

# Lipids

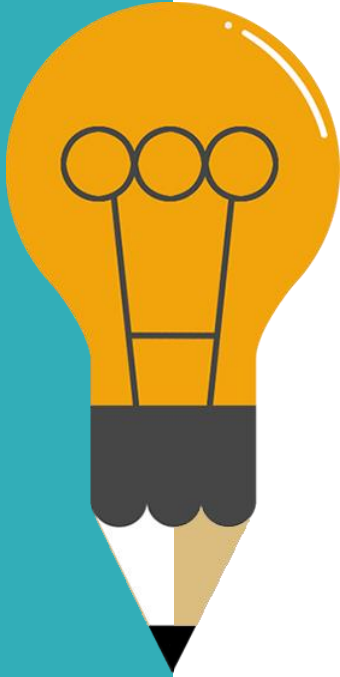
By: 1<sup>st</sup> year pharmD students

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welcome

*By the end of this presentation you will be able to:*



01

Define lipids

02

List functions of lipids

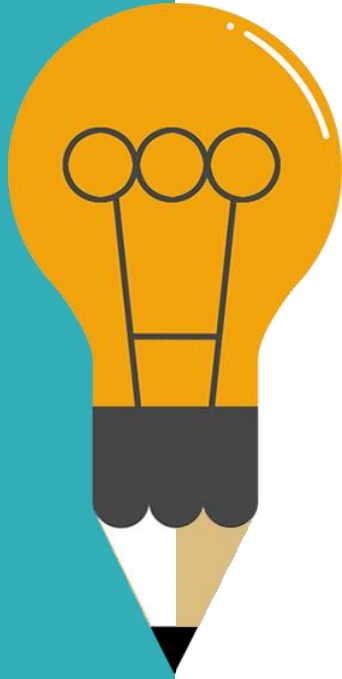
03

Classify lipids

04

Define fatty acids

*By the end of this presentation you will be able to:*



**05**

Describe functions of fatty acids

**06**

Classify fatty acids

**07**

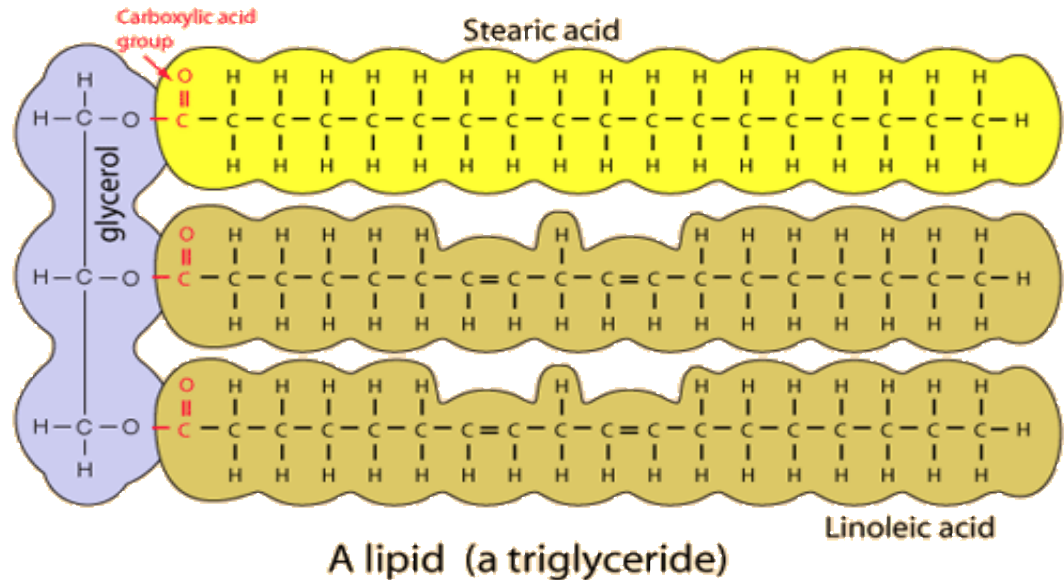
Define phospholipid

**08**

Mention functions of phospholipids

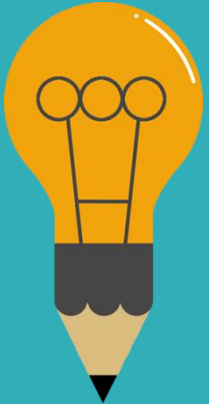
# Lipids

Group of organic compounds that are greasy to the touch, insoluble in water, and soluble in alcohol and ether: lipid comprise the fats and other esters with analogous properties and constitute, with proteins and carbohydrates, the chief structural components of living cells.

