Cardiac Muscles

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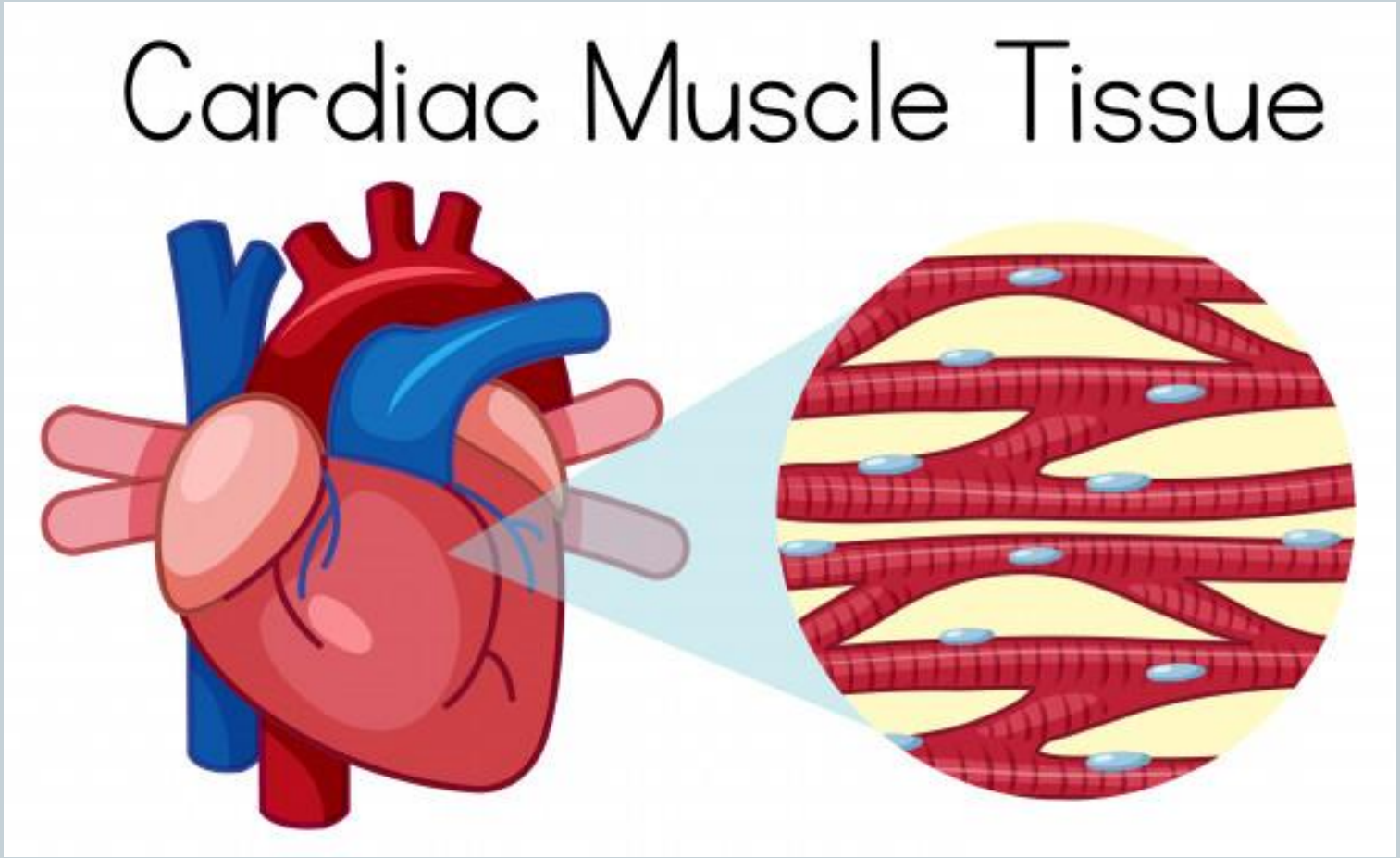
Cardiac Muscle

Introduction

- Cardiac muscle is a type of muscular tissue that is found in the myocardium of heart
- Structurally these muscles resemble striated muscles but involuntary like smooth muscles
- Its unique ability is to generate its own wave of excitation that can pass directly from fiber to fiber

Location of Cardiac Muscle



Cardiac Muscle

Structure of Cardiac Muscle

The cardiac muscles consist of short , cylindrical fibers.

