

## 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.



# MEGA LECTURE

**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.

*Definitions denoted with a '+' taken from: [Edexcel Biology A Salters-Nuffield Specification, 9BN0, Issue 4 \(Pearson\)](#)*