Animal Diversity

Instructor: Matt Schrader

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Office: 104 Conradi

Office hours: Thursday 9:30 – 10:30 or by appointment

Course Structure

1. Lectures:
   - Tuesdays with some exceptions
   - Lecture attendance is expected
   - Short assessments after some lectures
   - 2 Midterm lecture exams

     3/17/05: during class, through Arthropod 1

     4/28/05: 7:30 to 9:30 AM, cumulative

Course Structure

2. Labs:
   - As individually scheduled
   - Attendance is mandatory (no make ups)
   - More about lab policies and structure in your lab section next week

Course Structure

3. Videos:
    - Thursdays (with some exceptions)
    - Quiz after each video: quiz scores will be used as extra credit points.

Course Structure

Course Structure

4. Books:
   - Animal Diversity- Hickman, Roberts and Larson
   - An Introduction to Animal Diversity, 5th edition, Tschinkle, et al.
   - Animal Diversity Packet at Target Copy

Course Structure

5. Grades:

Lecture

- Midterm lecture exam: 15 %
- Final lecture exam: 20 %

} 35 %

Lab

- Weekly lab quizzes: 25 %
- Midterm Practical: 15 %
- Final Practical: 20%
- TA evaluation: 5 %

} 65 %

Course Structure

Succeeding in BSC 2011L

1. Stay on top of it !
2. Do well on your lab quizzes.
3. Come to your lab prepared.
4. Don’t leave your lab 2 hours early !
5. Ask questions: use your instructor and TA.

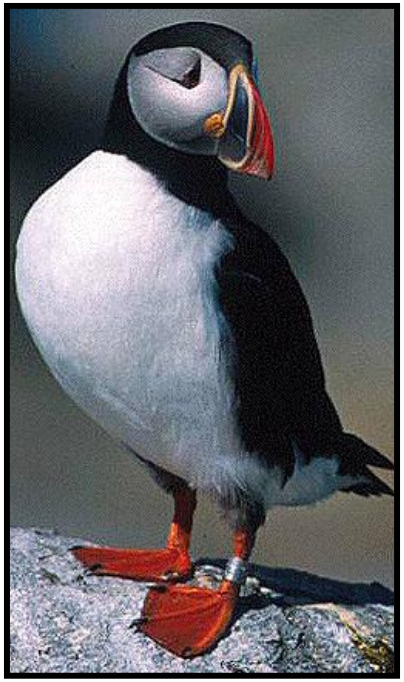
Course Goals

1. Give you an appreciation and understanding of the variety of animal life:

Form and Function

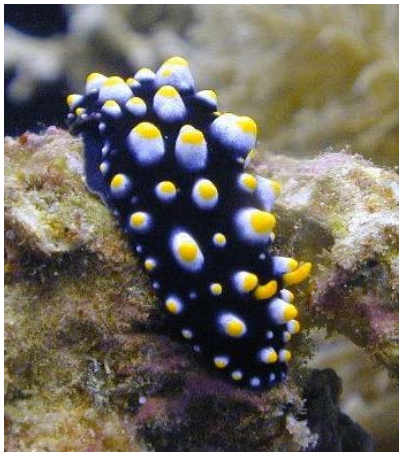
These animals appear to have similar body plans, but they are not closely related to one another. How are they unique?

Form and Function



These animals have vastly different body plans, yet they must solve similar problems. How do each of the major groups of animals solve the problems presented by their environment?

Evolution and Ecology

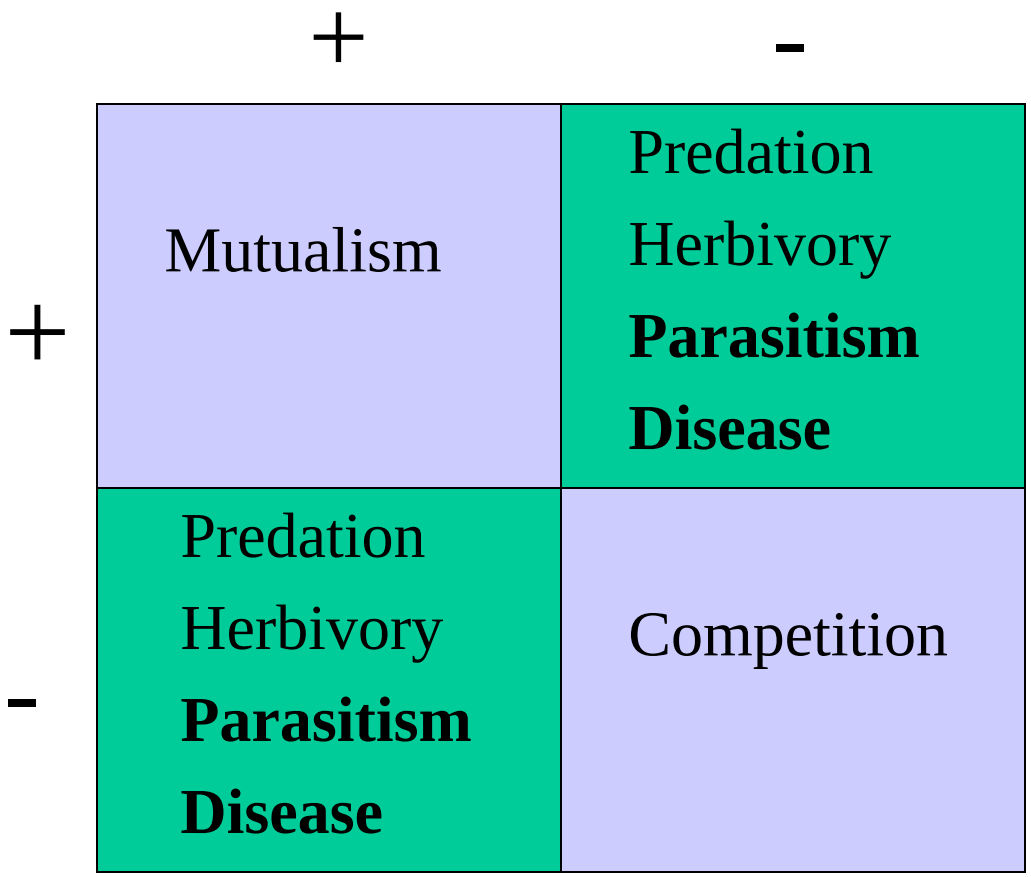


How do we know that such diverse forms as these share an evolutionary history?

