

# Biology

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## Introduction to Cells

\* In Biology, we are going to start small (the cell) and end with explaining a larger system (organisms)

\* How small?

\* [http://learn.genetics.utah.edu/  
content/cells/scale/](http://learn.genetics.utah.edu/content/cells/scale/)

# Biology

\* Biology is the study of life.

# Biology

- \* Biology is the study of life.
- \* But how do you know if something is alive?

# Biology

- \* Living things have a lifespan.
- \* They grow and reproduce.
- \* Can respond to changes in their environment.
- \* Require energy.
- \* Produce waste.

# Cells

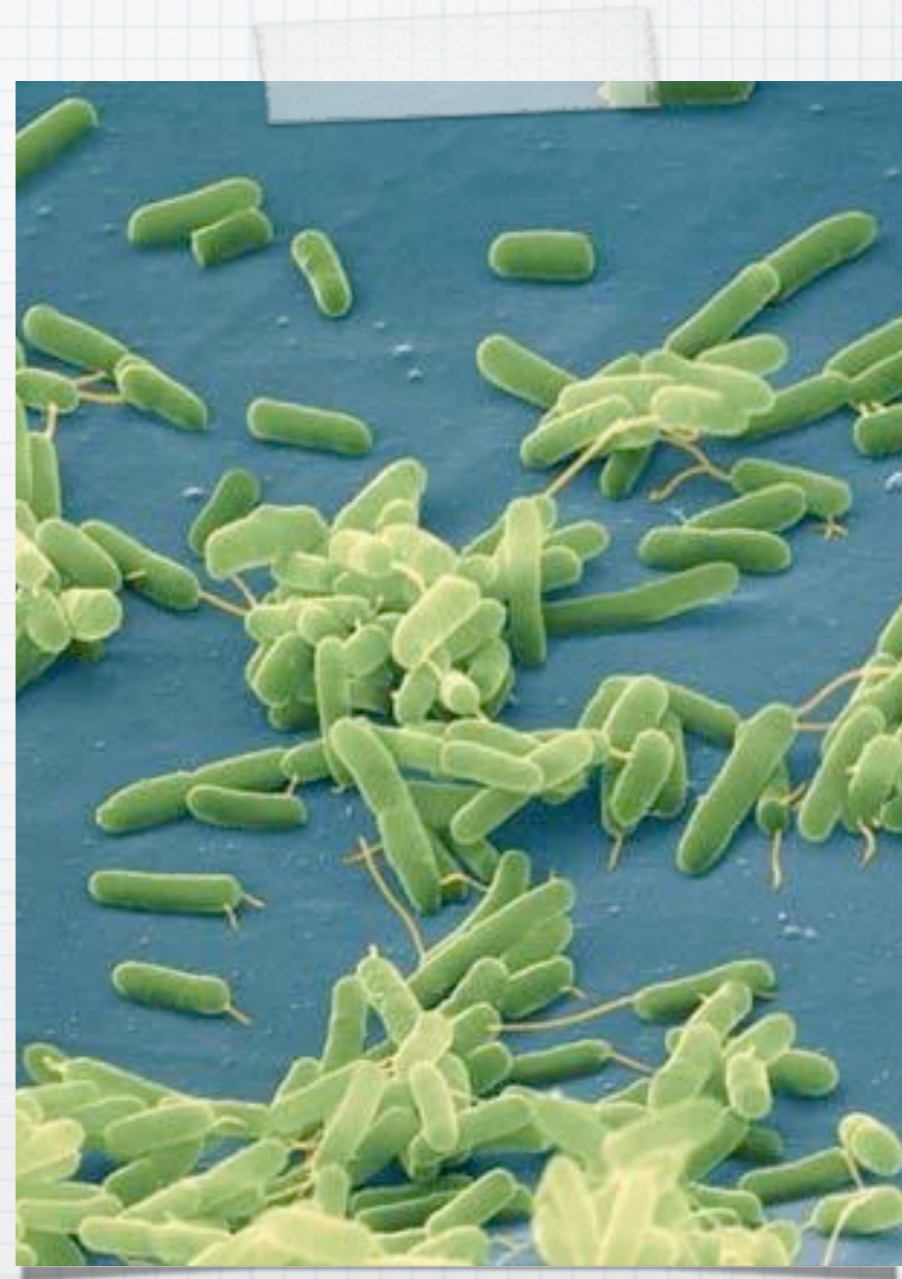
- \* The cell is the most basic unit of life.
- \* An organism made up of one cell is called unicellular.
- \* An organism made up of multiple cells is called multicellular.

