INTRODUCTORY CLASS TO BIO 102

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Course Goals

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Course Goals

INTRODUCTION

1. **Defining an animal**
2. **The kingdom system of classification**
3. **Kingdom animalia and its divisions**
4. **Taxonomy and nomenclature**

The Major Divisions of Life

•Traditionally all living things were classified as being either plants or animals.

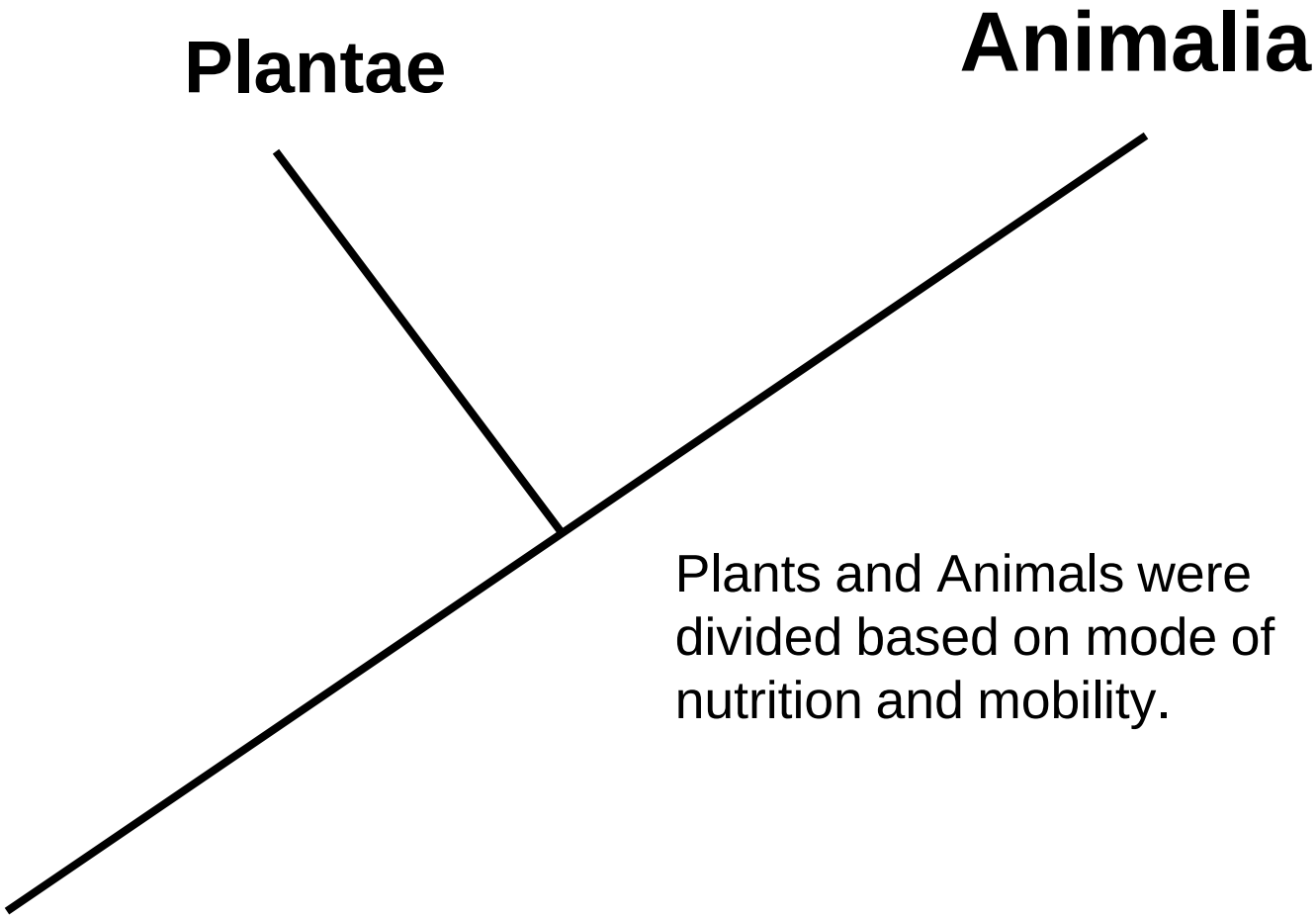
The Major Divisions of Life

•Traditionally all living things were classified as being either plants or animals.

Plants: Autotrophic (produce organic food molecules through photosynthesis) and sessile (don’t move).

