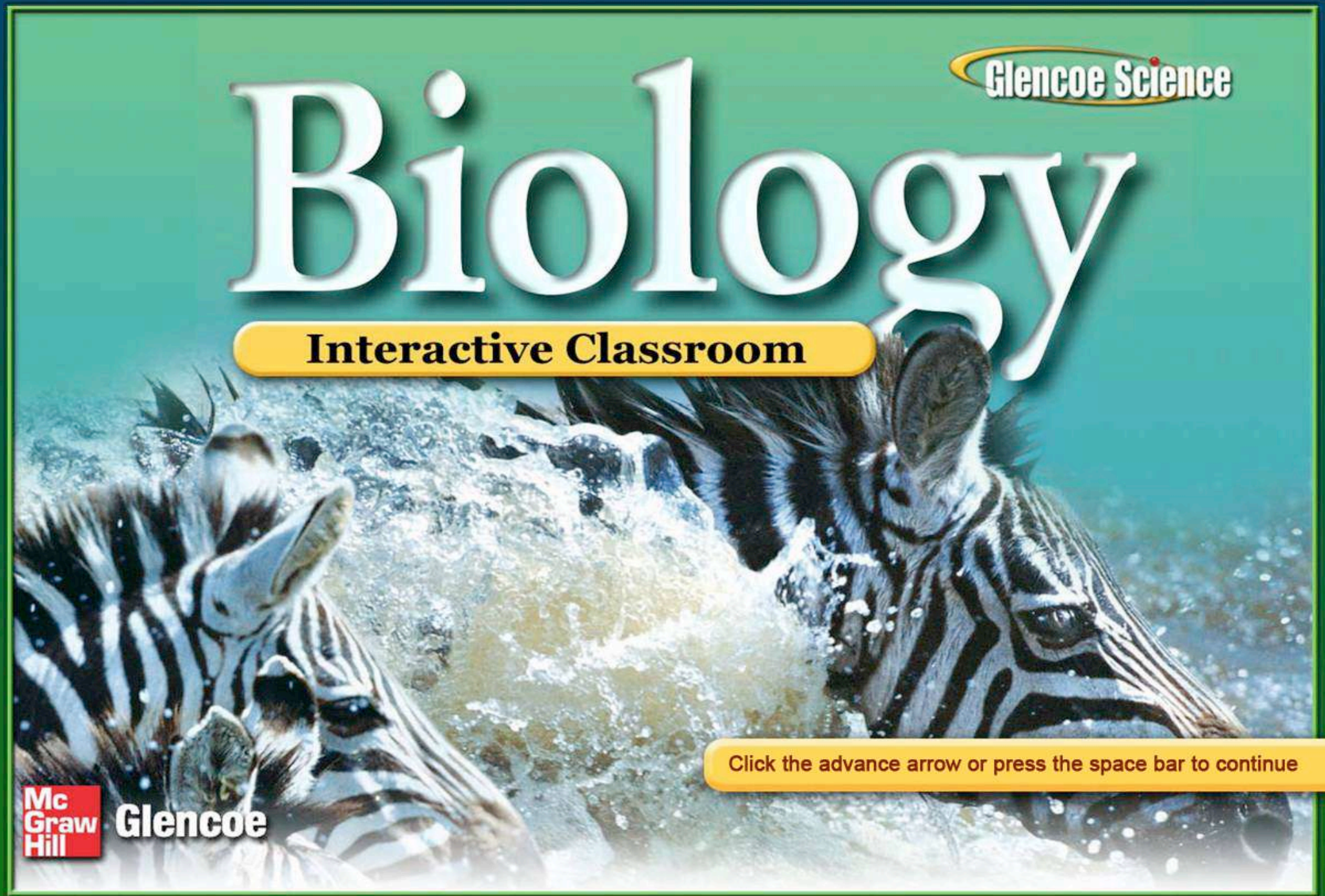
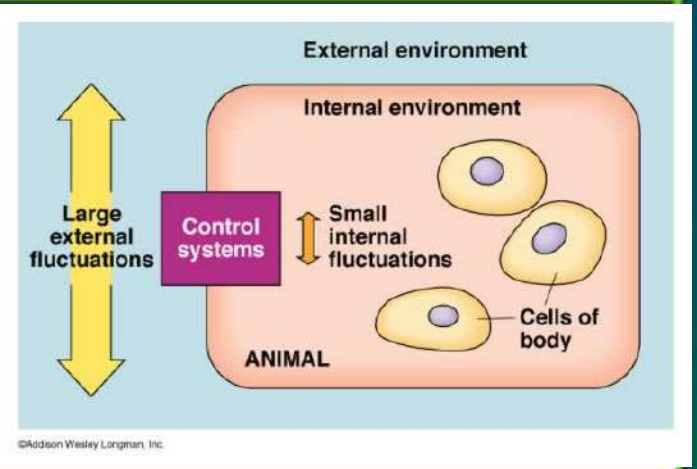


