

Prokaryotic versus Eukaryotic cells

Prokaryotic and Eukaryotic Cells

Prokaryotic

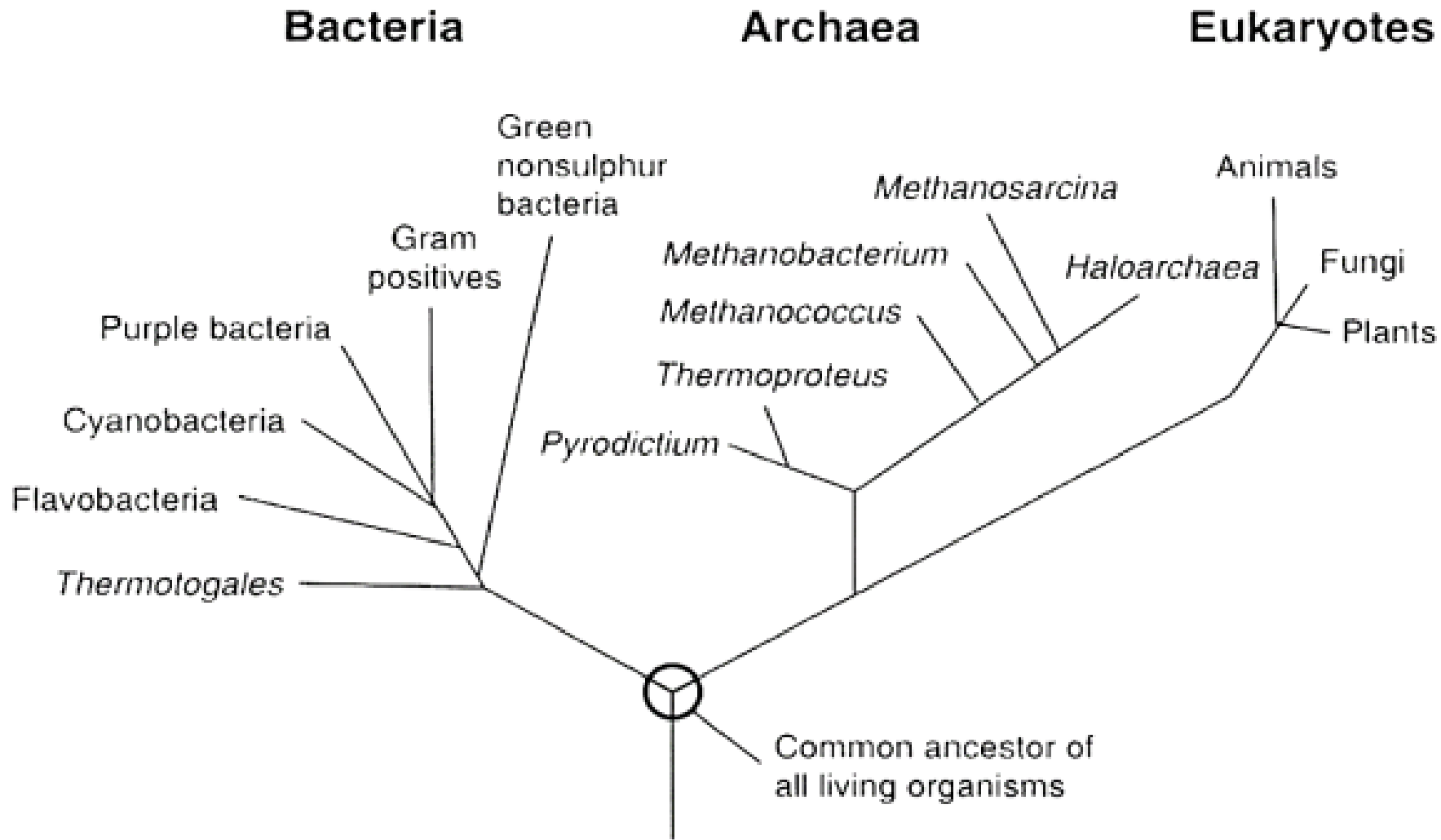
- Prefix - Pro- before
- Suffix – kary – nut, kernel or nucleus (Greek)
- Before nucleus – no nucleus

Eukaryotic

- Prefix – Eu – true
- Suffix – kary - nucleus
- True nucleus – with nucleus

Pro = before
Kary = nucleus

Eu = true
Kary = nucleus



A family tree of living organisms.

