Lipids

→ Lipids are heterogenous gop. of org. compounds which are relatively insoluble in H_2O but soluble in org. solvent like ether, chloroform, benzene, etc.

→ Most imp. constituent of most lipids is fatty acids.

Fatty Acids.

→ It is an org. acid having long chain of HC attached to a carboxylic acid gop.

$R - COOH$

↓
long chain of HC.

→ Like most carbonydrates, fatty acids also contain C, H & O but prop. of C is more & O is less in fatty acids.

→ More energy value than carbonydrates bcoz no. of C is more in lipids. but it requires more O_2 for oxidat^n.

Types of Fatty Acids

→ **Saturated**
- no double bond
- M.Pt. high. ∴ solid at room temp.
- Gen. formula $C_n H_{2n} O_2$

→ **Unsaturated**
- 1 or more double bond
- M.Pt. less ∴ liquid at room temp.
- Gen. formula $C_n H_{2n-2(c)} O_2$

↓
no. of double bond

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- Sat.

		Gen. form.	Unsat.
C=12	Lauric acid	$C_{12}H_{24}O_2$ OR $C_{11}H_{23}COOH$	
C=14	Myristic "	$C_{14}H_{28}O_2$	
C=16	Palmitic "		
C=18	Stearic "		

Unsat.

C=18 →	Monoenoic	- $C_{18}H_{34}O_2$	Oleic acid (1 double bond)
C=18 →	Dienoic	→ $C_{18}H_{32}O_2$	Linoleic acid (2 " ")
" →	Trienoic	→ $C_{18}H_{30}O_2$	Linolenic acid → Most essential
C=20 →	Tetraene	→ $C_{20}H_{32}O_2$	Arachidonic "

Essential for human body.

→ Fatty acids containing more than 1 double bond are k.a. polyunsaturate which is referred by physician to person suff. from cardio-vasc. disease bcoz unsat. fats ↓es cholestool level.

→ Plants synthesise all fatty acids.

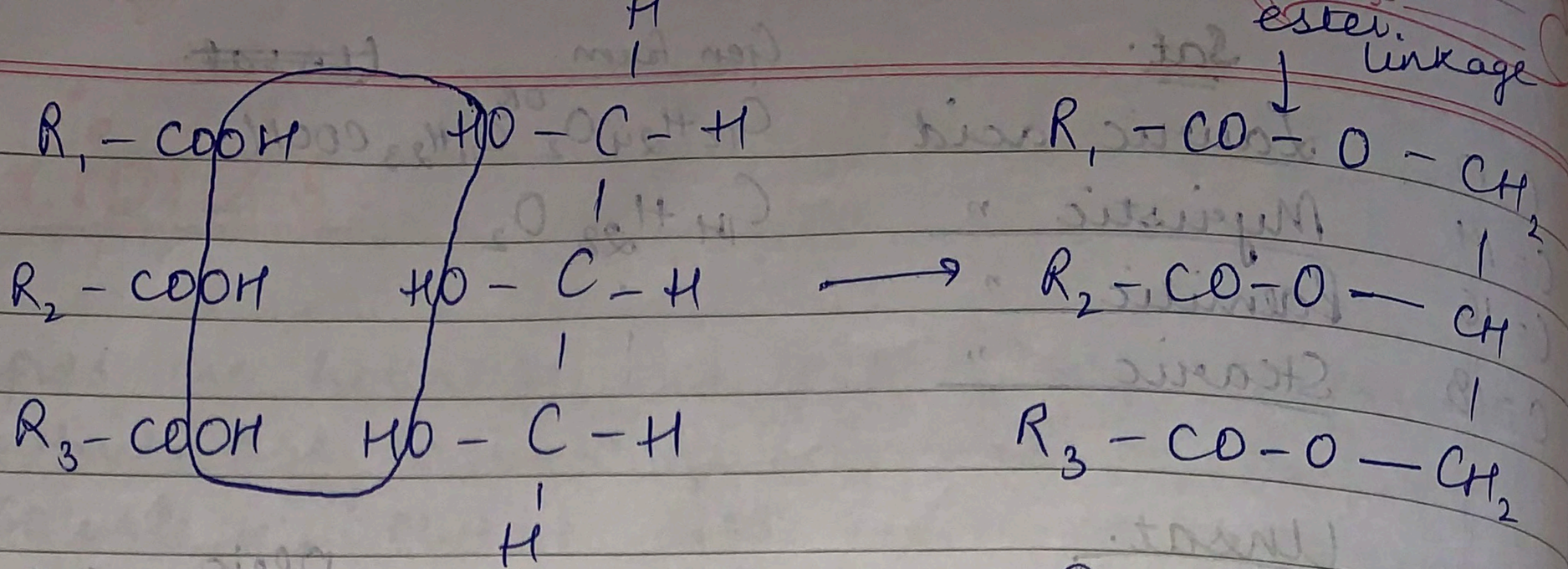
Good Lipid ← HDL → High density protein (↓ cholestrol level)
Bad " ← LDL → Low " " (↑ cholestrol level)

