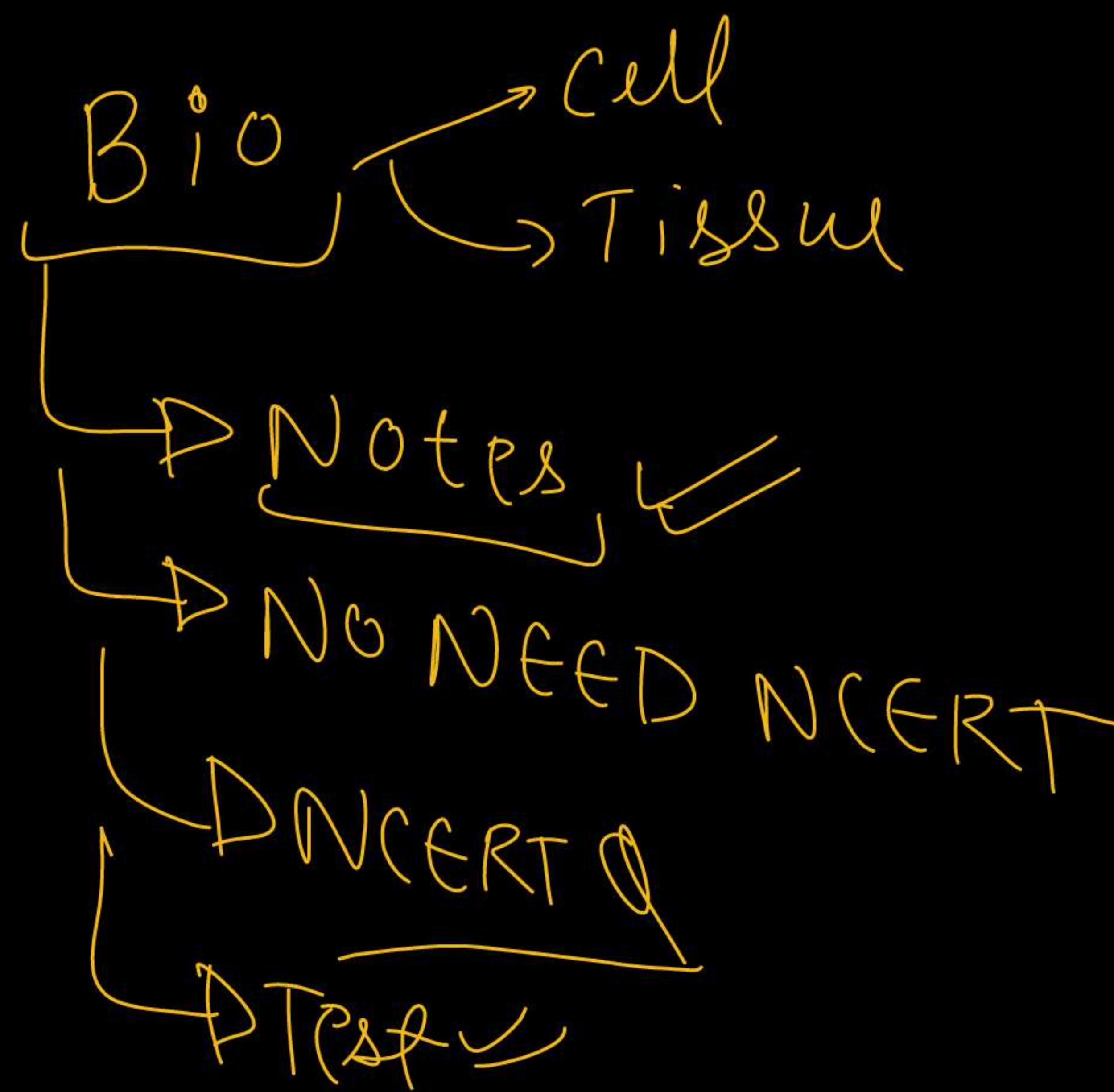


CLASS 9TH

THE FUNDAMENTAL UNIT OF LIFE

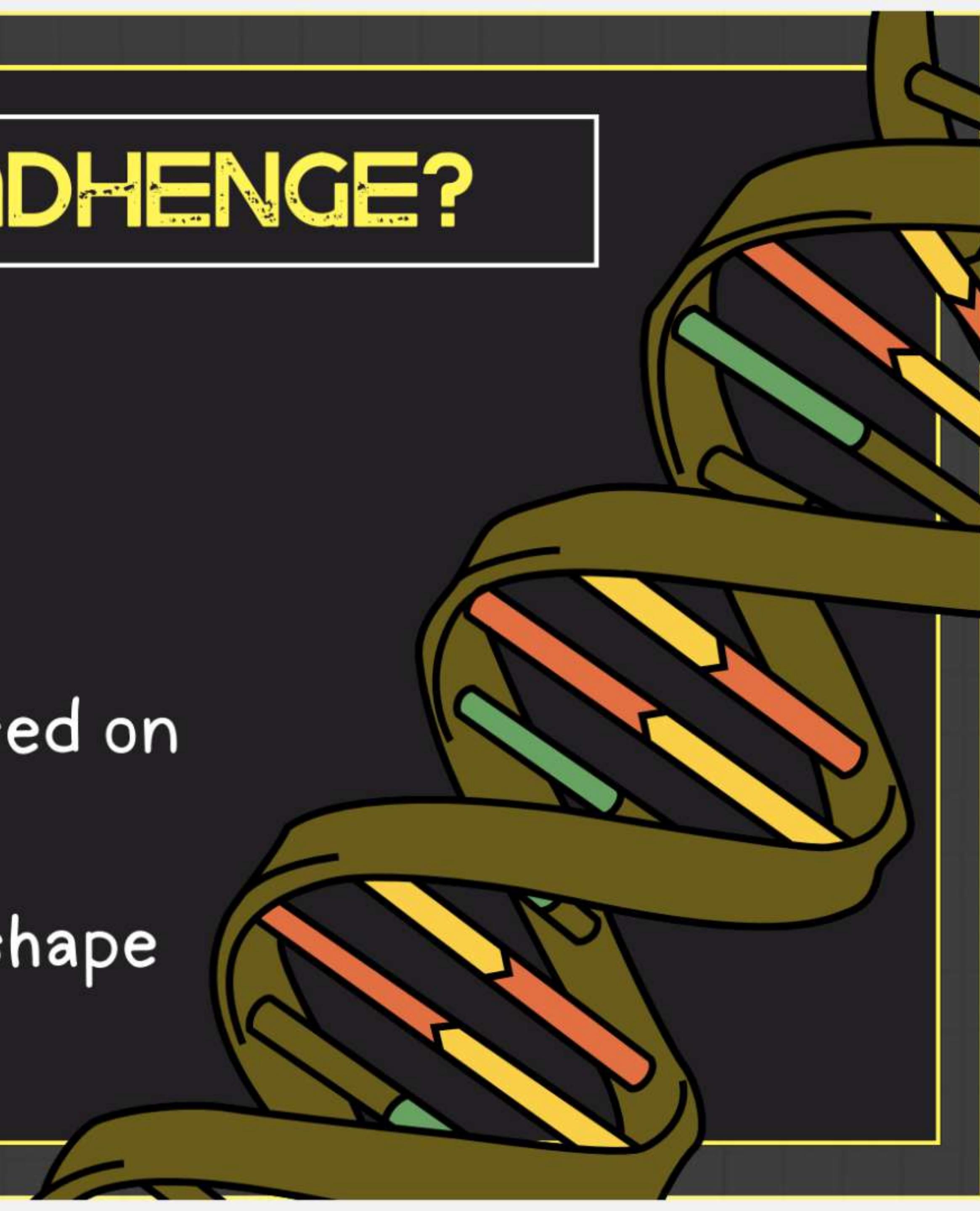


Kaise ho
sab?



AAJ KYA PADHENG?

- What is Biology?
- Cell and Its History
- Cell Theory
- Types of Organisms based on number of cells
- Types of cell based on shape and size



"YAAR BIOLOGY TOH BAHUT
DIFFICULT LAG RAHI HAI..."



DON'T WORRY GUYS,
PRASHANT BHAIYA HAI
NA...

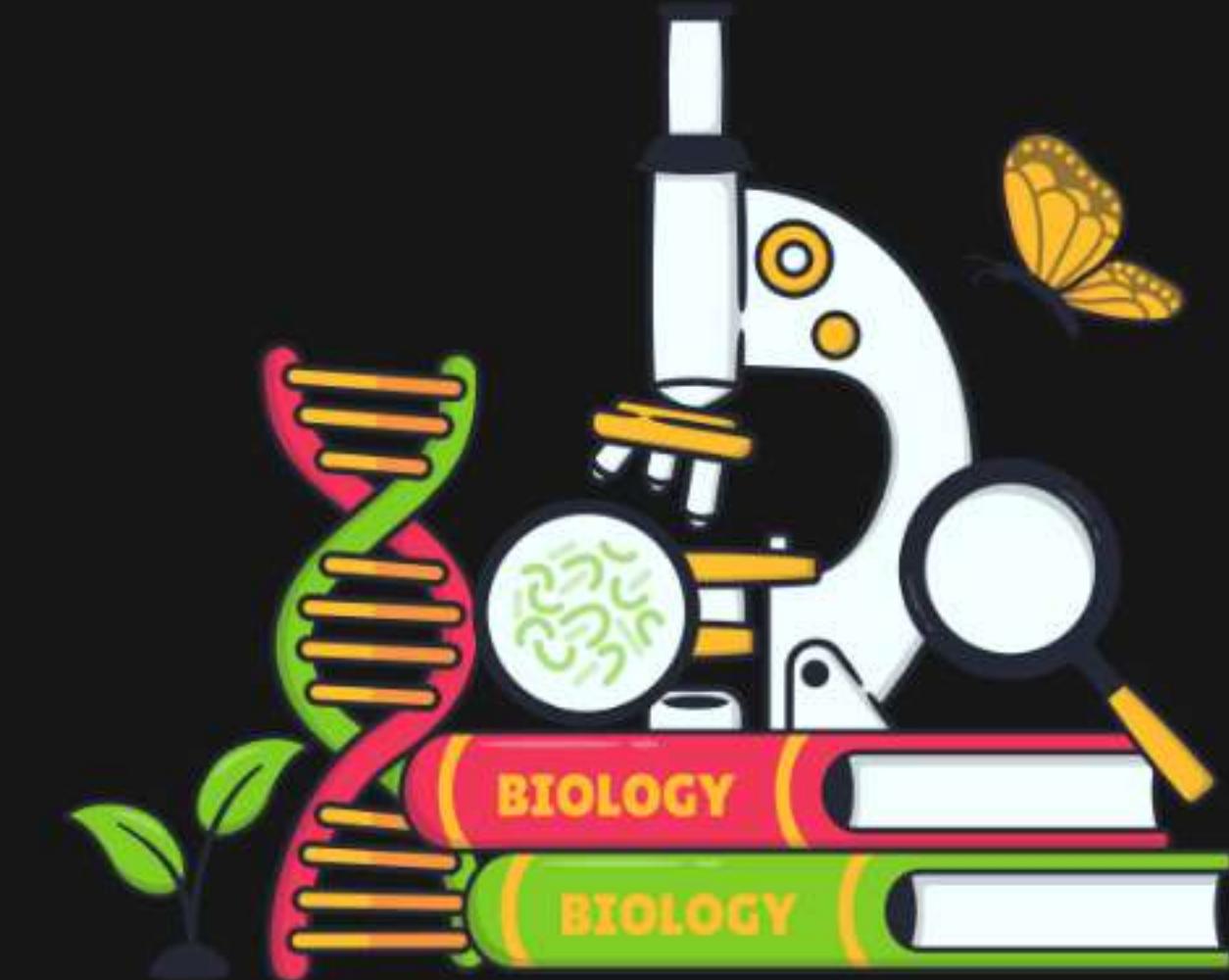


Biology comes from two Greek words:

"Bios" – meaning life

"Logos" – meaning study

So, Biology means "the study of life."