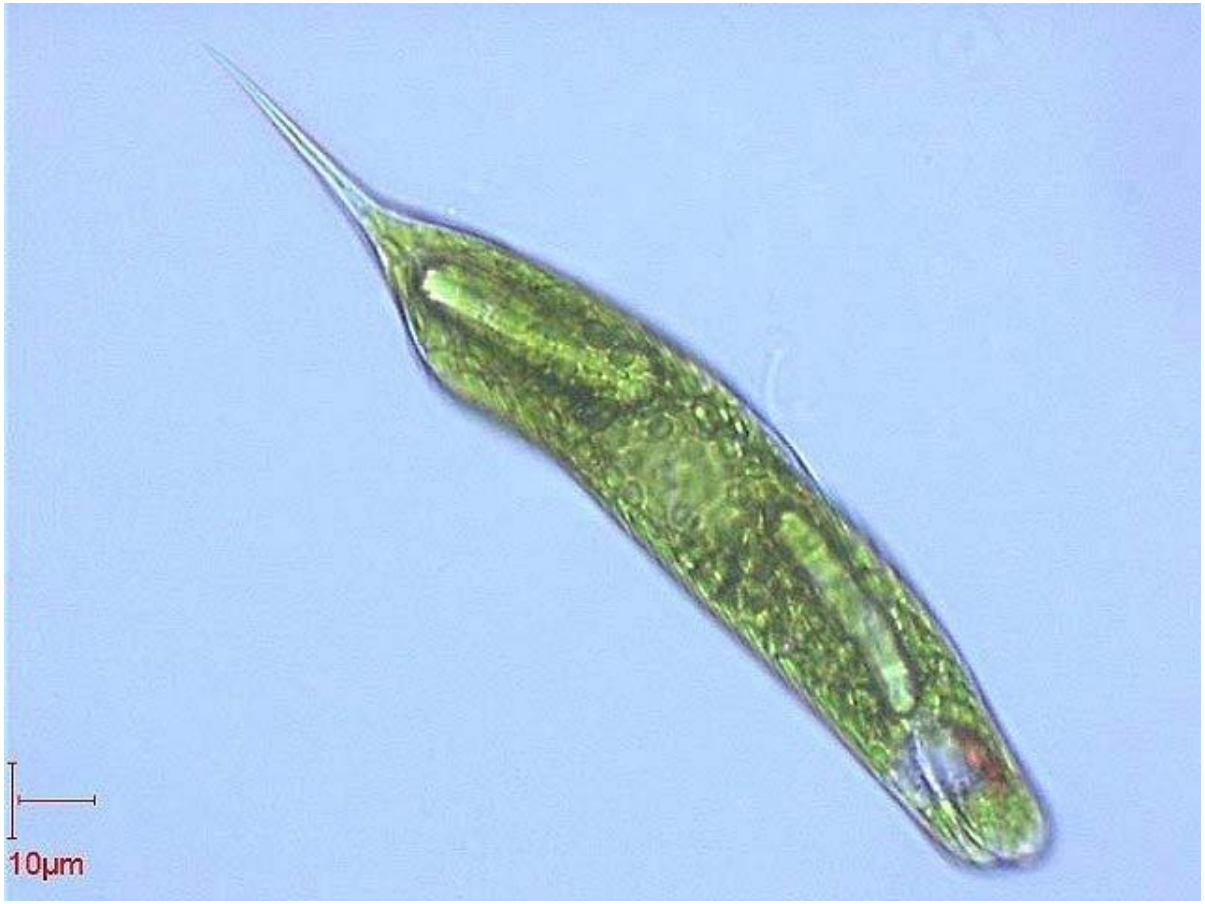
Animals: Heterotrophic (obtain organic food molecules by eating other organisms or their by products) and mobile.

The 2 kingdom System



Plants and Animals were divided based on mode of nutrition and mobility.

Problems With the 2 Kingdom System



Euglena: mobile and autotrophic.

Is this a plant or an animal?

Problems With the 2 Kingdom System

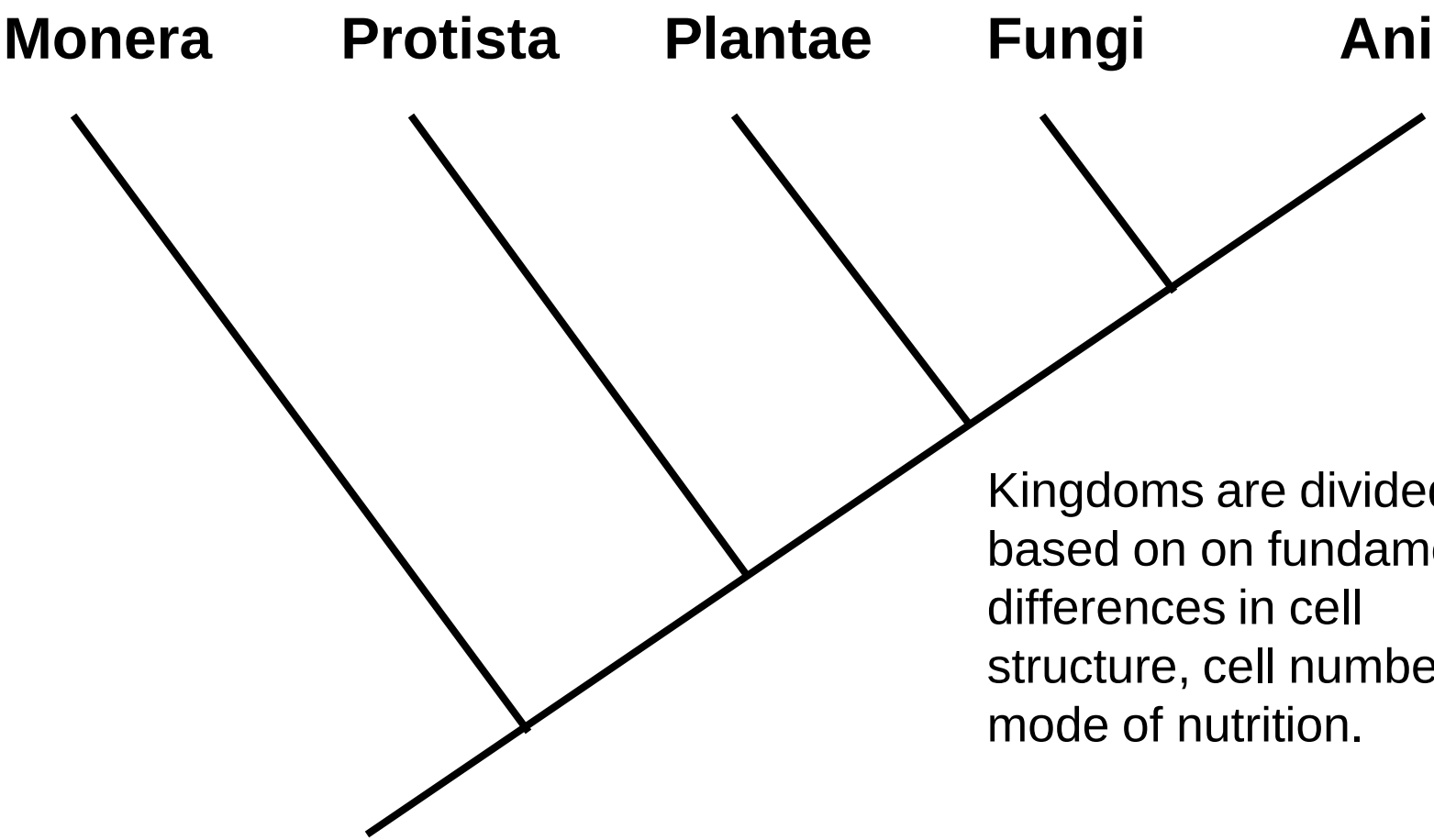
Mold and mushrooms: sessile and heterotrophic

Are these plants or animals?

