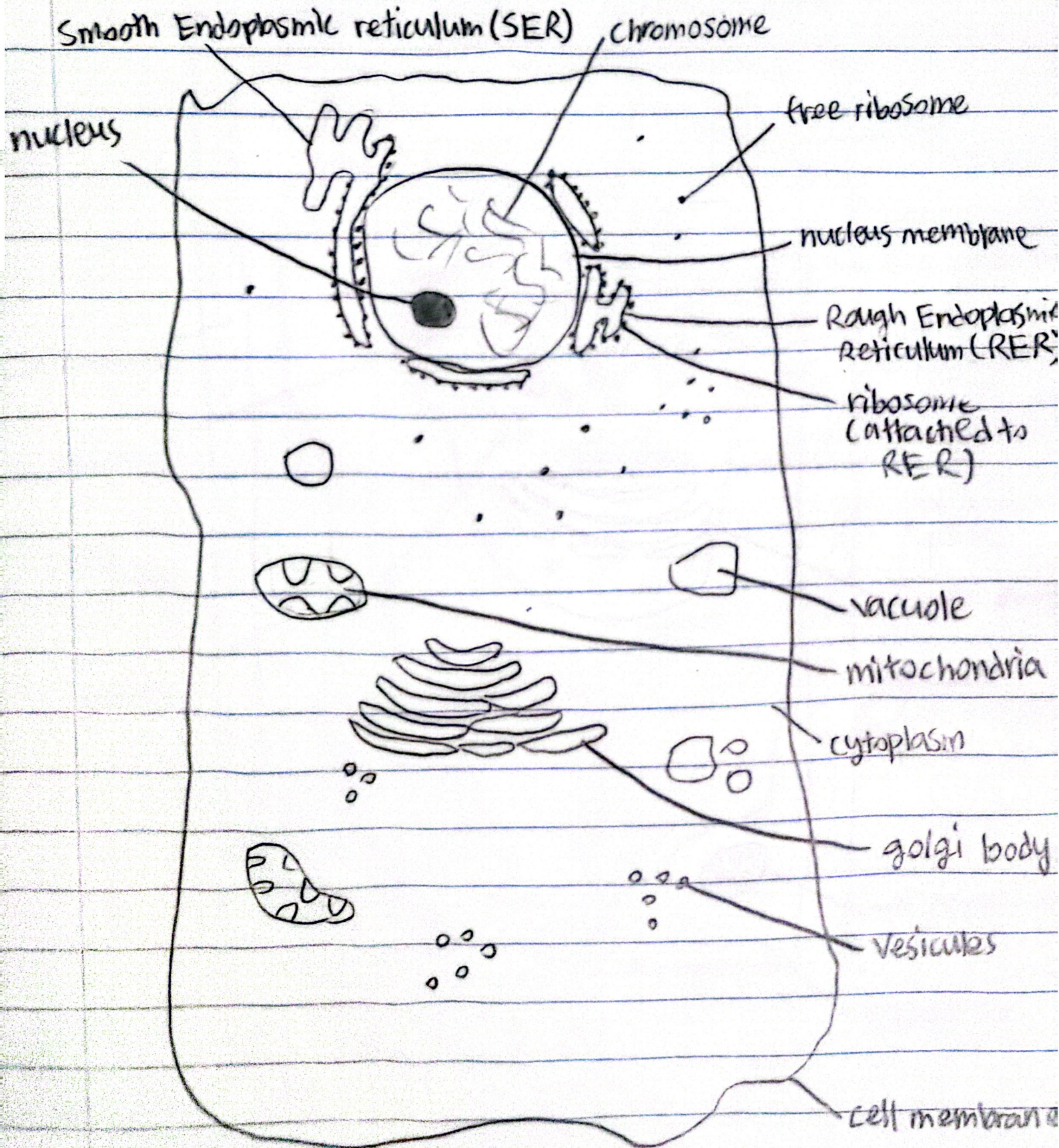


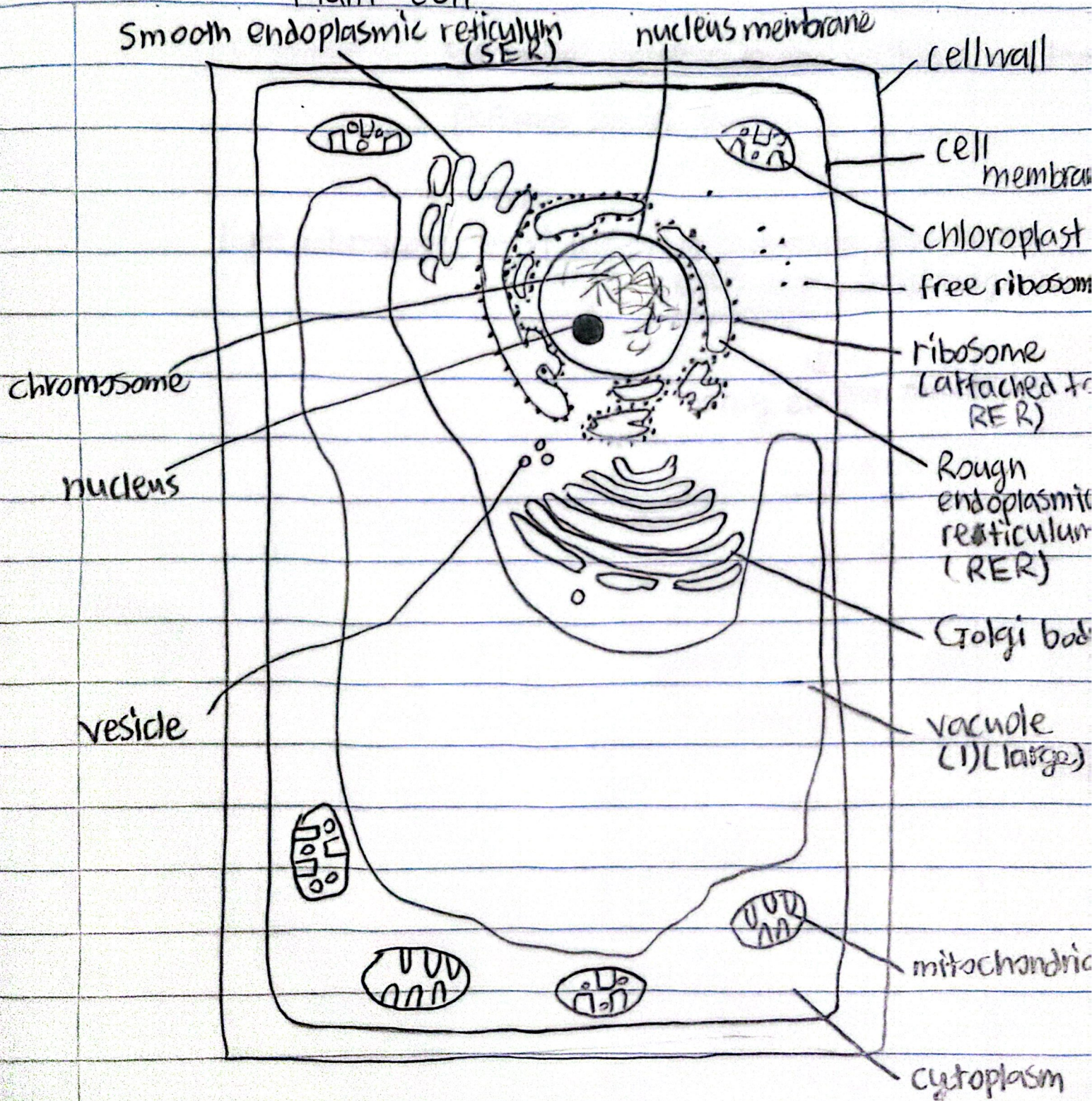
Animal cell

Date:



Plant cell

Date:



Date:

Organelle → specialised structure ~~that~~ within a cell that performs specific function.

light microscope ^{not} - visible → mitochondria, endoplasmic reticulum, Golgi body and ribosomes.