Biology is mainly divided into three major branches:

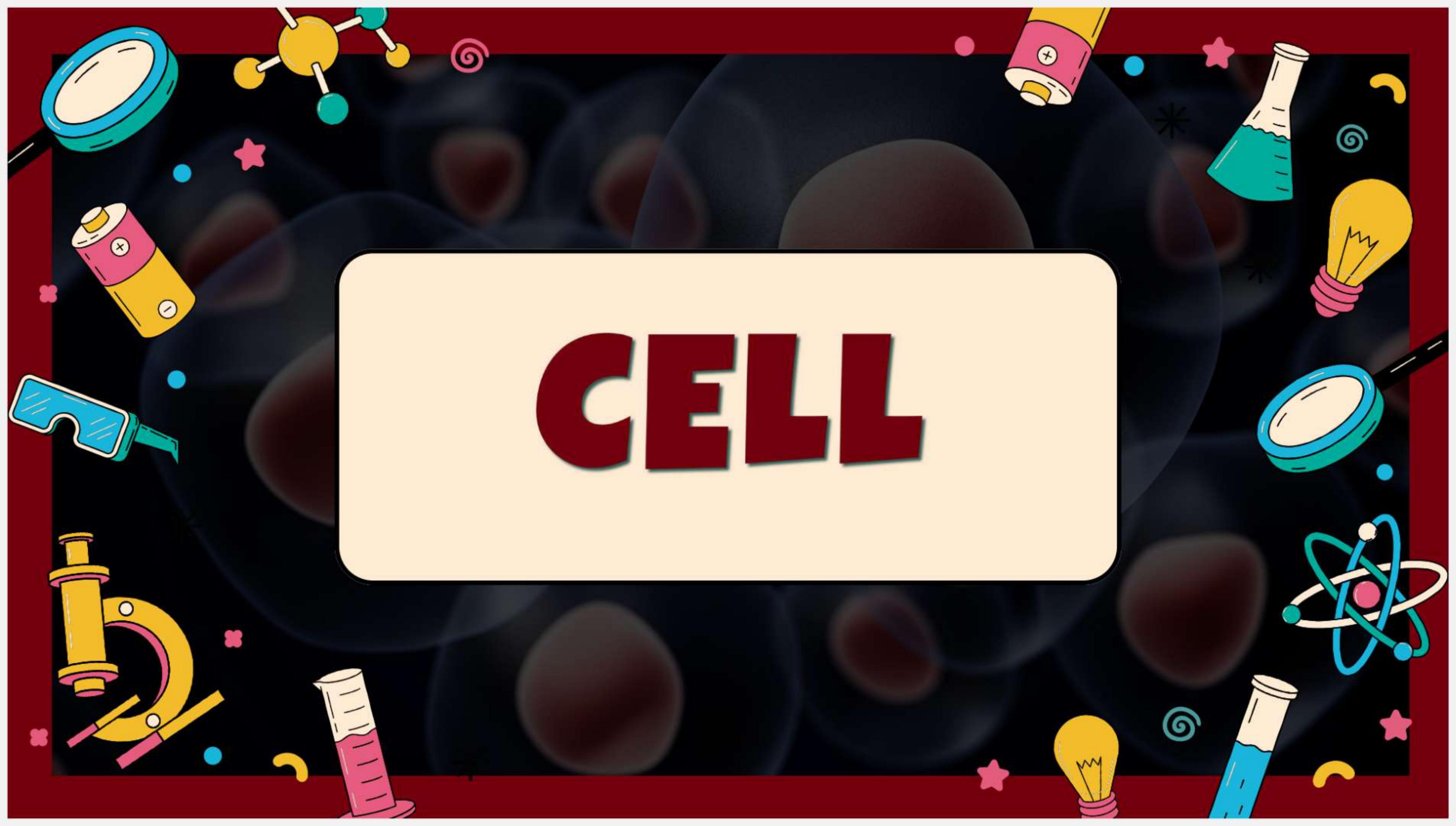
Botany – The study of plants.

Zoology – The study of animals.

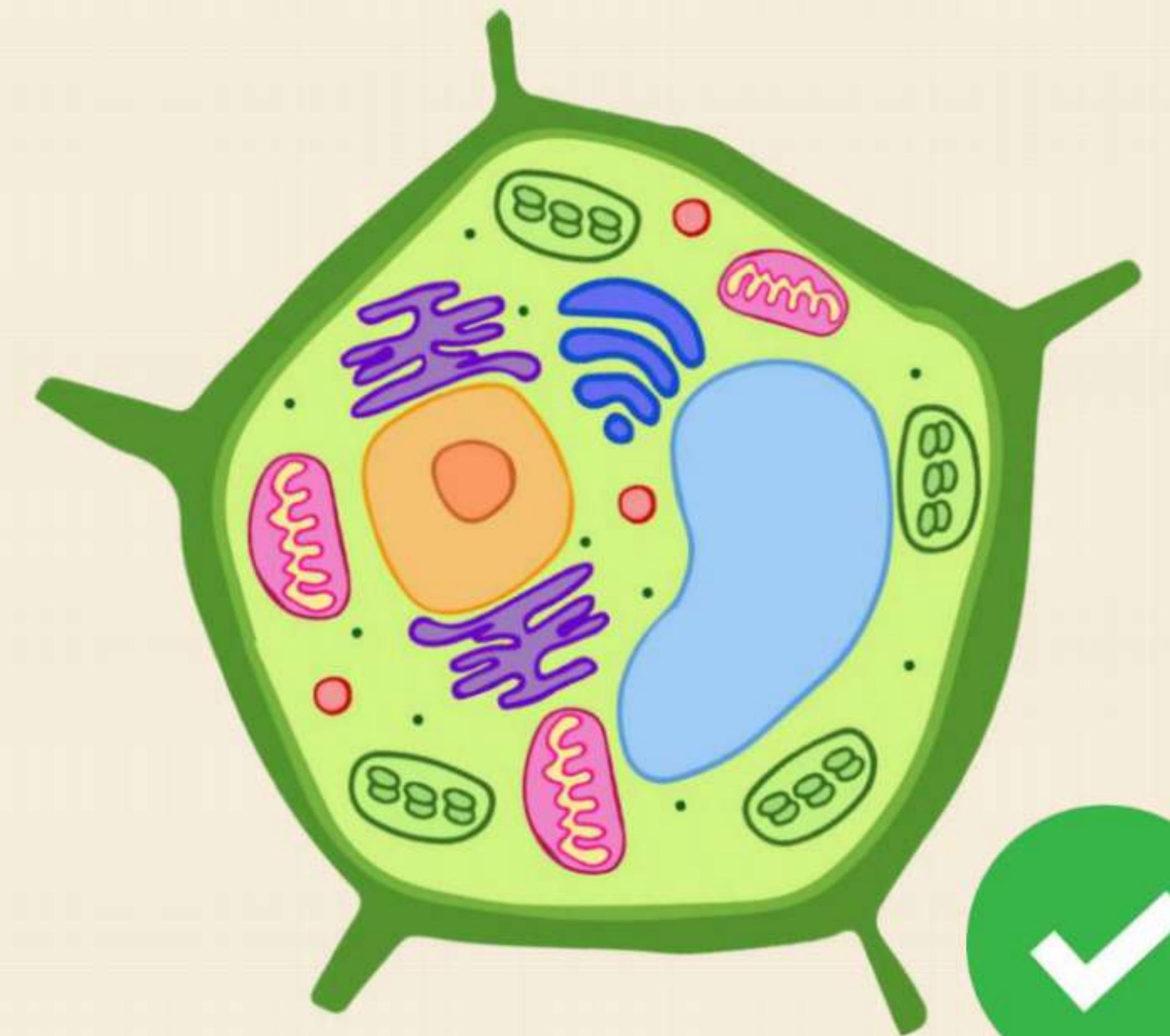
Microbiology – The study of microorganisms.



CELL



In Biology

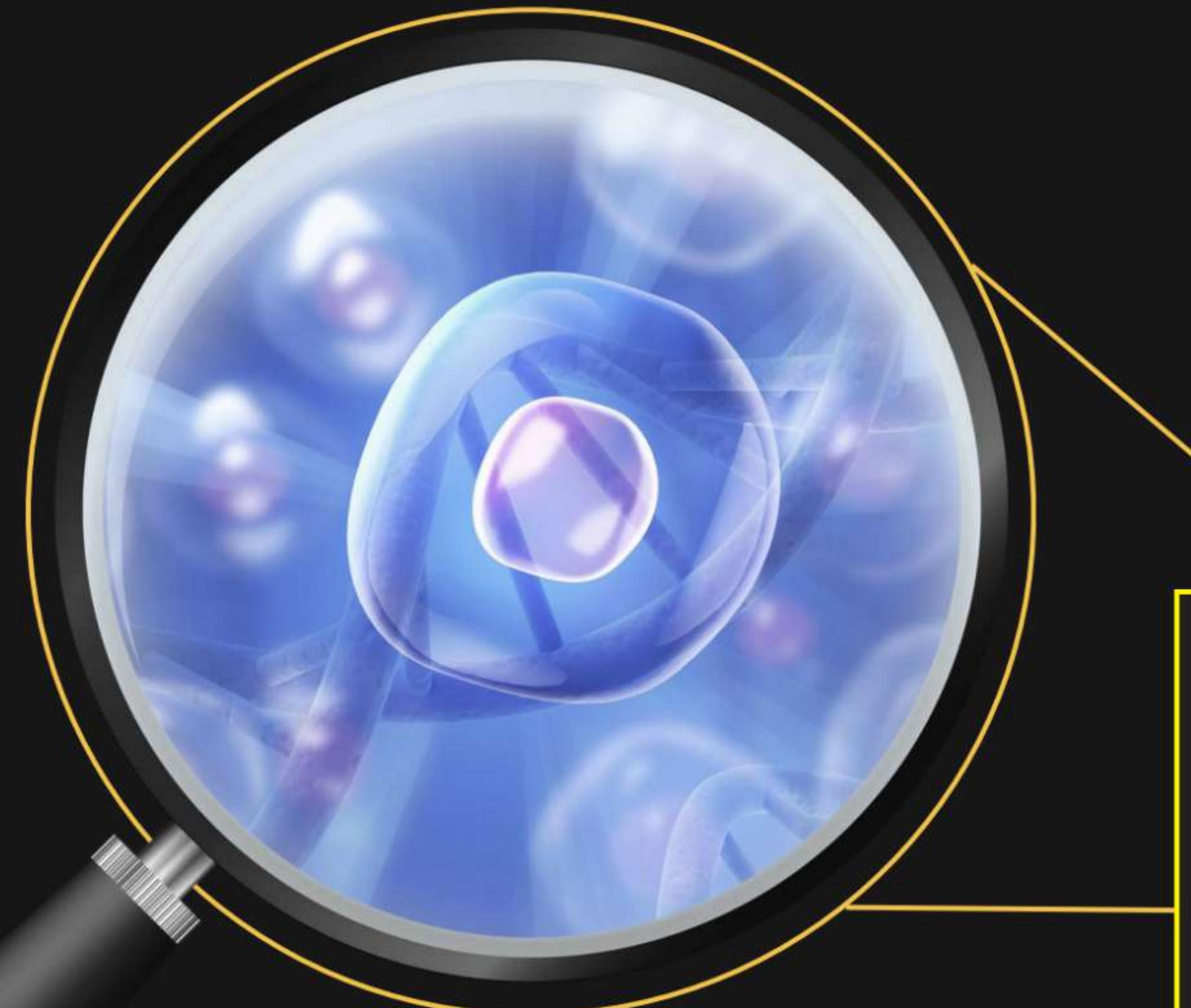


In Physics



When we see them, we
find something in common

~~The Cell~~



A cell is the smallest structural and functional unit of a living organism.

All living things are made up of cells.