→ If LDL is more in human blood, person is more ~~prone~~ prone to heart diseases.

→ CLASSIFICATION OF LIPIDS.

① Simple Lipids : These are ester of fatty acids with alcohol.

(a) Fats : ester of fatty acids with glycerol.



Fatty acids

Glycerol (trihydric alcohol)

Triglycerides

Fats

True

Sim. types of fatty acids are esterified. (same - R)

Mixed

diff. fatty acids esterified (diff - R)

(b) Wax

ester of fatty acids with alcohol other than glycerol.

In wax, alwaz monohydric alc. are + nt.

Eg :- Honeybee wax

Palmitic acid + Mericyl alcohol or Hexacosyl alcohol → Mericyl palmitate or Hexacosyl palmitate

② Compound Lipid

→ They contain some addit^nal grp. in addit^n to fatty acids & alcohol.

Phospholipids — Phosphorus

Glycolipids — Carbohydrate

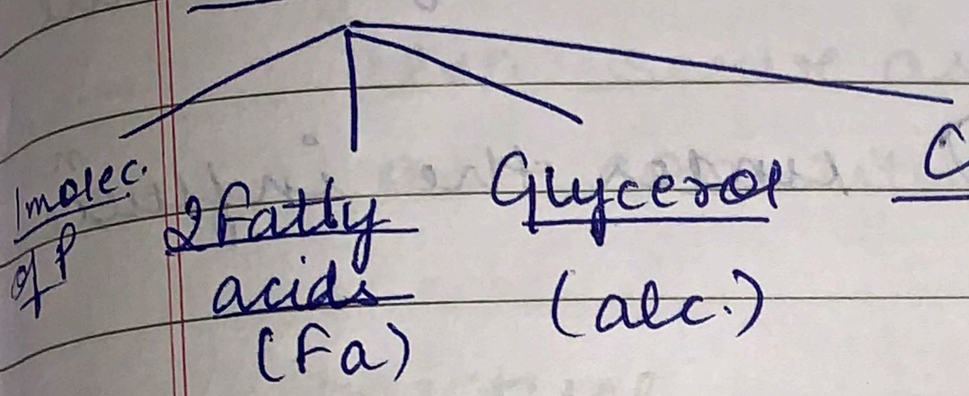
Add. grp.

Phospolipids

Glycero-phospolipid
(glycerol + ut.)

Eg :- **Lecithin**
(found in cell memb.)

