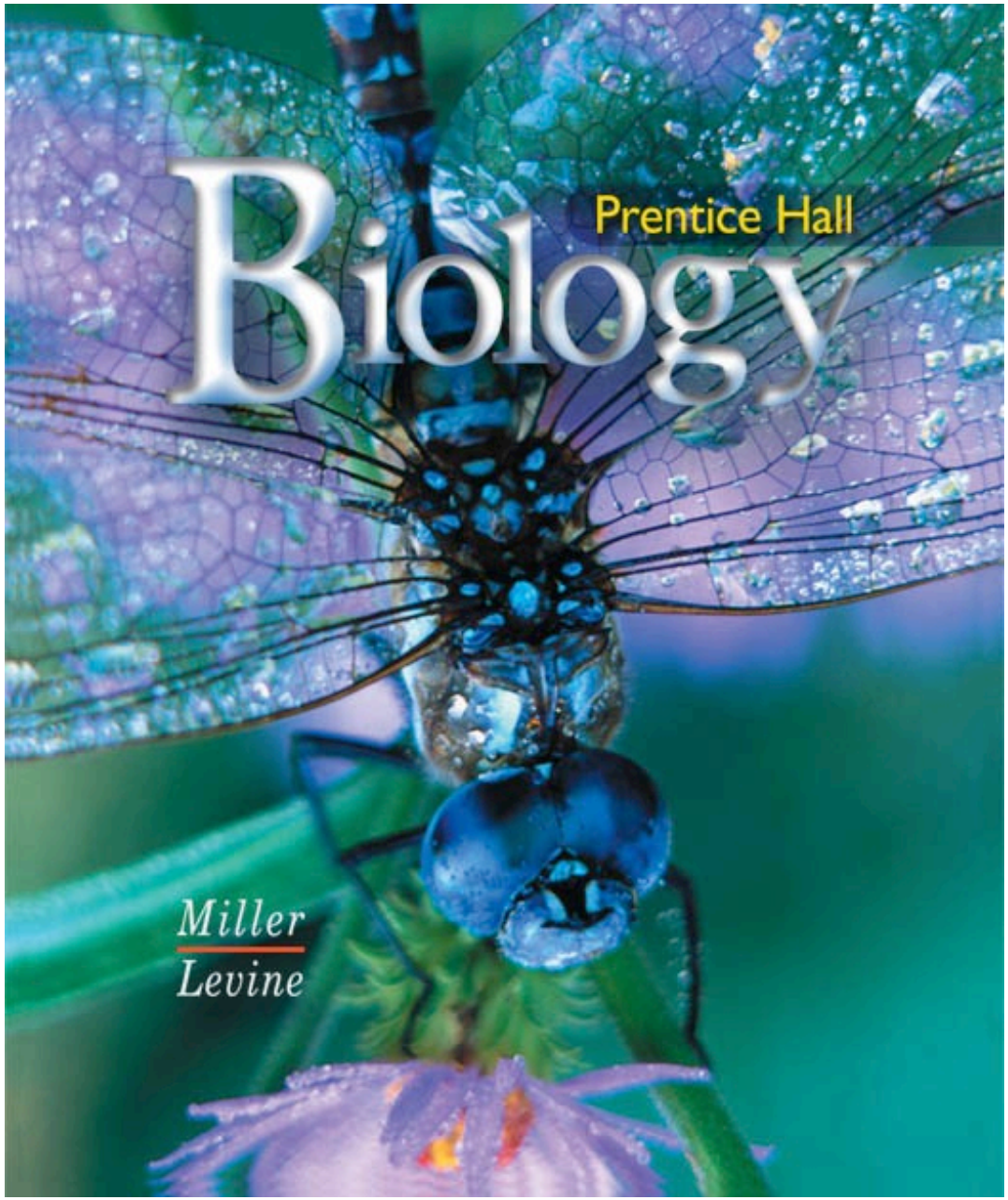


18-3 Kingdoms and Domains

The Tree of Life Evolves

Systems of classification adapt to new discoveries.

Linnaeus classified organisms into two kingdoms—animals and plants.

