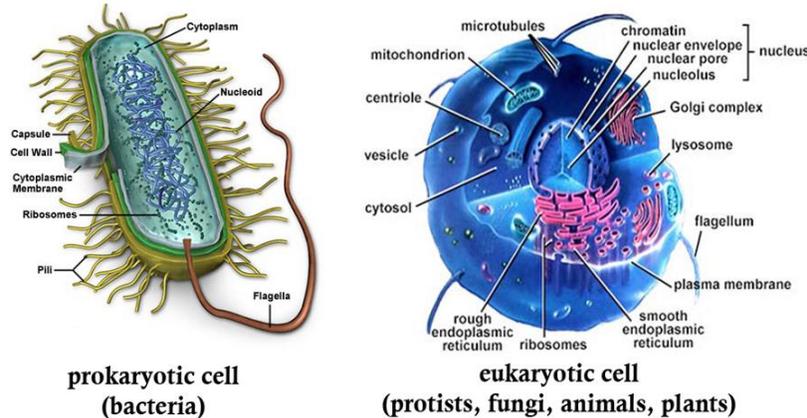


CELL BIOLOGY

Prokaryotic cell and eukaryotic cell.



Organisms can be classified into two

1. Prokaryotic cell
 - **All bacteria, mycoplasmas, blue green algae**
2. Eukaryotic cell
 - **All protozoa and multicellular organisms**

These terms were coined by **Hans Ris in 1960** to include all truly living organisms.

Both Prokaryotic cell and eukaryotic have a cellular grade of organizations, i.e. The body is composed of one or many cells.

Prokaryotes

pro = primitive karyon = nucleus

Prokaryotes are those organisms whose cells are not sub divided into separate nucleus and cytoplasm in prokaryotes all cell components are located together in the same compartment they are surrounded by plasma membrane.

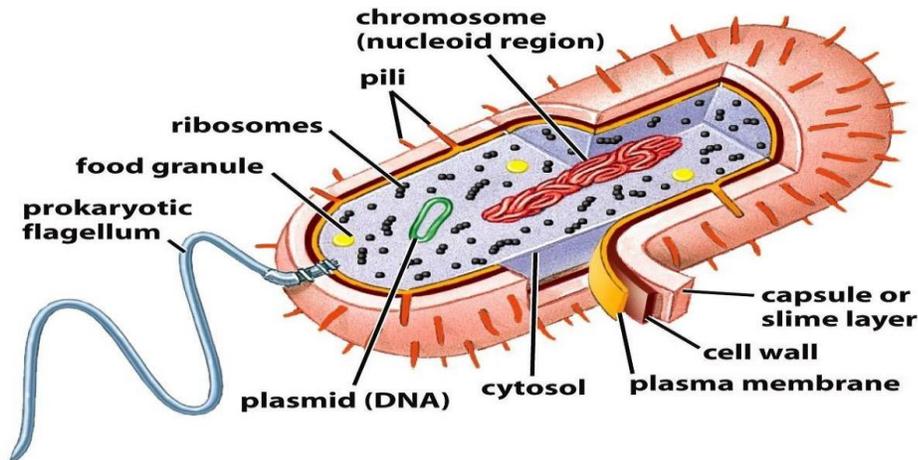
eg. All bacteria, mycoplasma, blue green algae

All prokaryotes possess cell wall outside the plasma membrane (exception in mycoplasma).

Ribosomes in the only organelle found in prokaryotic cell.

E ▶ ENTRI

Mitochondria, golgi complex, lysosomes, peroxisomes, centriole, basal bodies, apparatus for cell division are absent.



In prokaryotes due to absent in nuclear membrane a true nucleus and nucleolus are absent.

The nuclear area of prokaryotes is called **Nucleoid**.

The nuclear material include a single circular, double stranded DNA molecule which often called **bacterial chromosome**

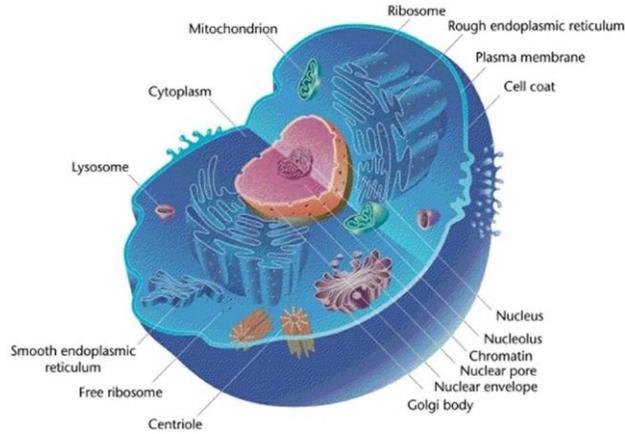
Eukaryotic cell

eu = truly karyotic = nucleated

They are nucleated.