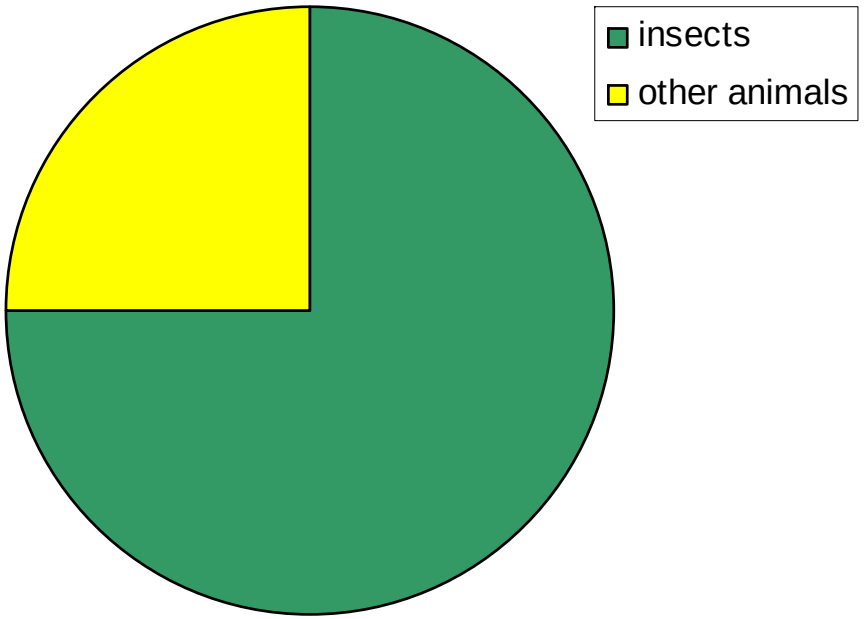
Evolution and Ecology

What evolutionary innovations allowed vertebrates to invade land 400 million years ago?

Evolution and Ecology

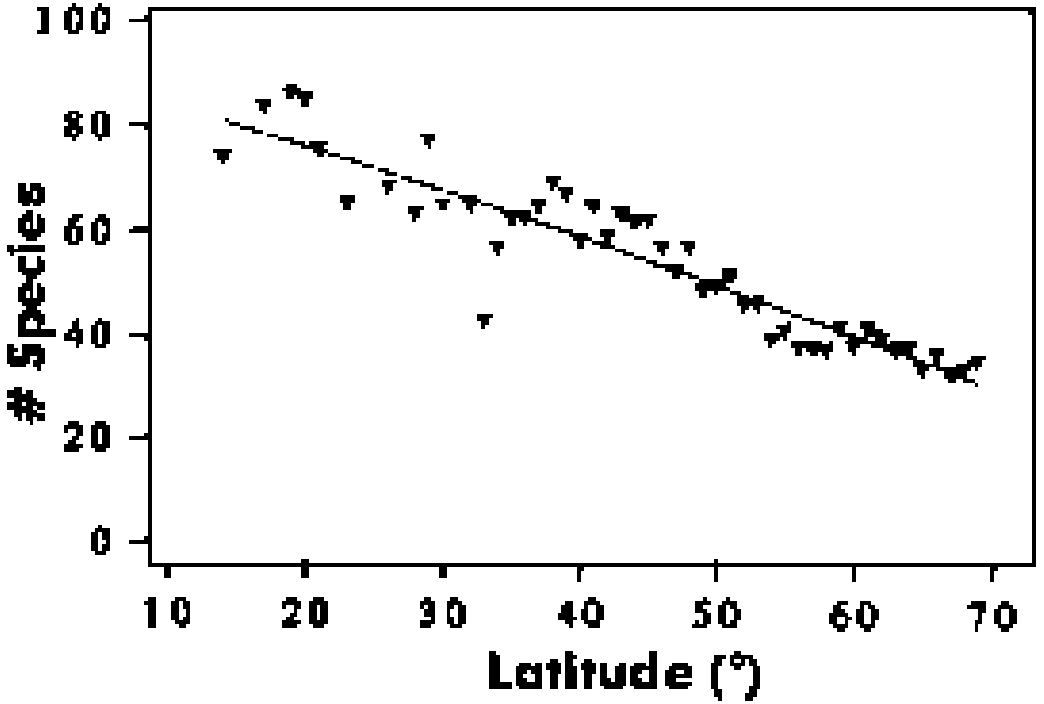


Patterns in Biodiversity



75 % of described animal species are insects. What characteristics of insects have allowed to be so successful?

Patterns in Biodiversity



The number of mammal species declines as distance form the equator increases. What might account for this pattern?

Conservation

- Since the arrival of Europeans in the late 1700's, > 50 % of Hawaii's endemic birds have gone extinct.
- What are some of the major threats to bio diversity?

Conservation

30 acres of national forest cut

DOT cleared area during road-widening

By Bruce Ritchie

DEMOCRAT STAFF WRITER

The Florida Department of Transportation is widening U.S. Highway 319 in Leon County, and it's taking some of the Apalachicola National Forest with it.

From today's paper

Course Goals

2. **Expose you to research that is being done on animals at FSU**

The Major Divisions of Life

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

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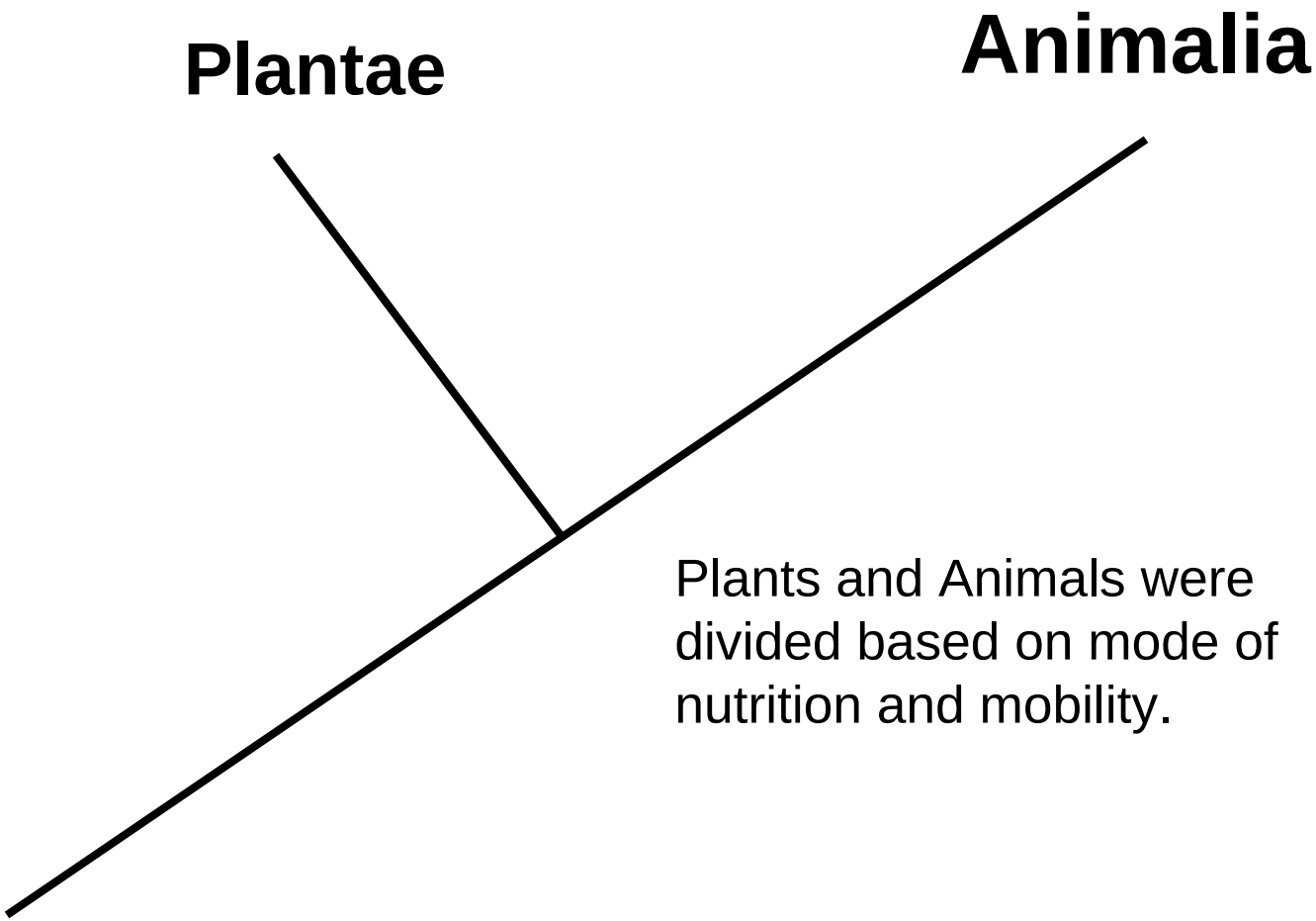
Plants: Autotrophic (produce organic food molecules through photosynthesis) and sessile (don’t move).

