

# 9. Golgi Bodies

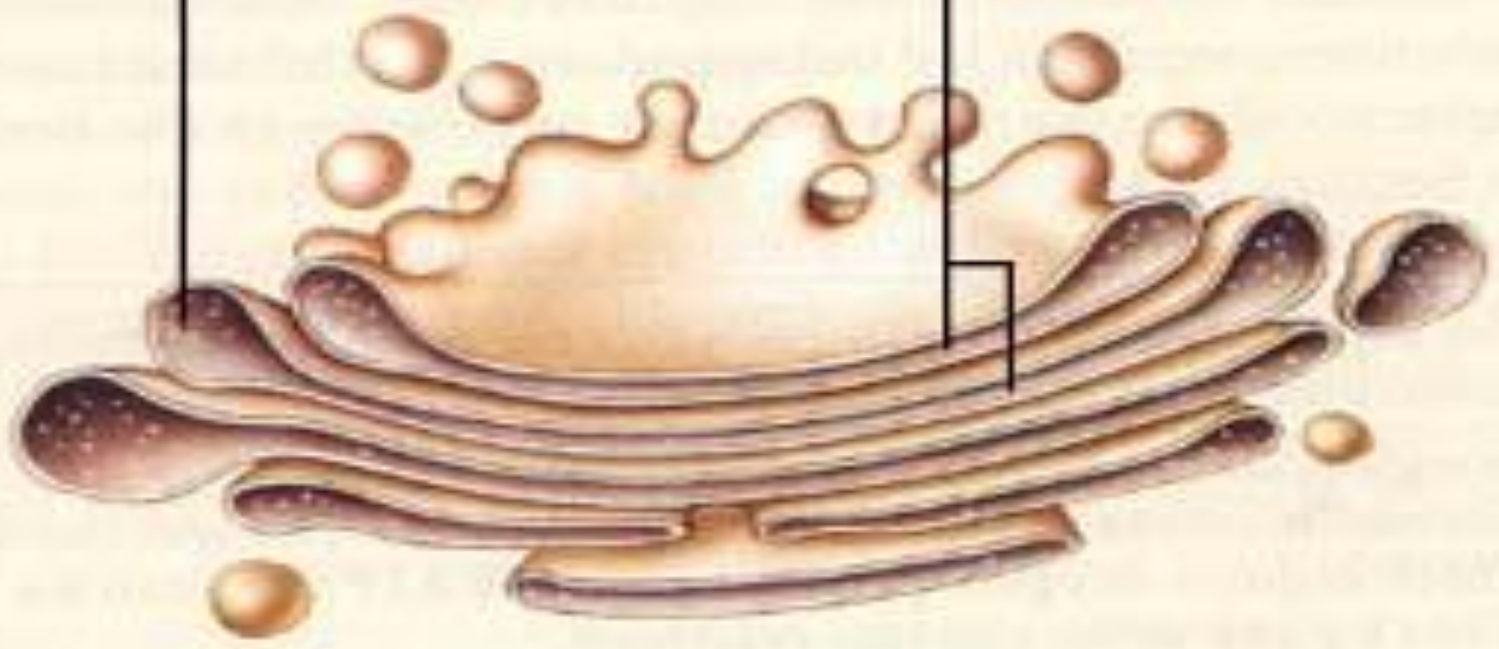
- Location: found in the cytoplasm. Animal cells usually have only one which is frequently located near the nucleus. Certain plant and animal cells may have several hundred.
- Structure: take the shape of stacked, flattened sacs.
- Function: serve as processing, packaging, and storage centers for the products to be released from the cell.



0.25  $\mu\text{m}$

budding vesicle

internal spaces



# 10. Vacuoles

- Location: found in the cytoplasm.
- Structure: fluid filled spaces surrounded by a single membrane.
- Function: used for the storage of food, water, and minerals. Certain vacuoles control water content within the cell and are referred to as *contractile* vacuoles.

