Comparison of eukaryotes and prokaryotes

Life on our planet evolved from the simplest organisms through the **prokaryotic cells**, whose collaboration created the **eukaryotic cells**. Yet the prokaryote did not die! Here we can see two survival strategies.

Prokaryotic strategy

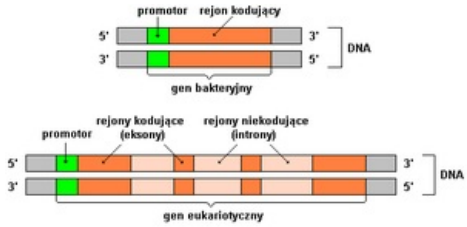
The prokaryotes “bet ” on **simplicity**. Their cells are very simply organized. Their reproduction is only non-sexual (yet they are capable of sexual processes!). Therefore, their **susceptibility** is only dependent on spontaneous mutations, plasmid transfer and recombinant *foreign* DNA. However, their simplicity allows them to multiply rapidly (one cycle can last only 20 minutes).

Eukaryotic strategy

Eukaryotic cells are complex and highly organized systems. Those that are diploid are capable of sexual reproduction, which radically increases the ability to create **new combinations of genes**. However, their complexity slows down their reproductive capacity (one cycle of about 6 hours).

Genetic information differences

---	Prokaryotes	Eukaryotes
Nucleus	don't have nucleus (only nucleoid)	have real nucleus
chromosome	only one circular	one or more linear
genes	without introns	with introns and exons
number of genes	6 to 8 thousands	more than 10 thousands
ploidy	only haploid	diploid or haploid
nucleolus	don't have nucleolus	have nucleolus
non-nuclear DNA	plasmids	mtDNA, possibly plasmids
nuclear proteins	without histones	histones



Comparison of prokaryotic (up) and eukaryotic (down) gene

Cell structure differences

---	Prokaryotes	Eukaryotes
size	0,3–6 µm	5 µm – few centimeters
organelles	only without membrane	with or without membrane
ribosomes	prokaryotic (70 S)	eukaryotic (80 S) i prokaryotic (mitochondria)

Proteosynthesis differences

---	Prokaryota	Eukaryota
modification	posttranslational	posttranslational
translation	in cytoplasm	in cytoplasm/mitochondria (mtDNA)/directly to ER

Links

Related articles

- Prokaryote
- Eukaryote

Bibliography

- NEČAS, Oldřich. *Obecná biologie pro lékařské fakulty.* 3. edition. Jinočany : H+H, 2000. ISBN 80-86022-46-3.