

# Structures and functions of muscles essay examples

[Health & Medicine](#), [Body](#)



Muscle plays important roles in the body. Those roles are attributed to the uniqueness in its anatomy and physiology. There are different types of muscles. This extends to its structures and functions. There are smaller which are in the groups of the ocular muscles and the bigger muscle in the range of biceps. It is an organ system which is usually categorized into three major forms. These are the skeletal muscles, smooth muscles and the cardiac muscles. The location, structures and function of each category is different. The major functions that is being performed by this organ is related to initiating and maintaining body movements, maintains posture, helps in blood circulation throughout the body.

The functional unit involved in the control of the muscle is the nervous system which has nerves sent to the muscle and that control the muscle through the signal that is being sent to the muscle. Muscle like the smooth and skeletal muscles mainly depends on the nervous stimulations while the cardiac muscles are independent of such controls. What is responsible for the initiation of the contraction is termed the action potential and this causes the shortening of the muscle hence resulting in contraction.

## **Anatomy**

Structure of muscle can fully be discussed by taking a simple muscle attached to a bone and highlighting the components. Muscle comes in different shapes and sizes however, there make up is still the same. The anatomy is usually made up of a layer of connective muscle tissue that is termed the epimysium. This is the outermost layer which helps protect all other component structure. It is the parts that contact all other muscle or

body structures. It extends throughout the length of the muscle and combining with other parts to form the tendon that is attached to the bone. Inside the epimysium, muscles are arranged in bundles made up of fibers.

The fibers are also termed fasciculi. Single fasciculi have been found to contain about 10 to 100 muscle fibers which are symmetrically arranged. The part of the muscle that covers each bundle is termed the perimysium. Taking a single muscle fiber, there are several other smaller components within the muscle fibers. This includes myofibril which is like a single smaller fiber. A section of the myofibril is known as the sarcomere. This is made up of myosin and actin. The myosin and actin are the two functional unit of a muscle. They are the part that is mainly responsible for the sliding that lead to eventual contraction. The component part that tends to insulate the muscle is the endomysium. This separates the one fibril from another. The fiber cell membrane is termed the sarcolemma which sarcoplasm below it. The sarcoplasm is another name for the cell cytoplasm.

Important facts about muscle structure and function are that the shape of the muscle is dependent on the architecture and function. Some are thicker while some are thinner. One important note about the structure in relation to the function is that of the cross-sectional area which a muscle can produce. A muscle with large cross-sectional areas tend to produce larger forces hence will be needed in regions that requires large forces for movements. This will also allow such group of muscle as a result of their structure contract over a greater distance. One unique aspect about the structure of muscles is that the separate nerve endings extend to each compartment.

The importance of the compartmentalization in the structure of muscles is that it allows contraction to occur relatively synchronously hence facilitating effective contraction.

## **Functions of muscle**

It is important to note that the two major or principal functions of muscles are to produce movement and to maintain human body's posture. The muscle tend to achieve this prime functions by contraction and relaxation which results in length adjustment and tension control (BMH linguistics). The smooth muscles which are also known as the visceral muscles are simply design to help the visceral functions effectively. Those muscles lined blood vessels and other visceral. The striations that characterized the skeletal muscles are absent in smooth muscles. The controls are also different. They are involuntary muscles that are being control by the autonomic nervous system. They are involuntary in the sense we have no control over their function unlike the skeletal muscles we can easily control.

Smooth muscles contraction is what result in constrictions hence resulting in the reduction in the diameter or narrowing of the blood vessels they line. These are often seen in cases of vasodilation and vasoconstrictions. It also functions in digestion by helping to break down food in the gastrointestinal tract. This is as a result of breaking down of the food through the peristaltic actions of the muscle. The smooth muscle also contributes to the elimination of waste products in the body.

Cardiac muscles are striated group of muscle fibers which do have single central nucleus making it different from skeletal muscle but similar to smooth muscle. Those fibers end by attaching to the subsequent fibers. The only function of cardiac muscle is to pump blood through the heart by alternating contraction and relaxation. The main functions of skeletal muscles are: involving in the movement of skeleton and also movement of tissues. Skeletal muscle because of the build and make up is involved in movement of the skeleton which is the basis of locomotion. This is done under conscious control hence movement of limbs fingers etc. occurs as a result of the contraction and relaxation of the skeletal muscles. Another major function of the skeletal muscles is the movement of the tissues which can be seen in the facial expression. This is also under conscious control hence resulting in smiling and frowning of the face.

One other important aspect of the structure and function of muscles especially the skeletal muscles; is that, the connection between both is the neuromuscular junction which stimulate the function as enabled by the structure of the muscle. The motor neuron attaches to the muscle and the neural impulse directed to the muscle for control aid the release of the acetylcholine which is a neurotransmitter that initiate the stimulation of the muscle actin and myosin to contract. Several other details are involved in this control that is beyond the scope of this paper. The importance of this paper is to highlight the major structural components and functions of muscles.

## **Conclusion**

As we can see, muscles are basic to human existence. Their function extends from movement to pumping of blood down to aiding digestion. Almost all the major systems in the body have it functions related to muscles. Hence the understanding of muscles structure and function is basic to knowledge of human body.

## **Work Cited**

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