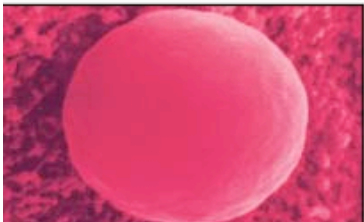
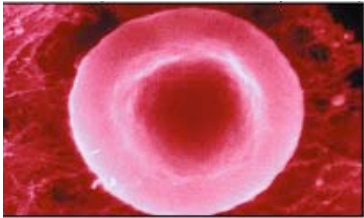


BIO 211:
ANATOMY & PHYSIOLOGY I

Please wait 20 seconds
before starting slide show.
Mouse click or
Arrow keys to navigate.
Hit ESCAPE Key to exit.

1



CHAPTER 03 + LAB

**Movements through
Cell Membranes**

Also see:
Cells: Summary Notes

Dr. Lawrence G. Altman

www.lawrencegaltman.com

Some illustrations are courtesy of McGraw-Hill.



Movements Into and Out of the Cell

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Reminder: Review states of matter/kinetic energy.

Passive Transport

(Physical processes)

requires *no cellular energy*

simple diffusion

facilitated diffusion

osmosis

filtration

Active Transport

(Physiological processes)

requires cellular energy

endocytosis

exocytosis

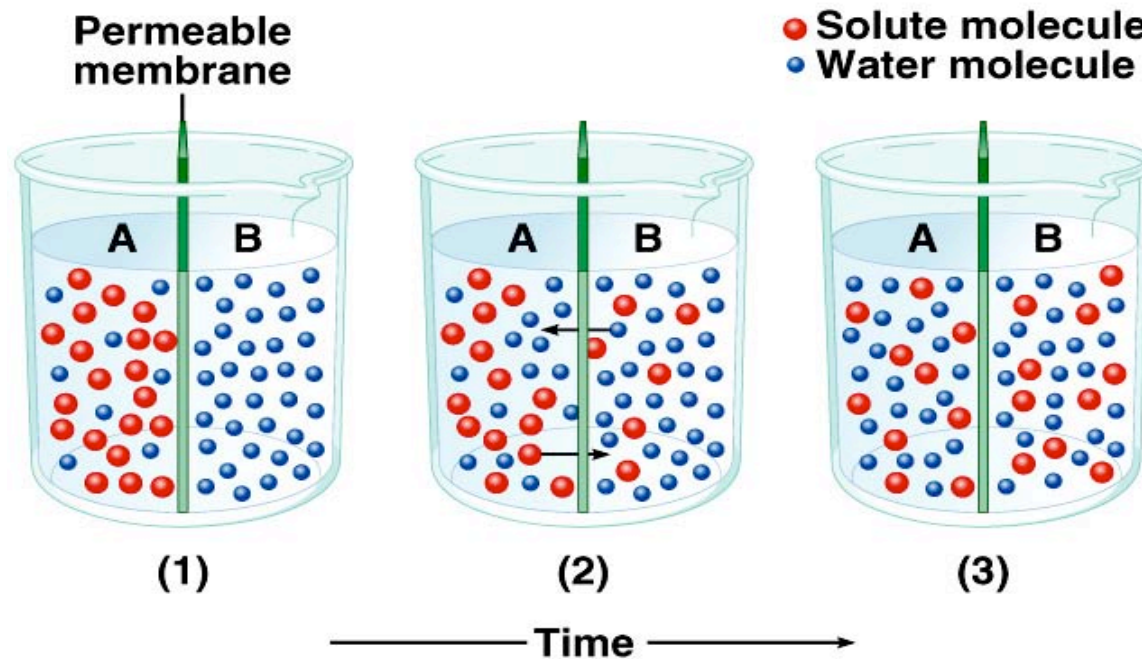
transcytosis

Simple Diffusion

movement of substances from regions of higher concentration to regions of lower concentration.