7.2 – The Plasma Membrane

State Standard
SB1a

Explain the role of cell organelles for both prokaryotic & eukaryotic cells, including the cell membrane, in maintaining homeostasis & cell reproduction.

Homeostasis

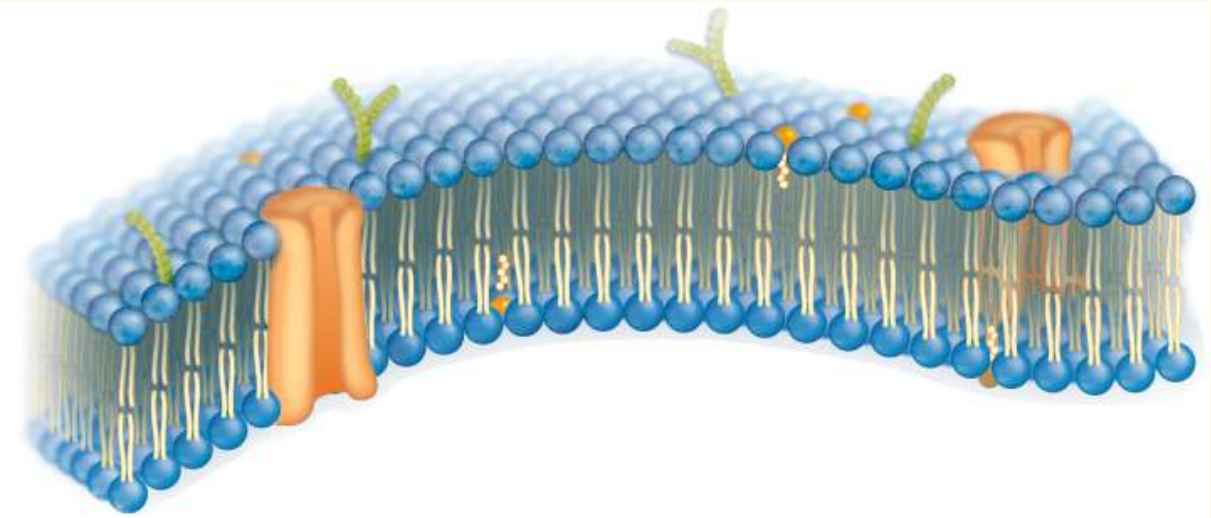


- Living cells maintain a **balance** between materials **entering** & **exiting** the cell.
- Their ability to maintain this balance is called **homeostasis**.
- It is important for a cell to control internal & external concentrations of **water**, **glucose**, & other nutrients, while eliminating cellular **wastes**.