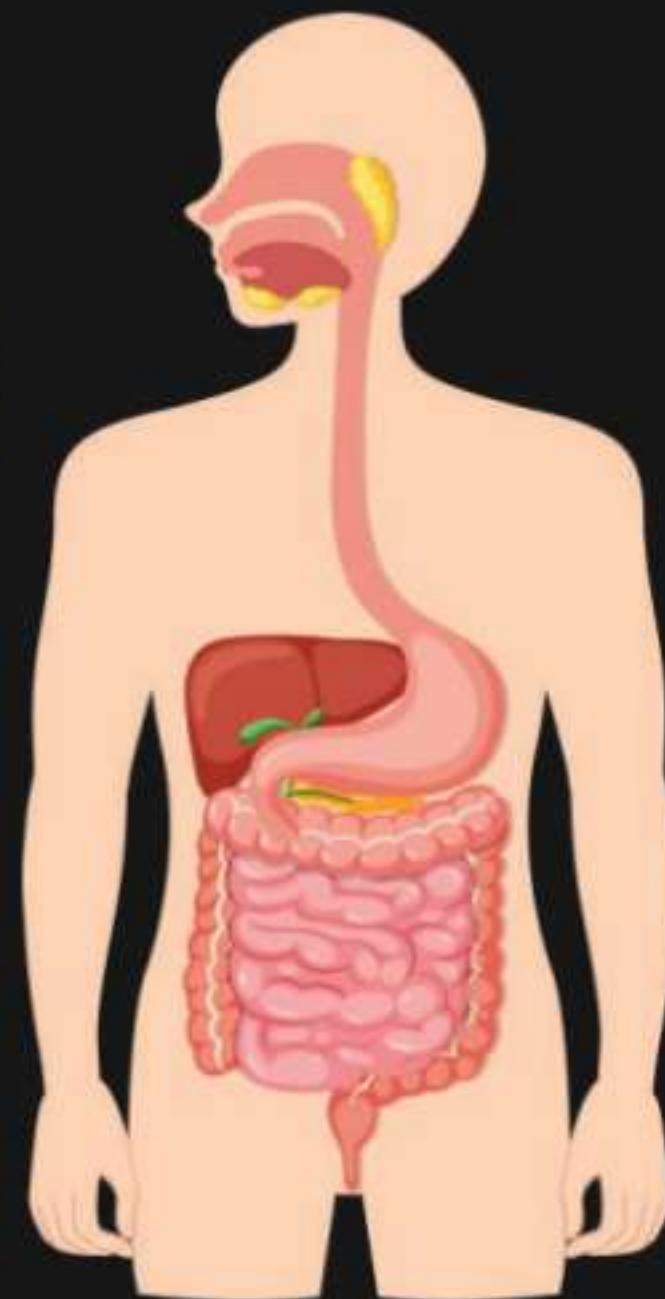
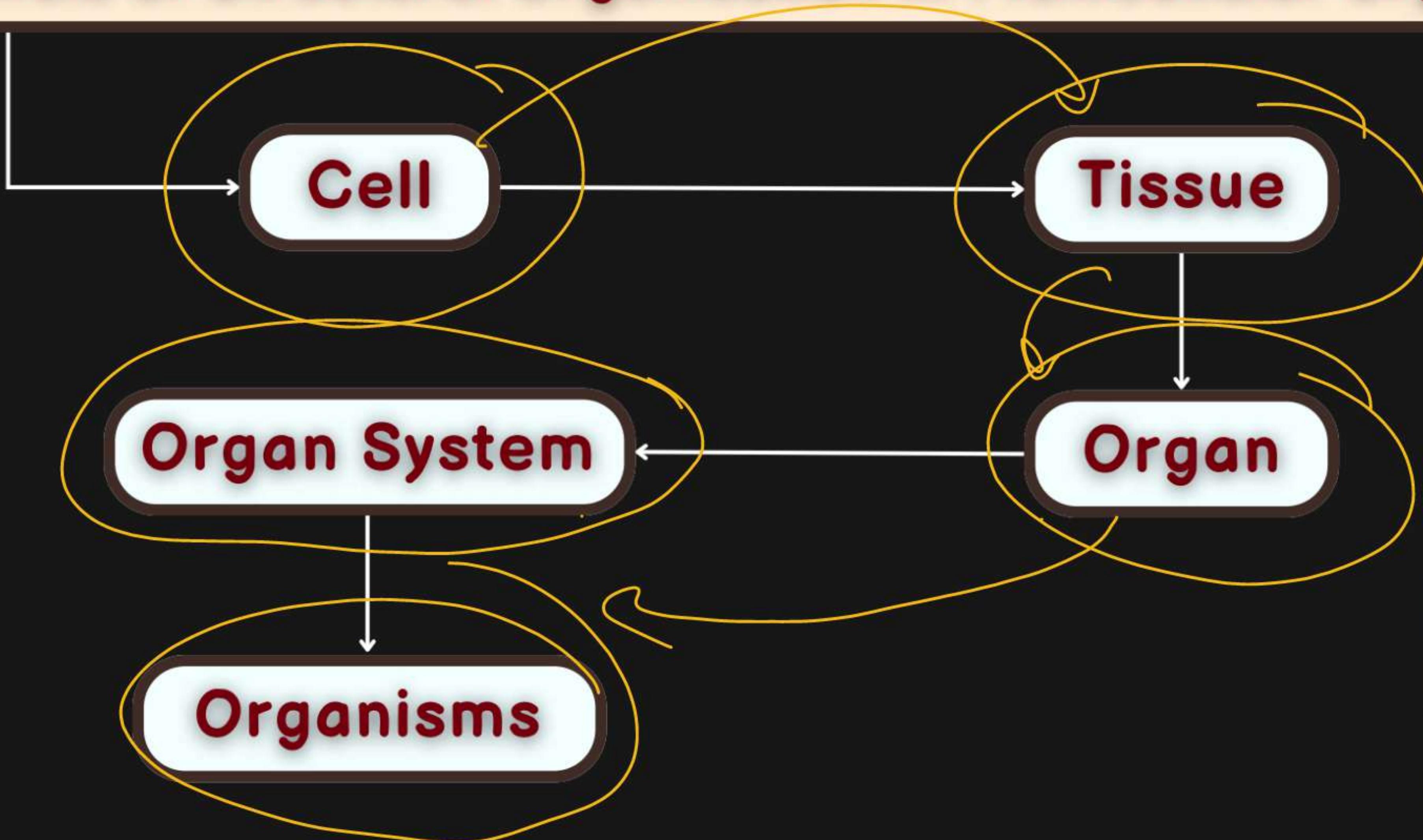
Q→ Why cell is called Structural Unit ?



Am I Also made up of Cells ?



Levels of Structural Organisation in Multicellular Organisms





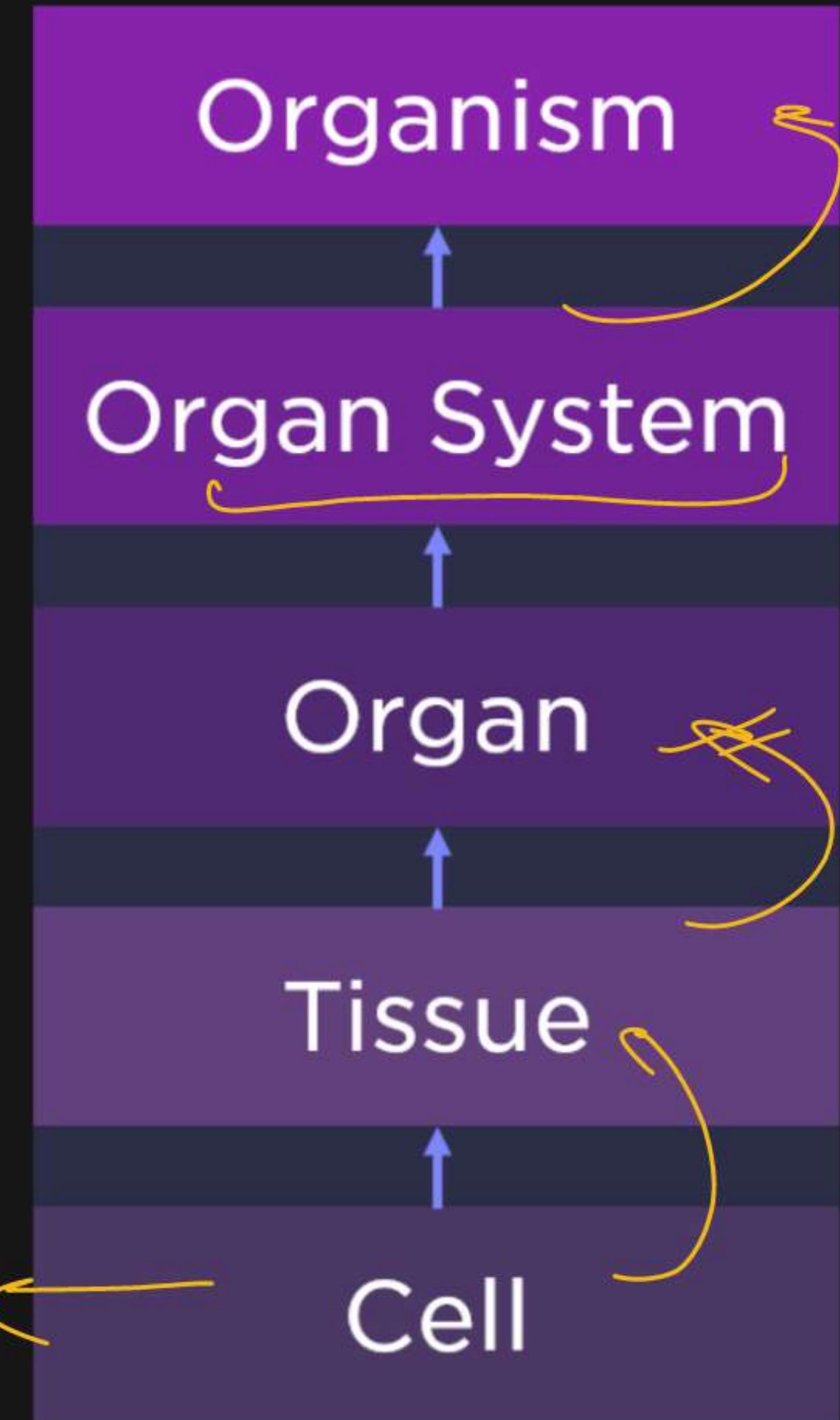
Example: human

Example: nervous system

Example: brain

Example: nerve tissue

Example: nerve cell,
also called a *neuron*



A bunch of organ
systems working
together

A bunch of organs
working together

A bunch of tissues
working together

A bunch of cells
working together

The smallest unit of
life

Fmhd

DISCOVERY OF CELL

In 1665, an English scientist named Robert Hooke was the first to discover cells.

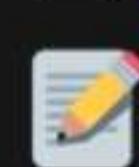
Robert Hooke
(Non-Living)



Hooke observed a thin slice of cork under a self-made microscope.

Hooke saw small box-like structures that looked like a honeycomb.

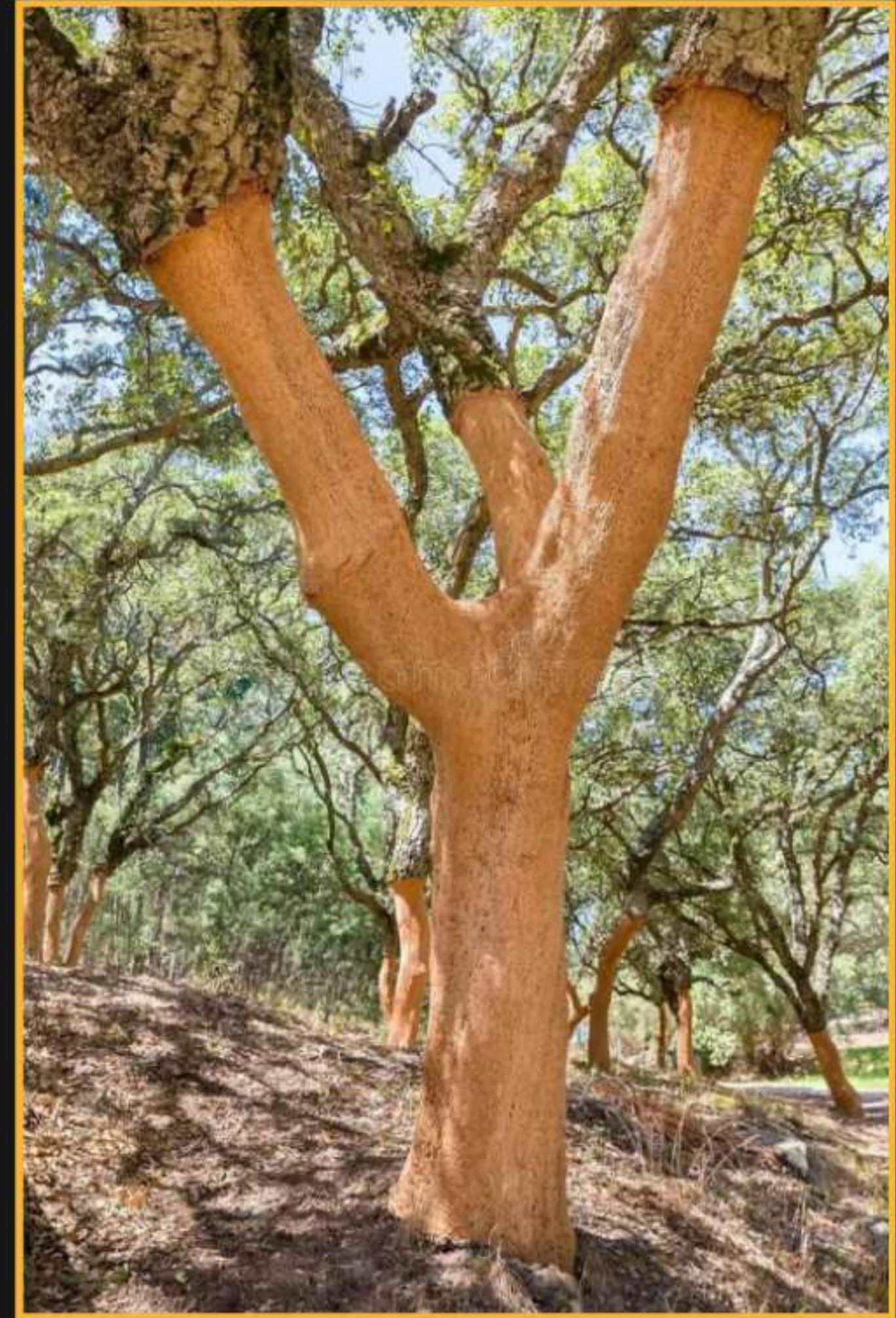
Hooke named them: "Cells" (from Latin cellula, meaning small rooms).

