

Microbiology: Concepts and Applications

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Microbiology

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Microbes and Disease



What are micro-organisms?

- Micro-organisms, or microbes for short, are very small living creatures.
- Most of them cannot be seen without using a microscope.

Friend or Enemy

- Only a small number cause disease, many more are helpful.
- Microbes play a key role in maintaining life on earth, fixing gases and breaking down dead plant and animal matter into simpler substances that are used at the beginning of the food chain.
- Their activity is exploited for the production of medicines, food and enzymes.
- They are used to breakdown sewage and other wastes.

Infection and disease

What is a pathogen?

- A pathogen is a micro-organism that has the potential to cause disease.

What is an infection?

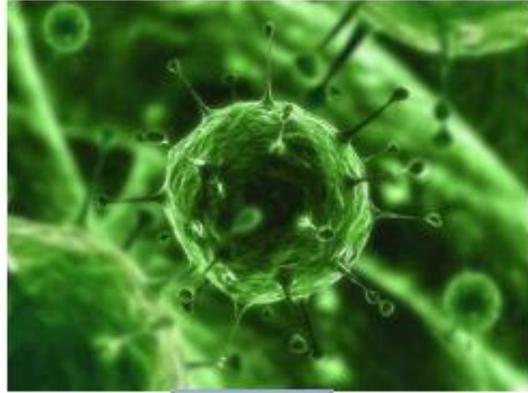
- An infection is the invasion and multiplication of pathogenic microbes in an individual or population.

What is disease?

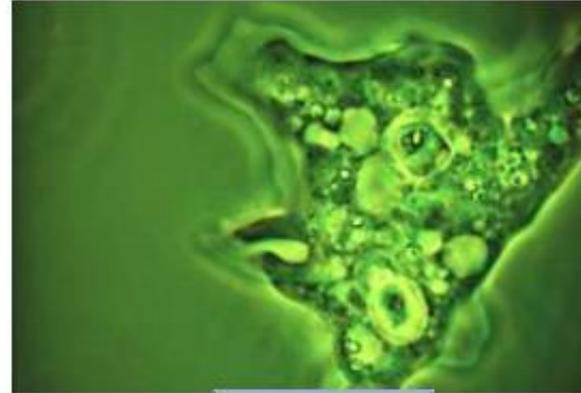
- Disease is when the infection causes damage to the individual's vital functions or systems.

An infection does not always result in disease!

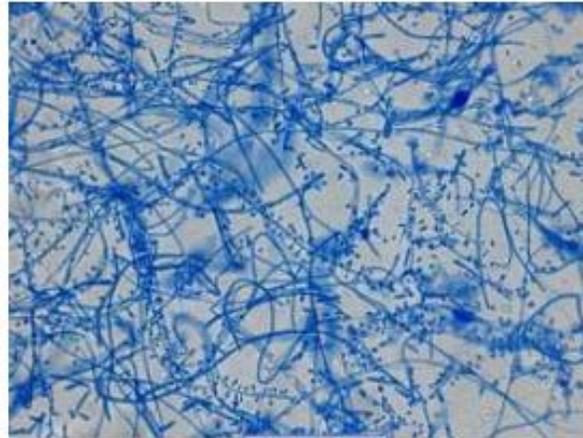
4 groups of disease causing microbes



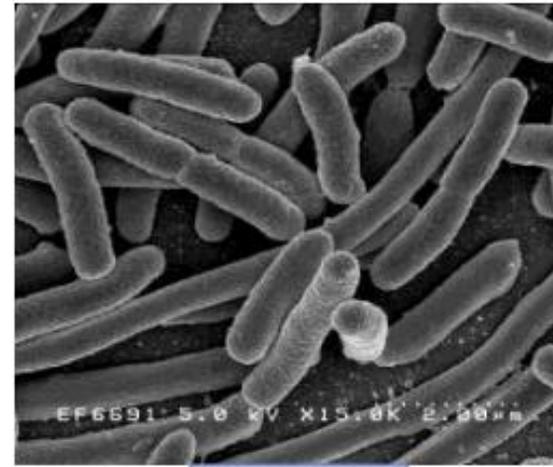
Virus



Protozoa



Fungi



Bacteria

Infectious disease	Microbe that causes disease	Type of microbe
Cold	Rhinovirus	Virus
German measles	Rubella virus	Virus
TB (Tuberculosis)	Mycobacterium tuberculosis	Bacteria
Cholera	Vibrio cholera	Bacteria
Malaria	Plasmodium falciparum	Protozoan
Ringworm	Trichophyton rubrum	Fungus
Athlete's foot	Trichophyton mentagrophytes	Fungus

- ▶ **Pathogenicity**
 - is the ability to cause disease
- ▶ **Virulence**
 - degree of pathogenicity
- ▶ **Pathogenesis**
 - is the steps or mechanisms involved in the development of the disease
- ▶ **Pathology**
 - is the study of the structural and functional manifestations of the disease
- ▶ **Symptoms**
 - Evidence of disease that is experienced or perceived
 - Subjective changes in body function noted by patient but not apparent to an observer
- ▶ **Sign**
 - Objective evidence of a disease the physician can observe and measure
- ▶ **Syndrome**
 - A specific group of signs and symptoms that accompany a particular disease