oxygen, carbon dioxide and lipid-soluble substances

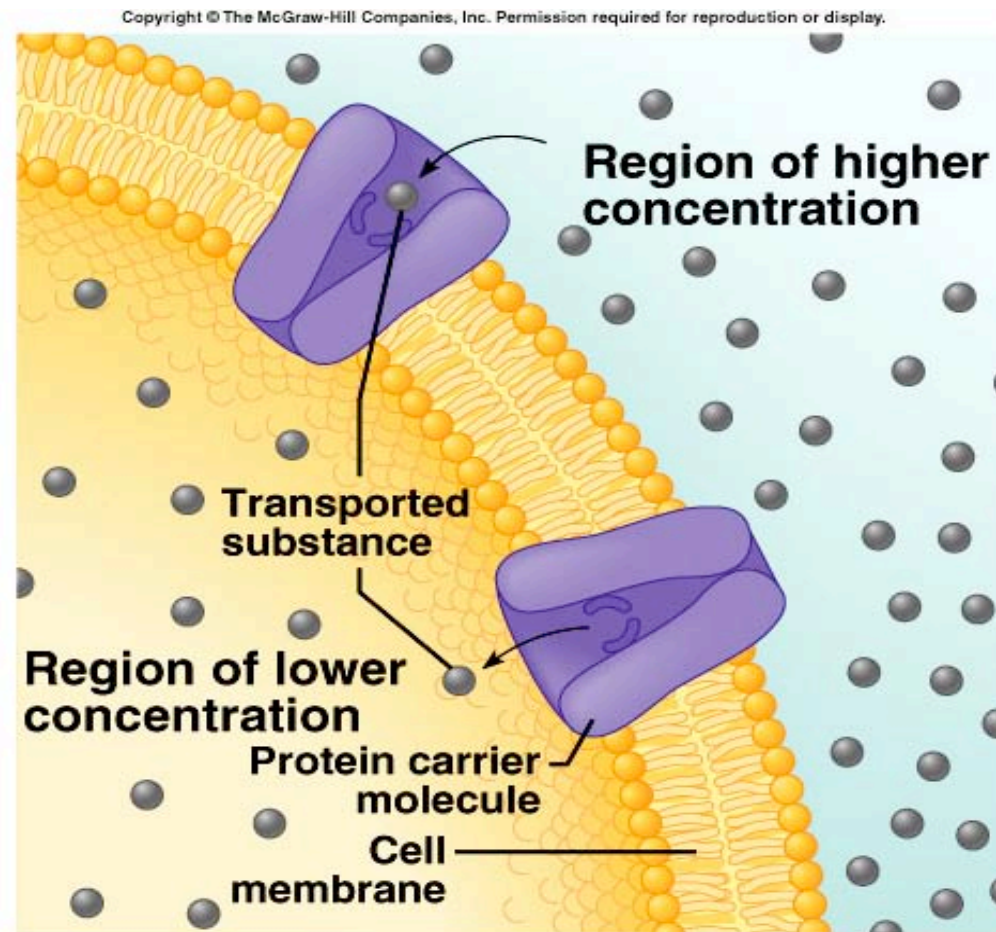
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Facilitated Diffusion

diffusion across a membrane with the help of a channel or carrier molecule.