 Note: These were dead plant cells.



What is cork?

Cork is a spongy, dead tissue found in the outer bark of trees, especially the cork oak tree.



WHEN SOMEONE ASKS ROBERT HOOKE ABOUT THE LIVING CELL:

HE WILL BE LIKE:



Apneko kya maalum bhai?

DISCOVERY OF LIVING CELLS

In 1674, Anton van Leeuwenhoek, a Dutch scientist, became the first person to observe living cells.



IT LIVING Anton van Leeuwenhoek improved the microscope and observed living cells in pond water.

He saw microorganisms like bacteria and protozoa.

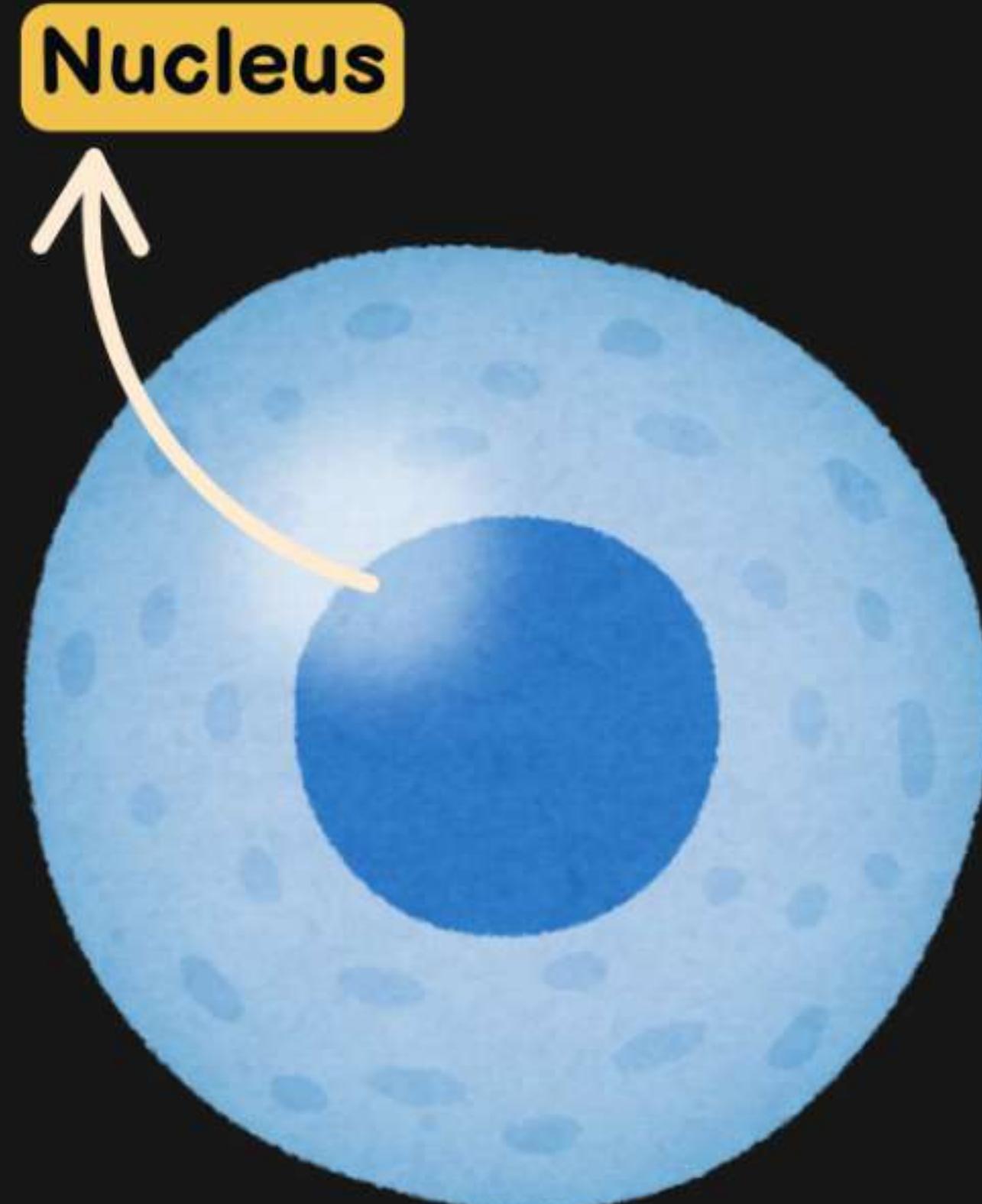
Important Discoveries Related to the Cell

Discovery of the Nucleus (1831)

- In 1831, Robert Brown was the first to identify and describe the nucleus in plant cells.

Brain of cell

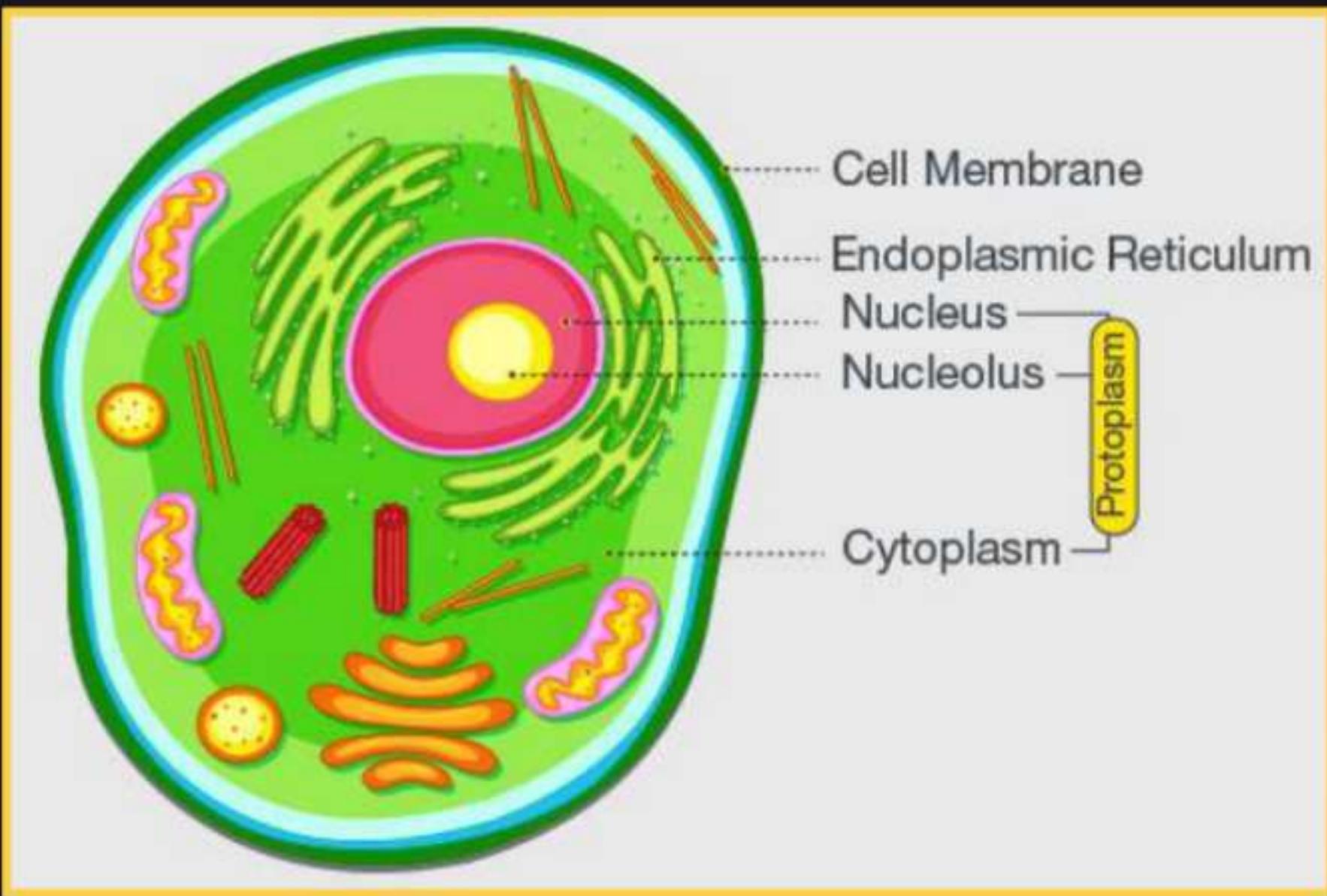
Importance: The nucleus acts as the control centre of the cell. It holds the cell's genetic material and manages its activities.



Term "Protoplasm" Coined (1839)

- J.E. Purkinje introduced the term "Protoplasm" to describe the living part of the cell.

Note: Protoplasm includes everything inside the cell that is alive.



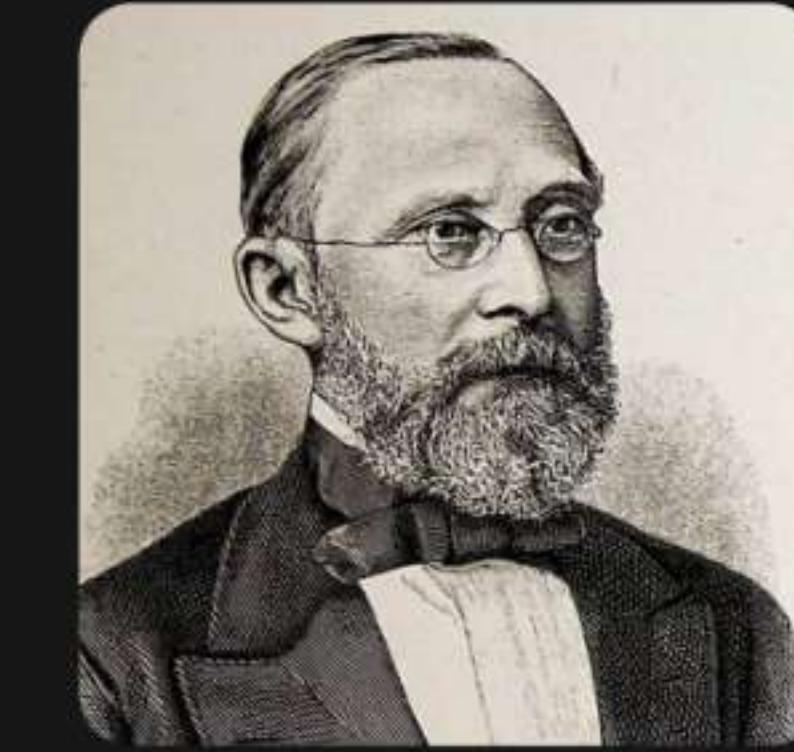
Nucleus + Cytoplasm = Protoplasm

CELL THEORY

Matthias Schleiden (plants) & Theodor Schwann (animals)

They stated:

- All living things are made of cells.
- The cell is the basic unit of life.

