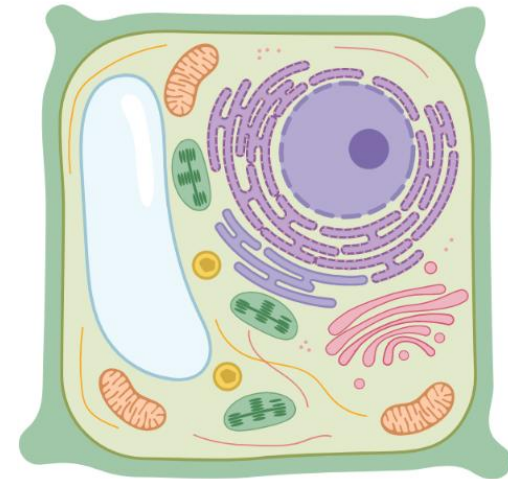
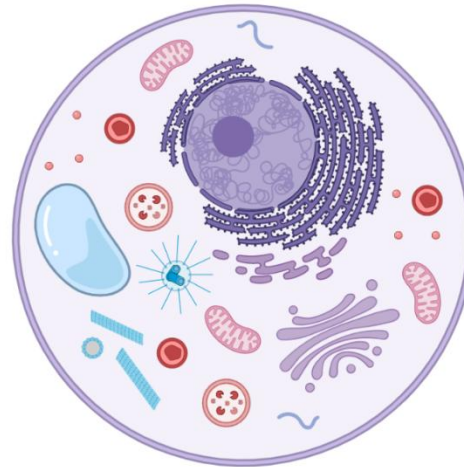
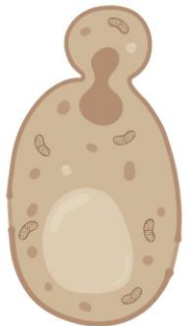
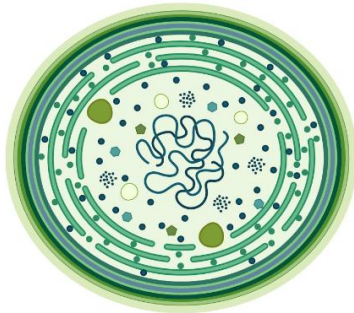




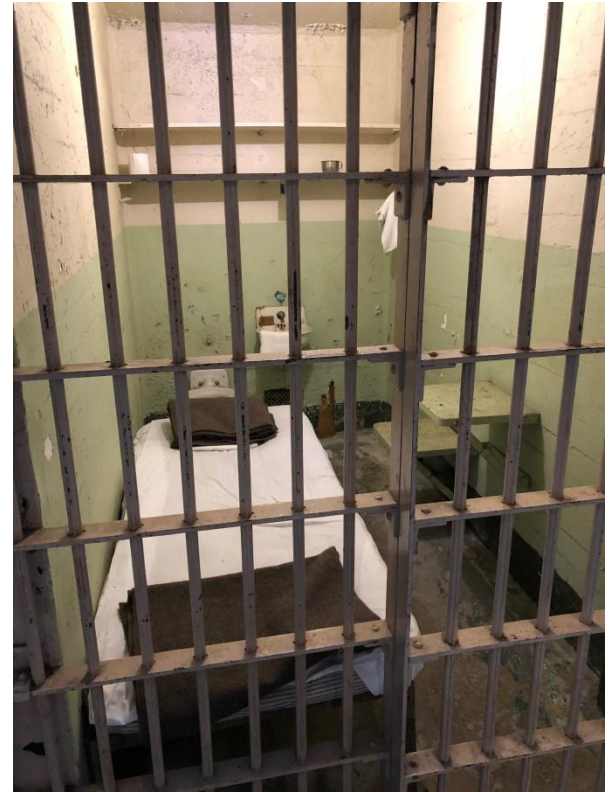
Weill Cornell Medicine
Feil Family Brain & Mind
Research Institute

What is a cell and what is inside a cell

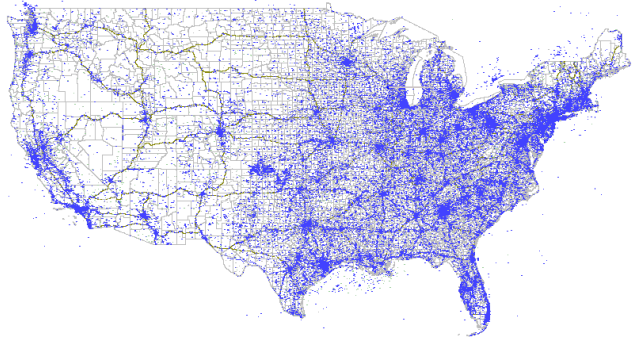


Dr. Alexander Galkin

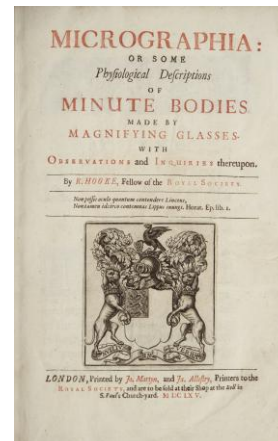
CELL



CELL







Robert Hook refined the design of the compound microscope around 1665 and published a book *Micrographia* which illustrated his findings using the instrument.



CELL THEORY

Four Fundamental tenets of cell theory :-

- 1 - All living things are composed of cells. 
- 2 - The cell is the basic functional unit of life 
- 3 - Cells arise only from preexisting cells 
- 4 - Cells carry genetic info in the form of DNA 

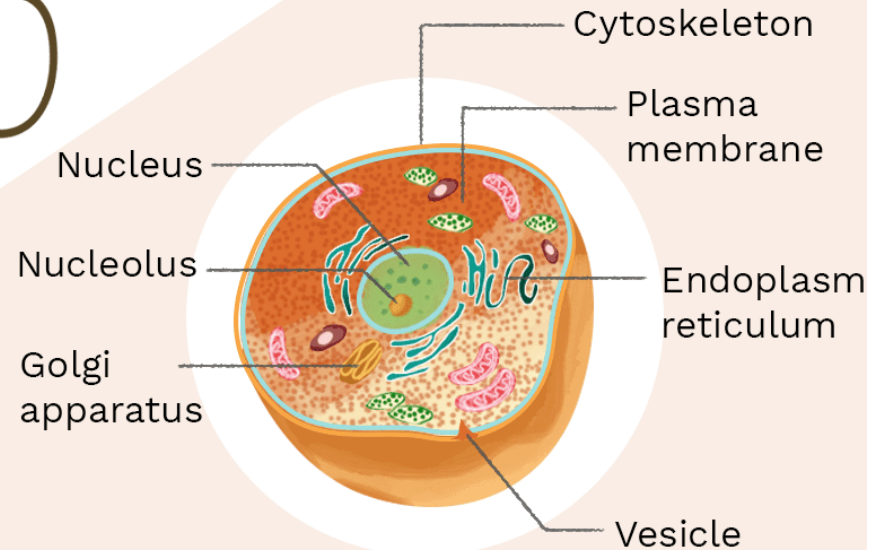
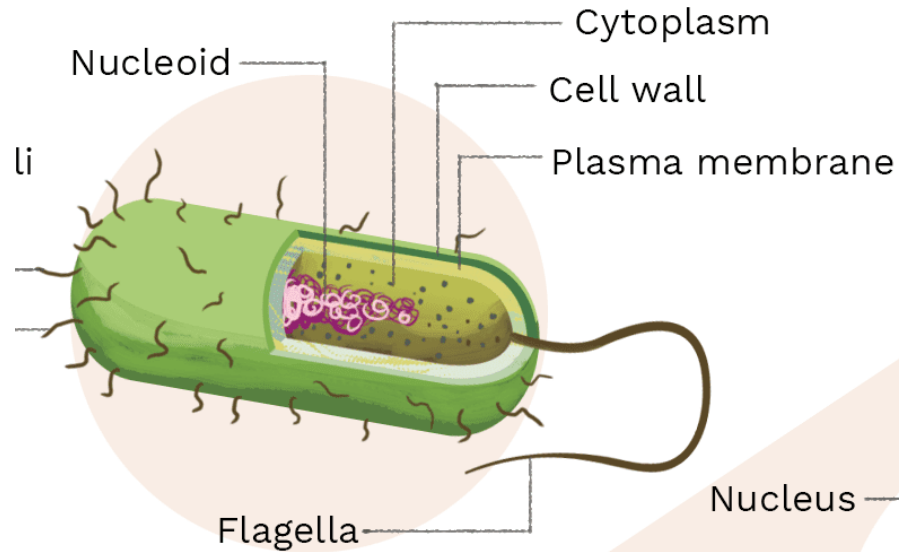
But what about me?