i.e. Glucose

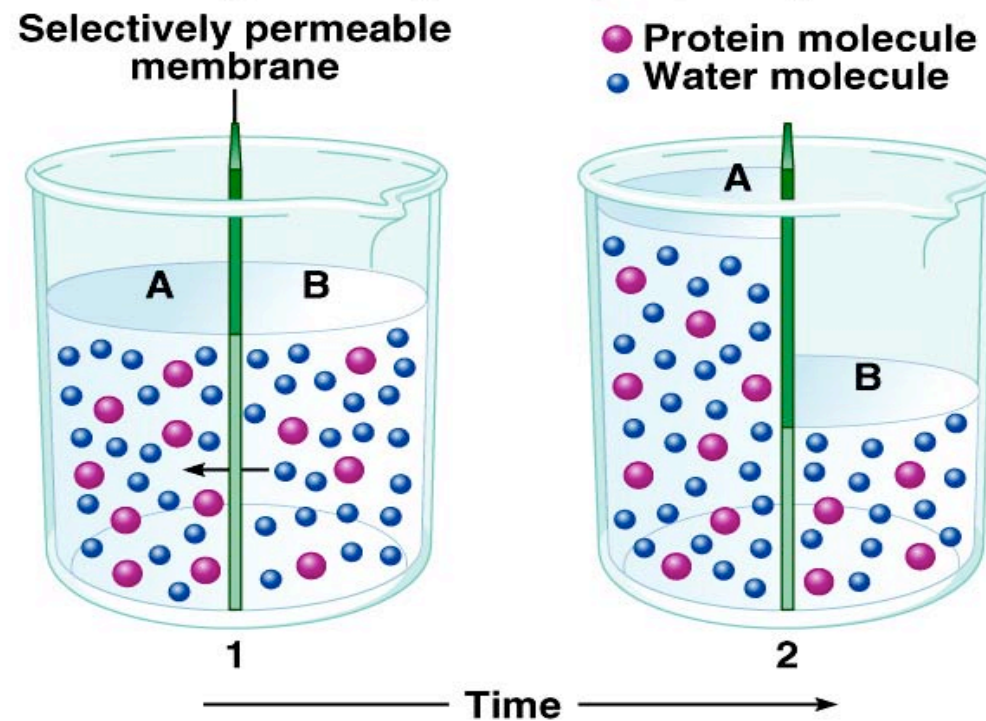


Osmosis

movement of water through a selectively permeable membrane from regions of higher concentration to regions of lower concentration.

water moves toward a higher concentration of solutes

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Osmosis

Osmotic Pressure – ability of osmosis to generate enough pressure to move a volume of water

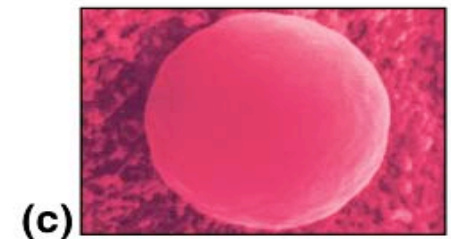
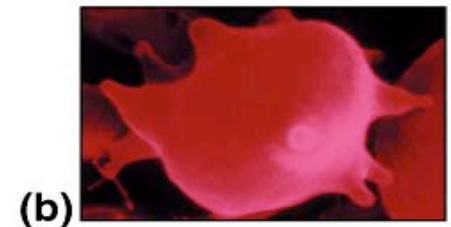
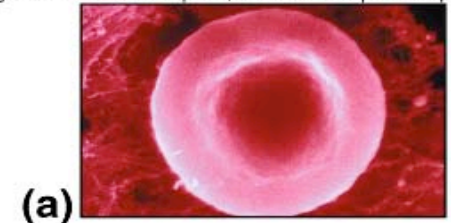
Osmotic pressure increases as the concentration of nonpermeable solutes increases

isotonic same osmotic pressure
RBC: **normal physiological saline** (0.85% NaCl)

hypertonic higher osmotic pressure
RBC: **crenation** (i.e., 1.5% NaCl)

hypotonic lower osmotic pressure
RBC: **hemolysis** (i.e., 0.25% NaCl)

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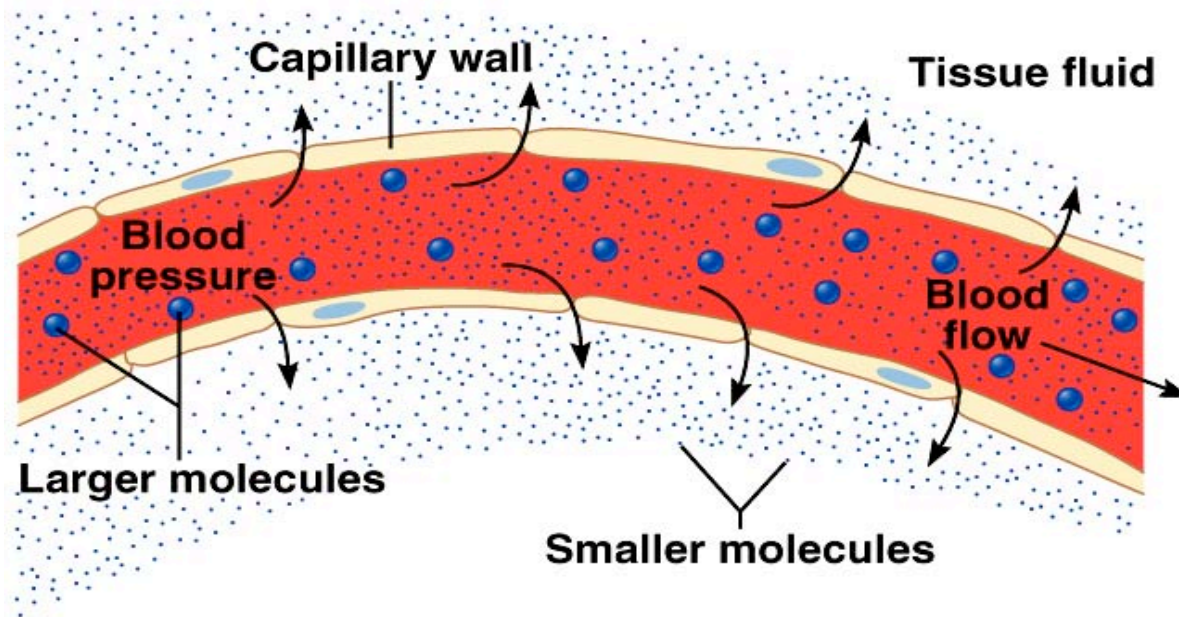


