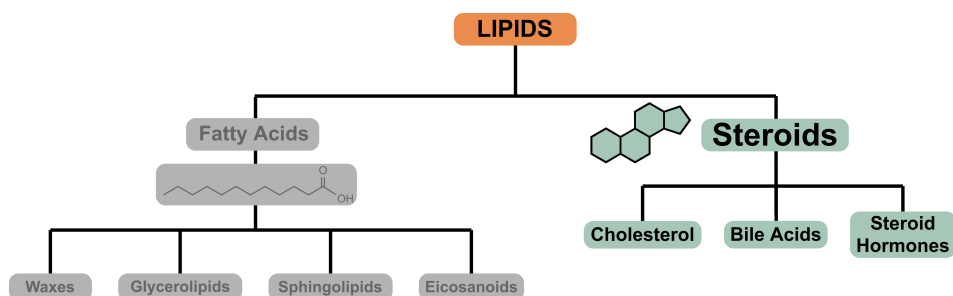
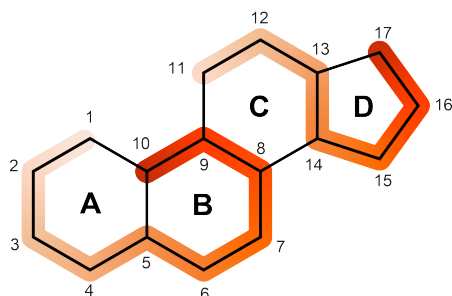


CONCEPT: STEROIDS

- Steroids are lipids that contain the steroid nucleus.

□ **Steroid Nucleus:** 3 cyclo____ane rings and 1 cyclo____ane ring fused together.



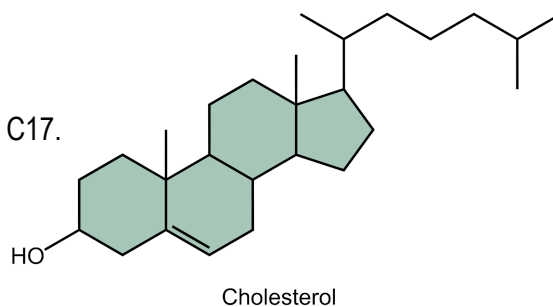
- Rings are designated A, B, C, and D and numbered in _____ order.

Cholesterol

- Cholesterol is the most abundant steroid in the human body.

- -OH group at C3
- Double bond at ____.
- Two -CH₃ groups at C10 and C13
- Hydrocarbon chain at C17.

- Helps maintain the structural integrity of the cell membrane.
- _____ of bile salts and steroid hormones.



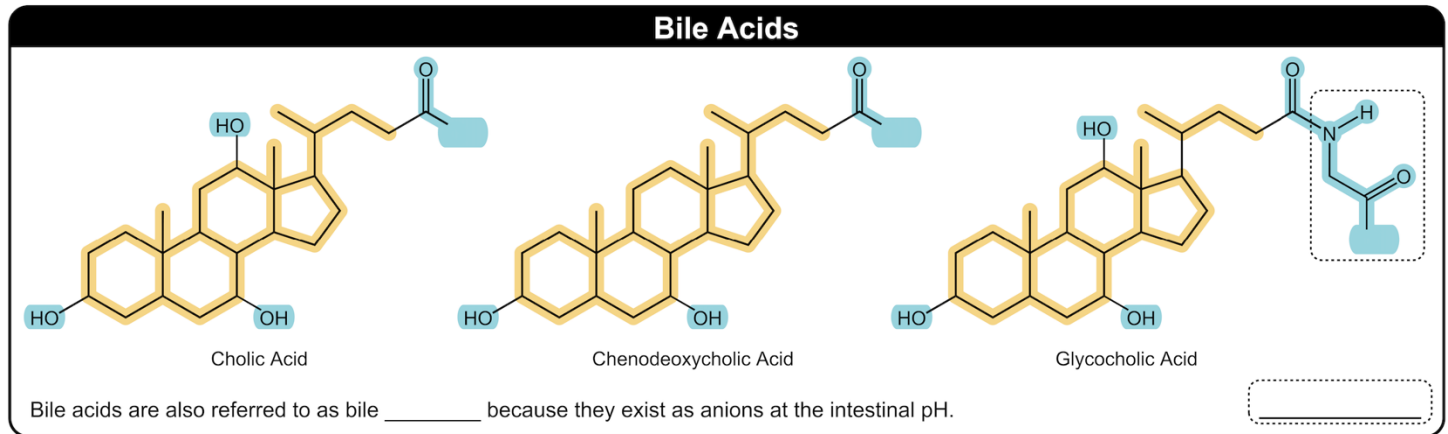
EXAMPLE: Explain why cholesterol is a lipid but does not undergo saponification with aqueous base.