The Major Divisions of Life

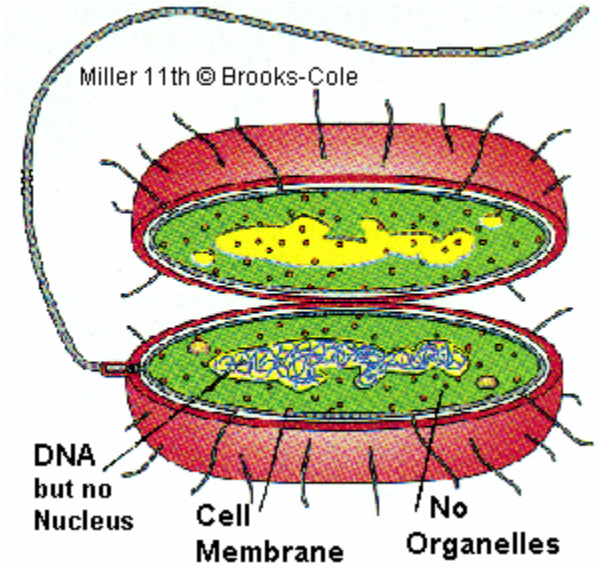
- The 2 kingdom system was abandoned in the late 60's in favor of the "five-kingdom system".
- The "five-kingdom system" divided organisms based on fundamental differences in cell structure, cell number, and mode of nutrition.

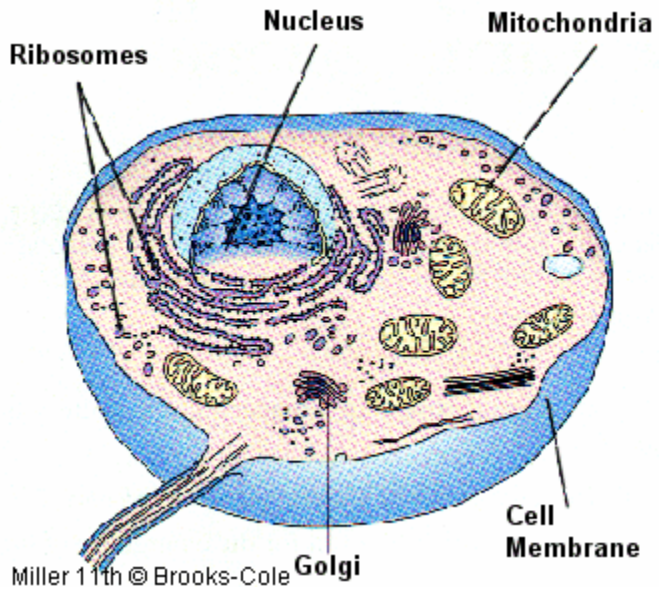
The 5 kingdom System



Kingdoms are divided based on on fundamental differences in cell structure, cell number, and mode of nutrition.

