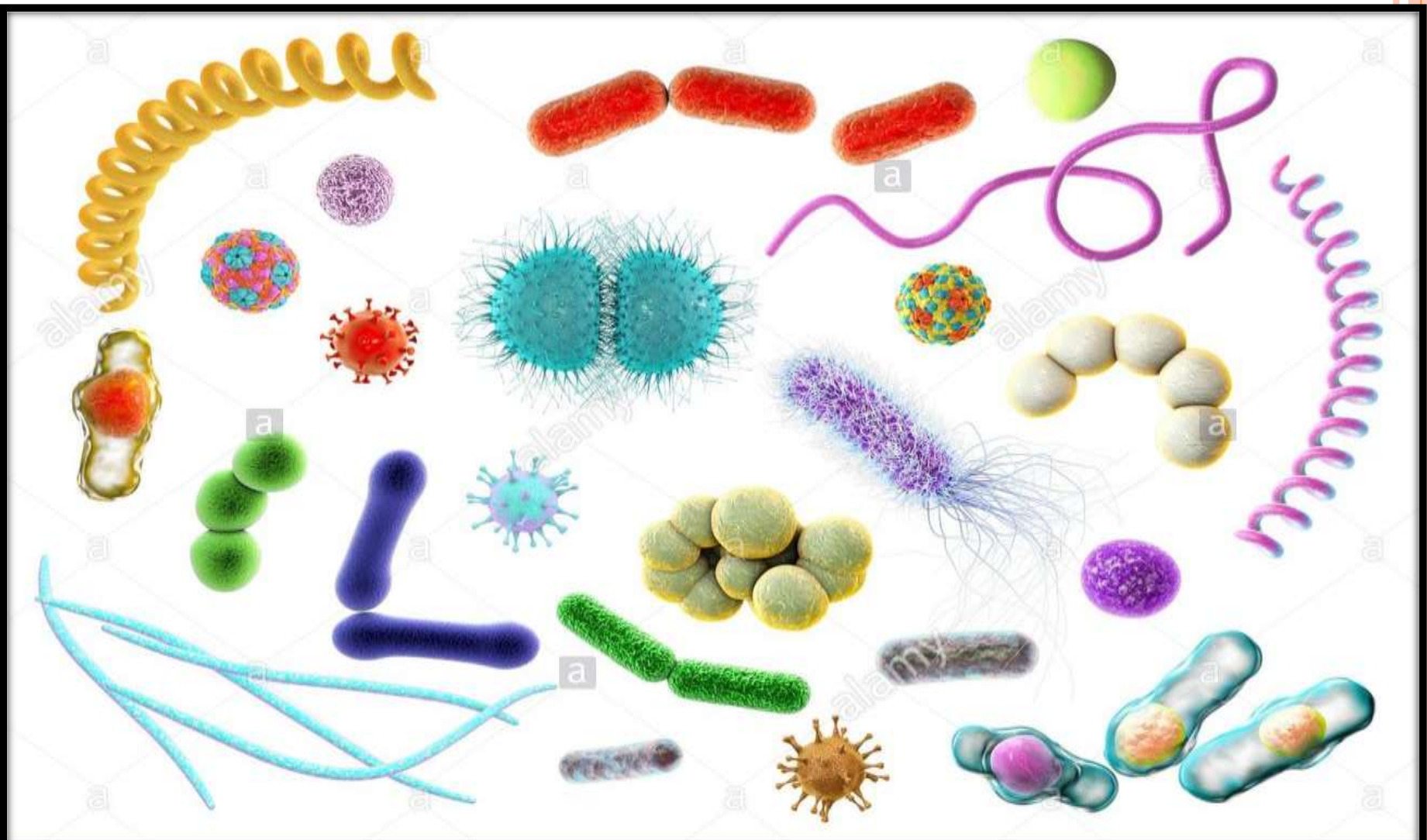


2. MICRO ORGANISMS:FRIEND AND FOE



WHAT ARE MICRO ORGANISMS???

Micro organism or microbe is a microscopic organism, which may exist in unicellular or multicellular form.



