



SNS COLLEGE OF TECHNOLOGY

(AN AUTONOMOUS INSTITUTION)

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Department of Biomedical Engineering

Course Name: 19GET277 & BIOLOGY FOR ENGINEERS

IV Year : VII Semester

Unit I –INTRODUCTION TO LIFE

Topic : Classification-cell theory-structure of prokaryotic and eukaryotic cell

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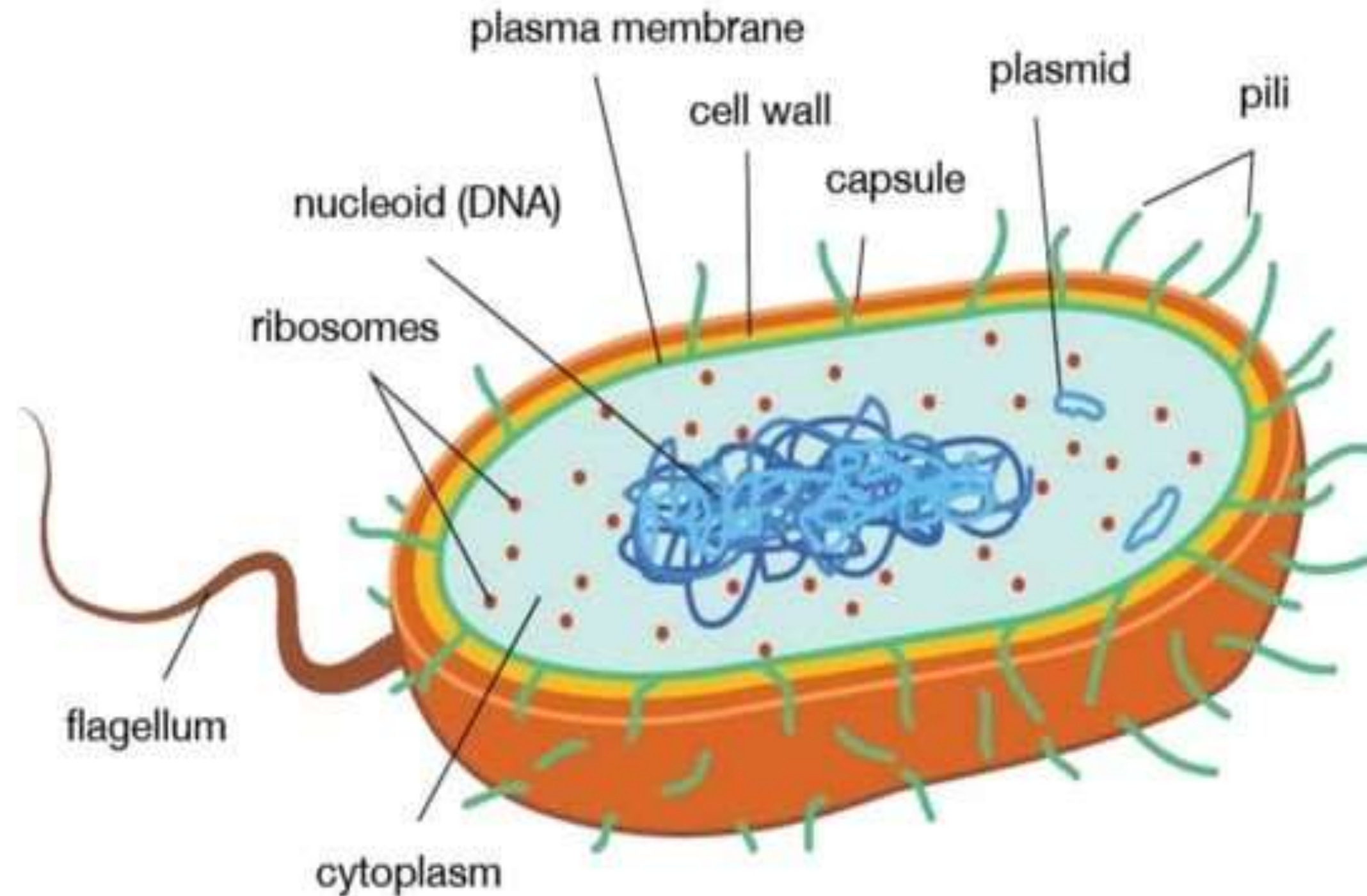
Types of cell

- Cells are of two types. i.e. **Prokaryotic and Eukaryotic cell.**
- Eukaryotic cell **contains a nucleus** and Prokaryotic **do not.**
- Prokaryotes are **single-celled organisms**, while Eukaryotes can be either **single-celled or multi-celled.**

1 Title 3

Prokaryotic cell: (Pro- first formed, Karyo- nucleus)

- Prokaryote is a single celled that lacks a membrane bound nucleus (**karyon**), mitochondria or any other organelles in the cytoplasm except ribosomes. Cell division occurs mainly by binary fission. E.g. Bacteria.
- Prokaryotic cells were the first form of life on Earth. They are simpler and smaller than Eukaryotic cells.