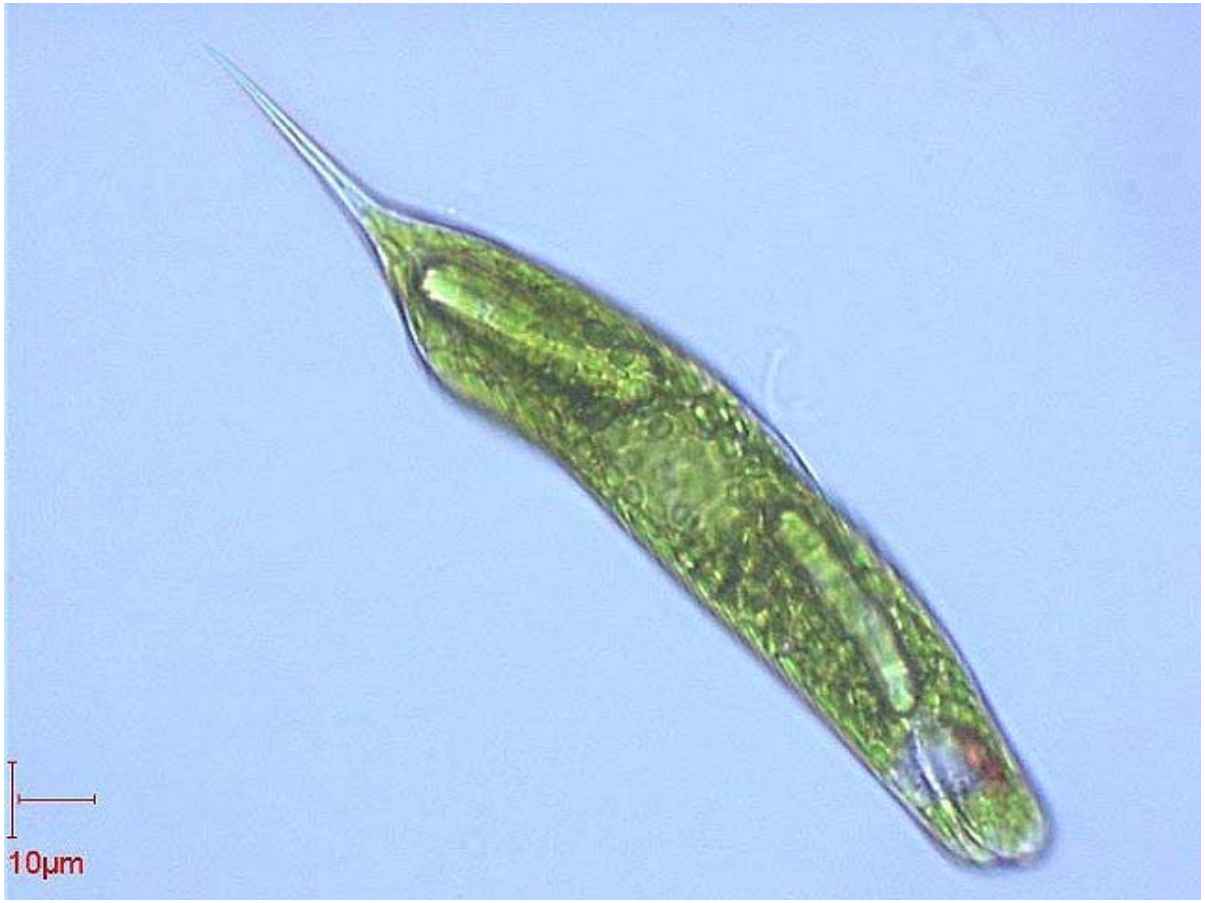
Animals: Heterotrophic (obtain organic food molecules by eating other organisms or their by products) and mobile.

