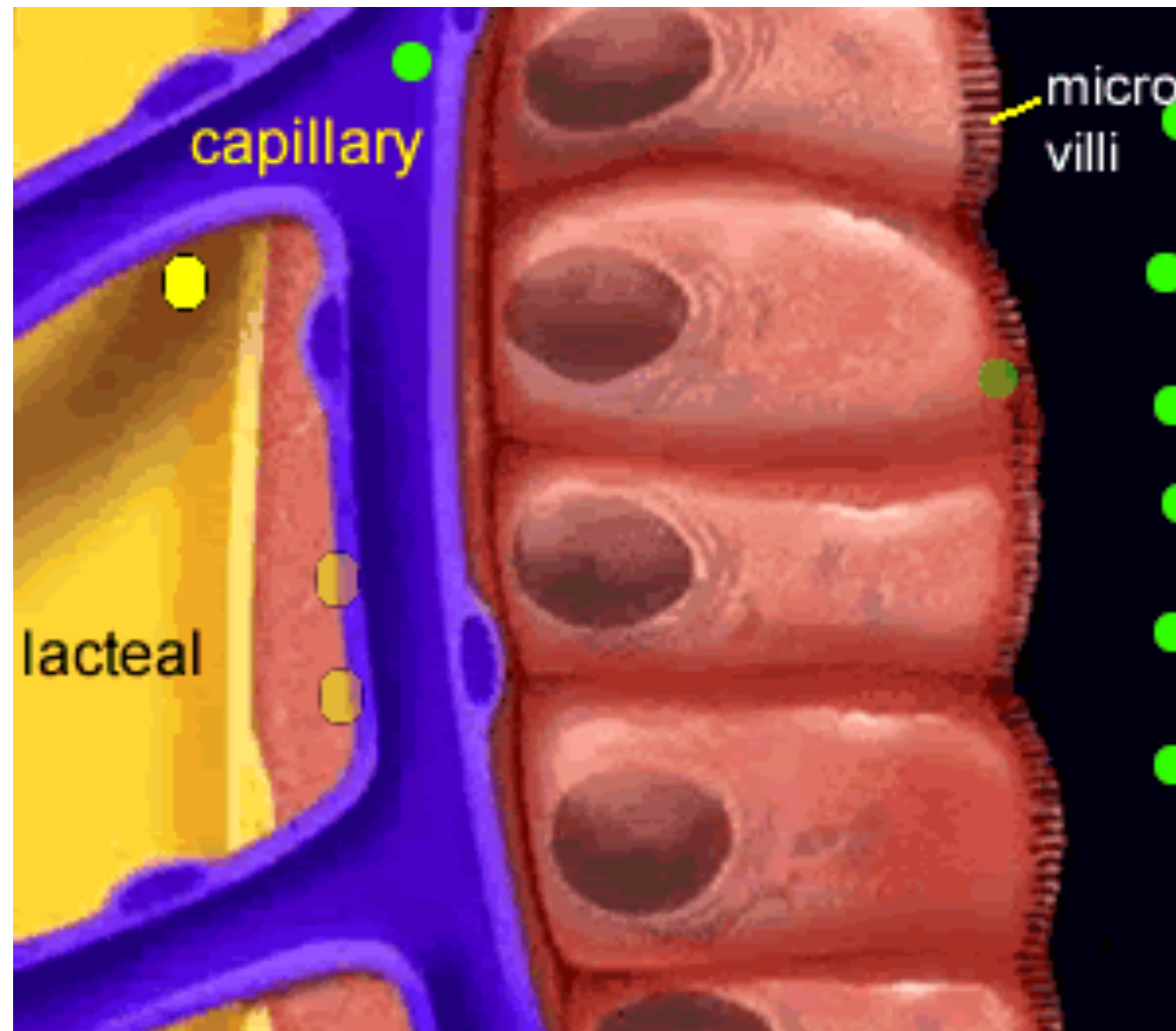
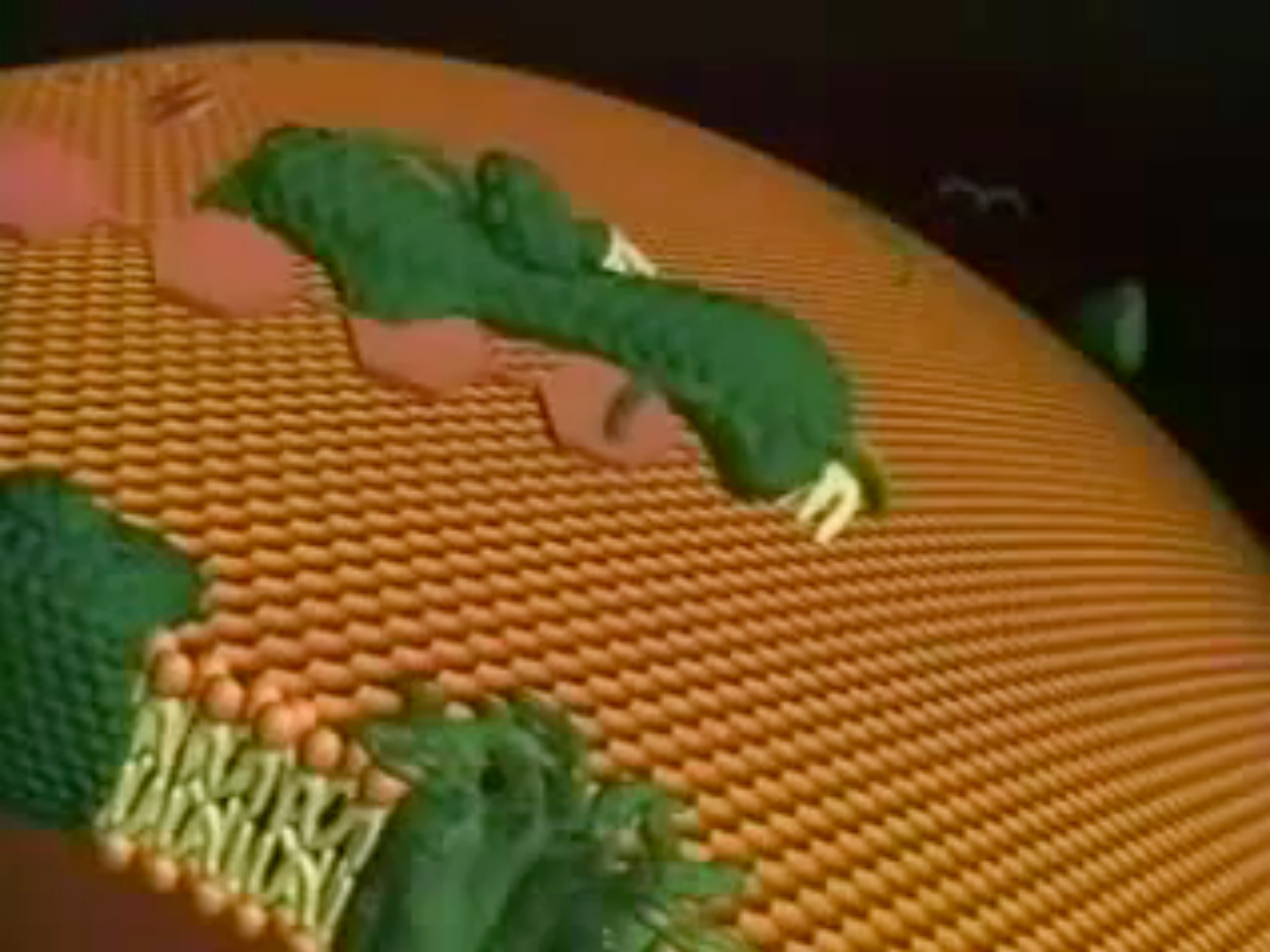


