

# Essay about anatomy and physiology

[Science](#), [Anatomy](#)



This assignment will describe the role of energy in the body and explain the physiology of two named body system in relation to energy metabolism. It will explain where energy comes from, how the body uses energy, what is metabolism/catabolism and anabolism and also it will explain cellular respiration aerobic/anaerobic is. Energy is necessary for muscular activity and movement however, energy is also necessary to circulate blood and lymph and tissue fluid throughout the body; for breathing and taking in oxygen; for making new cells for carrying out growth and repair.

Also, it can be used to transmit nerve impulses so that we can respond to changes in the environments such as temperature. ATP is the only source of energy that the body can use though there are several other types of energy that are chemical, heat, light, sound and nuclear. Energy can be stored as glucose and the process of turning this glucose into ATP is called cellular respiration. There are three stages of cellular respiration and these are, glycolysis, the krebs cycle and the electron transport chain (ETC). Glycolysis is the first step in a biomedical pathway of respiration.

It occurs in the cells cytoplasm and no oxygen is needed for this. The next stage is the Krebs cycle, this takes place in the mitochondrial matrix and is a cycle of reactions. One ATP is created for every complete cycle and oxygen is needed for this. The last stage of cellular respiration is ETC, this also occurs in the mitochondrial matrix and the molecules are passed next along the ETC. Oxygen is also needed for this. Cellular respiration is an example of an catabolic reaction as it is the breakdown of larger molecules to Mooresville smaller ones.

Metabolism in the body is a collection of chemical reactions that takes place in the body's cells. Metabolism converts the nutrients in the food that we eat (digestive system) into essential energy which is needed to power all the things we do, from something as little as thinking to growing physically or carrying out a physical activity. It is happening constantly in our body and there are two types, anabolic and catabolic. The building of complex molecules from simple molecules is known as anabolic reactions.

These reactions are all about building and storing for example they help with growth and repair of muscles and bones as anabolic is constructive and storing energy for the future use. The breaking down of complex molecules to simple molecules is known as catabolism reactions. Catabolism is destructive so examples would include things like digestion, respiration and the breakdown of glucose to release energy. Respiration releases energy for cells from glucose. This can be aerobic respiration, which needs oxygen, or anaerobic respiration, which does not. Aerobic respiration can be summed up with this formula.

Glucose + oxygen > carbon dioxide + water + energy As shown by this formula glucose and oxygen is used up and carbon dioxide, water and energy are produced. This is where the digestive, respiratory and cardiovascular come in and do their bit. When food is eaten at the start of the digestive system, the actions of enzymes in the system start to break down food. When food contains carbohydrates the body breaks these down to simple sugars, also known as glucose. To get oxygen we breathe in and the respiratory system delivers dissolved oxygen to the cells.

Now we have glucose and oxygen aerobic respiration can start, we have used the oxygen and glucose and if there is any left over it will be stored as fat. The waste product of this is carbon dioxide, which is transported back to the lungs by the blood (cardiovascular system) it is then got rid of by breathing back out (respiratory system). We are then left with water and energy, the energy now can be used or stored for later. Anaerobic respiration is used when the muscles don't have enough oxygen for aerobic respiration during exercise to obtain the energy needed.

It isn't as effective as aerobic respiration as it only releases around 5% of energy per molecule of glucose compared to aerobic. The formula for anaerobic is much simpler: Glucose  $\rightarrow$  lactic acid + very little energy. To get rid of this waste product, lactic acid the cardiovascular system helps. The lactic acid is carried away when blood flows through the muscles. The reason that much less energy is released during anaerobic respiration is because the breakdown of glucose is incomplete. M1 The cardiovascular system is a delivers nutrients, for example oxygen and glucose and waste product for example carbon dioxide via the blood stream.

Oxygen is necessary for aerobic respiration to occur, which having been explained, is more efficient than anaerobic respiration. The exchange of nutrients and waste products occur via capillaries, which have thin walls suited to the diffusion of nutrients and waste products. This is the system that carries everything around the body and links everything together. The respiratory system is a pathway for the intake of gaseous nutrients such as oxygen. The lungs contains alveoli, small sac-like structures that allow for

the diffusion of oxygen into the bloodstream, and carbon dioxide out of the bloodstream this is called gas exchange.

This allows for nutrients to be transferred from the respiratory system into the cardiovascular system and this is how the blood streams gets oxygen, a key ingredient to metabolism. The respiratory system can be seen as interacting with the external environment as we breathe air in from the outside environment. This system is how we get oxygen and expel carbon dioxide (gas exchange). The digestive system is both a delivery for liquid and soluble nutrients as well as processing digestion and processing of food. This digestion is where proteins, fats and carbohydrates get broken down into amino acids, fatty acids and glucose.

There are five main roles of the digestive system intake, digestion, absorption, processing and excretion. The digestion and absorptions is especially important, because it allows for the breakdown of food that has been eaten, into essential ingredients such as glucose, which can then be further broken down into ATP. This is how the digestive system provides fuel to be turned into ATP. This assignment has now discussed the role of energy in the body and processes of making energy. It has also explained the physiology of three body systems in relation to energy metabolism.