

CAIE Biology A-level

Topic 10 - Infectious Diseases

Definitions and Concepts

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Acquired Immunodeficiency Syndrome (AIDS) - A disease which occurs when HIV destroys a given proportion of T helper cells and the immune system is no longer functional.

Antibiotic - A chemical or compound produced by a living organism that kills or prevents the growth of bacteria.

Antibiotic resistance - Some bacteria have favourable mutations which allow them to survive in the presence of an antibiotic. These bacteria reproduce rapidly to form resistant strains.

Bacteria - Prokaryotic cells that have cell walls but lack organelles. Some bacteria are pathogenic, producing toxins that damage host cells.

Bacterial mutation - Random changes in the DNA sequence may result in a protein with an altered primary, and therefore tertiary structure.

Cholera - A disease caused by some strains of the bacterium *Vibrio cholerae*. It causes severe diarrhoea.

Disease - Dysregulation of a living system that impairs function.

Human Immunodeficiency Virus (HIV) - An infectious virus that destroys T helper cells, weakening the immune system of the body. HIV makes an individual more susceptible to opportunistic infections and can lead to AIDS (Acquired Immunodeficiency Syndrome).

Infectious disease - A disease that is caused by a pathogen and transmitted directly between organisms.

Malaria - A disease caused by the protoctists *Plasmodium falciparum*, *Plasmodium malariae*, *Plasmodium ovale* and *Plasmodium vivax* that live within two hosts, mosquitoes and humans. It causes recurrent episodes of fever and can be fatal.

Measles - A disease caused by the virus of the genus *Morbillivirus*. It causes cold-like symptoms and fever.

Non-infectious disease - A disease that cannot be transmitted by direct contact between individuals e.g. sickle cell anaemia or lung cancer.

Pathogen - A disease-causing microorganism. Includes bacteria, viruses, fungi and protoctista.

Penicillin - The first conventional, effective and safe antibiotic derived from the mould *Penicillium chrysogenum*. It was discovered by Alexander Flemming.

Protoctista - A group of eukaryotic, single-celled microorganisms that may cause disease. They digest cells and use the cell contents to reproduce.

Selection pressure - Environmental factor that drives evolution by natural selection.



Smallpox - A disease caused by viruses of the *Variola* genus. The initial symptoms are headache and fever. Later there is pockmarking of the skin. The World Health Organisation registers that the disease has been eradicated due to a successful vaccination program.

Tuberculosis (TB) - A bacterial disease, caused by *Mycobacterium tuberculosis* and *M. bovis*, that damages lung tissue and weakens the immune system.

Vector (disease) - A living or non-living agent that transmits a pathogen between organisms.

Virus - Non-living infectious agents that invade host cells and take over cell metabolism, replicating within them.