Two main types of cells

πρό (*pro*, 'before') and κάρυον (*karyon*, 'nut' or 'kernel')

PROKARYOTIC CELL

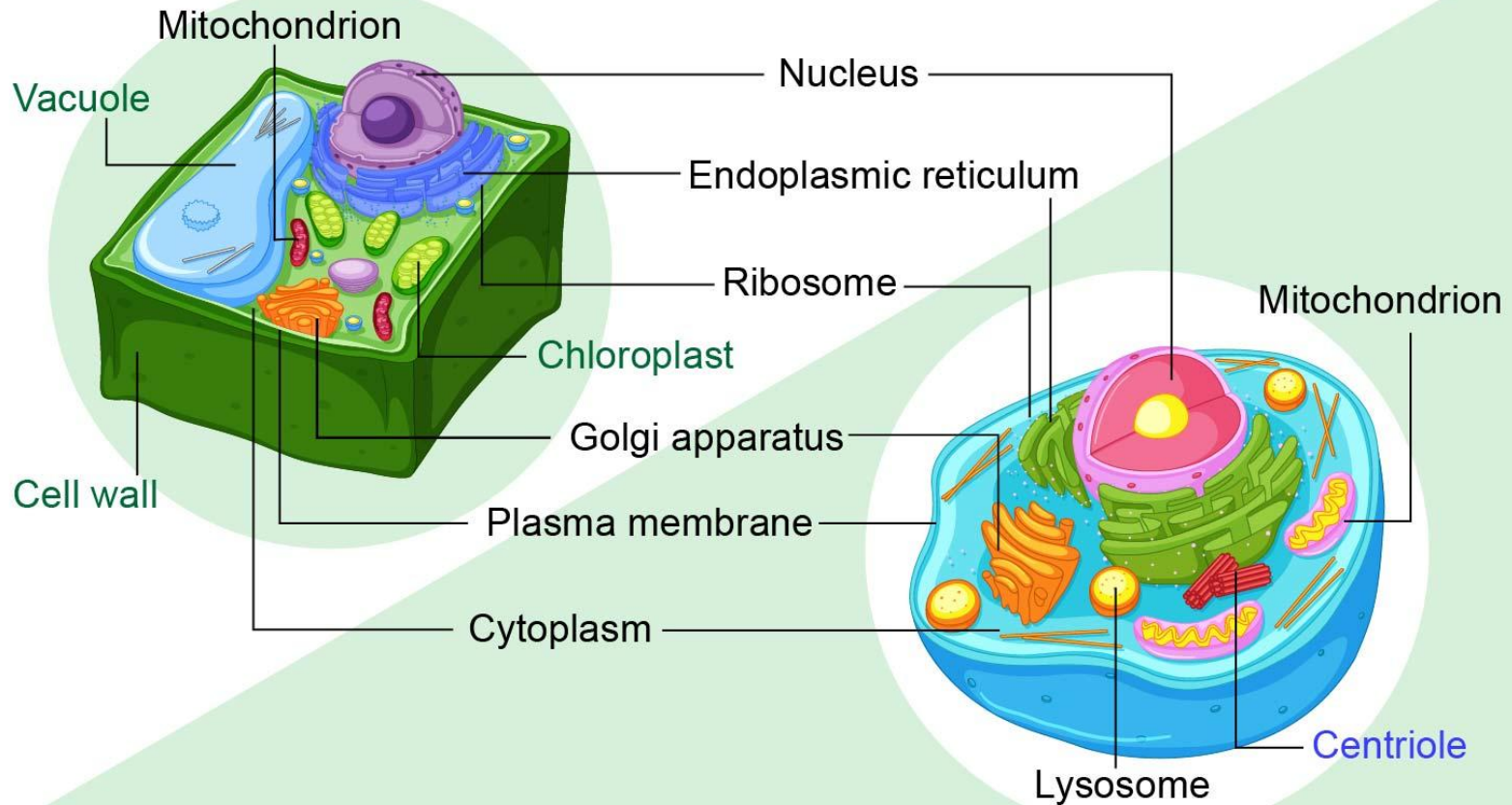


EUKARYOTIC CELL

eu, "well" or "good" and κάρυον (*karyon*, "nut" or "kernel")

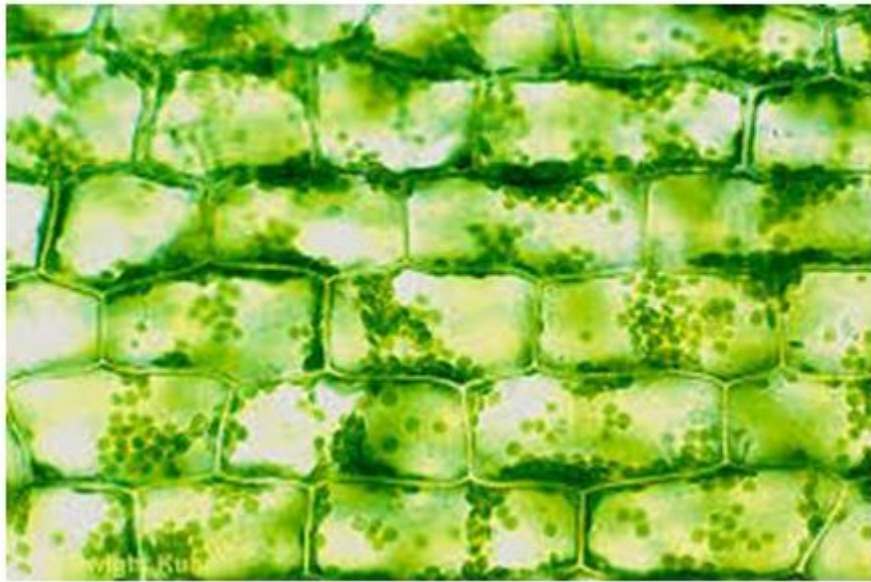
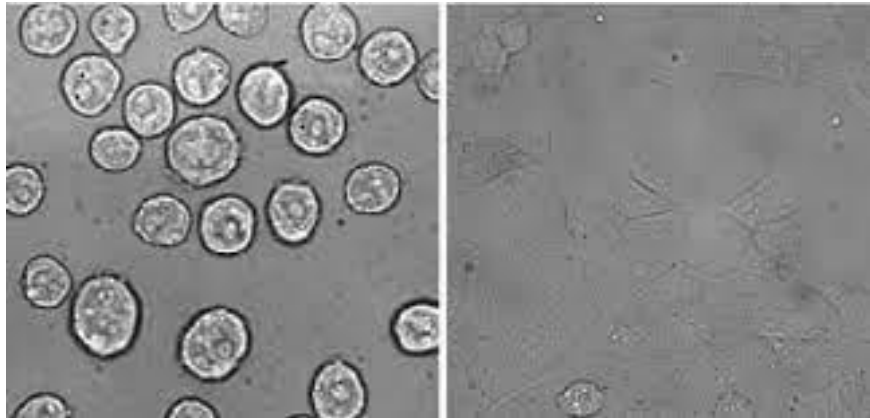
Two main types of eukaryotic cell

PLANT CELL

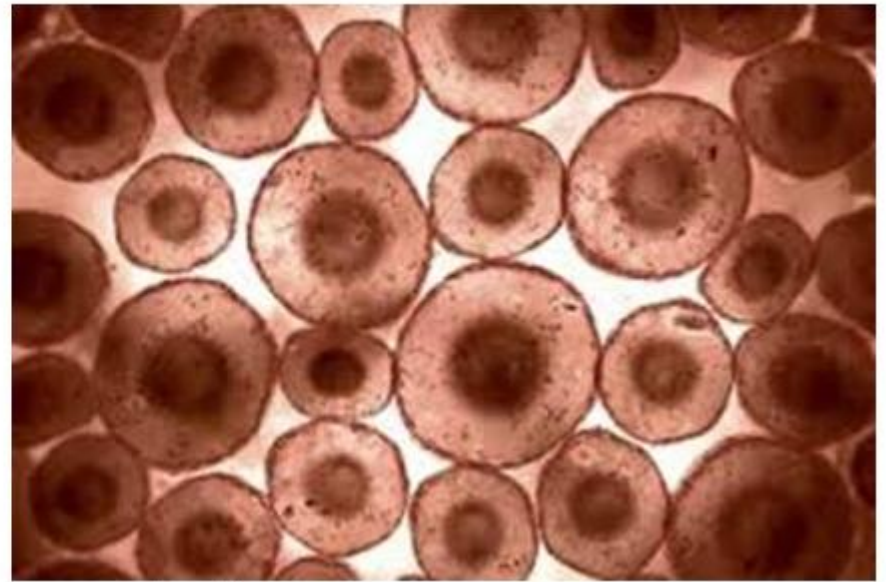


ANIMAL CELL

Under the microscope



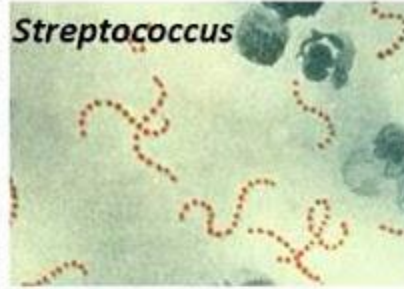
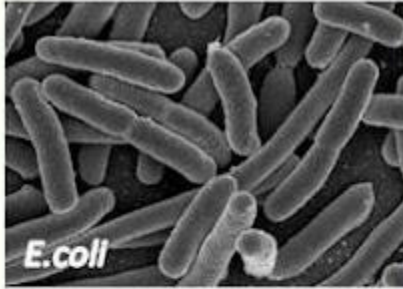
Algae