Filtration

7

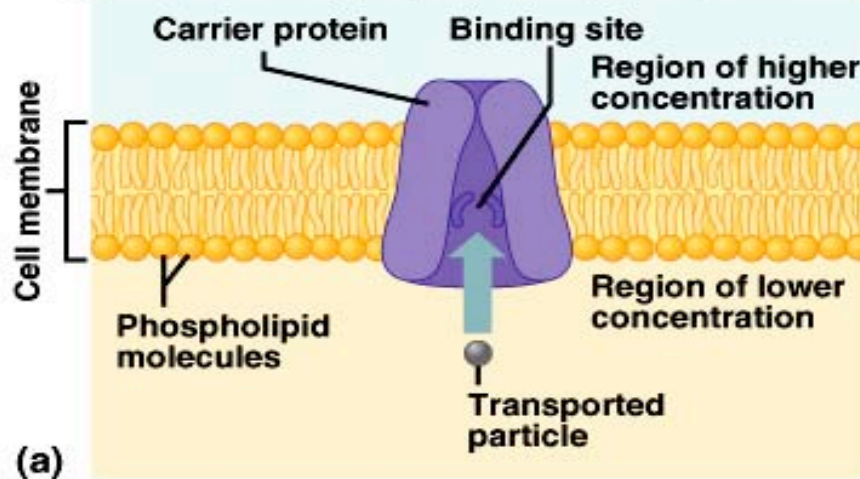
smaller molecules are forced through porous membranes.
Hydrostatic pressure is important in the body.
Example: molecules leaving blood capillaries

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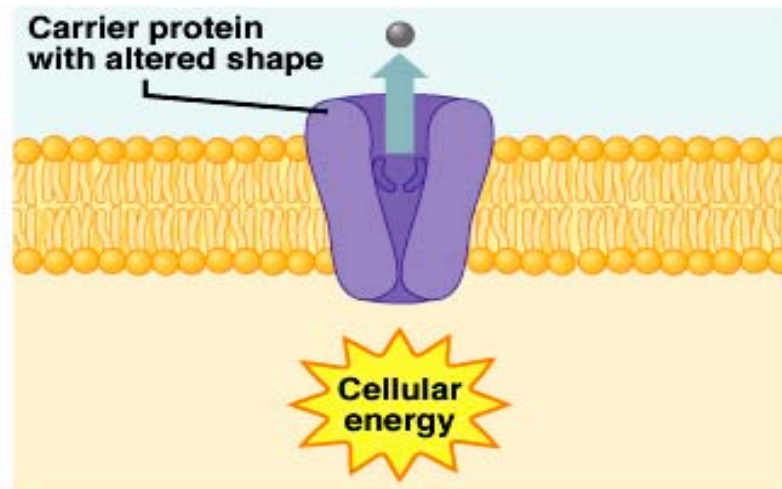


Active Transport

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(a)



(b)

Carrier molecules transport substances across a membrane from regions of lower concentration to regions of higher concentration.