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

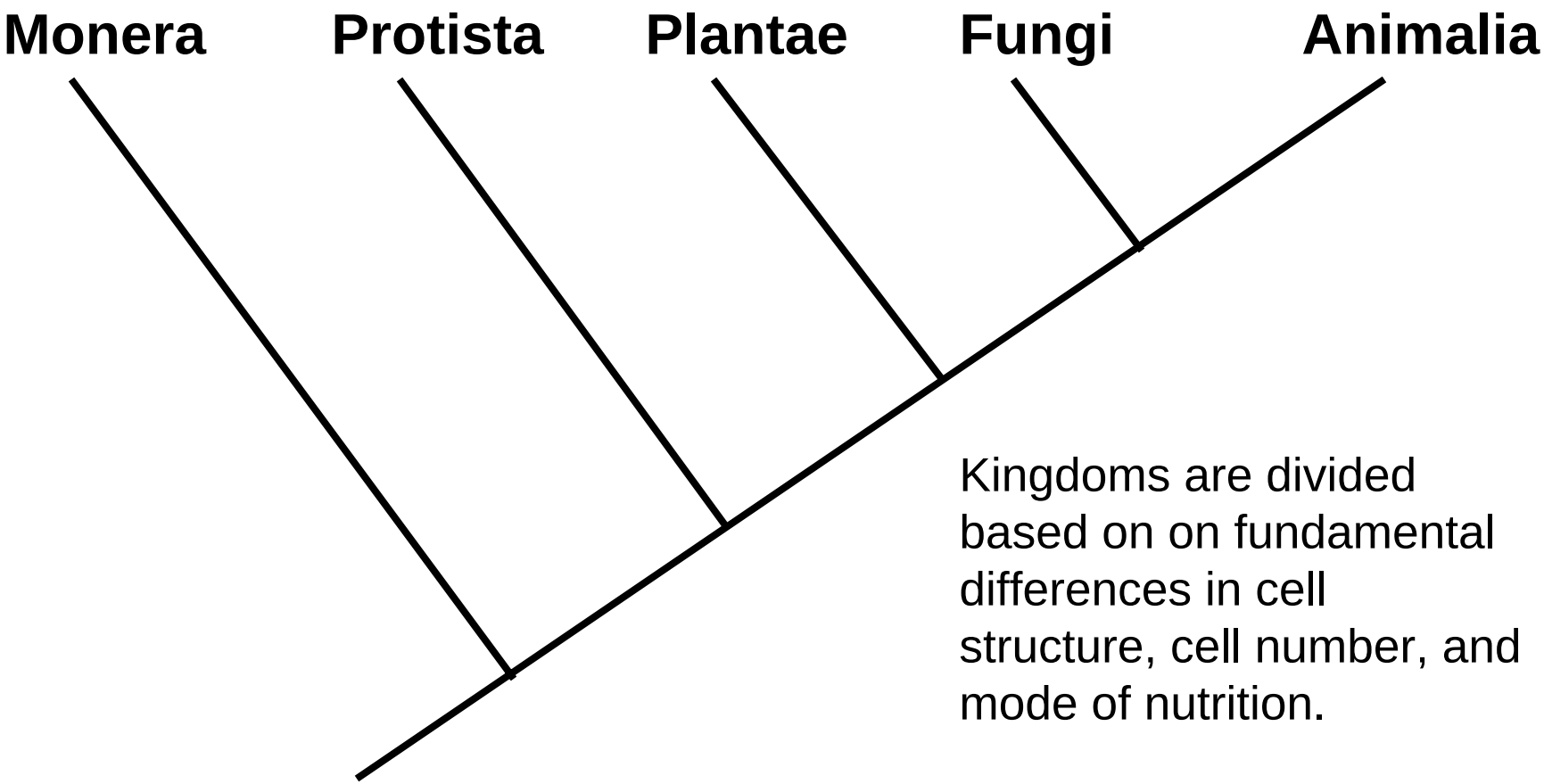
Mold and mushrooms: sessile and heterotrophic

Are these plants or animals?

The Major Divisions of Life

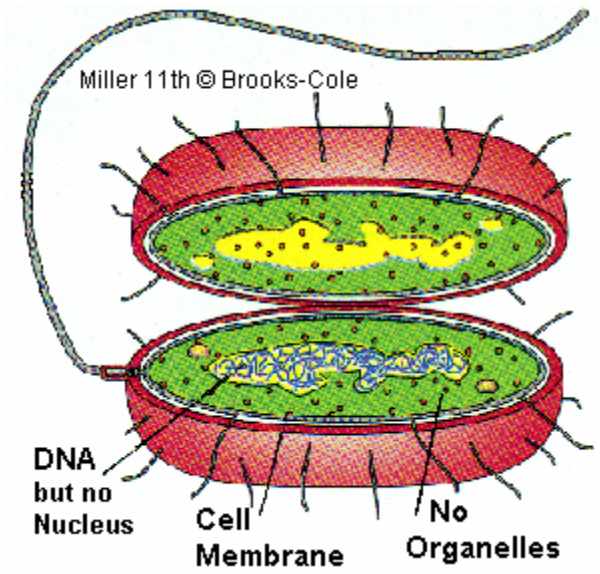
- The 2 kingdom system was abandoned in the late 60's in favor of the "five-kingdom system".
- The "five-kingdom system" divided organisms based on fundamental differences in cell structure, cell number, and mode of nutrition.

