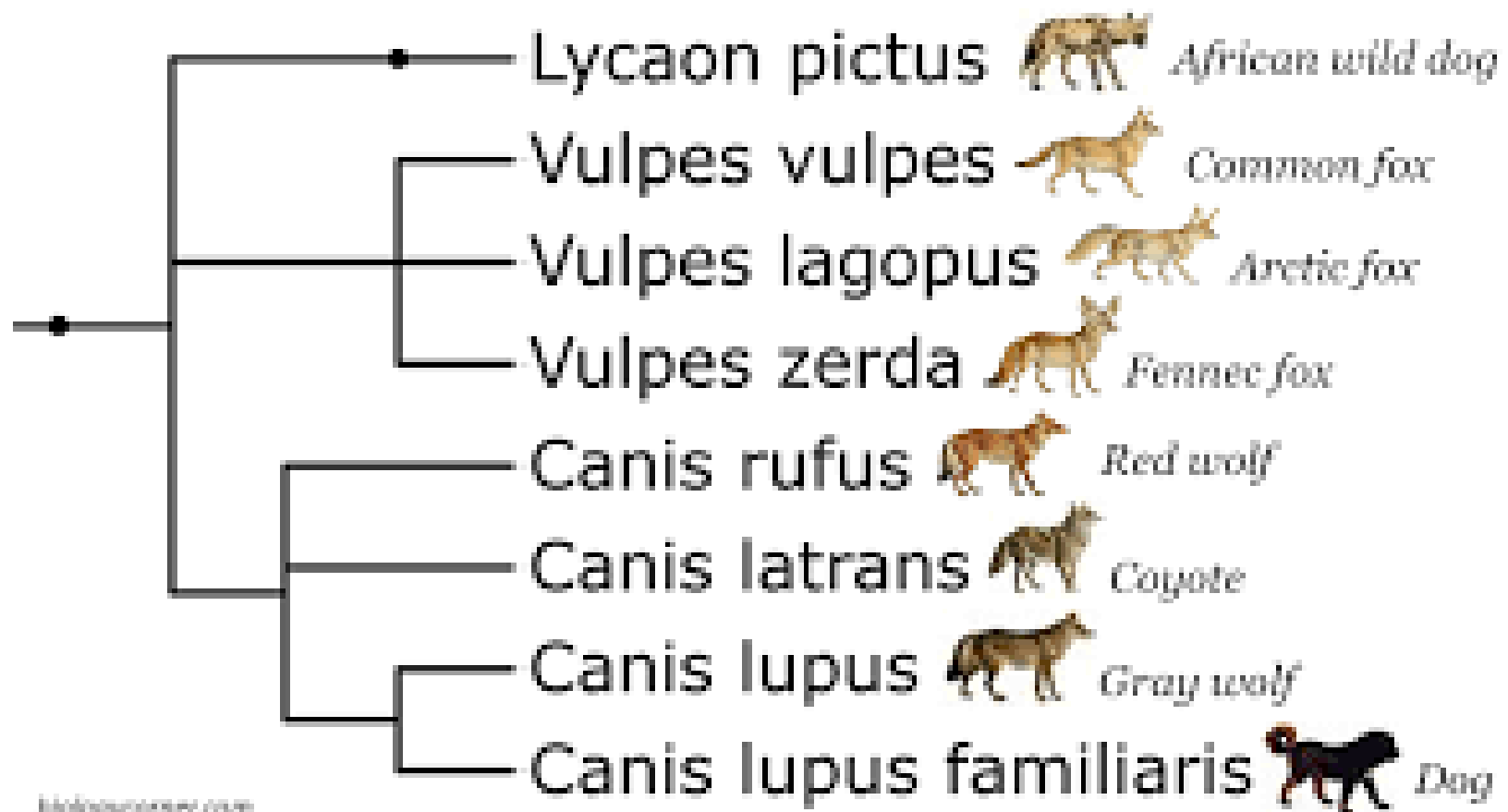


# **Biologists name organisms in systematic way**

**Concept outline**

# The classification organisms



# The polynomial system

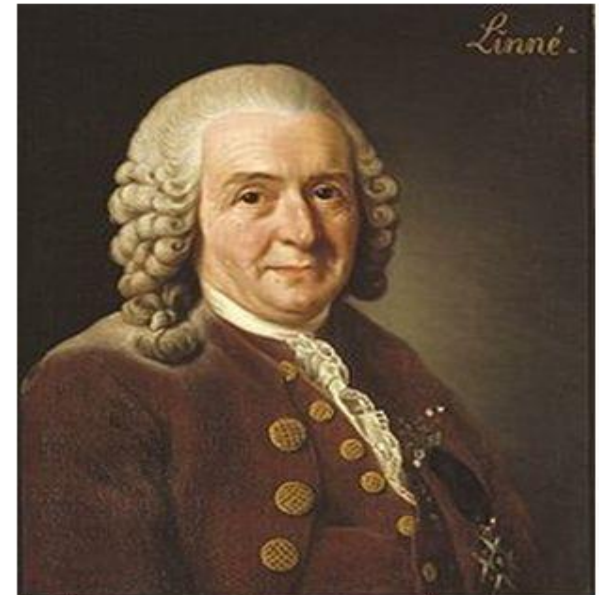
## Polynomial System

- A series of additional descriptive names added to the genus name
- Example: the scientific name for a bee using the polynomial system: *Apis pubescens, thorace subgriseo, abdomine fusco, pedibus posticis glabris utrinque margine ciliatis*



# Species name

Carolus Linnaeus



- Described organisms with two word names, instead of polynomials
- Developed binomial nomenclature
- First word = genus name
- Second word = species name