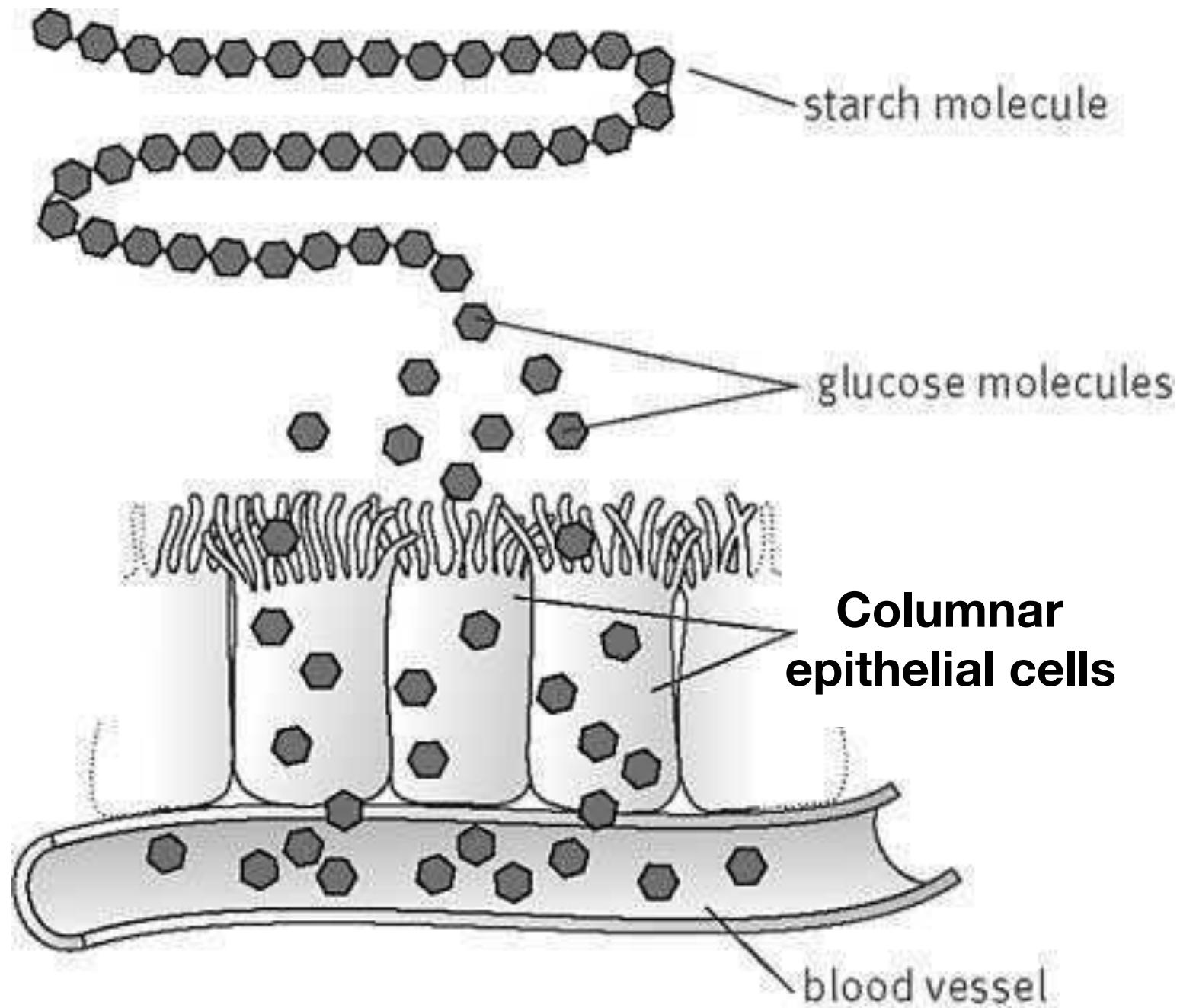
# Absorption in the Intestine





# The intestinal wall

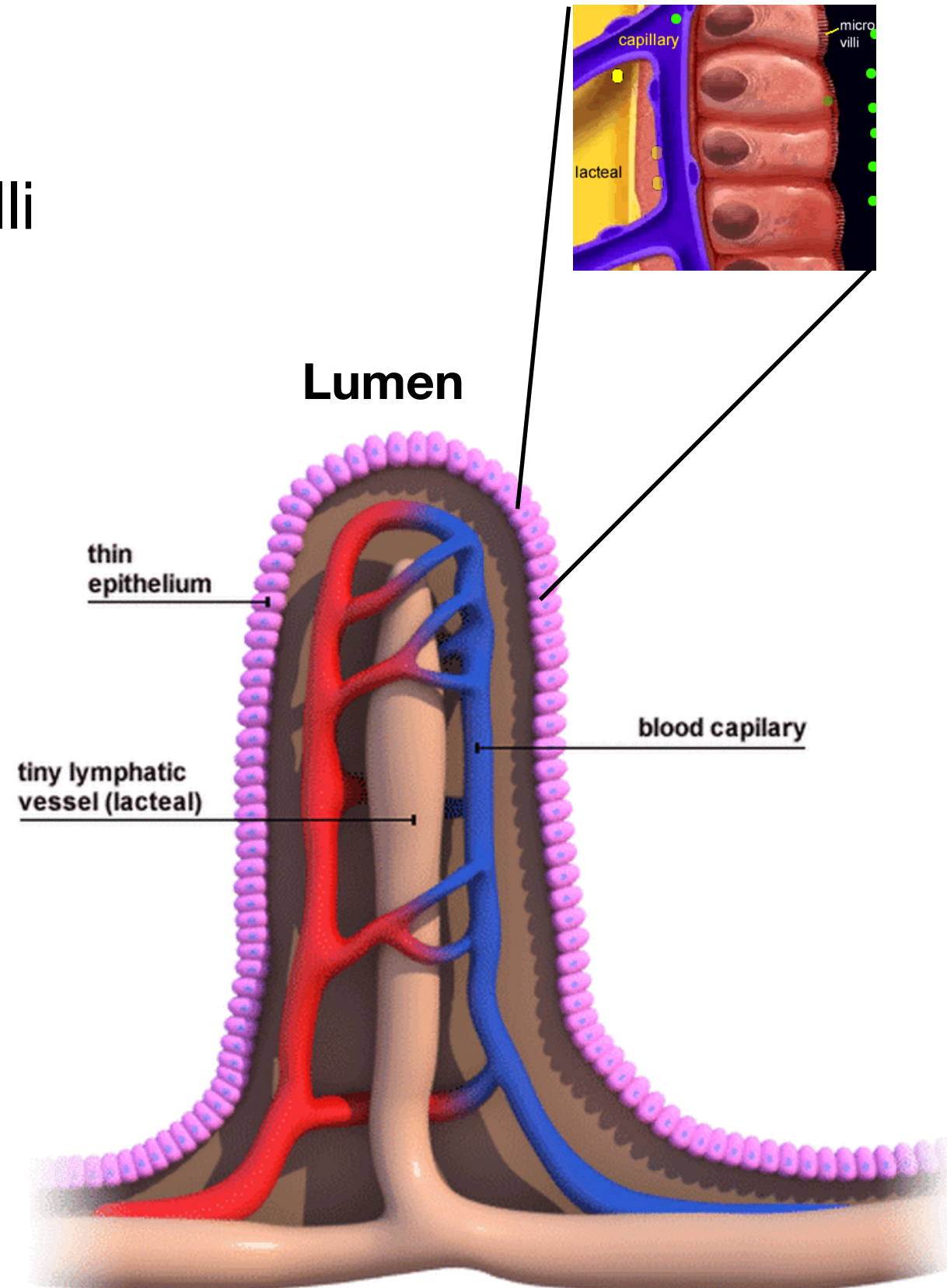
How do nutrients enter the blood stream?





# The intestinal wall

- 7m long in adults
- 25-30 mm wide
- folds in the wall, and finger like villi
  - 40/mm<sup>2</sup>
- all increases surface area

