

Introduction To Microbiology

OPTO 435



What is microbiology?

Micro → very small (needs a microscope to be seen).

Biology → the study of living organisms.

Microbiology → It is a branch of biology that studies very small living organisms and their effects on humans

Microorganisms:

Collection of organisms that share the characteristic of being visible only with a microscope and they are found in every ecosystem

Microorganisms are **EITHER**

➤ **Pathogens**

microorganisms that cause disease (3% of all).

or

➤ **Non pathogens**

microorganisms that do not cause disease

or

➤ **Normal Flora**

Microbes that live on and in the human body and they are benefit to us

Organisms included in the study of Microbiology

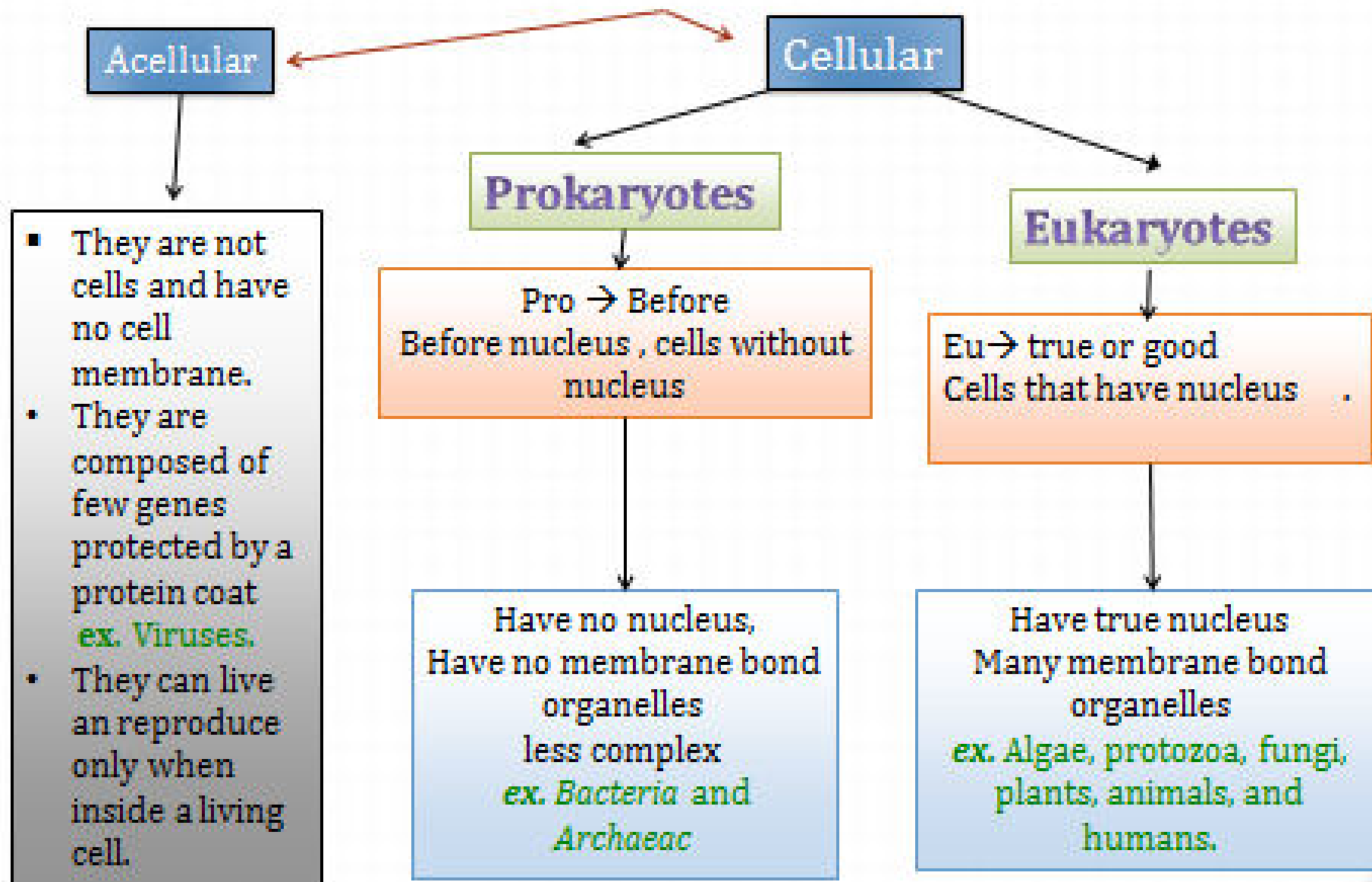
- **Bacteria**
- **Algae**
- **Parasites**
- **Fungi**
- **Viruses**
- **Bacteriology**
- **Phycology**
- **Parasitology**
- **Mycology**
- **Virology**

Why Should We Study Microbiology?