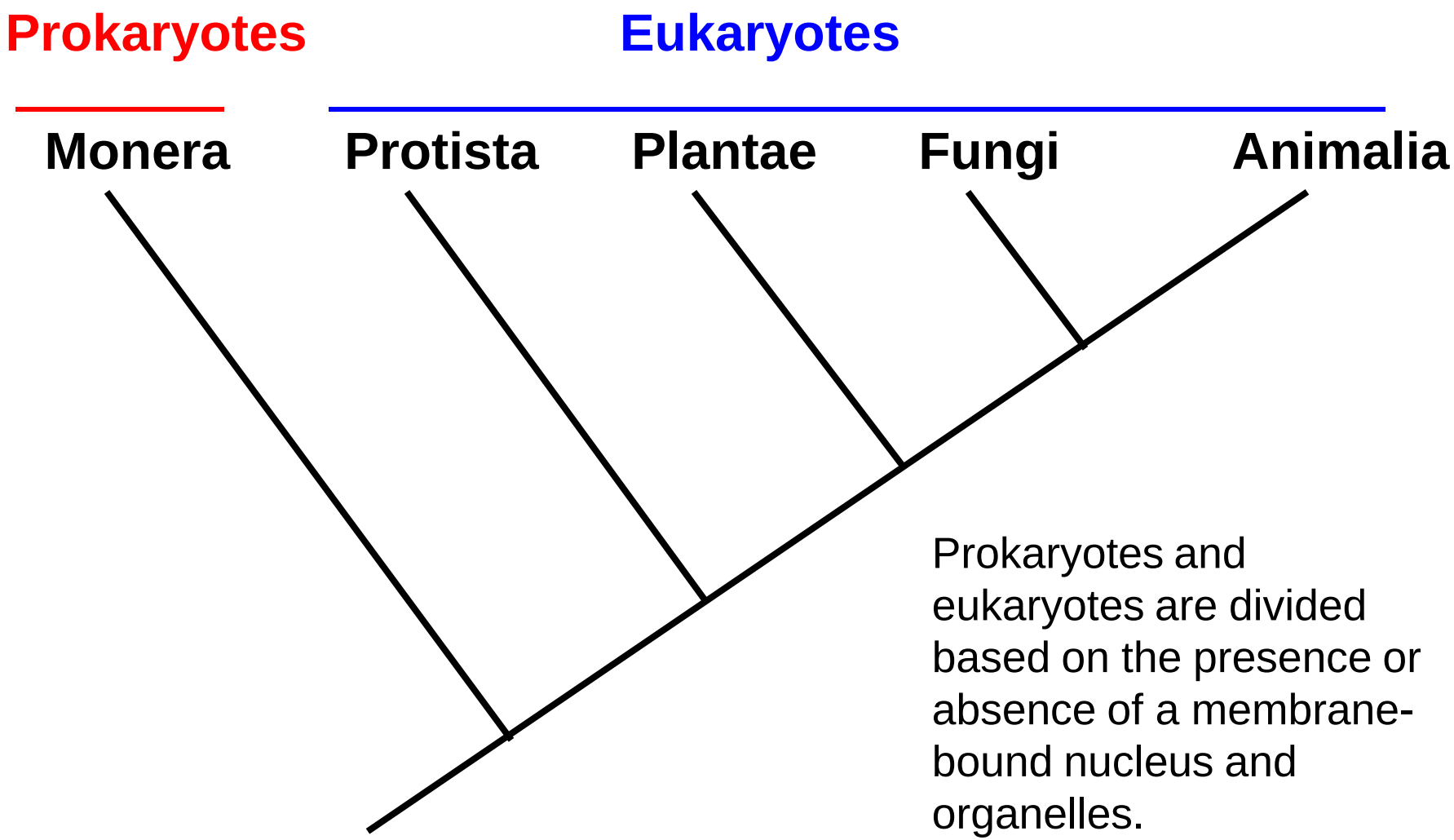
Prokaryotes and Eukaryotes





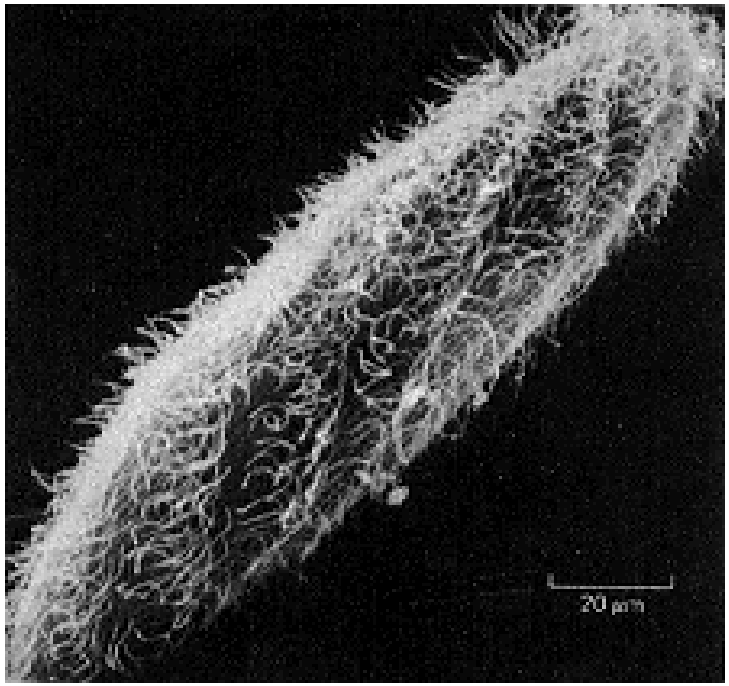
Prokaryotic cell: no nucleus or organelles

Eukaryotic cell: membrane bound nucleus and organelles



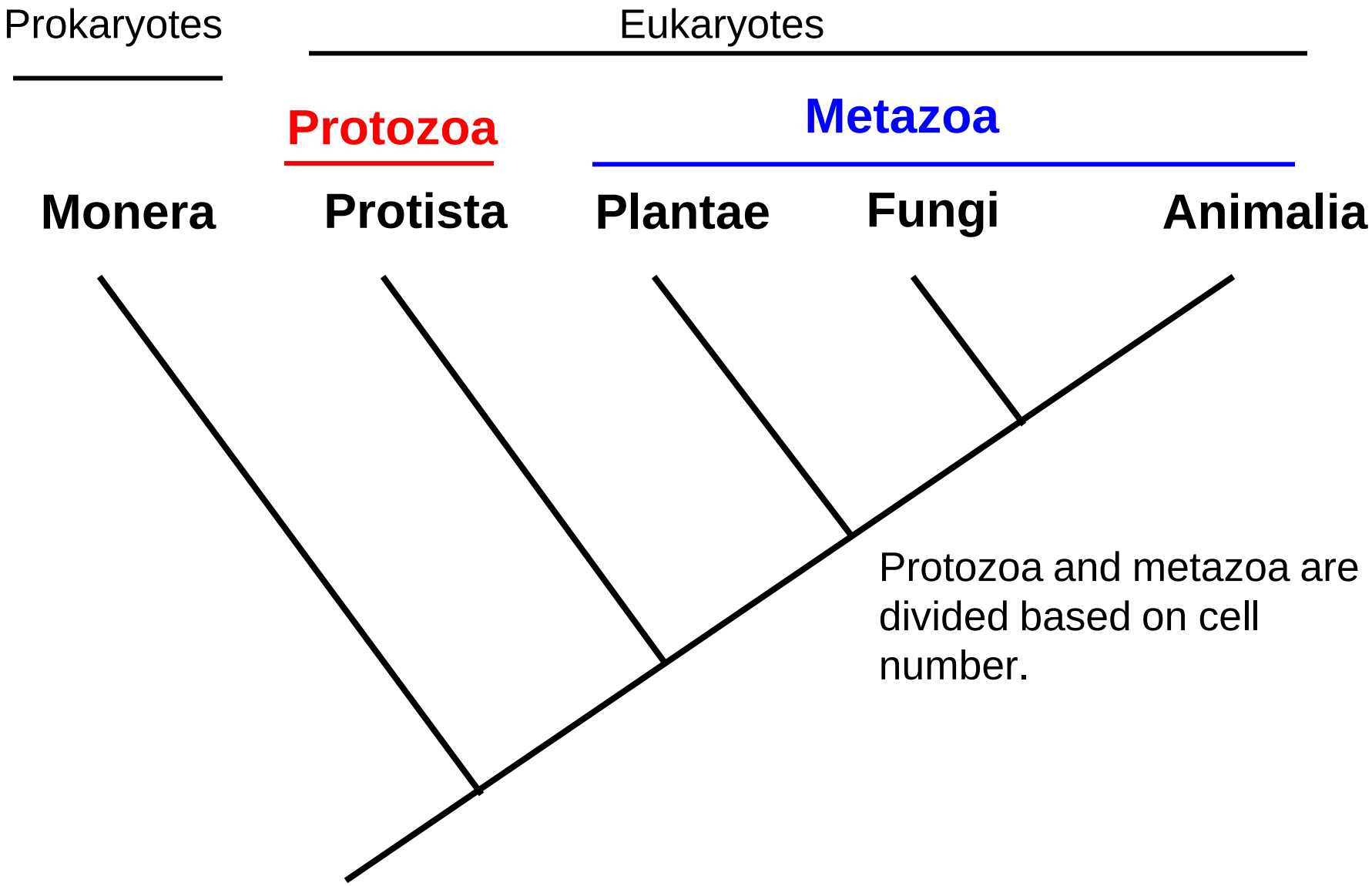
Prokaryotes and eukaryotes are divided based on the presence or absence of a membrane-bound nucleus and organelles.

