

Evaluation of Homeostasis in the Human Body

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1.0 Executive Summary

The concept of homeostasis is key in comprehending the human body's work. Homeostasis refers to the process of keeping things in constant. The word homeostasis comes from two Greek words: "home," which means 'similar' and 'stasis' which means 'stable.' Thus, homeostasis is a biological word that refers to a system or mechanism that manages its internal environment and tends to maintain a steady, relatively regular condition of properties (Modell et al., 2015, 256). This concept argues that all living things maintain a constant and stable internal environment, which helps preserve the constant conditions of life. Homeostasis is a process that is constantly happening to our bodies. For instance, we eat, drink, work, and engage in a lot of activities, yet our body composition remains stable and the same.

The concept of homeostasis was introduced by French physiologist known as Claude Bernard. He stated that no all-important mechanism consists of one object, which helps in preserving and maintaining steady conditions of life. Therefore, this one object is homeostasis, which regulates the process by which biological systems try to preserve steadiness while changing to situations that are crucial for survival. Homeostasis is a vital biological system since if it succeeds, life continues, and if it fails, death prevails. For instance, body size is an example of the homeostasis process in our bodies. Thus, no matter how much water we drink and eat, our bodies don't swell up like a balloon (Modell et al., 2015, 261). Therefore, this process helps human bodies to keep a certain amount of fluid at a regular level regardless of the amount of fluid we consume.

2.0 Introduction

Homeostasis plays an important role in the human body. The body environment of human beings, in order to live and function, entirely depends on body cells. Therefore, homeostasis keeps the internal body environment under control, thus enabling the cells to function and live. Thus, without appropriate body conditions, a certain process in the body will not function properly. For the homeostasis processes to work, endocrine systems play an important part. The endocrine system consists of all the glands in the human body that make up hormones. If the endocrine system is not healthy, the chemical messengers in our body will not function properly, leading to health-related issues (Kambe et al., 2015 777). Thus, the endocrine system involves homeostasis, for it maintains chemical body reactions as well. Endocrine systems help in controlling how the body functions. To

understand how homeostasis, the paper looks into examples of homeostasis within the human body, i.e., body temperature, maintenance of healthy blood pressure, and glucose level in the human body (Kambe et al., 2015, 756). Thus, for the human body to remain healthy, body temperature, blood pressure, and glucose in the body must maintain a constant and stable level. Homeostasis plays an important role in regulating and preserving the constant internal environment of the body. Also, for the human organ system to work to maintain healthily, there are key organs that work together and contribute essentially to the human body. Therefore, the paper discusses the importance of homeostasis within the human body, the interaction between the endocrine system and homeostasis, and examples of homeostasis within the human body. Also, the explanation of how key body organs work, as well as the explanation of the endocrine system, helps in controlling body functions.

3.0 Importance Of Homeostasis Within Human Body

To keep our body's health at the highest level, there must be a sense of balance between energy acquisition and utilization. Therefore, oversupply can affect the body system as well as undersupply. Thus, the significance of homeostasis within our body includes the following:

3.1 Homeostasis importance to cells

Cells depend on the human body to function and live. Also, living cells rely on the movement of chemicals around the body. Chemicals in our body are transported into and out of cells. The processes of transporting chemicals such as oxygen and carbon dioxide and dissolving are done through diffusion and osmosis (Kambe et al., 2015 265). Diffusion and osmosis rely on the body's fluid and salt balance. The body's water and salt balance is preserved and maintained by homeostasis. Also, homeostasis helps the body to maintain its stable and constant body temperature. Body temperature is essential to enzymes that facilitate chemical reactions that keep the cell alive.

3.1.1 Diffusion

Diffusion is the movement of particles in and out of the cell from an area of high concentration to an area with more space, i.e., an area of low concentration. Homeostasis maintains constant body conditions for this process to take place. For example:

3.1.1.1 Diffusion in lung

In the lungs, the blood continuously takes in the oxygen from the area of high concentration, i.e., alveolar air spaces, this because there is more oxygen in alveolar space than in the blood. The oxygen spreads across the alveolar walls into the blood. The circulation spreads the oxygen-rich blood

away and replaces it with blood with less oxygen.

3.1.2 Osmosis

Osmosis is the movement of water molecules from a dilute solution to a more concentrated solution through a partially permeable membrane. This process is a special type of diffusion. For this process to occur, body conditions must be in balanced equilibrium. Homeostasis helps keep the body in good shape. Therefore, homeostasis plays an important role in the human body.

3.1.3 Enzymes

Enzymes are proteins responsible for speeding up chemical reactions in our cells. Thus, they act as the catalysts of chemical reactions in our cells. Enzymes work well when the body temperature is at optimum levels. Homeostasis keeps the body temperature at an optimum level, enabling enzymes to work properly.