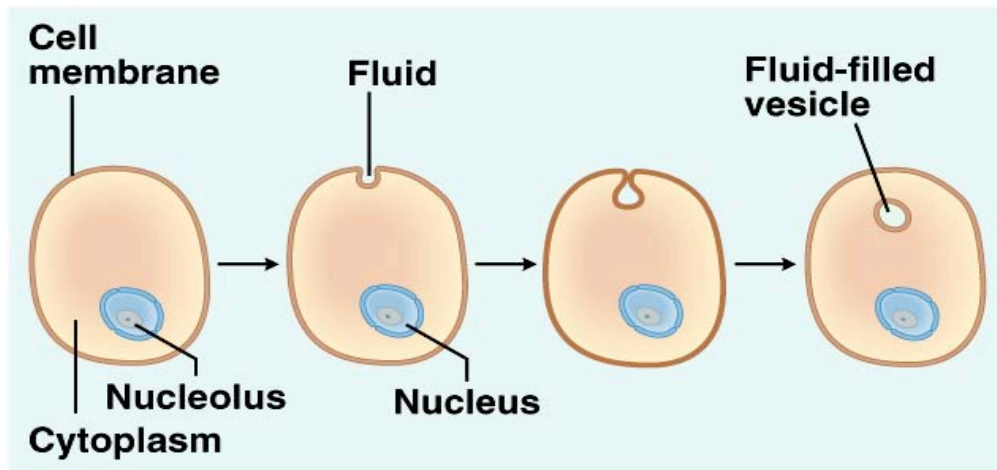
(against the concentration gradient)

**sugars, amino acids,
sodium ions, potassium ions, etc.**

Endocytosis

Cell engulfs a substance by forming a vesicle around the substance

9



3 types:

Dated Terminology
Modern:
Endocytosis

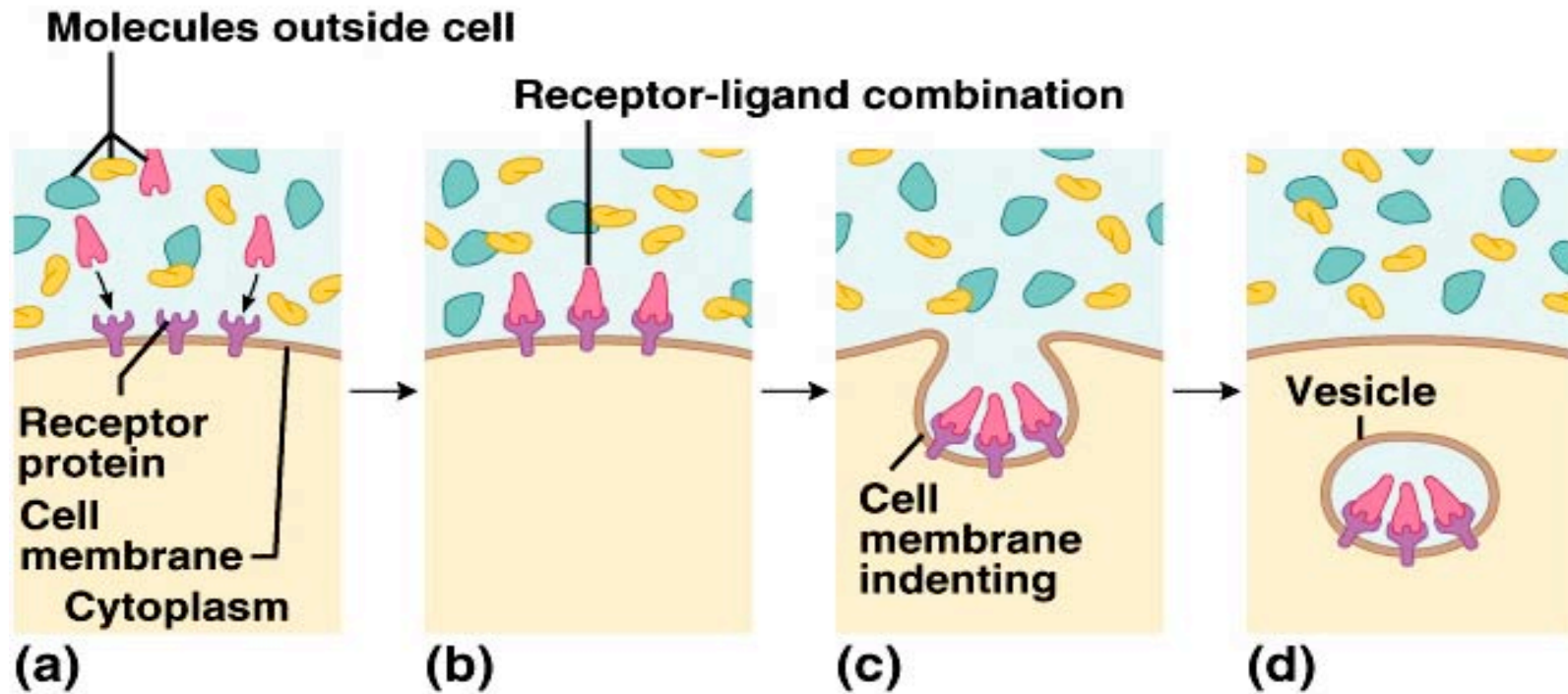
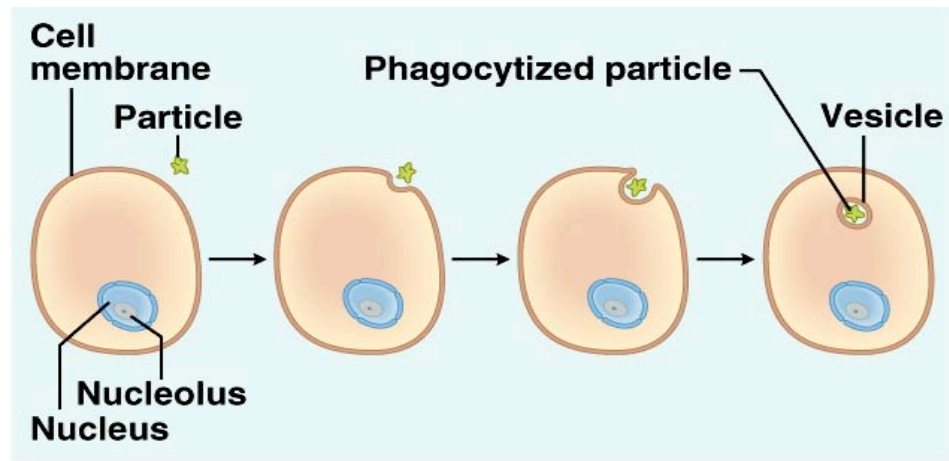


Pinocytosis
substance is mostly water
Phagocytosis
substance is a solid

Receptor-mediated endocytosis
requires the substance to bind to a membrane-bound receptor