# Cell Theory

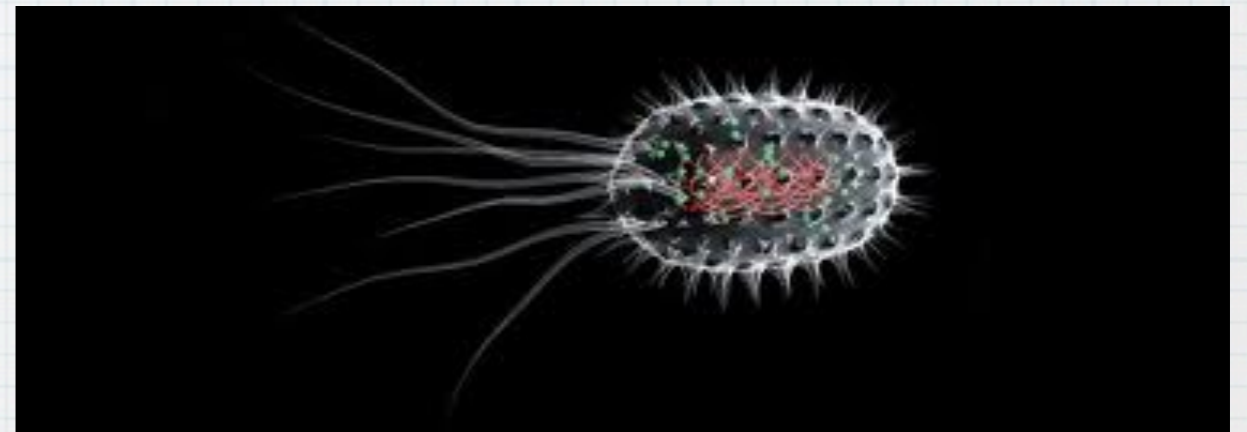
- \* Ideas about cells are built on the cell theory which states:
  - \* 1. All living things are made of cells and their products.
  - \* 2. The cell is the simplest unit of all life.
  - \* 3. All cells come from other cells

# Prokaryotes

- \* Cells can be simple or they can be complex.
- \* The simplest cells are known as prokaryotes.
- \* These cells lack a nucleus and other advanced cell parts!!