- These fibers are joined end to end and are interconnected by oblique bridges
- The fibers are mostly uninucleate
- The nucleus lies deep at the center of the fiber
- They contain myosin and actin myofilaments and show cross striation, but the striations are much fainter that those of the striated muscle fibers

Cardiac Muscle

Structure of Cardiac Muscle.. Contd..

- Each fiber each covered by sarcolemma
- The fibers contain numerous large mitochondria and glycogen granules
- The cardiac muscle fibers have well developed T tubule system and poorly formed sarcoplasmic reticulum
- The cardiac muscle fibers are branched interdigitate freely with each other
- Between the branches of neighboring fibers gap junctions are present, it helps in the transference of ions , electrical current from one fiber to other

Cardiac Muscle

Structure of Cardiac Muscle.. Contd..

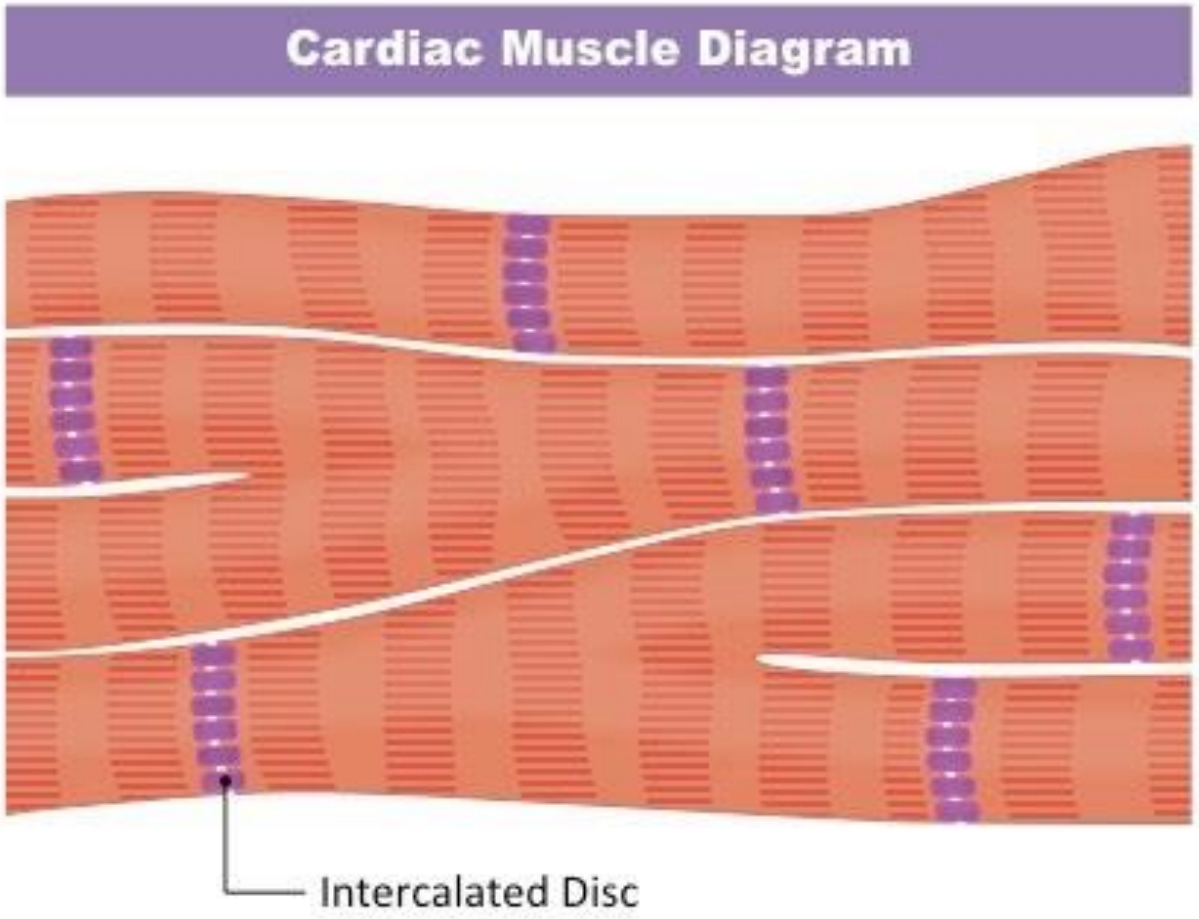
- Cardiac muscle fibers are also joined end to end in a series forming longer multicellular fiber
- These joints are called intercalated discs
- Thus the intercalated discs are specialized regions of cell membranes at the end of adjoining cardiac muscle fibers forming firm , dense junctions
- Here the cell membranes interdigitate extensively and have desmosome like gap junctions

