

Membrane Structure and Function POGIL

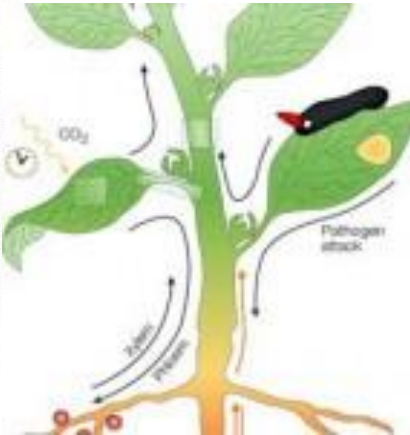
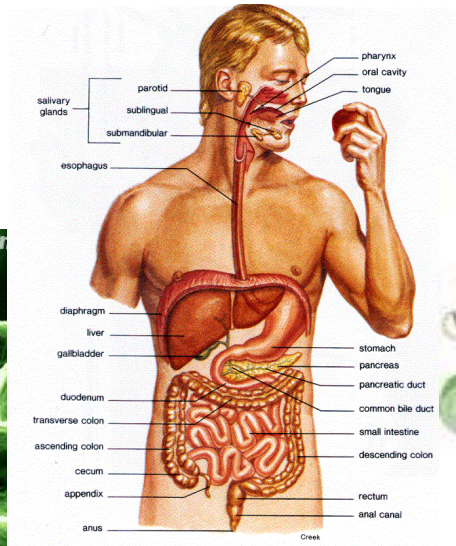
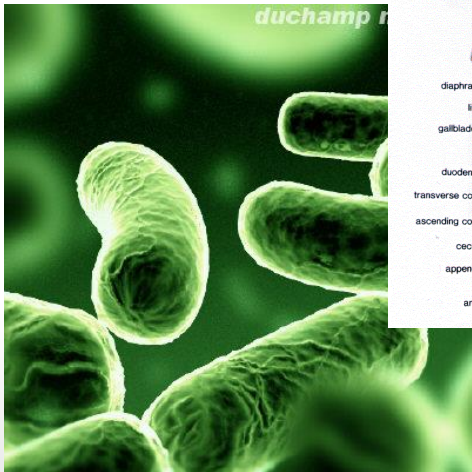
Tuesday, December 2, 2014

Welcome! 12/2/14

- **OBJECTIVE:** Students will participate in a POGIL assignment to investigate the structure and function of cell membranes.
- **CATALYST: (REVIEW)**
 1. What is the function of the cell membrane?
 2. What is the structure of the cell membrane?
 3. What analogy did we make for the cell membrane?
- **HOMEWORK:**
 - HW 3.2 DUE Friday, 12/5/14
 - Quiz 3.2 Friday, 12/5/14
 - Chapter 1 (Survival of the Sickest) DUE Monday, 12/8/14

Where have we been?

- Living things = organisms
- Characteristics of Living Things
 - MRS. NERG
- Cell Organelles



Where are we going?