Red Blood Cells

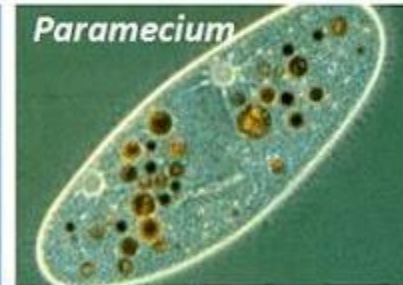
Single cell organisms

1 All Bacteria

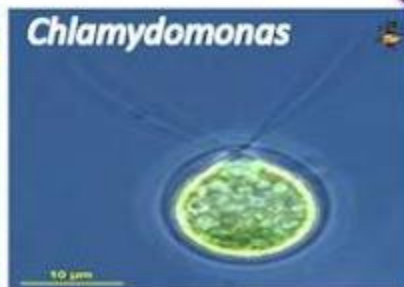
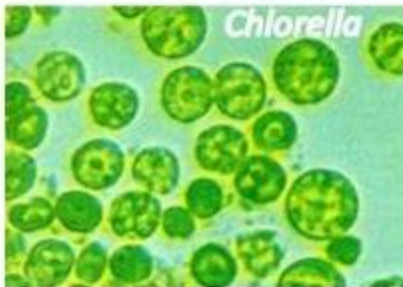


2 All Protists

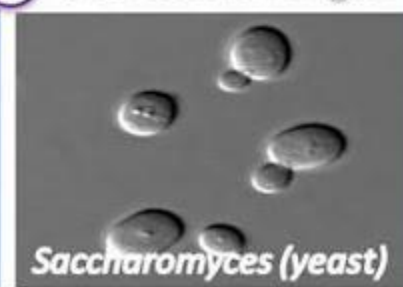
www.examplesof.net



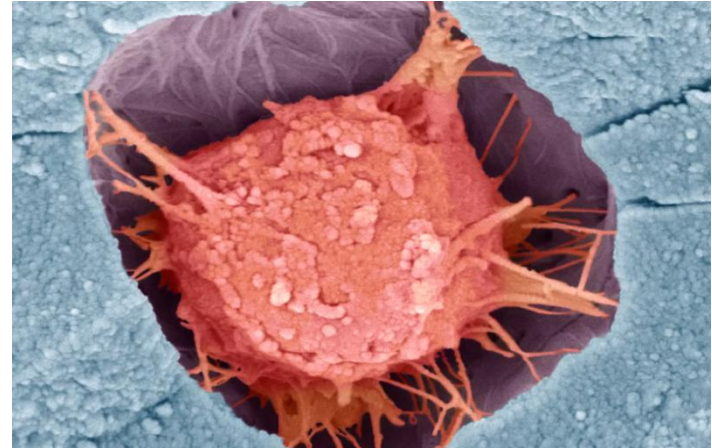
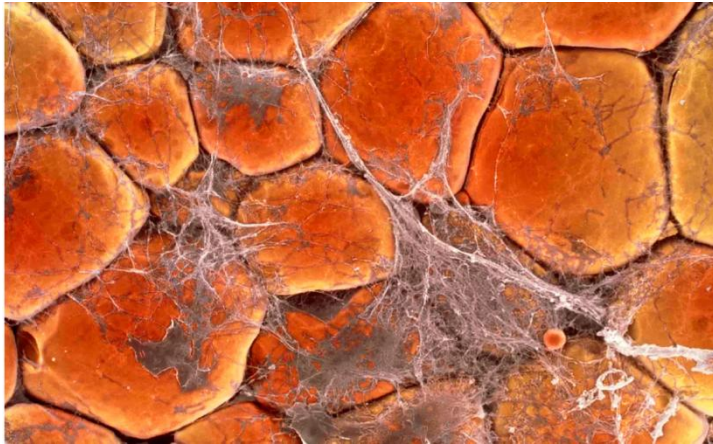
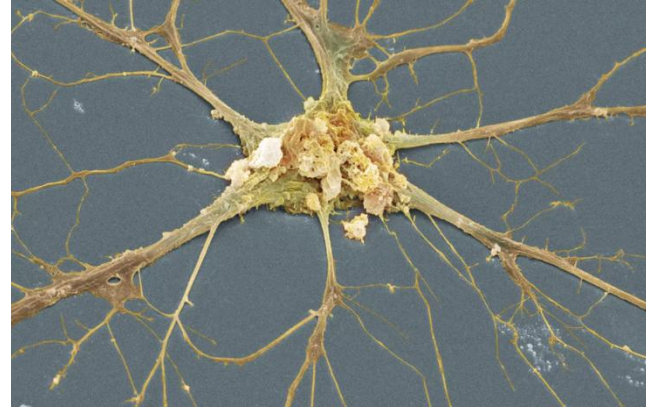
3 Some Algae



