Response 1

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Did you know the human body is composed of cells that actively facilitate the drive of constituents through the cell membrane? To understand the complex biological and metabolic processes, it is essential to know about the transport systems. This response focuses on the mechanisms of transport these cells adopt to carry ions, water and oxygen across the cells. Two of the key transport systems are characterized by active and passive transport (Dr, 2014).

Active transport refers to the movement of substances such as ions, water and oxygen across the cell membrane along their concentration gradient. This movement does not involve the expenditure of energy. Examples of such transport are diffusion and osmosis. It is the process of diffusion that helps oxygen transport through cells. Studies have shown several factors that affect the diffusion frequency (Dr, 2014). These include temperature, molecular mass, concentration slope, membrane surface zone, membrane penetrability and polarization. The movement of solvent from the area of lesser solute concentration to the area of higher soulte concentration is called osmosis. It is another type of passive transport that doesn't involve energy expenditure.

Another type of transport that requires the vitality expenditure to transport substrates against the concentration gradient is known as active transport (Dr, 2014).This energy is provided by the breakdown of ATP. Cell membrane adopts this mechanism when the molecules that move across the membrane are large. One such type of this transport is facilitated diffusion that involves a carrier molecule to move the large substances across the cell. The carrier molecule is mainly protein embedded in the cell membrane such as a sodium-potassium pump that serves as a gateway to transport ions across the membrane with the help of energy from an ATP breakdown. Studies have shown that Active Transport may either be direct or indirect (*Quantitative Human Physiology*, 2012). In the former, energy is used by the hydrolysis of ATP by directly binding, while, in the latter, already stored energy is used.

Vesicular transport is another type of Active transport that involves processes such as endocytosis and exocytosis. Endocytosis is the vesicular movement inside the cell while exocytosis contributes to the outside transport. An amazing example of such a system in a human is the engulfment of bacteria through endocytosis. Furthermore, I want to add that Receptor-mediated endocytosis is a complex type, which is performed with the help of receptor molecules embedded in the clathrin protein (Dr, 2014). It is mainly involved in the transportation of LDL across the membrane.

**References**

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*Quantitative Human Physiology*. (2012). https://doi.org/10.1016/C2009-0-64018-6