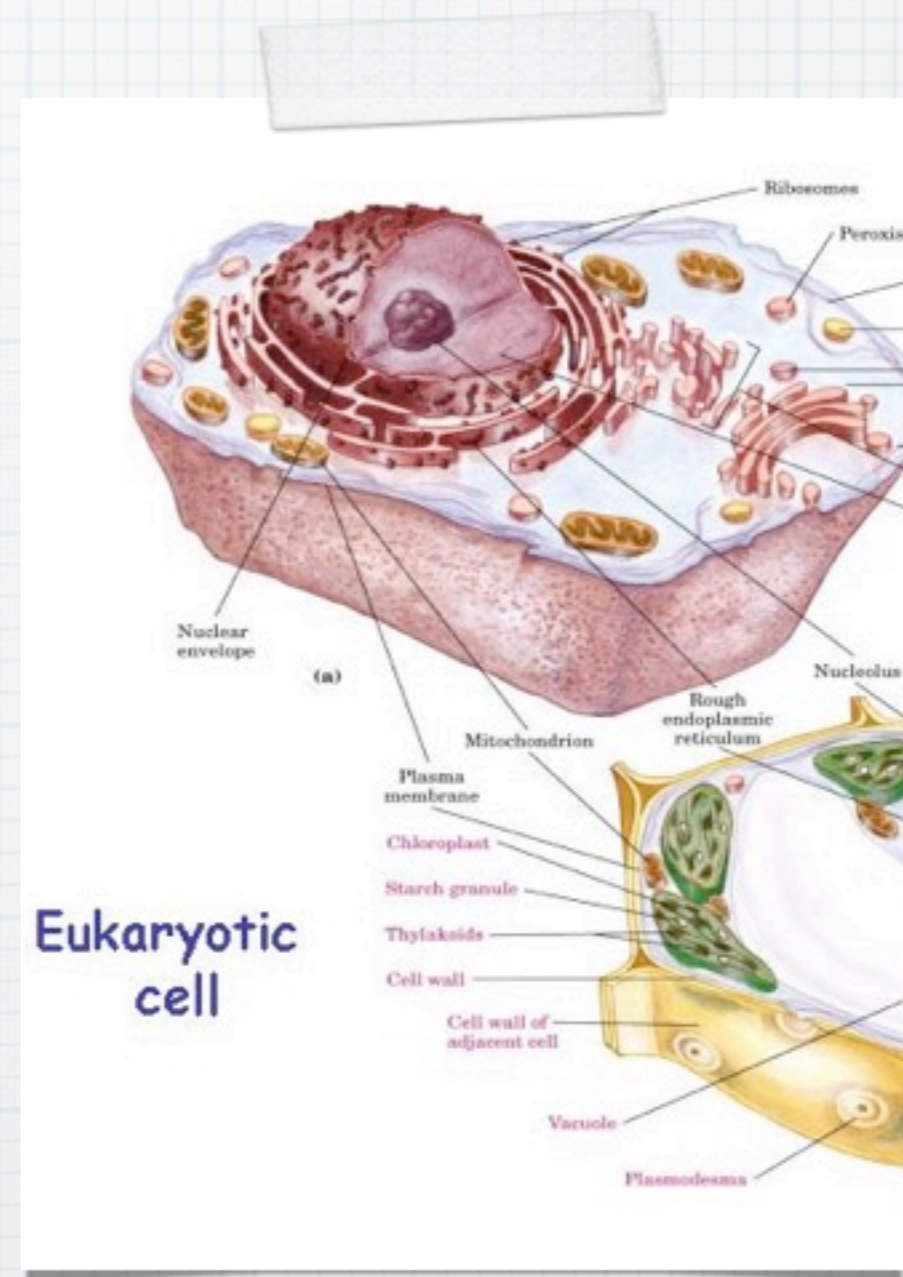