Unicellular microorganisms

- Bacteria
- Protozoa
- Some algae

Multicellular microorganisms

- Algae
- Fungi



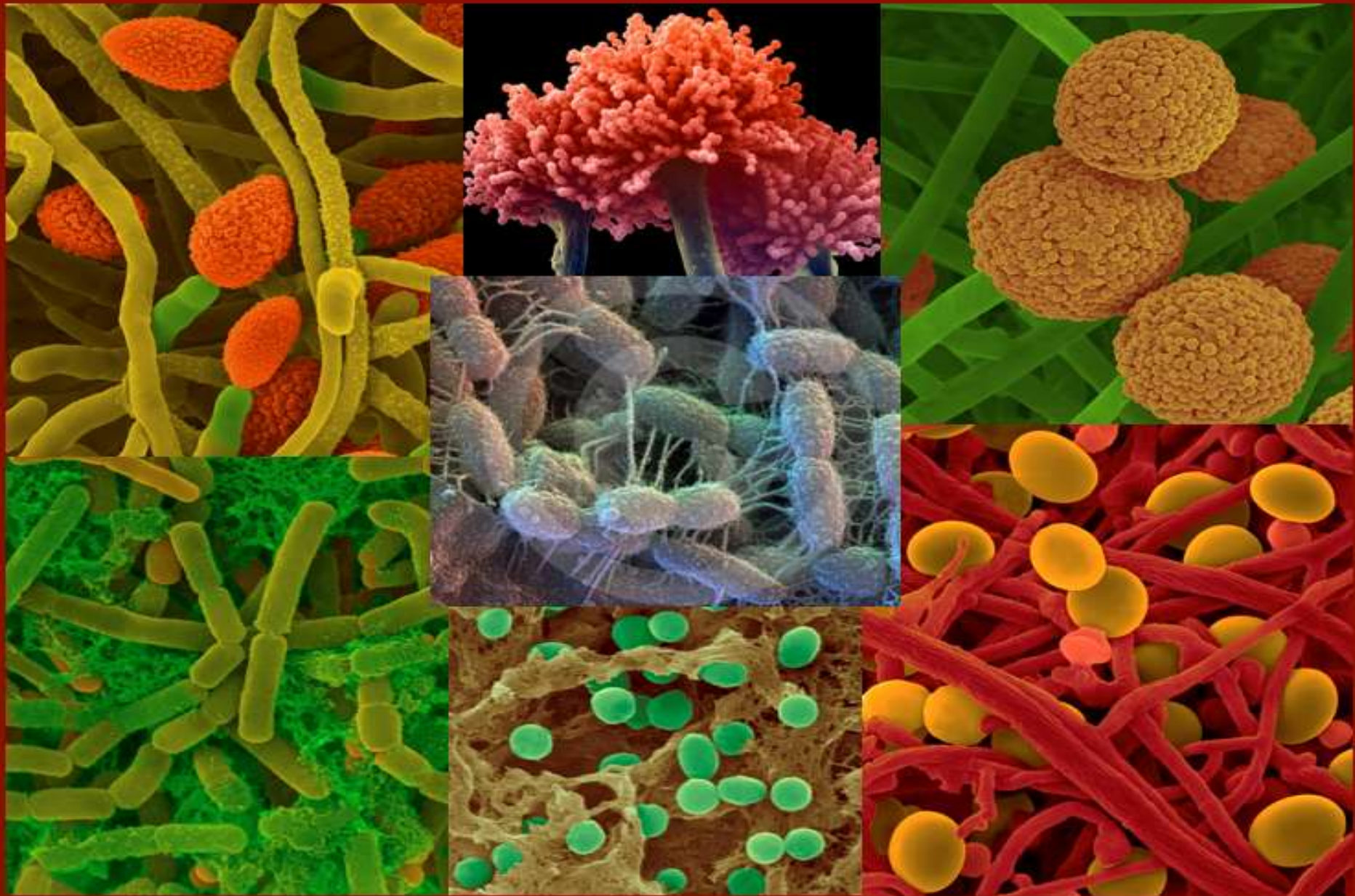
WHERE DO YOU SEE MICRO ORGANISMS?

- From ice cold environment to hot springs.
- From deserts to marshy lands.
- Also found in animals including human beings.
- Microorganisms can live alone like **amoeba** while **bacteria and fungi** live in colonies.