Protozoans and Metazoans



Protozoans like this *Paramecium* are unicellular

Metazoans like this beetle are multicellular


Prokaryotes
Eukaryotes
Protozoa
Metazoa
Monera
Protista
Plantae
Fungi
Animalia
Protozoa and metazoa are divided based on cell number.

Autotrophs and Heterotrophs

Autotrophs

Heterotroph: carnivore

Heterotroph: herbivore

Prokaryotes

Eukaryotes

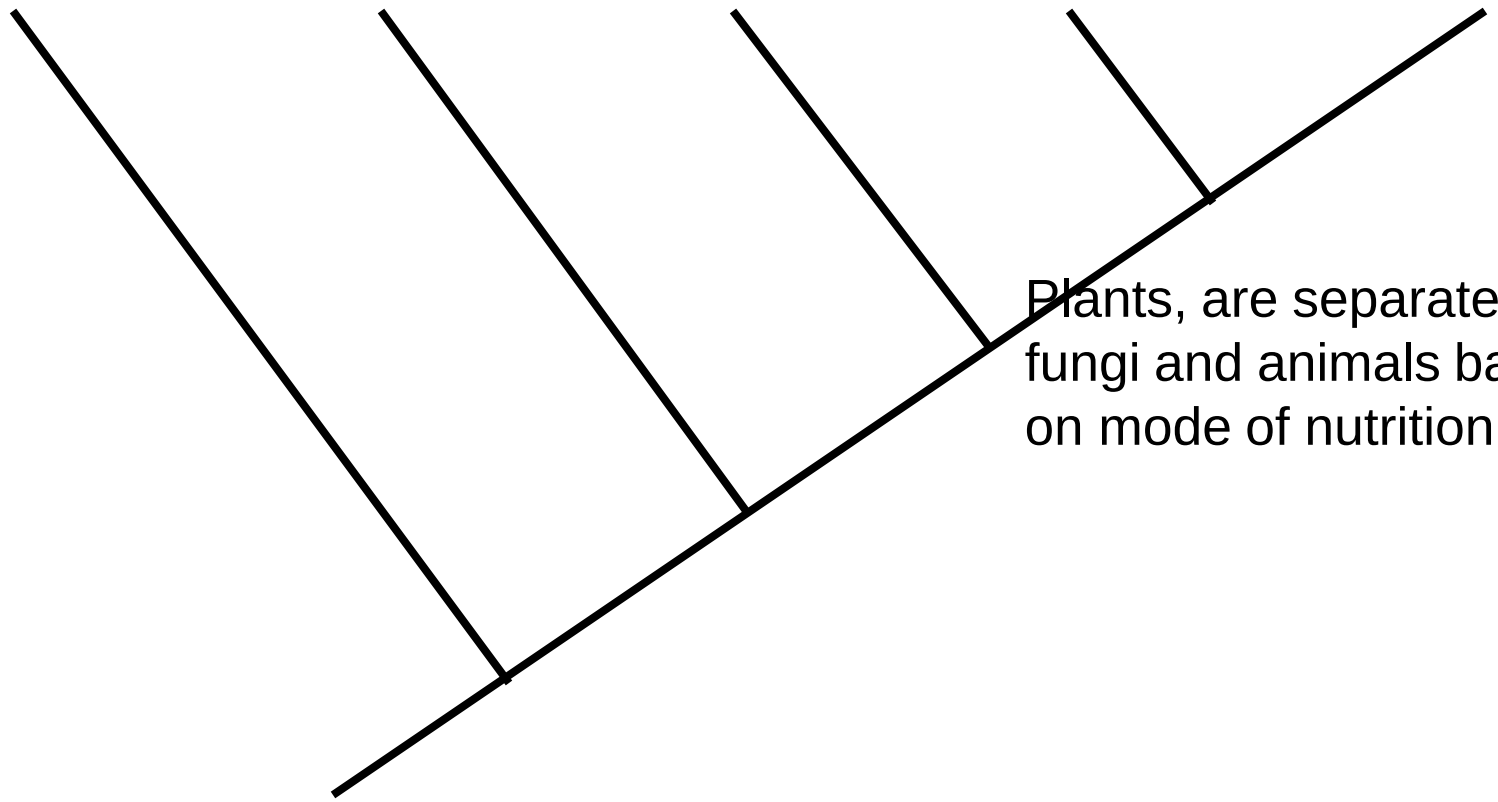
Protozoa

Metazoa

Autotrophic

Heterotrophic

Monera **Protista** **Plantae** **Fungi** **Animalia**



Plants, are separated from fungi and animals based on mode of nutrition.

Absorptive and Ingestive/digestive Heterotrophs

Fungi digest their food externally and absorb the digested food.

With some exceptions, animals must ingest and digest their food internally.

