

Definitions and Concepts for Edexcel (A) Biology A-level

Topic 6 - Immunity, Infection and Forensics

Topic 6 - Forensics

DNA profiling: A method of comparing DNA sequences by cutting it into fragments and comparing the fragments with each other for genetic identification or determining genetic relationships.

Exons: Sections of genetic material which code for proteins.

Forensic entomology: The analysis of the insects found on decomposing tissue which is often used to determine the time of death.

Gel electrophoresis: A technique used to separate DNA fragments based on their size by their movement through a gel when an electric current is applied.

Introns: Sections of genetic material which do not code for proteins.

Mature mRNA: mRNA molecules after the removal of the intron sequences by the spliceosome.

Polymerase chain reaction (PCR): A laboratory technique used for the mass amplification of DNA using heat cycling and a thermostable form of DNA polymerase.

Pre-mRNA: mRNA molecules before the removal of introns.

Rigor Mortis: The stiffening of the body caused by muscles contracting due to chemical changes a few hours after death.

Spliceosomes: A complex usually found in the nucleus which removes introns from transcribed mRNA molecules.

Stage of succession (forensics): Using knowledge of ecosystem development around a decomposing body to determine the rough time of death.

Topic 6 - Infection and the immune system

Acquired Immunodeficiency Syndrome (AIDS): The name given to the loss of immune function through the destruction of the immune system over time after infection by HIV.


M E G A
L E C T U R E

Antibody: A protein molecule which binds to an antigen and is produced by B cells in response to an infection.

Antigen: A foreign substance which is capable of triggering an immune response.

Antigen presenting cell (APC): A type of cell which breaks down pathogens and presents the cellular fragments on their surface for detection by other immune cells.

Artificial adaptive immunity: Immunity that is acquired by exposure to a dead or weakened version of a pathogen in the form of a vaccine.

Artificial passive immunity: Immunity that is gained by the transfer of premade antibodies to an individual through an injection.

Bacteria: A type of unicellular prokaryote which can exist alone or as a parasite.

Bacterial capsule: A polysaccharide layer that surrounds bacterial cells and provides strength.

Bactericidal antibiotics: A type of antibiotic which kills bacteria.

Bacteriostatic antibiotics: A type of antibiotic which prevents bacteria from growing by interfering with processes required for their growth such as metabolism or DNA replication.

B effector cell: A form of B lymphocyte that actively produces and secretes antibodies in response to an infection.

B memory cell: A class of B lymphocyte which resides in the lymph nodes and provides long term immunity to a pathogen.

Host/Parasite Evolutionary race: The continual competition over time where infectious agents are evolving better infection mechanisms whilst the hosts are simultaneously evolving better defences.

Immunodeficiency Virus (HIV): A virus spread through bodily fluids that attacks the immune system and can lead to AIDS.

Inflammation: The immune response to tissue damage involving swelling through the accumulation of immune cells and fluids.

Interferon: A cytokine released by virus infected cells which alerts nearby cells and triggers immune defences.

Lysozyme: The enzyme present in secretions such as tears, saliva and mucous which breaks down bacterial cell walls.


M E G A
L E C T U R E

Macrophages: A type of immune cell originating from monocytes which are specialised for phagocytosis of pathogens and can act as antigen presenting cells.

Mycobacterium tuberculosis (TB): A type of bacterium which causes the disease tuberculosis which typically affects the lungs by causing tissue death.

Natural adaptive immunity: Immunity that is gained from infection with a live pathogen.

Natural passive immunity: Immunity produced by the transfer of antibodies from a mother to a foetus through the placenta or to a baby through breastfeeding.

Pathogen: A microorganism which causes disease.

Phagocytosis: The ingestion of solid material (particularly pathogens and foreign material) by phagocytic cells.

Pili: Small hair-like projections on the surface of bacterial cells used to adhere to other cells.

Plasma cell (B cell): A type of lymphocyte which matures in the bone marrow and produces antibodies.

Plasmid: Loops of DNA found in the cytoplasm of prokaryotic cells.

Primary immune response: The initial response produced by the immune system when it encounters a pathogen for the first time.

Prokaryotic cell: A type of cell that does not contain any membrane bound organelles or a nucleus.

Secondary immune response: The response produced by the immune system to a pathogen which it has encountered previously.

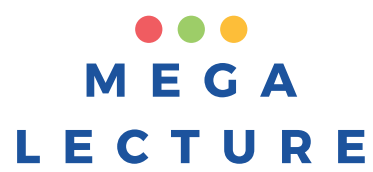
Skin flora: A group of typically harmless microorganisms which are found on the surface of the skin and provide protection from harmful pathogens by competing with them for nutrients.

T cells: A type of lymphocyte that matures in the thymus and is involved in cell mediated immunity.

T helper cell: A type of T lymphocyte which regulates the immune response through the release of cytokines.

T killer cell: A type of T lymphocyte which triggers apoptosis in cells which are damaged or infected with viruses.

T memory cell: A type of T lymphocyte with different subtypes found in different parts of the body which is used to provide long term immunity to a pathogen.



MEGA
LECTURE

Virus: A non-living microorganism that consists of genetic material surrounded by a protein husk.