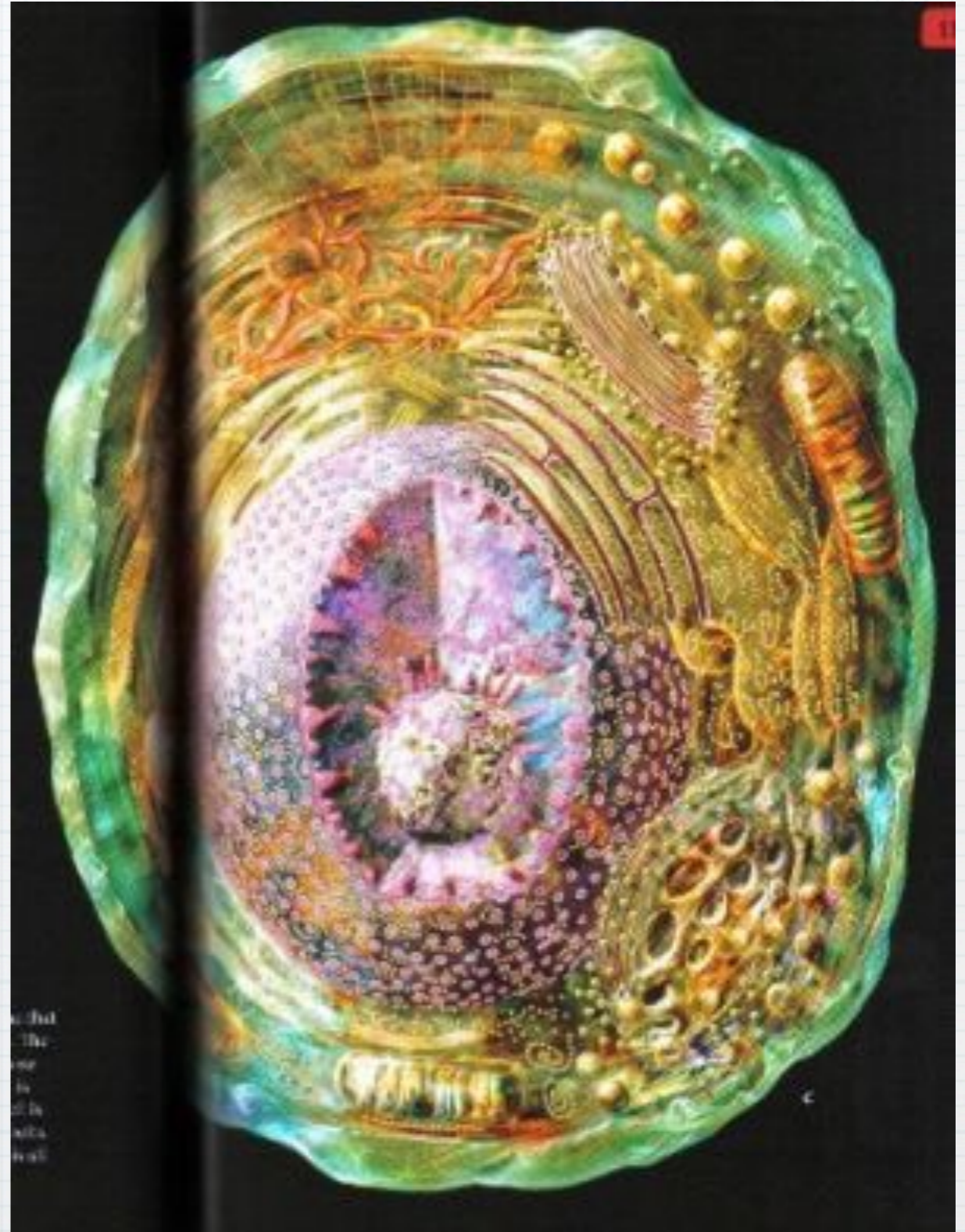
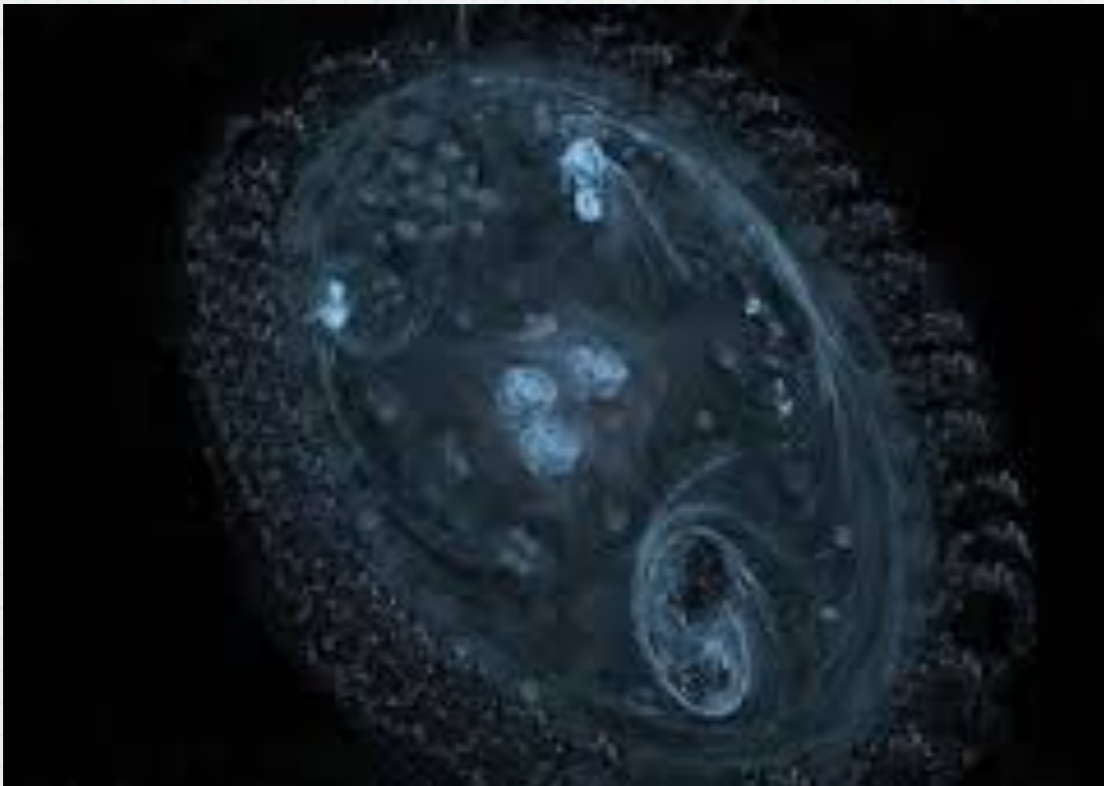