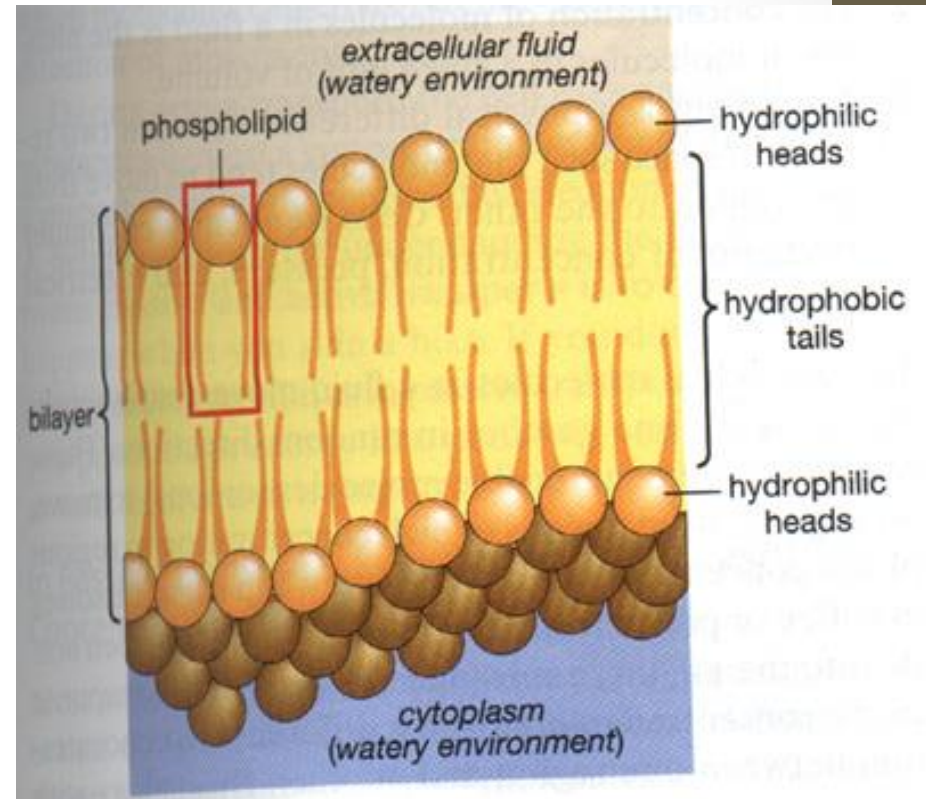
- Homeostasis in cell membranes
- Passive/Active Transport
- Osmosis
- Diffusion

Review Cell Membranes

1. What is the function of the cell membrane?
2. What is the structure of the cell membrane?
3. What analogy did we make for the cell membrane?

CELL (Plasma) MEMBRANE

- **Thin, Flexible Barrier** around the cell
- **Function:** Protects the cell and lets things in and out of the cell
- **Analogy:** Bouncer at a night club- only lets certain things in and out of the cell



POGIL Investigation

POGIL

- What is a POGIL?
- **Process Oriented Guided Inquiry Learning**
- The focus is on HOW you are gathering information

Role Cards

- In your 4 person groups, you will be assigned a role, or job.
- **Take 2 minutes to read your role card and write a 1 sentence summary IN YOUR OWN WORDS about what you should be doing during the POGIL.**

POGIL Roles

- Let's summarize what we feel are the most important parts of each role:
 - **Facilitator**
 - **Spokesperson**
 - **Quality Control**
 - **Process Analyst**

POGIL Guidelines

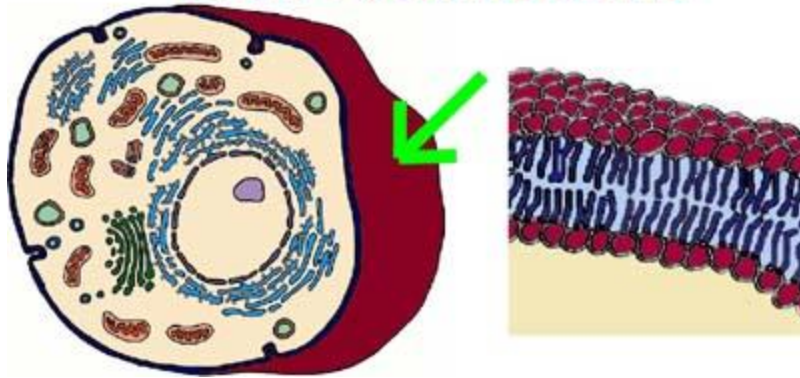
- Everyone should be participating and recording answers
- YOU are responsible for YOUR role!!!
- I will be checking that you are performing your role. THIS is what influences your final grade as a group. TEAMWORK!!
- When you get to a stop sign, make sure your team has all of the answers for each question and that they are consistent (NOT IDENTICAL). The spokesperson should raise their hand for me to check answers. I WILL CHOOSE the paper to check.
- I will give you some guidance with how much time you should need to complete each section.
- STAY ON TASK! 😊

