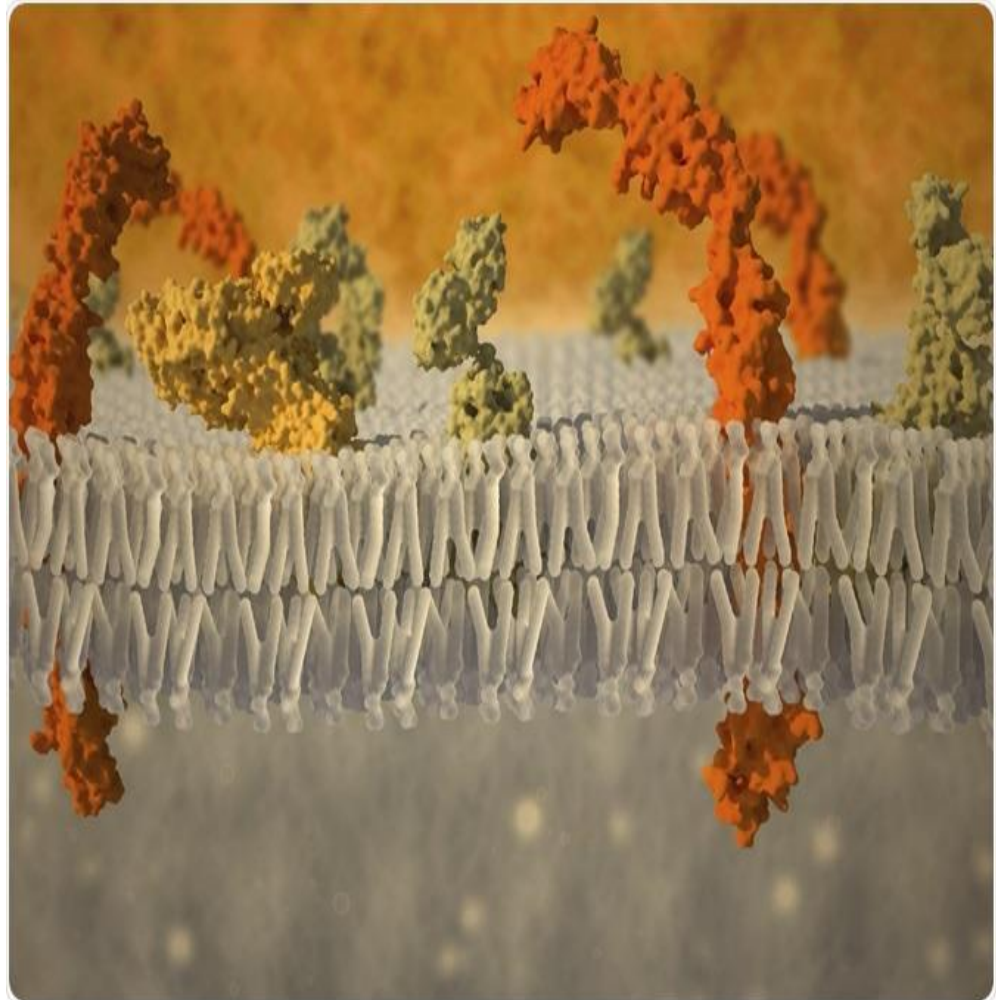


Chemistry of Lipids

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Lipids: are compounds formed from alcohol and fatty acids combined together by ester linkage

FUNCTIONS OF LIPIDS

- Storage molecules for **ENERGY** (fats and oils)
- Stored in adipose tissue
- Structural components of cellular membranes
- Protective molecules (waxes)
- Insulation

Fatty Acids

- **FATTY ACIDS (FA):** Long chain **carboxylic acids**
- **saturated:** have no double bonds between carbons in chain
- **unsaturated:** more than one double bond in the chain

Sat. Fatty Acids

Butyric

Palmitic

Stearic

Unsat. Fatty Acids

Oleic

Linoleic

Linolenic

Classification of Lipids

1. Simple lipids (Fats & Waxes)
2. Compound lipids
3. Derived Lipids

Simple Lipids

Neutral Fats and oils (Triglycerides)

- They are called neutral because they are uncharged due to absence of ionizable groups in it.
- The **neutral fats are the most abundant lipids in nature.**
- They are esters of glycerol with various fatty acids.

Waxes

- are solid simple lipids containing a monohydric alcohol esterified to long-chain fatty acids.

Compound Lipids

- They are lipids that contain additional substances, e.g., sulfur, phosphorus, carbohydrate, or proteins beside fatty acid and alcohol.

are classified into the following types:

1. Phospholipids
2. Glycolipids.
3. Lipoproteins

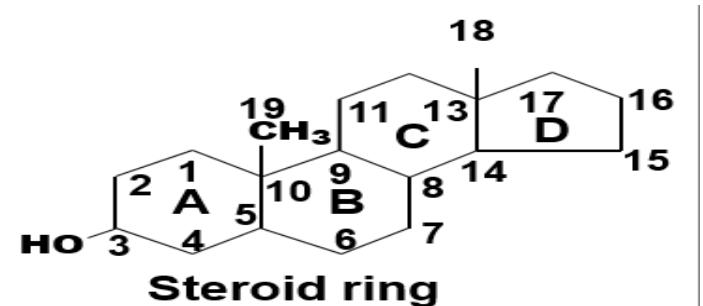
Cholesterol:

It is the most important sterol in animal tissues

- **Steroid hormones** , **bile salts** and **vitamin D** are **derivatives** from it.

Steroids

They are derivatives of cholesterol that is formed of steroid ring (**Sterols**, **Male and female sex hormones**, **Vitamin D**, **Bile acids**).



Bile acids

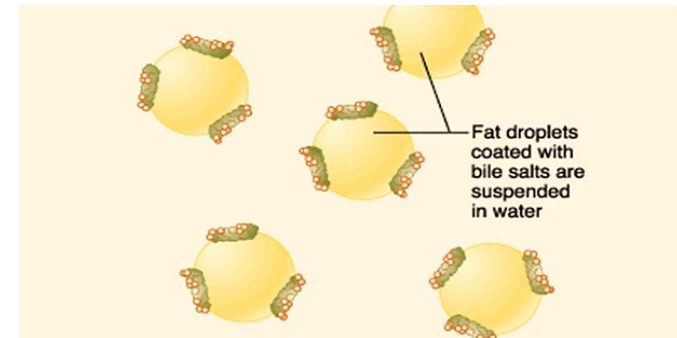
- They are produced from **oxidation of cholesterol in the liver**.
- Function : Emulsification of lipids during digestion.

Digestion of fat in Mouth

- lingual lipases

Emulsification

- **Bile salt** are responsible for formation of emulsion
- takes place in the duodenum.
- This emulsification **provide more site for lipases to act**



Digestion in small intestine

- Major site of fat **digestion** is **small intestine**
- Pancreatic lipase

Absorption of Lipids

- in the intestine, **lipids** and **bile salts** interact to form **micelles**