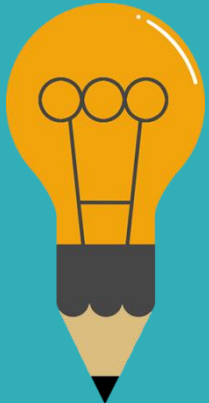
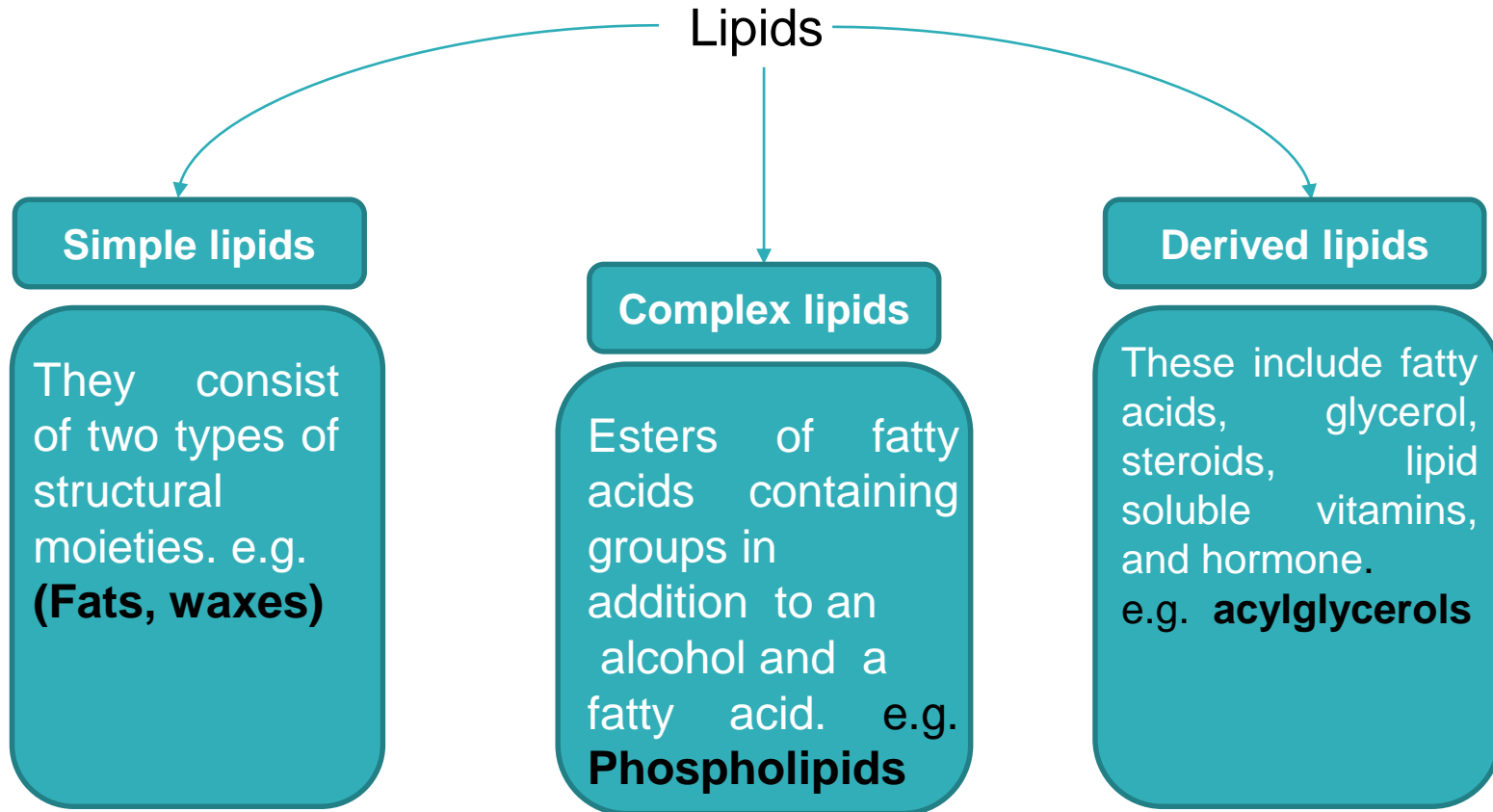