chloroplasts

cytoplasm

cell wall

cell membrane

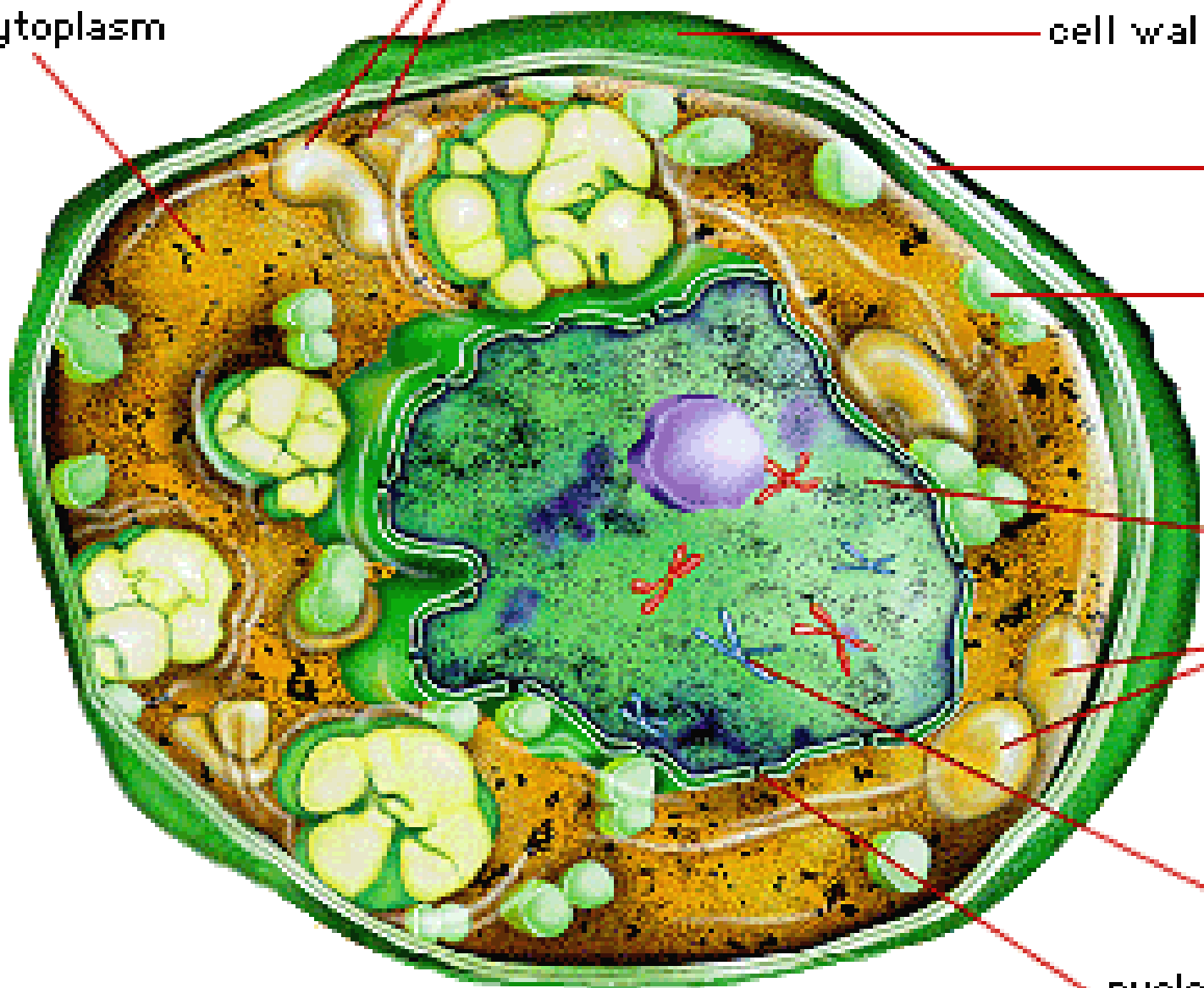
vacuole

nucleus

mitochondria

chromosomes

nuclear membrane



# 11. Lysosomes

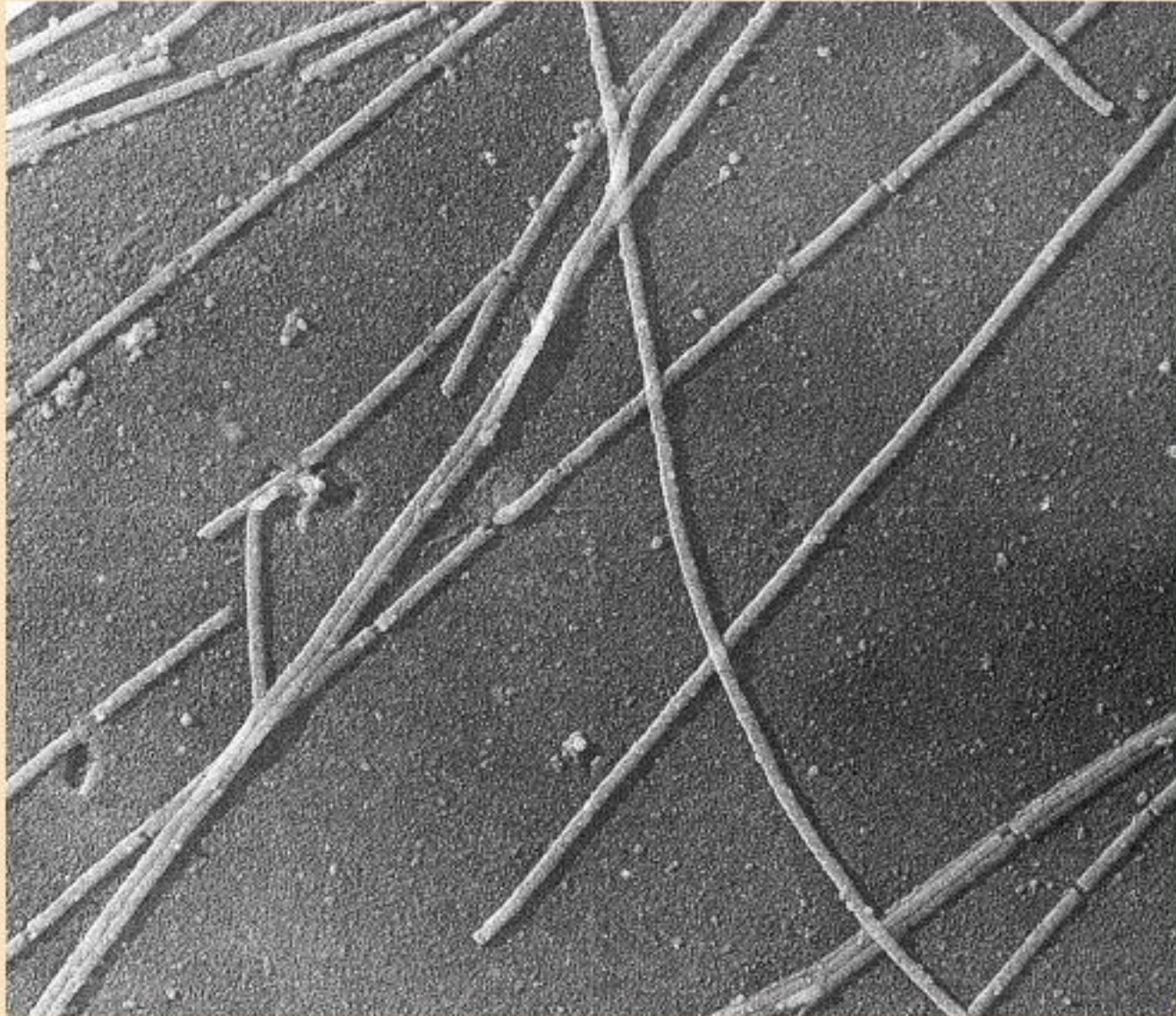
- Location: found in the cytoplasm.
- Structure: sac-like structures surrounded by a single membrane containing strong digestive enzymes.
- Function:
  1. Digestion of nutrients which enter the cell.

2. Destruction of harmful substances that enter the cell.
3. Destruction of worn out organelles.
4. Involved in certain developmental processes.

# 12. Microtubules

- Location: found in the cytoplasm.
- Structure: long, hollow, cylindrical structures composed of proteins.
- Function:
  1. Important in shaping a cell. Serves as sort of a skeleton.
  2. Basic unit of structure in *flagella* and *cilia*.

