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Competitive Exams: Types of Cells: Prokaryotic & Eukaryotic

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Characteristics of Prokaryotes and Eukaryotes

There are two general classes of cells: Prokaryotic and eukaryotic. The evolution of prokaryotic cells preceded that of eukaryotic cells by 2 billion years.

- Streptococcus pyogenes, the bacterium that causes strep throat, is an example of a prokaryote.
- Yeast, the organism that makes bread rise and beer ferment, is an example of an unicellular eukaryote.
- Humans, of course, are an example of a multicellular eukaryote.

Similarities

The major similarities between the two types of cells (prokaryote and eukaryote) are:

1. They both have DNA as their genetic material.
2. They are both membrane bound.
3. They both have ribosomes.
4. They have similar basic metabolism
5. They are both amazingly diverse in forms.

The major and extremely significant difference between prokaryotes and eukaryotes is that eukaryotes have a nucleus and membrane-bound organelles, while prokaryotes do not. The DNA of prokaryotes floats freely around the cell; the DNA of eukaryotes is held within its nucleus. The organelles of eukaryotes allow them to exhibit much higher levels of intracellular division of labor than is possible in prokaryotic cells.

Differences

Additional obvious differences between prokaryotes and eukaryotes include:

- Size: Eukaryotic cells are, on average, ten times the size of prokaryotic cells.

- **Genomic composition and length:** The DNA of eukaryotes is much more complex (in both size and organisation) and than the DNA of prokaryotes.
- **Cell Wall:** Prokaryotes have a cell wall composed of peptidoglycan, a single large polymer of amino acids and sugar. Many types of eukaryotic cells also have cell walls, but none made of peptidoglycan.
- Prokaryotic cells are relatively simple and Eukaryotic cells are more complex.

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