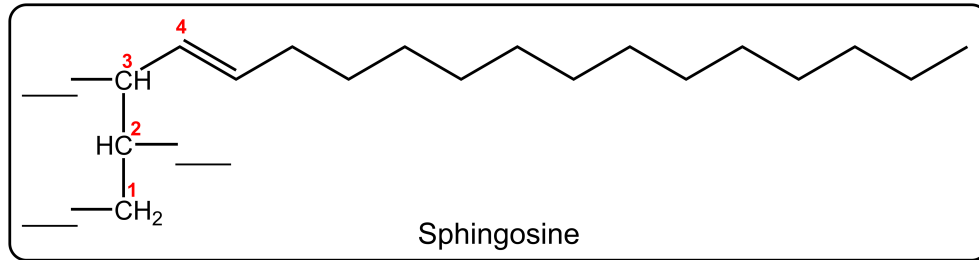


CONCEPT: SPHINGOMYELINS

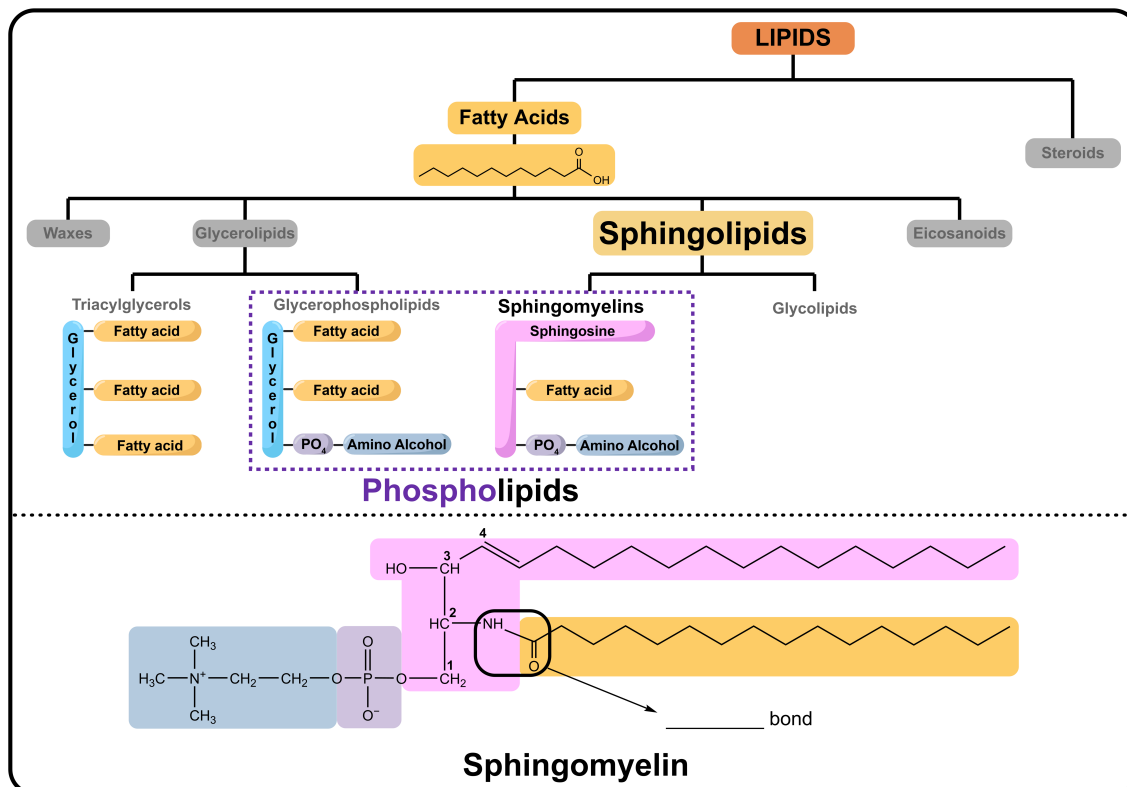
Sphingolipids

- Sphingolipids are lipids that have a _____ backbone.
 - Sphingosine is an ____-carbon amino alcohol.
 - C1 and C3 are analogous to glycerol.
 - amino ($-\text{NH}_2$) group at C2.
 - 15 C's attached to C3.
 - *trans* double bond at ____.



Sphingomyelins

- Sphingomyelins are phospholipids with a sphingosine backbone and _____ fatty acid.
 - Phosphate and a _____ head group form the head.
 - One tail is the sphingosine chain
 - Other tail is a fatty acid attached by an _____ bond.



- Sphingomyelins are primary structural components of the myelin sheath (nerve fiber coating).

CONCEPT: SPHINGOMYELINS

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

- a) The fatty acid at C2 is attached through an amide linkage.
- b) The backbone molecule in sphingomyelins is sphingosine.
- c) Sphingomyelins are essential for the structural integrity of the myelin sheath.
- d) A sphingomyelin has only one tail because it contains one fatty acid.

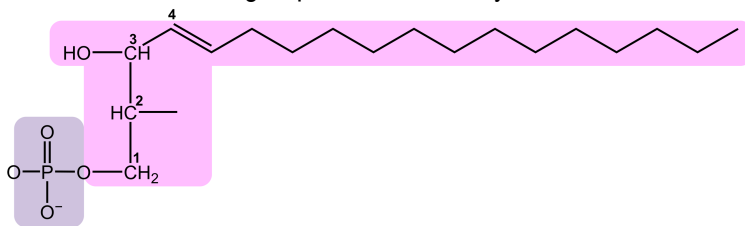
Drawing Sphingomyelins

- Drawing a sphingomyelin requires recalling the structures of sphingosine and fatty acids.

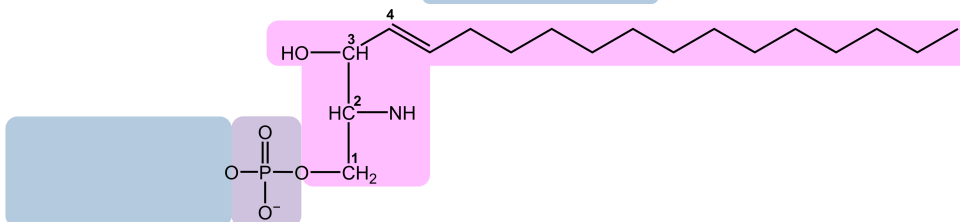
EXAMPLE: Draw the structure of a sphingomyelin that contains oleic acid.

STEP 1: Draw the sphingosine backbone with a phosphate group at ____.

- Instead of the -NH_2 group at C2, write only ____.



STEP 2: Extend the phosphate at C1 with the choline head group.



STEP 3: Draw the fatty acyl group (FA without -OH) from the -NH at C2.



CONCEPT: SPHINGOMYELINS

PRACTICE: Draw a sphingomyelin that contains palmitoleic acid.

PRACTICE: Which one of the following statements describes how sphingomyelins are similar to glycerophospholipids?

- a) Sphingomyelins have the same number of fatty acids as glycerophospholipids.
- b) Sphingomyelins and glycerophospholipids have the same linkage that holds the fatty acids.
- c) Sphingomyelins and glycerophospholipids have phosphate with head groups.
- d) Both can be classified as sphingolipids.

PRACTICE: Which one of the following statements is incorrect about triacylglycerols and phospholipids?

- a) Triacylglycerols contain glycerol while phospholipids do not.
- b) Phospholipids have a phosphate group attached at C3.
- c) Phospholipids and triacylglycerols contain 2 and 3 fatty acids, respectively.
- d) Due to polar head groups, phospholipids have a higher water solubility than triacylglycerols.