Endocytosis

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Exocytosis

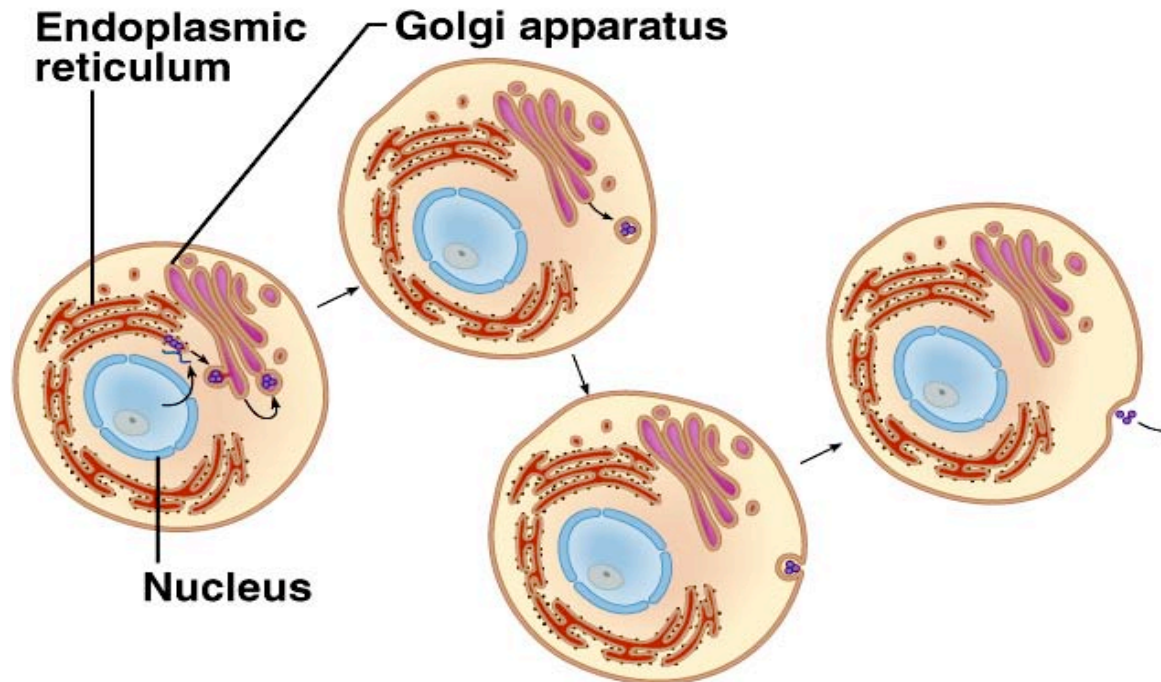
reverse of endocytosis.

substances in a vesicle fuse with cell membrane.

contents **released outside the cell.**

i.e., release of neurotransmitters from nerve cells

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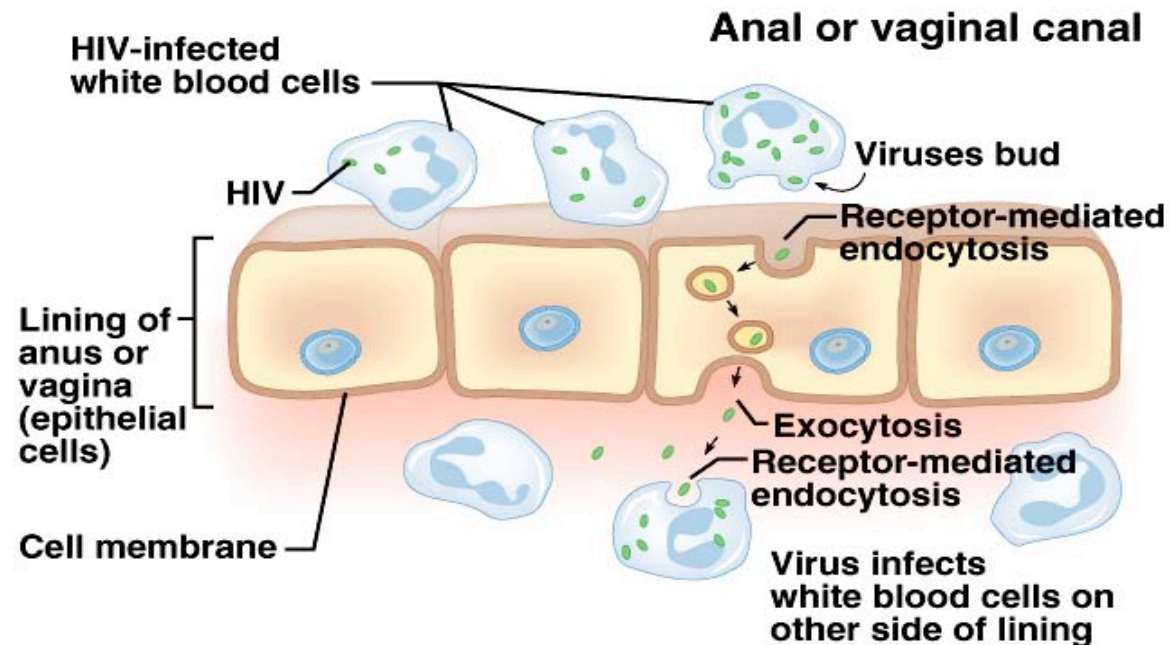


Transcytosis

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endocytosis followed by exocytosis.
transports a substance rapidly through a cell.
Example: HIV crossing a cell layer

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**The
End**