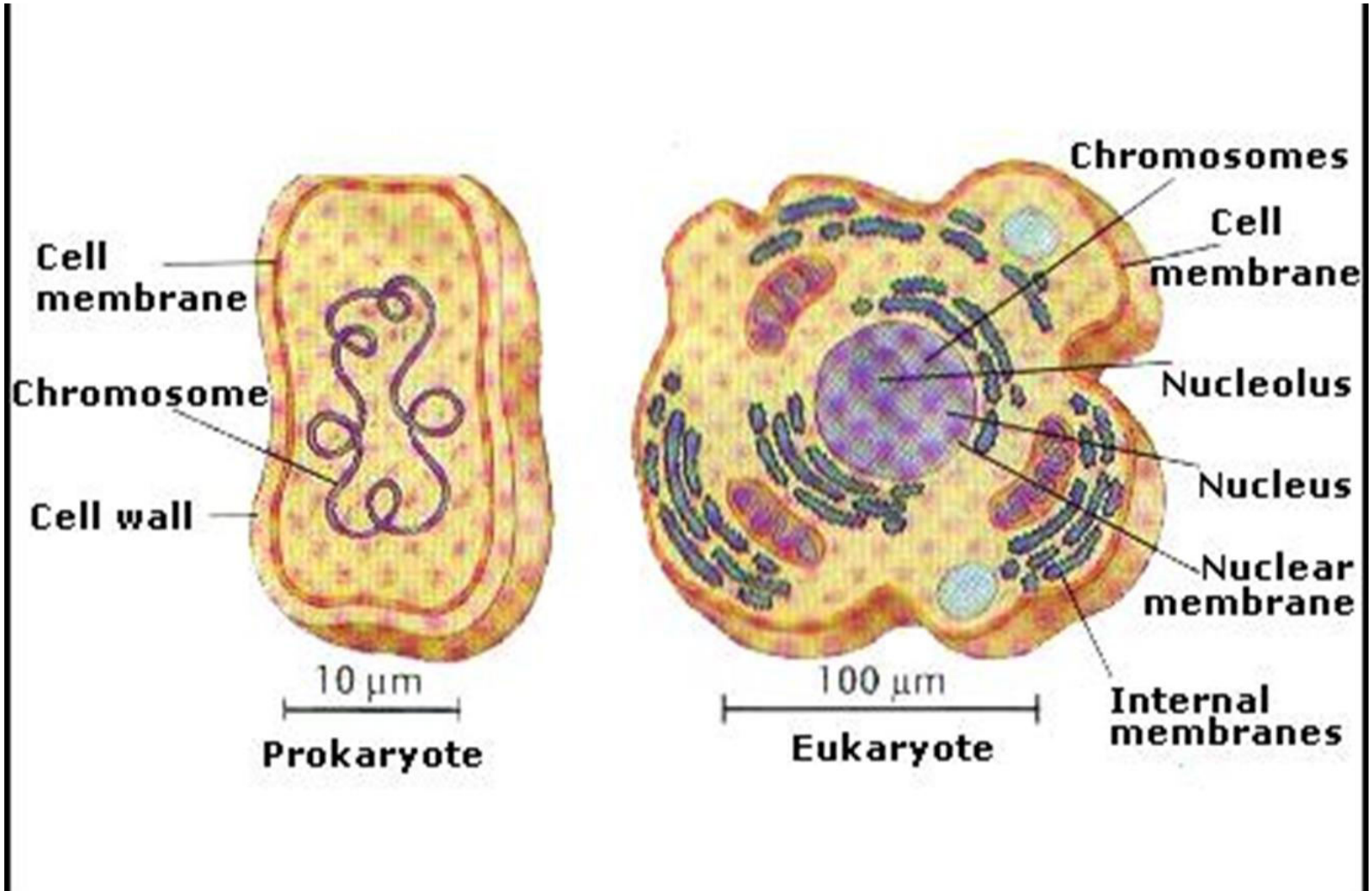
- Bacteria in intestine help in digestion of food and production of some vitamins.
- Many microbes produce various food products
 - cheese, pickles, green olives
 - yogurt, soy sauce, vinegar, bread
 - Beer, Wine, Alcohol
- Many microbes produce certain enzymes, chemicals and antibiotics
- Essential for life on this planet as some produce oxygen **e.g.** algae and cyanobacteria

- Are involved in the decomposition of dead organisms and the waste product of living organisms. These are called (**Decomposers** or **Saprophytes**)
- Decompose industrial waste like oil spills
- Part of the food chain as tiny animals feed on them
- Essential in the field of genetic engineering
- Finally microorganisms can cause disease either by colonizing the body or by production of toxins

Classification of Microorganism



Prokaryotic Cell & Eukaryotic Cell



Taxonomic Classification

Taxonomy is the science of classifying living organisms

Cat

- **Kingdom**
 - **Phylum**
 - **Class**
 - **Order**
 - **Family**
 - **Genus**
 - **species**
- Animalia
 - Chordata
 - Mammalia
 - Carnivora
 - Felidae
 - Felis
 - domestica

Binomial System of Taxonomic Classification

- Use only the Genus and species
- Genus is **always** capitilized
- species is **never** capitilized
- Genus and species are either underlined or *italicized*

EX: escherichia coli

Escherichia coli

Escherichia coli

Identification

- To identify an organism means to learn the organism's name

