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Diploma in Pharmacy 1st Year
Human Anatomy & Physiology
Experiment

To perform the microscopic examination of the given skeletal muscle tissue slide.

Aim:

To perform the microscopic examination of the given skeletal muscle tissue slide.

Reference :

Dr. Gupta G.D , Dr. Sharma Shailesh , Dr. Sharma Rahul Kumar , "Practical Manual of Human Anatomy and Physiology" Published by Nirali Prakashan , Pg.No 19- 24

Theory :

- Skeletal muscles are organs of the vertebrate muscular system that are mainly attached to the bone of the skeleton through tendons.
- Skeletal muscle cells are substantially longer than those found in other types of muscle tissue and are referred to as muscle fibres.
- Because the configuration of the sarcomeres, the muscular tissue of a skeletal muscle is striated, giving it a striped look.
- The other types of muscle include striated cardiac muscle and non-striated smooth muscle; both of these types of muscle tissue are categorised as involuntary, or under the direction of the autonomic nervous system.
- Multiple fascicles, or bundles of muscle fibres, make up a skeletal muscle.
- Fascia is a sort of connective tissue layer that surrounds each individual fibre and muscle.
- Fusion of developmental myoblasts in a process known as myogenesis, forms muscle fibres that result in long multinucleated cells.

- The nuclei of these cells are known as myonuclei that are found beneath the cell membrane.
- To meet energy demands, muscle fibres include many mitochondria.

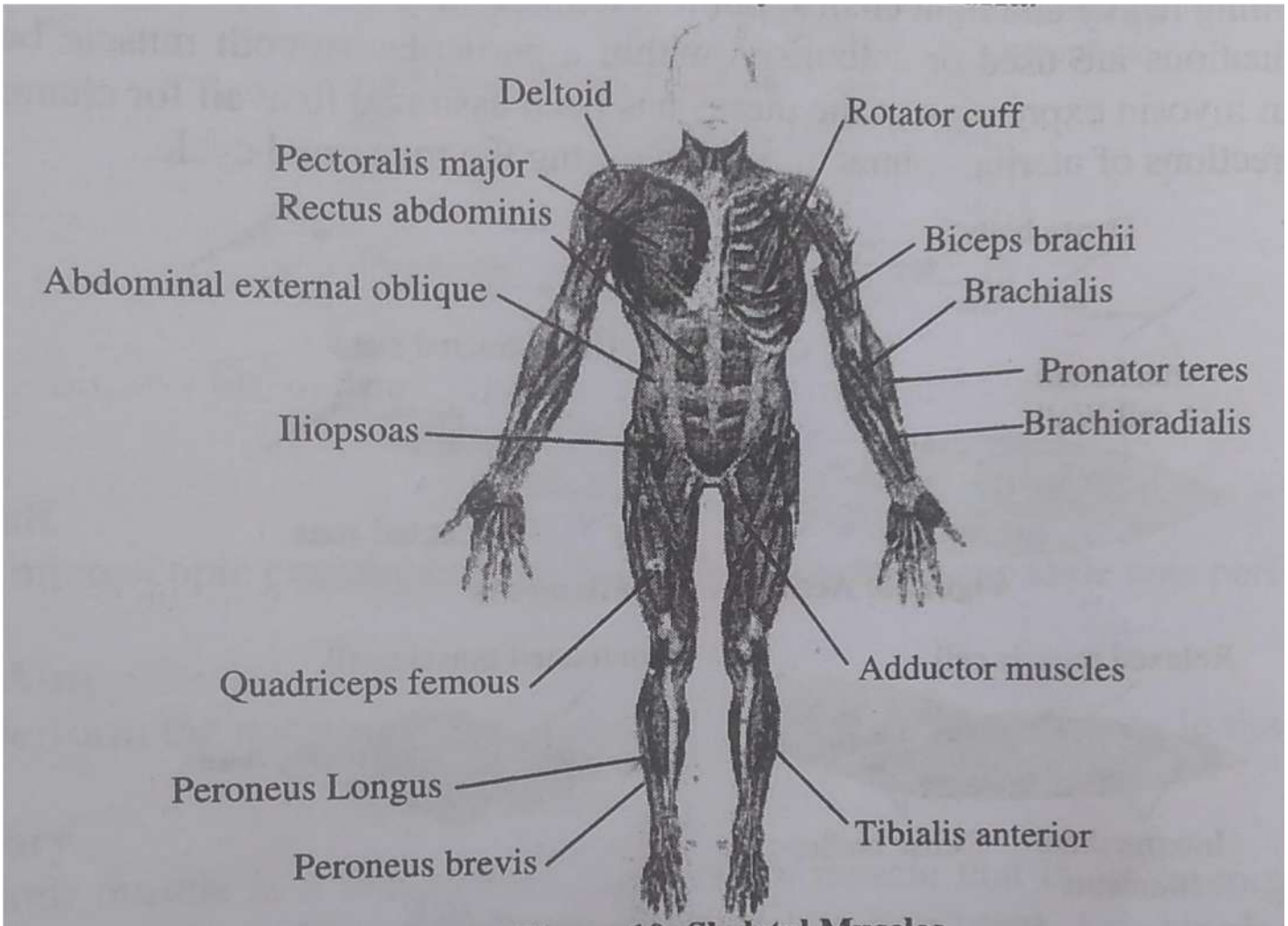
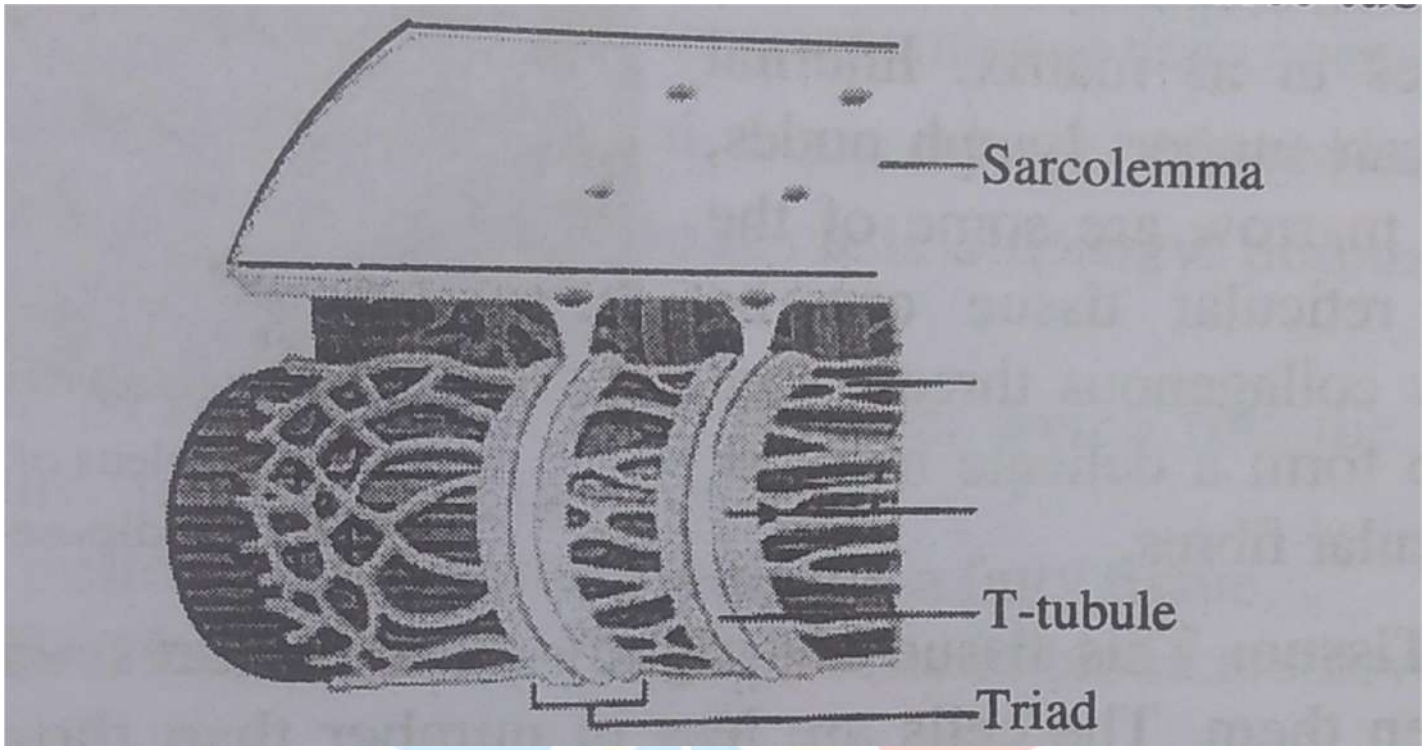