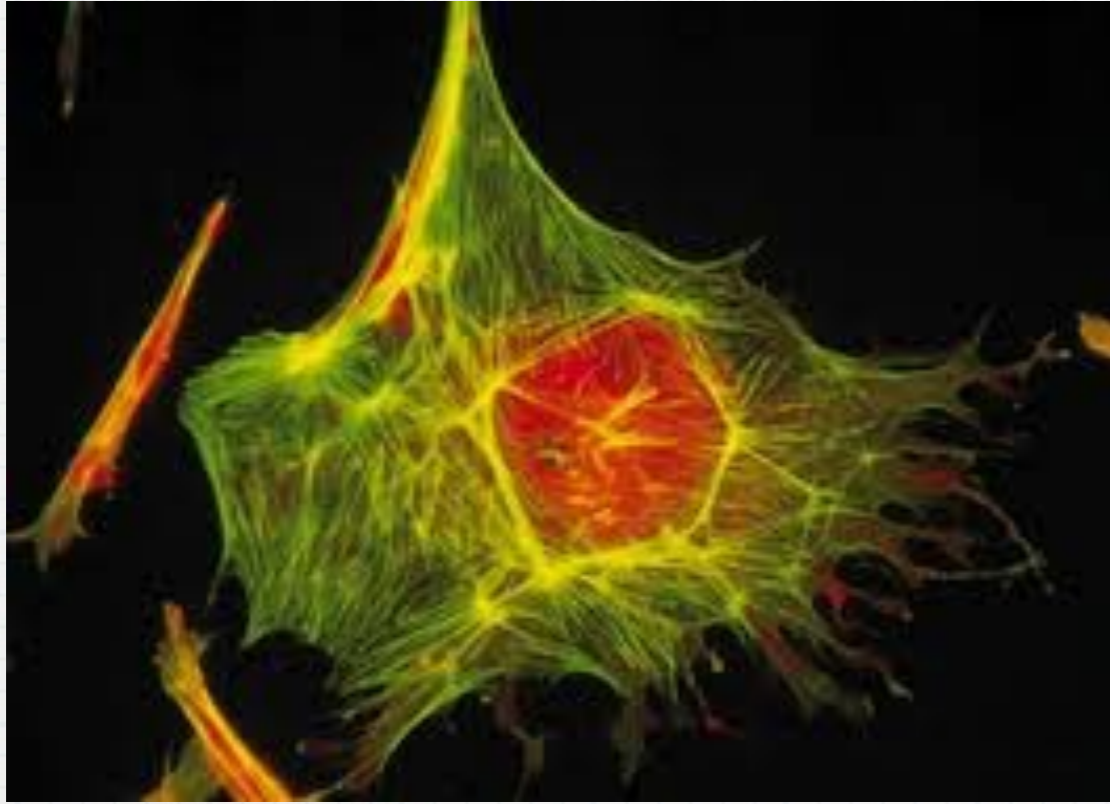