Five Kingdoms

Scientists realized there were enough differences among organisms to make 5 kingdoms:

- Monera
- Protista
- Fungi
- Plantae
- Animalia

Six Kingdoms

Recently, biologists recognized that Monera were composed of two distinct groups: **Eubacteria** and **Archaebacteria**

The six-kingdom system of classification includes:

- Eubacteria
- Archaebacteria
- Protista
- Fungi
- Plantae
- Animalia

Changing Number of Kingdoms

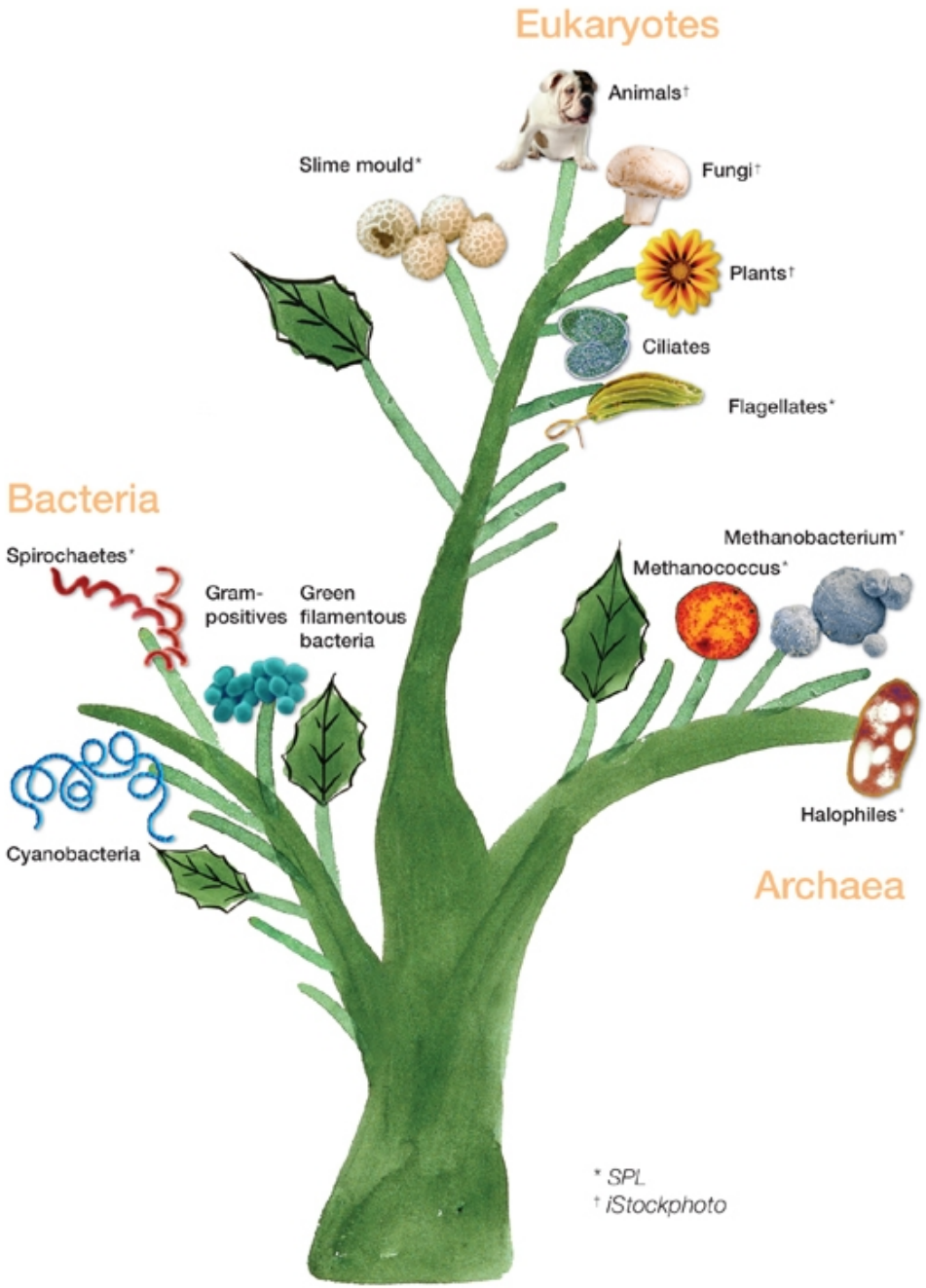
Introduced	Names of Kingdoms					
1700's	Plantae					Animalia
Late 1800's	Protista			Plantae		Animalia
1950's	Monera		Protista	Fungi	Plantae	Animalia
1990's	Eubacteria	Archae-bacteria	Protista	Fungi	Plantae	Animalia

The Three-Domain System

Molecular analyses have given rise to a new taxonomic category that is now recognized by many scientists.