Prokaryotes

Eukaryotes

Protozoa

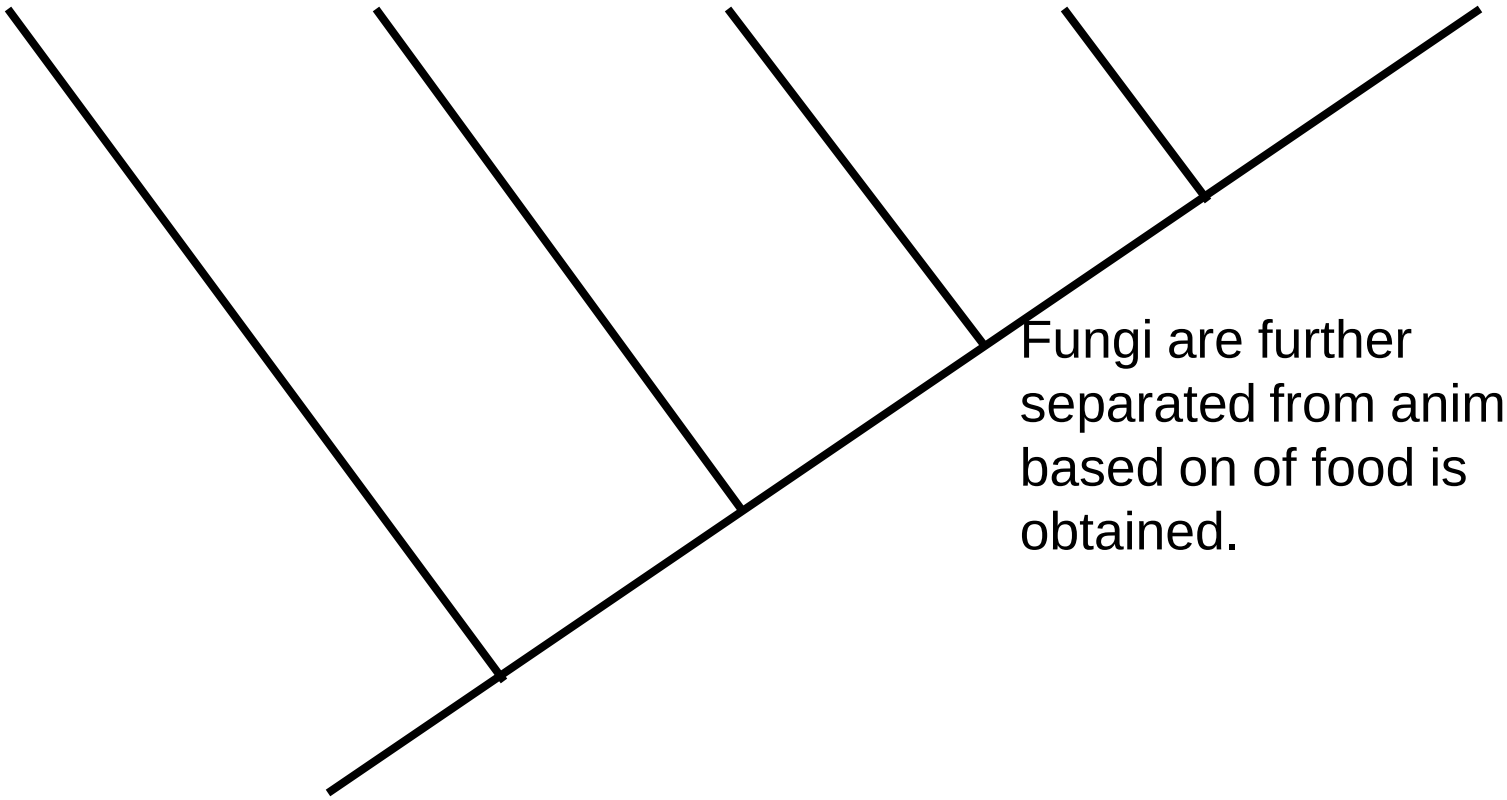
Metazoa

Autotrophic

Heterotrophic

Absorptive **Ingest/digest**

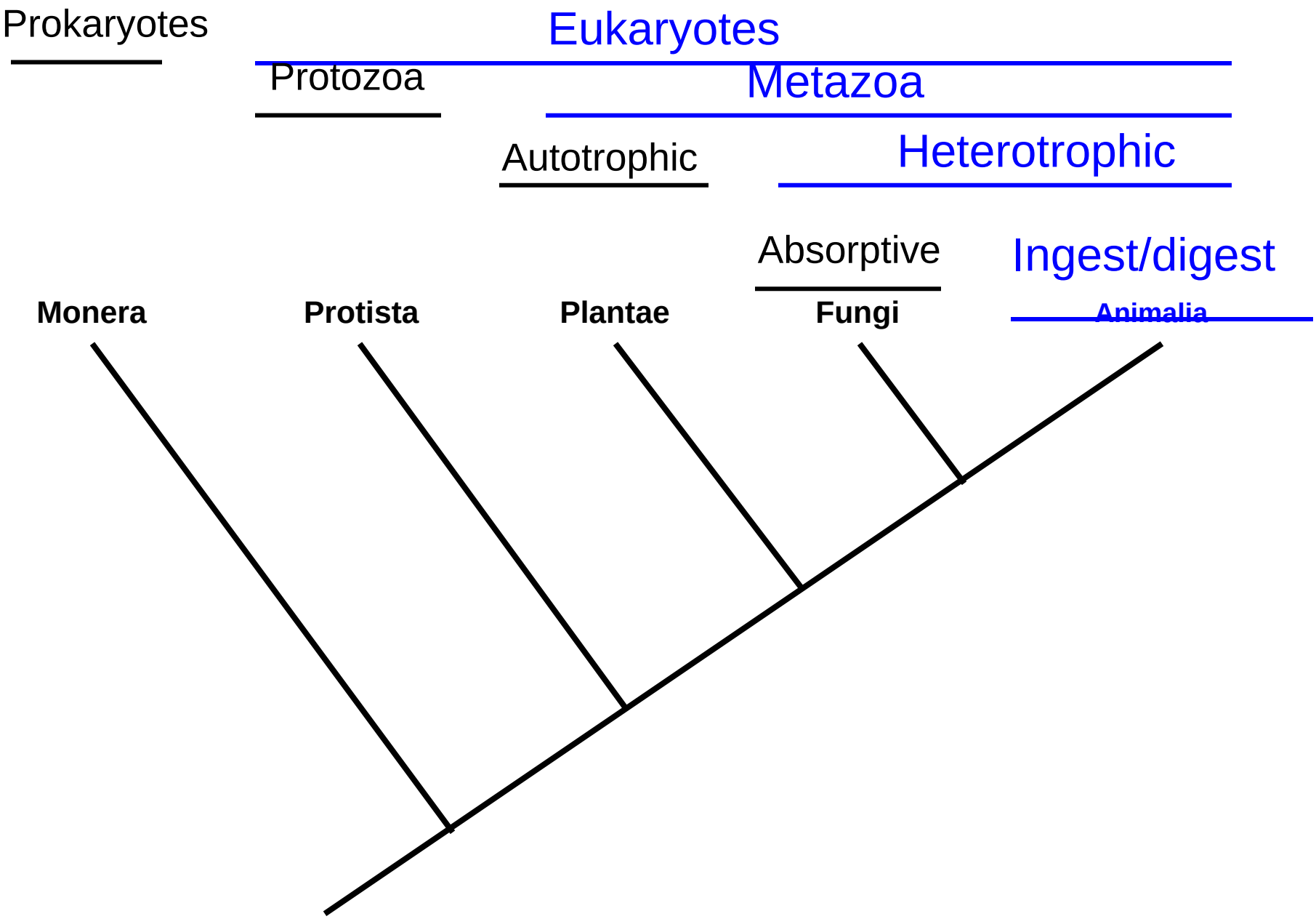
Monera **Protista** **Plantae** **Fungi** **Animalia**