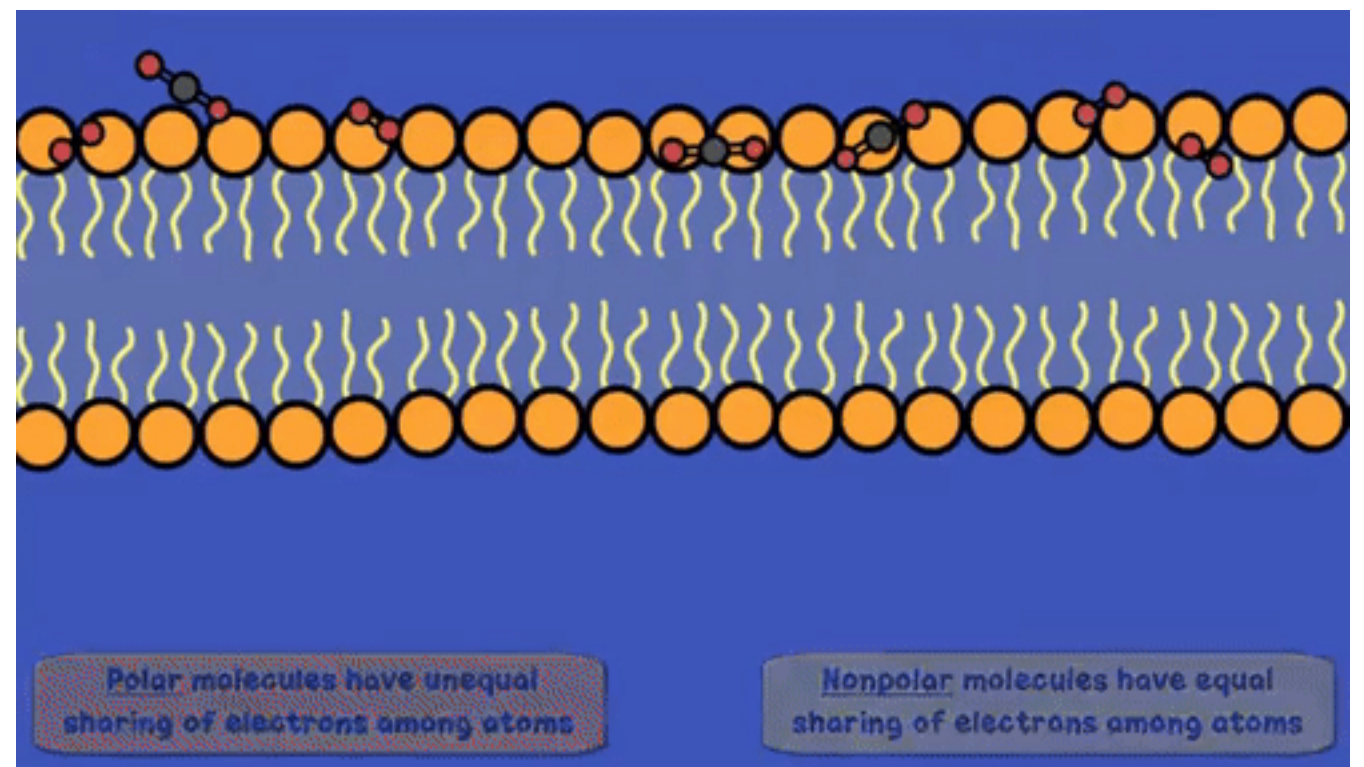


# Method of Absorption

- **Simple Diffusions** —>
  - nutrients pass **down a concentration** (from high to low) through the membrane bilayer
  - no energy required  
**PASSIVE**

eg. fatty acids

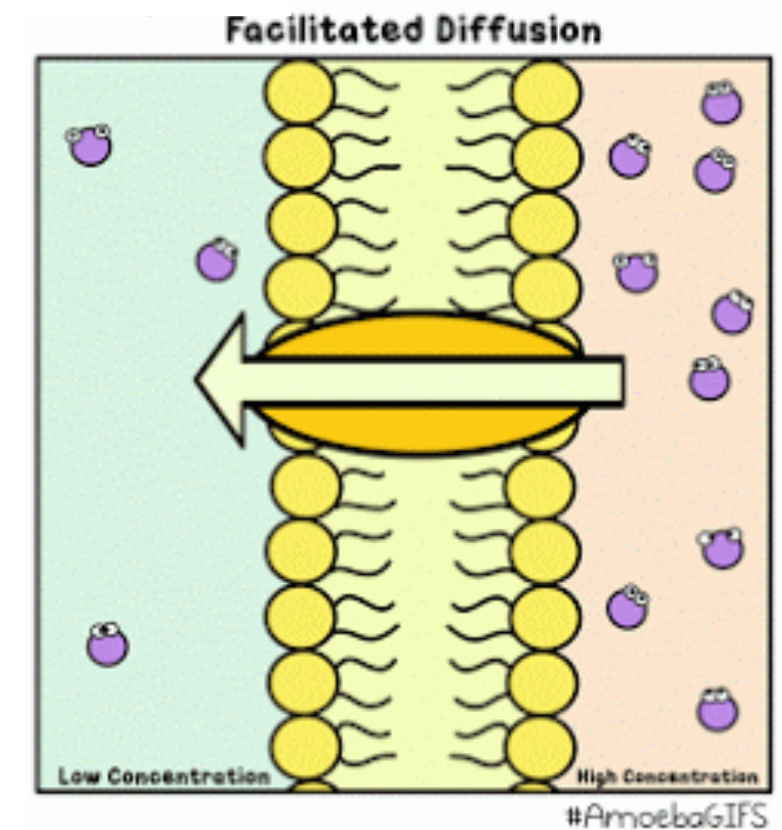
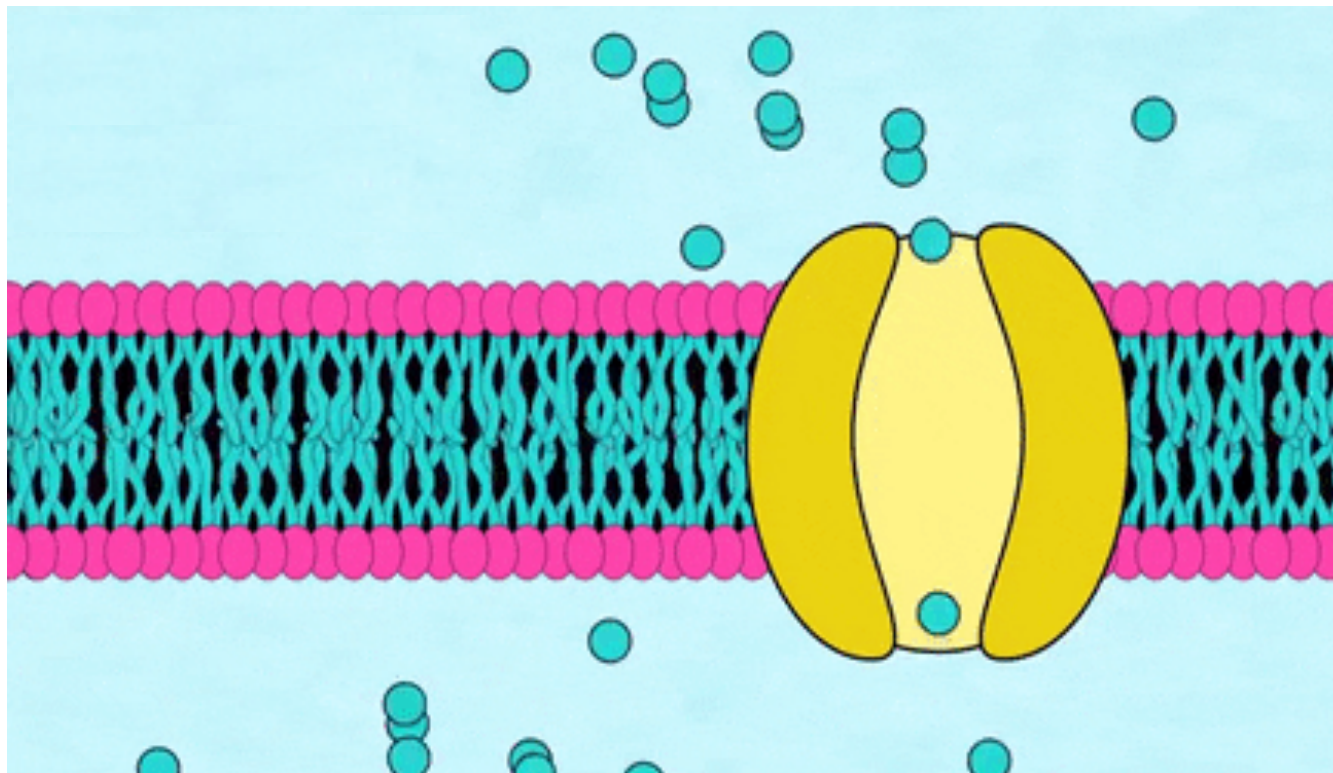
Simple Diffusion



# Method of Absorption

- **Facilitated Diffusions** —>
  - nutrients pass down a concentration (high to low) through a **protein channel** in the membrane bilayer
  - no energy required  
**PASSIVE**