7.2 The Plasma Membrane

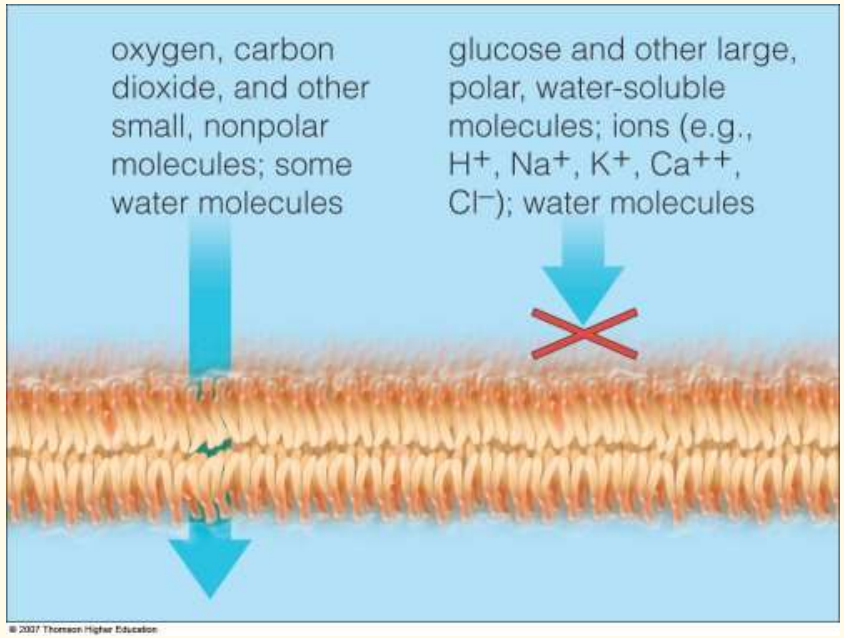
Plasma Membrane

- Thin, flexible **boundary** between the cell and its environment
- Allows **nutrients into** the cell
- Allows **waste** to **leave** the cell



Selective Permeability

- Property of the membrane that allows certain materials to **pass through** the cell while keeping others **out**

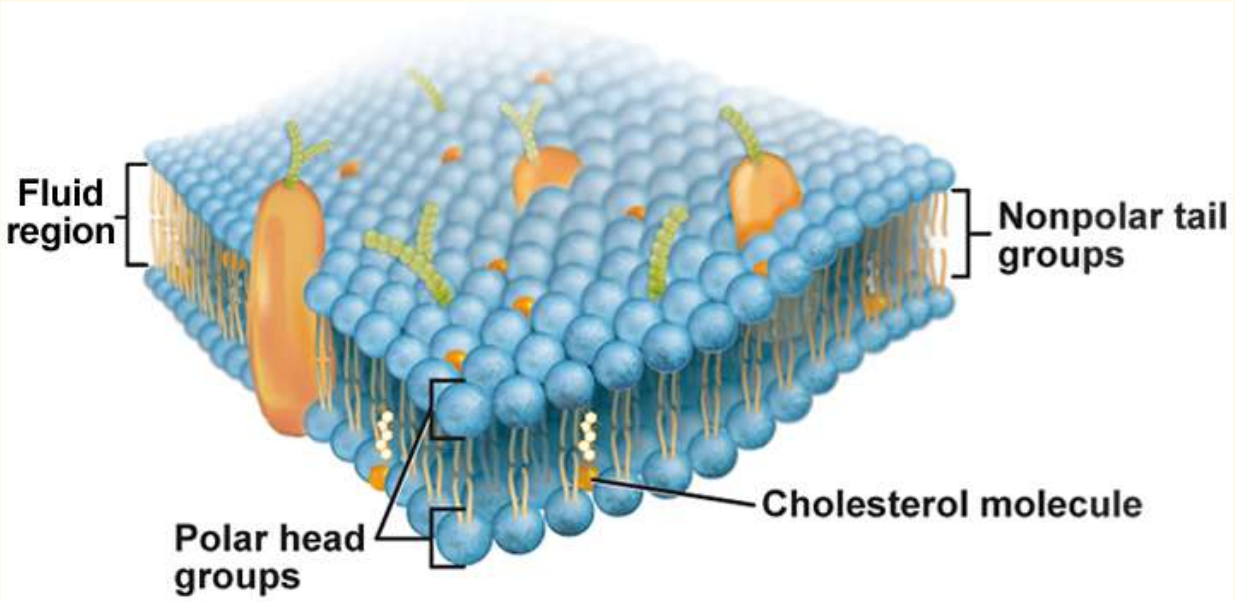


- It also allows **different** cells to perform different activities within the **same** organism.
- Example: Human nerve cells respond to a certain chemical that is present in the bloodstream. Other cells are exposed to this chemical but are not affected by it.