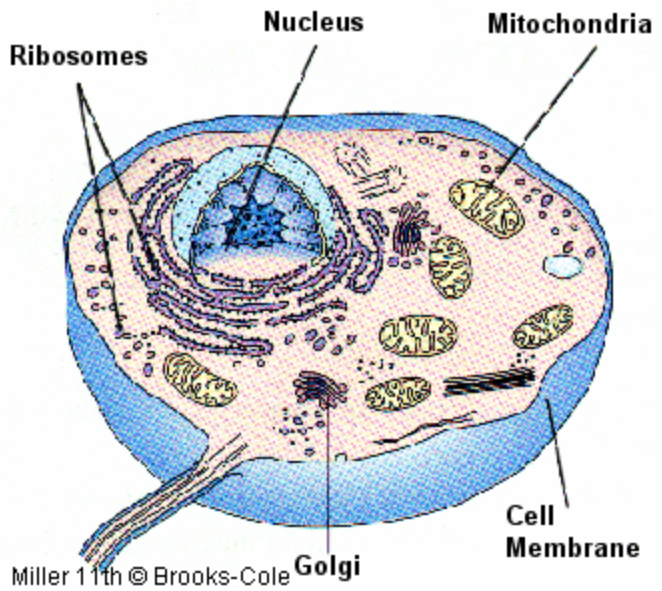
The 5 kingdom System



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

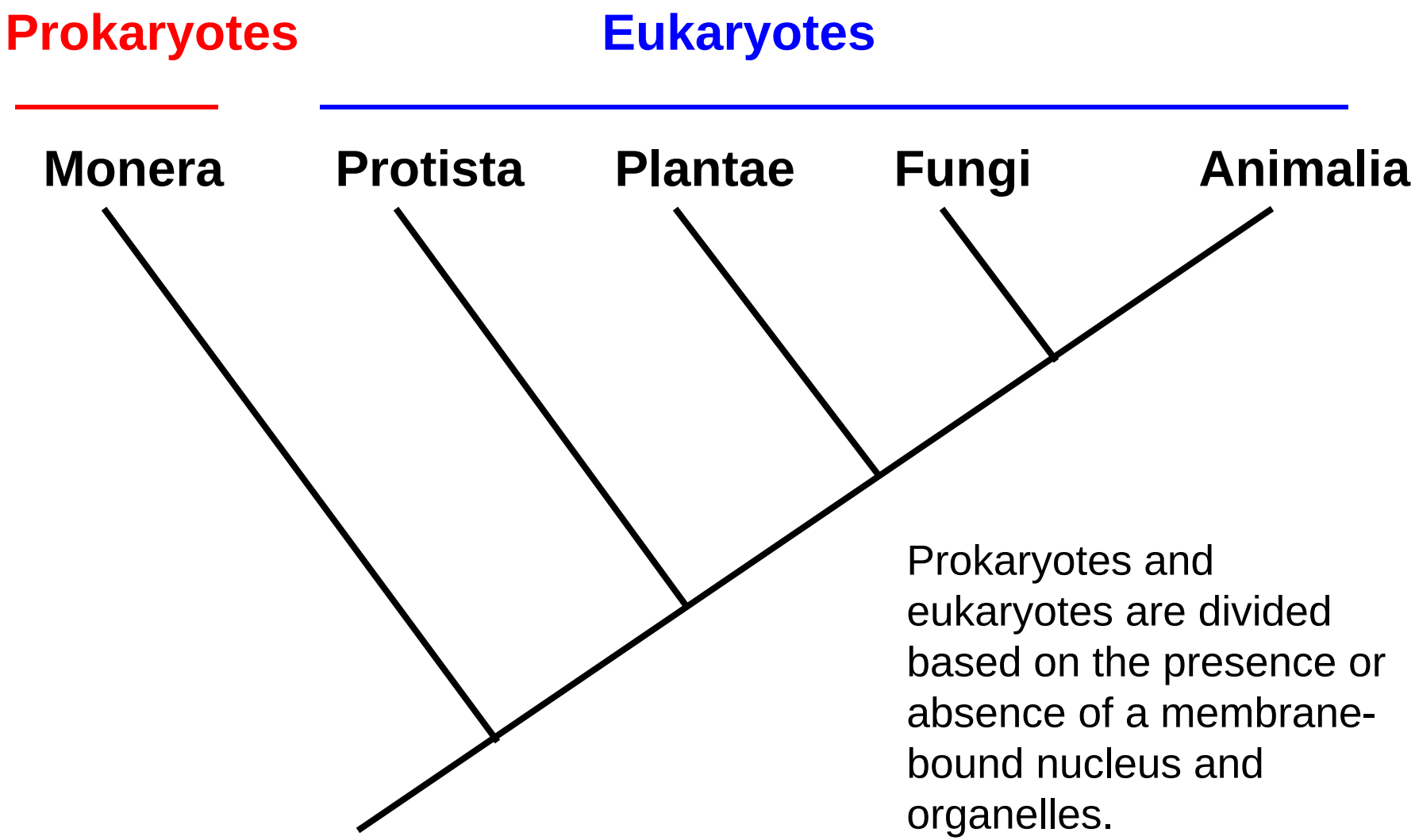
Prokaryotes and Eukaryotes





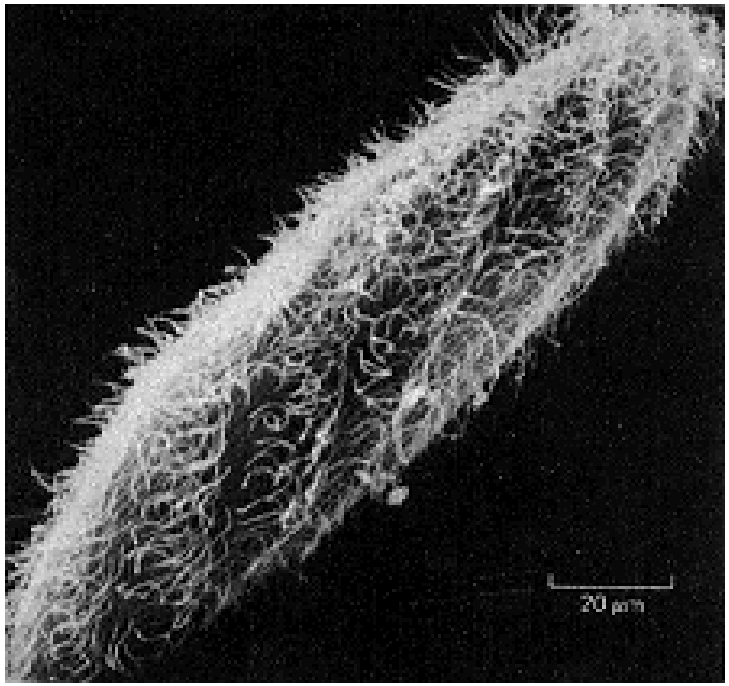
Prokaryotic cell: no nucleus or organelles

Eukaryotic cell: membrane bound nucleus and organelles



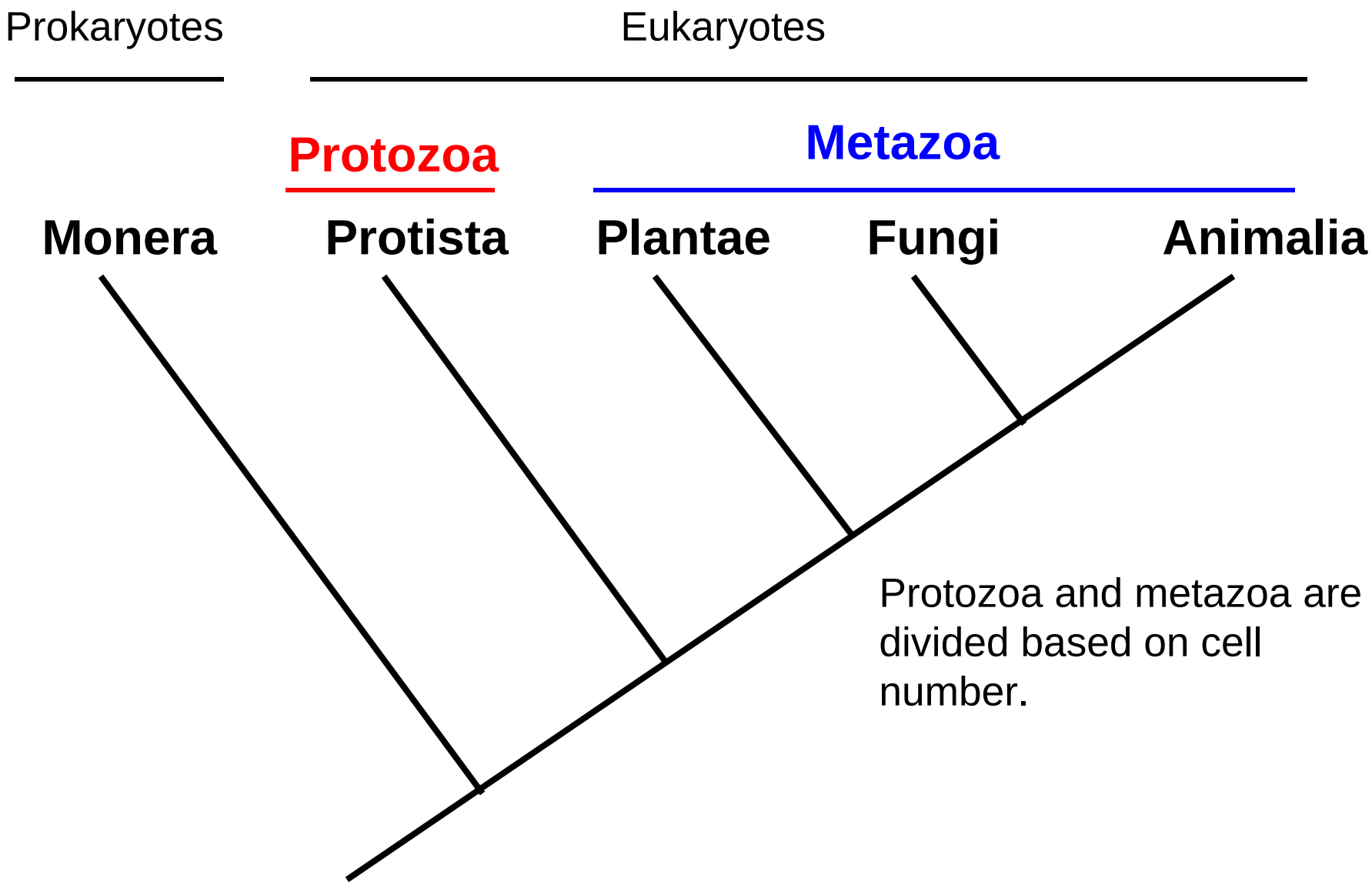
Prokaryotes and eukaryotes are divided based on the presence or absence of a membrane-bound nucleus and organelles.