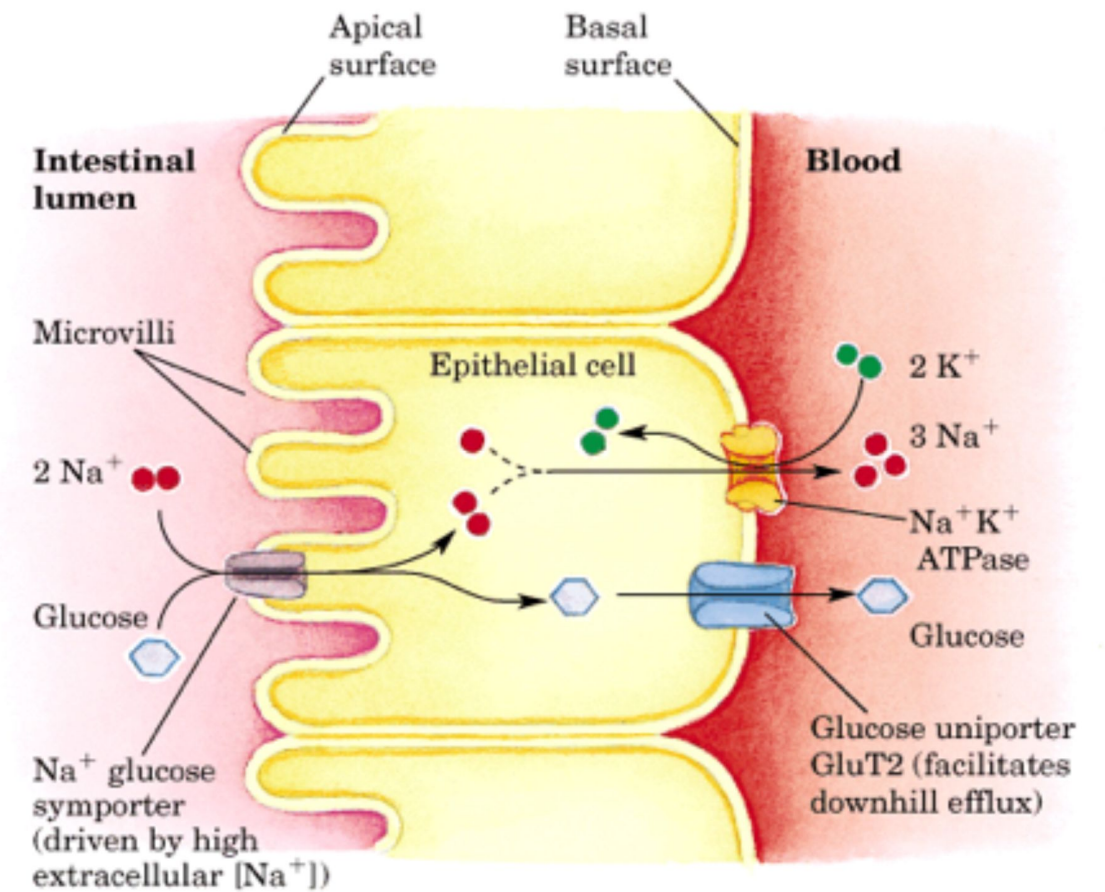
eg. sugars like glucose or fructose



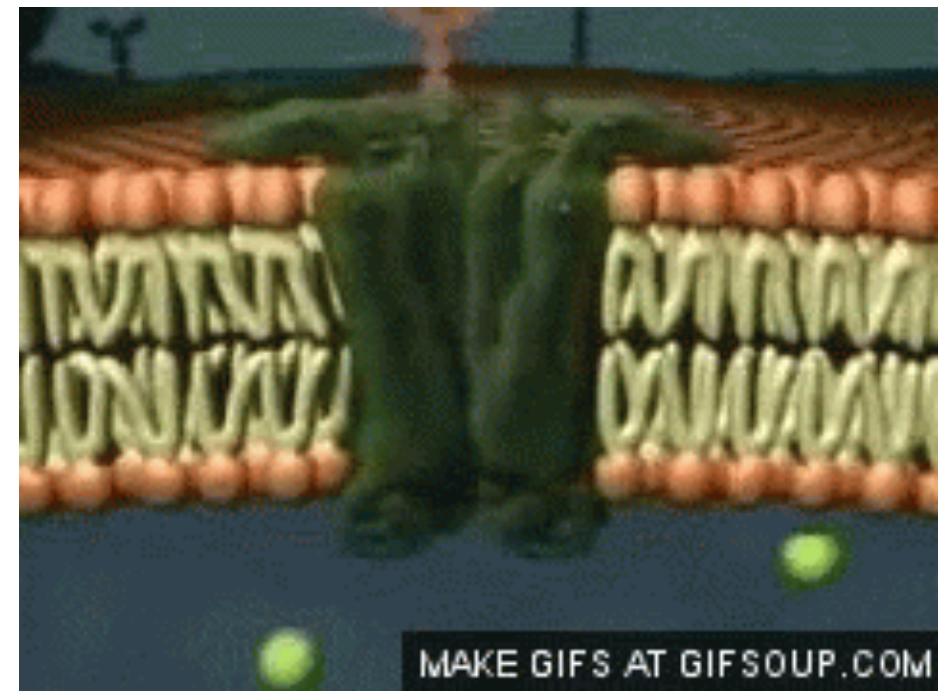
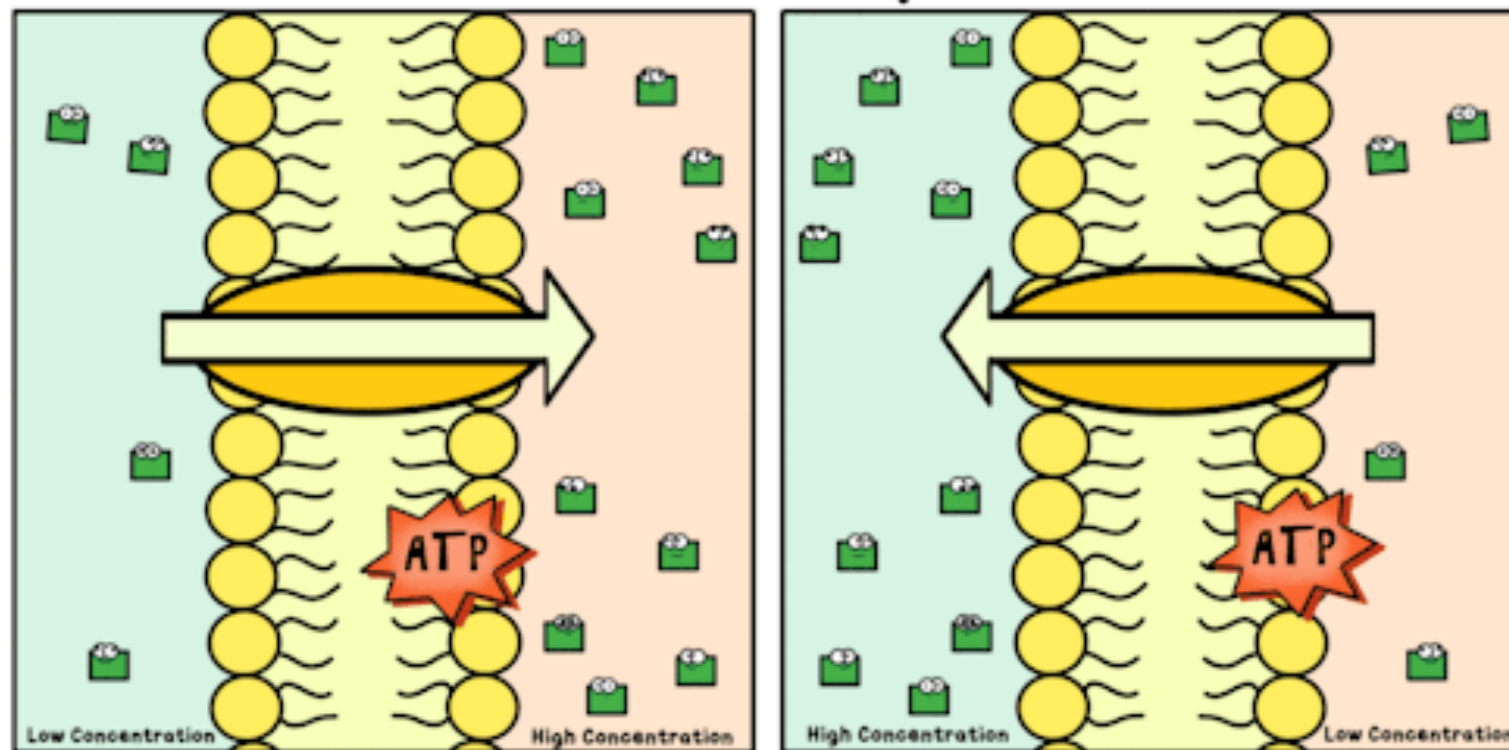


# Method of Absorption

- **Active Transport**—>
    - nutrients are pumped against the concentration (low to high) through specific **protein pumps** in the membrane bilayer
    - ATP Energy needed
- eg. minerals and ions like sodium or iron



