

Life on Earth

Evolution of Eukaryotes to Multicellular Life

Evolution of Eukaryotic Cells

- Several different specialized prokaryotes began to live together in a **symbiotic** relationship. These cell types took on specialized functions, and became **organelles** in a larger cell.
- A **eukaryote** is a cell that contains a separate nucleus to hold its DNA and RNA.

Study Tip

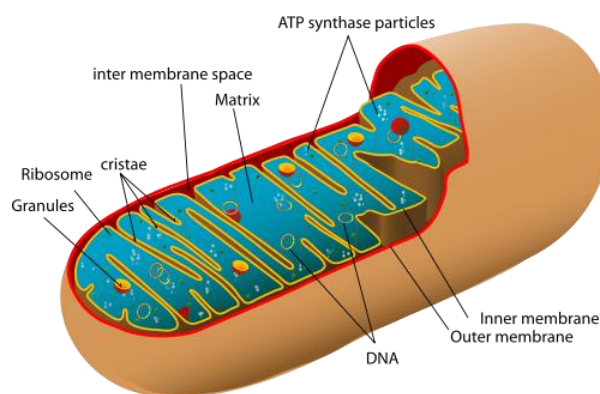
To remember the difference between eukaryotes and prokaryotes, remember that **you** are a **eukaryote**. Humans are large, complex organisms whose eukaryotic cells have nuclei.

Multicellular Life

- Prokaryotes and Eukaryotes can both be multicellular.
- Multicellular life may have evolved several times throughout Earth's history.

Why It Took So Long

- Evolutionary processes are generally slow
- No evolutionary advantage to being larger and more complex
- Harsh conditions during Earth's earlier years
 - Limited atmospheric oxygen
 - Planet was too cold for complex life
 - Extinction due to global glaciations



Eukaryotic cells formed as simpler, specialized prokaryotes began working together in cells.

Concept Check

- What are the differences between eukaryotes and prokaryotes?
- How did one evolve into the other?
- Why did complex life take so long to evolve?