

Biological Significance of Cholesterol

Lipid molecule

found exclusively in animals

chemically it is steroid

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Hence it is often called as animal steroid

Cholesterol is a

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- structural component of cell membrane
- precursor for synthesis of many steroidal hormone, Vit-D, Bile acids etc.
- essential for lipoprotein structure.
- essential for maintaining structural integrity and fluidity of the membrane.
- Important for metabolism of fat soluble vitamins like A, D, E, K.
- Insulates Nerve fibres.

Conversion of Cholesterol

B. Acid

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Vitamin D

→ steroid hormone

Cholesterol $\xrightarrow{\text{Hydroxylase}}$ Hydroxycholesterol

Cholic acid

Glycocholate

Taurocholate

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Deoxycholic acid

chenodeoxycholic acid

Glycochenodeoxycholate

Taurochenodeoxycholate

Now after conjugation they are called as

Primary Bile Acids

secondary

Bile Acid

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Lithocholic

- ② Vitamin-D synthesis
- ③ steroid hormone

cholesterol

→ Cortisol
→ Aldosterone
→ sex steroids

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(estrogen, progesterone, testosterone etc.)

② Vitamin-D synthesis

cholesterol $\xrightarrow[\text{skin}]{\text{in}}$

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7 dehydrocholesterol in skin

↓ U.V rays

cholecalciferol

↓ 25 hydroxylase (liver)

25-OH-cholecalciferol

↓ 1 α hydroxylase (kidney)

1,25 Dihydroxycholecalciferol

* 1,25 Dihydroxycholecalciferol is the Active form of this Vitamin-D

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