

MBIO140

Lecture-1

Microbiology

- Microbiology derived by Greek
- mikros (small)
- bios (life)
- logos (science)

- The study of organisms too small to be seen individually with the naked eye during part or all of their life cycle.
- This includes bacteria, archaea, viruses, fungi, prions, protozoa and algae, collectively known as 'microbes'.

Microbiology

It has different branches as follows:

1.	Bacteriology	Study of bacteria
2.	Virology	Study of viruses
3.	Protozoology	Study of protozoa
4.	Mycology	Study of fungi
5.	Phycology or Algology	Study of algae

Microorganisms

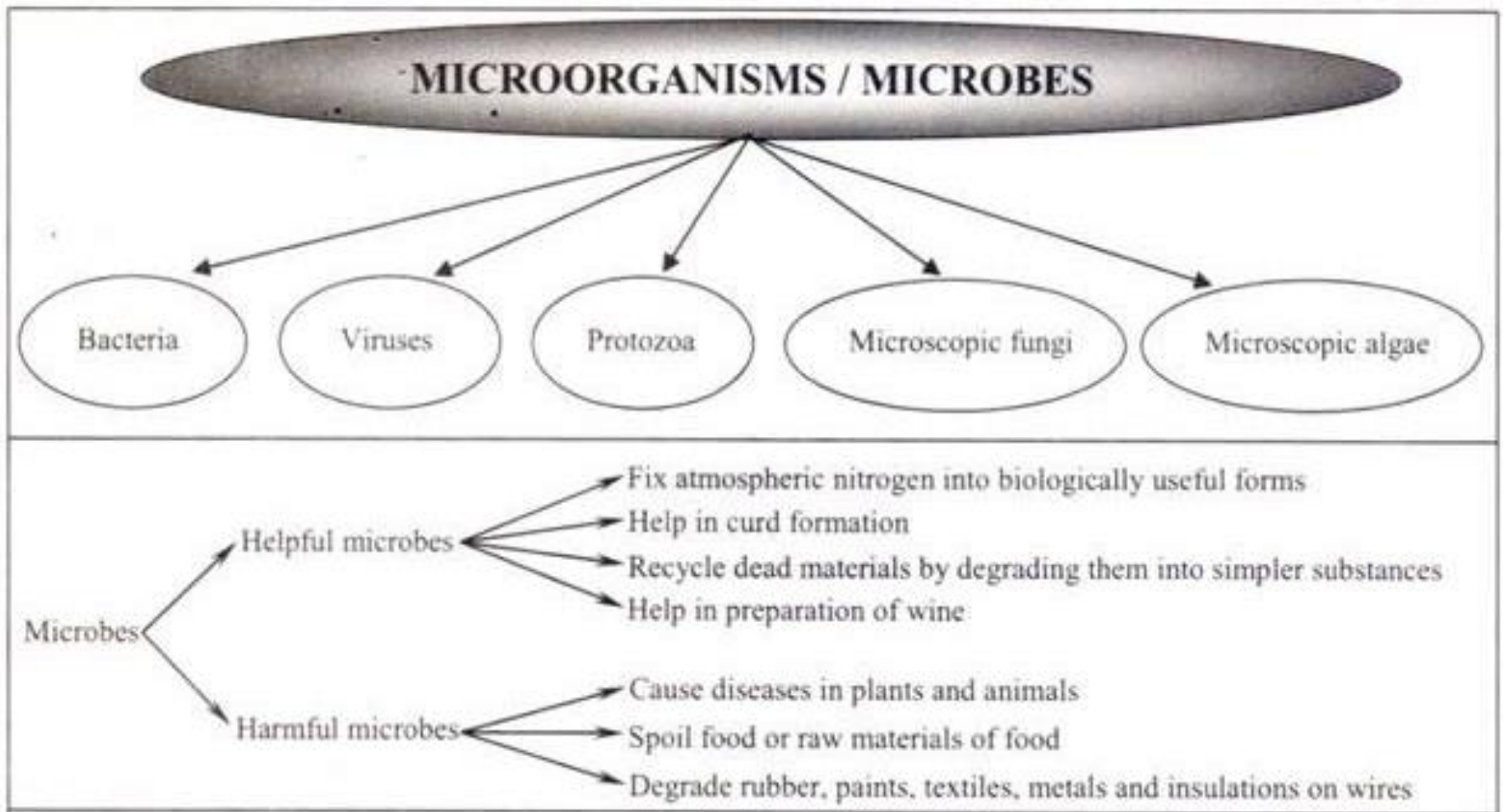
- A microorganism or microbe is an organism that is so small that it is microscopic (invisible to the naked eye).
- Microorganisms are often illustrated using single-celled, or unicellular organisms and viruses, which are microscopic but not cellular.