Protozoans and Metazoans



Protozoans like this *Paramecium* are unicellular

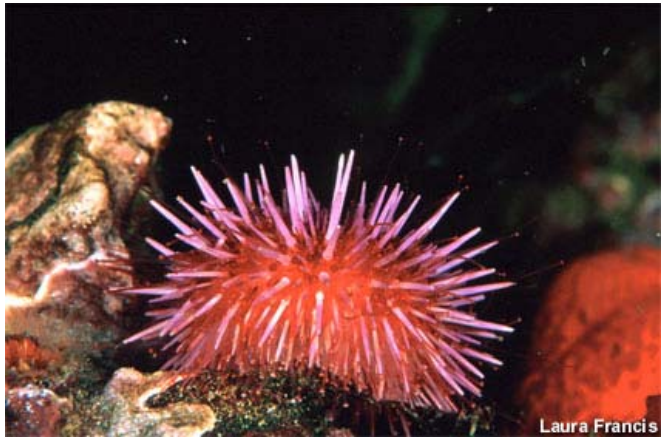
Metazoans like this beetle are multicellular


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

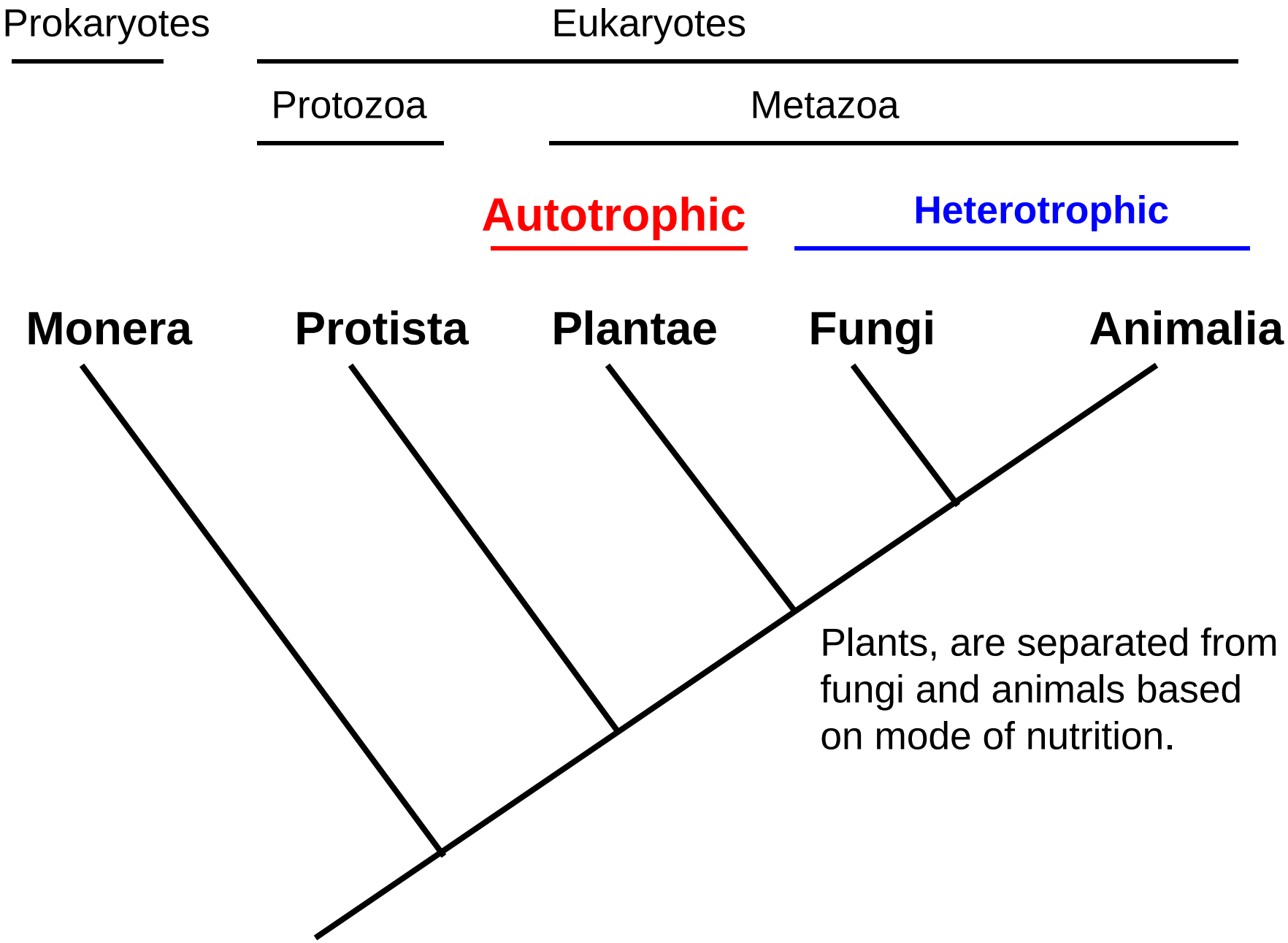
Autotrophs and Heterotrophs

Autotrophs

Heterotroph: carnivore



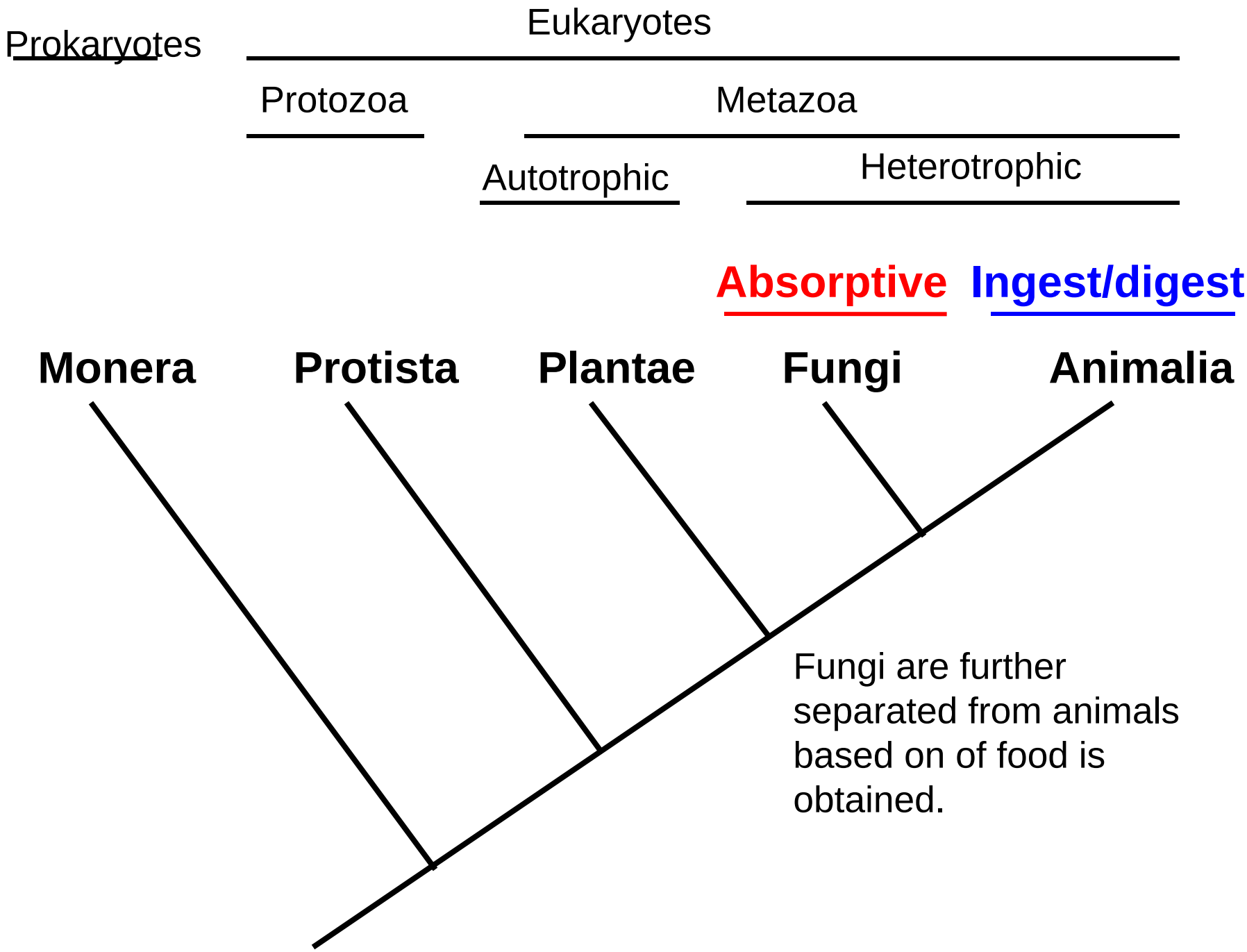
Heterotroph: herbivore