7.2 The Plasma Membrane

Basic Structure of the Plasma Membrane

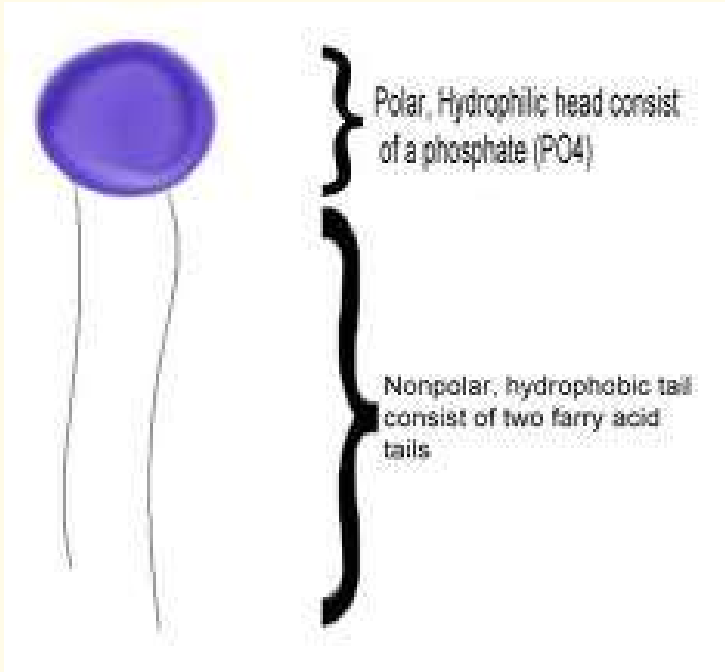
- The plasma membrane is composed of the **phospholipid bilayer**.
- A phospholipid molecule is composed of a **glycerol** backbone, two fatty acid **chains**, and a **phosphate** group.

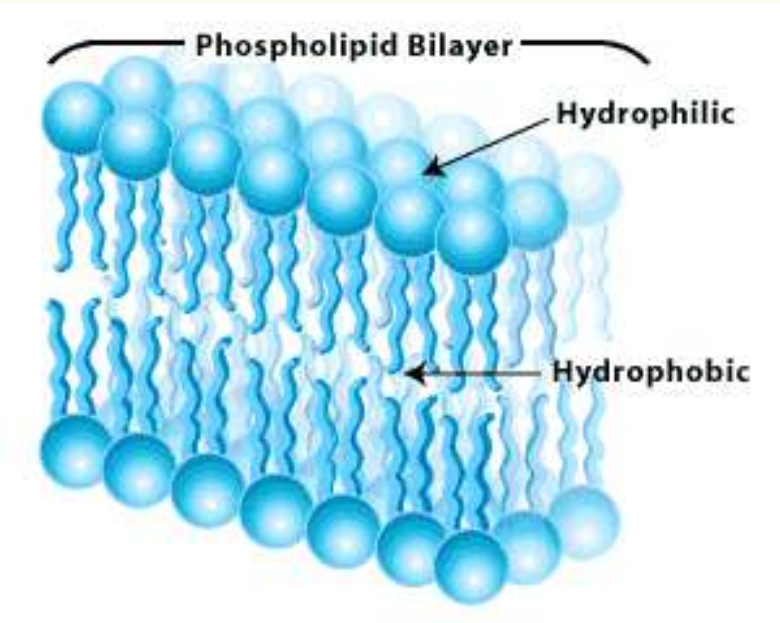


7.2 The Plasma Membrane

Basic Structure of the Plasma Membrane Cont'd

- The **polar**, phosphate head of a phospholipid molecule is **hydrophylic**.

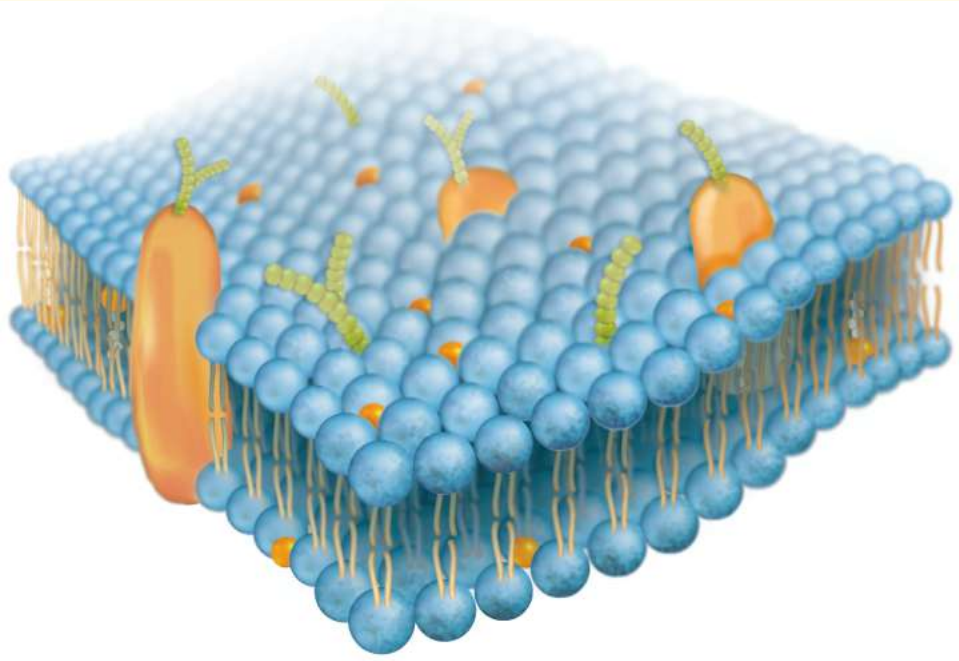




- The **nonpolar**, fatty acid tail of a phospholipid molecule is **hydrophobic**.