# Species name

I am billee  
in Hindi

I am mao in  
Chinese

I am kot in  
Russian

I am qat in  
Arabic

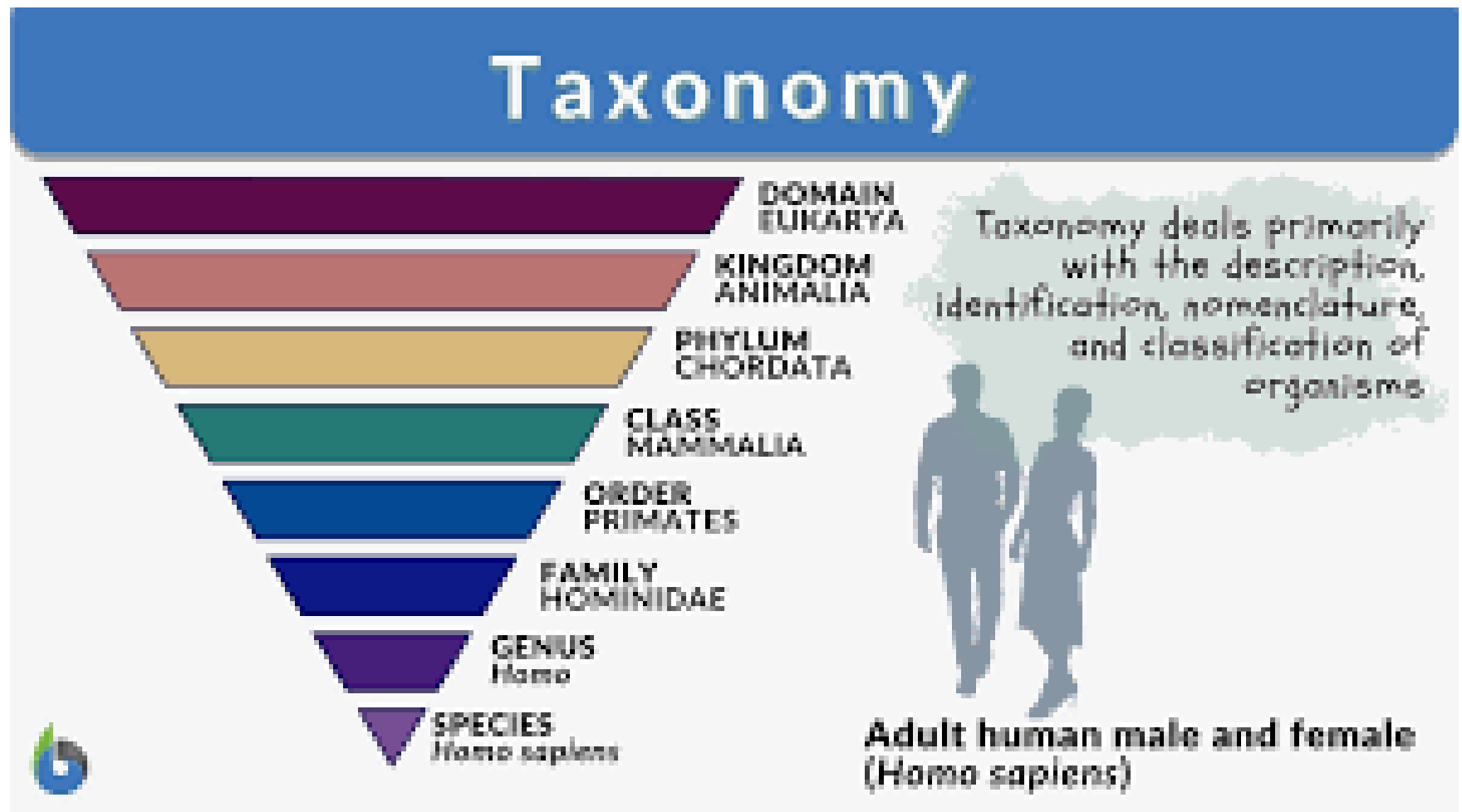
I am cat in  
English

I am chat in  
French

I am gato in  
Spanish

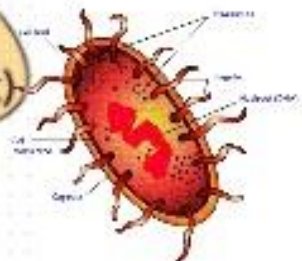
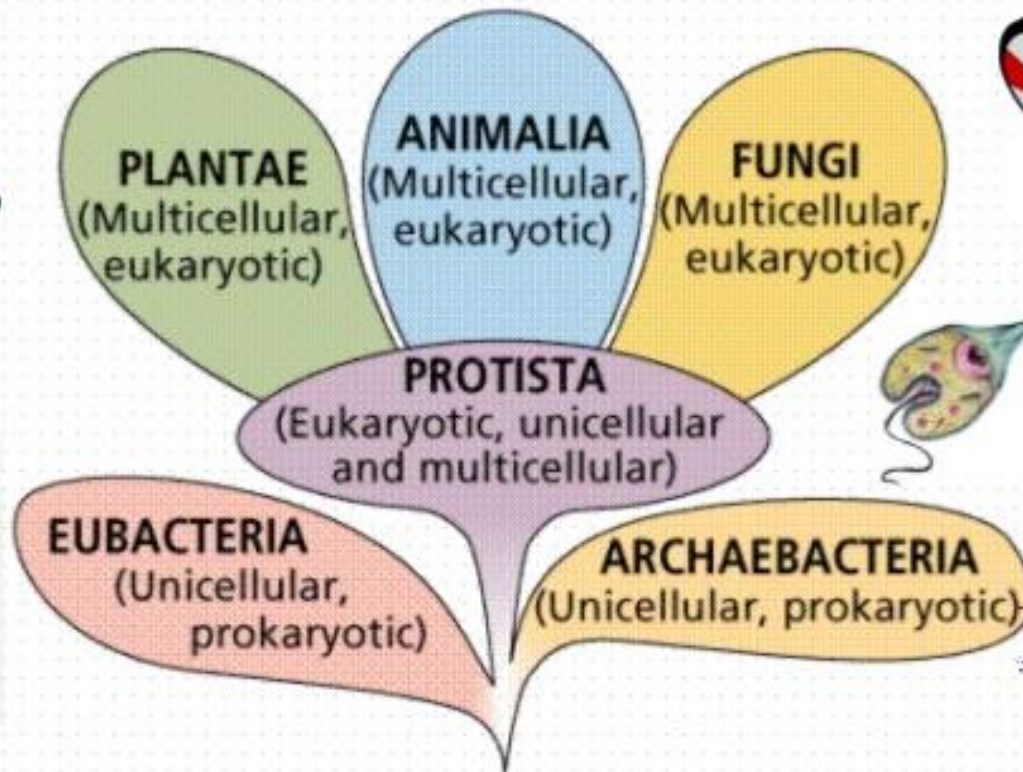
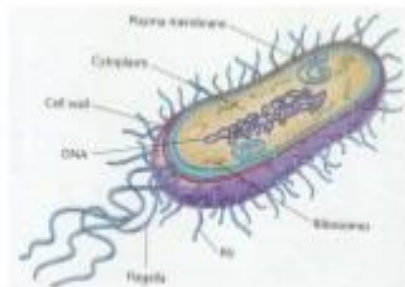


