

# SMALL AND MIGHTY: A-Z GLOSSARY

*This glossary explains some of the words and phrases that we use in the course. It's a work in progress, so if there's anything you think is missing, let us know in the comments and we'll add them to the document for next time.*

NAME	DESCRIPTION
Acellular	Not consisting of cells
Adenosine triphosphate (ATP)	A chemical that is the main energy currency of the cell.
Aerobe	An organism which grows in the presence of air/oxygen.
Anaerobe	An organism which does not require oxygen to grow.
Antibiotic	A medication that kills or inhibits the growth of bacteria.
Antibody	A protein that is produced by B-cells in the immune system to identify and destroy invaders like bacteria and viruses.
Antifungal	A medication that kills or inhibits the growth of fungi.
Antigen	A substance which provokes the body to make an immune response.
Antimicrobial	A compound which either kills microorganisms or stops their growth.
Antiparasitic	A medication that kills or inhibits the growth of parasites, such as protists.
Antiseptic	An agent that is used to kill microorganisms but can only be used topically (on the surface of the body) because it is toxic to humans if ingested or injected. Very useful to prevent infections of wounds, especially during surgical operations.

<b>Antiviral</b>	A medication which specifically treats viral infections by inhibiting a step in the viral replication cycle.
<b>Archaea</b>	One of the five major groups of microbes. Archaea are prokaryotes (Step 1.4).
<b>Bacteria</b>	This is one of the five major groups of microbes. Bacteria are prokaryotes. (Step 1.4).
<b>Bacterivore</b>	Any organism which eats and derives nutrition from bacteria.
<b>Binary fission</b>	A type of asexual reproduction. A unicellular organism divides in two, to produce two separate cells.
<b>Capsid</b>	The shell of a virus particle made up of proteins.
<b>Chemotaxis</b>	Movement of cells in response to chemical signals.
<b>Chitin</b>	A nitrogen containing polysaccharide (complex sugar). A component of fungal cell walls. Also a major component of arthropod (e.g. insects, spiders, crustaceans) exoskeletons.
<b>Chromatid</b>	Each of two identical copies of a chromosome, formed immediately after chromosome replication in eukaryotes.
<b>Chromosome</b>	Chromosomes are made of DNA. In eukaryotes, each chromosome is a linear DNA molecule that is tightly coiled and bound by proteins. In prokaryotes, the genome is also called a chromosome, but this is a circular molecule found in the cytoplasm.
<b>Cofactor</b>	A non-protein component of an enzyme that is necessary for enzyme activity
<b>Deoxyribonucleic acid (DNA)</b>	The molecule which contains the genetic material (or instruction manual) that an organism needs to make more copies of itself. Composed of a sequence of nucleotides.
<b>Dimorphic</b>	Occurring in two distinct forms. In fungal biology, it is used to describe fungi that can switch between yeast-like growth and hyphal-like growth.
<b>Electron transport chain (ETC)</b>	A chain of proteins and molecules that are embedded within a lipid membrane that perform a series of redox reactions (by transferring electrons from one component to another). This releases energy from an energy source (e.g. sunlight in photosynthesis) in manageable amounts, which can be used to make the storage molecule ATP.
<b>Endospore</b>	A dormant and very tough structure produced in certain Gram positive bacteria that is resistant to environmental stress and contains a copy of the genome. It can germinate into growing cell when conditions become favourable.

<b>Enzyme</b>	Protein molecules which speed up chemical processes by lowering the amount of energy needed to make them to happen.
<b>Eukaryote</b>	An organism that has one or more cells that contain a clearly defined nucleus and membrane-bound organelles.
<b>Extremophile</b>	An organism that lives in an "extreme" environment, such as very high temperature, low pH (acidic), high pH (alkali), high salinity, high radiation etc.
<b>Fermentation</b>	A metabolic process in which a carbohydrate such as starch or sugar is converted into an alcohol or an acid.
<b>Fimbriae</b>	Very thin, hair-like appendages which occur on the outer membrane of bacteria. They often help bacteria to attach to surfaces. Sometimes called pili.
<b>Flagella</b>	Long structure found on the outer surface of many organisms. It acts like a propeller to push the cell through liquids. The structure is different between bacteria, archaea and eukaryotes. In bacteria it is involved in chemotaxis.
<b>Fungi</b>	One of the 5 major groups of microbes, but also contains multicellular organisms. Includes unicellular yeasts and multicellular rusts, smuts, mildews, molds and mushrooms. Some species are dimorphic.
<b>Genome</b>	One complete set of the genetic material that an organism needs to make copies of itself, including all the genes.
<b>Horizontal Gene Transfer (HGT)</b>	The transmission of DNA or genetic material between different organisms which are not in a parent-offspring relationship.
<b>Host</b>	An organism on or in which another organism lives, be that a parasite or commensal.
<b>Last Universal Common Ancestor (LUCA)</b>	The most recent ancestor from which all cellular life on Earth is descended from.
<b>Microbiome</b>	The complete collection of genes of all the microbes in a community.
<b>Microbiota</b>	The complete collection of microbial populations in a community.
<b>Multicellular</b>	An organism that is made up of more than one cell.
<b>Mutation</b>	An alteration or change that occurs in the DNA sequence.
<b>Peptidoglycan</b>	A chemical that is an essential component of the bacterial cell wall.
<b>Porin</b>	A protein in the shape of a pore which is found in the outer membrane of Gram negative bacteria.

<b>Prokaryote</b>	Any organism which lacks a distinct nucleus and other organelles due essentially to a lack of internal membranes
<b>Proteome</b>	The complete set of proteins in an organism
<b>Protists</b>	One of the 5 major groups of microbes, but also contains multicellular organisms. Protists are eukaryotes. Includes plant-like algae, fungi-like slime-molds and animal-like protozoa.
<b>Reactive oxygen species (ROS)</b>	Unstable oxygen-containing molecules that react very rapidly with other cellular molecules such as DNA and lipids, causing them damage.
<b>Recombinant protein</b>	A protein that is produced in a non-native organism as a result of genetic engineering (e.g. a human protein produced in <i>E. coli</i> ).
<b>Restriction enzyme</b>	An enzyme which cuts DNA at a specific nucleotide sequence.
<b>Ribonucleic acid (RNA)</b>	Composed of a sequence of nucleotides (similar to DNA). Messenger RNA is used by ribosomes to transfer the information in the genetic code into proteins. Non-coding RNAs (ncRNAs) have various functions and are not used by ribosomes to form proteins. Some viruses use RNA as their genetic material.
<b>Siderophore</b>	A molecule with a high affinity for iron. Produced by many organisms to obtain ("scavenge") iron from the environment or their host.
<b>Spores</b>	A reproductive structure which is designed for efficient dispersal in the environment and/or survival in stressful conditions.
<b>Scanning Electron Microscopy (SEM)</b>	A type of electron microscope which can directly study the surface of solid objects.
<b>Transmission Electron Microscopy (TEM)</b>	A type of electron microscope which allows users to study the internal structure of materials
<b>Toxin</b>	A poisonous substance, generally a protein, produced by living cells
<b>Unicellular</b>	Single celled
<b>Viruses</b>	One of the five major groups of microbes. They are composed of a protein capsid surrounding a nucleic acid genome (DNA or RNA) and are unable to reproduce outside of a host cell.
<b>Yeast</b>	A unicellular fungus.