# SEM Microtubules



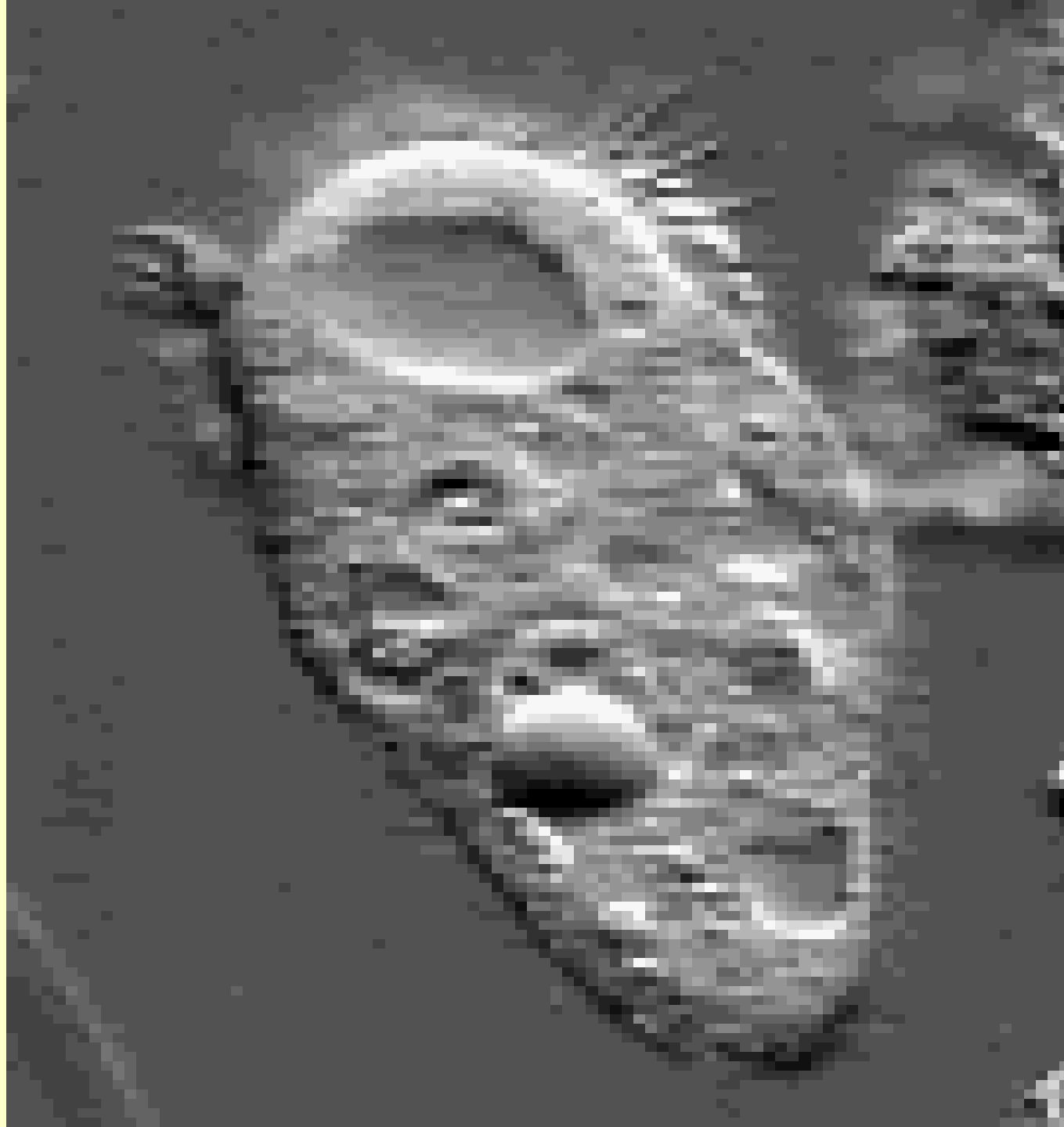


# 13. Microfilaments

- Location: found in the cytoplasm.
- Structure: long, solid, thread-like strands composed of protein.
- Function:
  1. Support the cell.
  2. Aid in the movement of cytoplasm within the cell (cyclosis).
  3. Those containing the protein *actin* are involved in muscle contraction.

