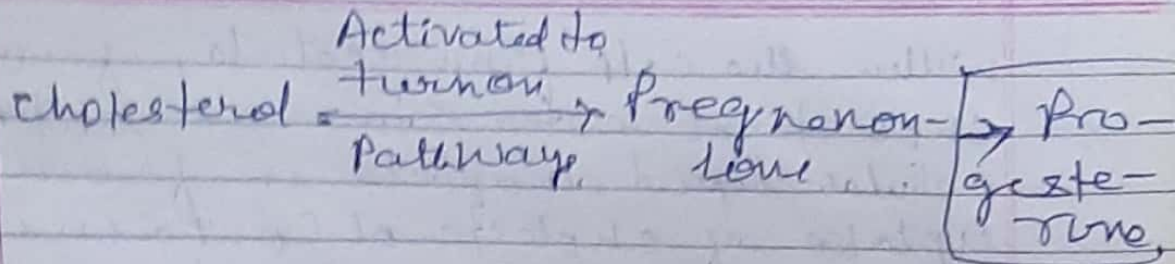


Fig. General pathways for the synthesis of aldosterone and cortisol in the adrenal cortex.

Adrenal Steroidogenesis:

In adrenal steroidogenesis, the first enzymatic step is the conversion of cholesterol to progesterone, which occurs in the mitochondria.

This reaction is carried out by the enzyme cytochrome P450. This is rate limiting, nonreversible step in the initiation of steroid biosynthesis. This step occurs in adrenal gland, ovary, and testis.

In the next step pregnenolone can be converted into three

different pathways, depending what
it make mineralocorticoids, glucocorticoids or androgen.