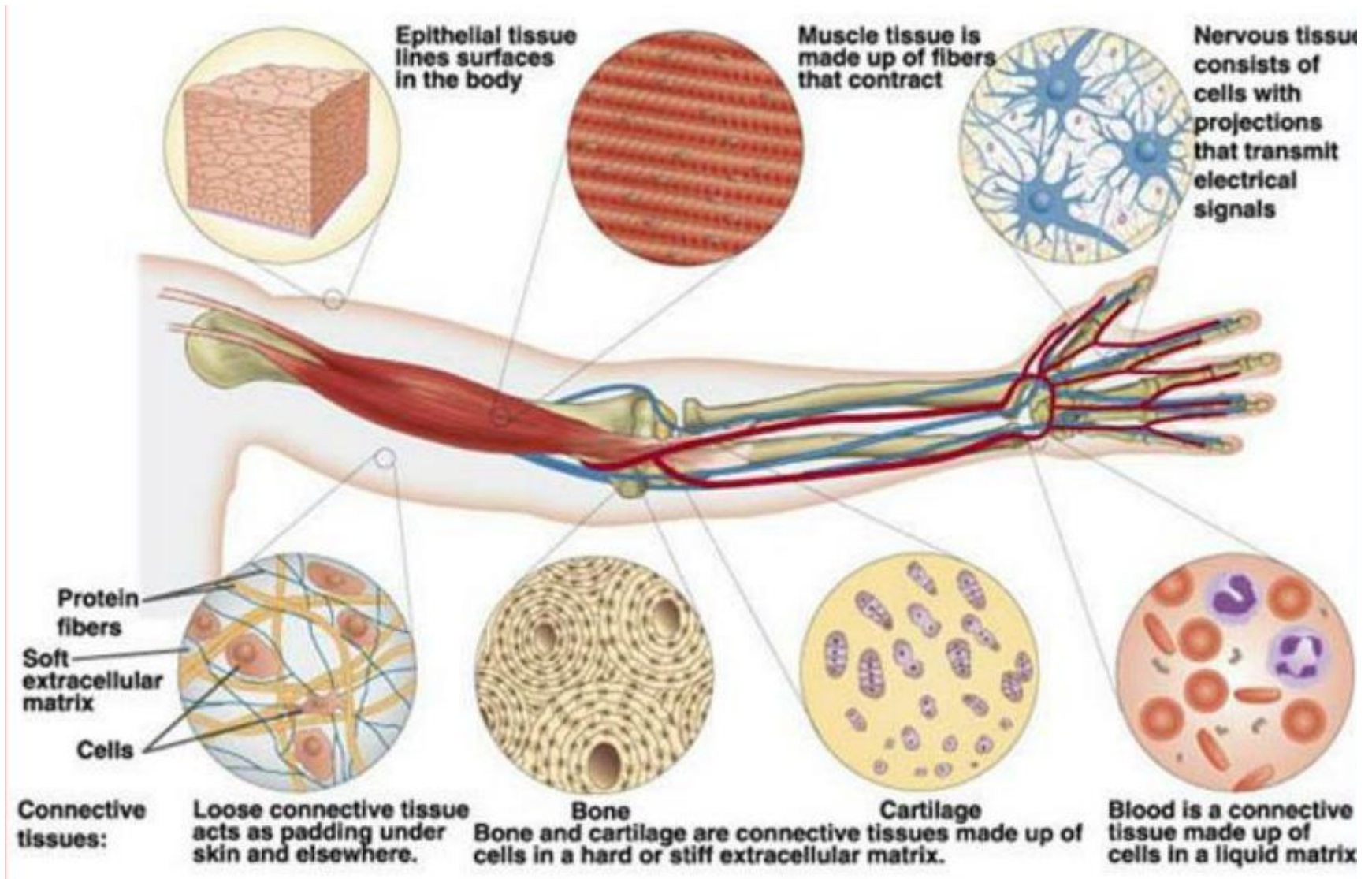
4 Unicellular Fungus



Different human cells



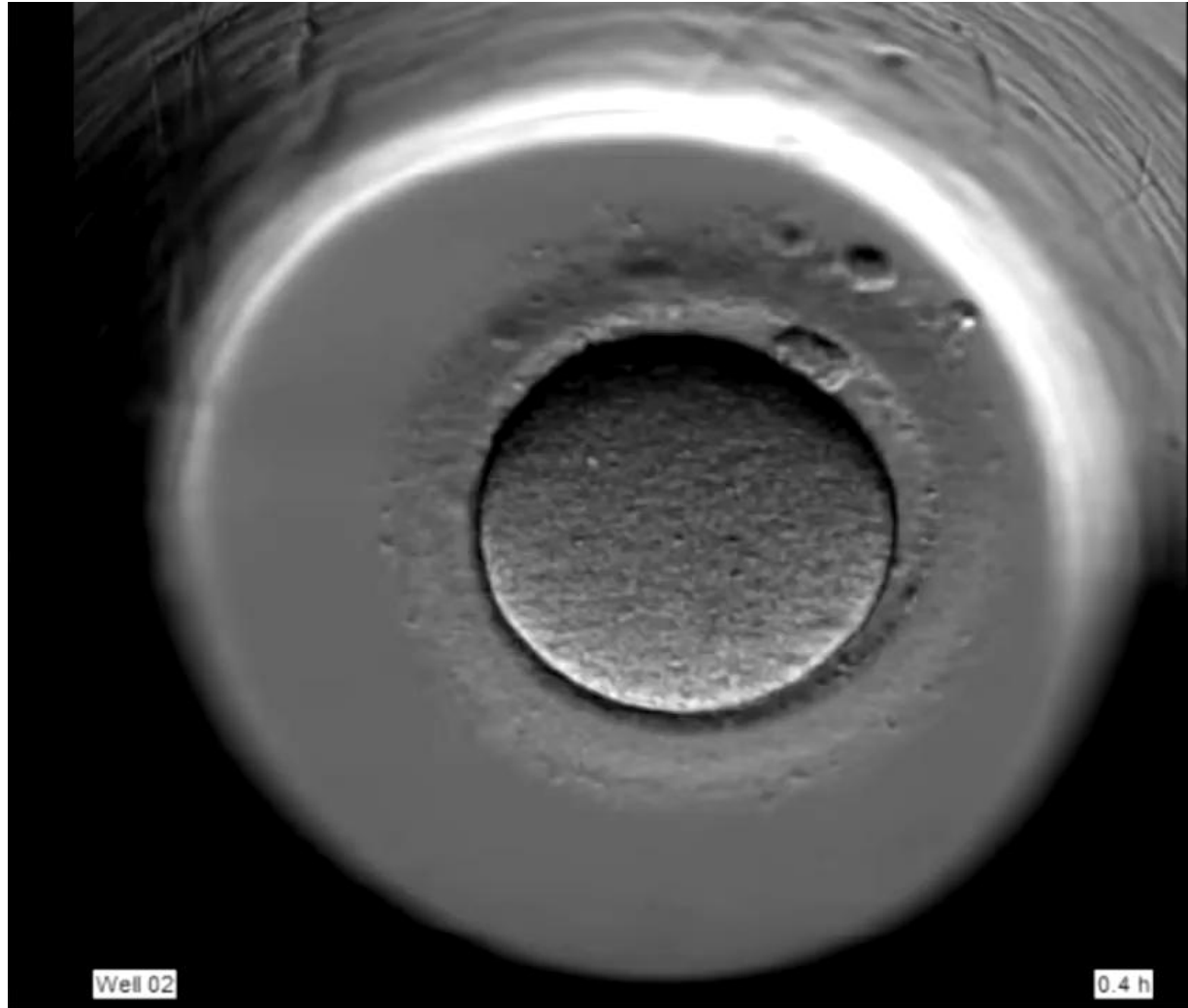
Different cell types form different tissues



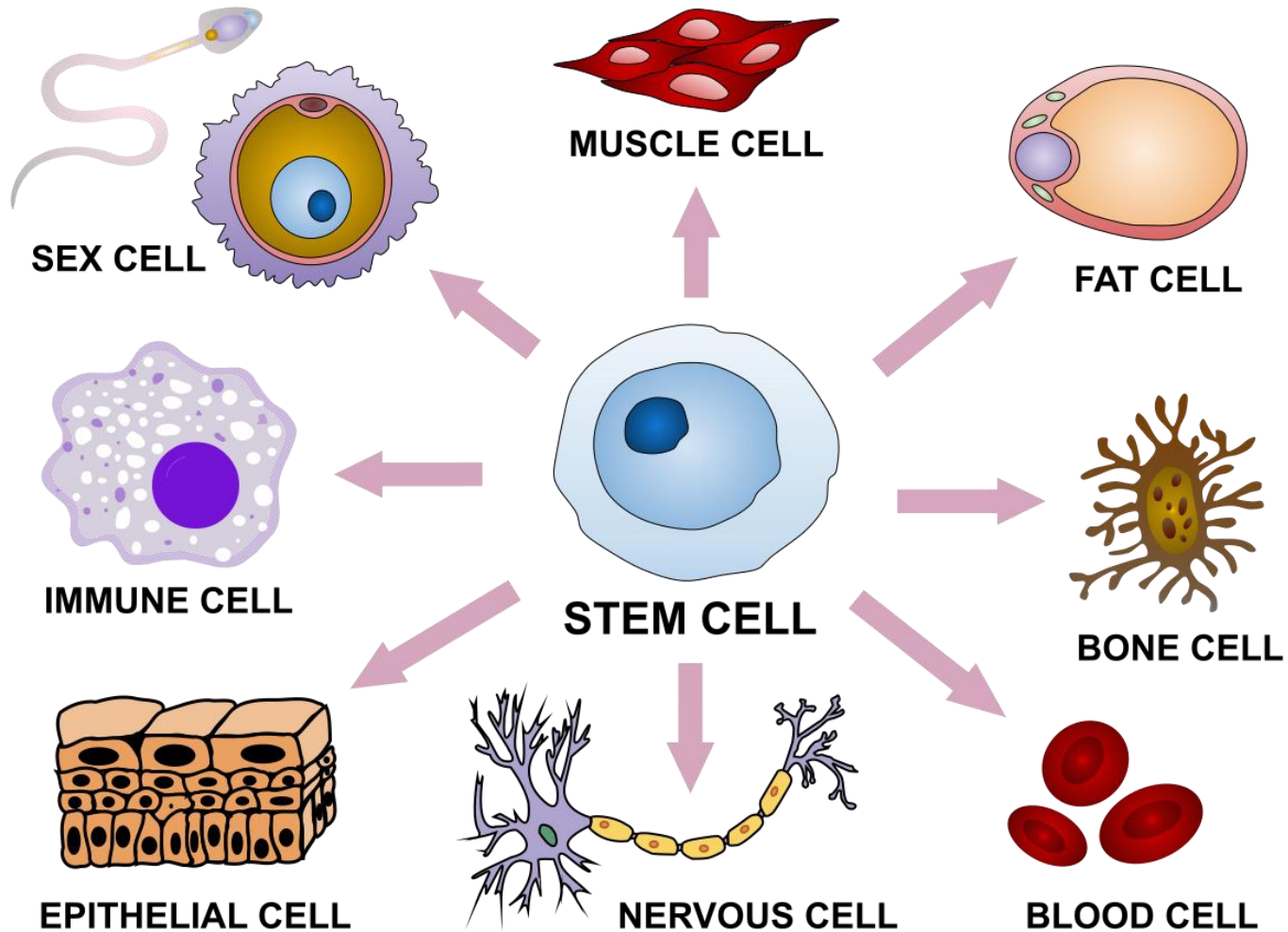
All living cells arise from pre-existing cells by division