POGIL

- Let's check some of the answers: 7, 16, 33

	Active Transport	Passive Transport	
		Diffusion	Facilitated Diffusion
Requires energy input by the cell			
Molecules move along (down) a concentration gradient			
Moves molecules against (up) a concentration gradient			
Always involves channel (membrane-spanning) proteins			
Molecules pass between phospholipids			
Moves ions like Na ⁺ and K ⁺			
Moves large molecules			
Moves small nonpolar and polar molecules			

Cell Membrane



Review

Review Questions:

1. What is the function of the cell membrane in a cell?
2. What macromolecule makes up a cell membrane?
3. What is “homeostasis”?
4. Why is homeostasis important?

Cell Membranes

- Made of lipid bilayer
 - “bi” = “two”
- Hydrophobic—
 - “hydro” =
 - “phobia” =
- Hydrophilic—
 - “hydro” =
 - “phil” =

Lipid Bilayer

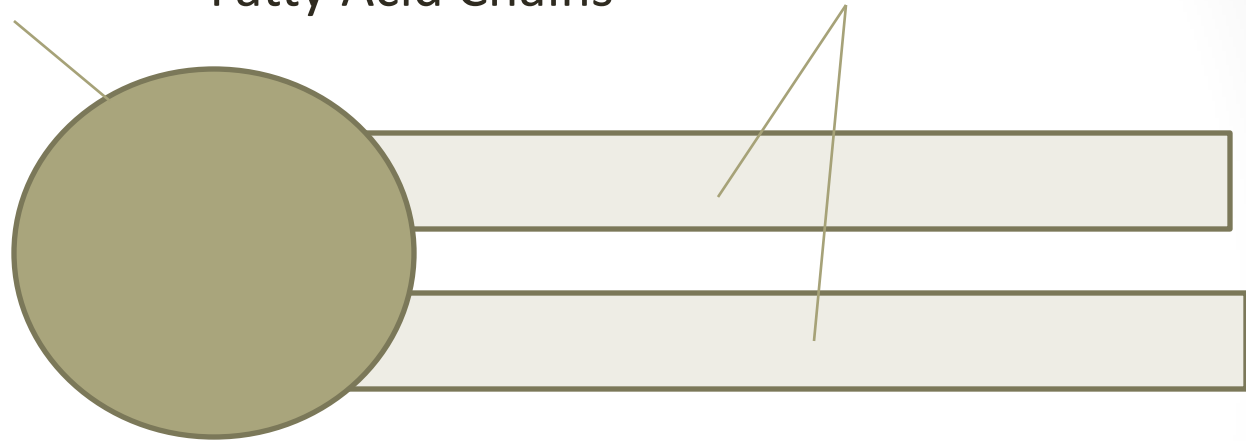
- Hydrophobic— “afraid of water”
- Hydrophilic— “water lover”
- What are the subunits of the lipid molecule?
- Based on your prior knowledge, what part will love water? What part will hate water?



