

Example of essay on respiratory tract travel

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The brain transmits the signal of oxygen requirement and the diaphragm expands that inhales the air. The inhaled air is composed of several different molecules and oxygen is one of the vitals. The respiratory system is a pathway that begins from external organ, nose, from where the air is inhaled. Air passes to the nasal cavity which is lined by ciliary cells that clean, warm and humidifies the air preparing it for gas exchange in lungs. The air then travels through the pharynx that is divided into three regions namely nasopharynx, oropharynx and hypopharynx that are connected with the middle ear, mouth & tongue respectively. Air is then passed to the larynx, a crossover point for air and food. The passages for food & air are definitely maintained via epiglottis, a cartilage flap. Larynx is the vocal box whereby there is enhanced activity of muscles with cartilaginous tissues to control the essential processes of sound production and air passage. Larynx is then followed by trachea or windpipe, a pile of ~20 semi cartilaginous ringed structures immersed in connective tissue widening up to two centimeters. The trachea is about eleven centimeters long tube shaped structure made up of fibrous elastic tissues and smooth muscles. It is lined inside by epithelium containing mucous cells and by muscular fibers on outside filling the gaps. At the termini, it terminates into two bronchi branches leading to lungs. The observations show that right bronchus is larger than the left so as to filter down the foreign molecules from larynx to the right lung.

The branches are responsible for maintaining air flow pressure through its complex structural organization into three layers that conduct from one end and exchanges gases from another via a transitional zone in mid. The

bronchi are lined by specialized goblet cells that secrete mucous to further clean up the air preparing it for gaseous exchanges. These cells reduce in quantity in the bronchioles that follow the bronchi.

Bronchioles are enriched with ciliary cells called clara cells and terminates into cup like highly elastic tissues called alveoli. It marks the beginning of lungs that are soft tissue organs protected by rib cage in the thoracic cavity. Around 300 million alveoli are present inside the lungs promoting exchange between air and blood. The right and left lungs are differentiated into lobes. The fibrous layer continues from bronchi to lungs (layer on lungs is known as pleura) that comprises lymphatic, nerves and vessels. The oxygen molecule is then diffused to the pulmonary capillaries in exchange of CO₂ (then breathed out) due to pressure gradient through thin lining of interstitium cells on alveoli. This happens due to pumping of deoxygenated blood (carrying carbon di oxide) by heart via the circulatory system which is eventually oxygenated when oxygen molecules pass in the blood stream. O₂ is carried via red blood cells in the blood stream through arteries to various body parts where it is required by molecular respiration to produce energy with the help of glucose and water. Oxygen cannot be transported through plasma as it dissolves poorly there and thus it binds to heme molecules (one O₂ per heme) in hemoglobin protein of RBC for transport. Hemoglobin comprises four heme i. e. Iron molecules bound to a large globin protein. The oxygen's partial pressure determines its binding to heme. Being associative, one oxygen molecule binding enhances the rate of other molecules binding at remaining heme sites. When oxygen is left to source,

the red blood cells travel back through veins carrying the waste produced by the source cells.