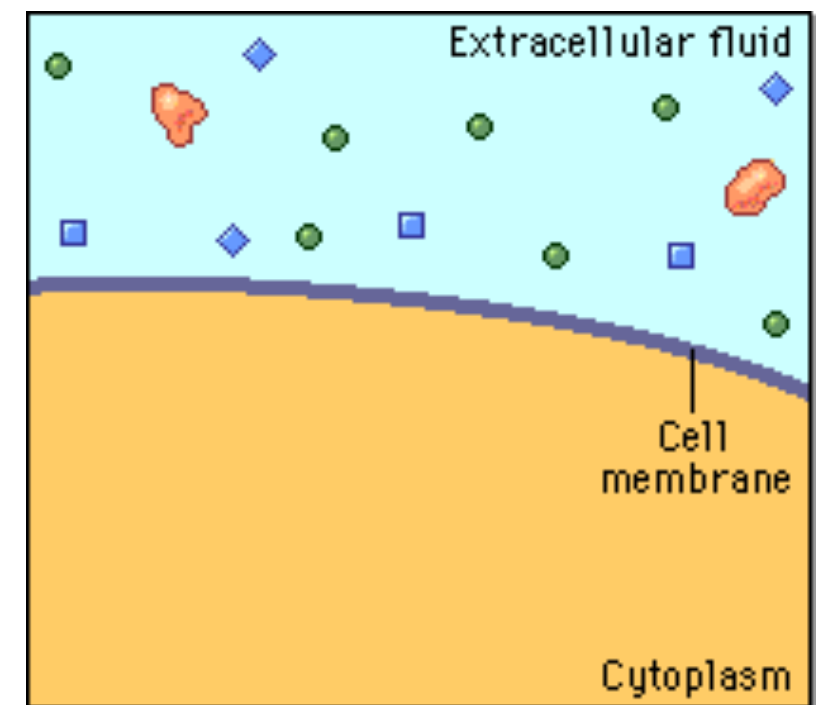
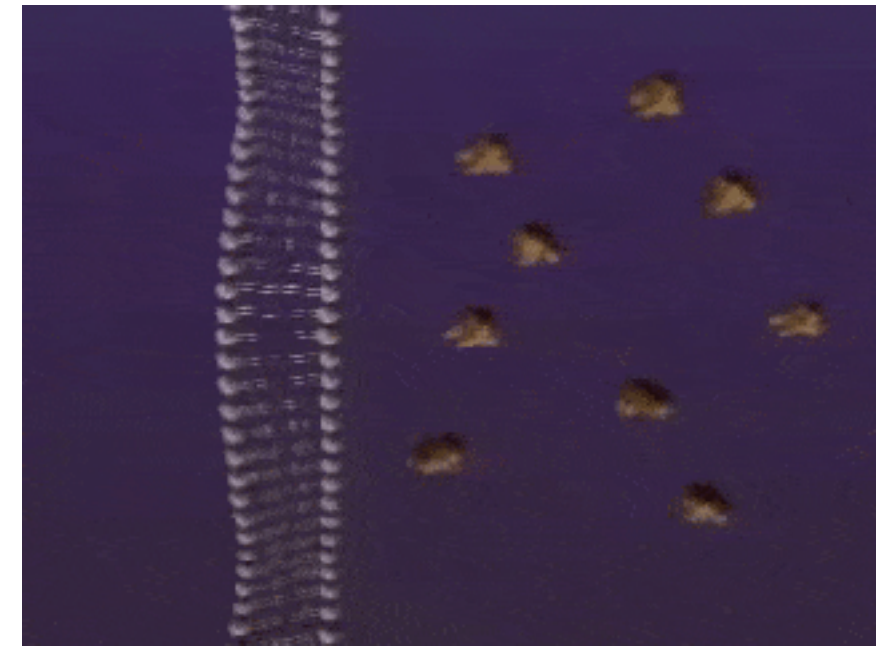
## Active Transport



# Method of Absorption

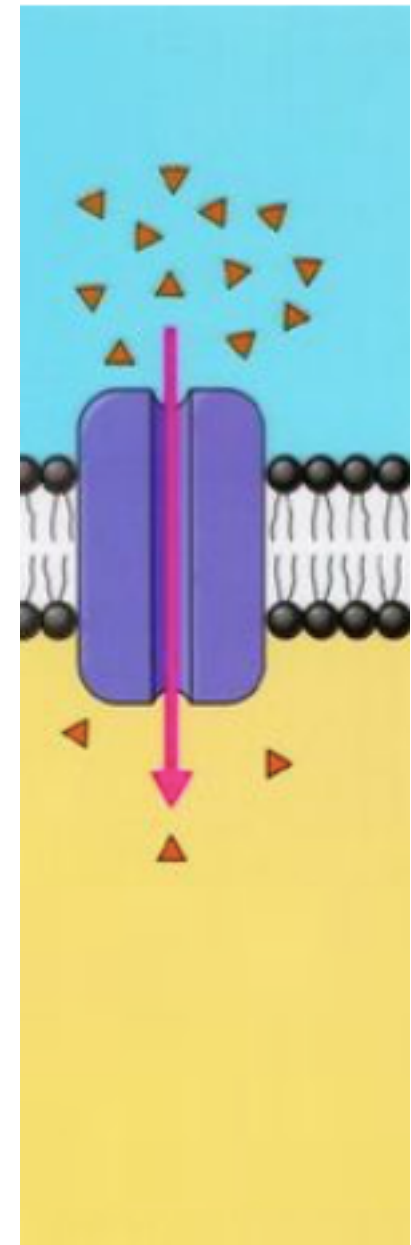
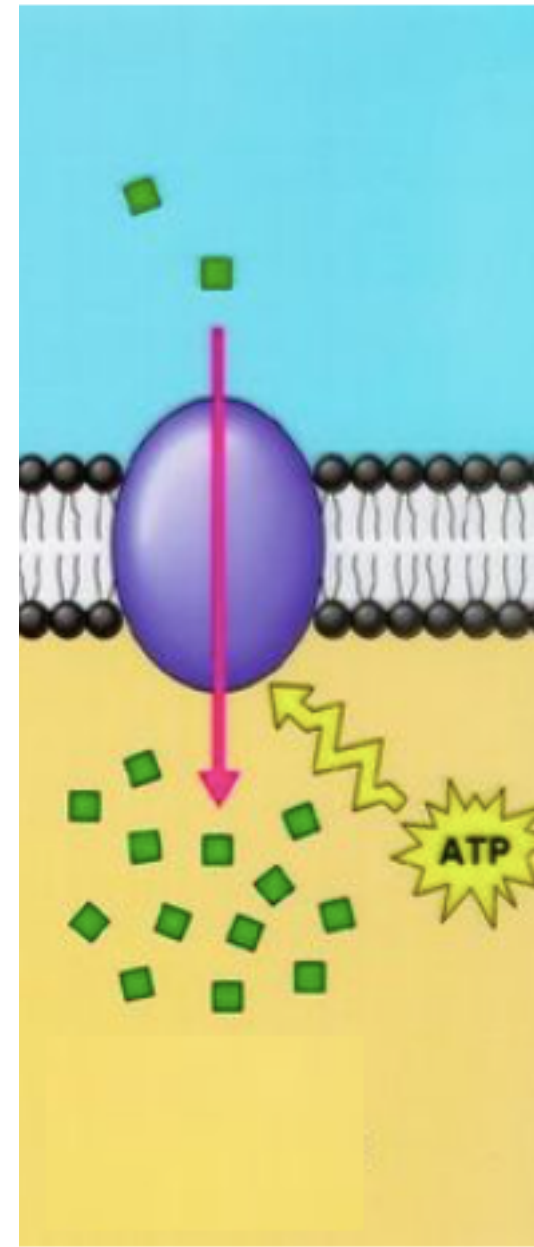
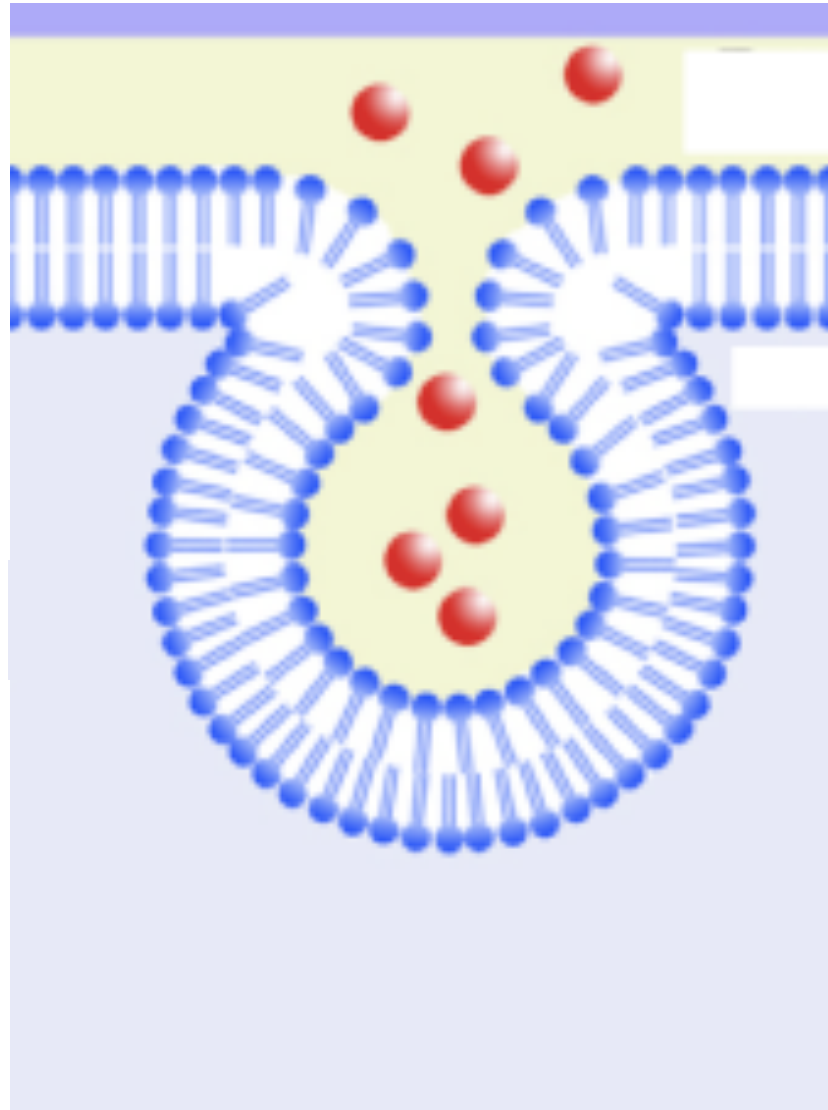
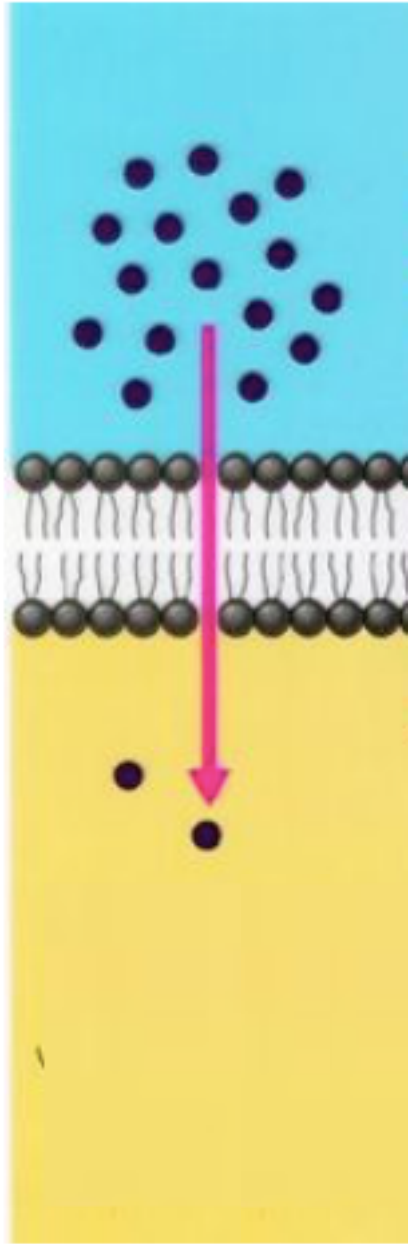
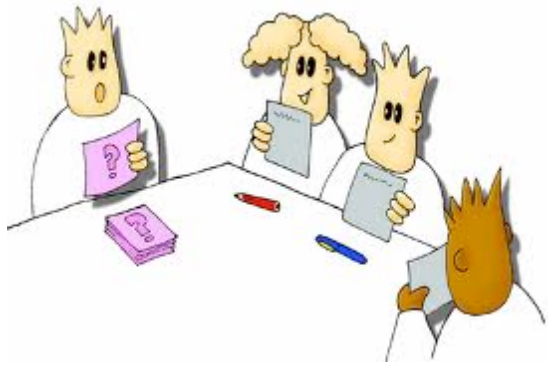
- **Endocytosis**
  - dissolved nutrients pass through the cell inside a **vesicle** created by the cells membrane
  - Energy needed by the cells