MICRO ORGANISMS IN SOIL

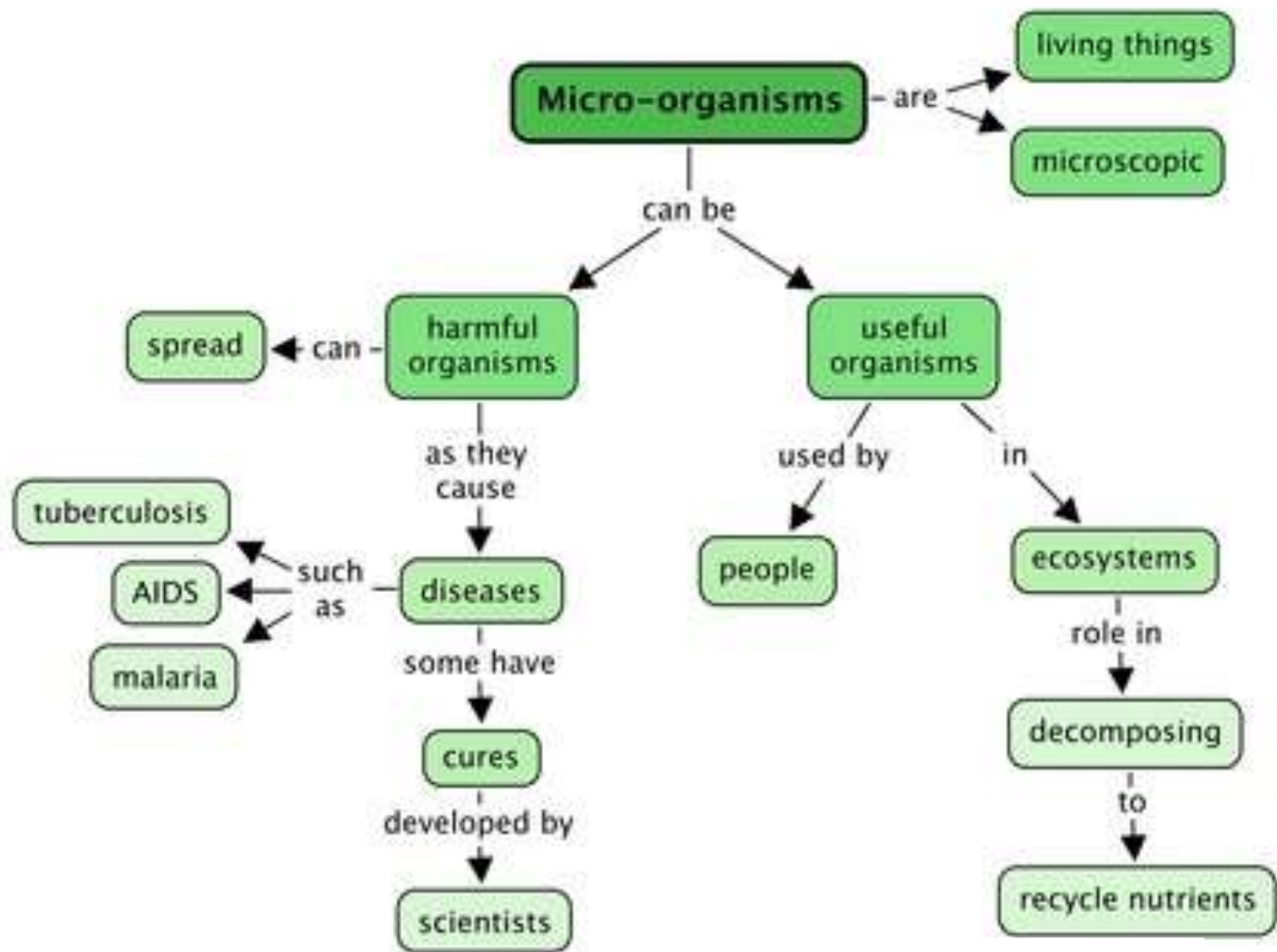


MICRO ORGANISMS IN POND



**ARE ALL MICRO
ORGANISMS HARMFUL?**



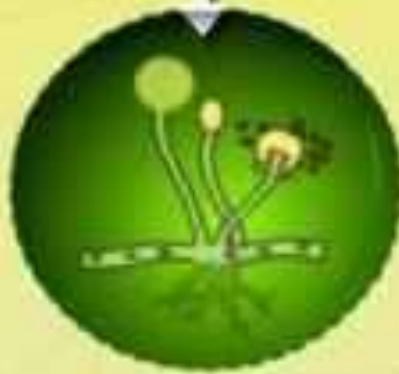


TYPES OF MICRO ORGANISMS

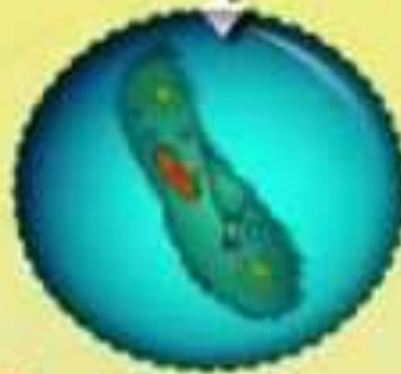
Microorganisms



Bacteria



Fungi



Protozoa



Algae



BACTERIA



