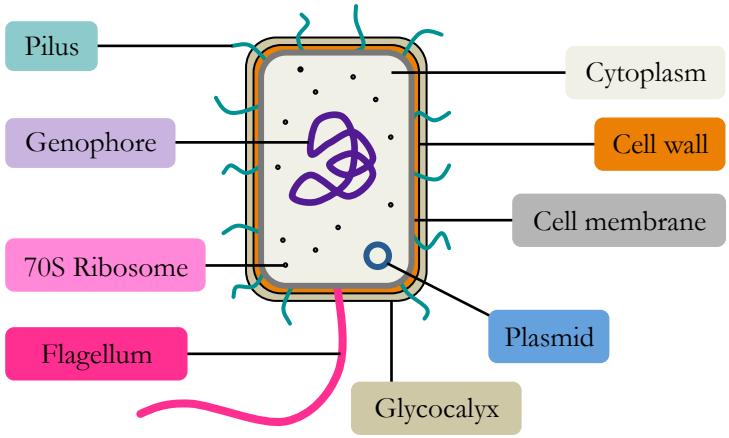
TOPIC 1.2: PROKARYOTIC CELLS

Prokaryotic Cell Structure

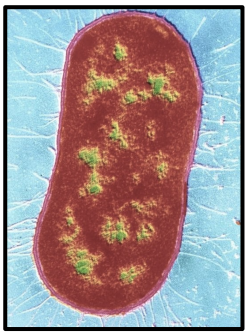
Prokaryotes are organisms whose cells lack a nucleus
- They belong to the kingdom Monera (i.e. bacteria)

Prokaryotic cells share the following structures:
- A single, circular DNA molecule (genophore)
- A peptidoglycan cell wall and 70S ribosomes

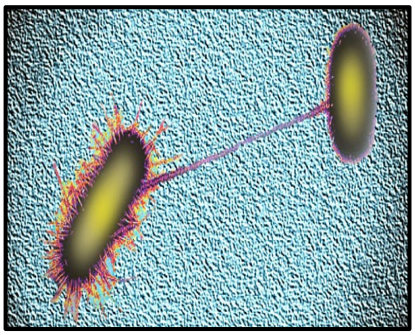
Prokaryotic cells may also contain the following:
- Pili (for attachment or bacterial conjugation)
- Flagella (a long whip-like tail for movement)
- Plasmids (autonomous DNA molecules)



Prokaryote Micrographs

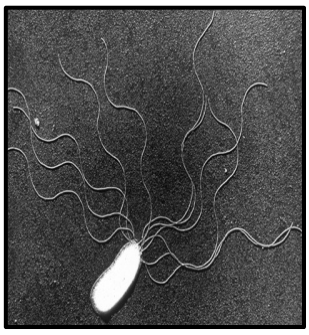


Nucleoid (yellow)



Bacterial Conjugation (pili = red)

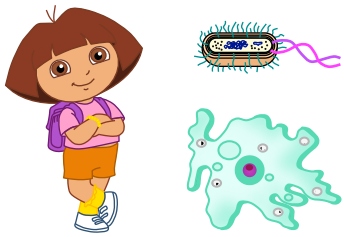
Cell Wall (purple)



Flagella (white)

Prokaryotic versus Eukaryotic Cells

Prokaryotic and eukaryotic cells differ according to a number of key features:
- **D**NA (composition and structure)
- **O**rganelles (types present and sizes)
- **R**eproduction (mode of cell division)
- **A**verage Size (exceptions may exist)



	Prokaryote	Eukaryote
DNA	DNA is naked DNA is circular Usually no introns	DNA bound to protein DNA is linear Usually contains introns
Organelles	No nucleus 70S ribosomes	Has a nucleus 80S ribosomes
Reproduction	Via binary fission Single chromosome	Via mitosis and meiosis Paired chromosomes
Average Size	Smaller (~1 – 5 μM)	Larger (~10 – 100 μM)

Bacterial Cell Division

Prokaryotes divide via a process of asexual reproduction known as binary fission

In this process
- The circular DNA is copied
- The DNA loops attach to the membrane
- The cell elongates, separating the loops
- Cytokinesis occurs to form two cells