All living cells arise from pre-existing cells by division

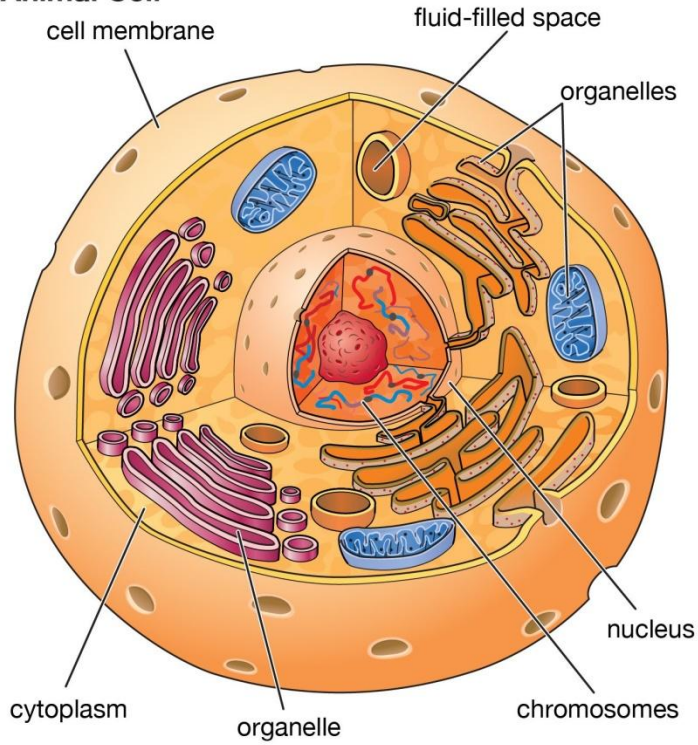


Cell specializations and stem cell



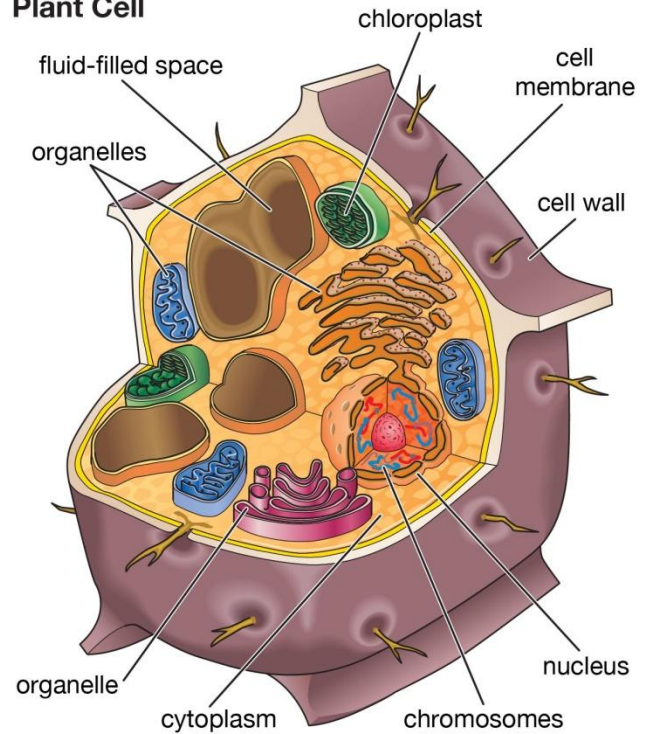
What is inside of a cell?

Animal Cell



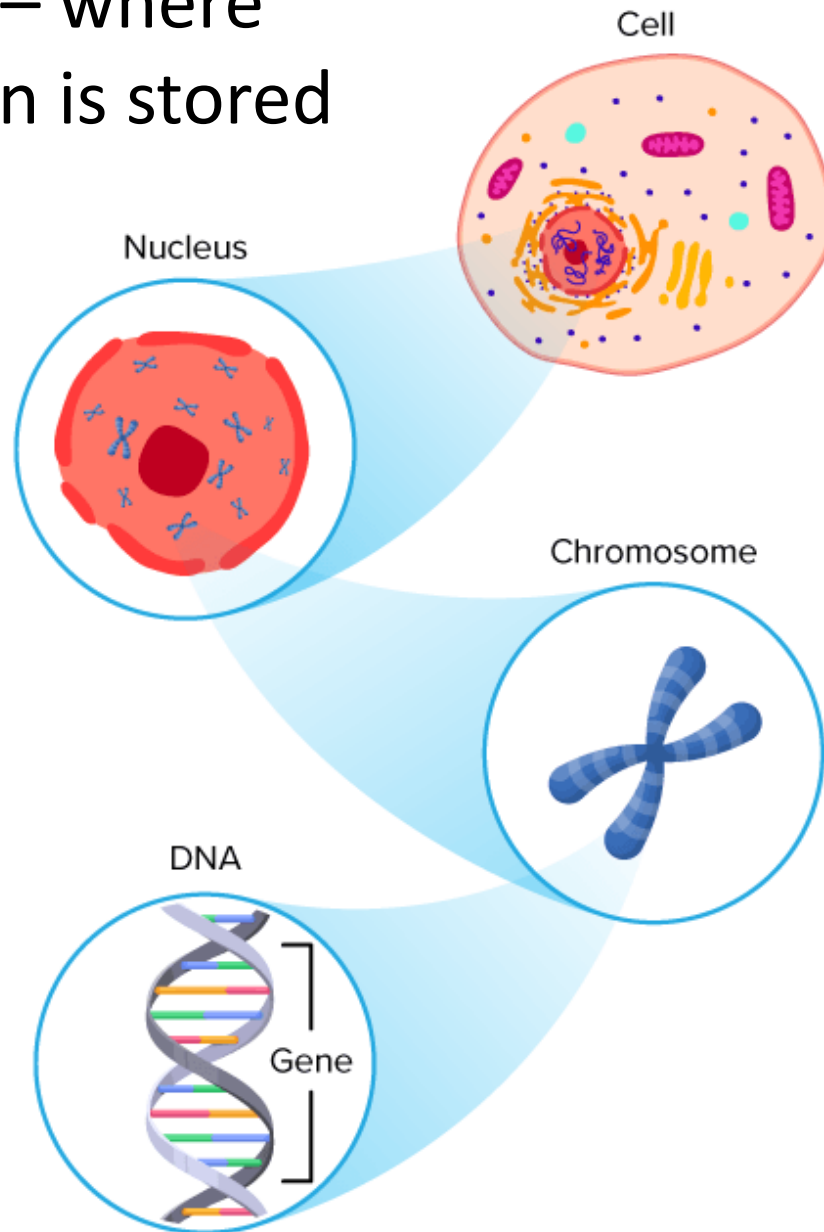
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Plant Cell