# Function of lipids

- In cell membrane structure.
- Store the fat soluble vitamins.
- Essential fatty acids are useful for transport of cholesterol.
- Keep body warm.
- Store energy.



# Classification types of lipid

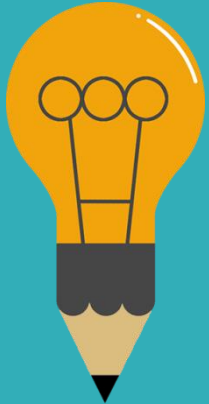


# Complex lipid

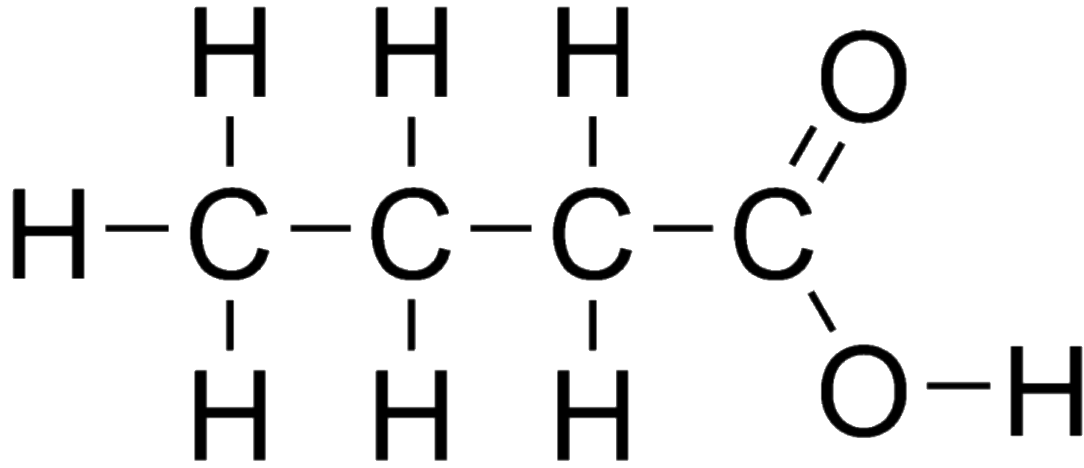
**Glycolipids:** Lipids containing carbohydrate moiety are called glycolipids.

**Sulpholipids:** Lipids characterized by possessing sulphate groups.

**Lipoproteins:** Lipids as prosthetic group to proteins.





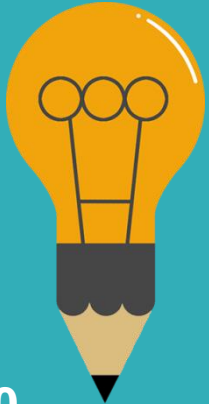


## Fatty acids

A class of aliphatic acids, especially palmitic, stearic, or oleic acid, consisting of a long hydrocarbon chain ending with a carboxyl group that bonds to glycerol to form a fat.

# Functions of fatty acids

- Oxygen transport.
- Providing energy.
- Development of strong tissues and organs.
- Brain functioning .
- Lowering cholesterol and reducing risk of heart disease.

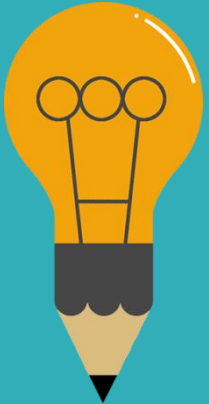


# Classification fatty acids

Moreover, on the basis of the **absence / presence of double / triple bonds** they can be grouped into two broad classes:

**Saturated fatty acids:** if there are no double bonds in the carbon chain

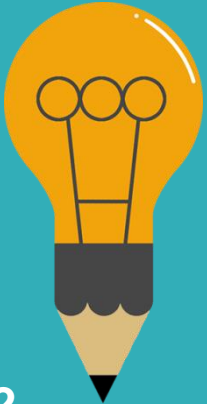
**Unsaturated fatty acids:** if there are one or more double bonds in the carbon chain.