Fluid Mosaic Model

- The phospholipid bilayer allows other molecules to "**float**" in the membrane.



Other Components

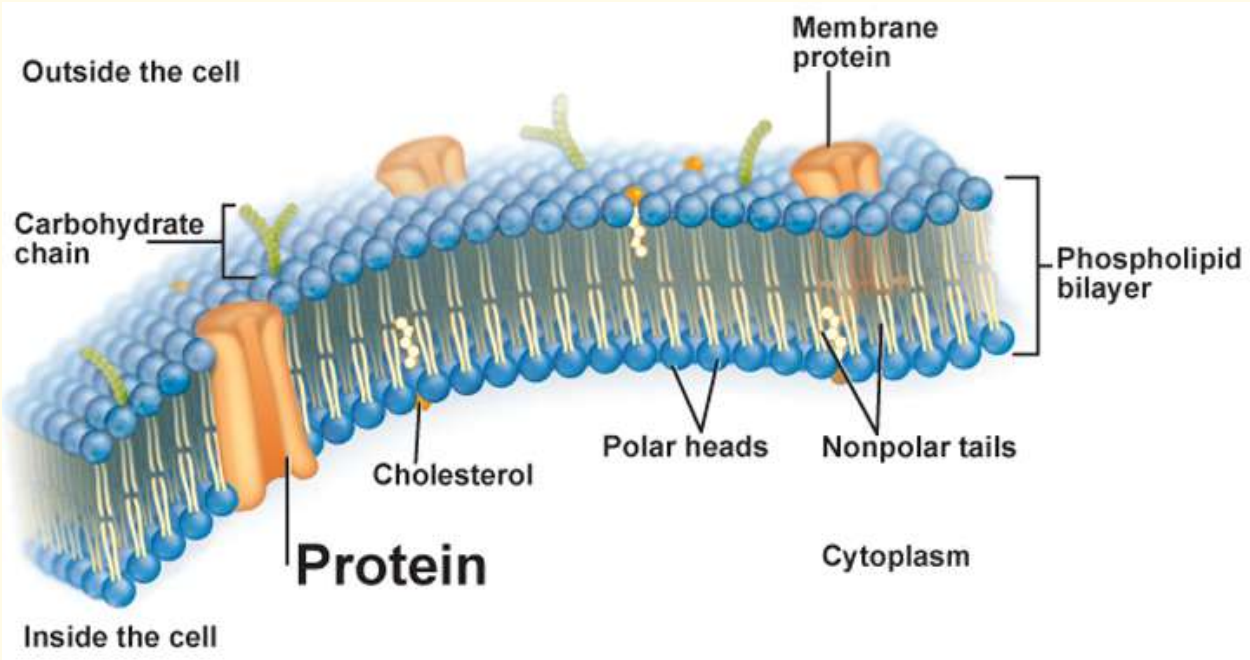
- Proteins
- Cholesterol
- Carbohydrates

- Class Discussion: What is the meaning of the word ***mosaic***?