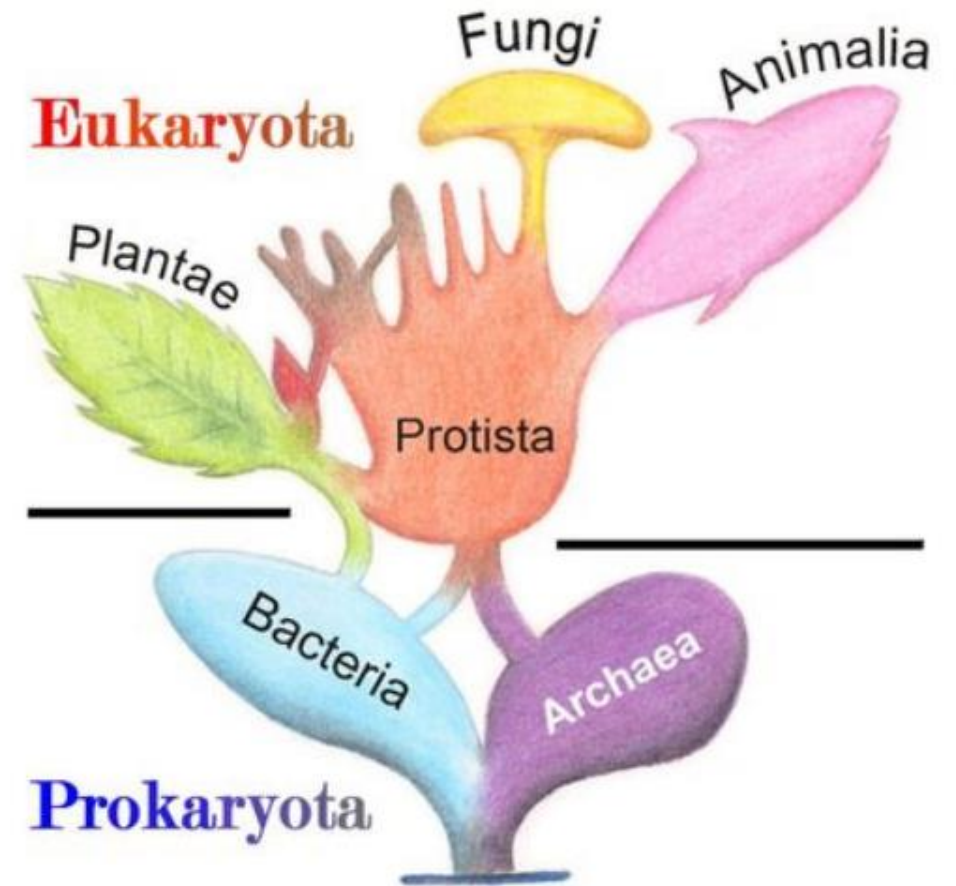
Prokaryotic and Eukaryotic Cells

Cell

Cells are the basic unit of life for **ALL** living things.

Two Basic types

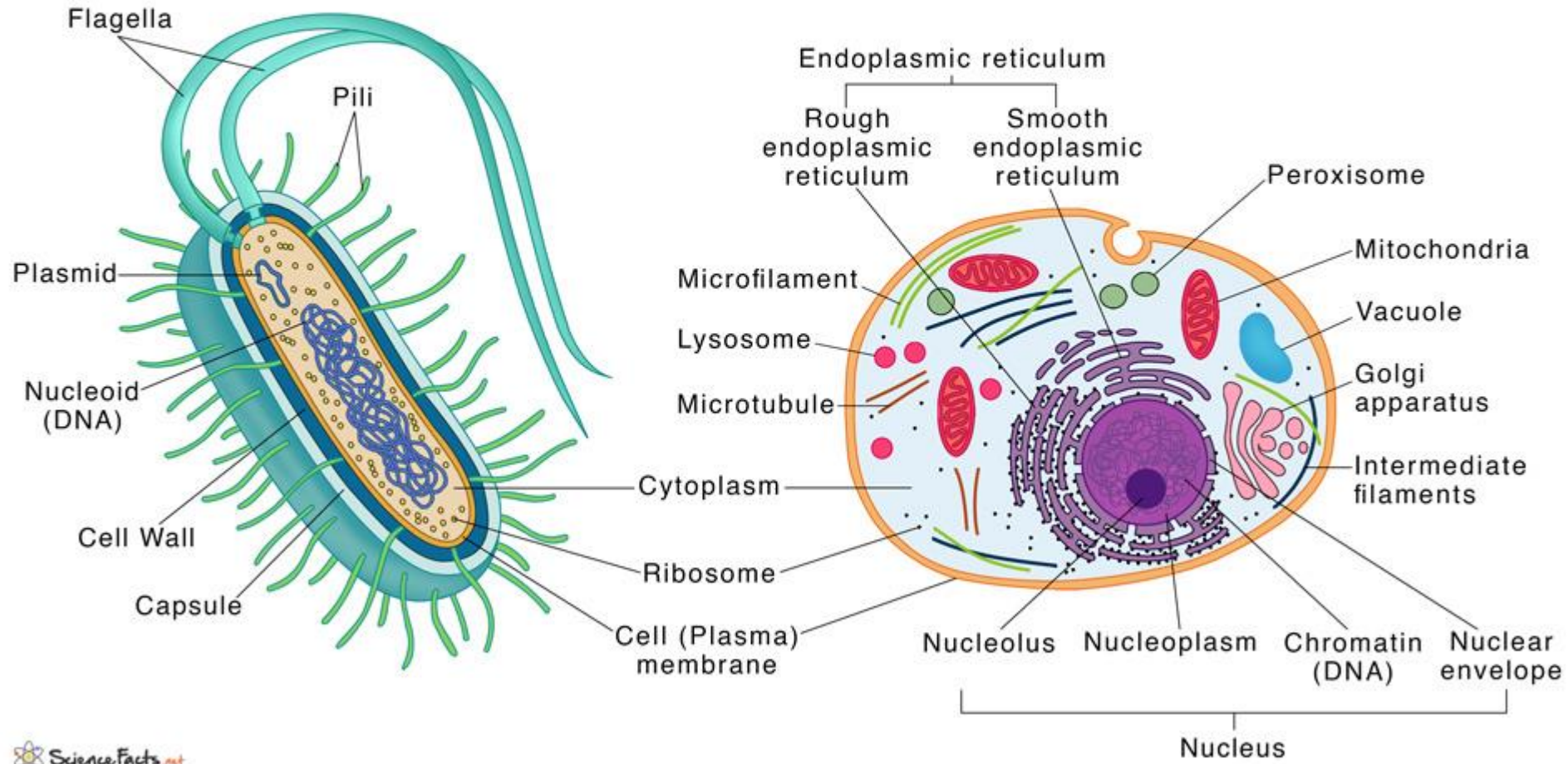
1. **Prokaryotic** –
Domain – Bacteria and Archaea
Kingdom – Eubacteria and Archaeabacteria
2. **Eukaryotic** –
Domain – Eukaryotic
Kingdom - Protists, Fungi, Plantae and Animalia



