

Keystone Biology Remediation

A4: Homeostasis and Transport

Assessment Anchors:

- to describe how the structure of the plasma membrane allows it to function as a regulatory structure and/or protective barrier for the cell (A.4.1.1)
- to compare the mechanisms that transport materials across the plasma membrane (i.e. passive transport – diffusion, osmosis, facilitated diffusion; and active transport – pumps, endocytosis, exocytosis) (A.4.1.2)
- to compare how membrane-bound cellular organelles (e.g. endoplasmic reticulum, Golgi apparatus) facilitate the transport of materials within the cell (A.4.1.3)
- to explain how organisms maintain homeostasis (e.g. thermoregulation, water regulation, oxygen regulation) (A.4.2.1)

Unit Vocabulary:

active transport

carrier (transport) proteins

concentration

concentration gradient

diffusion

endocytosis

endoplasmic reticulum

exocytosis

extracellular

facilitated diffusion

Golgi apparatus

homeostasis

homeostatic mechanism

impermeable

intracellular

marker protein

osmosis

passive transport

phospholipid bilayer

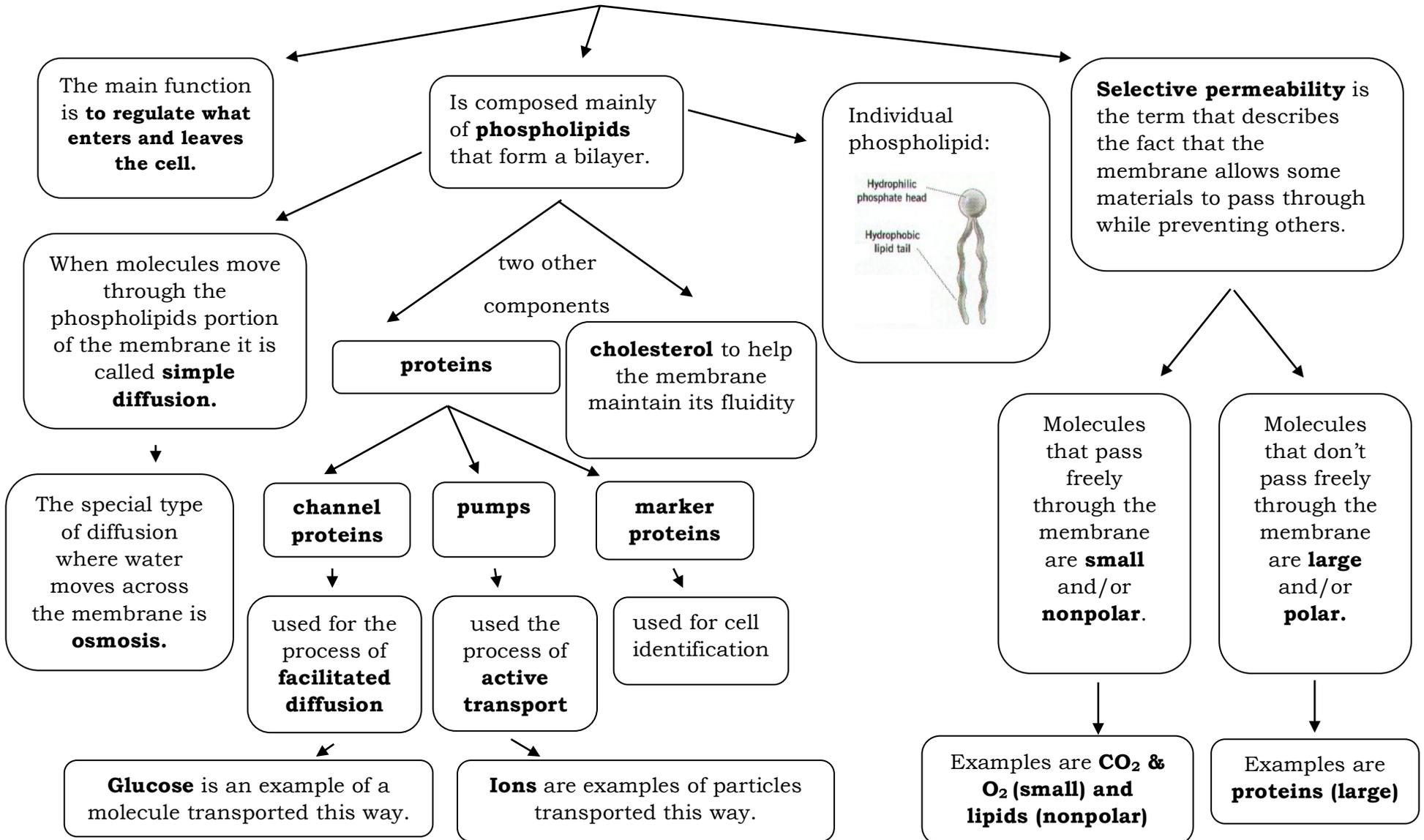
plasma membrane

pumps (ion or molecular)

transport protein (pump)

