

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

Topic 3 - Voice of the Genome

Topic 3 - Cell organelles

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

Cell: The basic unit of a living organism composed of organelles suspended in a cytoplasm with a cell membrane surrounding it.

Cell wall: A tough outer layer made of polysaccharides found in plant cells, bacteria and fungi.

Centrioles: Structures found in the cytoplasm made of microtubules that produce the spindle fibres during mitosis.

Flagella: A whip-like structure found on bacterial cells that is used for cell movement.

Golgi apparatus: An organelle found in eukaryotic cells that is involved in the modification and packaging of proteins.

Lysosomes: Membrane-bound vesicles found in the cytoplasm that contain a hydrolytic enzyme called lysozyme.

Mesosomes: Inward folds in the membrane of bacteria which are used for respiration.

Mitochondrion: An organelle found in eukaryotic cells that is the site of aerobic respiration.

Nuclear envelope: A double membrane that surrounds the nucleus.

Nucleolus: A structure found inside the nucleus that contains proteins and RNA and is involved in synthesizing new ribosomes.

Nucleus: An organelle found in eukaryotic cells that stores the genetic information of the cell as chromosomes and is surrounded by a membrane called the nuclear envelope.

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

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

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

Ribosomes: Organelles found either free in the cytoplasm or membrane bound that are involved in the synthesis of proteins.

Rough endoplasmic reticulum (RER): A membrane-bound organelle that is involved in the synthesis and packaging of proteins.

Smooth endoplasmic reticulum (SER): A membrane-bound organelle involved in lipid synthesis.

Topic 3 - Reproduction

Sperm cell: The male gamete which contains a long tail, an acrosome and lots of mitochondria and is specialised to fertilise an egg cell.

Acrosome: An organelle found in the head of sperm cells which is specialised to digest the outer coating of an egg cell during fertilisation.

Zona pellucida: The tough outer layer of the egg cell which is composed of glycoproteins and is used to prevent multiple sperm cells from fertilising the egg.

Locus: The location of a gene on a chromosome. †

Sex linkage: An allele which is found on a sex chromosome and so its expression is determined on the gender of the organism.

Meiosis: A type of cell division used to produce gametes that produces four genetically different haploid daughter cells from one parent cell.

Independent assortment: A source of variation in meiosis where the bivalent chromosomes can line up either way around on the metaphase plate.

Mitosis: The division of a cell to produce two genetically identical daughter cells.

Asexual reproduction: The production of genetically identical offspring from one parent through the process of mitosis.

Topic 3 - Stem cells and epigenetics

Continuous variation: A type of variation within a population produced by polygenic inheritance where the phenotypes are spread over a range of values.


M E G A
L E C T U R E

Differential gene expression: The process of switching on or off genes to control functions within a cell by varying the production of proteins.

DNA methylation: The epigenetic modification of DNA by the addition of a methyl group which reduces transcription.

Epigenetics: The study of how gene expression influences traits in an organism.

Histone acetylation: The epigenetic modification of histone proteins by the addition of an acetyl group which relaxes the DNA and increases transcription.

Lac operon: A group of genes that control lactose uptake and metabolism in certain types of bacteria and are all regulated by the binding of the lac repressor to the lac operator.

Operon: A group of genes which are all under the control of the same operator.

Organ: A group of specialised tissues working together to carry out a specific function.

Organ system: A group of specialised organs working together to carry out a specific function.

Pluripotent stem cell: A type of stem cell which has the ability to differentiate into any cell type in the body.

Polygenic inheritance: The inheritance of multiple different alleles at multiple loci that control a single phenotype.

Stem cell: An undifferentiated cell that can divide to produce many specialised cells of the same type.

Tissue: A group of specialised cells working together to carry out a specific function.

Totipotent stem cell: A type of stem cell which has the ability to differentiate into any type of cell in the body or in the placenta.