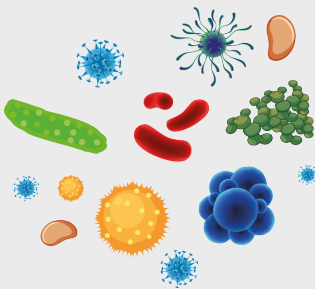


SESSION 1: KEY TERMS

Bioaerosols



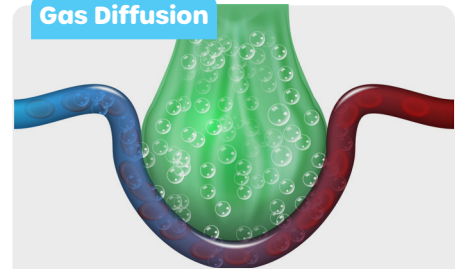
Bioaerosols are particles of biological origin that are present in the air we breathe. They consist of both living and non-living components, such as fungi, pollen, bacteria, and viruses. Common sources of bioaerosols include soil, water, and sewage.

Pet Dander



Pet dander is tiny particles (skin cells) shed from animals with fur or feathers.

Gas Diffusion



Gas diffusion is the net movement of a gas across a membrane from a region of higher concentration to a region of lower concentration. In the alveoli, oxygen diffuses from the alveoli across the epithelial membrane into the blood vessels. Carbon dioxide diffuses across the same barrier but in the opposite direction.

Visit BBC Bitesize for more about this:
www.bbc.co.uk/bitesize/guides/zsry39q/revision/5

Mouth



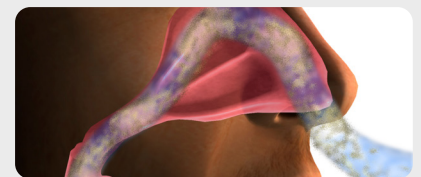
The **mouth** is part of the respiratory system, although breathing is not its primary function. The mouth allows for air to be breathed in and breathed out, and is relied on for breathing when the nose or nostrils are blocked (such as during infection, allergy or injury).

Nose



The **nose** is the primary organ of the respiratory system. It contains the nostrils and is involved in smell and speech. The main function of the nose is breathing, and it conditions inhaled air by warming and moistening it. Filtering of the air by nasal hair in the nostrils prevents large particles from entering the lungs. Sneezing is a reflex to expel/force out unwanted particles from the nose. Sneezing can transmit infections, because bioaerosols can harbour microbes.

Nasal Passages



The **nasal passages**, also referred to as sinuses, are hollow spaces in the skull around your nose, cheeks, and forehead. They act as a filtration system for the air that is taken in through the nostrils as well as passages for mucus drainage. Mucus lines the walls of the nasal passages to allow for particles to become trapped and removed, preventing them from getting to the lower airways.

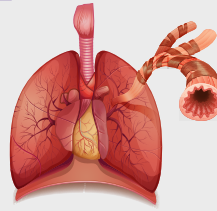
Trachea

The **trachea**, or windpipe, is the main vessel that carries oxygen-rich air to the lungs. It also carries carbon dioxide (a waste gas) out of the lungs. It is lined with mucus to trap particles and ciliated cells to carry mucus and particles out of the lungs for disposal. When you inhale, air travels from your nose, through your larynx, and down your windpipe. The windpipe splits into two bronchi that enter your lungs.

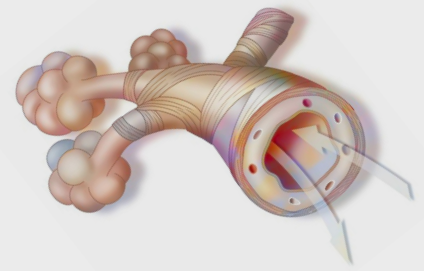


Bronchus

A **bronchus** (plural: bronchi) is a passage or airway in the respiratory system that conducts air into the lungs. The first bronchi to branch from the trachea are the right main bronchus and the left main bronchus, also known as the primary bronchi. These are the widest and enter the lungs, where they then branch into narrower secondary bronchi or lobar bronchi, and these branch into narrower tertiary bronchi. Bronchi are supported by cartilage.