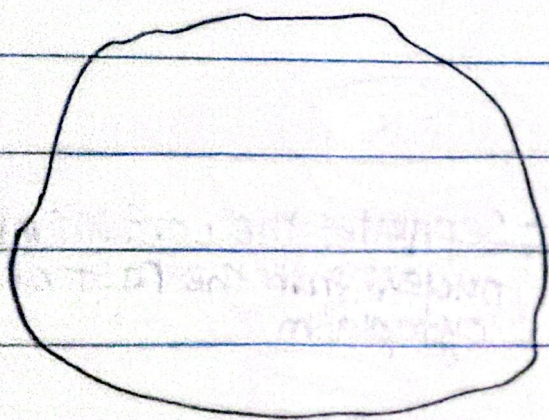
↓
only electron microscope

Organelles

~~cells~~ found in both animal

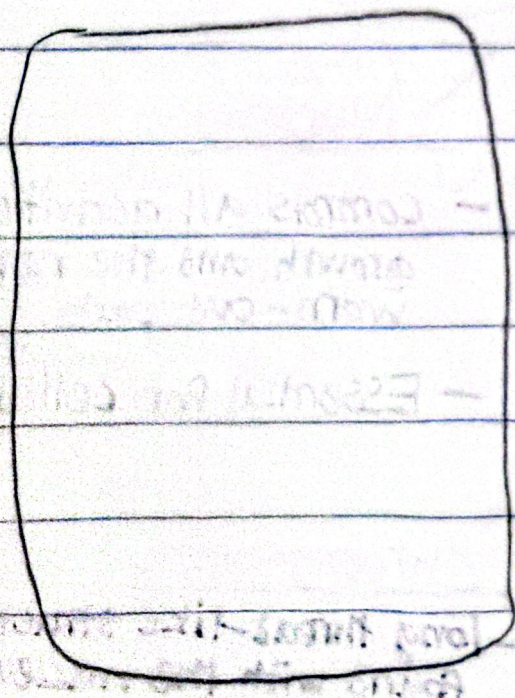
and plant cell.

Date:



Cell membrane

- partially permeable membrane (property)
- allow some substances to pass through
- controls movement of substances in and out of the cell



Cell wall

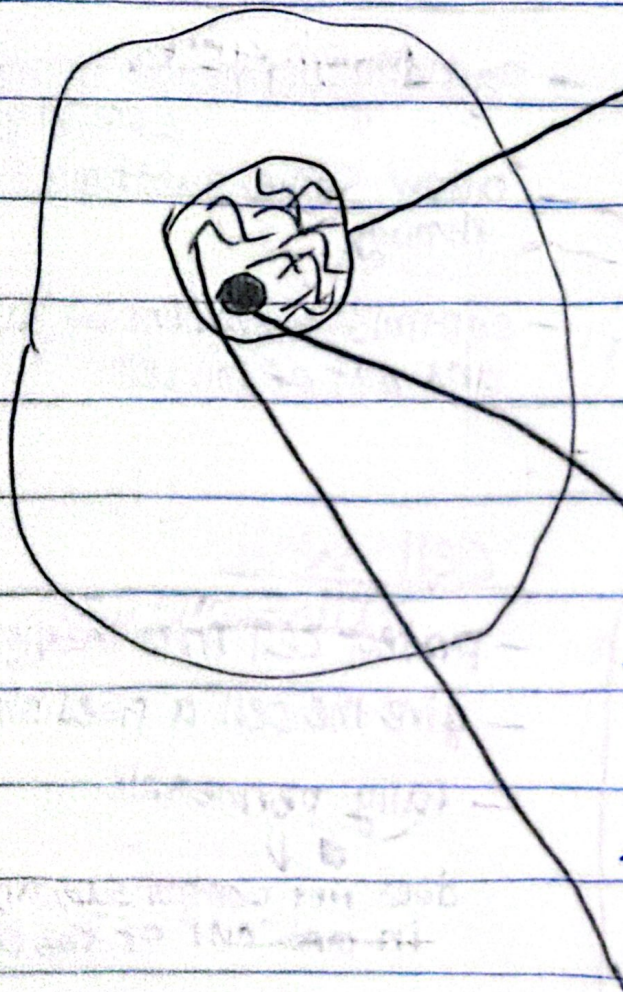
(found in plant cell)