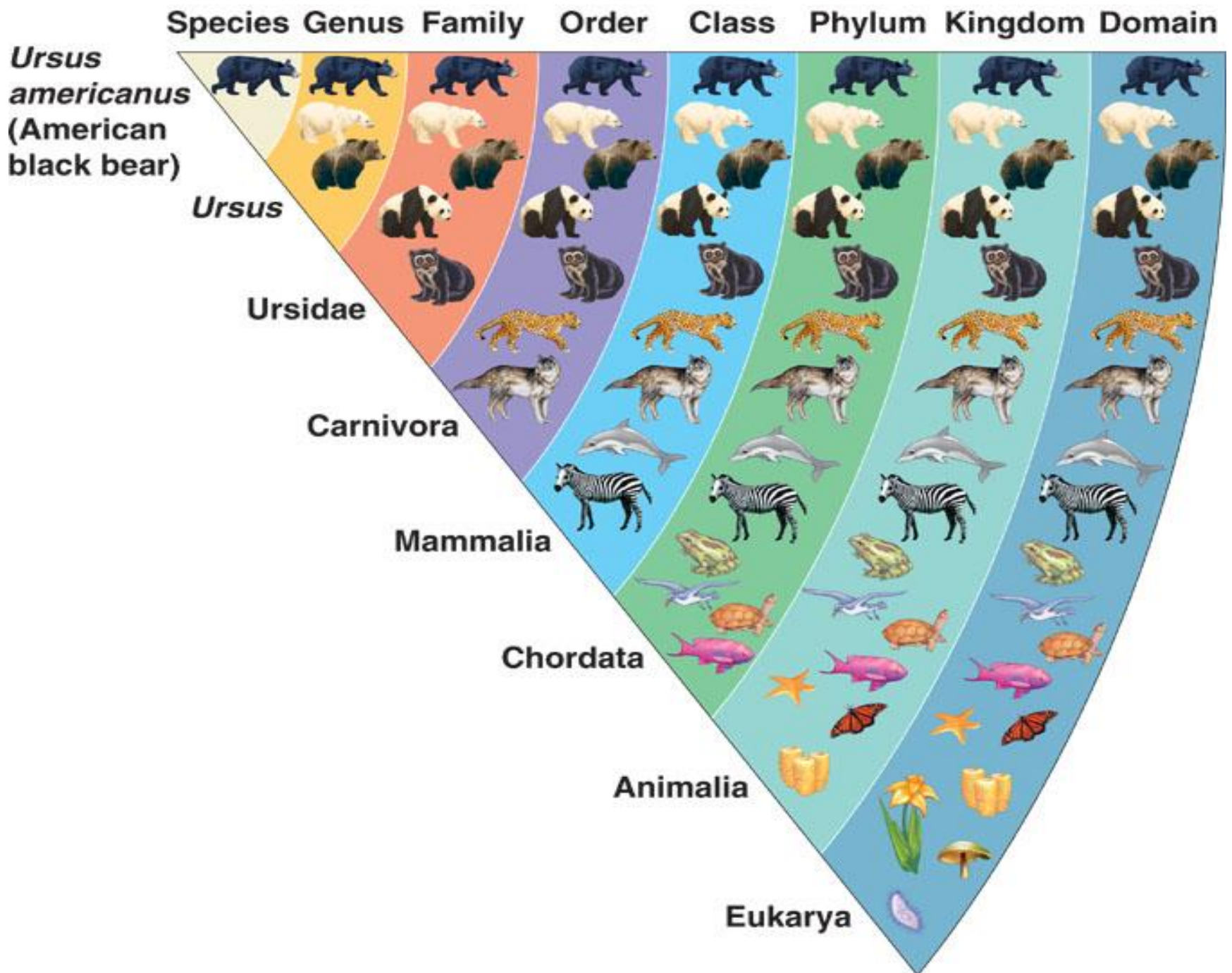
# The Taxonomic Hierachy





# THE SIX KINGDOMS



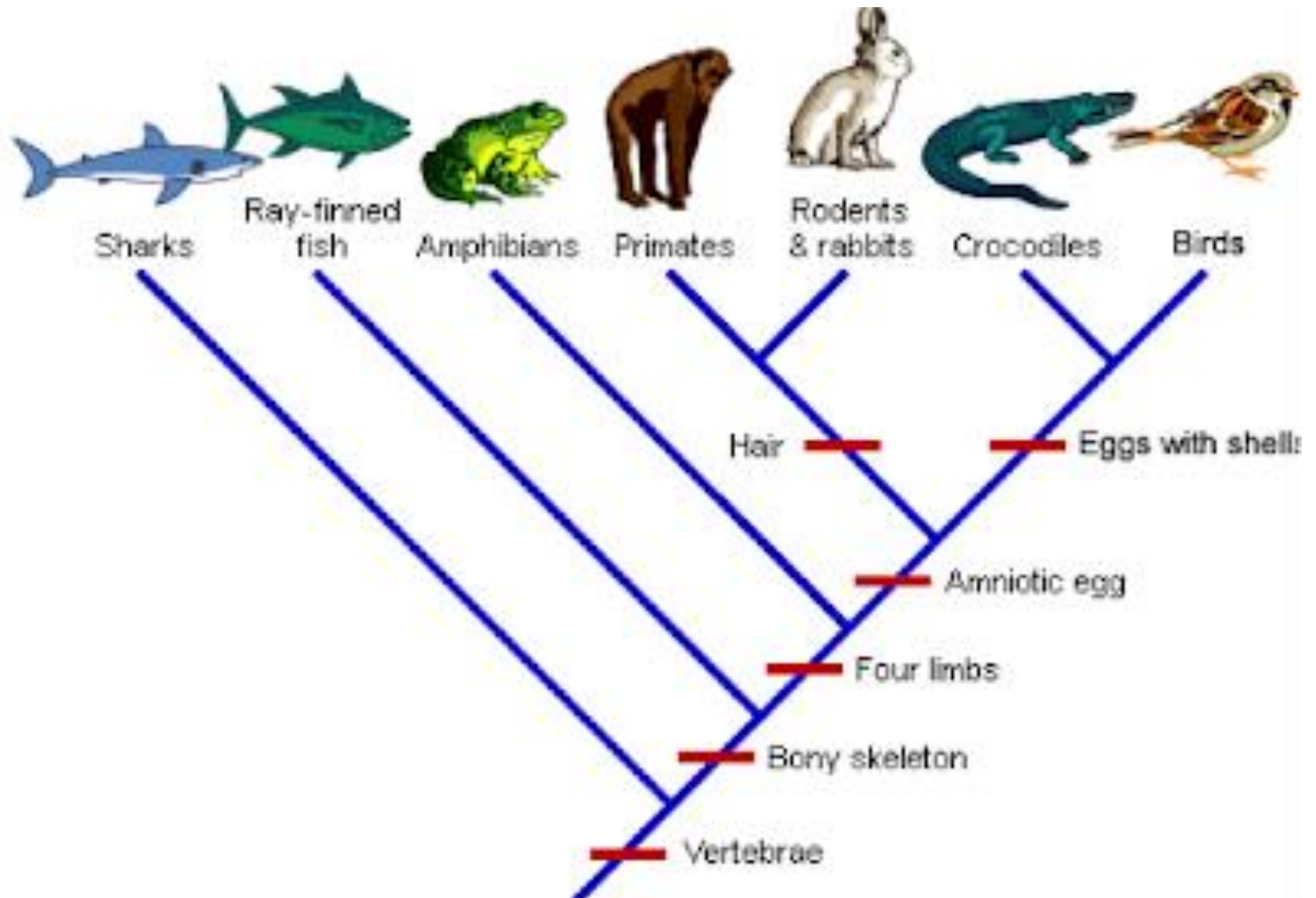




# What is Species

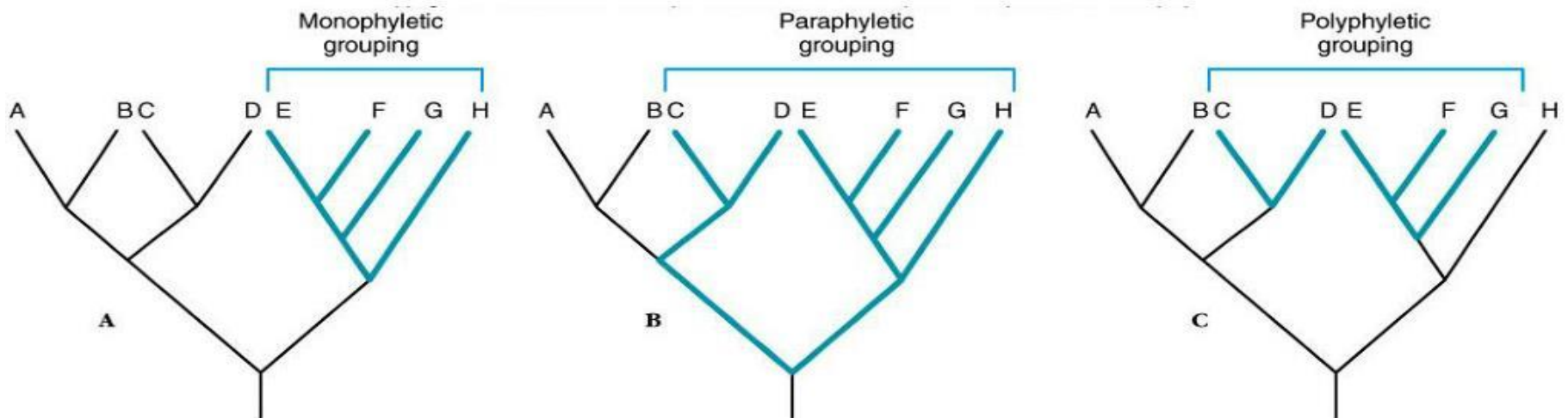


# Evolutionary species concept



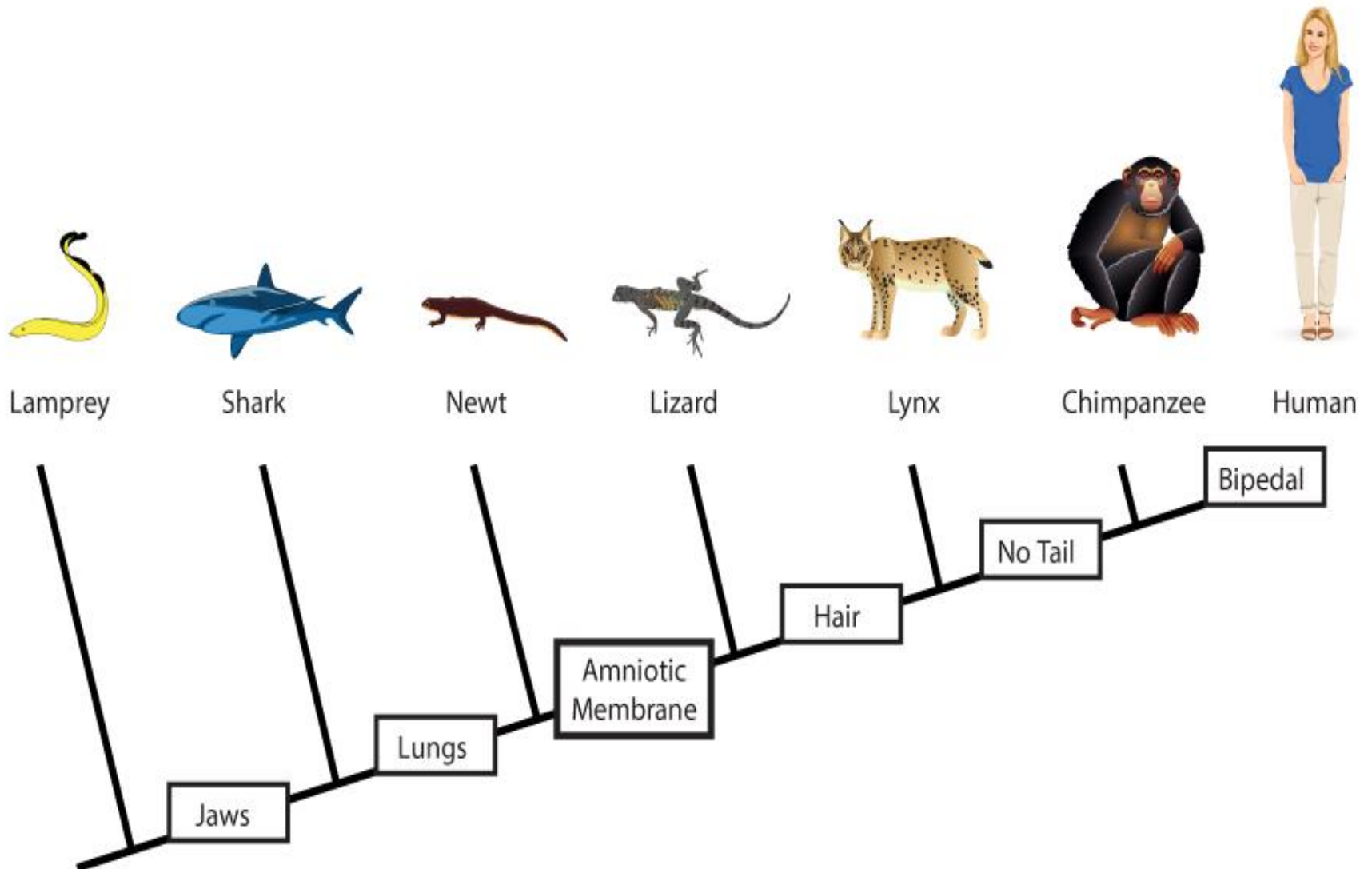
# Evolutionary classificatins

## Phylogenetic Groupings



- **Monophyletic**
  - All descendants and most recent common ancestor
- **Paraphyletic**
  - Leaves out some descendants from a recent common ancestor
- **Polyphyletic**
  - Arbitrary groupings which do not include common ancestors

