

HUMAN ANATOMY AND PHYSIOLOGY-1(BP101T)

UNIT: 2 SKELETAL SYSTEM

CLASS: 6

TOPIC-ORGANIZATION OF SKELETAL MUSCLE

INTRODUCTION;

- Each skeletal muscle is a separate organ in the body.
- It is made up of hundreds to thousands of muscle fibers (myocytes).

Structure of Skeletal muscle;

Skeletal muscle contains:

- Muscle fibers (cells) : These are elongated, cylindrical cells, contains multiple nuclei and specialized organelles for contraction (like myofibrils).
- Connective tissues (support and protect muscle fibers)
- Blood vessels (supply oxygen and nutrients)
- Nerves (control muscle contraction)

Levels of Skeletal Muscle Organization:

- ✓ Skeletal muscle is organized in layers, from the largest structure (whole muscle) down to the smallest functional unit (sarcomere).
- ✓ Each level is surrounded by connective tissue layers that protect, support, and connect muscle fibers.

1.Skeletal muscle(whole muscle);

- A skeletal muscle is an organ made up of many bundles of fascicles.

- The Connective Tissue surrounds the entire muscle is known as **Epimysium**
- Epimysium is outer most layer of the muscle tissue.
- It's made of dense irregular connective tissue.
- It protects and helps the muscle maintain its shape.
- Epimysium is continuous with tendons, which attach muscle to bones.

2. Fascicles (Bundles of Muscle Fibers);

- Fascicles are groups (bundles) of muscle fibers (cells).
- You can see fascicles in a cross-section of meat, where they appear as visible "grains".
- The Connective Tissue present here is **Perimysium**
- Perimysium surrounds each fascicle.
- Also made of dense irregular connective tissue.
- It contains blood vessels and nerves that supply the muscle fibers in the fascicle.

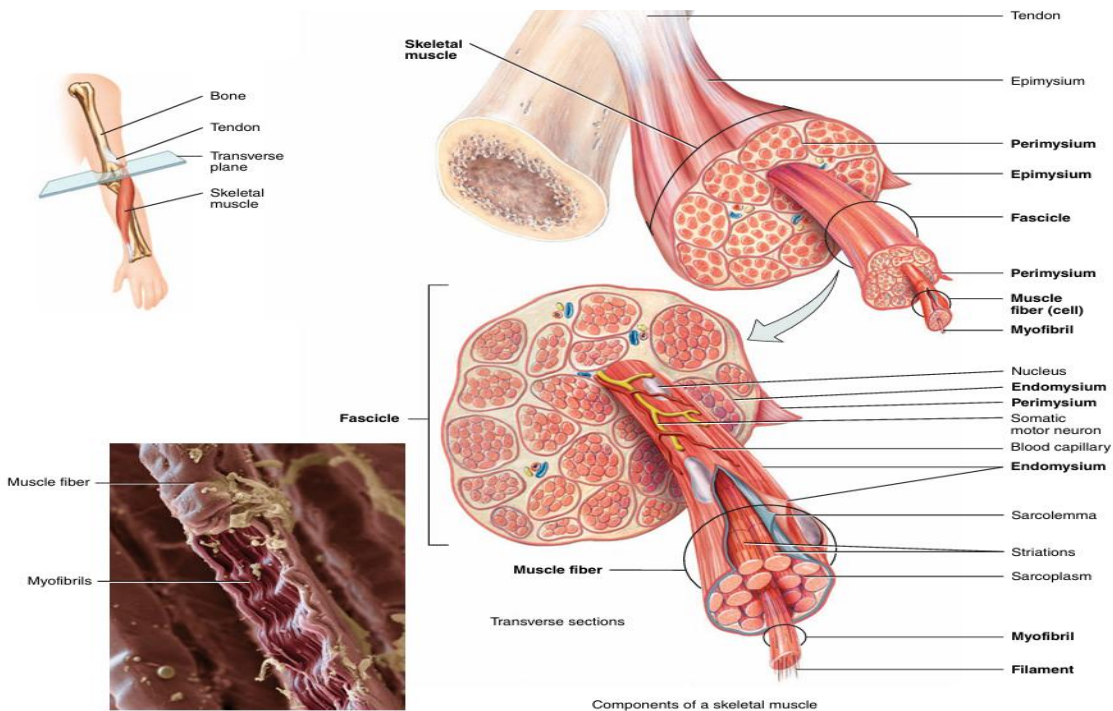
3. Muscle Fibers (Muscle Cells / Myocytes):

- A muscle fiber is a single muscle cell, long and cylindrical in shape and multinucleated cell formed by the fusion of myoblasts. It is surrounded by the **sarcolemma** (plasma membrane) and contains **sarcoplasm** (cytoplasm).
- Each fiber contains many myofibrils.
- Muscle fibers are responsible for contraction.
- The Connective Tissue present here is **Endomysium**

- Endomysium surrounds each individual muscle fiber within a fascicle.
- Made of areolar connective tissue (mostly reticular fibers).
- It contains capillaries and nerve fibers for individual muscle fiber nourishment.

4. Myofibrils (Inside Muscle Fibers):

- Each muscle fiber is packed with myofibrils, which run the length of the cell.
- Myofibrils are composed of **sarcomeres**, the functional units of contraction.
- Sarcomeres are repeating units within myofibrils.
- They are made up of thin (actin) and thick (myosin) filaments.
- Sarcomeres are responsible for muscle contraction (sliding filament theory).



Function of These Connective Tissues:

- Protect and support muscle structures.
- Provide pathways for nerves, blood vessels, and lymphatics.
- Help transmit force generated by muscle fibers to bones (via tendons).