Fungi are further separated from animals based on of food is obtained.

What is an Animal ?

1. Animals are multicellular, heterotrophic, eukaryotes that ingest and digest their food.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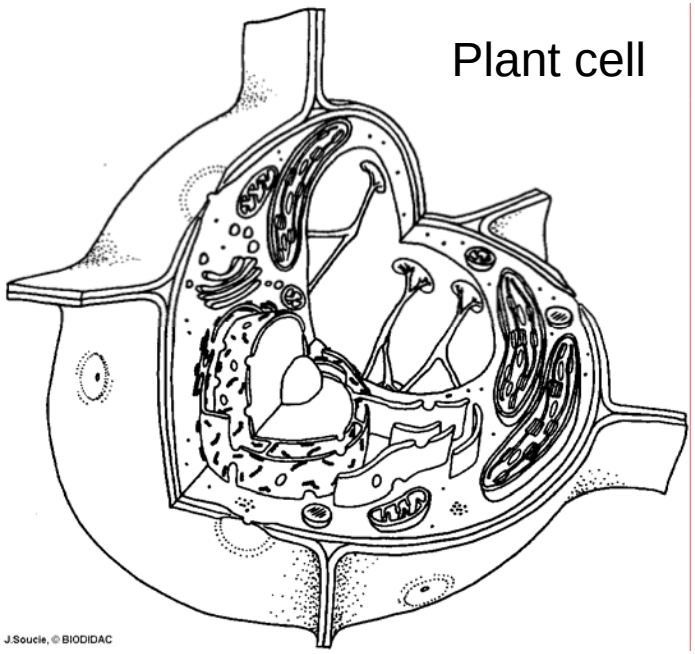
Ingest/digest
Monera
Protista
Plantae
Fungi
Animalia

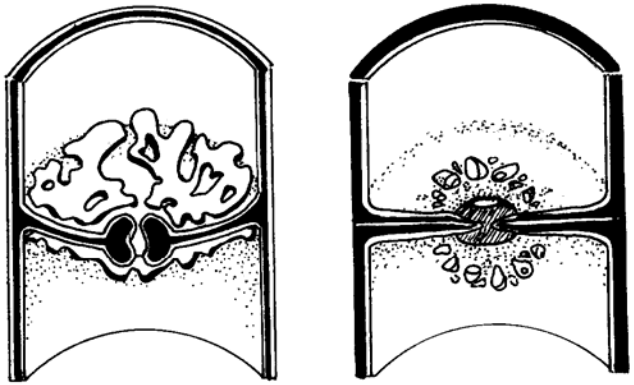
What is an Animal ?

1. Animals are multicellular, heterotrophic eukaryotes that ingest and digest their food.
2. Animal cells lack a cell wall.

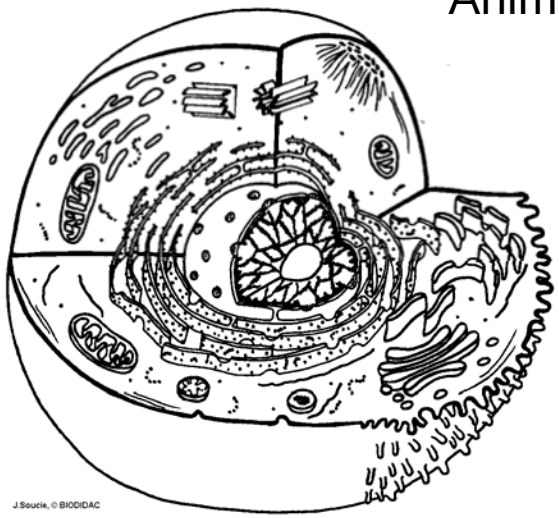
Plant cell



Fungal cell



Animal cell



Plants have a cell wall made of **<u>cellulose</u>**.

Fungi have cell walls made of **<u>chitin</u>**.

Animals cells lack a cell wall.

What is an Animal ?

1. Animals are multicellular, heterotrophic, eukaryotes that ingest and digest their food.
2. Animals lack a cell wall.
3. Are capable of moving (during some point in their lives).

What is an Animal ?