- protect cell from injury
- give the cell a fixed shape
- fully permeable

↓
does not control type of substances in and out of the cell

Cytoplasm

- Jelly-like substance
- fills inside of cell
- contains organelles *
- site of chemical reaction



nucleus membrane

- Separates the content of the nucleus from the rest of the cytoplasm

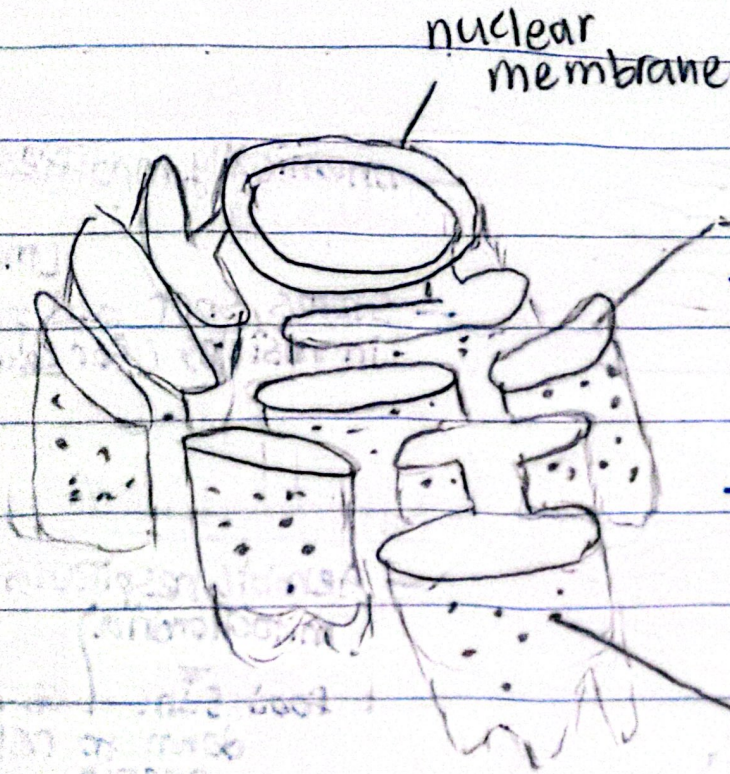
Nucleus

- controls all activities such as growth and the repair of worn-out parts
- Essential for cell division

Chromosomes

- long thread-like structure found with the nucleus
(human cell contain 46 chromosomes each)
- made up of protein and a compound called deoxyribonucleic acid (DNA).
 - ↳ stores Hereditary Information
 - ↳ carries ~~out~~ instructions that a ~~need~~ cell needs for carrying out its activities.
- when cell dividing, chromosomes condense and shorten to become thick, rod-shaped structures.

Date:



rough endoplasmic reticulum

- transport protein made by ribosomes to Golgi body / apparatus for secretion out of the cell

- chemically modifies proteins

ribosomes (attached to RER)

- site of protein synthesis

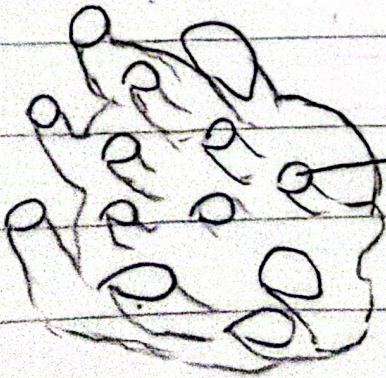
↓
are secreted out of cell

free ribosomes

- lies freely in the cytoplasm

- site of protein synthesis

↓
are used within cell



Smooth endoplasmic reticulum

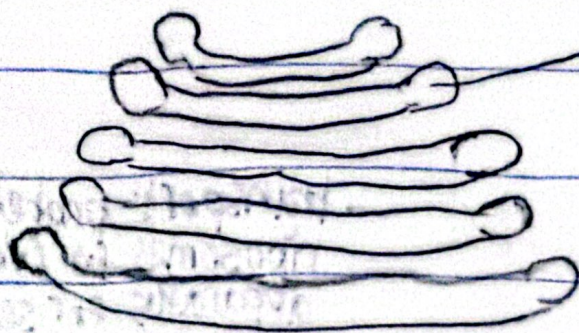
- synthesis substances eg. fats and steroids (sex hormones in mammals are steroids.)