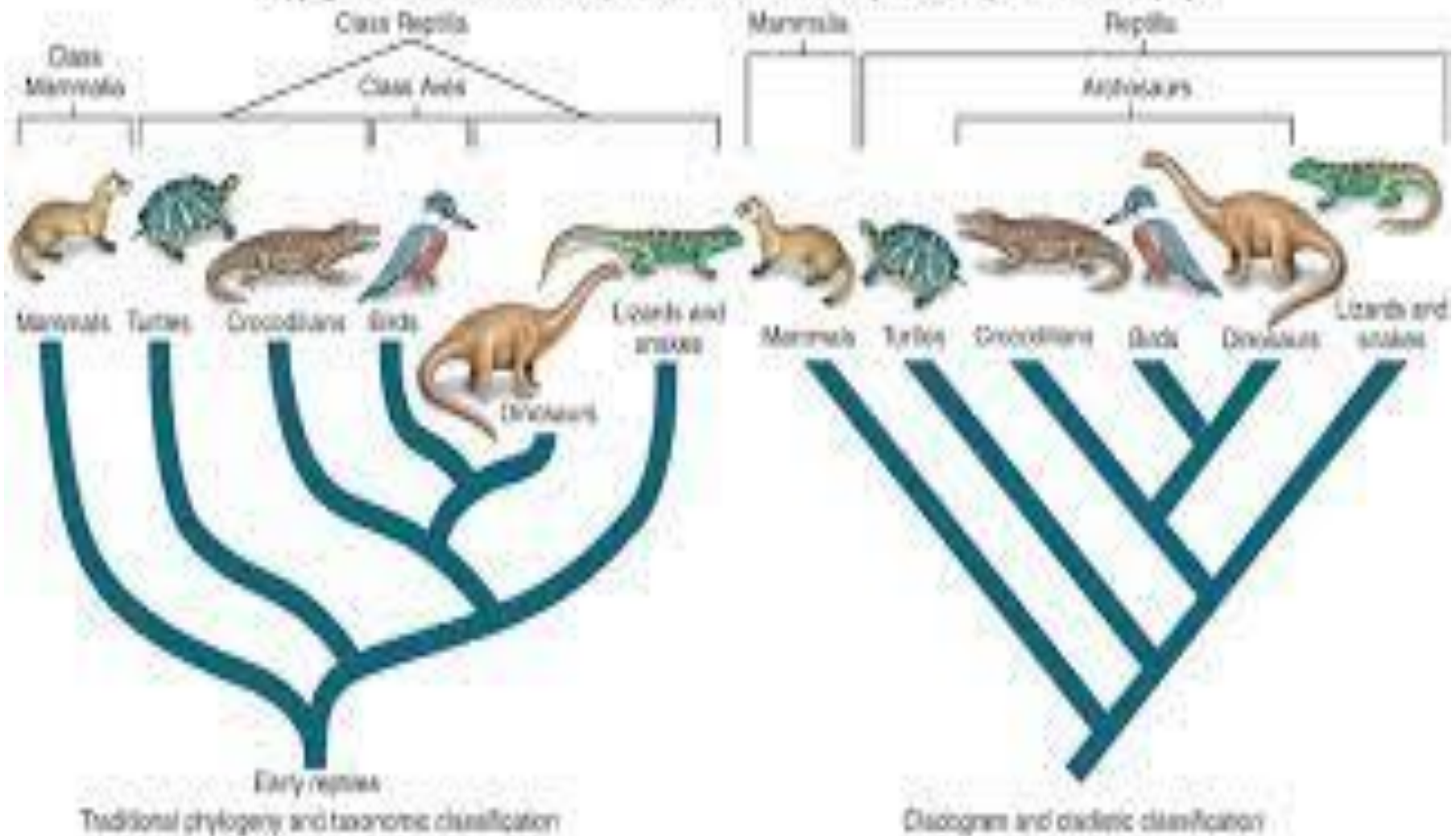
# Cladistics





# Traditional Taxonomy

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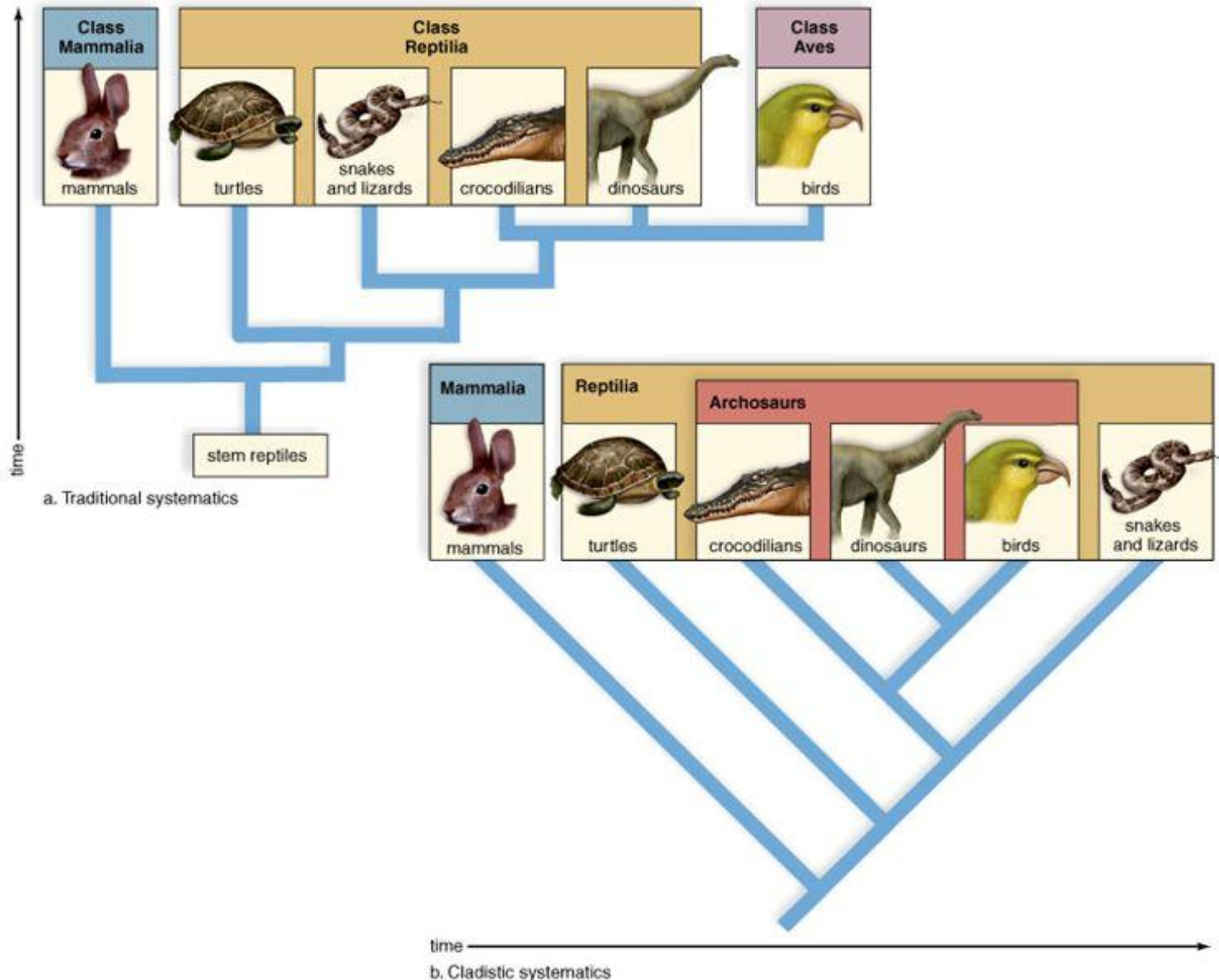




