

Classification

Classification is the process of organizing living things into groups based on their similarities. This process is also known as scientific classification or taxonomy.

The Linnaean System

- ▶ In the early 1700s, Carl Linnaeus began organising living organisms into groups based on the similarities and differences in their structure and characteristics.
- ▶ Initially, Linnaeus divided living organisms into two kingdoms, which are the animal kingdom and the plant kingdom. Then he further divided each kingdom into smaller and more specialised categories. The sequence of classification is:

1. **Kingdom**
2. **Phylum**
3. **Class**
4. **Order**
5. **Family**
6. **Genus**
7. **Species**



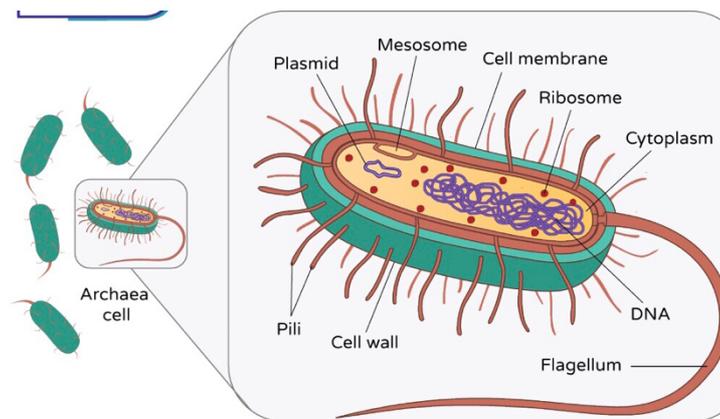
Taxon ↓				
Species	<i>sapiens</i>	<i>troglydytes</i>	<i>musculus</i>	<i>naja</i>
Genus	<i>Homo</i>	<i>Pan</i>	<i>Balaenoptera</i>	<i>Naja</i>
Family	Hominidae	Hominidae	Balaenopteridae	Elapidae
Order	Primates	Primates	Artiodactyla	Squamata
Class	Mammalia	Mammalia	Mammalia	Reptilia
Phylum	Chordata	Chordata	Chordata	Chordata
Kingdom	Animalia	Animalia	Animalia	Animalia

Changes to Classification

- ▶ Models of **classification** have changed over time due to advancements in **technology** and deeper understandings of **biochemical processes**, e.g. advancements in **microscopes** led to an improved understanding of the **internal structures** of certain organisms and led to **alterations** in how we **classify** certain species.
- ▶ **Carl Woese** proposed a **three-domain system** in 1990 after advancements in **chemical analysis techniques** led him to discover that some species weren't as closely related as we originally thought.
- ▶ The **three domains** are:
 1. **Archaea**
 2. **Bacteria**
 3. **Eukaryota**

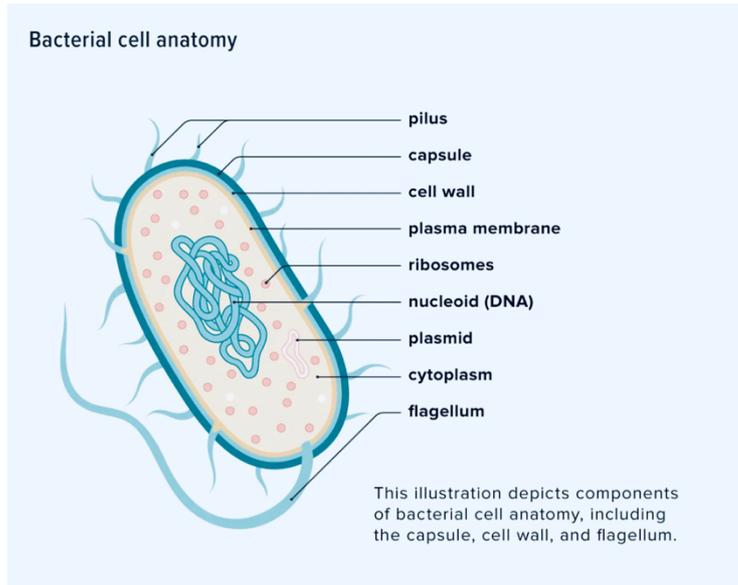
1. Archaea

Archaea are prokaryotic cells that live in extreme conditions. They have no nucleus. Examples include the halobacteriales.



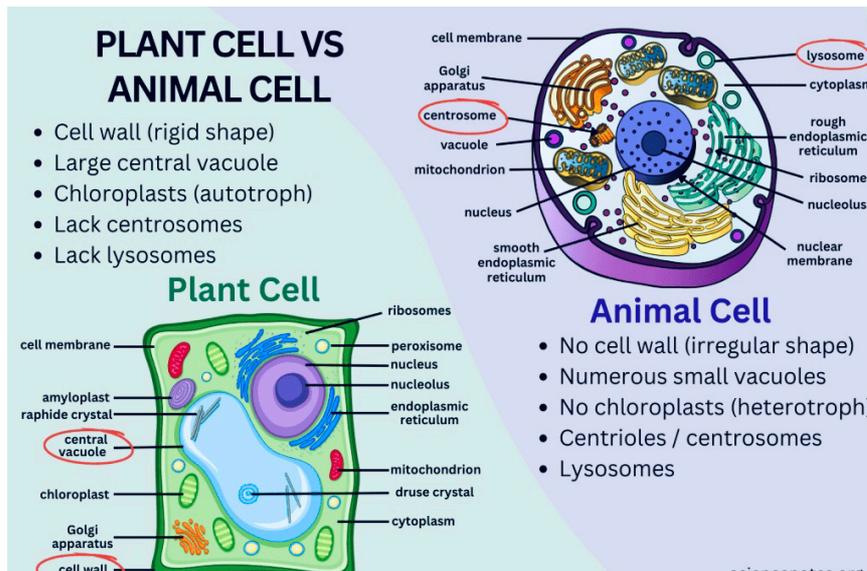
2. Bacteria

Bacteria cells are the true bacterial cells. They are again prokaryotic and examples include the Spirochetes.



3. Eukaryota

Eukaryota encompass the rest of the organisms. It includes fungi, plants, animals and protists.



Domains

➤ These **domains** are then split into the original groups of **kingdom, phylum, class, order, family, genus and species**.

Evolutionary Tree:

B6: Inheritance, variation and Evolution

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Evolutionary trees are a good way to represent evolutionary relationships between different species. Evolutionary trees are often created by comparing physical features, DNA analysis results and fossils from fossil records.

The Binomial System

- ▶ Linnaeus proposed the binomial system as a standardised way of naming organisms. This two-name system consists of the genus, which is followed by the species. The binomial system uses Latin names, and both the genus and species names are written in italics.
- ▶ For example, human beings are classified as members of the genus *Homo*, and our species is *sapiens*; so, our scientific name is *Homo sapiens*.
 - The scientific name for brown bears is *Ursus arctos*