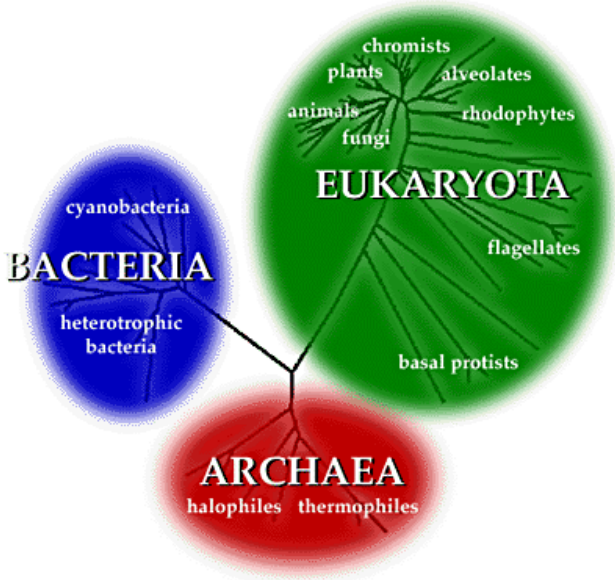
The **domain** is a more inclusive category than any other — **larger than a kingdom**.

TREE OF LIFE



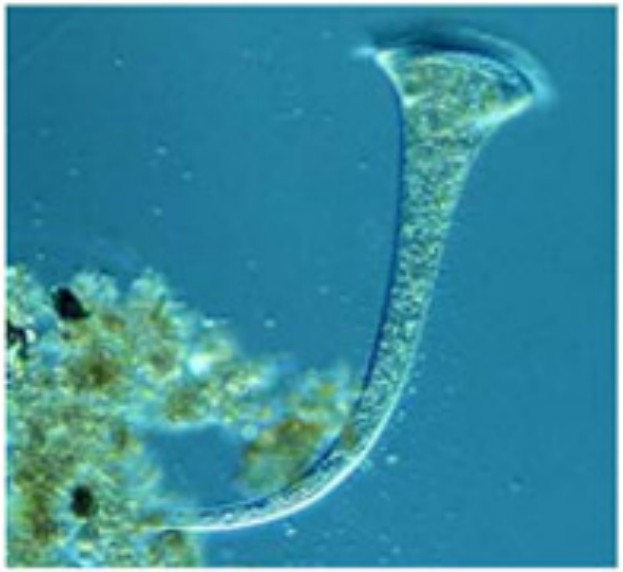
The three domains are:

- **Eukarya,** which is composed of protists, fungi, plants, and animals.
- **Bacteria,** which corresponds to the kingdom Eubacteria.
- **Archaea,** which corresponds to the kingdom Archaebacteria.