7.2 The Plasma Membrane

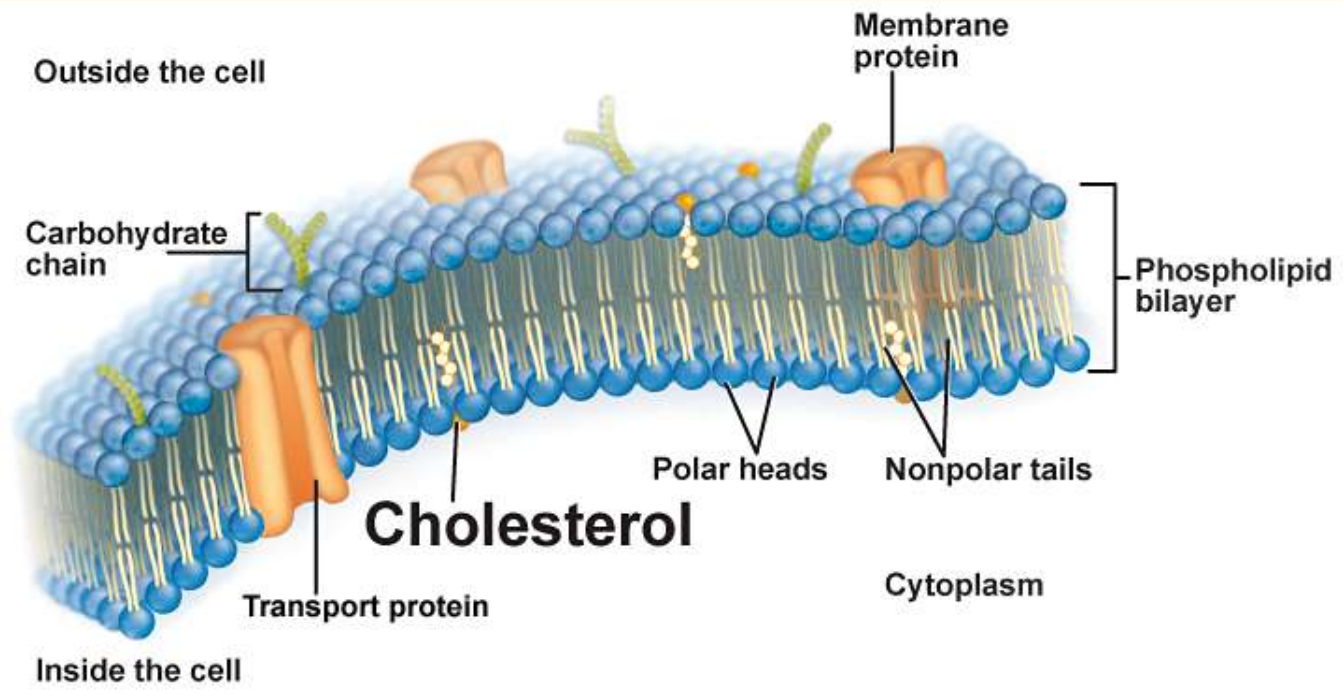
Proteins

- **Transmit** signals inside the cell
- Act as a **support** structure
- Provide **pathways** for substances to enter and leave



Cholesterol

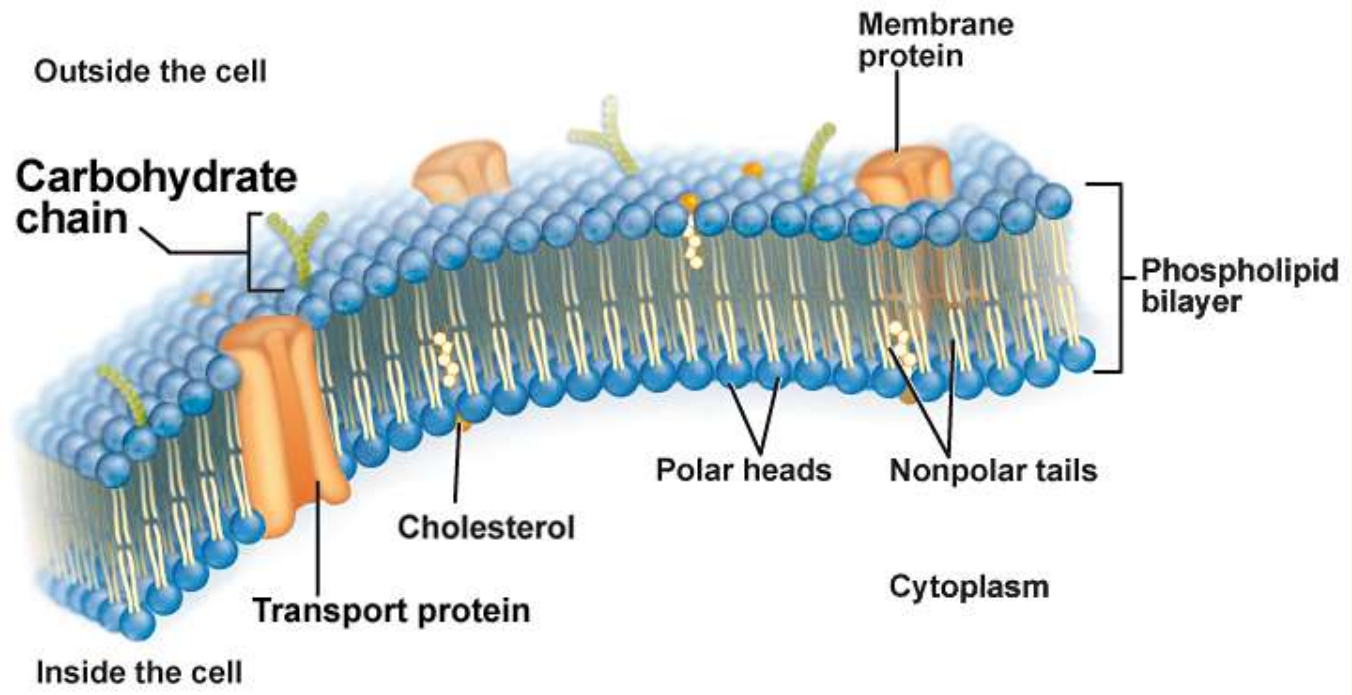
- **Prevents** fatty acid tails from **sticking** together