- Cholesterol molecule is decomposed under strong basic conditions.
- Cholesterol can only be hydrolyzed under acidic conditions.
- The side chain on the steroid skeleton is very stable and does not undergo hydrolysis.
- Cholesterol is not a fatty acid ester that can undergo hydrolysis.

CONCEPT: STEROIDS

Bile Acids

- Synthesized in the liver from cholesterol and stored in the gall bladder.
- _____ lipids in the small intestine and increase their surface area for digestion.
 - **Emulsifying Agent:** helps a **hydrophobic** substance to remain _____ in an **aqueous** medium.
 - Emulsifying agents have **nonpolar** and **polar** regions in their structures.



- Bile acids help in the absorption of _____.

EXAMPLE: Which one of the following statements is incorrect about bile acids?

- Bile acids are emulsifying agents and help in fat digestion.
- Bile acids act as coenzymes for lipases.
- Bile acids exist as their salts at the intestinal pH.
- Bile acids are produced from cholesterol in the liver.

CONCEPT: STEROIDS

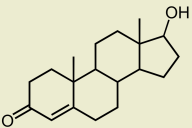
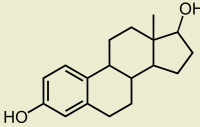
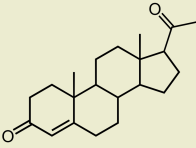
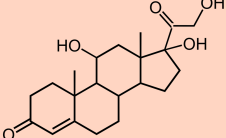
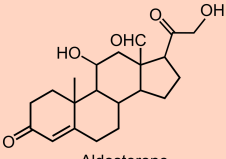
Steroid Hormones

● **Hormones:** Chemical _____ that help one part of a body communicate with the other.

□ Steroid hormones can be broadly classified into _____ groups.

1) **Sex Hormones:** control sexual characteristics and regulate _____ growth.

2) **Adrenal Corticosteroids:** regulate a wide range of physiological functions.

Steroid Hormones			
Steroid Hormone	Produced in	Function	Example
Androgens	• Testes	• Control sexual development in _____. • Control muscle growth.	 Testosterone
Estrogens	• Ovaries	• Control sexual development in _____.	 Estradiol
Progestins	• Ovaries	• Control the menstrual cycle & _____ in females.	 Progesterone
Glucocorticoids	• Adrenal glands	• Regulate _____ metabolism. • Reduce _____.	 Cortisol
Mineralocorticoids	• Adrenal glands	• Regulate the balance of _____ and _____ ions in cells and body fluids.	 Aldosterone

MEMORY TOOL 1: _____y Tests Strange _____ram.

MEMORY TOOL 2: Glucose Control and Miner_____es.

EXAMPLE: Which one of the following statements is an incorrect description of a function of a steroid hormone?

- a) Cortisol is a glucocorticoid and regulates glucose metabolism.
- b) Aldosterone helps maintain the balance of Na^+ and K^+ ions.
- c) Estradiol stimulates glycogenolysis in the liver.
- d) Testosterone contributes to the regulation of muscle growth.

CONCEPT: STEROIDS

PRACTICE: Which of the following compounds is not a steroid hormone?

- a) Cortisol
- b) Testosterone
- c) Phenazone
- d) Aldosterone

PRACTICE: Which of the following compounds is not a bile acid?

- a) Cholic acid
- b) Glycocholic acid
- c) Chenodeoxycholic acid
- d) Glycyrrhizinic acid