**NEISSERIA
GONORRHOEAE**



**ACINETOBACTER
BAUMANNII**



**STAPHYLOCOCCUS
AUREUS (MRSA)**



**BURKHOLDERIA
CEPACIA**



**PSEUDOMONAS
AERUGINOSA**



**CLOSTRIDIUM
DIFFICILE**



**ESCHERICHIA
COLI (E.COLI)**



**MYCOBACTERIUM
TUBERCULOSIS**

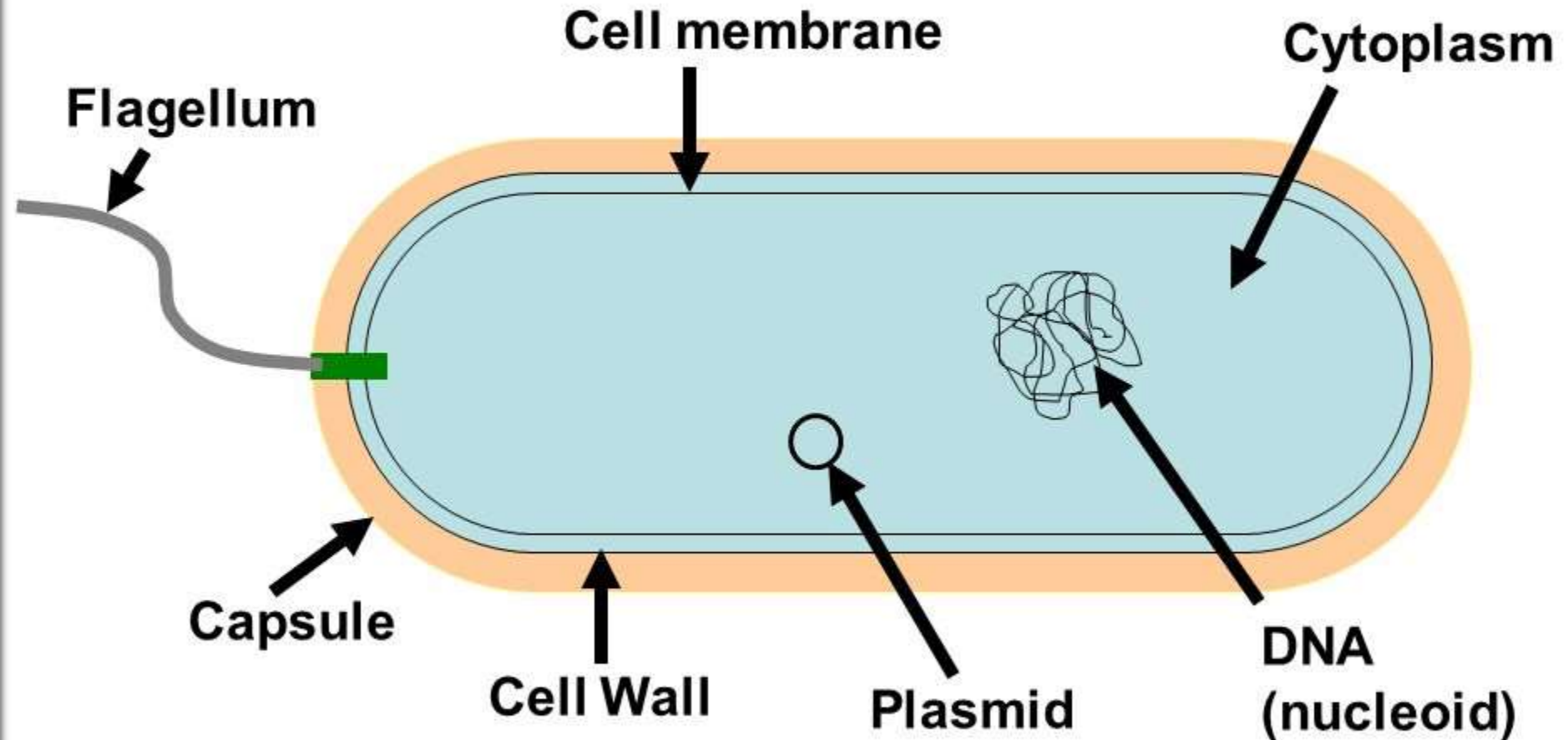


**KLEBSIELLA
PNEUMONIAE**