Lipid Bilayer

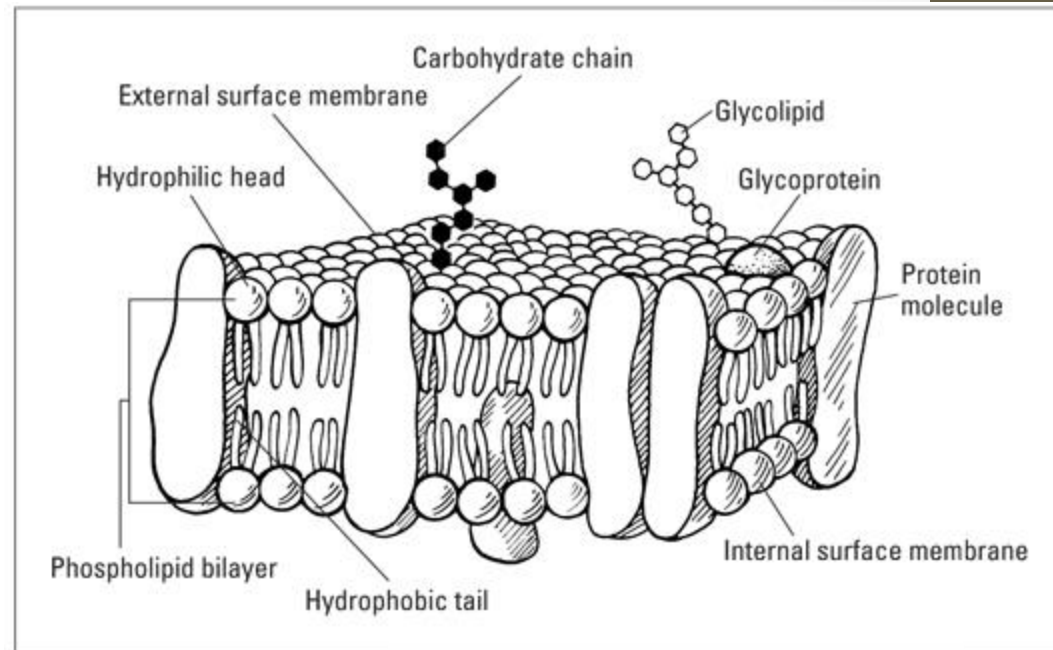
Glycerol Head

Fatty Acid Chains



Cell Membranes...

- Contain
 - Transport Proteins
 - Receptor Proteins
 - Carbohydrates
 - Cholesterol



- Are semi-permeable or selectively permeable

Think-Pair-Share

- What do the words “selective” and “permeable” mean?
 - 1 min—THINK
 - What do I think they mean?
 - 2 min—PAIR
 - What does my partner think they mean?
 - Are our definitions different or the same?
 - 2 min—SHARE
 - What does the class think?

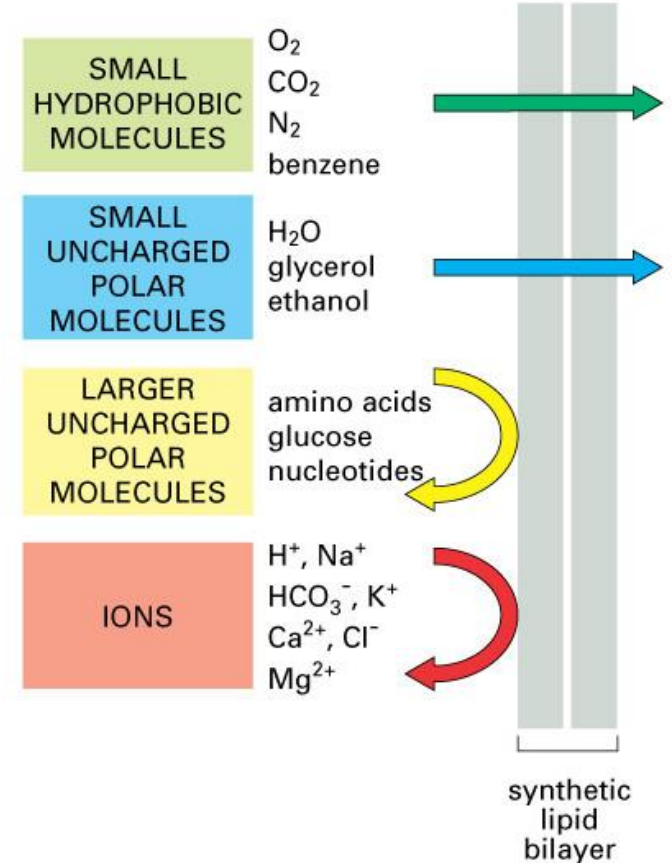
Selectively Permeable

- Membrane chooses what can come in and go out of the cell
- Whether something will pass through the membrane is determined by:
 - Size
 - Charge
 - Concentration

Selectively Permeable

Look at the chart on the right.