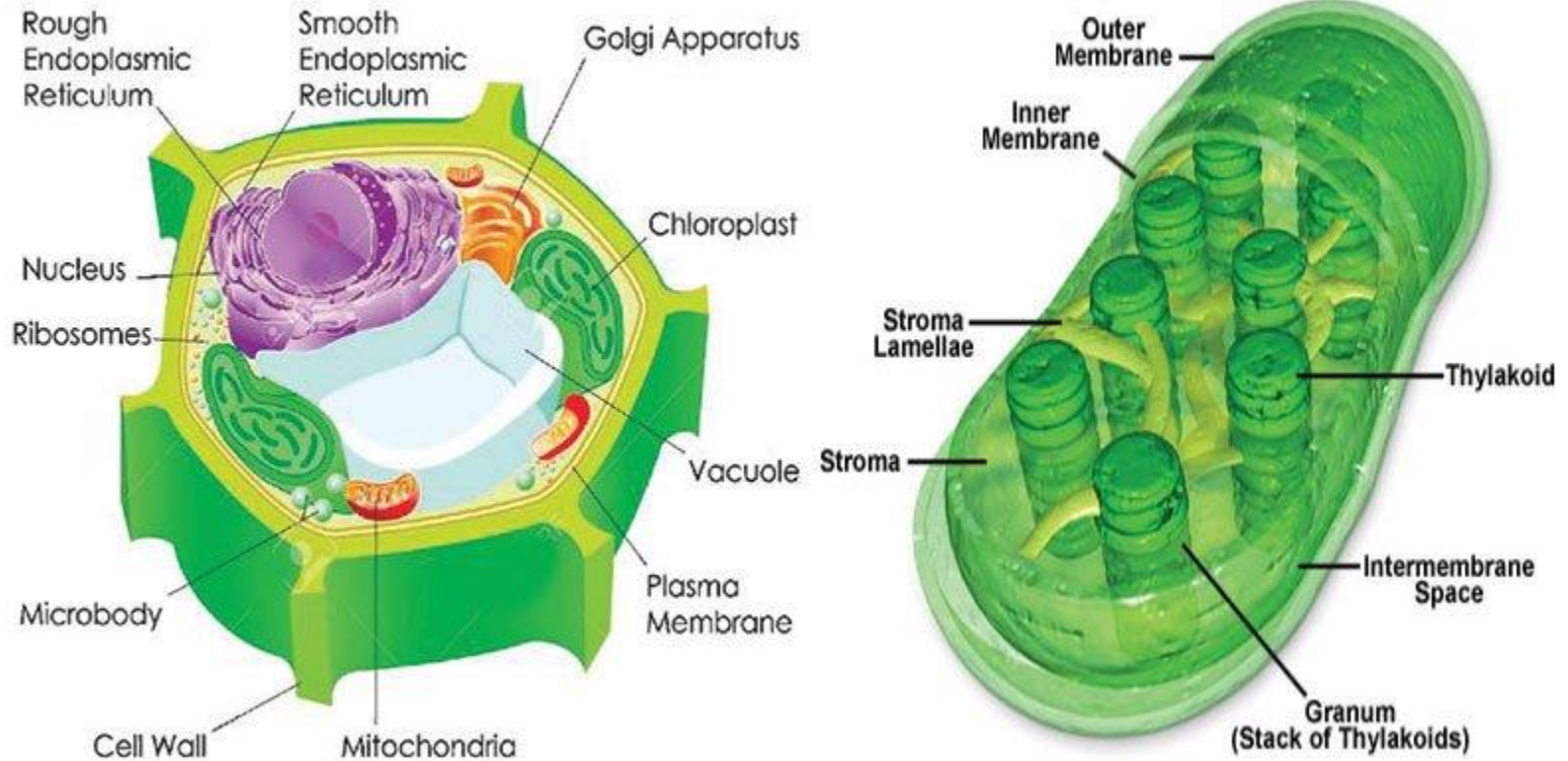


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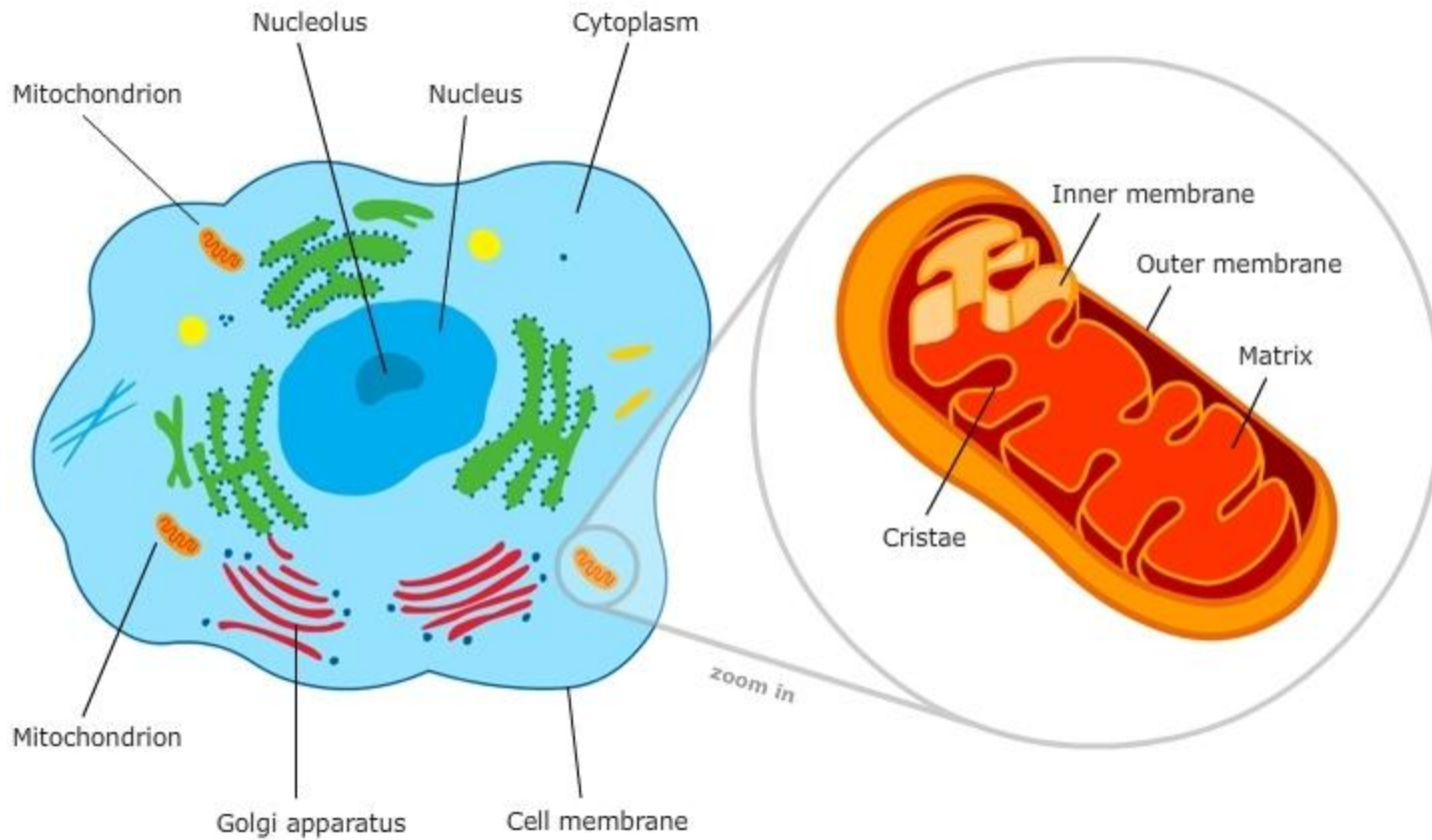
Nucleus – where information is stored



Chloroplasts – where food is produced (plants cells)

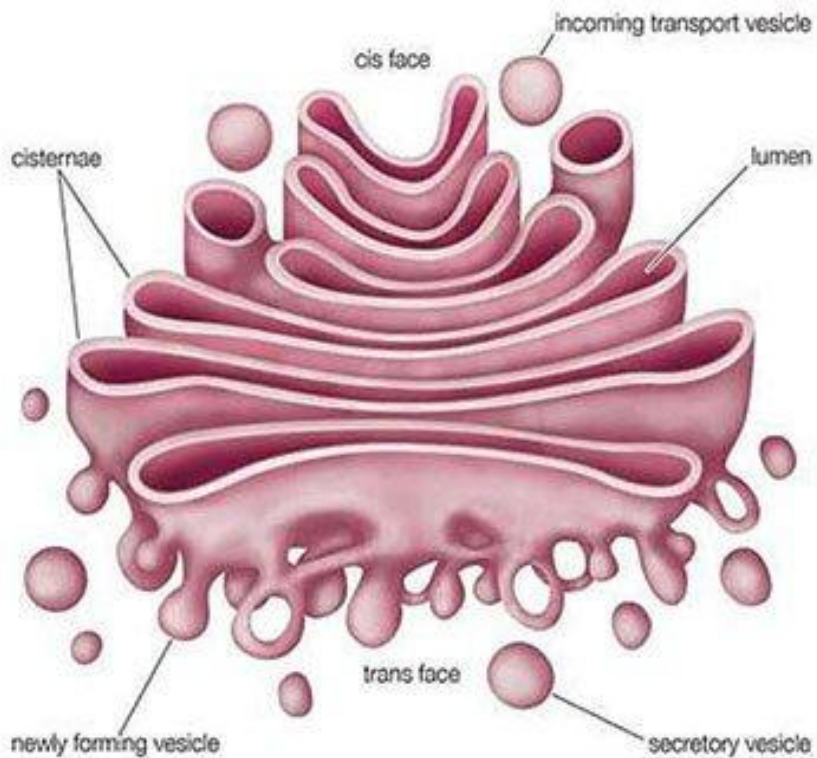


Mitochondria – where energy is produced (animal cells and plant cells)