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.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Eukaryotes
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Autotrophic
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Ingest/digest
Monera
Protista
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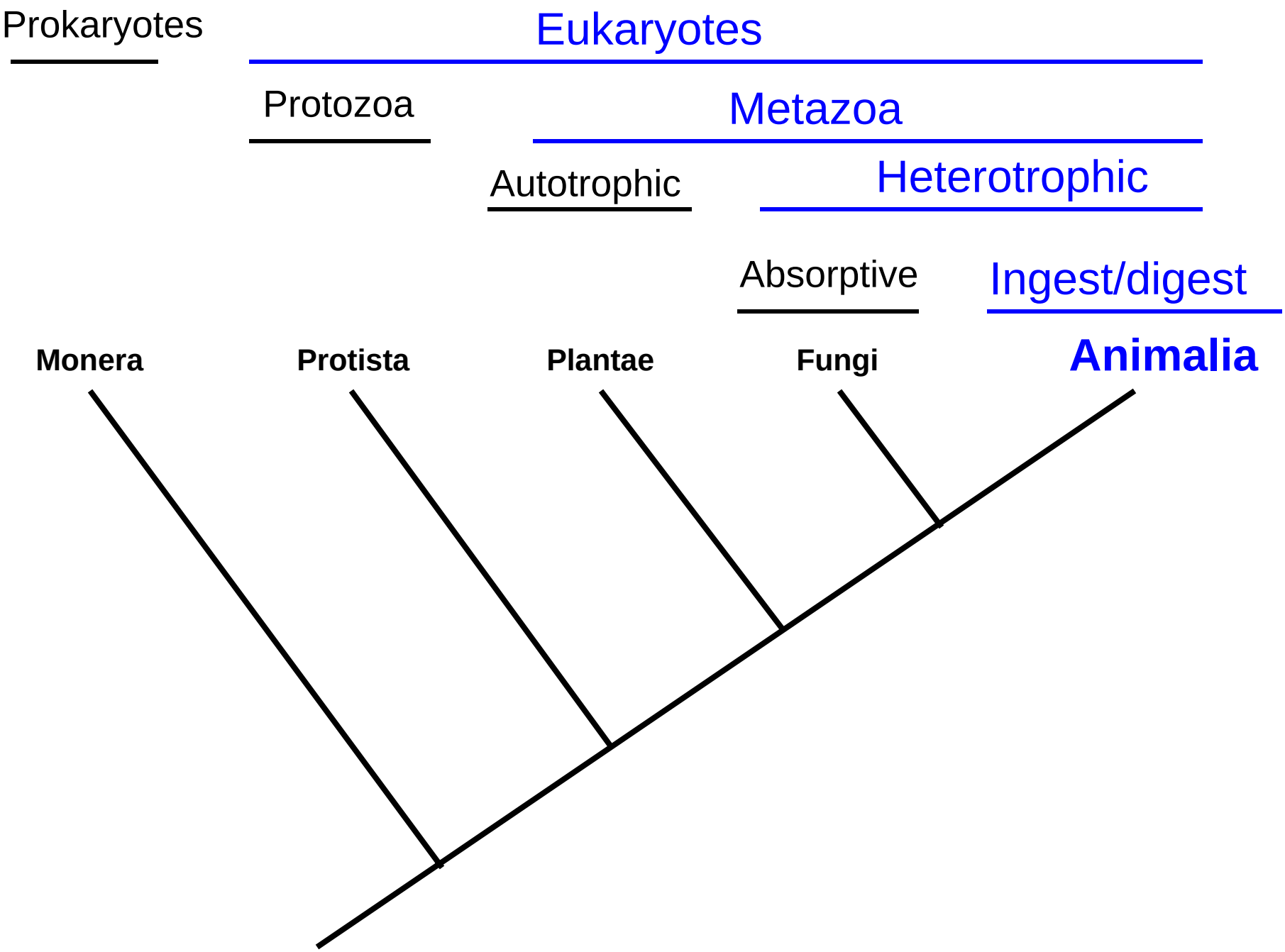
Fungi are further separated from animals based on of food is obtained.

What is an Animal ?