- What molecules will pass through the membrane easily?
- What molecules will not pass through easily?

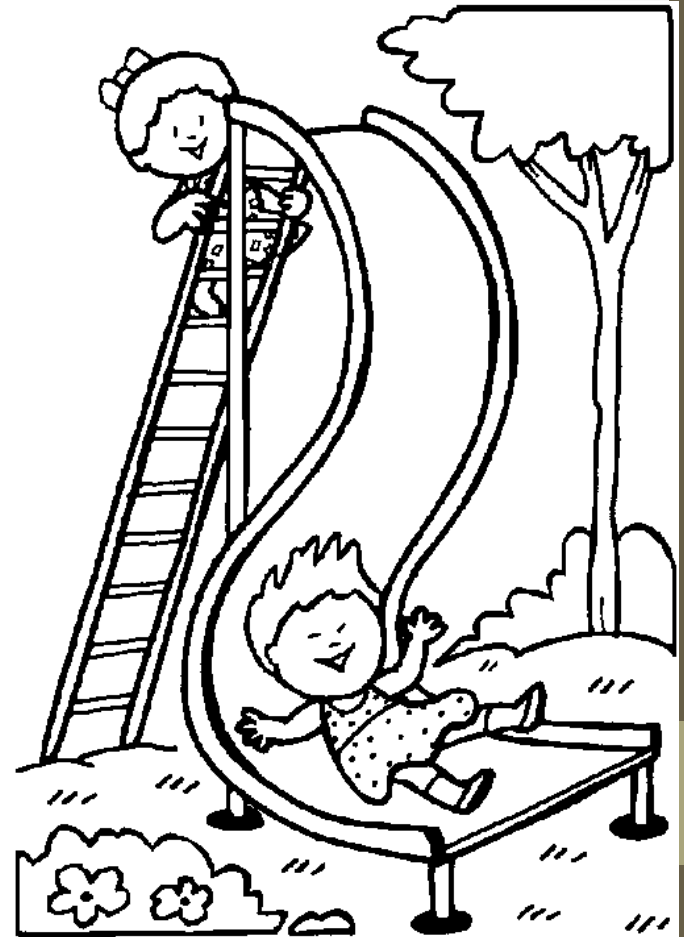


Types of Transport

- ACTIVE



- PASSIVE



Types of Transport

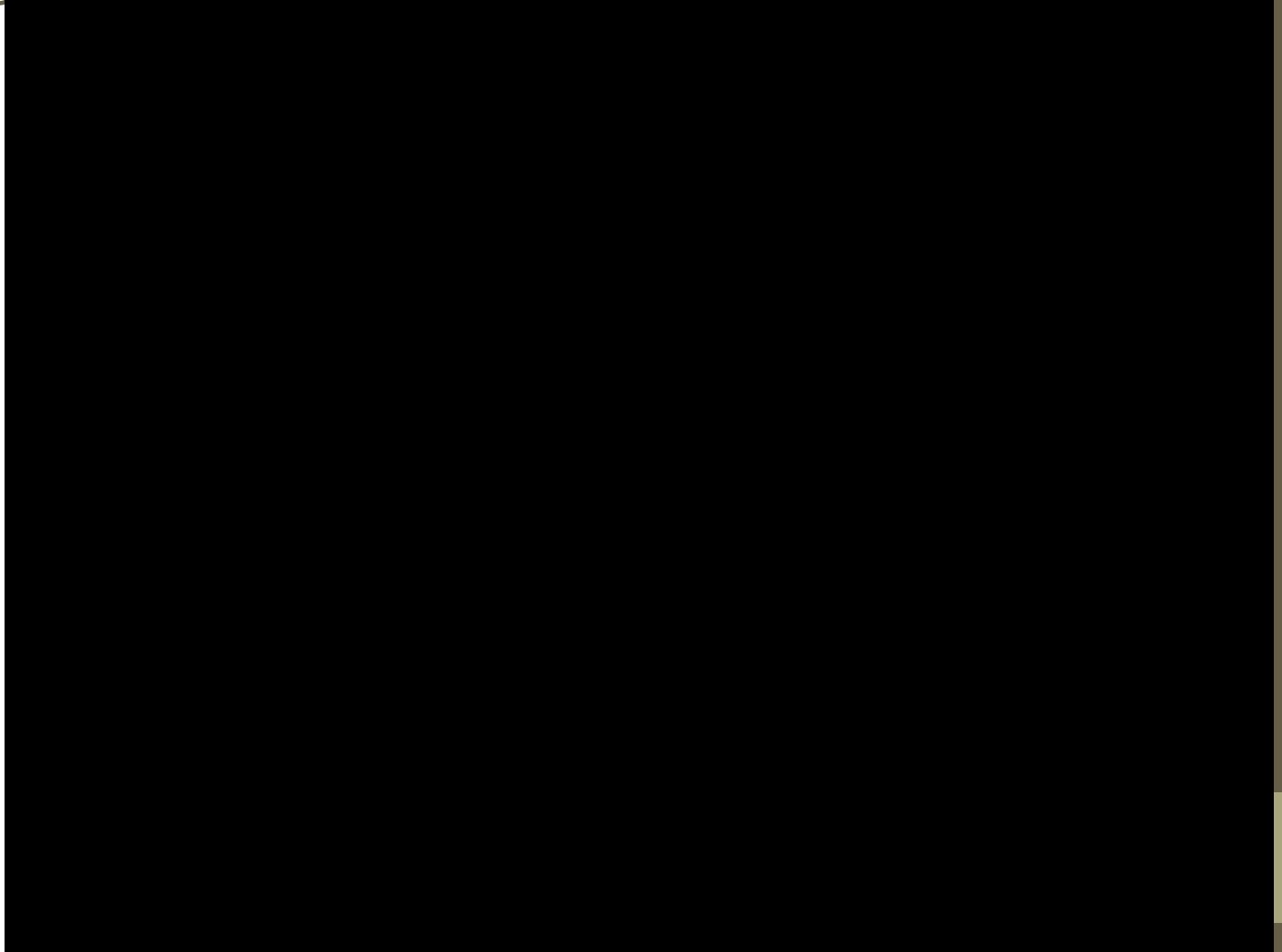
- Particles can pass through a membrane in two ways.

Active Transport	Passive Transport
Requires <u>energy</u> Examples: - Pumps - Endocytosis - Exocytosis	Does NOT require <u>energy</u> Examples: - Diffusion - Osmosis - Ion Channels - Carrier Proteins