Prokaryotic Cells

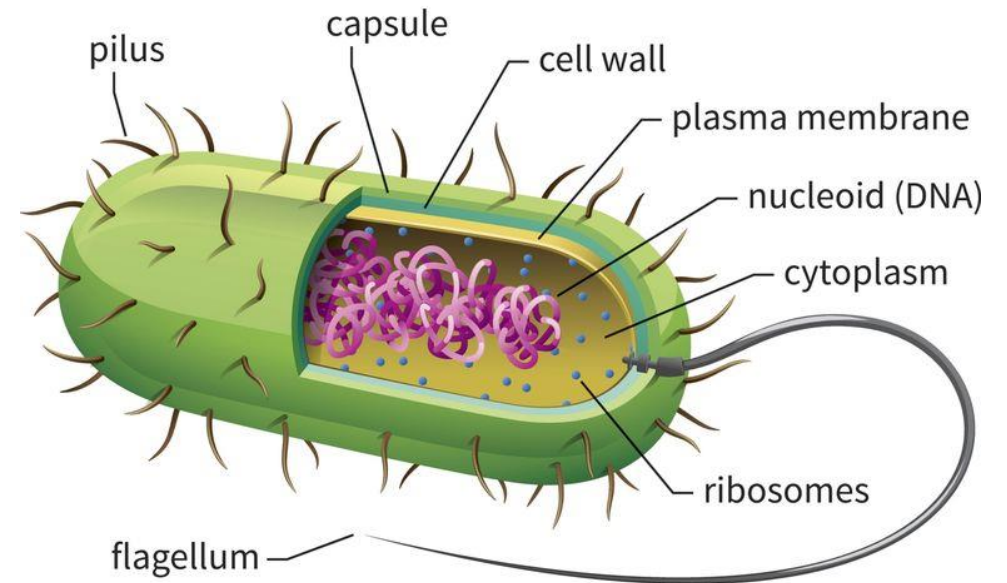
VS

Eukaryotic Cells



Prokaryote Cells Parts

- **capsule**: slimy outer coating
- **cell wall**: tougher middle layer
- **cell membrane**: delicate inner skin



- **cytoplasm**: inner liquid filling
- **DNA** in one big loop
- **flagella**: for swimming
- **ribosomes**: for building proteins

Prokaryotes	Eukaryotes
Circular DNA (in cytosol)	Linear DNA (in nucleus)
No organelles	Several membrane bound organelles
Nucleoid (not membrane bound)	Nucleus (membrane bound)
Single chromosome	Several chromosomes
Plasma membrane typically lacks receptors	Plasma membrane with receptors (sterols and carbohydrates)
Chemically complex cell wall (may contain peptidoglycan)	Chemically simple cell walls (cellulose (plants) and chitin (fungi))
DNA transcription and mRNA translation occurs simultaneously (in cytosol)	DNA transcription in nucleus, and mRNA translation in cytosol
Flagellum (if present) Simple, built from two proteins	Flagellum (if present) Complex, built from microtubules
May have pili and fimbriae	May have cilia
Haploid genome (only one copy of each gene)	Diploid genome (more than one copy of each gene)
May have plasmids (DNA outside chromosome)	Plasmid DNA not common
Compact genome (little repetitive DNA)	Usually large amounts of non-coding and repetitive DNA
May have a glycocalyx cover	Glycocalyx only if no cell wall
Small ribosomes	Large ribosomes in cytosol/nucleus small ribosomes in organelles
No histones in chromosome	DNA "wound" around histones
Lacks cytoskeleton	Cytoskeleton (actin, microtubules)
Mucilaginous capsule	No Mucilaginous capsule
Cell size range 0.5–100 μm	Cell size range 10–150 μm
Asexual reproduction (binary fission)	Sexual reproduction (meiosis and mitosis)