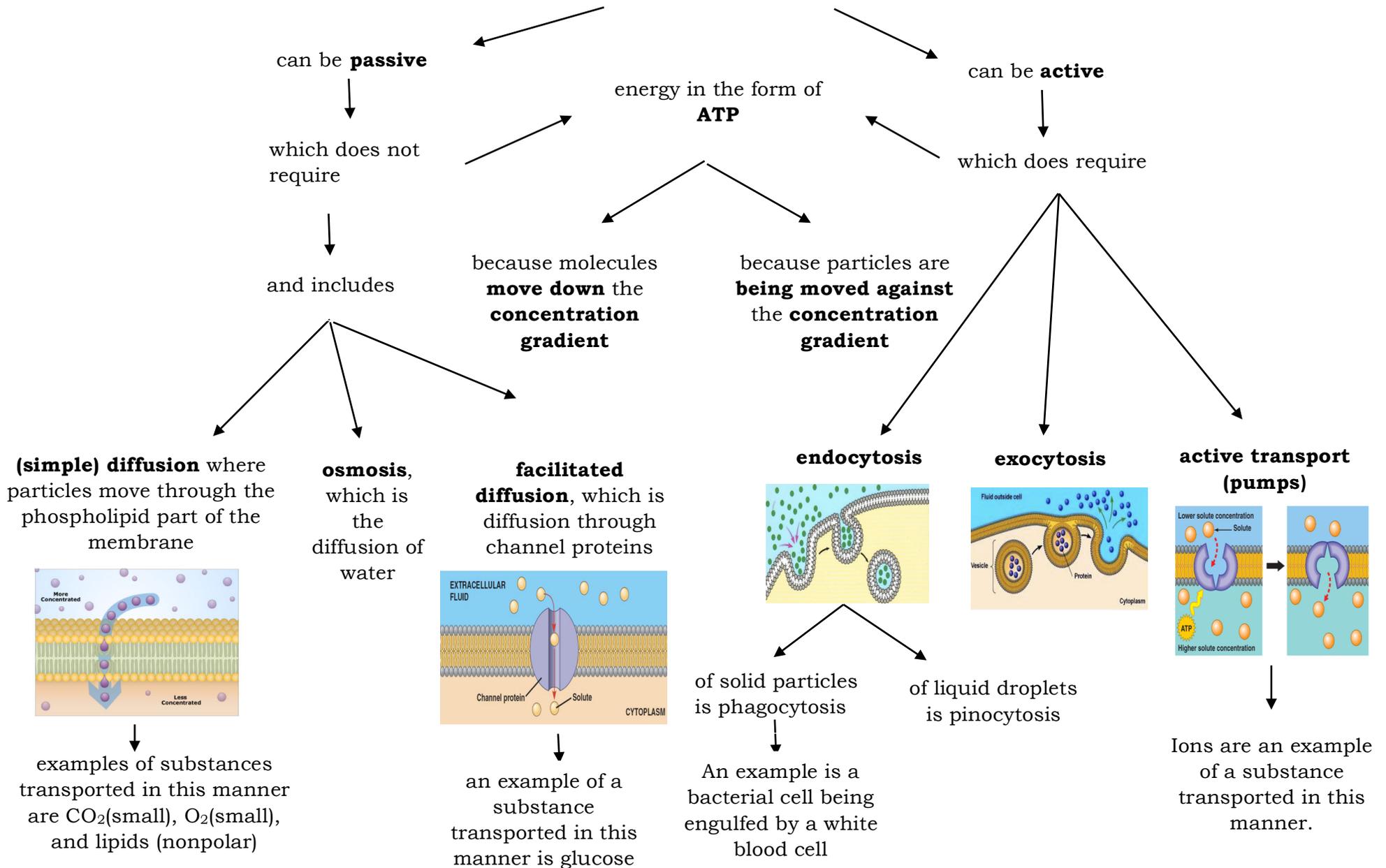
Assessment Anchor: Describe how the structure of the plasma membrane allows it to function as a regulatory structure and/or protective barrier for the cell (A.4.1.1)

The Cell Membrane
(A.K.A. Plasma Membrane)



Assessment Anchor: Compare the mechanisms that transport materials across the plasma membrane (i.e. passive transport – diffusion, osmosis, facilitated diffusion; and active transport – pumps, endocytosis, exocytosis) (A.4.1.2)

Moving Materials across the **Plasma Membrane**



Assessment Anchor: Compare how membrane-bound cellular organelles (e.g. endoplasmic reticulum, Golgi apparatus) facilitate the transport of materials within the cell (A.4.1.3)

Smooth ER is involved in the production of lipids and the detoxification of poisons.