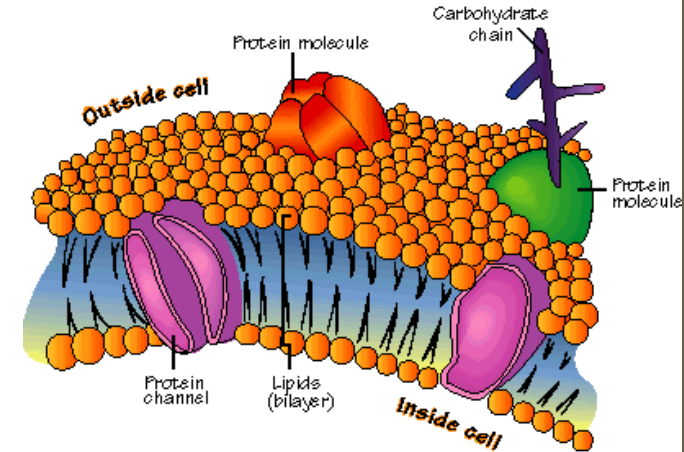


Passive and Active Transport

VIDEO



Fluid Mosaic Model



- The cell membrane is always changing!
- The lipids and proteins fit together like a mosaic—lots of pieces put together to make a picture.
- But they are able to move around the membrane—"fluid," like water.

Exit Slip

- What does it mean for a cell to be semi-permeable?
- Give an example.