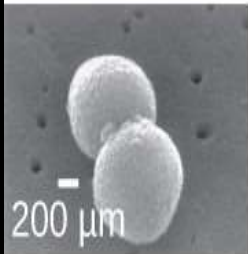


**STREPTOCOCCUS
PYOGENES**

Basic Structure of Bacterium



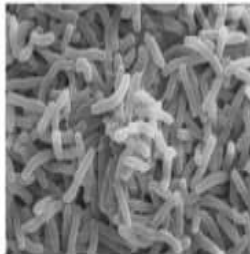
(Note: rod-shaped bacterium)



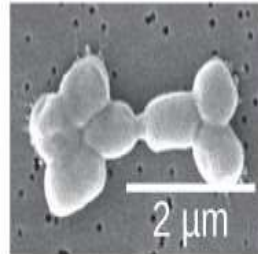
Coccus



Bacillus



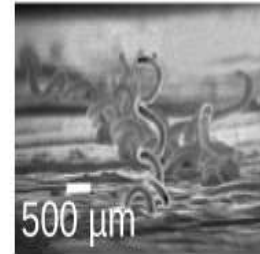
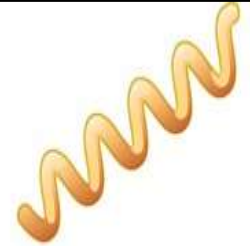
Vibrio