Vision Title 3

Prokaryotic cell

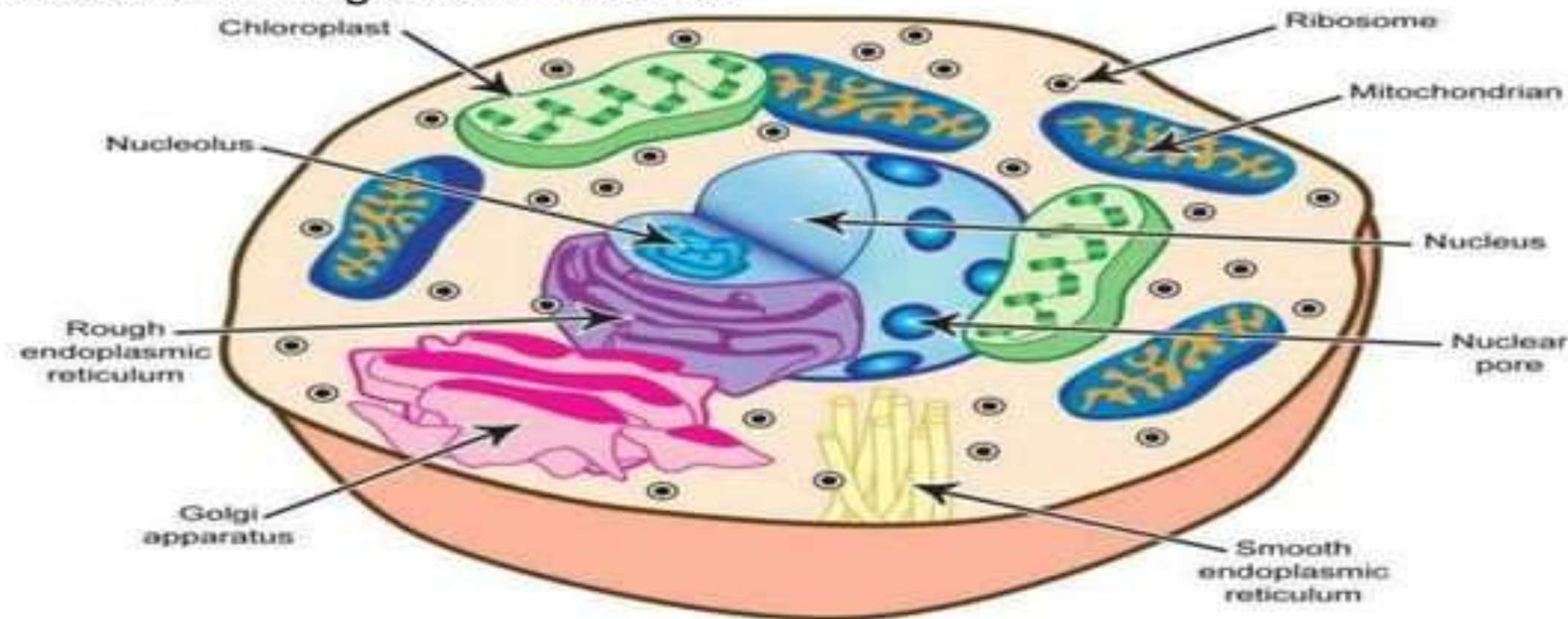
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Eukaryotic cell: (Eu- true, Karyo- nucleus)

- ❑ Eukaryotes have specialized organelles in the cytoplasm, a membrane bound nucleus enclosing genetic material organized into chromosomes. Their cell division occurs by mitosis and meiosis. eg. Plants, animals, fungi, protozoa and algae.
- ❑ These cells are larger than a typical prokaryote and can be as much as a thousand times greater in volume.

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Features	Prokaryotic cells	Eukaryotic cells
Example	Bacteria	Algae, fungi, protozoa and animals
size	1-2 by 1-4 μm or less	Greater than 5 μm in width or diameter
Genetic system location	Nucleoid, chromatin body or nuclear materials	Nucleus, mitochondria , chloroplasts
Structure of the nucleus	Not bound by nuclear membrane; one circular chromosome	Bounded by the nuclear membrane; more than one chromosome
	Chromosome does not contains histones, no mitotic division	Chromosomes have histone; mitotic nuclear division
	Nucleolous absent	Nucleolous present



Features	Prokaryotic cells	Eukaryotic cells
Cytoplasmic structures	Mitochondria absent	Mitochondria present
	Chloroplasts absent	Chloroplasts may be present
	Golgi bodies absent	Golgi bodies present
	Endoplasmic reticulum absent	Endoplasmic reticulum present
	Membrane bound vacuoles absent	Membrane bound vacuoles present
	70 S ribosome is found. (subunit : 50S and 30S)	80S ribosome is found. (subunit : 60 S and 40S)
Cell wall	Peptidoglycan (murein or mucopeptide)	Absence of peptidoglycan
Pseudopodia	Absent	Present in some