Types of Microorganisms

Microorganisms include

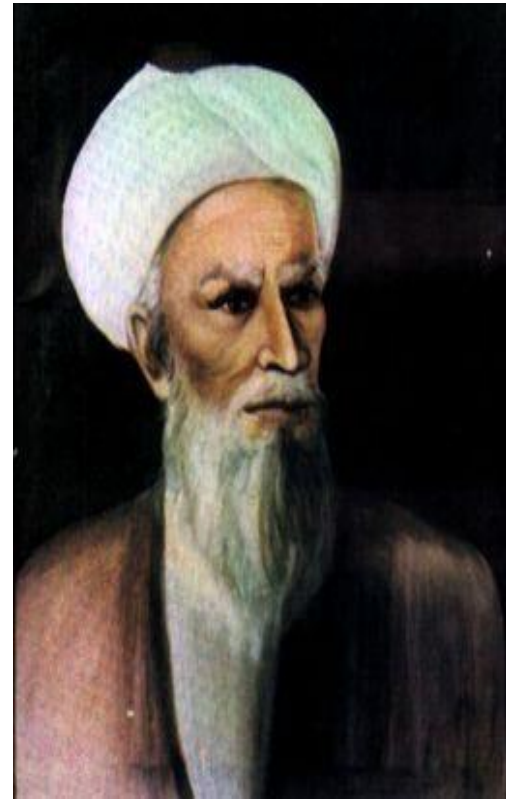
- Bacteria,
- Viruses,
- Protozoa,
- Microscopic fungi and
- Algae.

Importance of Microorganisms



History of Microbiology

- **Abu Bakr Al- Razi (250-311 H, 865-923 G).**
- He was the first scientist to differentiate between the "smallpox" and "measles", and presented a detailed description of the two diseases, and symptoms of each.



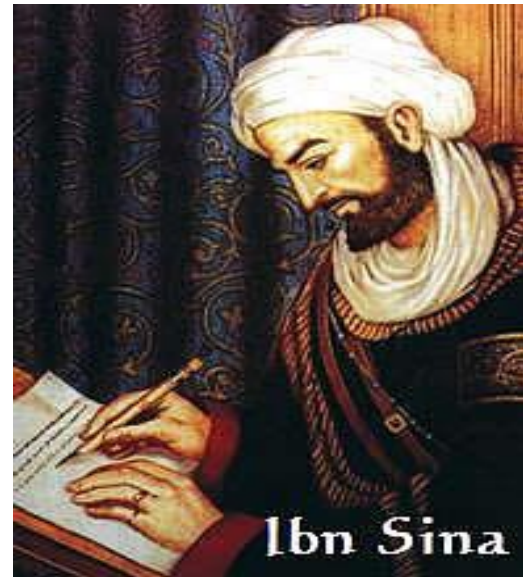
History of Microbiology

- **Abu al- Qassim Al-Zahrawi (324-400 H, 936-1013 G).**
- An Arabian scientist was known in the medicine field. Wrote in medical encyclopedia and also books on open abscess and treated warts.



History of Microbiology

- **(Ibn Sina) (368- 424 H , 980-1037 G).**
- His book *The Canon of Medicine* was one of the best references in medicine and pharmacology known for describing infectious diseases and quarantine them as control procedures.
- In Pharmacology, he discussed how to effectively test new medicines.