Coccobacillus



Spirillum



Spirochete



Beneficial and harmful bacteria

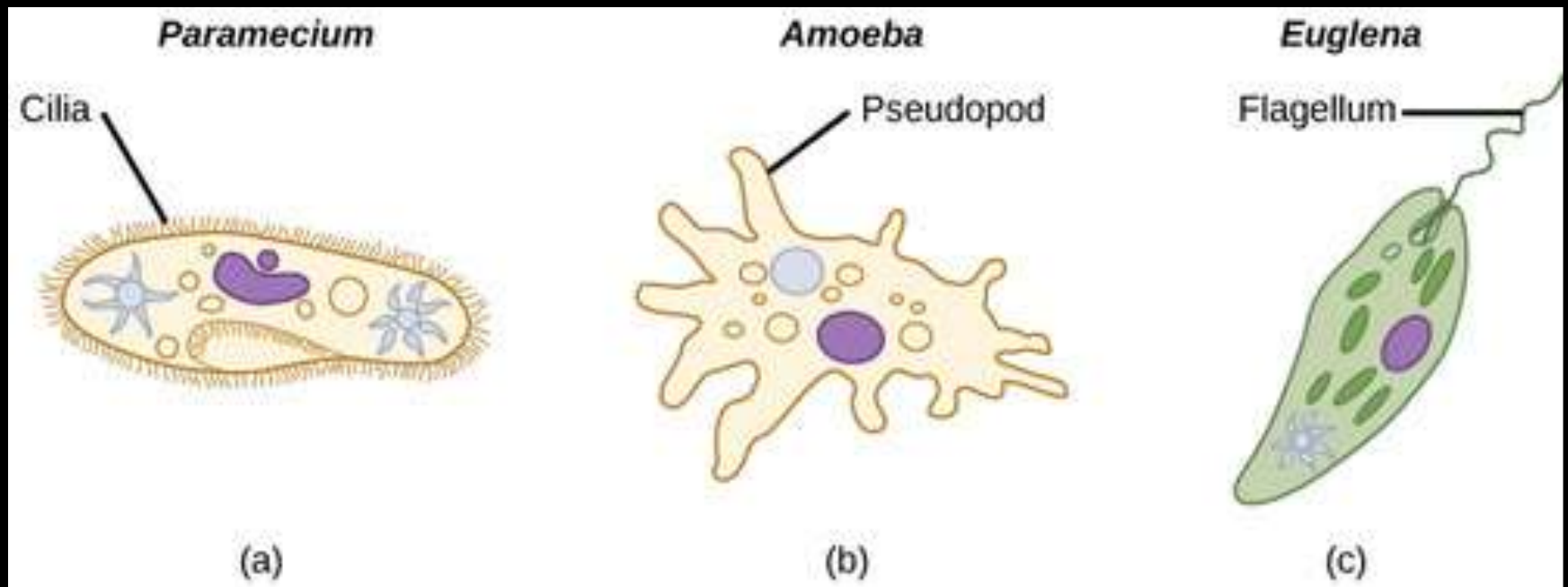
BENEFICIAL

- Lactobacillus converts milk to yoghurt and cheese
- Antibiotics can be formed by some microorganisms
- Bacteria in the colon help produce vitamins
- G.M.O.'s are used to make insulin and other useful compounds
- Bacteria are active in the Carbon and Nitrogen Cycles

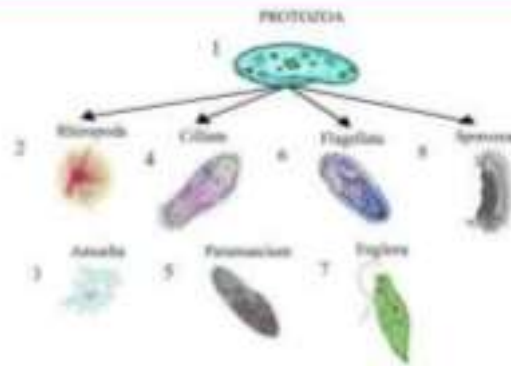
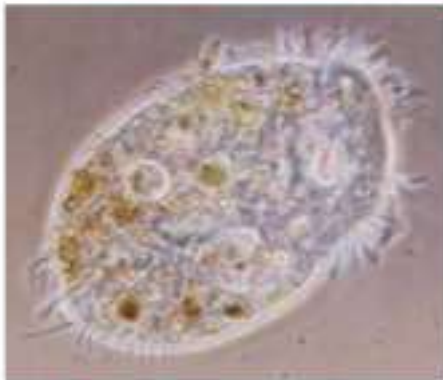
HARMFUL

- Pathogenic Bacteria can cause diseases in humans and animals.
- Pathogenic Bacteria can cause diseases in plants.
- Bacteria can cause food spoilage
- Bacteria can cause tooth decay.

PROTOZOA



protozoa



- Unicellular
- Heterotrophic
- have a nucleus
- very diverse, can be many different shapes
- can cause serious diseases like malaria
- they are useful
- they are used to eat harmful bacteria found in our sewage plants



Did you know...?

There are more protozoa
in the world than any
other animal!

What Are Fungi?

Kimberly Griffith Anderson





What are fungi?

Fungi cannot make their own food but must grow on their food source.

All fungi like warm, moist conditions.

Some fungi are unicellular, eg yeast (used to make bread and beer), while others are multicellular, eg mushrooms.

Most fungi are saprophytes, meaning they live on and digest dead material, eg wood and bread.

Other fungi are parasites, meaning they live on and digest living things, eg rusts on plants and athlete's foot in humans.