# Eukaryote

- \* More complex cells can exist as single-celled organisms or multi-cellular organisms.
- \* These more advanced cells, called eukaryotes, have complex internal organization, including a nucleus and many cell parts.
- \* Protists, fungi, plants, and animals have eukaryotic cells.



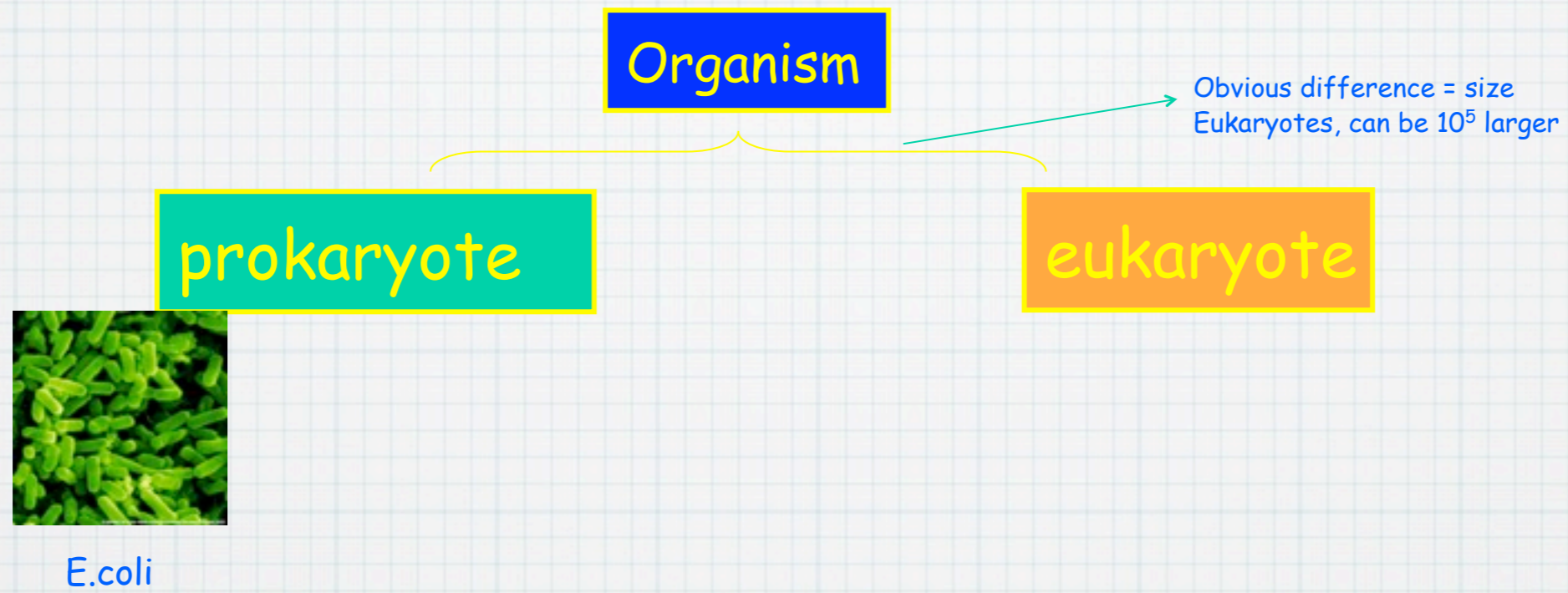


# Prokaryotic vs Eukaryotic

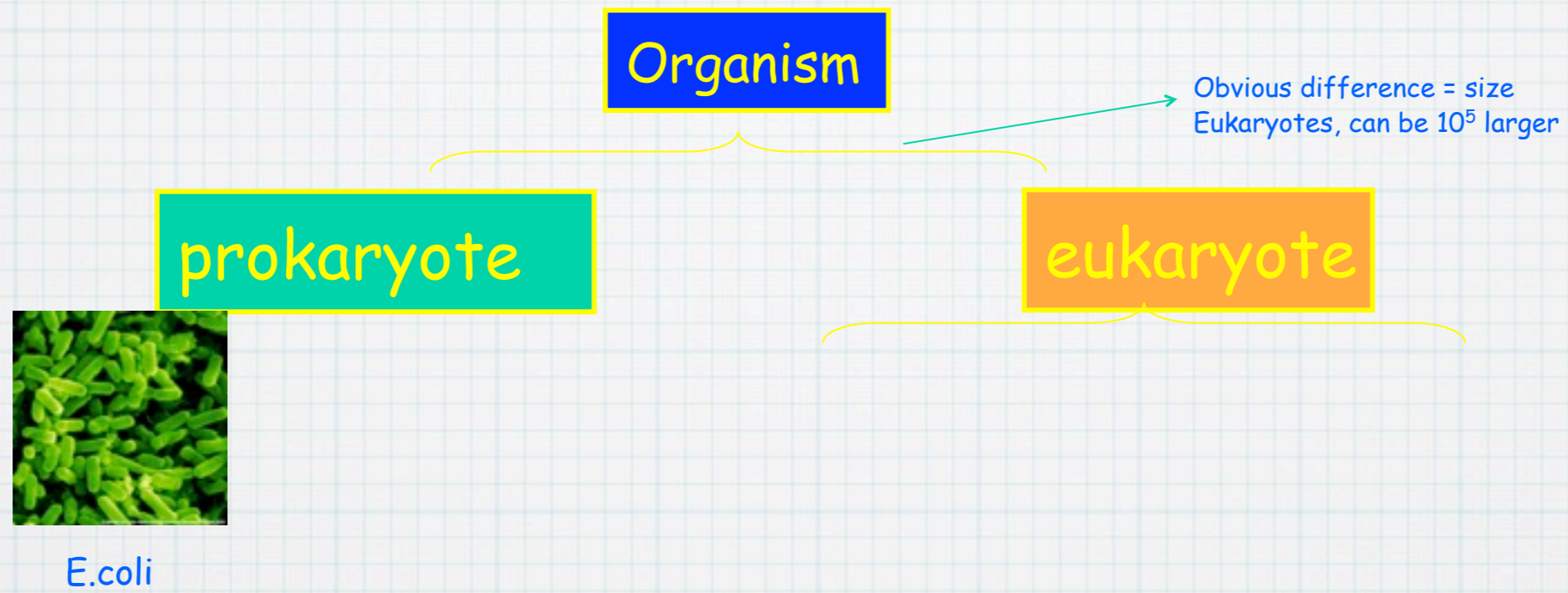
Organism

Obvious difference = size  
Eukaryotes, can be  $10^5$  larger

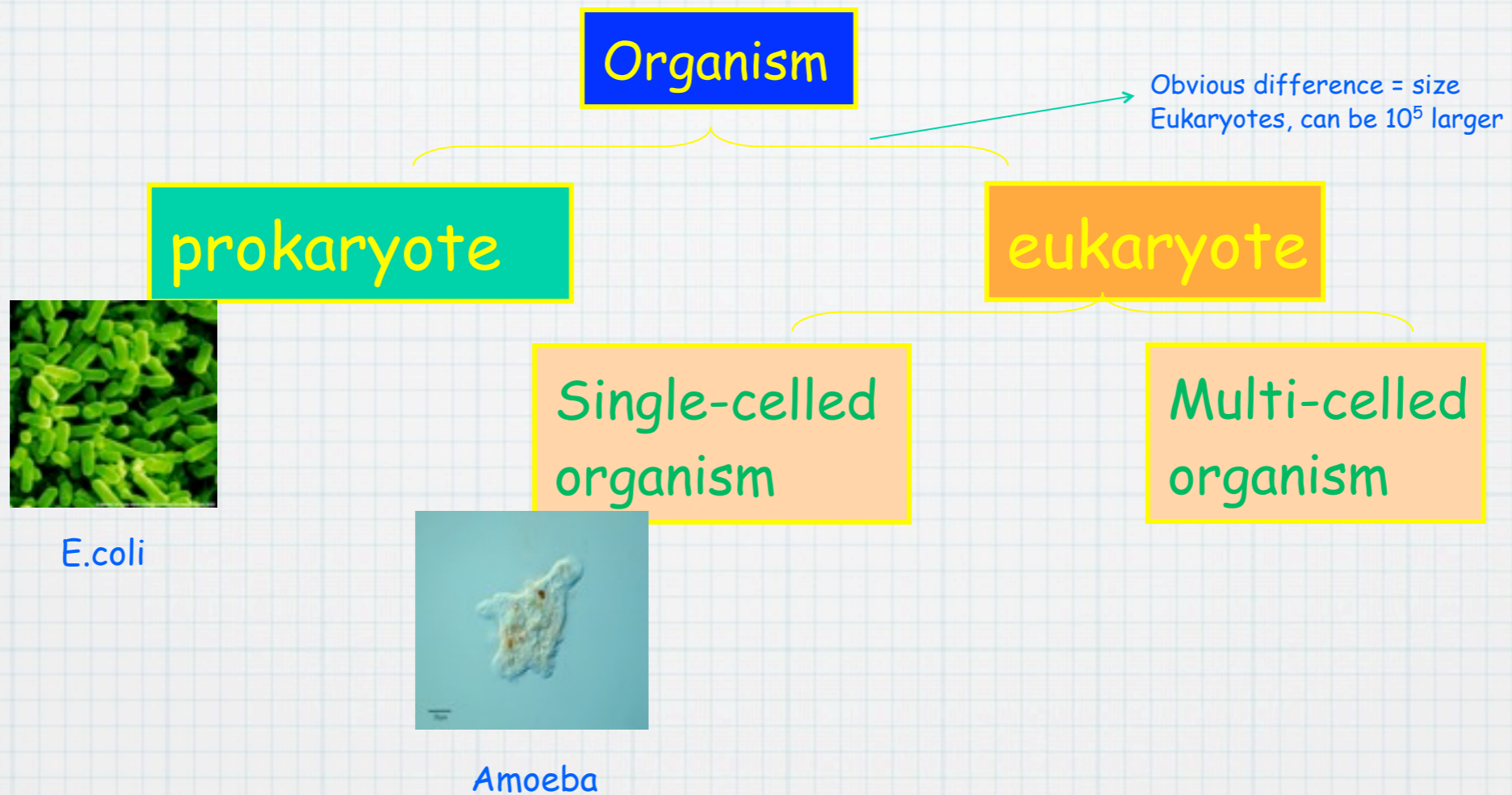
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