Cells of eukaryotic organisms are divided into separate compartments namely nuclear and cytoplasmic compartments.

eg : animals , plants ,fungi and protists



They are structurally larger and complex than prokaryotic cells.

All cells are typically composed of plasma cytoplasm bounded by plasma membrane.

Cell organelles namely, nucleus, mitochondria, endoplasmic reticulum, golgi complex, ribosomes, Lysosomes etc are present.

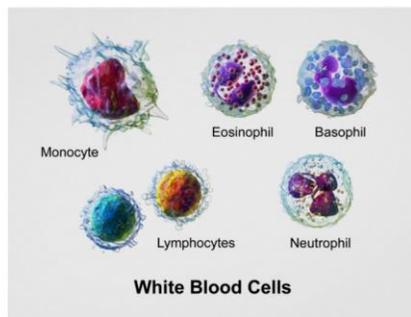
The nuclear contents such as DNA, RNA, nucleoproteins and nucleolus, remaining separated from the cytoplasm by a perforated nuclear membrane.

Cell shape

The shape of the cell varies from animals to animals, organ to organ.

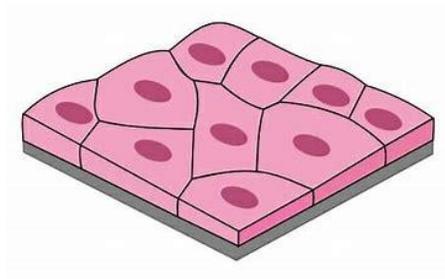
The shape of the cell is determined by its **function**.

Irregular shape – leucocytes, amoeba.



E ▶ ENTRI

Polyhedral shape – squamous epithelium.

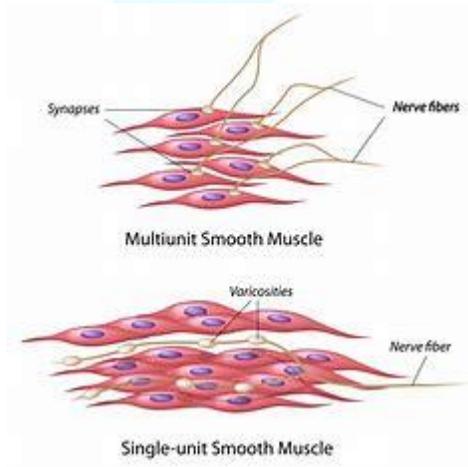


Columnar – intestinal cells.

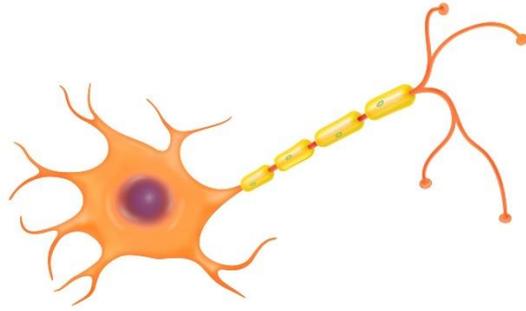
Discoidal – erythrocytes.



Spindle shaped – smooth muscles.



Elongated – neurons.



Cell size

Ranges from 10 to 100microns

Amoeba proteus is the biggest among the unicellular organisms.

The single celled algae acetabularia measures upto 10 cm.



The human erythrocytes is between 7 to 8 microns in diameter.

The largest animal cell is the egg of ostrich having a diameter of 18cm.



CHARACTERISTICS	PROKARYOTIC CELL	EUKARYOTIC CELL
Size	0.2 to 2 microns	10 to 100 microns
Multicellular form	Rare	Common with extensive tissues
Nucleus and nuclear membrane	Absent	Nucleus with nuclear envelope
Chromatin with histone	Absent	Present
Nucleoli and mitotic apparatus	Absent	Present
Genetic material	A circular, double stranded DNA without histone Genes are not interrupted by interveing sequences or introns	Liner double stranded DNA molecule with histones Genes are interrupted by introns
Cell wall	Present, non cellulosic Bacterial cell wall formed of peptydoglycan	Cellulose cell wall in plant and fungal cells Cell wall is absent in animal cells
Cytoskeleton and cytoplasmic streaming	Absent	Present
Membrane enclosed organelle	Absent	Present(mitochondria, ER, golgi complex, lysosomes, chloroplast
Ribosomes	70s ribosomes formed of 50s and 30s subunits	80s ribosomes of 60s and 40s subunits
Centrioles	Absent	Present