# Cladistic Versus Traditional View of Reptilian Phylogeny

27

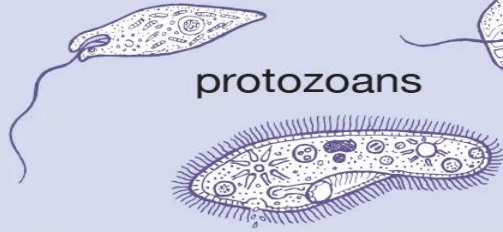
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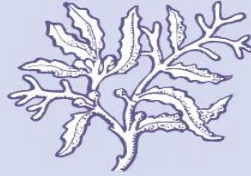
# The Kingdoms of life

## Kingdom of Protists

protozoans

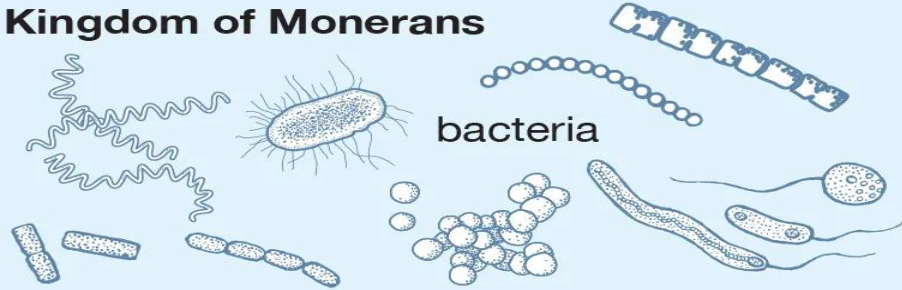


algae



## Kingdom of Monerans

bacteria



## Kingdom of Fungi



mushrooms



yeast



mold

## Kingdom of Plants

conifer tree



broad-leaved tree



fern



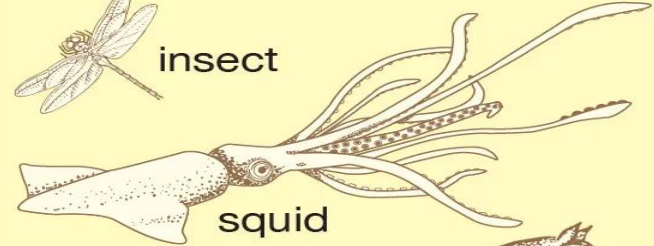
moss

## Kingdom of Animals

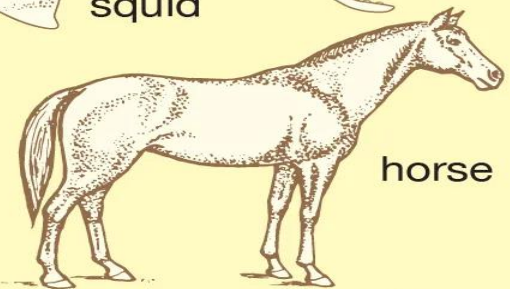
insect



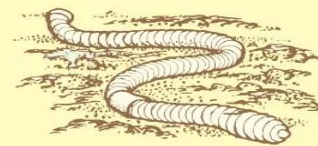
squid



horse



earthworm



sponge



Domain  
Eukarya

Domain  
Archaea

Domain  
Bacteria

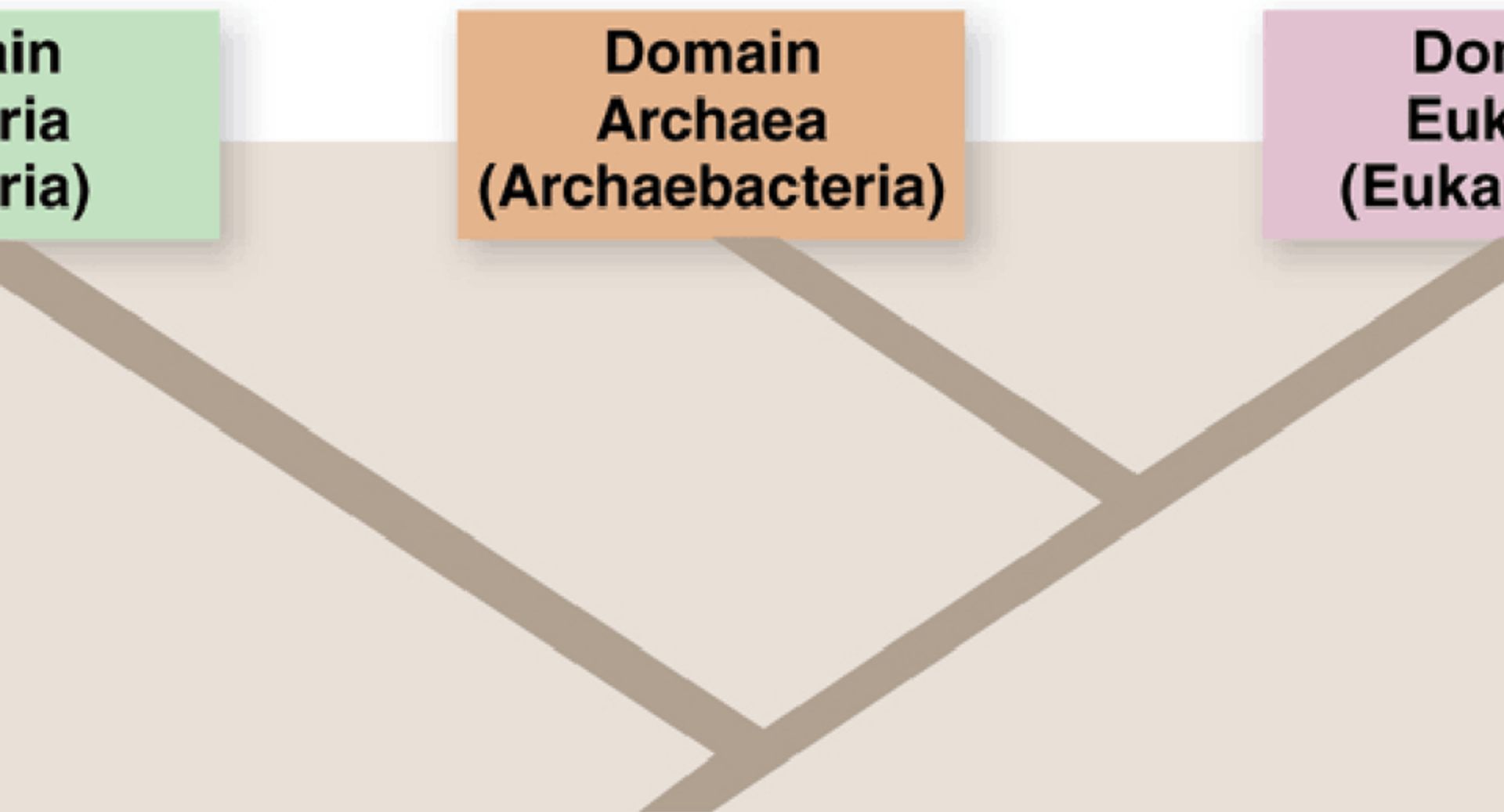
LUCA

```
graph BT; LUCA --> Eukarya; LUCA --> Archaea; LUCA --> Bacteria;
```

The diagram illustrates the three domains of life and their common ancestry. At the bottom, the text 'LUCA' (Last Universal Common Ancestor) is centered. Three white lines branch upwards from this point, forming a Y-shape. The leftmost branch leads to a purple rectangular box containing the text 'Domain Eukarya'. The middle branch leads to a light green rectangular box containing the text 'Domain Archaea'. The rightmost branch leads to a bright green rectangular box containing the text 'Domain Bacteria'.