Fungi are useful:

1. Decay dead material and are important to recycle nutrients in the soil
2. Decompose sewage
3. Are used to make the antibiotic penicillin
4. Are eaten e.g. mushrooms
5. Yeast is useful to make bread,

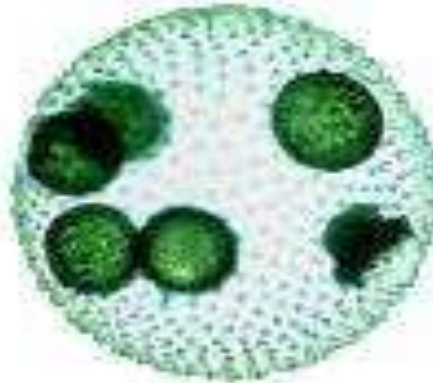
Harmful Effects of Fungi

1. Destruction of food, lumber, paper, and cloth.
2. Diseases, including allergies.
3. Toxins produced by poisonous mushrooms and within food (Mycetism and Mycotoxicosis).
4. Plant diseases.
5. Spoilage of agriculture produce.
6. Damage the products such as magnetic tapes and disks, glass lenses, marble statues, bones and wax.

ALGAE



Chlamydomonas



Volvox



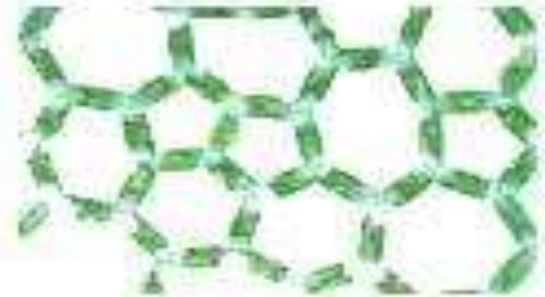
Ulothrix



Frustuliella



Ulva



Hydrodictyon

Beneficial Microorganisms

- **Algae** grows on water and produces oxygen
- **Plankton** and Algae provide food for fish



Plankton
under a
microscope

Algae



Harmful Microorganisms

Harmful Algae

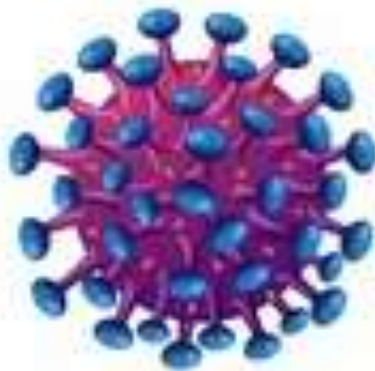
Red Tide

Algae grows too quickly, covering large amounts of water making it look red (this algae is TOXIC).

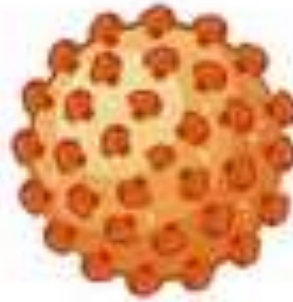
This toxic algae is harmful for people, plants and animals



VIRUS



HIV



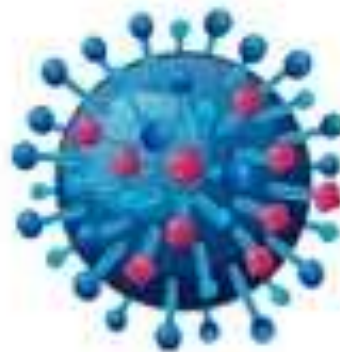
Hepatitis B



Ebola Virus



Adenovirus



Influenza



Bacteriophage

General Properties of virus

- ◆ It is very smallest infectious agent (20 –350nm)
- ◆ Obligate intracellular parasites
- ◆ Contain only one type of nucleic acid, either DNA or RNA
- ◆ Do not possess cellular organization
- ◆ Lacks enzymes necessary for protein & NA synthesis
- ◆ Depends on host cell machinery for replication
- ◆ Causes a large no. of human diseases ranging from minor ailments like common cold to terrifying diseases such as rabies, HIV etc.

VIRUS

- ❑ **The term 'virus' is derived from Latin which means poison or venom.**
- ❑ **In 1886, Adolf Meyer observed viruses in Tobacco plants and the viruses were TMV (Tobacco mosaic virus).**
- ❑ **Virus is an ultra microscopic, infectious agent that are metabolically inert and which multiply only within the living cells or host.**