- detoxification → converts harmful substances into harmless

- No ribosomes attached on

- More tubular than RER

Date:

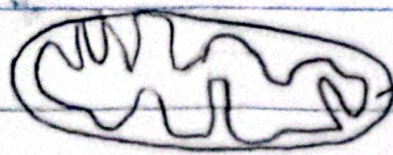


Golgi body / apparatus

— chemically modifies protein

(made by RER)

— Stores, sort and packages protein in vesicles (for secretion out of cell)



Mitochondrion (singular spelling)

— Aerobic respiration occurs in mitochondrion

↓
Food substance broken down to release energy

↓
used to perform cell activities, eg. growth and reproduction

Organelles found in plant cell only

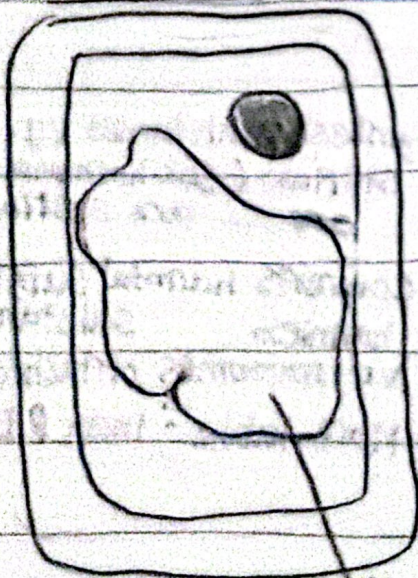


chloroplast

— contains chlorophyll

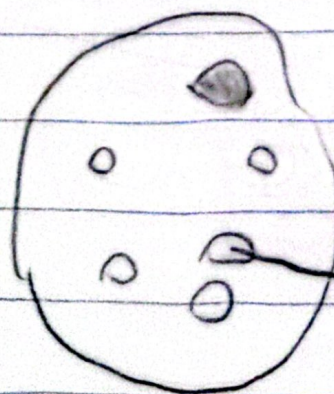
↓
Essential for photosynthesis

Plant



Large central vacuole (permanent)

animal



Small and many vacuoles (temporarily exist)

Date:

Vacuole

- Stores substances within the cell

plant cell

large central vacuole

↓
contains cell sap (liquid)