# Three Domains of Life

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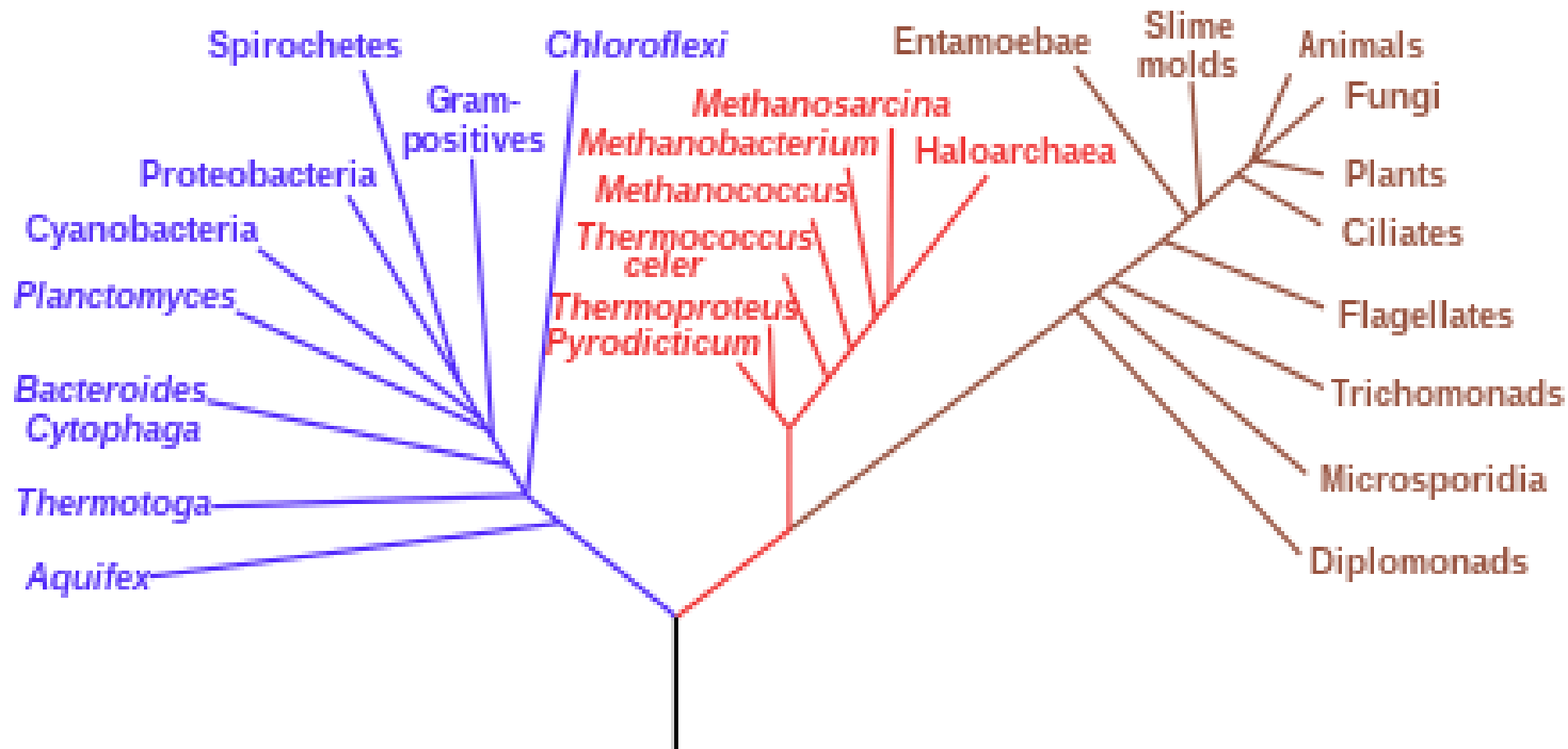