4.0 Involvement Of Endocrine System In Homeostasis

The endocrine system includes all the glands in the human body that make up hormones. The endocrine system plays a significant role in homeostasis since the hormones control the activity of the body cells. Stimulus regulates the release of hormones into the body cells. For instance, the stimulus either results in an increase or decrease in the number of hormones produced. This mechanism is known as feedback regulation. The mechanism occurs when a response to stimulus change has the impact of the original stimulus (Modellet al. I, 2015 264). The type of response is either negative or positive feedback. Negative feedback occurs when a response to the stimulus reduces the original stimulus, while positive feedback does the opposite. Negative feedback is most common in biological systems since the systems act in the opposite direction of change. This process tends to keep things steady and constant, thus allowing homeostatic balance. Example of negative feedback: when there is an increasing concentration of carbon dioxide in the human body, the lungs are signaled to increase their activity more. As a result, they exhale more carbon dioxide. Therefore, the endocrine systems help in maintaining homeostasis and balance in the human body.

5.0 Example Of Homeostasis Within Human Body

Homeostasis refers to the ability of the internal environment of the human body to maintain constant stability under different changes. Examples of homeostasis in the human body include:

- The maintenance of good and healthy blood pressure. The heart senses changes in the blood

pressure, thus signaling to the brain about the blood pressure changes. Then, the brain signals to the heart how to respond to the changes in blood pressure. Therefore, if blood pressure is too high, the heart should slow down and vice versa. The maintenance of healthy blood pressure is an example of homeostasis in the human body.

- Another example of the homeostasis is the human's body temperature. A healthy human beings body temperature remains at the constant level of 37.5 degrees Celsius equivalent to 98.6 degrees Fahrenheit (Ribas-Latre, 2016 140). The body regulates temperate by making or releasing the heat internally. Thus, homeostasis controls the temperature within itself to help in keeping the cells alive and functioning.

III. Another great example of homeostasis within the human body is the ability to maintain constant levels of Glucose. Glucose is the type of sugar in the bloodstream that helps the body remain healthy. Thus, when glucose levels are too high in the bloodstream, the pancreas releases insulin hormones to balance them, and when they are too low, the liver converts glycogen in the blood to increase them.

6.0 Organ Systems Working Together Contribute To Overall Body Function

Body organ systems work together to contribute to overall body function, thus helping maintain a healthy body. The key organ systems and how they work with each other include:

6.0.1 Respiratory and Circulatory System

The respiratory system consists of lungs and other breathing system organs. Air enters the lungs, and it travels through bronchi to alveolar air spaces, this because there is more oxygen in alveolar space than in the blood (Modell et al, 2015 260). The oxygen diffuses across the alveolar walls into the bloodstream through capillaries. The oxygen-rich blood travels back to the heart and circulatory system, where then it transfers to other parts of the body.

6.0.2 Circulatory and Digestive System

The organs of the digestive system need blood to accomplish its function. Circulatory systems supply the rich blood to the digestive systems, enabling the organs to digest food. Also, after digestion, circulatory systems distribute nutrients to other parts of the body. This helps maintain a healthy body, thus contributing to the overall well-functioning of the body.

6.0.3 Digestive and Endocrine Systems

These two body organ systems work together to provide the body with glucose. The digestive

systems digest carbohydrates, which are turned into glucose. Then, the pancreas, which is part of the endocrine system, produces insulin (hormone) that regulates the amount of sugar in the blood. For instance, the glucose levels are too high in the bloodstream, the pancreas releases insulin hormone to balance it, and when the glucose is too low, the liver converts glycogen in the blood to increase the glucose levels (Ribas-Latre, 2016 149).

7.0 Endocrine System Helps Control Our Body Functions

The endocrine system has a control effect on other organ systems within the human body. In the muscular system, hormones (produced by the endocrine system) adjust energy production, muscle metabolism as well as growth. In the nervous system, hormones control the amount of fluid and level of ion concentration and also affect neural metabolism (Ribas-Latre, 2016 144). Also, the endocrine system helps in the production of hormones that are influential in brain development. Thus, the endocrine system affects and controls the muscular and nervous systems so that the body functions effectively.

8.0 Conclusion

Homeostasis plays an important role in the human body. The body environment of human beings, in order to live and function, entirely depends on body cells. Therefore, homeostasis keeps the internal body environment under control, thus enabling the cells to function and live. Thus, without appropriate body conditions, a certain process in the body will not function properly. For the homeostasis processes to work, endocrine systems play an important part. The endocrine system consists of all the glands in the human body that make up hormones. If the endocrine system is not healthy, the chemical messengers in our body will not function effectively, thus resulting in health-related issues. Also, for the body to be healthy, all body organ systems must work together for the better function of the body.

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