1. Animals are multicellular, heterotrophic, eukaryotes that ingest and digest their food.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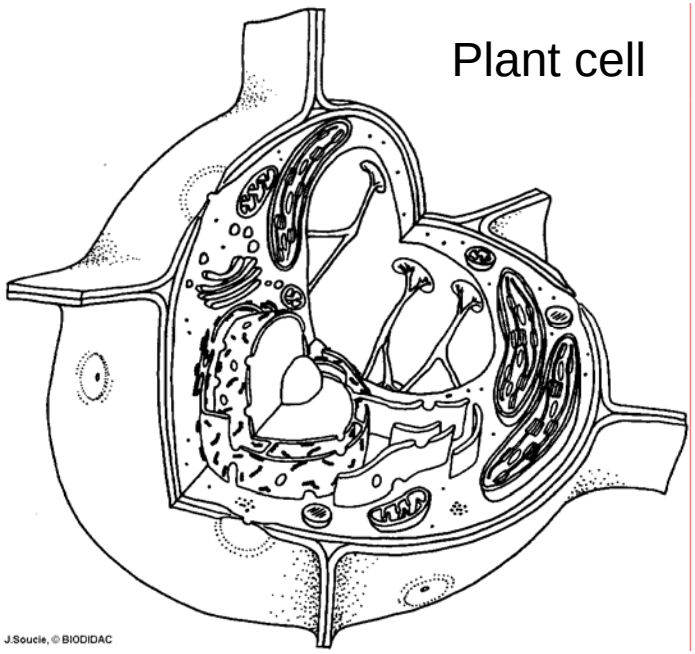
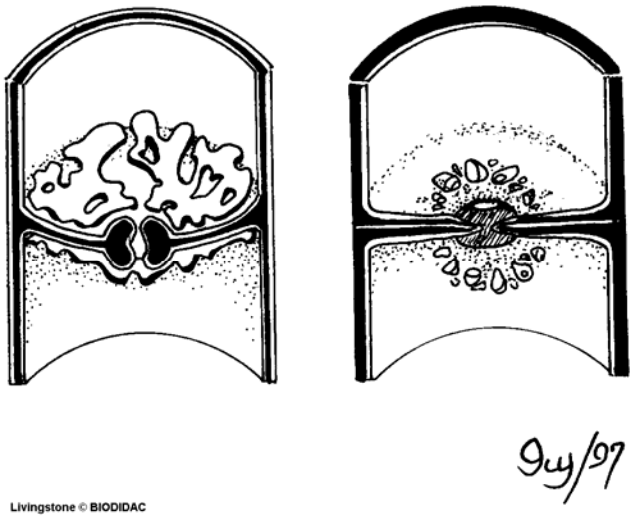
What is an Animal ?

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

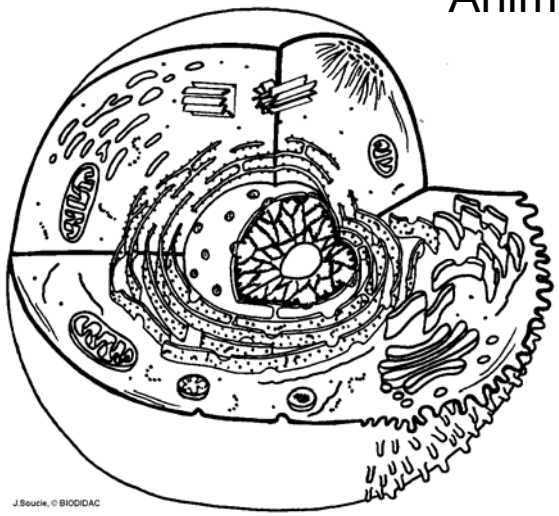
Plant cell



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).

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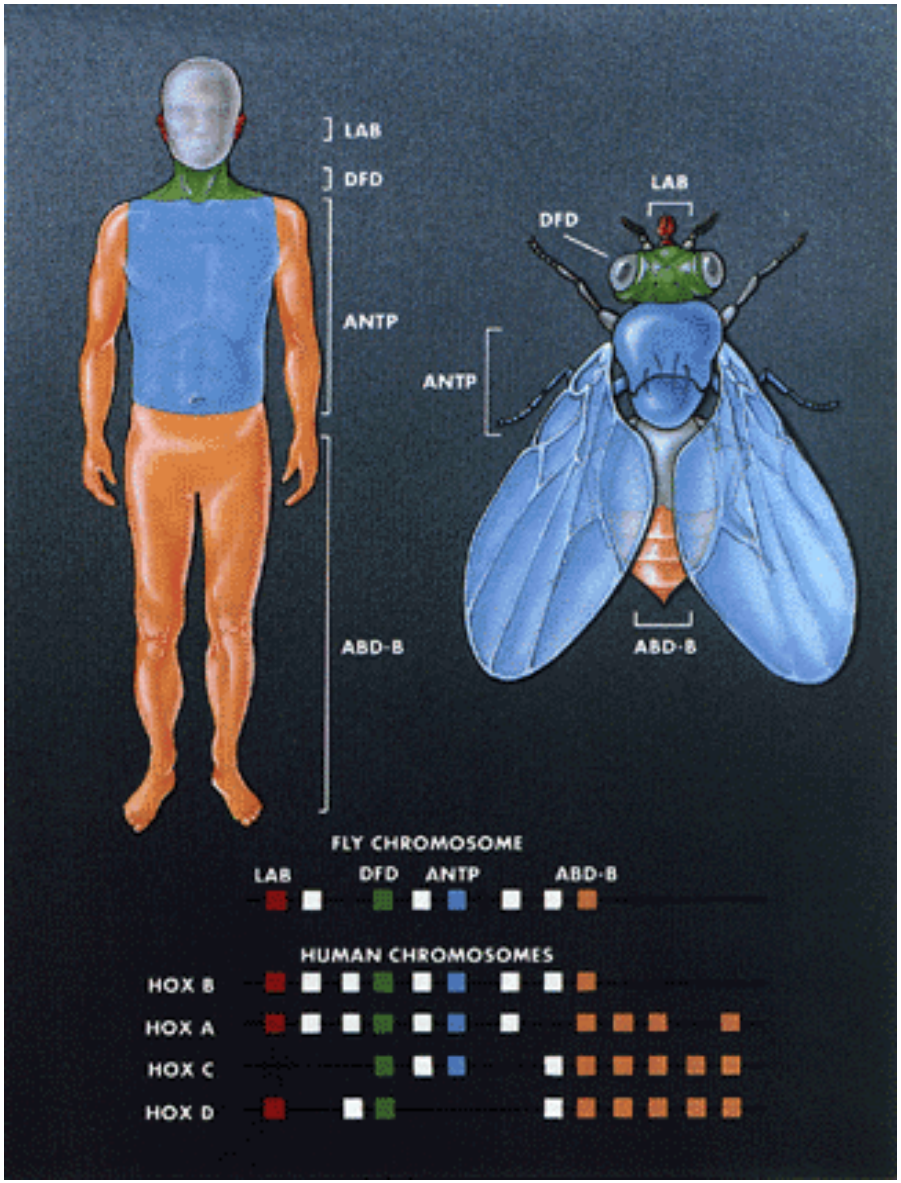
2. Animals lack a cell wall.
3. Are capable of moving (during some point in their lives).
4. All animals have regulatory genes called Hox genes.



- 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.

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