

# DIFFERENCES BETWEEN PROKARYOTIC AND EUKARYOTIC CELLS

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Unit-I

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The principal differences between prokaryotic and eukaryotic cells may be summarized and presented in a tabular form as below:

Characteristics	Prokaryotic cell	Eukaryotic cell
(1) Cell size	Mostly 0.2-2.0 $\mu\text{m}$ in diameter	Mostly 10-100 $\mu\text{m}$ in diameter
(2) True membrane-bound nucleus	Absent	Present
(3) Chromosome (DNA)	Single (Plasmids may be additional ones); Circular	More than one; linear (Single, circular in mitochondria and chloroplasts)
(4) DNA complexed with histones	DNA without histones	DNA complexed with histones
(5) Introns in genes	Rare	Common
(6) Nucleolus	Absent	Present
(7) Mitosis, Meiosis	Absent	Present
(8) Genetic recombination	Partial, Unidirectional transfer of DNA	Occurs during meiosis and fusion of gamet
(9) Flagella	One flagellin fibre; rotatory movement	Multiple microtubul membrane-bound with 9+2 arrangement; Undulatory movement
(10) Cell Walls	Usually chemically complex with peptidoglycan (except in Archaea and Mycoplasma)	Chemically simpler; found in plant cell pecto-cellulosic; no peptidoglycane
(11) Plasma membrane with sterols	Usually not so (except methanotrophs and mycoplasma)	Present
(12) Cytoplasmic streaming	Absent	Present

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Characteristic	Prokaryotic cell	Eukaryotic cell
(13) Cytoskeleton	May be absent	Present
(14) Ribosomes	70S	80S (70S in mitochondria and chloroplasts) Present
(15) Lysosomes and Peroxisomes	Absent	Present
(16) Phagocytosis, Pinocytosis, Amoeboid movement	Absent	Present
(17) Microtubules	Absent or rare	Present
(18) Endoplasmic reticulum	Absent	Present in the cytoplasm
(19) Golgi Apparatus	Absent	Present for packaging of cell products Role in cell wall formation
(20) Mitochondria	Absent; site for oxidative phosphorylation is plasma membrane	Always present for transduction of ATP as energy provider molecules
(21) Chloroplasts	Absent; site of photosynthesis is plasma membrane in autotrophic prokaryotes Binary fission	Present (except in fungi)
(22) Growth/Cell division		Occurs by mitosis (Binary fission in mitochondria and chloroplasts)
(23) Differentiation	Rudimentary	Occurs for the formation of tissues and organs in the majority of forms.