# Classification fatty acids

Depending on their **degree of saturation/unsaturation** in the carbon chain, they can be divided into three classes:

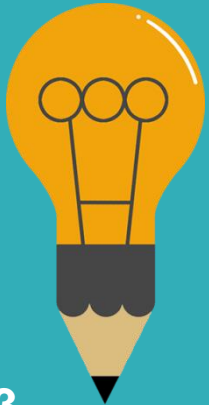
- **Monounsaturated** fatty acids (MUFA), if only one double bond is present;
- **Polyunsaturated** fatty acids (PUFA), if two or more double bonds are present.



# Classification fatty acids

On the basis of the **ability or not to synthesize** they can be classified as:

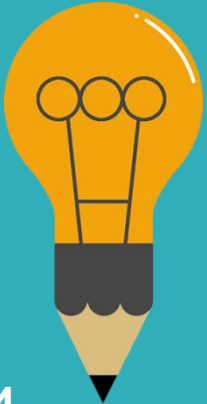
- **Essential**
- **Not essential**

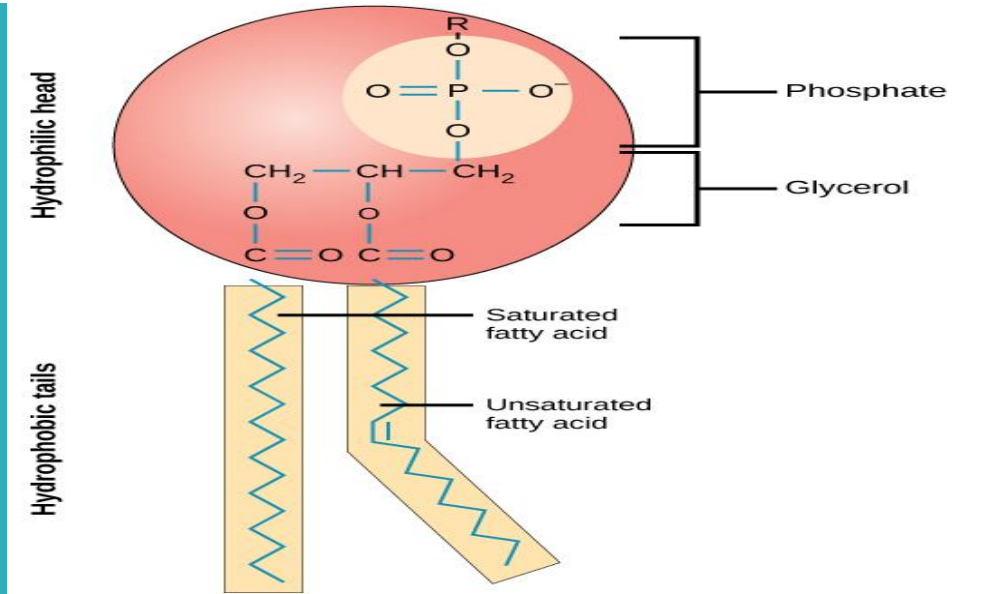


# Classification fatty acids

Depending **only on chain length** they can be functionally divided into:

- **Short chain FA (SCFA):** up to 6 carbon atoms;
- **Medium chain FA (MCFA):** from 8 to 12 carbon atoms;
- **Long chain FA (LCFA):** from 14 to 18 carbon atoms;
- **Very long chain FA (VLCFA):** from 20 carbon atoms onwards.