eg. triglycerides (fats)

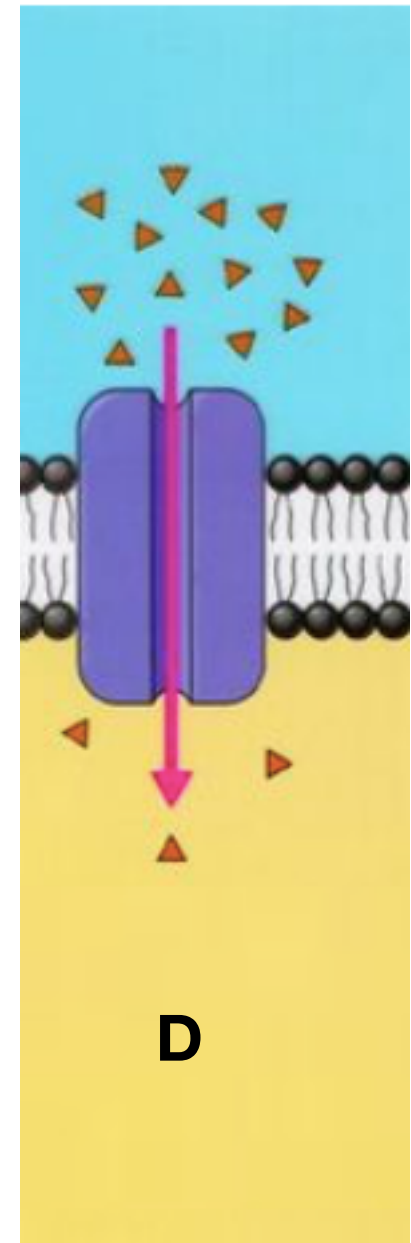
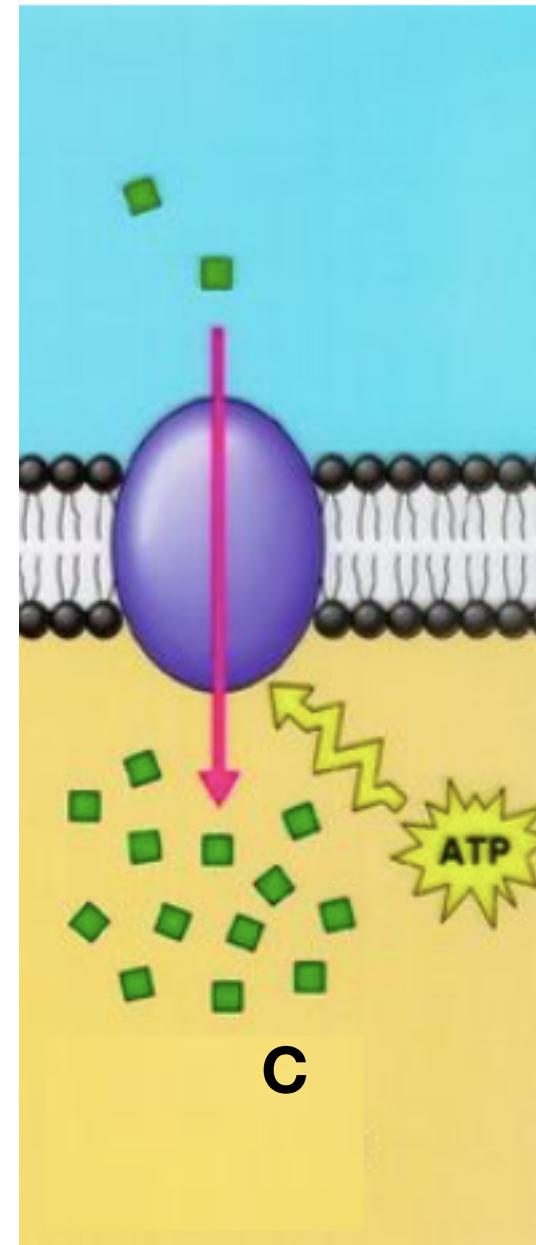
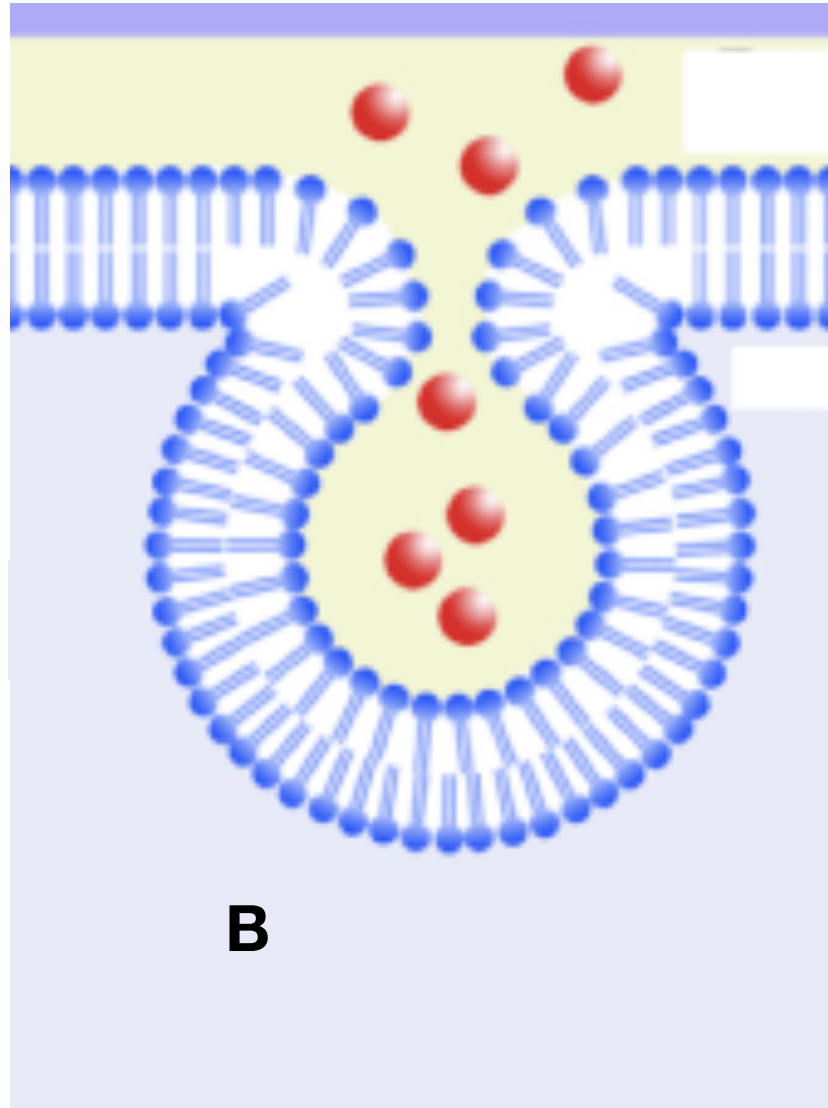
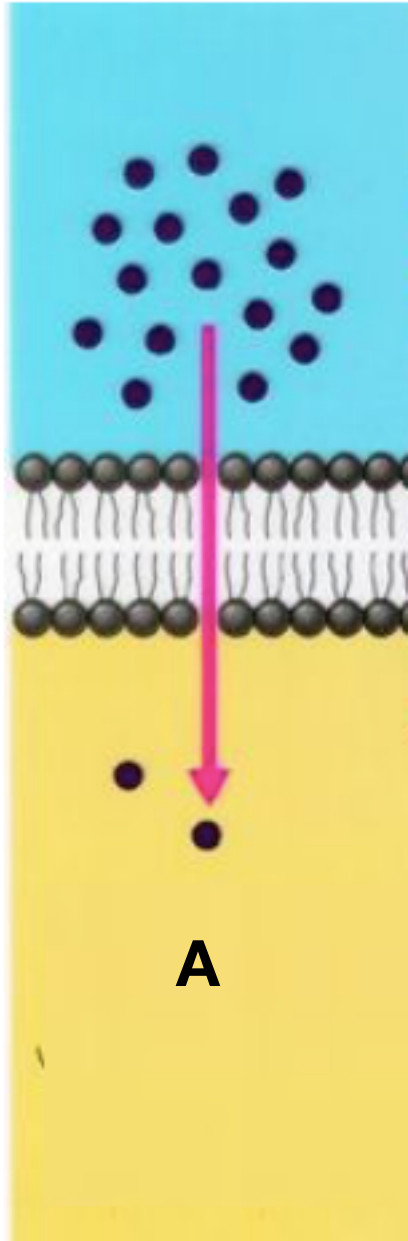
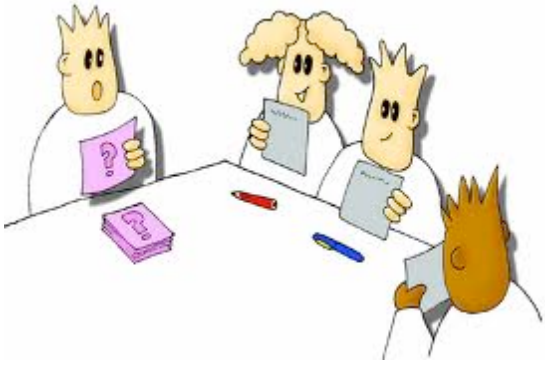