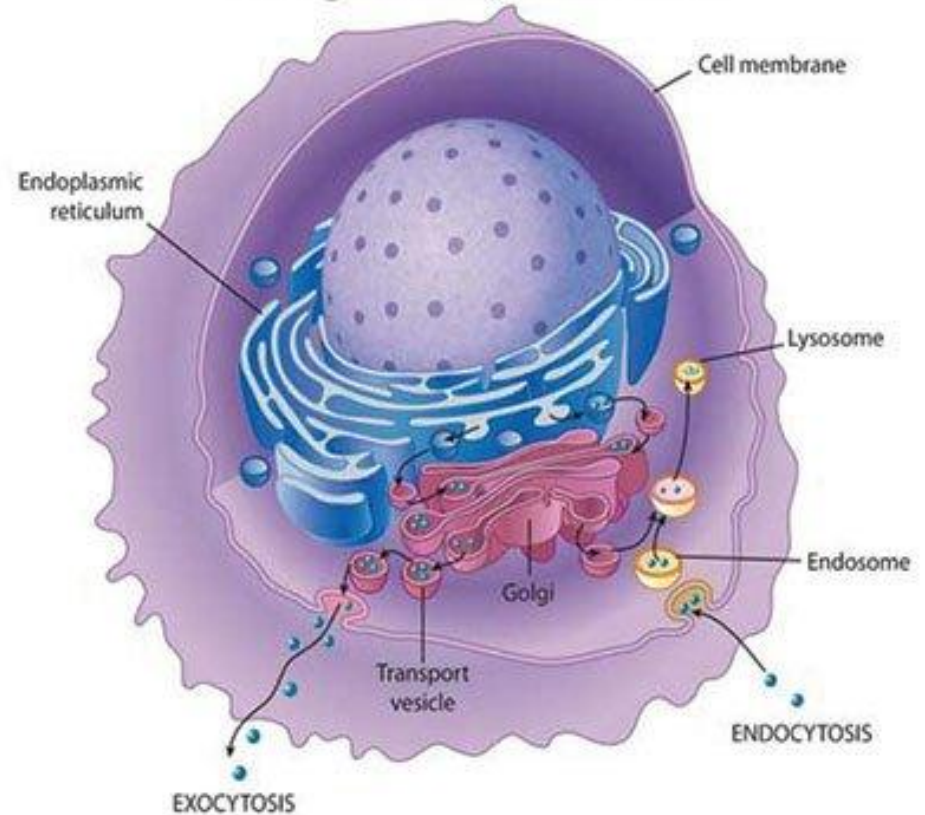


Golgi apparatus – where things for export are made

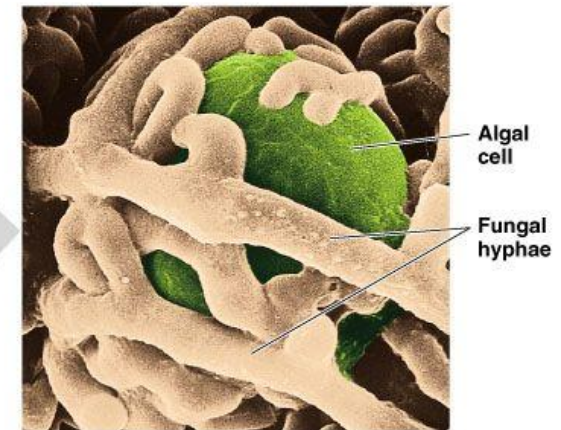
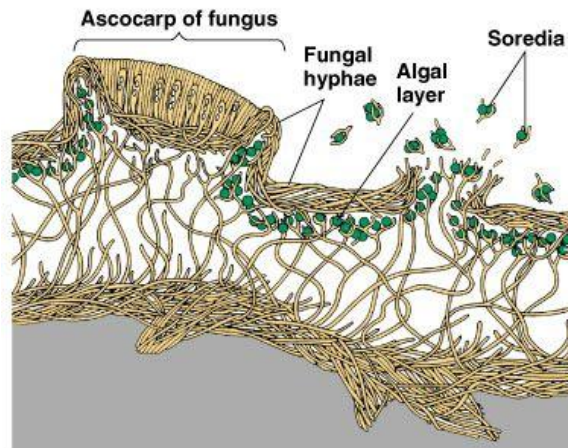
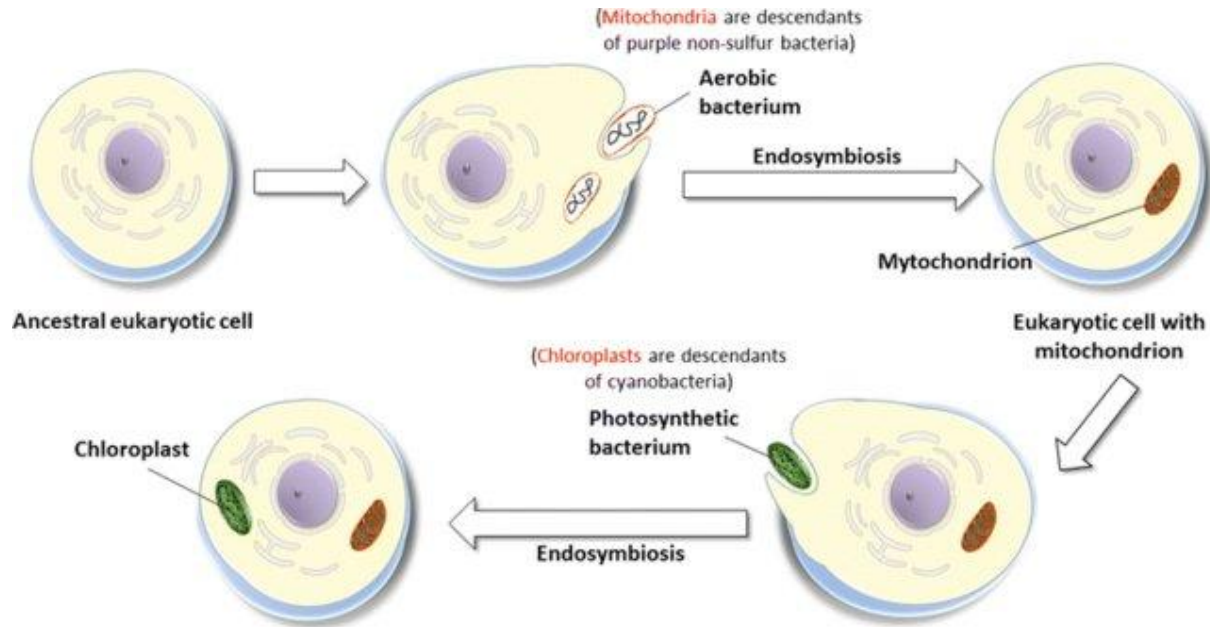
Golgi Apparatus