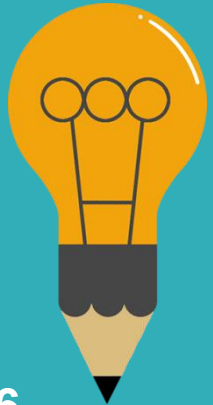
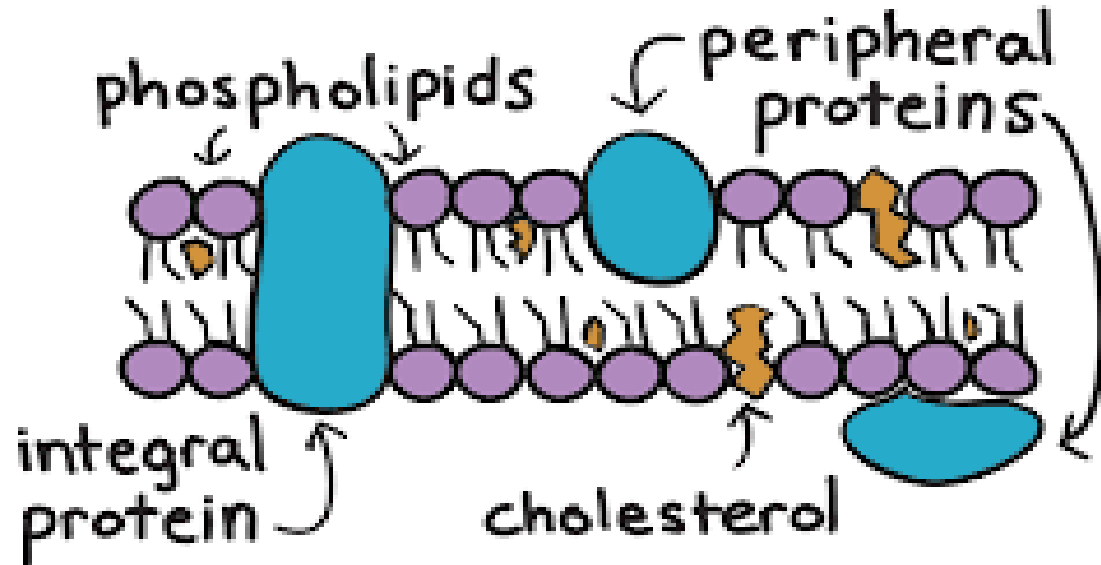


# Phospholipids

A phospholipid is a compound of lipid molecule that is the main component of the cell membrane. each phospholipid is made up of two fatty acids, a phosphate group, and glycerol molecule. when many phospholipids line up, they form a double layer that is all cell membranes.

# Functions of phospholipids

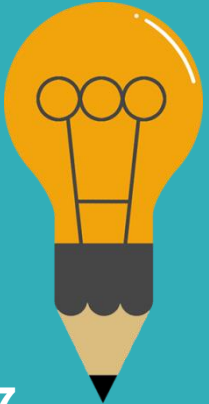
- Forms bilayers of cell membrane.





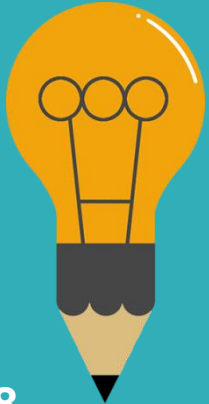
# Functions of phospholipids

- During digestive process phospholipid form clusters to Help move vitamins, nutrients and fat containing molecules through the body.
- They can be used as signal transducer between cells.



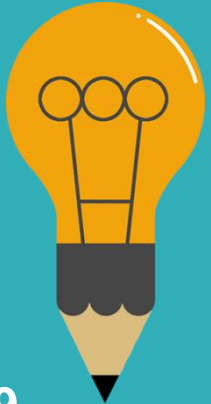
# Summary

- Lipids are divided into glycerol and fatty acid.
- Lipids are main component of cell membrane.
- Lipids are divided into simple, complex and derived lipids.
- Fatty acids consisting of hydrocarbon chain ending in a Carboxyl group.
- Function of fatty acids e.g. oxygen transport, providing Energy.
- Fatty acids are divided into saturated and unsaturated.



# Summary:

- Phospholipids contain two fatty acids, a phosphate group, and a glycerol molecule
- Function of phospholipids e.g. forms bilayers of cell membrane





Thank you  
For your attention

# References:

- Harper's Biochemistry 26th chapter (14) page (111)
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