

Prokaryotes vs. Eukaryotes

Prokaryotes

No nucleus or membrane bound organelles. DNA is contained in the nucleoid, and single circular chromosome. Contain pili, ribosomes and cell wall. Approx. 1-10 micrometers in size. (Kingdom Archaea and Bacteria)

Eukaryotes

Membrane-bound organelles. DNA in nucleus and multiple linear chromosomes. Approx 10-100 micrometers (about ten times larger). (Kingdom Eukarya)

Cell Size

1) *Dilution problem*- if nutrients are limiting, it is hard to concentrate them in a large volume. Eukaryotes---> can concentrate nutrients into compartments.

2) *Surface Area to Volume Ratio*- As cell increases, surface area increases by a factor of 2 and volume increases by a factor of 3. Eukaryotes--->have internal membranes that increase surface area.

Prokaryotes---> Grow long and skinny. Or remain really small.

Macromolecule Table

	Type of Polymer			
	Polysaccharide	Protein	Lipid	Nucleic Acid
General Monomer	Monosaccharide Eg) Glucose	Amino Acid NH ₂ R-COOH	-Not a true Monomer -Hydrophobic -Fatty Acids	Nucleotide= Ribose sugar; nitrogenous base (ATGCU)
Bond Type	Glycosidic (Covalent)	Peptide (Covalent)	Ester Linkage joining hydrocarbon tail to backbone	Phosphodiester (Covalent)
Function(s)	-Structure -Energy Storage	-Enzymes -Transport -Structure (Basically everything)	-Form membrane -Energy Storage	Information Storage
Unique Features	-Highly Branched	-3D Structure is Functional	-Not true Monomer	DNA- 3' OH RNA- 3' and 2' OH
Directionality	Depends on Polymer	N → C	None	5' → 3'

