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Cell Biology Lab2- The Cell: First stage.

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1. Introduction

Both living and non-living things are composed of molecules made from chemical elements such as Carbon, Hydrogen, Oxygen, and Nitrogen. The organization of these molecules into cells is one feature that distinguishes living things from all other matter.

The cell is the smallest unit of matter that can carry on all the processes of life.

Cell Theory: the cellular theory is the most important basic principle in biology, as this principle indicates that all living things consist of similar primary units called cells.

Cell Theory consists of three principles:

1. All living organisms are composed of one or more cells.
2. The cell is the most basic unit of life.
3. All cells come only from the replication of existing, living cells.

2.Types of Cells:

1. Eukaryotic cells: cells containing organized nucleus and organelles which are enveloped by membrane-bound organelles. Golgi apparatus, Mitochondria, Ribosomes, Nucleus are parts of Eukaryotic Cells. Their genetic material is highly organized in chromosomes. Examples of eukaryotic cells are plants, animals, and fungi.

2. Prokaryotic cells: lack both, a well-defined nucleus and membrane-bound cell organelles. Examples of prokaryotes are blue-green algae, bacteria and mycoplasma.

3. Difference Between Prokaryotic and Eukaryotic Cells:

Parameter	Prokaryotic Cells	Eukaryotic Cells
Nucleus	a well-defined nucleus is absent yet, there a “nucleoid” which is an open region that contains DNA.	A well-defined nucleus enclosed by a nuclear membrane it.
Cell size	The cell size is smaller(0.1-5 µm)	The cell size is larger(10-100 µm) in contrast
Cell structure	Unicellular structure	Most eukaryotic cells are multicellular. However, some are unicellular
DNA Form	They have a circular Double-stranded DNA form	Double-stranded Linear DNA form
Cell wall	The cell wall is present here. Furthermore, it comprises of mucopeptide or peptidoglycan	Usually, there is an absence of cell wall here. However, in case it is present, it comprises cellulose
Ribosome	70S	80S
Mode of Reproduction	Asexual	Sexual reproduction is certainly the most common here
Cell Division	Binary fission, transduction, conjugation, and transformation	Mitosis
Translation and Transcription	It occurs together	Translation happens in the cytosol. Moreover, transcription happens in the nucleus
Number of chromosomes	Only one	More than one
Replication	These cells have a single origin of replication	These cells have multiple origins of replication
Organelles	The organelles in prokaryotic cells are not membrane-bound	The organelles in eukaryotic cells are certainly specific in function. Most noteworthy, they are membrane-bound
Examples	Archea and bacteria	protists, animals, and plants