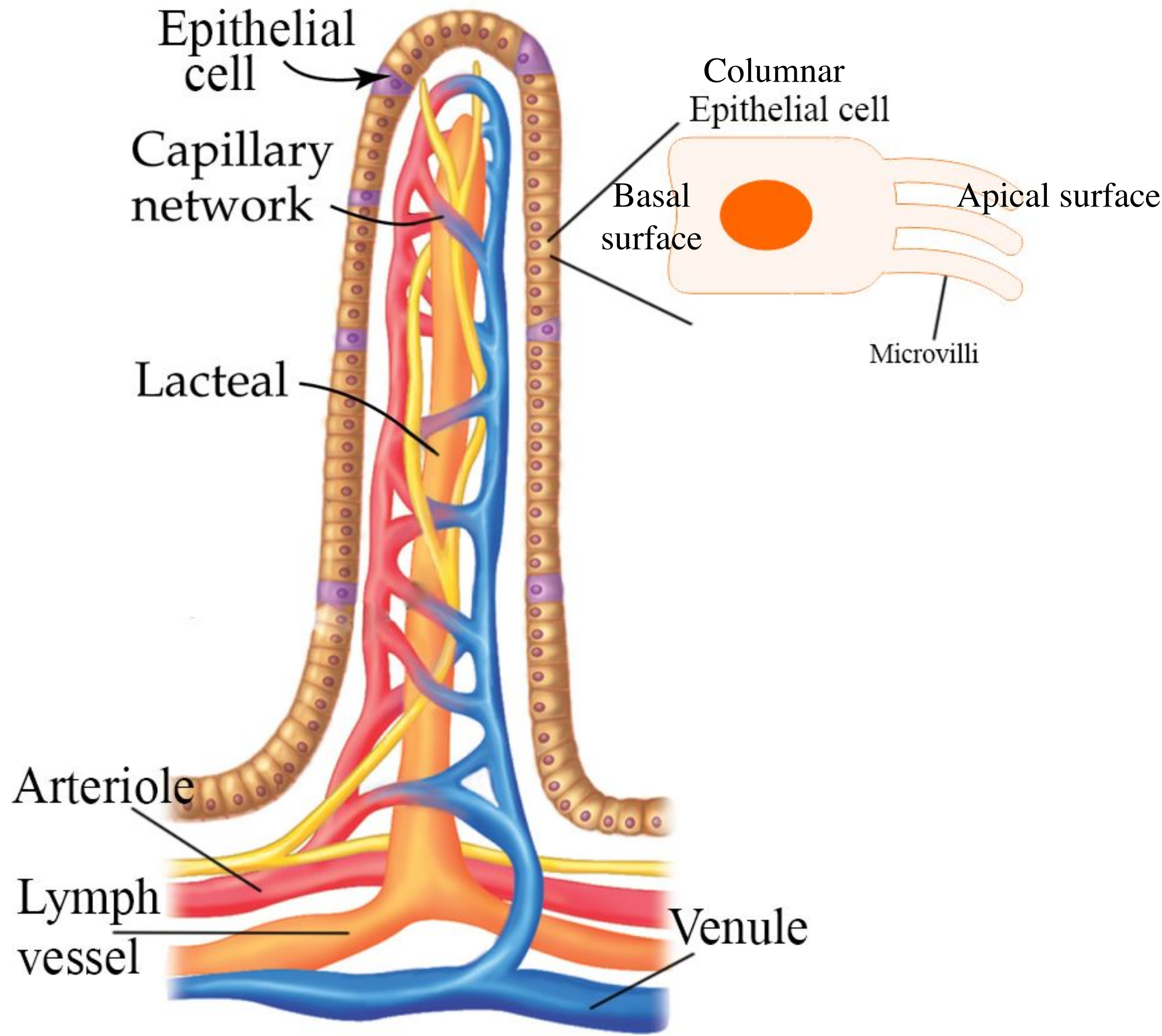


Examine each and determine the type of transport method into the body



Which type of molecule would be transported by each of the transport methods shown?