The **nucleus** contains chromosomes made of **DNA** and protein. The DNA contains the code that specifies the order that the amino acids should be placed in to make a particular protein.

The code for the production of a particular protein is found in the chromosomes which are located in the **nucleus**.

Proteins are produced on the **ribosomes**.

The proteins are sent for further processing to the **rough endoplasmic reticulum**.

Proteins are transported in **vesicles**.

The proteins are then packaged for their final destination in the **Golgi complex**.

Proteins are transported in **vesicles**.

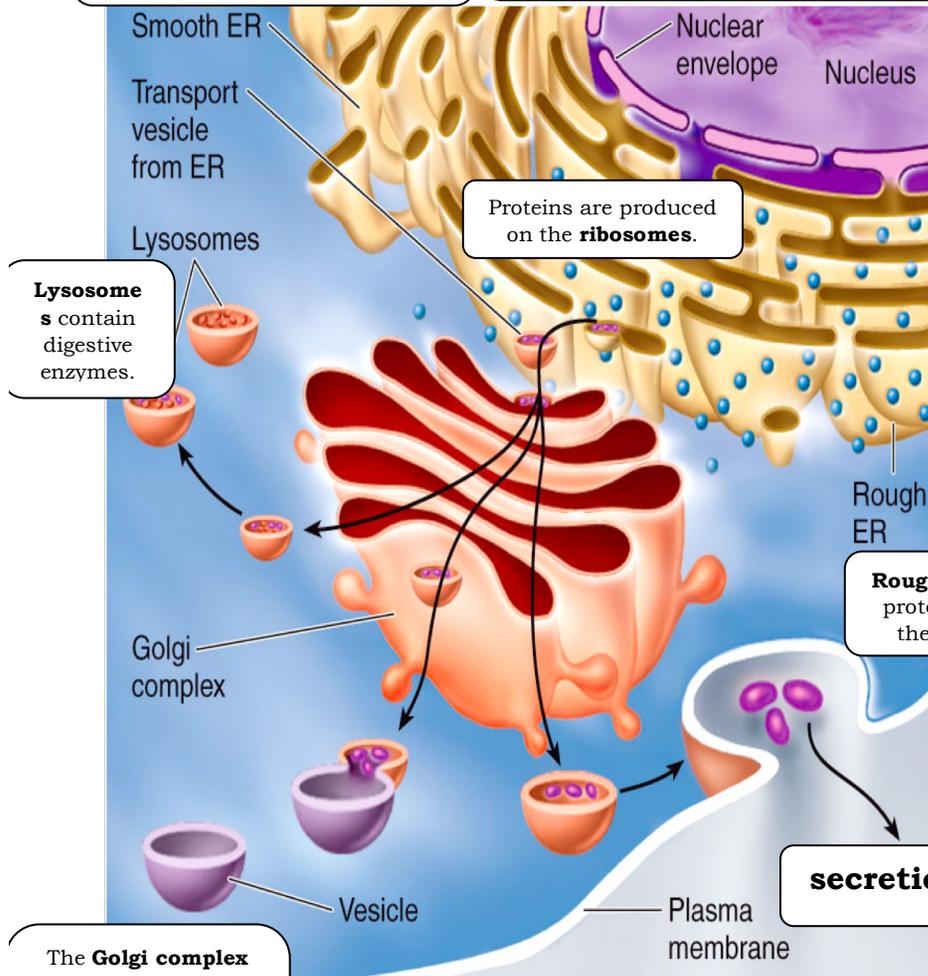
If the proteins are to be **secreted** from the cell (such as hormones), the vesicle must fuse with the **plasma membrane**.

Some vesicles develop into organelles used for digestion within the cell and are called **lysosomes**

Some proteins will speed up chemical reactions within the cell. These are called **enzymes**.

Some proteins will be incorporated into the plasma membrane. Examples are:

- **marker proteins**
- **channel proteins**
- **transport proteins (pumps)**



Lysosomes contain digestive enzymes.

Proteins are produced on the **ribosomes**.

Rough ER modifies proteins made on the ribosomes.

The **Golgi complex** receives proteins from the rough ER and sorts and packages them into vesicles.

secretion

Assessment Anchor: Explain how organisms maintain homeostasis (e.g. thermoregulation, water regulation, oxygen regulation) (A.4.2.1)