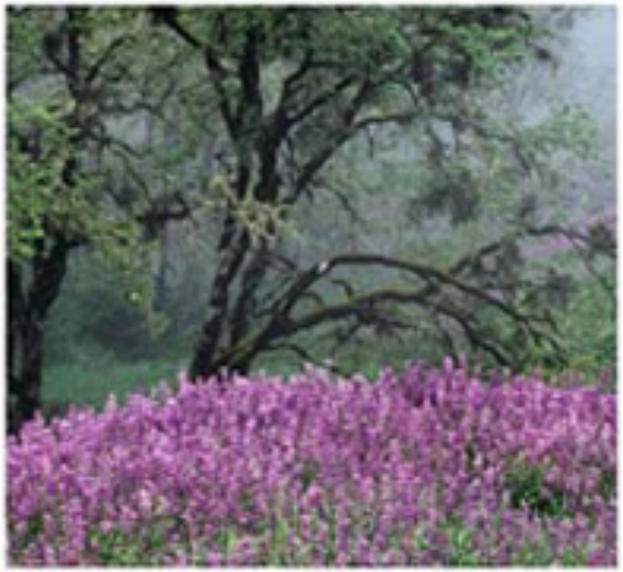
Bacteria

Archaea



Protista

3 Domains of Organisms: Eubacteria, Archaea, & Eucarya

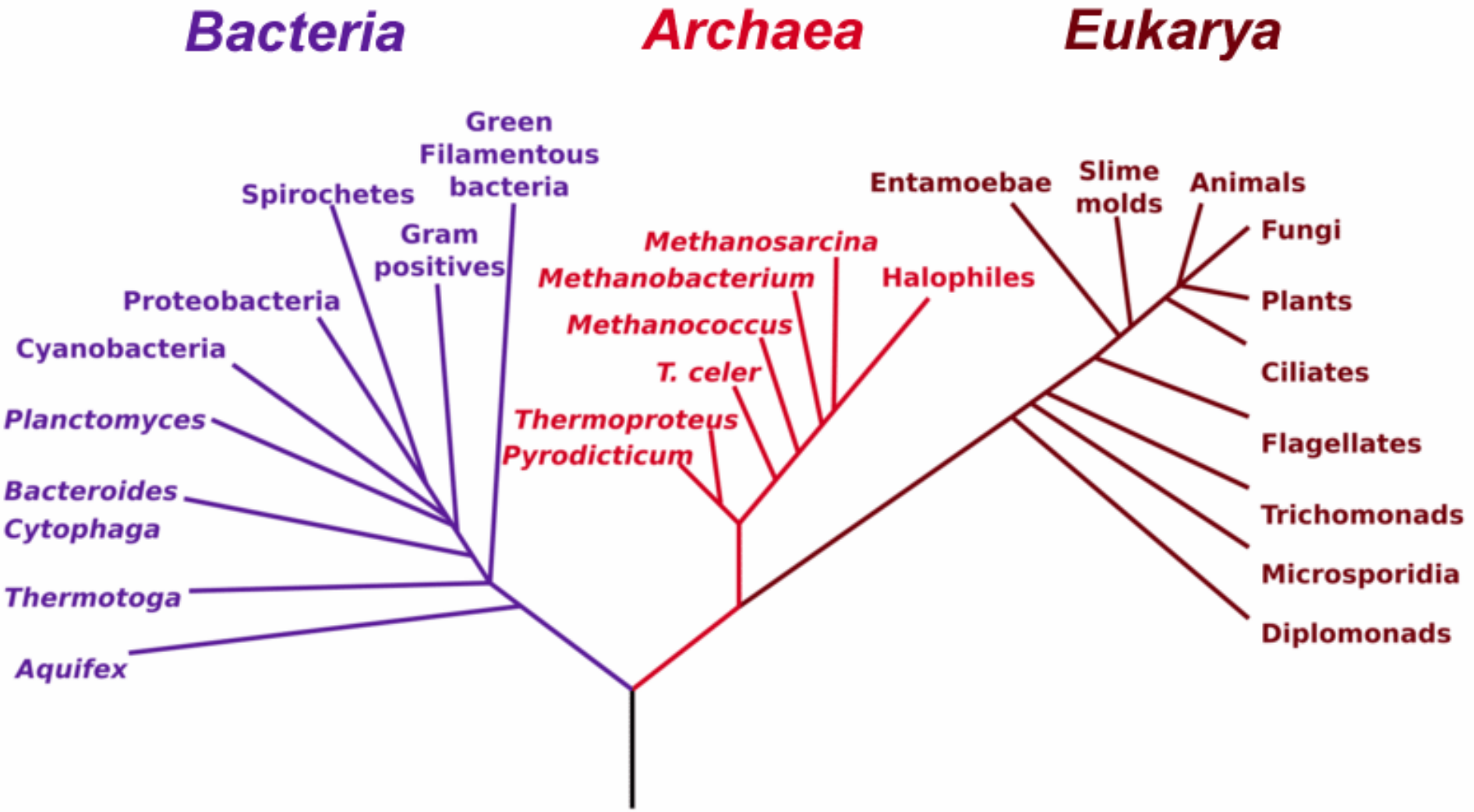


Plantae

Fungi

Animalia

Phylogenetic Tree of Life



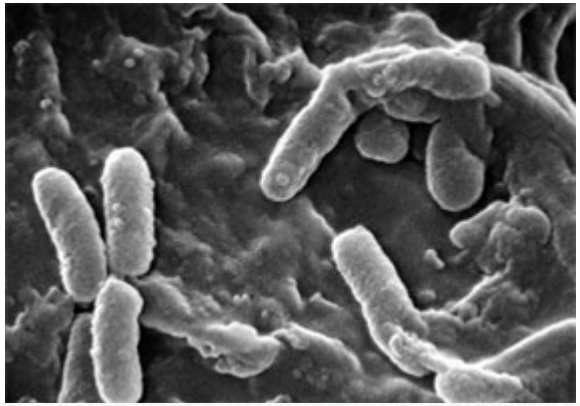
Domain Bacteria

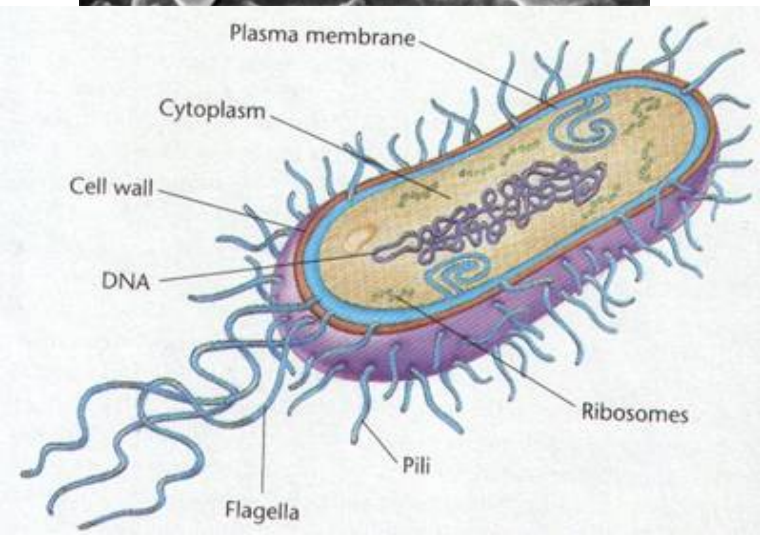
Members of the domain Bacteria are **unicellular prokaryotes**.

Their cells have thick, rigid cell walls that surround a cell membrane.

Their cell walls contain **peptidoglycan**.

The domain Bacteria corresponds to the kingdom **Eubacteria**.





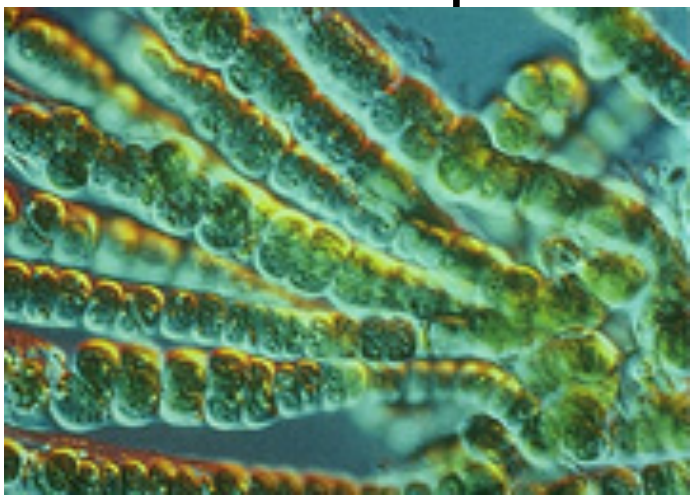
Classification of Living Things	
DOMAIN	Bacteria
KINGDOM	Eubacteria
CELL TYPE	Prokaryote
CELL STRUCTURES	Cell walls with peptidoglycan
NUMBER OF CELLS	Unicellular
