

Muscle Tissue

- One of the four types of tissue (epithelial, connective, muscle and nervous)
- Muscle tissue is of three types (skeletal, cardiac, smooth)

Skeletal Muscle

● Cells/Fibers

- Single, multinucleated cells

● Cell/Fiber Shape and Size

- Cylindrical
- 10-100 μm in diameter
- Many cm long

● Striations

- Present

● Location of Nuclei

- Peripheral, adjacent to sarcolemma

● T - tubules

- Centre of triad at the A-I junction

● Sarcoplasmic Reticulum

- Well developed
- There are 2 sarcoplasmic reticulum in each triad in a sarcomere (typically there are 2 triads in one sarcomere)

● Special Structural Features

- Sarcomere: Well organized
- Sarcoplasmic reticulum: Well Developed
- T - tubule (transverse tubule) system: Present

● Connective Tissue Organization

- Epimysium (surrounds the whole muscle)
- Perimysium (surrounds each fascicle)
- Endomysium (surrounds external lamina which is the connective tissue covering each muscle fiber)

● Location

- Muscles of limbs
- Tongue
- Diaphragm

Cardiac Muscle

● Cells/Fibers

- Cells aligned in a branching arrangement

● Cell/Fiber Shape and Size

- Cylindrical
- 10-20 μm diameter
- 50-100 μm long

● Striations

- Present

● Location of Nuclei

- Central

● T - tubules

- In dyads at Z - discs
- Dyad = T - tubule + terminal cisternae of sarcoplasmic reticulum

● Sarcoplasmic Reticulum

- Less developed

● Special Structural Features

- Intercalated discs
- Have,
 - Adherent junctions → For mechanical coupling
 - Gap junctions → For electrical coupling
- These junctions result in coordinated contractions of atria and ventricles

● Connective Tissue Organization

- Endomysium
- Sub-endocardial CT layer
- Sub-pericardial CT layers

● Location

→ Heart

Smooth Muscle

● Cells/Fibers

- Single, small, loosely packed fusiform cells

● Cell/Fiber Shape and Size

- Fusiform shape
- Diameter: 0.2 to 10 μm

● Striations

- Absent

● Location of Nuclei

- Central (at the widest part of cell)

● T - tubules

- Absent
- Counter part: Caveolae present

● Sarcoplasmic Reticulum

- Irregular SR without distinctive organization

● Special Structural Features

- Gap junctions
- Caveolae
- Dense bodies

● Connective Tissue Organization

- Endomysium

● Location

- Blood vessels
- Respiratory tract
- GIT