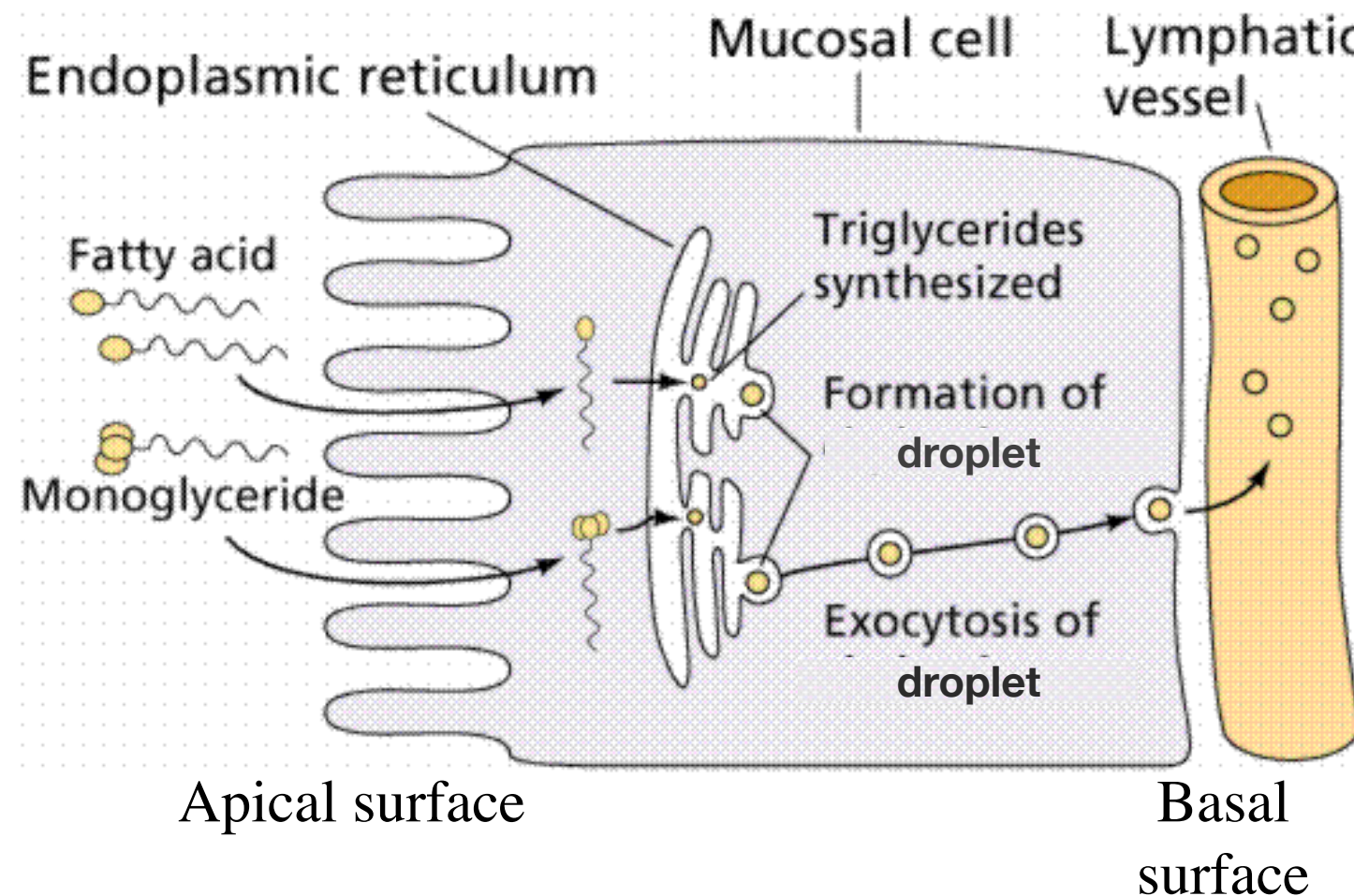
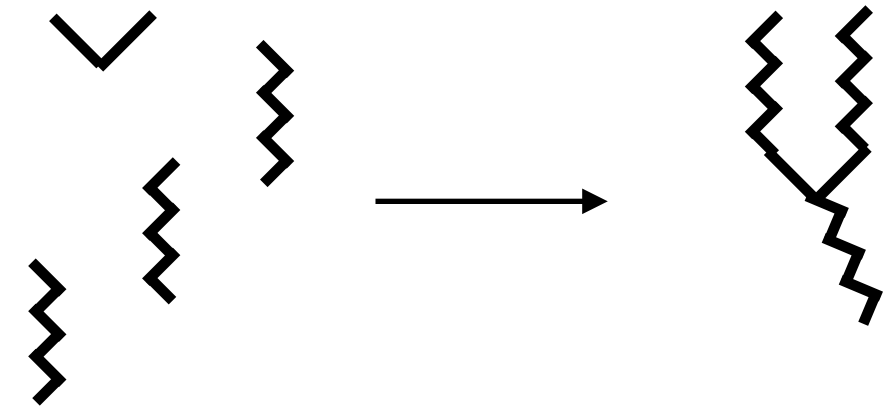






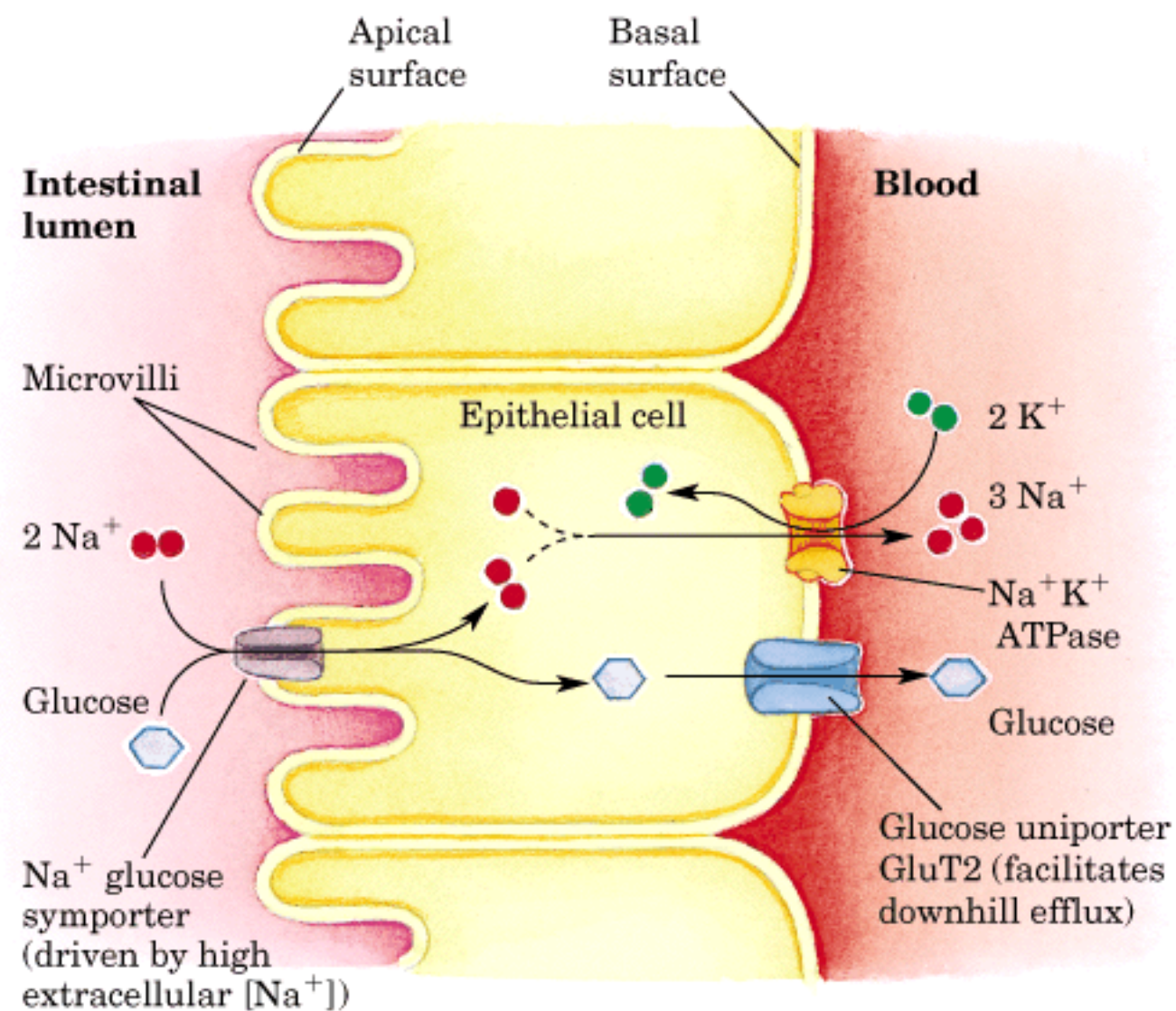
# Molecules Absorbed

- Fatty acids and monoglycerides
  - by **simple** or **facilitated** diffusion
  - once absorbed they recombine to prevent them from leaving back to the lumen
  - combine with cholesterol and to form droplets
  - **exocytosis** (opposite of endocytosis) out of cell into a lymphatic vessel (lacteal)
  - lymph vessel empties in blood



# Molecules Absorbed

- Sugars like glucose
  - are transported by **facilitated diffusion**
  - Sodium-glucose membrane protein is a *co-transport protein* that moves both sodium and glucose into the cell
  - glucose moves out of the cell to the blood stream by a second transport protein (*facilitated*)



- Activity - absorption using coca cola.