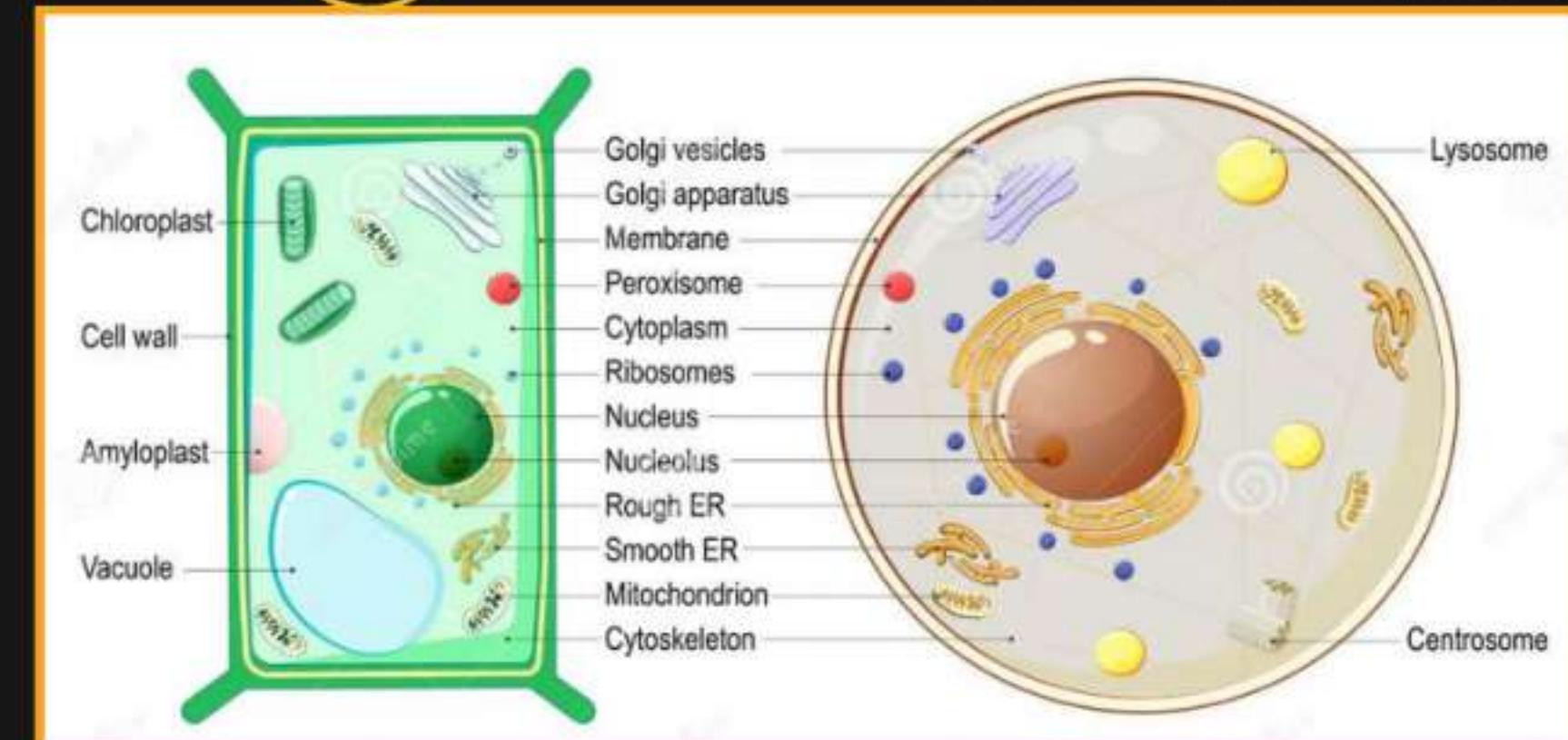


Cell Theory (Completed) -

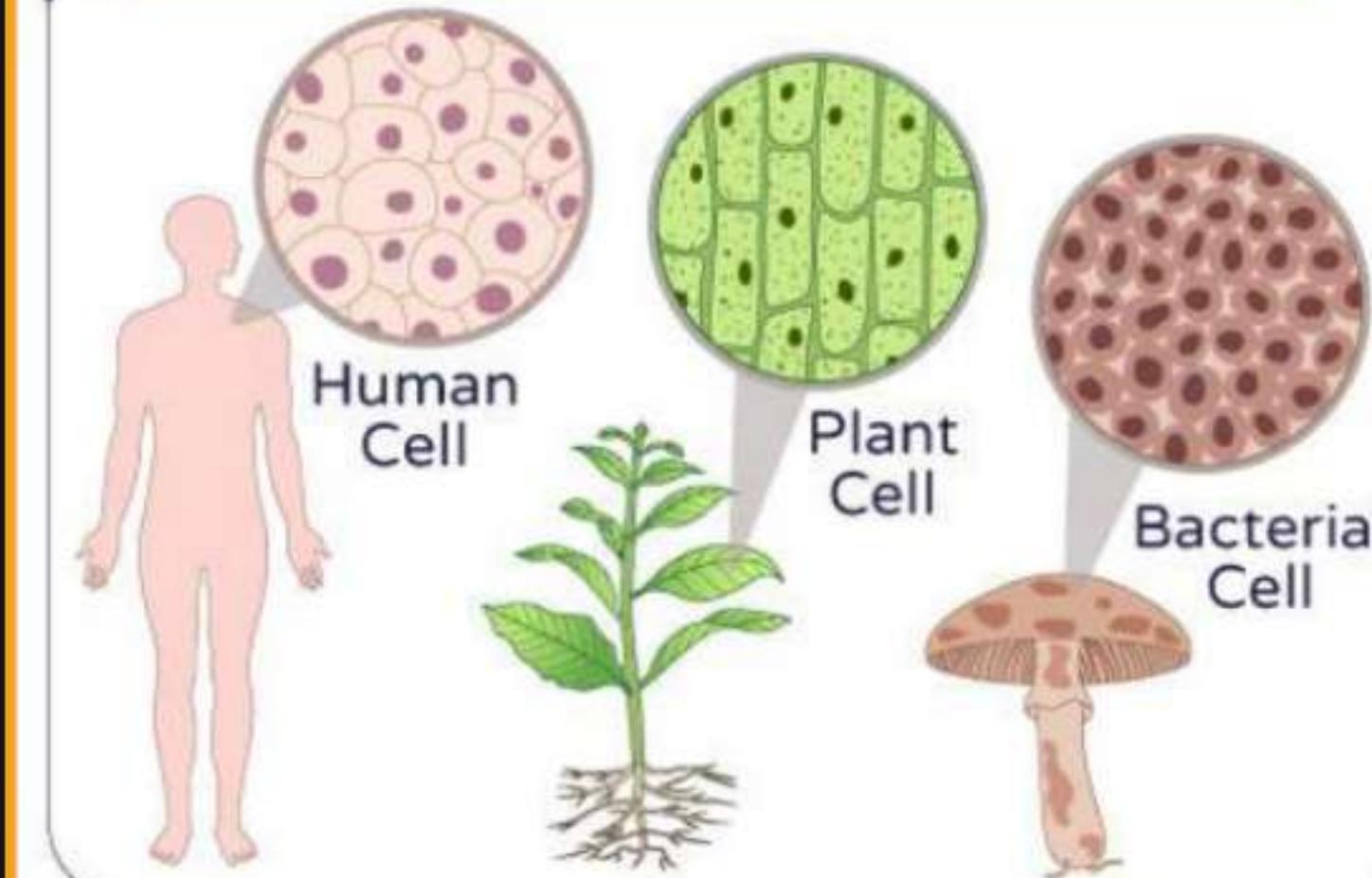
1855

- In 1855, Rudolf Virchow completed the cell theory.

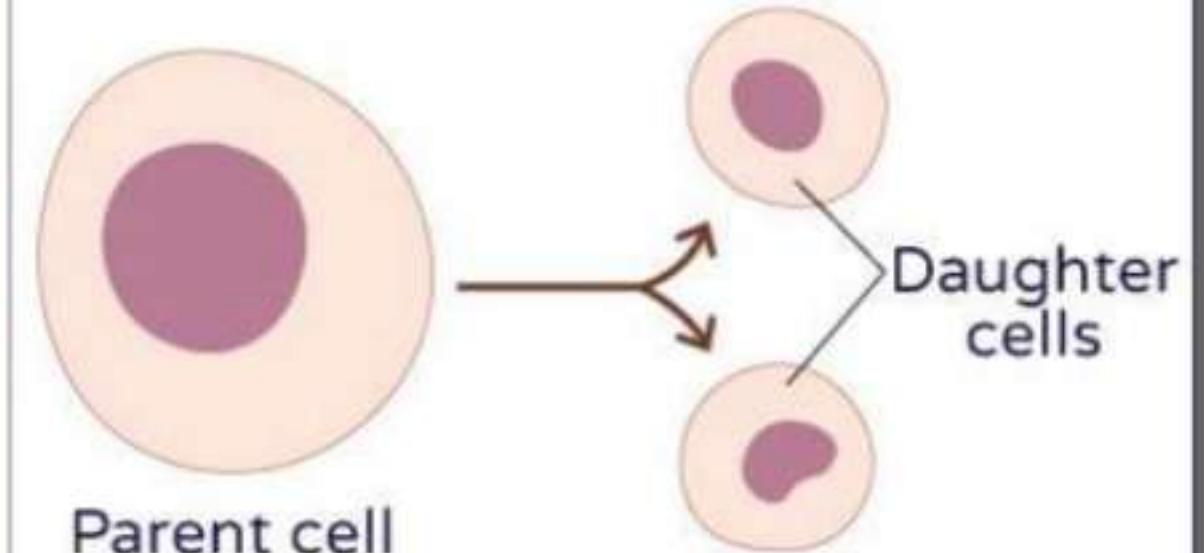
He added: "All cells arise from pre-existing cells" (Omnis cellula e cellula).



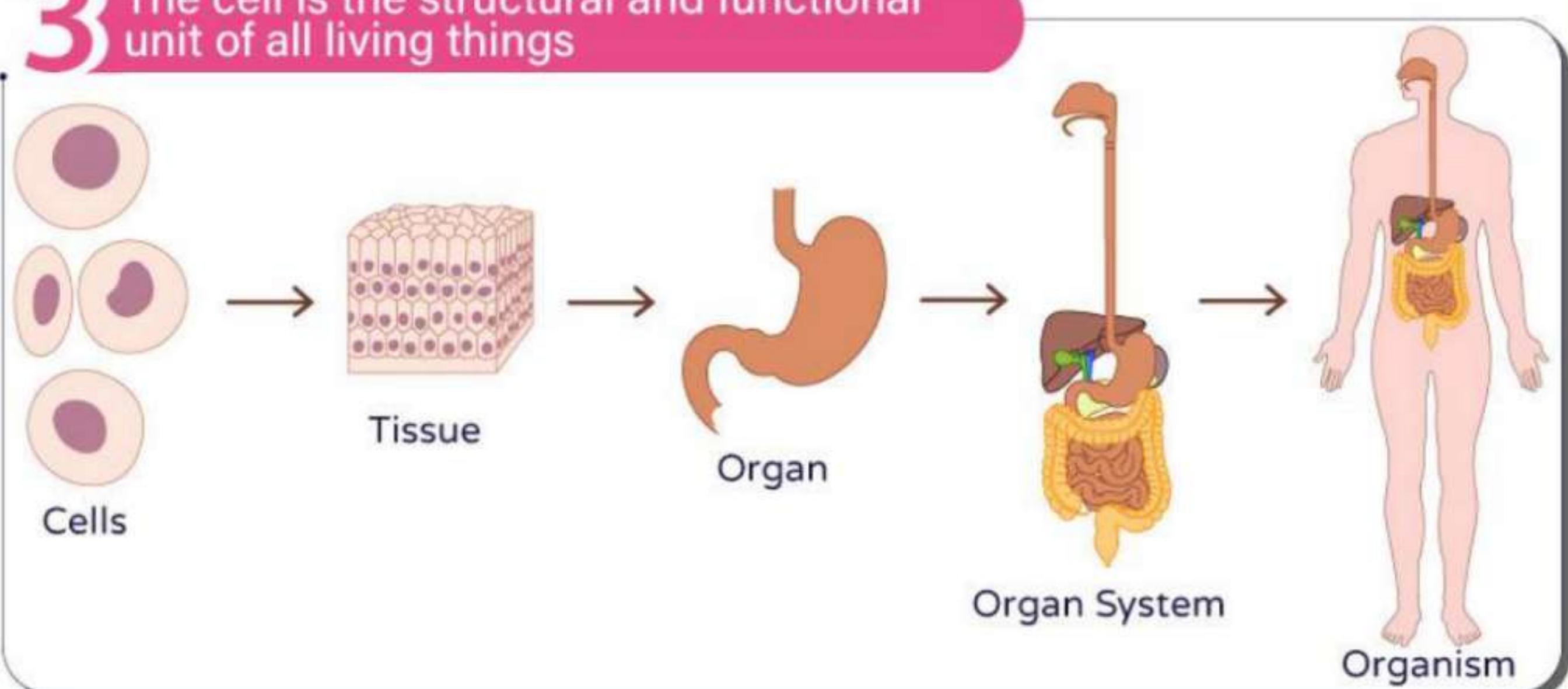
1 All organisms are composed of one or more cells



2 All cells arise from pre-existing cells



3 The cell is the structural and functional unit of all living things



Question: The first living cell was observed by:

- A) Schleiden
- B) Schwann
- C) Virchow
- D) Anton van Leeuwenhoek



Question: Who discovered the cell in 1665?

- A) Anton van Leeuwenhoek
- B) Robert Brown
- C) Robert Hooke
- D) Rudolf Virchow



Question: Who stated that new cells arise from pre-existing cells?