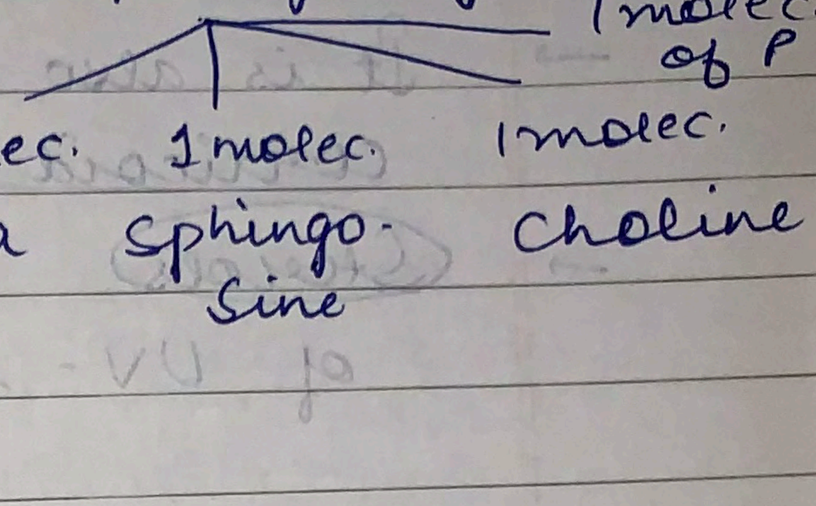
→ **Lecithin**



Chem. Name :
Phosphatidyl choline

Sphingo phospolipid
(Sphingosine alcohol)

Eg :- **Sphingomyelin**



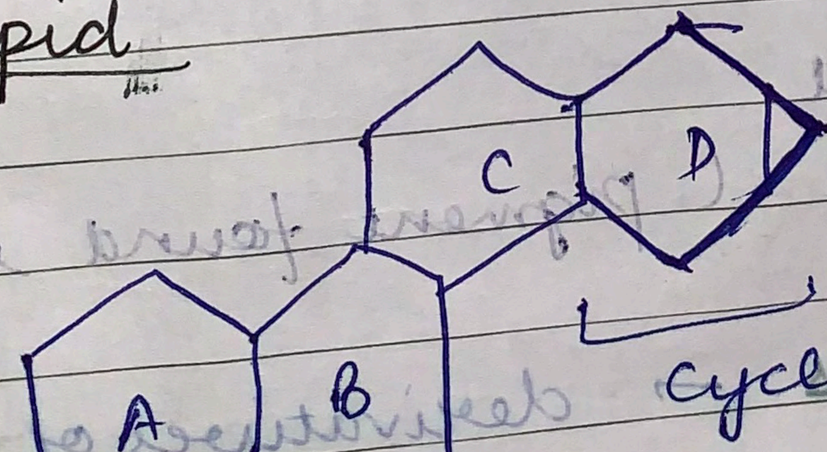
Glycolipids

Cerebroside
found in cerebrum.
→ Fa + Sphingosine + galactose (monosacch.)

Ganglioside
found in ganglion.
→ Fa + Sphingosine + oligosaccharide

③ Derived lipid

① Steroids



CYCLO PENTANO PERHYDRO PHENANTHRENE Ring.

→ Any compound containing this ring is k. a **steroid**.

(a) **Sterols**

(i) Cholestrol → animal sterol (found in animals)
(ii) Ergosterol → plant " (" " plants)

→ Cholestrol is precursor of most of the sex hormones.
→ It is also precursor of hormones of adrenal corticoid.
→ Sterols produce Vit. D under the influence of UV-rays.

(b) **Diosgenin**

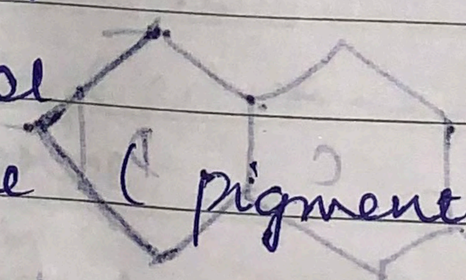
→ It is obtained from dioscorea plant (Yam plant)
→ It is used for making anti-fertility pills.

(C) **Digitilin**

→ It is obt. from leaves of fox glove plant.
→ It is used as Heart stimulant (↓ heart rate)

(ii) **Terpenes** → made of Isoprene unit. (C_5H_8)

Eg :- Camphor
Menthol
Lycopene (pigment found in tomatoes)



(iii) **Prostageandins** → derivatives of arachidonic acid.

→ First of all, obt. from Prostate Gland of ♂.
→ It is synth. (secreted) by most of the cells of body.
→ It initiates contract". of uterus during parturit". (come from body of foetus)
→ It also helps in transport of sperms in ♀