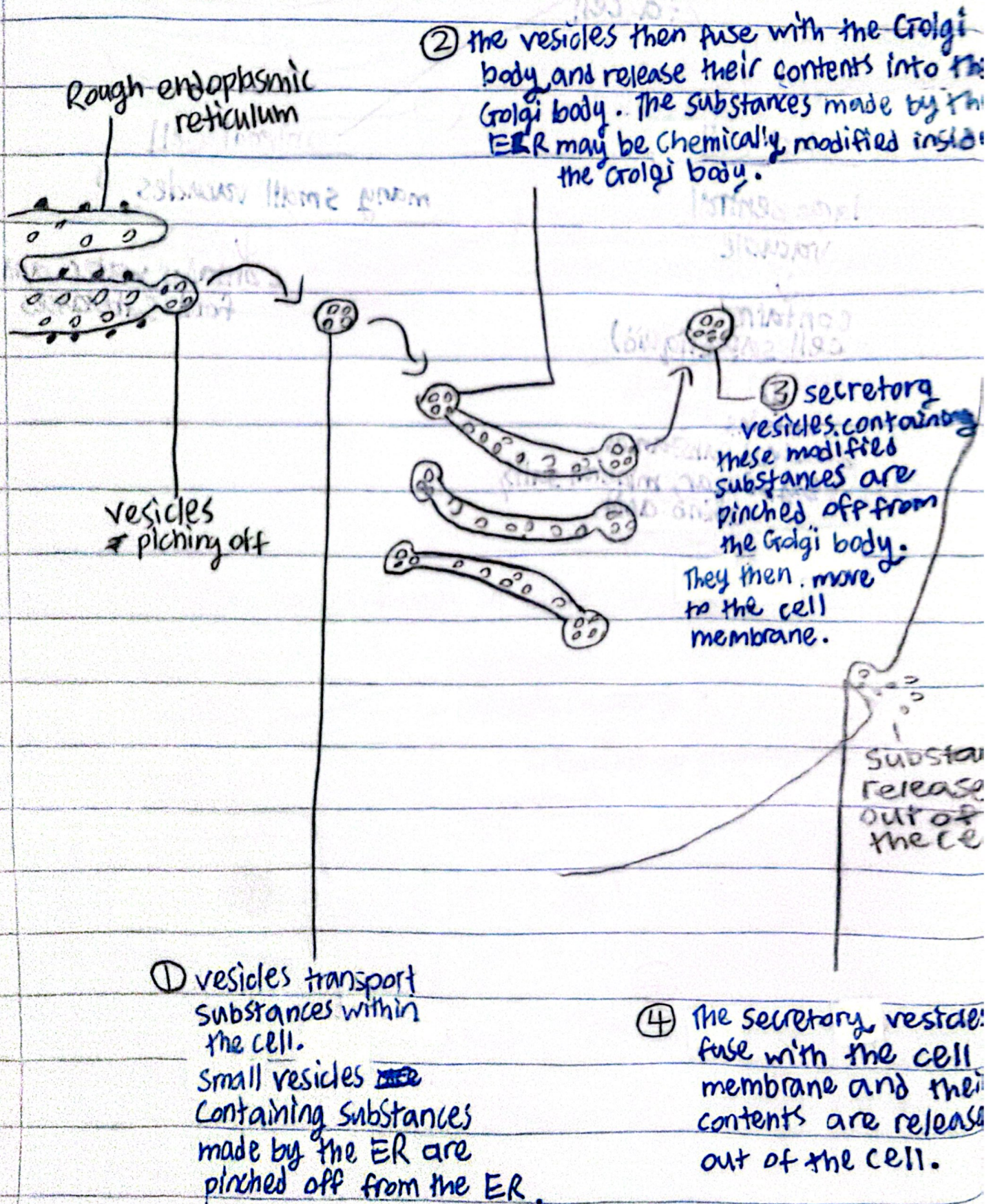
↓
contains dissolved substances,
Eg. Sugar, mineral salts,
amino acid

animal cell

many small vacuoles

↓
contains water and food substances

How substances (proteins) made by smooth/rough endoplasmic reticulum are moved out of the cell?



Date:

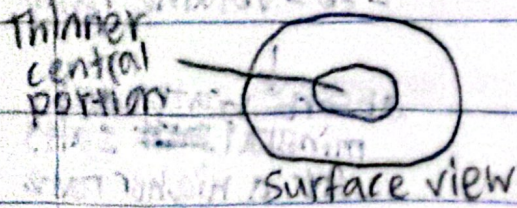
Describe how proteins made in the cell are released the outside the cell.

- proteins synthesized by the ribosomes on the rough endoplasmic reticulum pinches off in vesicles and are sent to fuse with the Golgi body.
- Here (Golgi body), they are chemically modified. Sorted, ~~se~~ stored and packaged into vesicles that pinches off ~~into vesicles~~ from the Golgi body.
- The secretory vesicles ~~are~~ move to ~~the~~ and fuse with the cell membrane to release proteins outside the cell.

Cell structures

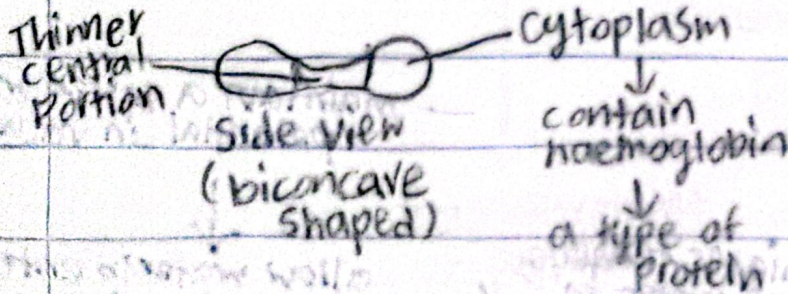
Adaptation to Function

Red blood cell



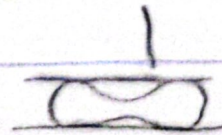
- Contains haemoglobin (a red pigment which binds to oxygen and transports it around the body).