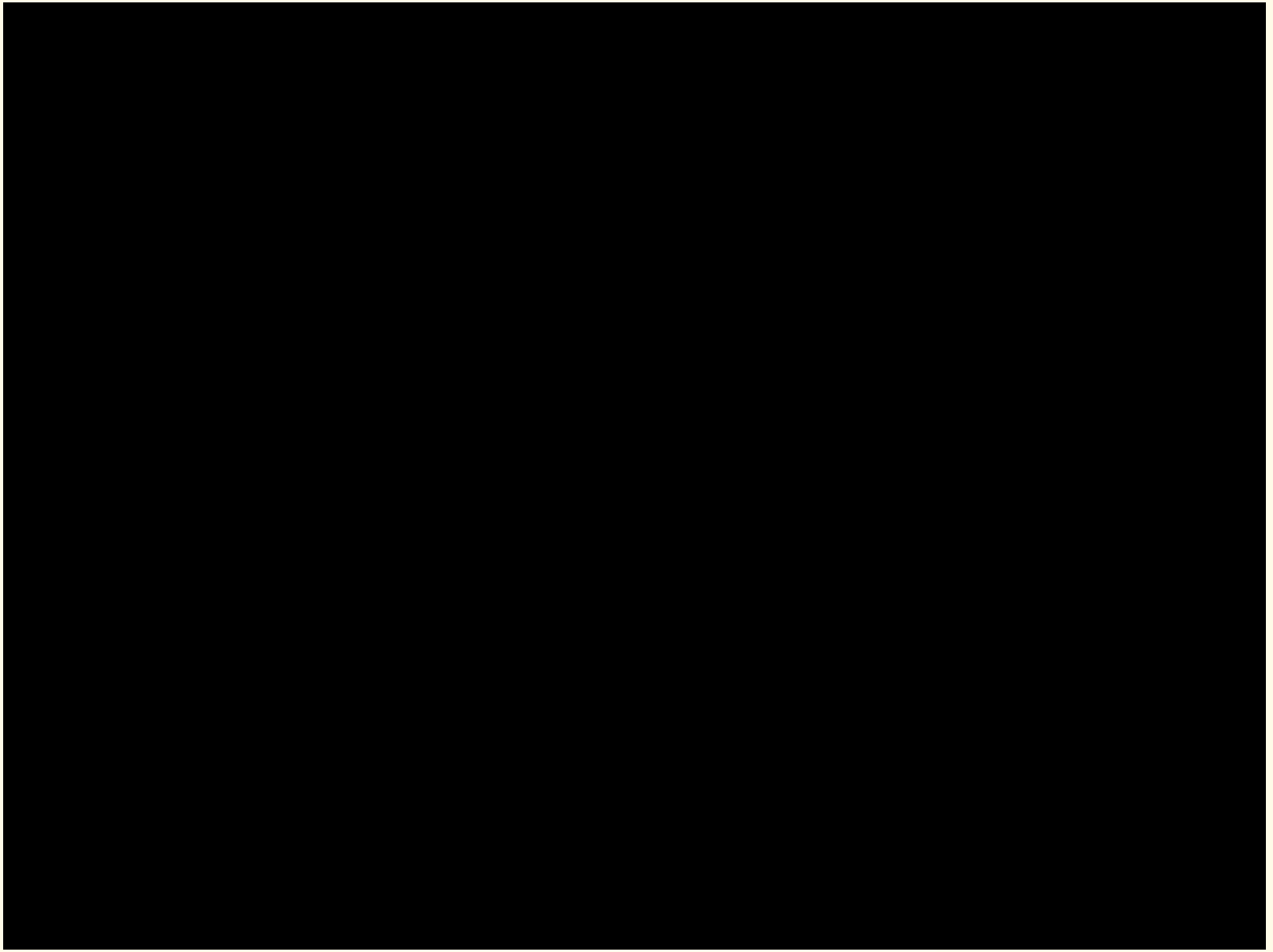
Review: What macromolecule group to cholesterols belong to?

