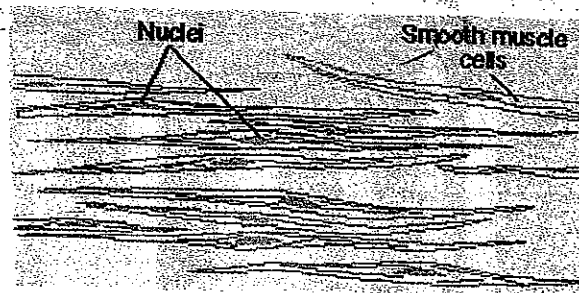


COMPARISON OF THE THREE TYPES OF MUSCLES

There are four basic types of tissues recognized in higher animals, epithelial, connective, muscular and nerve. This activity focuses on muscle tissue. Students should complete the worksheet before you compare and contrast the different types of muscle cells.

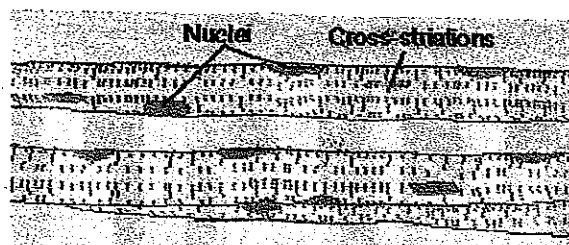
A muscle is a tissue that performs different functions which cause some sort of movement to take place. There are three different types of muscle cells: skeletal, smooth, and cardiac. The various muscles of our bodies serve as the engines or powerhouses of the body and are so constructed to provide speed and power. Each muscle cell is designed for various functions that are needed by a certain area in the body. Muscle tissue has the ability to contract or to shorten, thus producing movement of internal and external body parts. Breathing, speaking, walking, talking, eating, and almost every other function requires muscle tissue.

Smooth muscles are composed of elongated, spindle shaped cells and are commonly involved in involuntary motions. Involuntary muscle contractions or motions are those movements that cannot be consciously controlled. The nucleus is centrally located and there are no striations in smooth muscle cells. These types of cells are located throughout the body. Muscles made from these types of cells include those found in the walls of blood vessels, urinary bladder, and the digestive system.



Smooth muscle

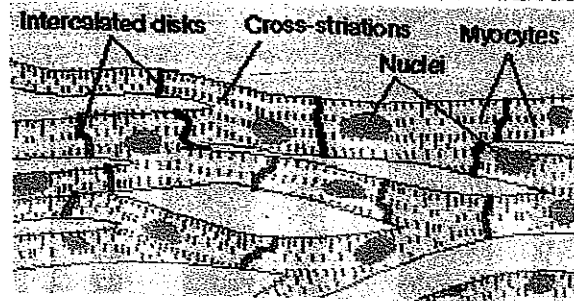
Skeletal muscles allow movement by being attached to bones in the body. Skeletal muscles control voluntary movements which can be consciously controlled. Skeletal muscles are made up of cylindrical fibers which are found in the locomotive system. The nucleus of each cell tends to be toward the edge of each cell and the cells are striated.



Skeletal muscle

Cardiac muscles are roughly quadrangular in shape and have a single central nucleus. The cells form a network of branching fibers. The muscles are cross striated and are involuntary. The muscles are found in the heart.

Muscle tissues are supplied with nerve fibers that carry messages to and from the central nervous system (brain and spinal cord). Muscles are composed of about 75 per cent water, 20 per cent protein, and about 5 per cent is made up of carbohydrates, lipids, inorganic salts, and nonprotein nitrogenous compounds. The composition does vary in the different muscles.



Cardiac muscle

BIOLOGY 2401**COMPARISON OF THREE TYPES OF MUSCLE TISSUES**

	Skeletal	Cardiac	Smooth
Size			
Nucleus Number Where located			
Presence of Triads			
Filament Organization			
Striations			
Ca²⁺ Source Regulation			
Contraction Onset Tetanzied Fatigue			
Special Cells Intercalated Discs Pacemaker cells Dense bodies Myoblasts			
Energy Source			
Control Mechanism			
Voluntary/Involuntary			
Function			