

Types of Skeletal Muscle and Muscle Contraction Overview

by Sophia



WHAT'S COVERED

In this lesson you will learn about the two basic types of skeletal muscle and how skeletal muscles work together to create move the body. Specifically, this lesson will cover:

1. Red Skeletal Muscles

Red skeletal muscles are also known as **slow skeletal muscles**. They are the type of skeletal muscles that can contract slowly for long periods of time. These are muscles that you use on a regular basis and include those that help you to maintain your posture.

These muscles have fibers with more **myoglobin** and capillaries in them to allow for the sustained activity they require. Myoglobin is a protein that binds to oxygen; more myoglobin means more oxygen is being delivered to muscle cells. This protein is also red in color and is what gives this type of muscle its red appearance. Red skeletal muscles also have more capillaries. This allows more blood to run to the muscles, delivering oxygen and taking away carbon dioxide as the muscles work.



TERMS TO KNOW

Slow Skeletal Muscle

Also known as red skeletal muscle: A type of muscle that can contract slowly for long periods of time.

Myoglobin

A protein that binds oxygen which is necessary for the production of ATP.

2. White Skeletal Muscles

White skeletal muscles, or **fast skeletal muscles**, can contract quickly for short periods of time.

➔ **EXAMPLE** The muscles in your hand can contract quickly, but they can't sustain activity for a very long period of time. If you are writing, you can only write so long before your hand really starts to cramp up.

This type of muscle lacks the amount of myoglobin that red skeletal muscles contain, so they are white in appearance. They also have fewer capillaries running to them, meaning less blood is supplied to them as well. This is why they can only contract for short periods of time. White skeletal muscles also have fewer mitochondria in them; mitochondria provides muscles with ATP and energy to sustain contractions.



TERM TO KNOW

Fast Skeletal Muscle

Also known as white skeletal muscle; a type of muscle that can contract quickly for a short period of time.

3. Muscle Groups

We will continue using biceps and triceps as our example for how skeletal muscles interact with the skeleton to allow for movement.

3a. Antagonistic

The bicep and tricep are arranged in a pair working antagonistically to one another. **Antagonistic contraction** means that the action of one muscle opposes the action of the other. This is allowed by something called **reciprocal innervation**. Reciprocal innervation acts on groups of muscles so that when one muscle contracts, no signals are sent by the nervous system to the opposing muscle; the opposing muscle relaxes. Reciprocal innervation also allows for the protection of **joints**, or areas where bones come together.

➞ **EXAMPLE** When the bicep contracts, the tricep relaxes because your nervous system is not sending any signals to your tricep. Conversely, when the tricep contracts, the bicep relaxes.



TERMS TO KNOW

Antagonistic Contraction

When an opposing muscle on the opposite side of a joint contracts to create an opposing movement to its muscle counterpart; for example, your biceps pull your forearm toward your upper arm (flexion), while your triceps help you straighten out your arm (extension); biceps are antagonistic to triceps.

Reciprocal Innervation

The nervous system controlling muscle groups that oppose and work against one another; allows for a variety of movements and protection of joints.

Joint

An area where two or more bones come together.

3b. Synergistic

Another type of muscle group is synergistic muscles. Instead of opposing reactions, these muscle groups are working together to increase the force or to stabilize another muscle in the body, otherwise known as **synergistic contraction**.



TERM TO KNOW

Synergistic Contraction

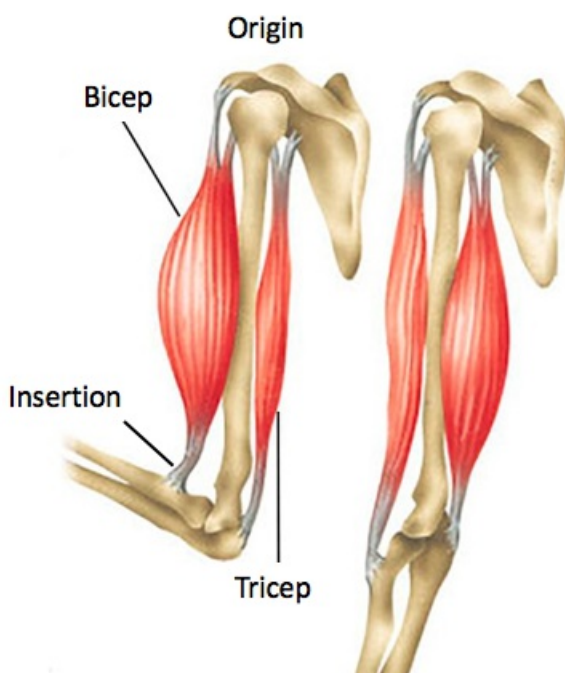
When a group of muscles work together to create the same movement; an example would be your bicep brachii and brachialis muscle contraction simultaneously to create flexion (bending) of your elbow.

4. Origin and Insertion

Our muscles, bones, and **tendons** (dense connective tissues that attach bone to muscle) work together to act as a series of levers allowing for the skeleton to move.

The **origin** is the end of a muscle that attaches to a stable bone, while the **insertion** is the end of a muscle that attaches to a bone that moves.

Look at the diagram below as an illustration of origin and insertion.



➔ **EXAMPLE** For the bicep, the origin is going to be the scapula. This is the stable bone, so when your bicep contracts or relaxes, your scapula is not going to move. Your forearm is what moves when your bicep contracts or relaxes, so that would be the insertion.



TERMS TO KNOW

Origin

The fixed, non-moveable end of a skeletal muscle.

Insertion

The fixed, moveable end of a skeletal muscle.

Tendon

A tough band of fibrous connective tissue that usually connects muscle to bone.



SUMMARY

There are two types of skeletal muscles. Red skeletal muscles, also known as **slow skeletal muscles**, are muscles that contract slowly over a long period of time. They contain more myoglobin and capillaries carrying blood to sustain long periods of work. White skeletal muscles are also called **fast skeletal muscles**. While they can contract quickly, they cannot sustain activity for a long time.

There are two different types of **muscle groups** that work together to allow for movement, to stabilize joints and even to stabilize each other. One type of muscle group works antagonistically to each other. This means when one muscle contracts, the other relaxes. The other type of group is synergistic muscles. These muscles work together at the same time to increase force. Skeletal muscles connect to bone or other muscles at the origin and insertion. The **origin** is the part of the muscle that connects to a stable bone, while the **insertion** attaches to a bone that will move. Keep up the learning and have a great day!

Source: THIS WORK IS ADAPTED FROM SOPHIA AUTHOR AMANDA SODERLIND



ATTRIBUTIONS

- [Bicep and Tricep](#) | Author: Wikipeda | License: Creative Commons



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