

## **The differences between Eukaryotic cells and prokaryotic cells**

1. Eukaryotic cells have a true nucleus, bounded by a double membrane, Prokaryotic cells have no nucleus , most primitive , earliest form of life.
2. Eukaryotic DNA is linear , prokaryotic DNA is circular , it has no end.
3. Eukaryotic DNA is complex with proteins called “ histones ” and is organized into chromosomes , prokaryotic DNA is simple and “ necked” meaning that it has no “ histones ” associated with it and is not formed into chromosomes .
4. Eukaryotic cell contains a number of chromosomes “ multiple” , a prokaryotic cell contains only one (single) circular DNA molecule and assortment of much smaller circles of DNA called “ plasmids ” the smaller simpler prokaryotic cell requires for fewer genes to operate than the eukaryotic cell .
5. Eukaryotic cells have many ribosomes , (80<sub>s</sub>) larger and more complex than those of prokaryotic cell (70<sub>s</sub>) (sedimentation constant) .
6. Eukaryotic ribosomes are composed of five (5) kinds of rRNA and about eighty (80) kinds of proteins , prokaryotic ribosomes are composed of only three (3) kinds of rRNA and about fifty (50) kinds of proteins .
7. Eukaryotic cells either have a plasma membrane or a cell wall in addition to the plasma membrane , prokaryotic cells have a plasma membrane in addition to bacteria cell wall .

8. Eukaryotic cells are largest cells while prokaryotic cells are smaller than eukaryotic cells , have not organelles . eukaryotic cells contain organelles with membrane bounded .
9. Eukaryotic cells reproduce by sexually with use of meiosis while prokaryotic cell don't undergo of meiosis , reproduce sexually by transfer of DNA fragments of DNA through conjugation “ plasmids ”.
- 10.Eukaryotic cells have a complex cytoskeletal structure while prokaryotic cells have a primitive or don't have a cytoskeletal at all .

**The different between prokaryotic cell and eukaryotic cell**

Features	Prokaryotic cell	Eukaryotic cell
<b>1.type of cell</b>	Unicellular	Multicellular and unicellular
<b>2.cell wall</b>	Rigid made of lipids, carbohydrates, and protein.	Flexible made of cellulose .
<b>3.chromosomes</b>	One chromosome, circular molecule of double stranded DNA .	More than one chromosome , multiple linear .
<b>4.nucleus</b>	Nuclear region ,nucleoid .	A true nucleus .
<b>5.histones</b>	Absents.	Presents .
<b>6.plasmids</b>	Presents , one or more (smaller) extra chromosomal elements contain a few genes that	Absents .

	help bacteria survive under specific conditions (circular DNA).	
<b>7.size of ribosomes</b>	70s (small).	80s (large).
<b>8.organelle</b>	Absents.	Presents .
<b>9.sexually reproduction</b>	Don't happen in their cells (without mitosis)	Happen in their cells , cell division by mitosis .
<b>10.growth in antibiotics</b>	Inhabit (sensitive to anti-biotic).	Don't Inhabit no sensitive to anti-biotic.
<b>11.decomposers</b>	Remain unavailable in wastes and dead organisms .	Less than prokaryotic .
<b>12.examples</b>	Bacteria , cyanobacteria	Plants , animals
<b>13.memberane-enclosed organelles including nucleus .</b>	No-membrane enclosed organelles .	Presents .
<b>14.cytoskeleton</b>	No known cytoskeleton .	Present .
<b>15.flagella</b>	Simple flagella .	Complex flagella .
<b>16.streaming in the cytoplasm</b>	No streaming in the cytoplasm .	Not always present .

**Characteristics of prokaryotic and eukaryotic cells**

<b>Characteristic</b>	<b>Prokaryotic Bacterial cells</b>	<b>Eukaryotic Human cells</b>
<b>1.DNA within a nuclear membrane</b>	No	Yes
<b>2.Mitotic division</b>	No	Yes
<b>3.DNA associated with histones</b>	No	Yes
<b>4.chromosome number</b>	One	More than one
<b>5.membrane bound organelles , such as mitochondria and lysosomes</b>	No	Yes
<b>6.size of ribosome</b>	70s	80s
<b>7.cell wall containing peptidoglycan</b>	Yes	No
<b>8.cytoskeletal structure</b>	A primitive or no	A complex or yes
<b>9.organelles</b>	No	Yes

**Names of some important biologists**

Who have made land-mark discoveries during the courses of history are listed below :

<b>Name of scientist</b>	<b>Discoveries</b>
<b>1.hippocrates 460 B.C.</b>	He is considered a father of medicine “ use of plants in medicine ”
<b>2.Aristotle 384 B.C.</b>	Initiated the study of morphology and classification of animals .
<b>3.Theopharstus 370 B.C.</b>	Listed five hundred plants . he is called as “ <b>father of botany</b> ”.
<b>4.Herophilus 300 B.C.</b>	Study animal body methodically . he is called as “ <b>father of anatomy</b> ”.
<b>5.Dioscorides 40 B.C.</b>	Studied medicinal properties of plants and “ <b>wrote a book namely</b> ” “ Meteria Medica ”.
<b>6.William Harvey (1570 -1657).</b>	<b>Studied blood circulation.</b>
<b>7.Antoni van Leeuwenhoek 1632 – 1723 .</b>	Discovered the <b>microscope</b> “ lenses ” and <b>discovered bacteria.</b>
<b>8. Robert hook 1635 – 1750 .</b>	Studied the <b>cork cell</b> “ <b>cellula</b> ”.
<b>9. Carolus Linnaeus 1707-1778.</b>	Expanded the <b>binomial system of classification in plants .</b>
<b>10.Robert Brown 1773-1858.</b>	Asserted the prescience of <b>nucleus in cell</b> and <b>discovered Brownia movement in protoplasm .</b>
<b>11.Mathias Schleiden 1804- 1882</b>	<b>Propounded cell theory .</b>

<b>Theodore Schwann 1810-1882.</b>	
<b>12. Charles Darwin 1809-1882.</b>	Described the <b>theory of natural – selection and origin of species .</b>
<b>13. Grego Mendel 1822-1884 .</b>	<b>Laws of inheritance .</b>
<b>14. Louis Pasteur 1882-1895 .</b>	<b>Importance of microorganisms in fermentation .</b>
<b>15. Julius Sachs 1832-1897 .</b>	<b>Importance of photosynthesis and respiration in plants .</b>
<b>16. Thomas Morgan 1886-1945.</b>	Importance of <b>genes</b> in heredity ( <b>hereditary</b> ).
<b>17. W. M. Stanley 1904-1954.</b>	<b>Isolated Tabaco mosaic virus (TMV or TMD).</b>
<b>18. Watson and Grick 1953 .</b>	<b>Gave model of DNA in 1953 .</b>
<b>19. Har Gobind Khorana .</b>	<b>Studied genetic code and biosynthesis of protein in 1968 .</b>

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