- Has a circular, biconcave shape which increases the surface area-to-volume ratio so that oxygen can diffuse in and out at a higher rate.

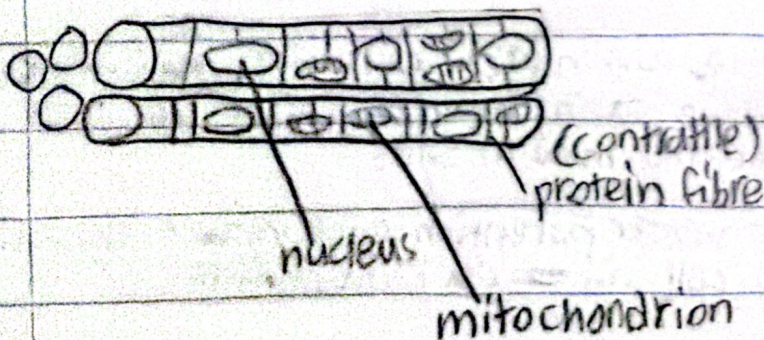


- Lacks a nucleus, enabling the cell to store more haemoglobin for transport of oxygen.

- It is flexible and can squeeze through capillaries easily.



Muscle cell



- contains many nuclei and mitochondria.

↓
provides energy for the contraction of the muscle cell.

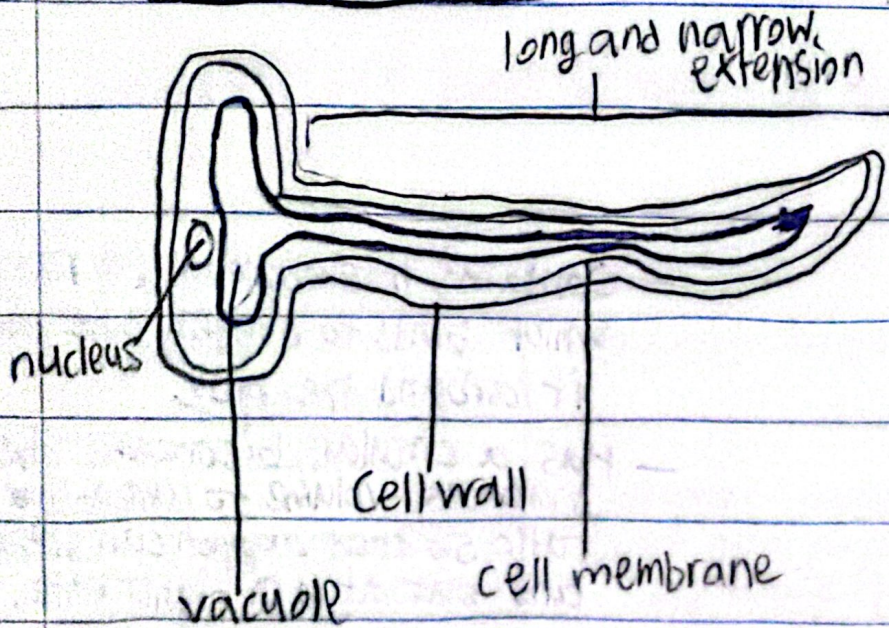
↓
allow for cell division

↓
(high demand of energy)

- Has contractile protein fibre → contracts and relax to bring about movement

Date:

Root hair cell



- ~~has~~ Has a long and narrow extension

↓
increase surface area
- to - volume ratio

↓
absorb water and mineral ~~salt~~ salts at a higher rate

- maintain a lower water potential in vacuole

(higher tendency of water to transfer in the cell)

↓
allow water to enter the root hair cell via osmosis

↓
higher to lower concentration

Describe and explain how root hair cells are adapted to their function.

- Root hair cell have long and narrow extension, ^{that} increases surface area to volume ratio, for ~~the~~ faster ^{the} rate of absorption of water and mineral salts.
- Maintains a lower water potential in the vacuole. This allows water to enter the ~~the~~ root hair cell via osmosis.