# Domain Archaea (Archaeobacteria)

## Bacteria

## Archaea

## Eukaryota



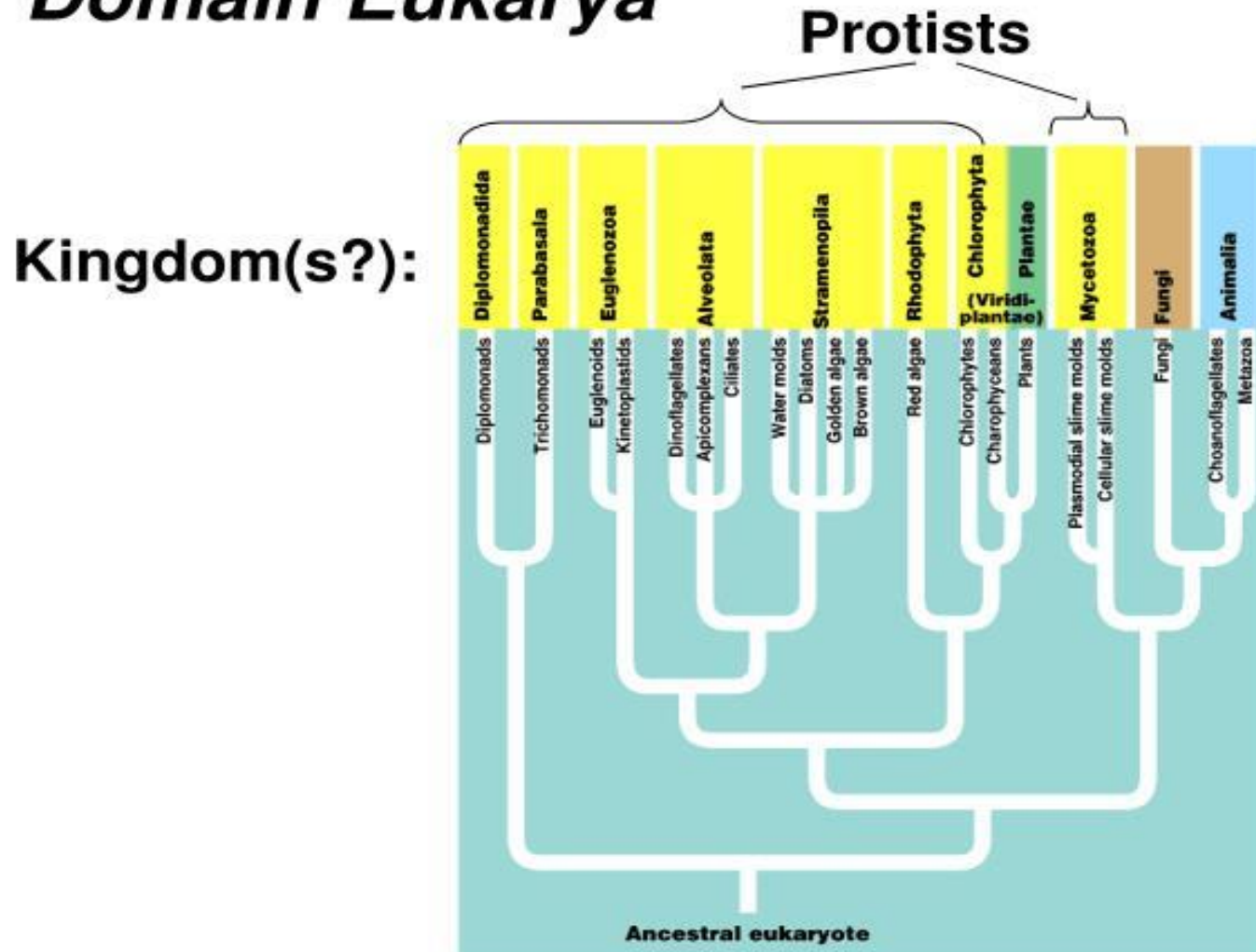


# Domain (Bacteria)

FEATURES	PROKARYOTIC CELL	EUKARYOTIC CELL
<b>Cell wall</b>	Made up of <b>peptidoglycan</b> in Eubacteria and in Archaea, usually made of <b>pseudomurein</b> .	Present in <b>plants</b> (chiefly made up of cellulose, hemicellulose and pectic substances) and in <b>fungi</b> (chiefly made of chitin). Absent in <b>animal cells</b> .
<b>Cell Size</b>	Usually small (0.1-5.0 $\mu\text{m}$ )	Large (5-100 $\mu\text{m}$ )
<b>Lipids of the membrane</b>	Some branched hydrocarbons	Unbranched hydrocarbons
<b>Membrane bound organelles such as Golgi apparatus, ER, lysosomes etc</b>	Absent	Present
<b>Nuclear envelope</b>	Absent	Present
<b>Histones</b>	Absent	Present
<b>Chromosome</b>	Circular	Linear
<b>Ribosomes</b>	70S type	80S type (in cytosol) and 70S (in organelles)
<b>Thylakoids</b>	If present, lie free in cytoplasm.	They are grouped in chloroplasts.
<b>Introns</b>	Absent	Present
<b>Initiator amino acid at the time of protein synthesis</b>	Formyl-methionine	Methionine
<b>RNA polymerase</b>	One type in eubacteria but of several types in archaea.	Several types (I,II,III)
<b>Response to antibiotics such as streptomycin and chloramphenicol</b>	Growth is inhibited.	Growth is not inhibited.
<b>Spindle apparatus formation during division</b>	It is not formed.	It is formed.
<b>Transcription and Translation</b>	These processes occur in cytoplasm.	Transcription occurs in nucleus while translation occurs in cytoplasm.
<b>Sterol in plasma membrane</b>	Absent (except <i>Mycoplasma</i> )	Present

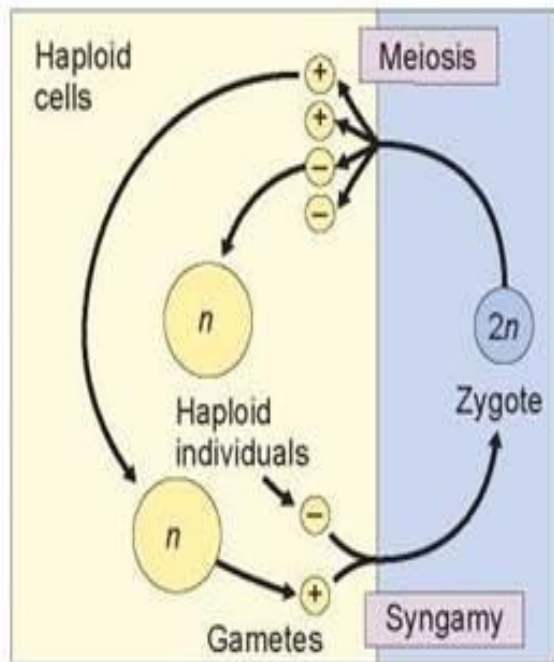
# Domain Eukaryotes

## *Domain Eukarya*

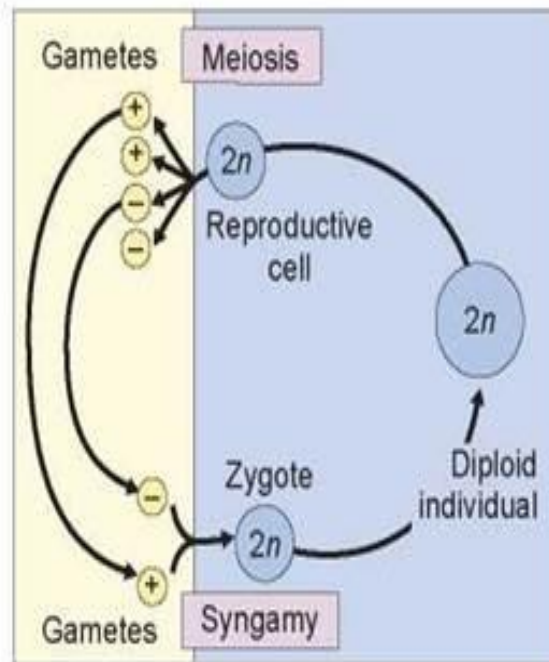


# Eukaryotic Life Cycle

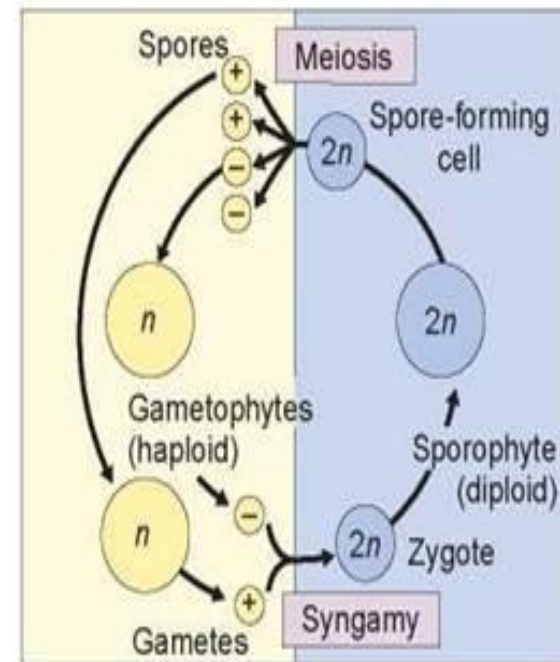
Key:  Haploid  Diploid



(a) Zygotic meiosis



(b) Gametic meiosis



(c) Sporic meiosis