- A) Robert Hooke
- B) Schleiden
- C) Schwann
- D) Rudolf Virchow

(D)



1590**Zacharias Janssen**

- Invented the first compound microscope
- Objects looked enlarged under the microscope

1665**Robert Hooke**

- Used light microscope to look at thin slices of plant tissue (cork)
- Saw small, box-like structures and coined the term 'Cell'

1673**Anton van Leeuwenhoek**

- First to see living organisms under a microscope
- Termed these organisms 'animalcules'

1838

Cell

**Matthias Schleiden**

- Stated that 'All living plants are made of cells'
- Developed the first two tenets of the cell theory (with Schwann)

1839

**Theodore Schwann**

- Stated 'All living animals are made of cells'
- Developed the first two tenets of the cell theory (with Schleiden)

1855

**Rudolf Virchow**

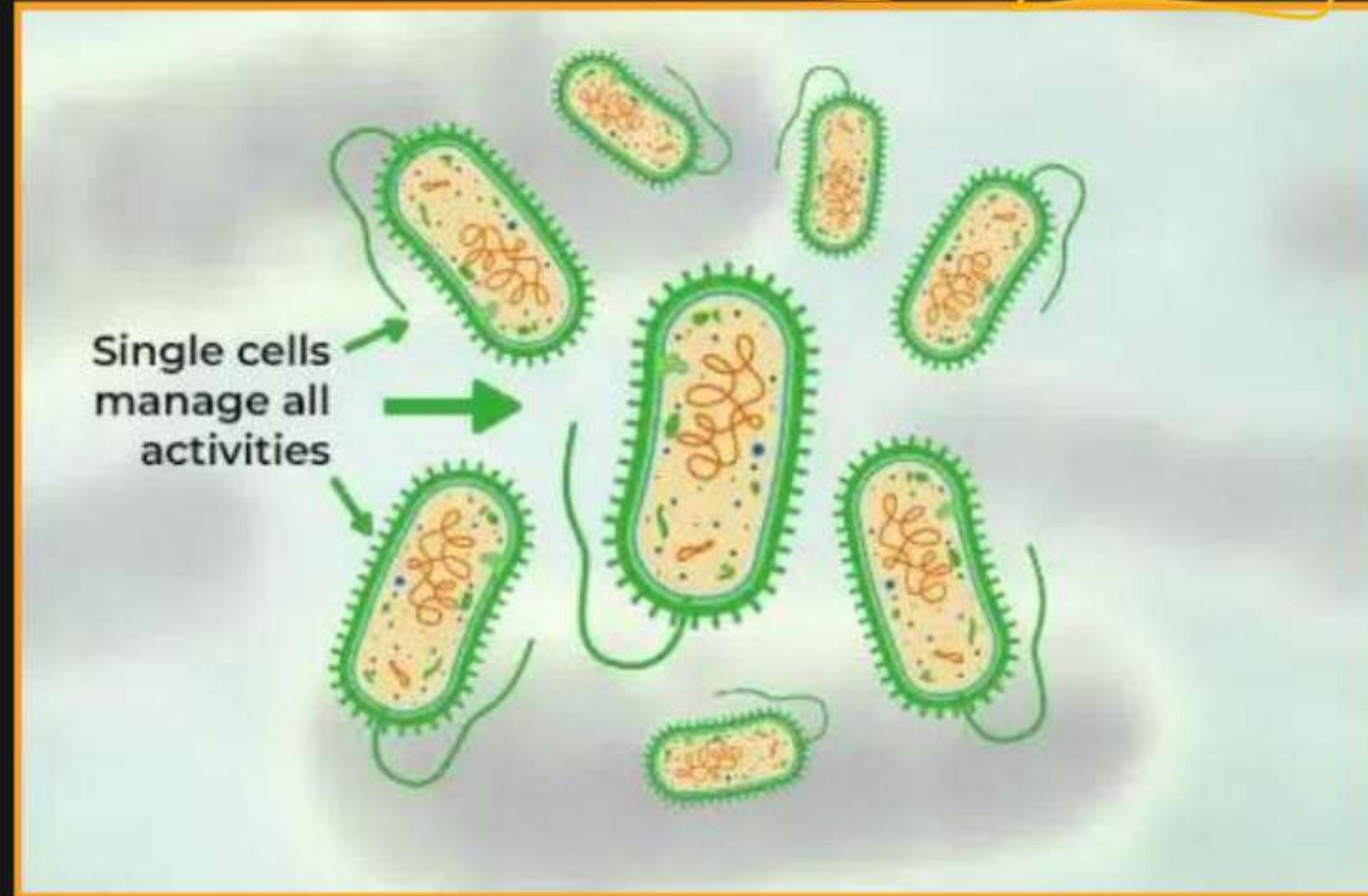
- Stated that 'Where a cell exists, there must have been a pre-existing cell'
- Developed the third tenet of the cell theory