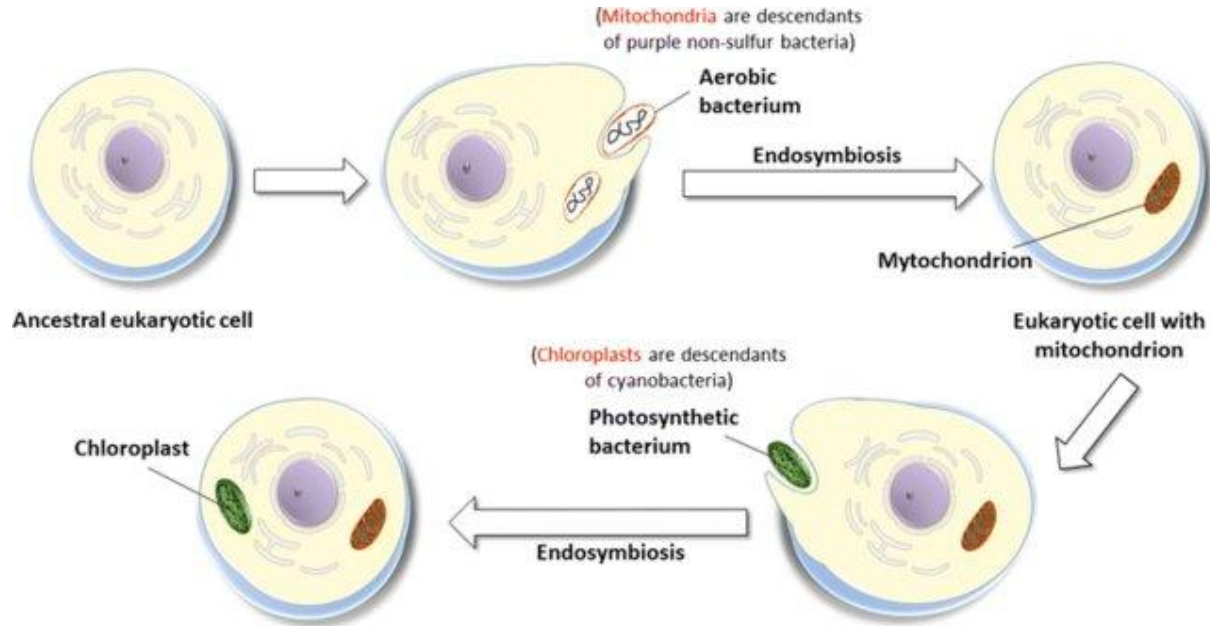
Golgi Body in a Cell



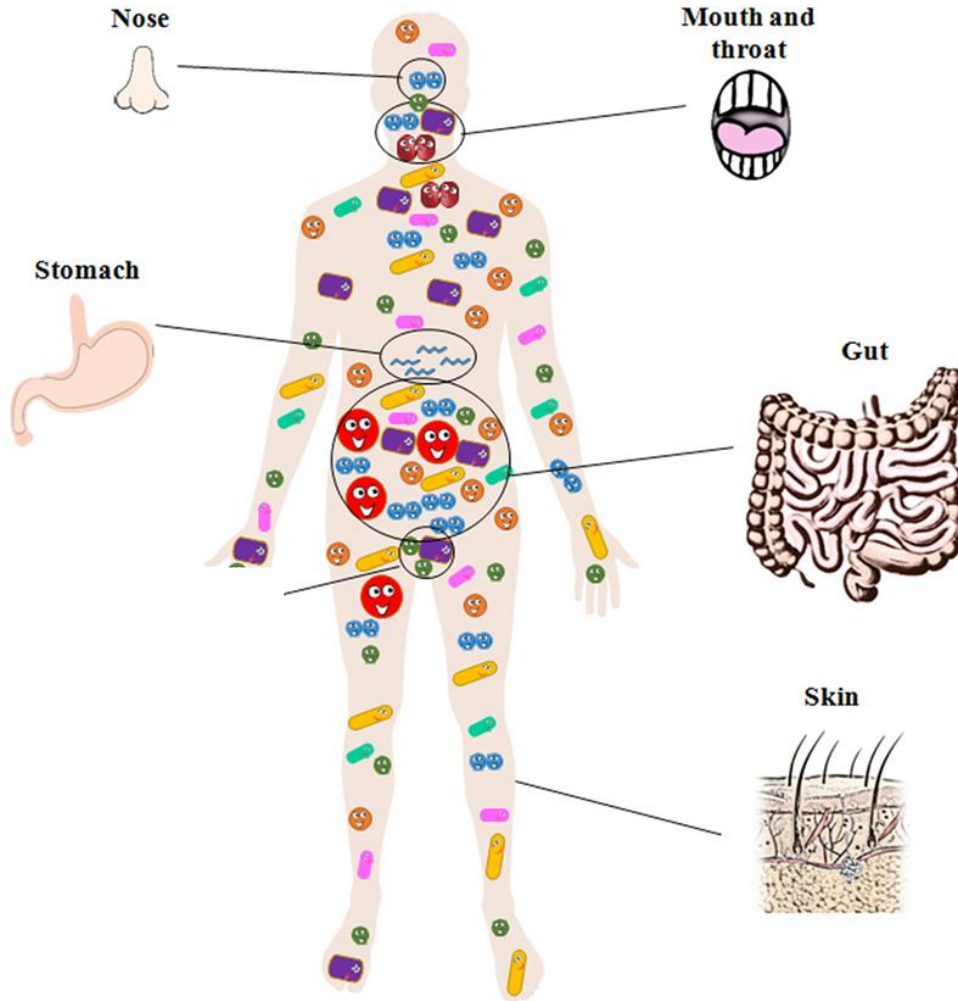
Mitochondria and chloroplasts – cellular old friends (symbiosis)



Mitochondria and chloroplasts – are our old friends (symbiosis)

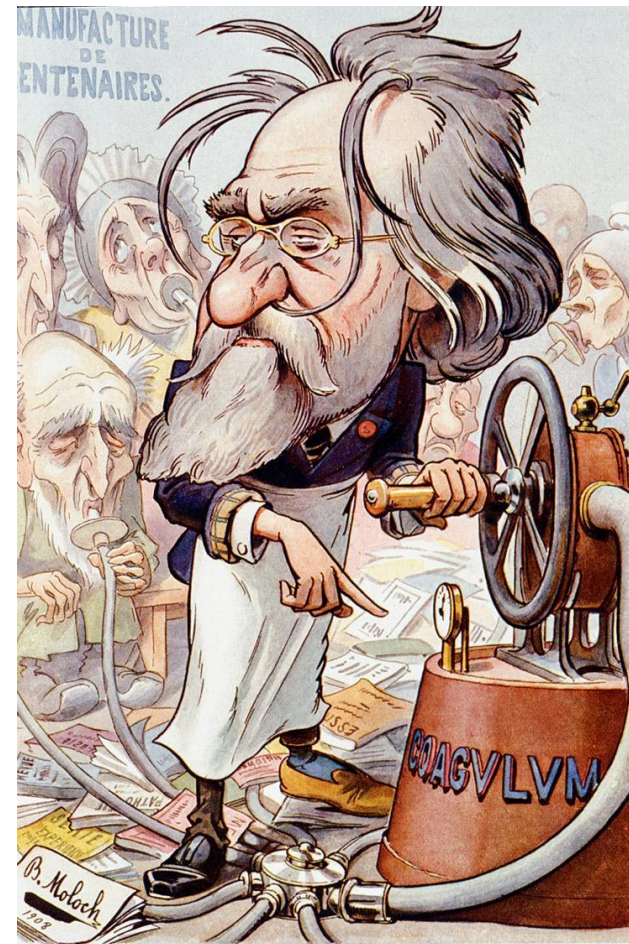
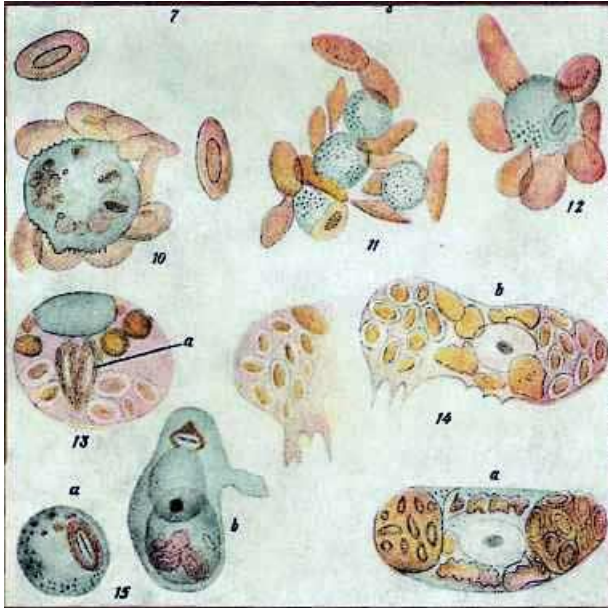


Microbiome



Phagocytosis and Yogurt

From *L'Immunité dans les Maladies Infectieuses*
(Immunity in infectious diseases) 1901



In 1883, he observed that
fungal spores can be
attacked by the blood cells



Elie Metchnikoff

White blood cell is hunting bacterium



Visible Organs



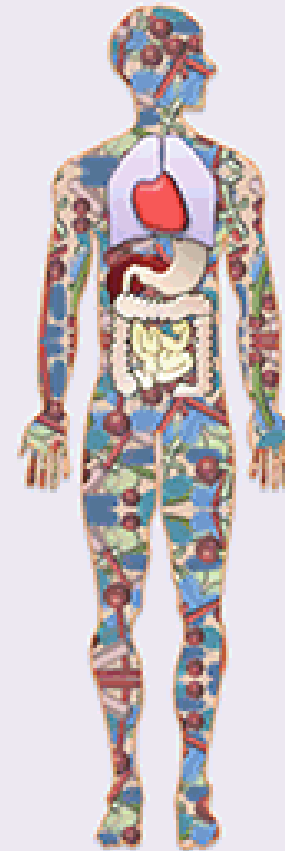
- ▶ $\sim 10^{14}$ cells
- ▶ ~ 23000 genes

Invisible Microbiome



- ▶ $\sim 10^{14}$ million microbes
- ▶ ~ 9 million genes

Complete Human



Normal functioning body