Carbohydrates

- **Identify** chemical **signals**



Concepts In Motion



7.2 Formative Questions

CheckPoint

Which term describes the function of proteins found on the outer surface of the plasma membrane?

A. identifiers

B. receptors

C. supporters

D. transporters

7.2 Formative Questions

CheckPoint

Which component of the plasma membrane contributes to the fluidity of the plasma membrane?

A. phospholipids

B. proteins

C. carbohydrates

D. cholesterol molecules

7.2 Formative Questions

CheckPoint

What is the function of carbohydrates that stick out from the outer surface of the plasma membrane?

A. They give the cell shape and enable it to move.

B. They give the plasma membrane fluidity.

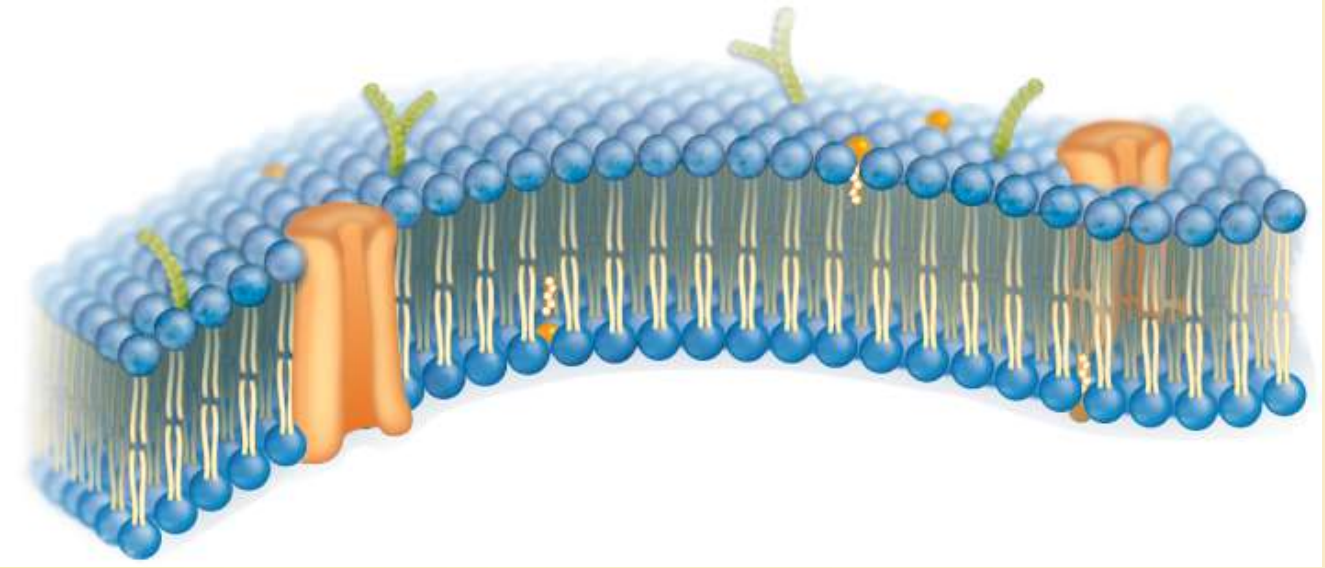
C. They help the cell identify chemical signals.

D. They hold the cell in place.

Chapter Assessment Questions

CheckPoint

Identify the structure represented by this image.



Answer: plasma membrane and phospholipid bilayer

Standardized Test Practice

CheckPoint

What part of the plasma membrane makes it difficult for water-soluble substances to move freely into and out of the cell?

A. membrane proteins

B. transport proteins

C. the nonpolar tails in the middle of the plasma membrane

D. the polar heads facing the inside and outside of the cell