Organisms

Singler

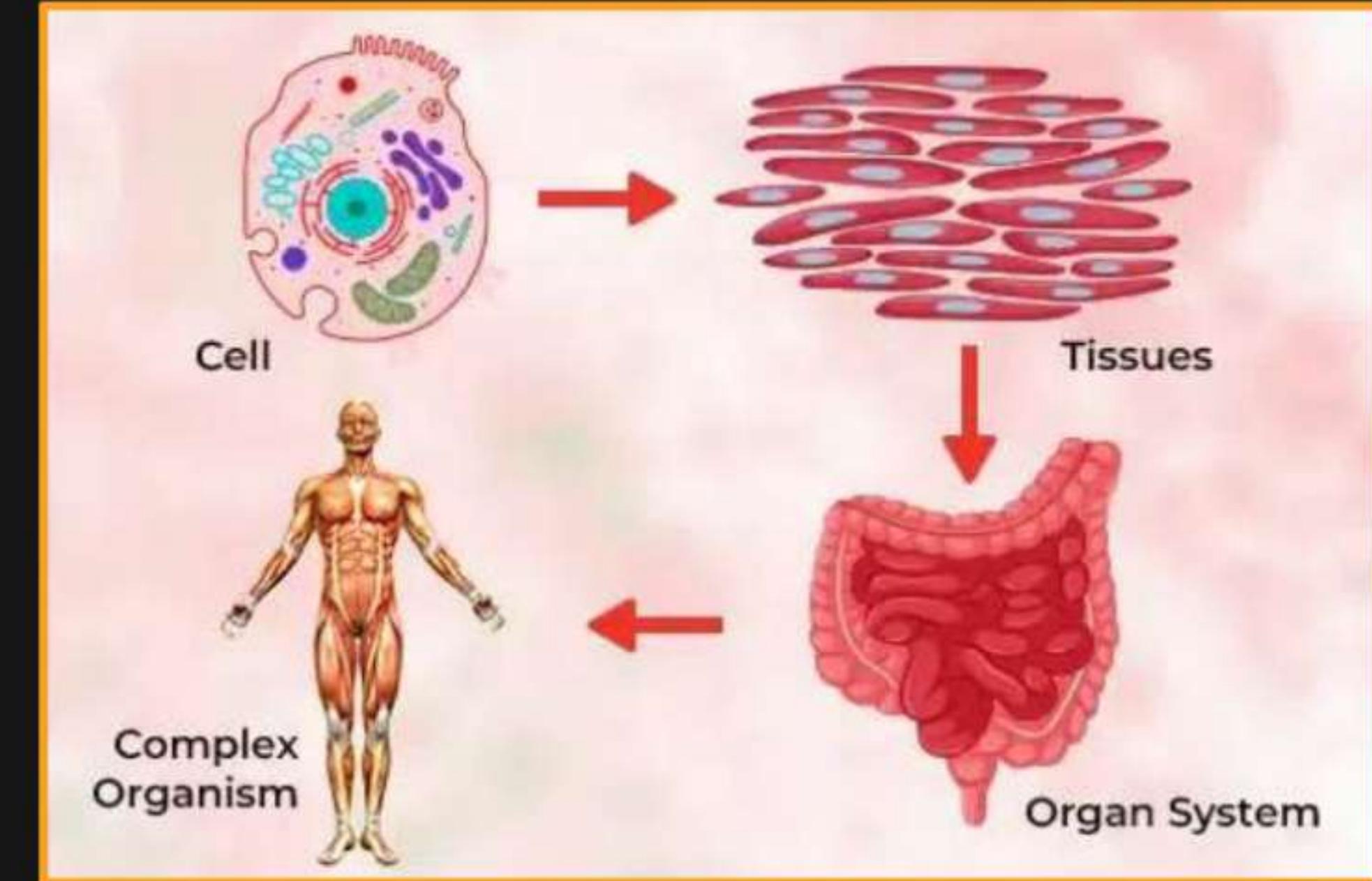
Unicellular Organisms

Example: Amoeba, Paramecium, Bacteria, Euglena

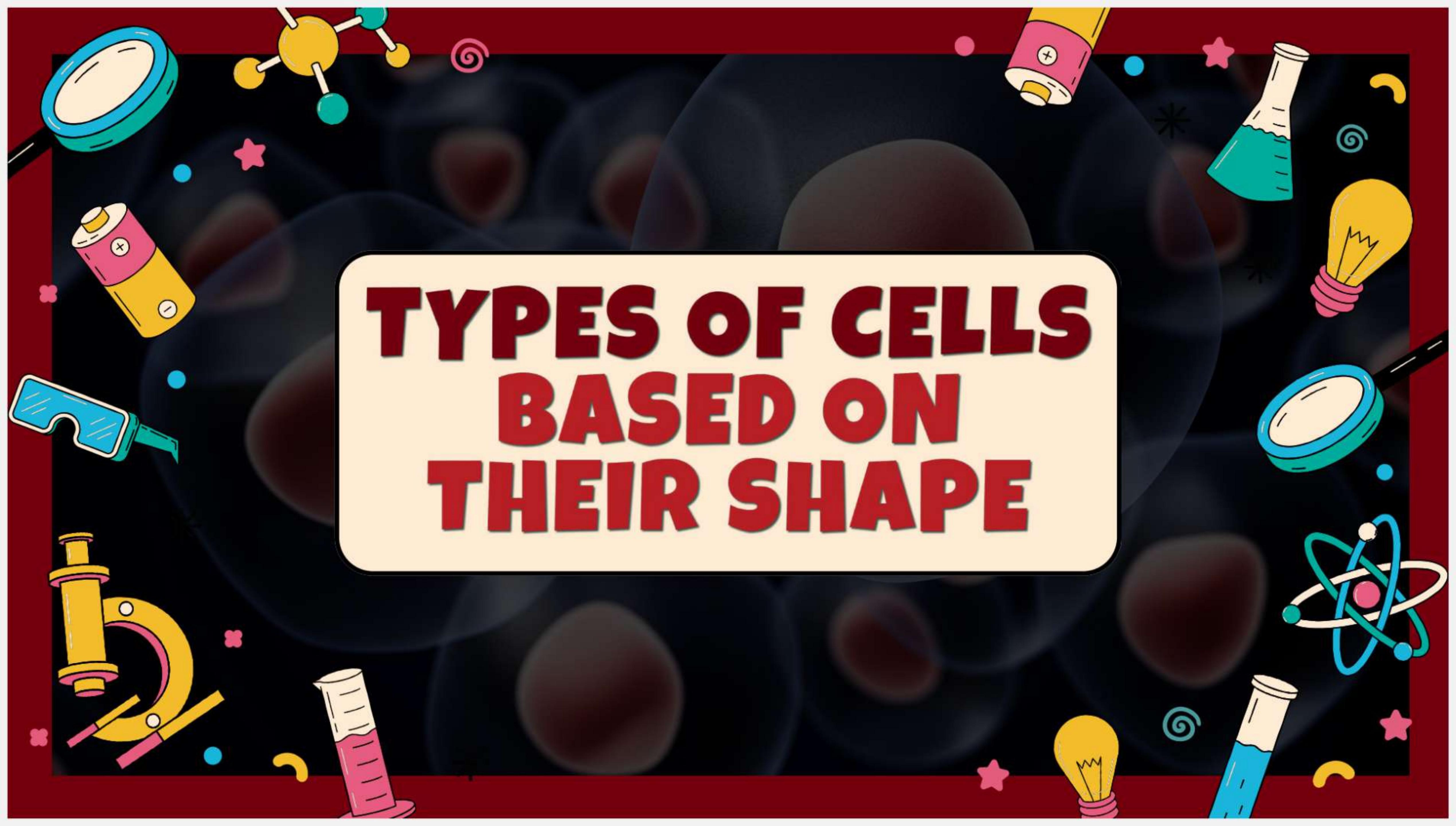


Multicellular Organisms

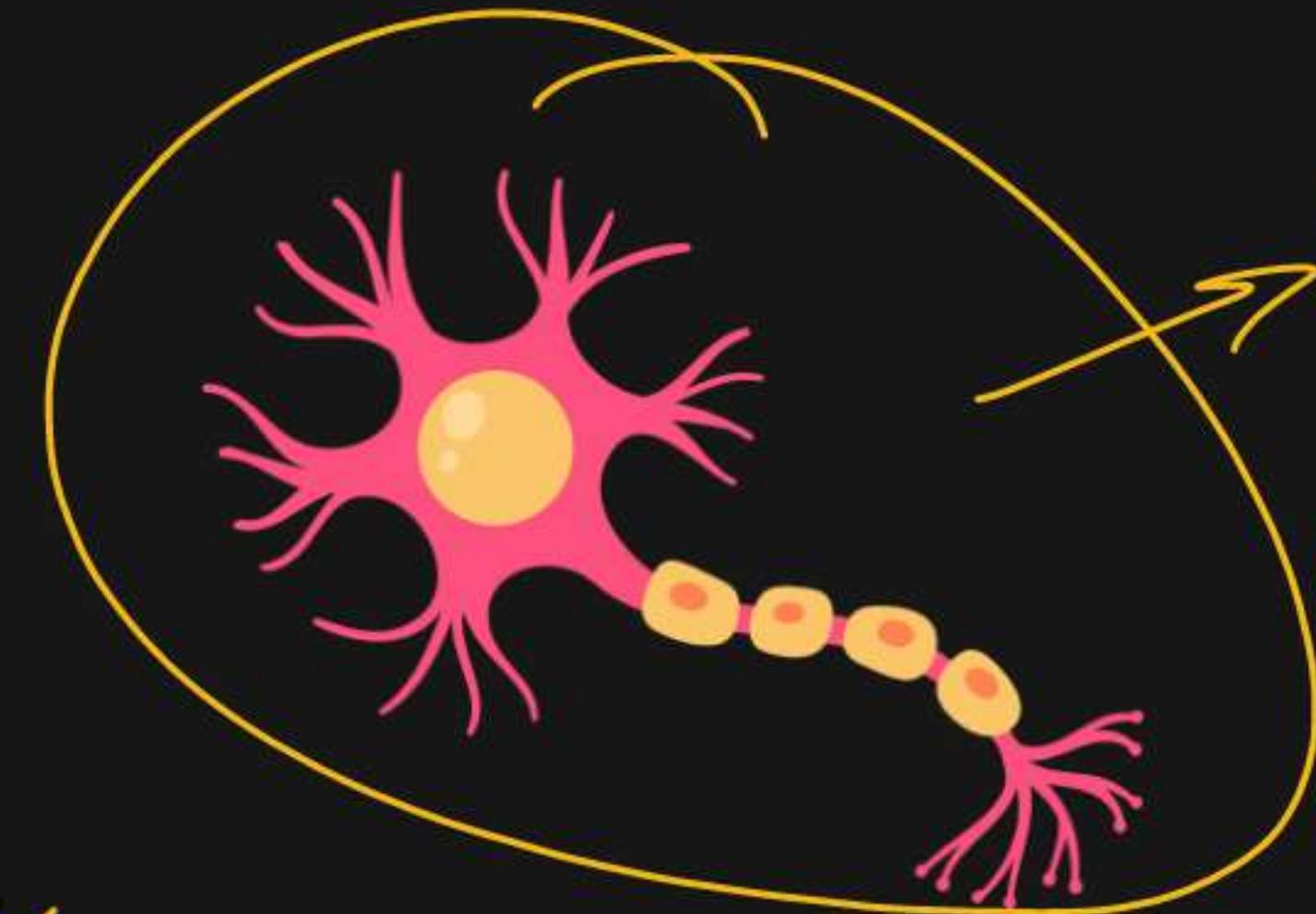
Example: Humans, Plants, Frog, Earthworm



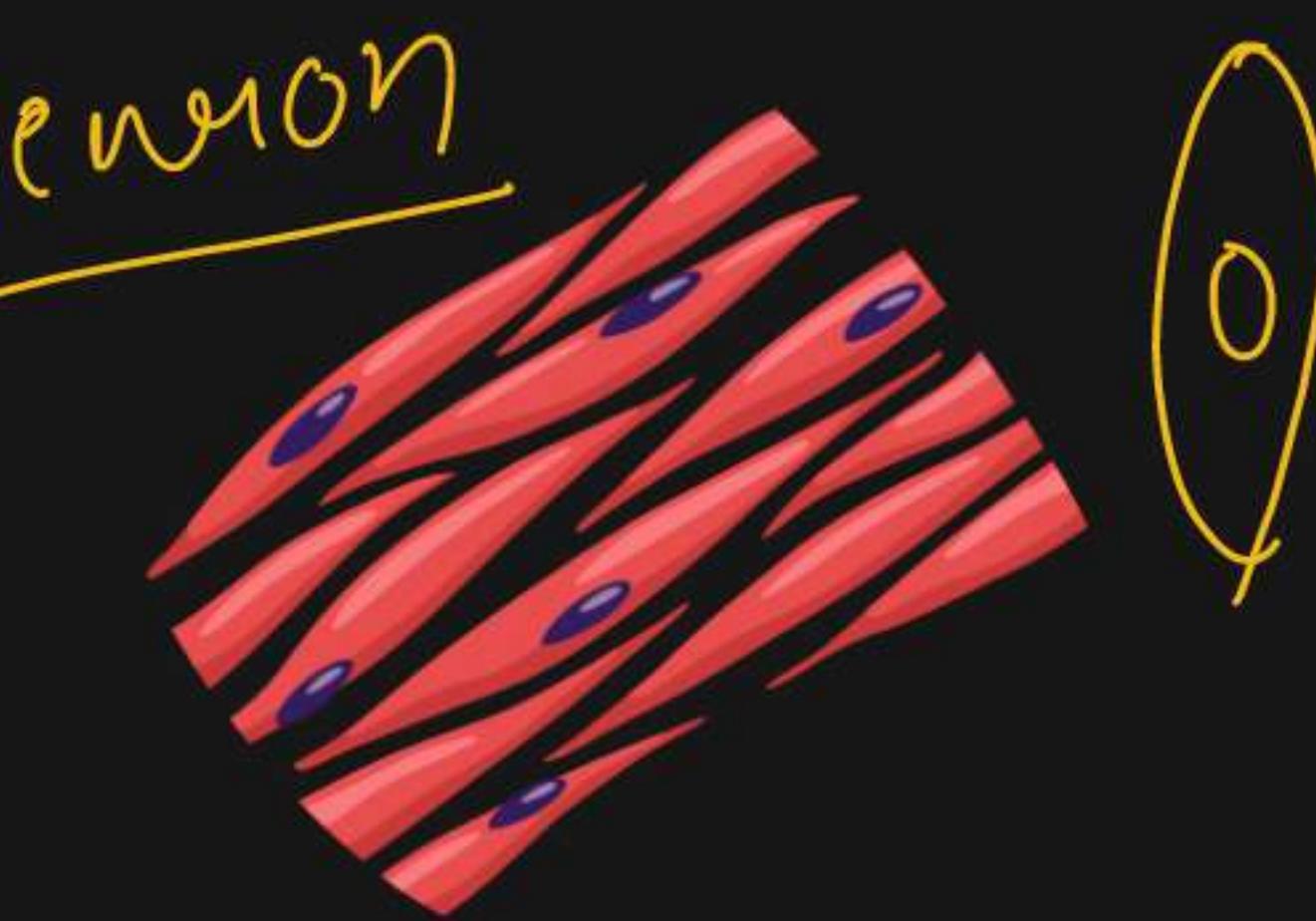
TYPES OF CELLS BASED ON THEIR SHAPE



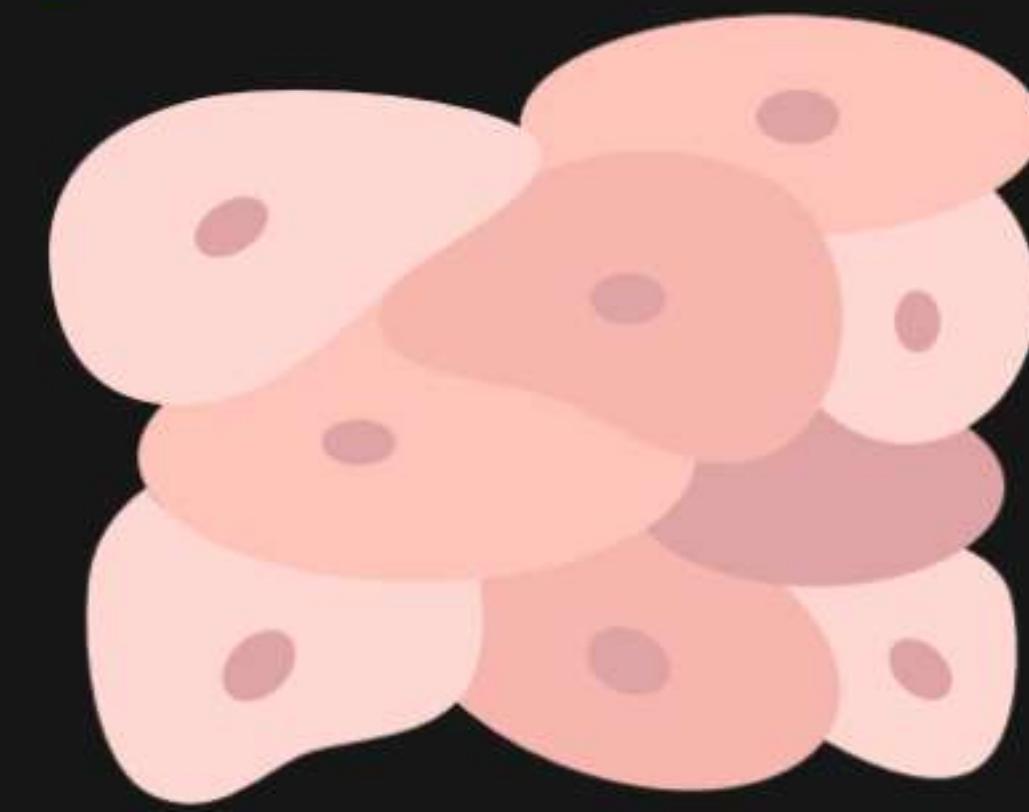
Ovum → Round आम
BATCH



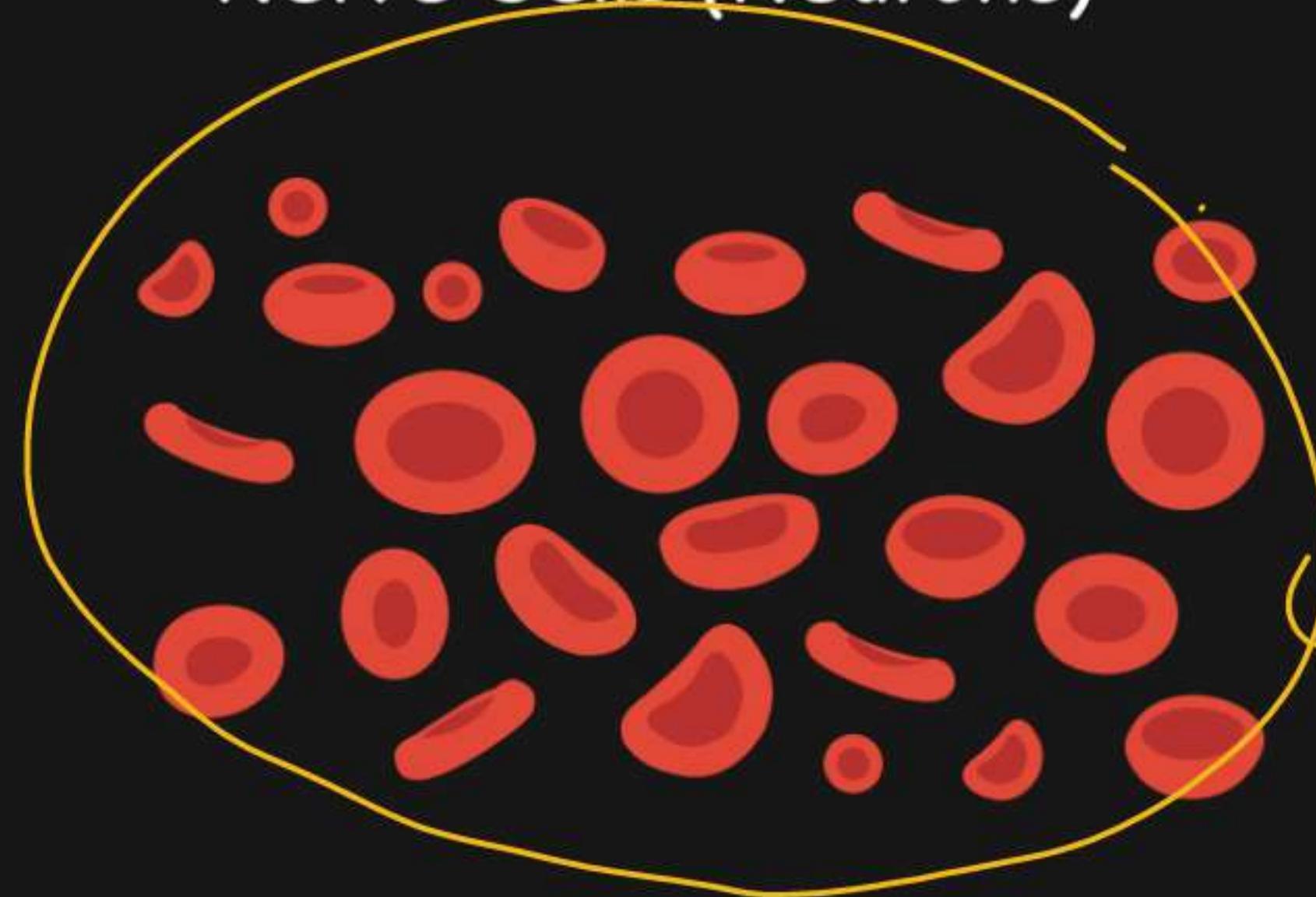
Long and Thread-Like Cells
– Nerve Cells (Neurons)



Spindle-Shaped Cells
– Muscle Cells.