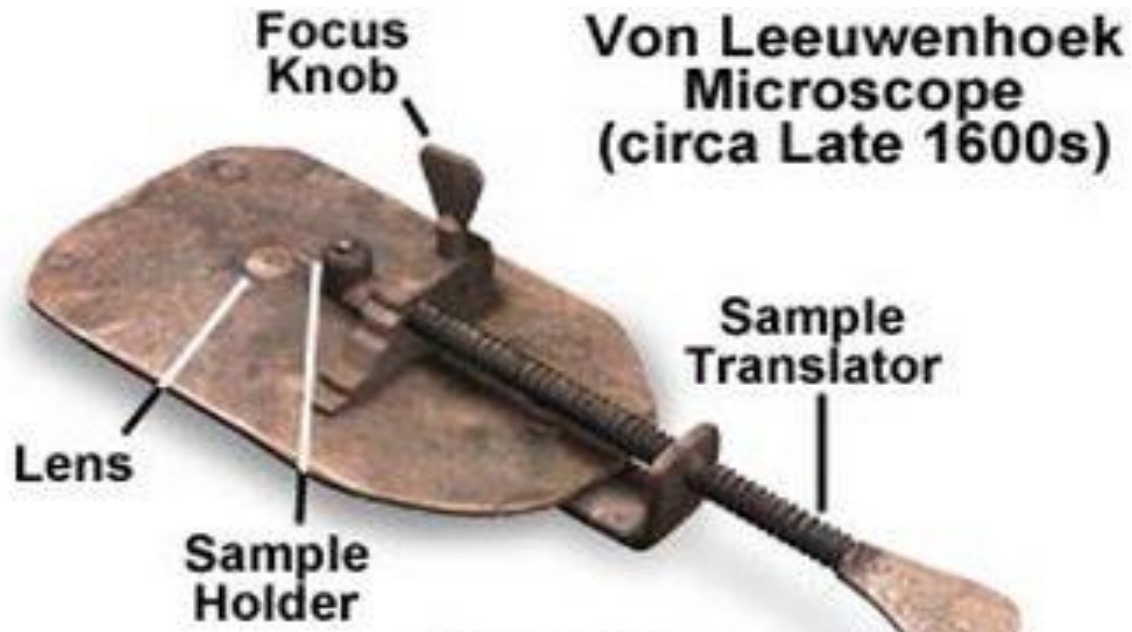


History of Microbiology

Antony Van Leeuwenhoek (1632 – 1723)

- ❖ Invented the first practical microscopes and used them to become the first person to see and describe bacteria.
- ❖ Descriptions of Protozoa, basic types of bacteria, yeasts and algae.
- ❖ Father of Bacteriology and protozoology.
- ❖ In 1676, he observed and described microorganisms such as bacteria and protozoa as “Animalcules”.

The van Leeuwenhoek microscope



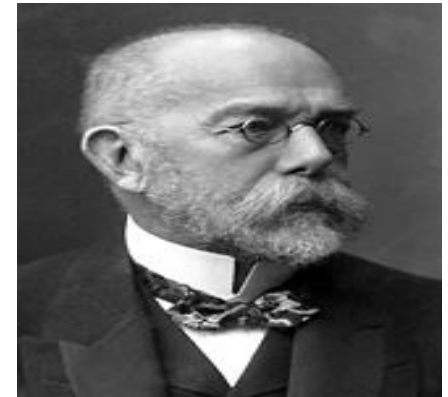
History of Microbiology

- **Louis Pasteur, a chemist, scientist, and inventor (1822–1895).**
- “A father of microbiology”.
 - Vaccines development- anthrax, cholera, TB, rabies.
 - Infections caused by germs → Healthcare awareness for surgeons.
 - Food safety- “*Pasteurization*”.

History of Microbiology

- **Robert Koch (1843-1910).**

- Discovery of the causative agent Anthrax, *Bacillus anthracis*.
- The causative agent of cholera, *Vibrio cholerae*.
- The causative agent of tuberculosis, the slow-growing bacterium, *Mycobacterium tuberculosis*.
- Developing the technique of growing bacteria
- (Isolating pure culture on solid media).



History of Microbiology

- **Robert Koch- Four postulates:**

- The organism must always be present, in every case of the disease.
- The organism must be isolated from a host containing the disease and grown in pure culture.
- Samples of the organism taken from pure culture must cause the same disease when inoculated into a healthy, susceptible animal in the laboratory.
- The organism must be isolated from the inoculated animal and must be identified as the same original organism first isolated from the originally diseased host.

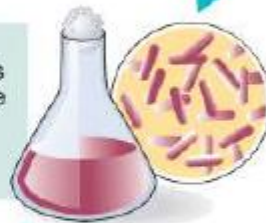
Koch's postulates

Postulate 1
The same microorganisms are present in every case of the disease.



Anthrax bacilli Spore

Postulate 2
The microorganisms are isolated from the tissues of a dead animal, and a pure culture is prepared.



Postulate 4
The identical microorganisms are isolated and recultivated from the tissue specimens of the experimental animal.



Postulate 3
Microorganisms from the pure culture are inoculated into a healthy, susceptible animal. The disease is reproduced.



QUESTIONS??

