

Definitions and Concepts for AQA Biology A-Level

Topic 3 - Exchange

Alveoli: Small air sacs found in the lungs at the end of bronchioles which provide a large surface area for gas exchange.

Amylases: A class of enzymes that hydrolyze polysaccharides.

Antiporter: A membrane protein involved in the cotransport of molecules in opposite directions.

Aorta: The main artery that carries oxygenated blood away from the heart at high pressure.

Arteriole: A smaller type of blood vessel that connects arteries with capillaries.

Artery: A type of blood vessel that carries blood away from the heart.

Atrium: A type of chamber in the heart which receives blood directly from a vein and passes it on to a ventricle.

Bile salts: Molecules found in the small intestine that assist in the coagulation of lipids, increasing the lipid surface area for breakdown.

Bronchi: The two airways branching out from the trachea and lead to the smaller bronchioles.

Bronchioles: Small airways which branch out from the bronchi and end at the alveoli.

Capillary: A very small blood vessel with thin walls and a small diameter used for substance exchange in tissues.

Capillary bed: A network of many different capillaries that supply the tissues with blood.

Coronary artery: The main artery that supplies the heart tissue with blood.

Co-transport - A type of membrane transport mechanism involving two different molecules moving across a cell membrane.

Diaphragm: A large sheet of muscle below the lungs used to reduce and increase the lung capacity to create pressure changes necessary for ventilation.

Endopeptidase: A class of enzymes that hydrolyze peptide bonds within polypeptides.

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Exopeptidases: A class of enzymes that hydrolyze peptide bonds at the end of proteins (e.g. between the penultimate and last amino acid in the polypeptide).

External intercostal muscles - A set of muscles found between the ribs on the outside that are involved in forced and quiet inhalation.

Gill filaments: Small divisions of the gills in fish that extend off the gill arch.

Gill lamellae: Small protrusions on the gill filaments designed to increase the surface area available for gas exchange.

Haemoglobin: A protein found in red blood cells that has a quaternary structure and is specialised to carry oxygen to the tissues.

Internal intercostal muscles - A set of muscles found between the ribs on the inside that are involved in forced exhalation.

Left atrium: The chamber in the heart that receives oxygenated blood from the pulmonary vein and passes it on to the left ventricle.

Left ventricle: The chamber in the heart that receives oxygenated blood from the left atrium and pumps it out of the heart to the rest of the body.

Lipase: A class of enzymes that hydrolyze lipids.

Membrane-bound dipeptidases: A class of enzymes found within membranes that hydrolyze dipeptides into singular amino acids.

Membrane-bound disaccharidases: A class of enzymes found within membranes that hydrolyze disaccharides into monosaccharides.

Micelles: An organised group of lipid molecules that aggregate together to provide a hydrophobic capsule for the uptake of lipids.

Phloem: A type of tissue found in plants used to transport organic substances from where they are made to where they are needed.

Positive cooperativity: Conformational changes caused by the binding of oxygen to haemoglobin that increase the ability of haemoglobin to bind more oxygen.

Pulmonary artery: The main artery that carries deoxygenated blood from the heart to the lungs for reoxygenation.

Pulmonary vein: The main vein that carries oxygenated blood away from the lungs and back to the heart.


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Renal artery: The main artery that carries oxygenated blood to the kidneys from the heart.

Renal vein: The main vein that carries deoxygenated blood away from the kidneys back to the heart.

Right atrium: The chamber in the heart that receives deoxygenated blood directly from the vena cava and passes it on to the right ventricle.

Right ventricle: The chamber in the heart that receives deoxygenated blood from the right atrium and pumps it out of the heart to the lungs for reoxygenation.

Spiracles: Small openings on the surface of insects that allow for the exchange of gases with their environment.

Spongy mesophyll: A type of loosely packed mesophyll tissue with air pockets found in plant leaves which is specialised for gas exchange.

Stomata: Small holes found on leaves that can be opened or closed by guard cells to control the amount of water loss and gas exchange.

Symporter: A membrane protein involved in the cotransport of molecules in the same direction.

The Bohr effect: A decrease in the affinity of haemoglobin for oxygen in areas with a high carbon dioxide concentration.

Tissue fluid: Fluid filtered out from the blood that bathes tissues and provides the cells with substances like food and dissolved gases for exchange.

Trachea: The main airway that acts as a passage for air to pass to and from the bronchi.

Trachea (mammals): A tube reinforced with cartilage that allows for the movement of air between the larynx and bronchi.

Tracheae (insects): Tubes leading from the spiracles to the tracheoles that are part of the gaseous exchange system.

Tracheoles: Very small tubes that make up the respiratory system of insects and carry gases from the tracheae to the cells.

Vein: A type of blood vessel that carries blood into the heart from other parts of the body.

Vena cava: The main vein that carries deoxygenated blood into the right atrium of the heart.

Ventricle: A type of chamber in the heart which receives blood from the atrium above it and pumps it out of the heart.


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Venule: A smaller type of blood vessel that connects capillaries with veins.

Xerophyte: A type of plant that is adapted to survive in places with very little water.

Xylem: The tissue that transports water in the stem and leaves of plants.