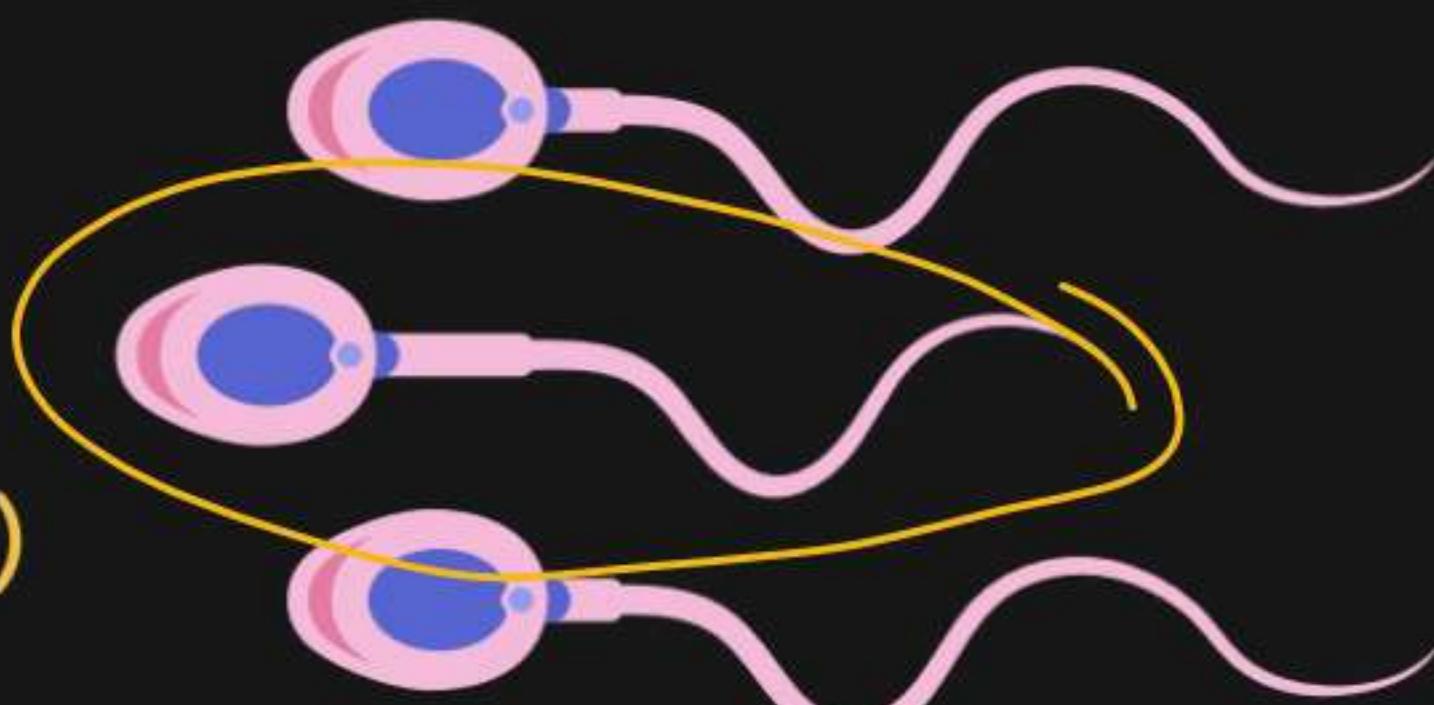


Flat and Thin Cells – Skin
Cells (Epithelial Cells)



Spherical Cells – Red
Blood Cells (RBCs)

Tail-Shaped (Flagellated)
Cells – Sperm Cells



Question: Which cell is the longest in the human body?

- a) Red blood cell
- b) Muscle cell
- c) Nerve cell
- d) Skin cell

→ (C)

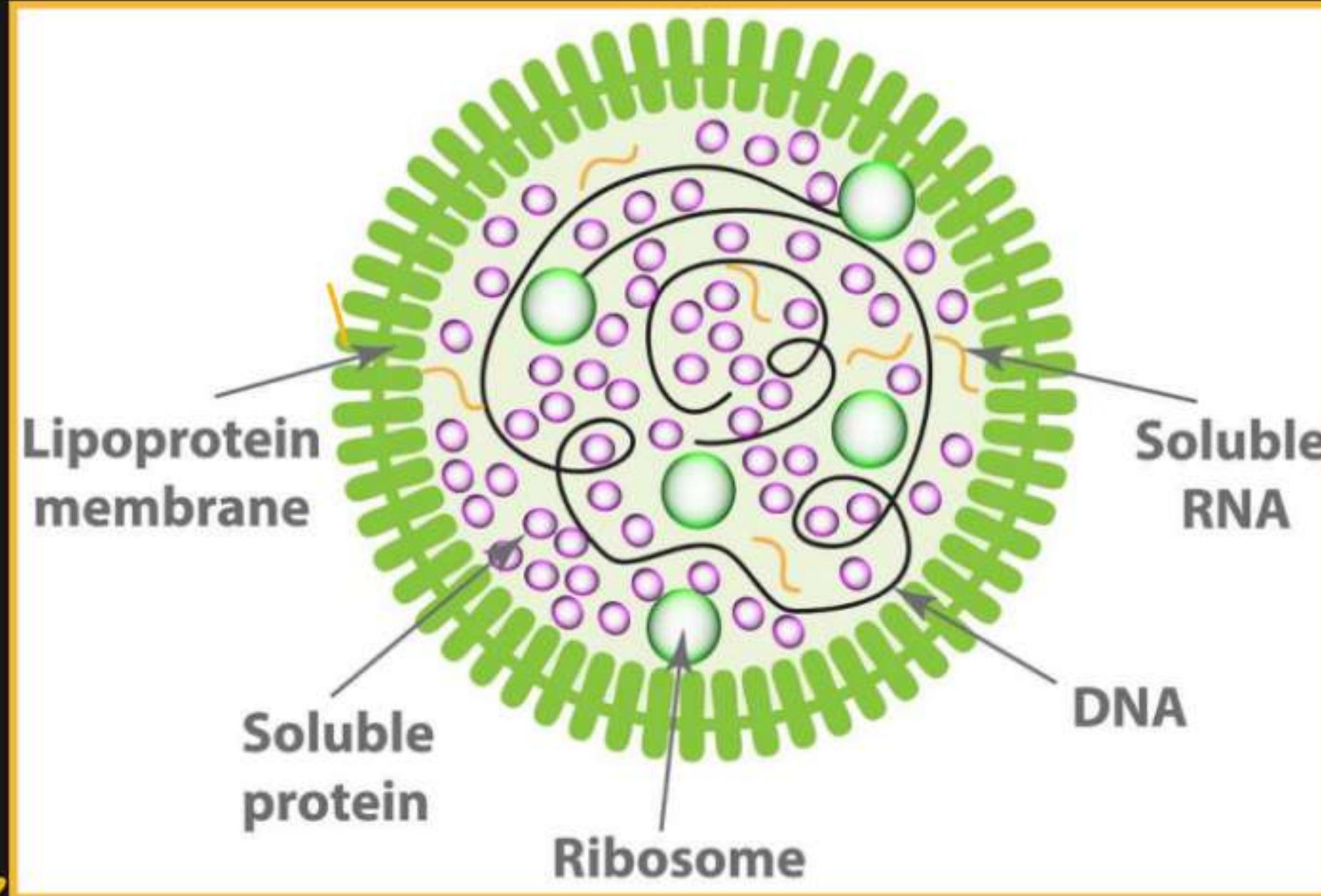


LARGEST & SMALLEST LIVING CELL



Largest Living Cell - Ostrich Egg

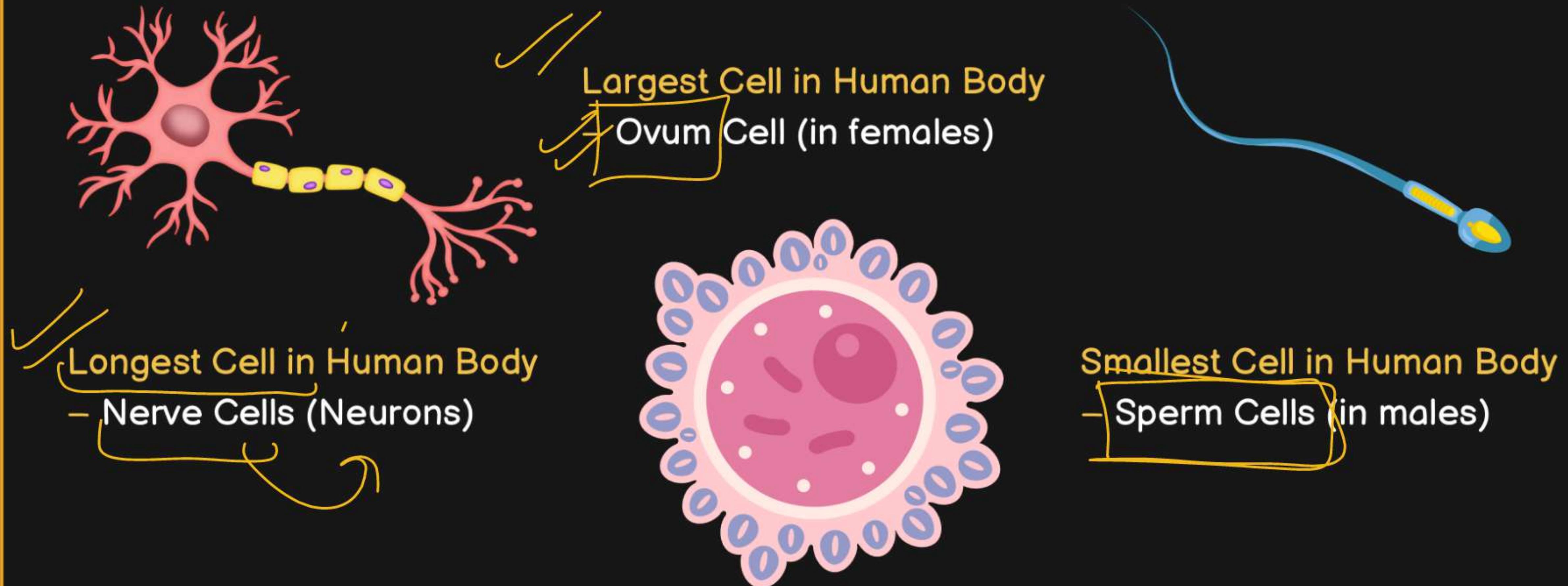
Visible to the naked eye;
represents the largest single cell.



Smallest Living Cell - Mycoplasma

A type of ~~bacteria~~ that lacks a cell wall. Making it highly flexible.

Key Cells of the Human Body: Size Comparisons



Question: largest living cell?

- A) ostrich cell
- B) Amoeba
- C) bacteria
- D) mycoplasma



Question: What is the structural and functional unit of life?

- A) Cell
- B) Organism
- C) Tissue
- D) Organ

(A)



Question: Which of the following is NOT true about multicellular organisms?

- a) They are made of many cells
- b) All cells perform the same function
- c) They show division of labor
- d) They include animals and plants



It's over, So Do
Revision and
Have Some
Fun....