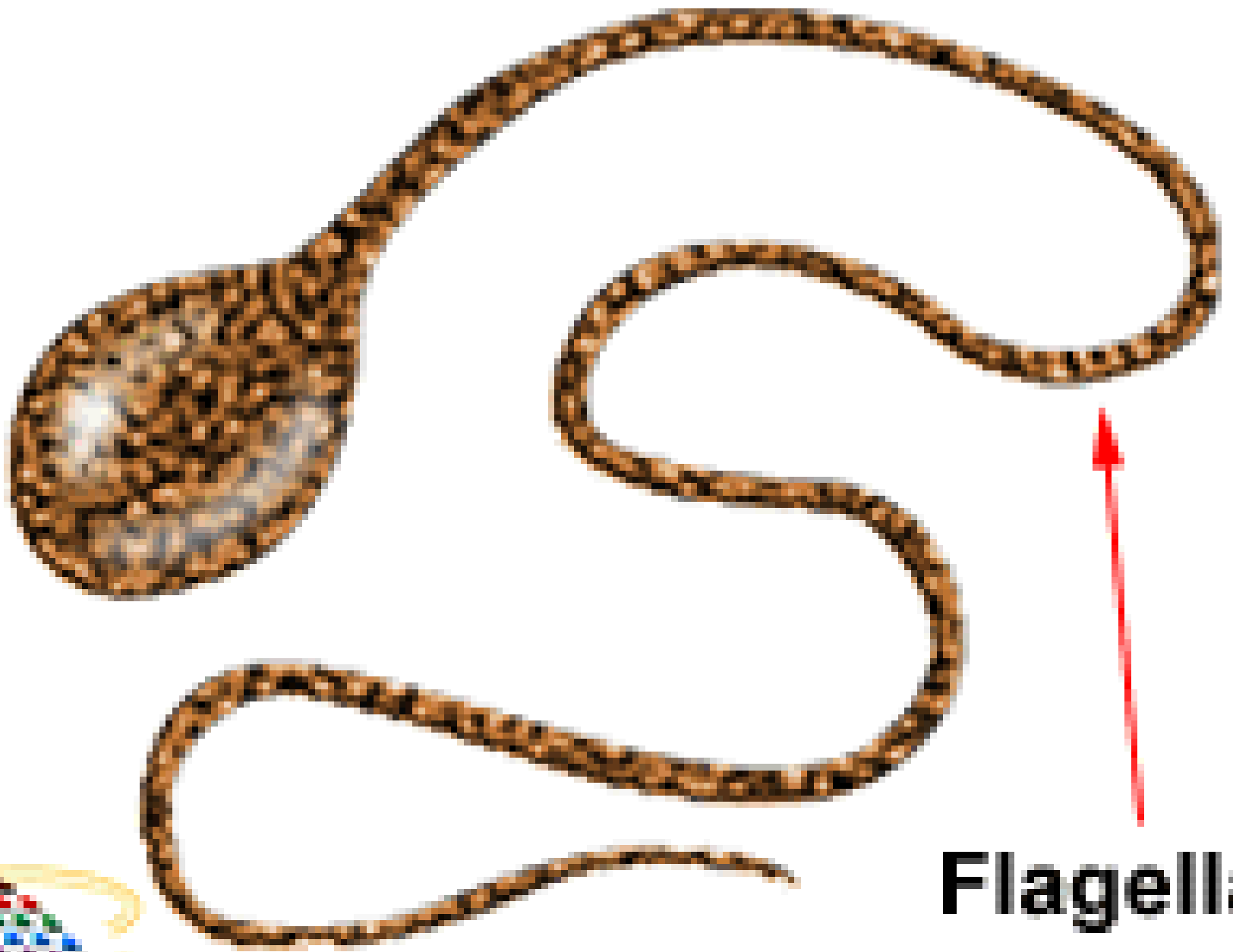
# 14. Cilia

- Location: extend from the cell membrane while being attached to the interior of the cell by a basal body.
- Structure: short hair-like projections usually present in large numbers. They contain 9 pairs of microtubules surrounding a central pair,
- Function:
  1. Important in movement and capturing of food in microorganisms.
  2. Move substances over the surface of cells in multicellular organisms.



# 15. Flagella

- Location: extend from the cell membrane; attached to the interior of the cell by a basal body.
- Structure: long hair-like structures usually present in small numbers. Microtubules: 9 pairs + 1 central pair.
- Function: important in movement.



**Flagella**





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