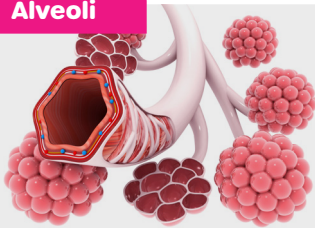


Bronchioles



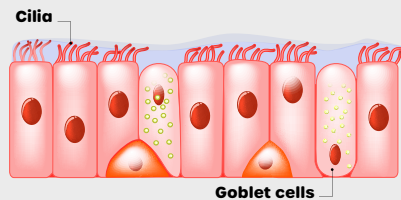
The **bronchioles** are the smaller branches of the airways in the respiratory tract. They deliver air direct to the gas exchanging units of the alveoli. The bronchioles can be distinguished from bronchi in that they are no longer supported by cartilage.

Alveoli



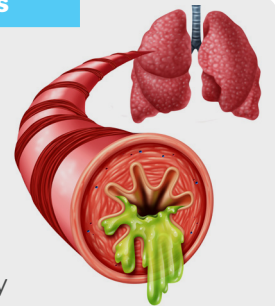
An **alveolus** (plural: alveoli) also known as an air sac or air space is a hollow cup-shaped cavity found in the lungs where gas exchange (the exchange of oxygen and carbon dioxide) takes place. Alveoli make up the functional tissue of the lungs and take up 90% of the total lung volume. They provide a large surface area for gas exchange to take place. Alveoli are only found in mammals.

Cilia



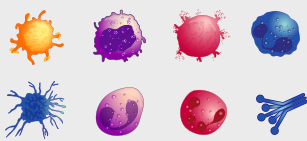
Cilia are hair-like organelles that extend from the surface of many different cell types in the human body. In the respiratory system, cilia exist on the epithelial cells lining the respiratory tract. Their function is to beat in a co-ordinated manner to move mucus and trapped particles up the respiratory tract, out of the lungs and into the throat, where it can be swallowed or coughed up.

Mucus



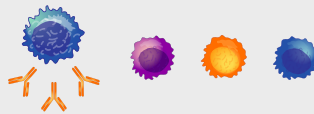
Mucus is a sticky fluid substance produced by cells lining the respiratory tract (mucus can also be made in other parts of the body). It acts as a protective and moisturising layer to keep cells from drying out and acts as a trap for irritants like dust, smoke, or microbes. In the respiratory tract, mucus is produced by goblet cells and works with the cilia to remove foreign particles.

Innate Immune System



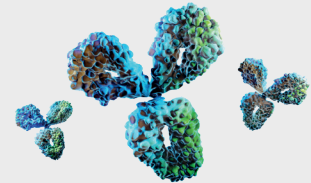
The **innate immune system** is the body's first line of defence against microbes, viruses, and foreign substances entering the body. It responds in the same way to all foreign cells and substances. The innate immune system includes anatomical barriers such as skin, the gut and the lungs (i.e., cilia and mucus) and cells designed to attack and kill microbes and viruses. The process of inflammation is part of the innate immune response.

Adaptive Immune System



The **adaptive immune system** is the body's second line of defence and is responsible for producing antibodies to microbes and viruses that we are exposed to. Adaptive immunity can create an 'immunological memory' after an initial exposure to a specific microbe or virus and leads to an enhanced response to any future encounters. Adaptive immunity can provide long-lasting protection, sometimes for the person's entire lifetime. This process of adaptive immunity is the basis of vaccination.

Antibody



An **antibody** is a large, Y-shaped protein used by the immune system to identify and neutralise foreign objects such as pathogenic bacteria, fungus, and viruses. The antibody recognises a unique molecule of the pathogen, called an antigen, allowing these two structures to bind together. An antibody can tag a microbe or an infected cell for attack by other parts of the immune system.