Figure 10: Skeletal Muscles

Microscopic Examination

- ✓ When seen under a microscope, skeletal muscle has a particular banding pattern due to the organisation of two contractile proteins, myosin and action, which are two of the myofilaments in the myofibrils.

- ✓ The thick filaments are formed by myosin, and the thin filaments are formed by actin, and they are grouped in sarcomeres, which are repeating units.
- ✓ Muscle contraction is caused by the interaction of both proteins.
- ✓ Intermediate filaments in the cytoskeleton connect the sarcomere to other organelles like the mitochondria.
- ✓ The sarcomere is attached to the sarcolemma by the costamere.
- ✓ The muscle fiber's organelles and macromolecules are arranged to confirm that it performs its functions.
- ✓ The sarcolemma is the cell membrane, while the sarcoplasm is the cytoplasm.
- ✓ The myofibrils are found in the sarcoplasm.
- ✓ Myofibrils are lengthy protein bundles with a diameter of one micrometre.
- ✓ The peculiar flattened myonuclei are pressed on the inside of the sarcolemma.
- ✓ The mitochondria are located between the myofibrils.
- ✓ The muscle fibre contains sarcoplasmic reticulum and lacks smooth endoplasmic cisternae.
- ✓ The myofibrils are surrounded by the sarcoplasmic reticulum, which stores a reserve of calcium ions required for muscle contraction.
- ✓ At times, it has dilated end sacs known as terminal cisternae.
- ✓ These run from one side of the muscle fibre to the other.
- ✓ A transverse tubule (T tubule) is a tubular infolding that exists between two terminal cisternae.
- ✓ Action potentials trigger the sarcoplasmic reticulum through T tubules to release calcium, causing a muscle contraction.
- ✓ A triad is formed by two terminal cisternae and a transverse tubule.



Muscle Fibre

Result:

The microscopic examination of the given skeletal muscle tissue slide was performed.