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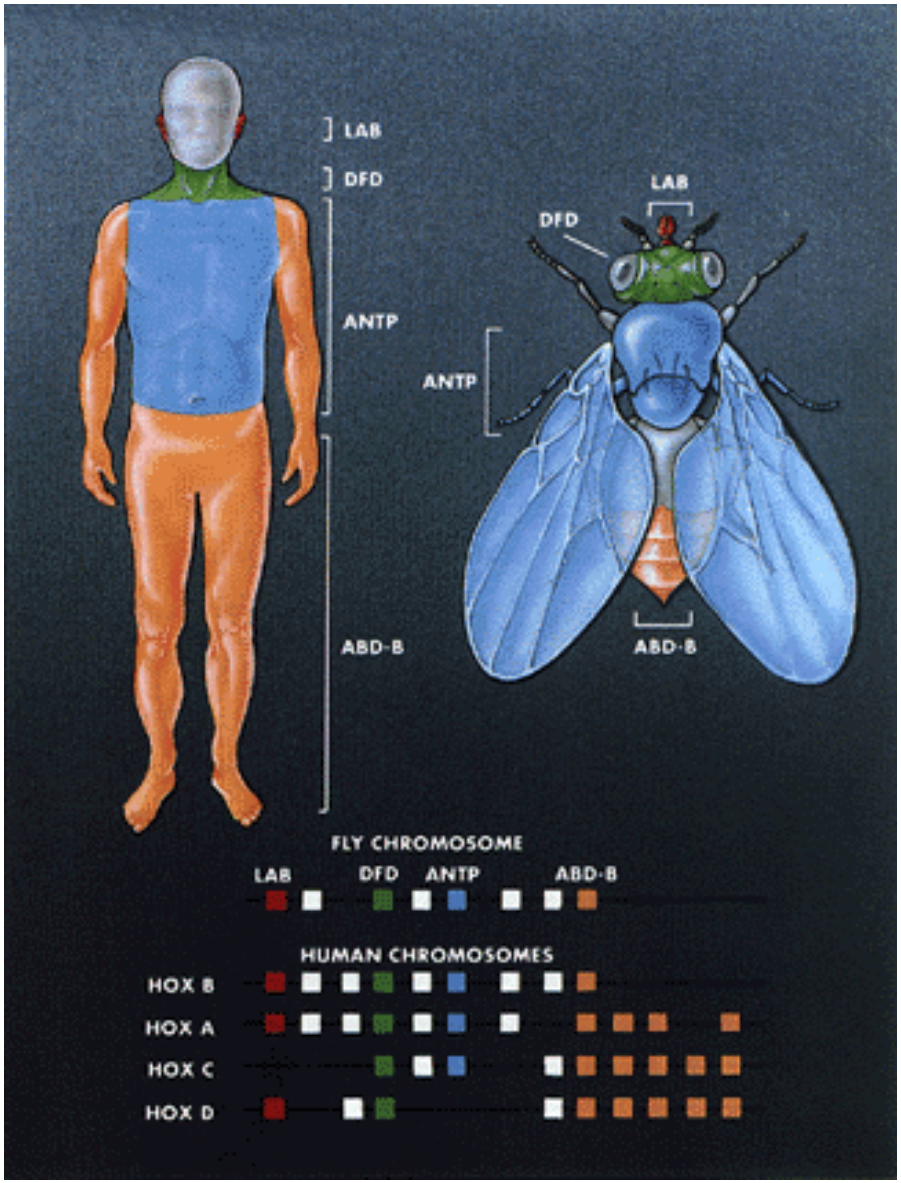
2. Animals lack a cell wall.
3. Are capable of moving (during some point in their lives).
4. All animals have regulatory genes called Hox genes.



- Hox genes are involved in the development of the body plan in animals.
- Hox genes (or hox- like genes) have been identified in all major animal groups.

What is an Animal ?

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KINGDOM ANIMALIA

- The kingdom where you find the animals

- Animal are
  multicellular,
  Eukaryotic,
  Heterophytic,
  Motile
  Ingest or digest food
  Lack cell wall

- We have 35 Phyla or divisions in the Kingdom Animalia

PHYLA in the Kingdom Animalia

We have 35 Phyla in the Kingdom Animalia, and they can be divided into Major and Minor Phyla.

Major Phyla

- Any phylum that has more than 1000 species

Minor Phyla

- Any phylum that has less than 1000 species

IMPORTANT ANIMAL PHYLA

Of the 35 animal phyla, only 10 are of importance to zoologist.

1. *Phylum Protozoa*
2. *Phylum Porifera*
3. *Phylum Coelentrata*
4. *Phylum Platyhelminthes*
5. *Phylum Nematoda*
6. *Phylum Annelida*
7. *Phylum Mollusca*
8. *Phylum Arthropoda*
9. *Phylum Echinodermata*
10. *Phylum Chordata*

We also have the Invertebrate and Chordate Phyla

Invertebrate Phyla

- Animals in these phyla donot have backbone
  - *Phylum Protozoa*
  - *Phylum Porifera*
  - *Phylum Coelentrata*
  - *Phylum Platyhelminthes*
  - *Phylum Nematoda*
  - *Phylum Annelida*
  - *Phylum Mollusca*
  - *Phylum Arthropoda*
  - *Phylum Echinodermata*

Chordate Phylum

- Animals in this phylum have backbone
  - *Phylum Chordata*

Backbone also known as notochord

Among the Invertebrate Phyla we have the:

Lower Invertebrate

Animals that have a very small size and body

- *Phylum Protozoa*
- *Phylum Porifera*
- *Phylum Coelentrata*
- *Phylum Platyhelminthes*
- *Phylum Nematoda*

Higher Invertebrate

Animals that are bigger in size and body

- *Phylum Annelida*
- *Phylum Mollusca*
- *Phylum Arthropoda*
- *Phylum Echinodermata*

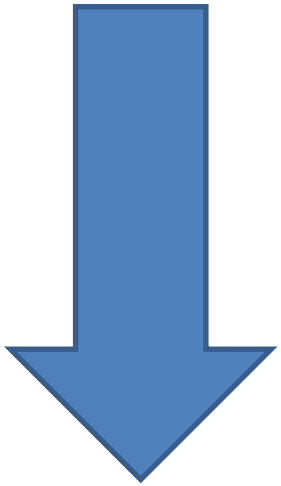
TAXONOMY

Taxononmy is the theory and practice of collecting, identifying, naming and classifying living organisms based on shared characteristics

After collecting an organism from the field, a taxonomist may need to classify the organism collected.

The recognized system of classification is

Kingdom
Phylum
Class
Order
Family
Genus
Species



Decreasing order of complexity

NOMENCLATURE

Nomenclature is the act of giving names to living organisms. There are 2 types of naming system

Binomial nomenclature.

-Giving organisms 2 names, the first is the generic name, and the second is the specific name

e.g *Ascaris lumbricoides*

Trinomial nomenclature.

-Giving organisms 3 names, the first is the generic name, and the second is the specific name, the third is the sub-specific name

e.g *Buteo jamaicensis borealis*