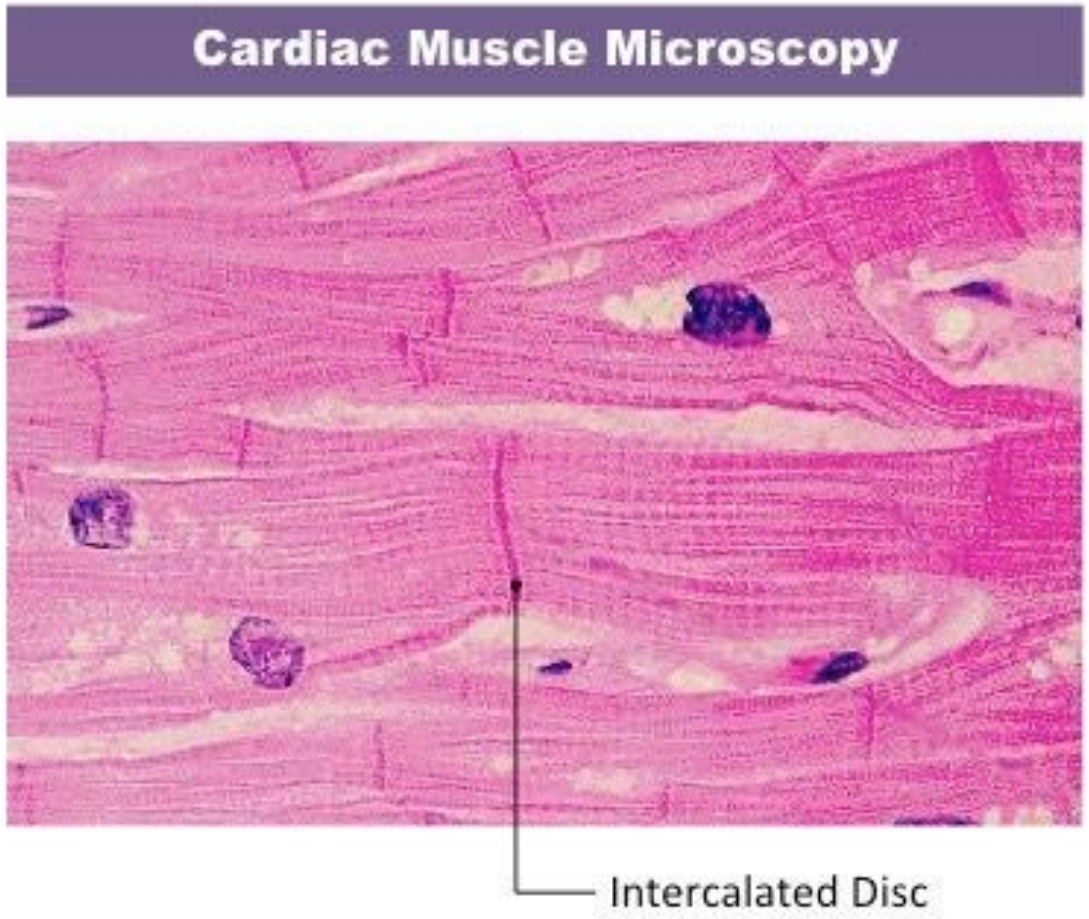
Cardiac Muscle

Structure of Cardiac Muscle.. Contd..

- This ensures addition between the ends of the adjoining cells, so that the repeated contraction do not pull the cells apart
- Beside holding the cells together, the intercalated discs also provide ionic continuity between the adjacent cells
- These muscles have a rich blood supply , blood capillaries penetrate the fibers.

Structure of Cardiac Muscle





Cardiac Muscle

Functioning of Cardiac Muscle

- The cardiac muscles contract rhythmically and it never gets fatigued
- Each contraction is followed by a refractory period to allow the muscles to relax
- For this reason cardiac muscles can not go into a sustained contraction
- Its contraction is involuntary

Thank You