MODE OF NUTRITION	Autotroph or heterotroph
EXAMPLES	*Streptococcus*, *Escherichia coli*

Domain Archaea

Members of the domain **Archaea** are **unicellular prokaryotes**.

Many live in extreme environments.

Their cell walls lack peptidoglycan, and their cell membranes contain unusual lipids not found in any other organism.



The domain Archaea corresponds to the kingdom **Archaebacteria.**

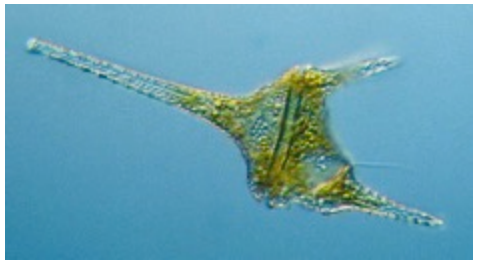
Classification of Living Things	
DOMAIN	Archaea
KINGDOM	Archaebacteria
CELL TYPE	Prokaryote
CELL STRUCTURES	Cell walls without peptidoglycan
NUMBER OF CELLS	Unicellular
MODE OF NUTRITION	Autotroph or heterotroph
EXAMPLES	Methanogens, halophiles

Domain Eukarya

The domain **Eukarya** consists of organisms that have a nucleus.

This domain is organized into four kingdoms:

- **Protista**
- **Fungi**
- **Plantae**
- **Animalia**

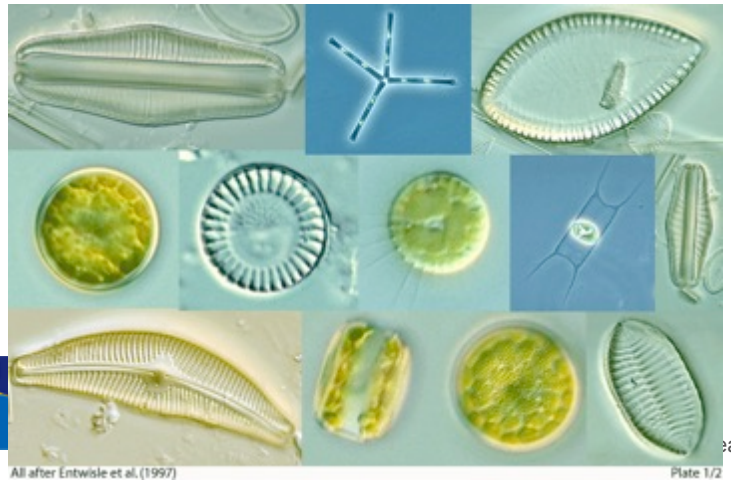


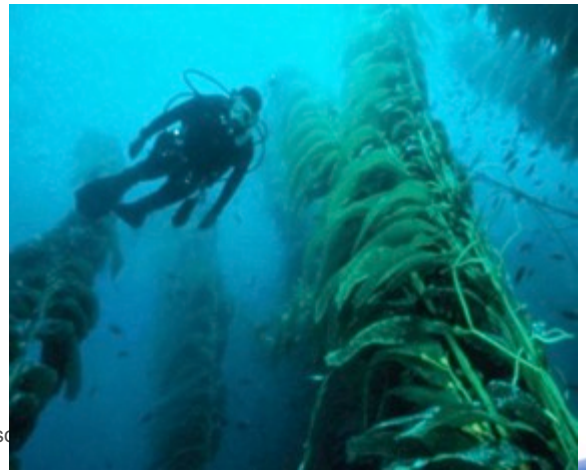
Protista

The kingdom **Protista** is composed of eukaryotic organisms that cannot be classified as animals, plants, or fungi.

Its members display the greatest variety.

They can be unicellular or multicellular; photosynthetic or heterotrophic; and can share characteristics with plants, fungi, or animals.





Fungi

Members of the kingdom **Fungi** are heterotrophs.

Most fungi feed on dead or decaying organic matter by secreting digestive enzymes into it and absorbing small food molecules into their bodies.

They can be either multicellular (mushrooms) or unicellular (yeasts).

Plantae

Members of the kingdom **Plantae** are multicellular, photosynthetic autotrophs.

Plants are **nonmotile**—they cannot move from place to place.

Plants have cell walls that contain cellulose.

Animalia

Members of the kingdom **Animalia** are multicellular and heterotrophic.

The cells of animals do not have cell walls.

There is great diversity within the animal kingdom, and many species exist in nearly every part of the planet.

1 Organisms whose cell walls contain peptidoglycan belong in the kingdom

a. Fungi.

b. Eubacteria.

c. Plantae.

d. Archaebacteria.

2 Multicellular organisms with no cell walls or chloroplasts are members of the kingdom

a. Animalia.

b. Protista.

c. Plantae.

d. Fungi.

3 Organisms that have cell walls containing cellulose are found in

a. Eubacteria and Plantae.

b. Fungi and Plantae.

c. Plantae and Protista.

d. Plantae only.

4 Molecular analyses have given rise to a new taxonomic classification that includes

a. three domains.

b. seven kingdoms.

c. two domains.

d. five kingdoms.

5 Which of the following contain more than one kingdom?

a. only Archaea

b. only Bacteria

c. only Eukarya

d. both Eukarya and Archaea