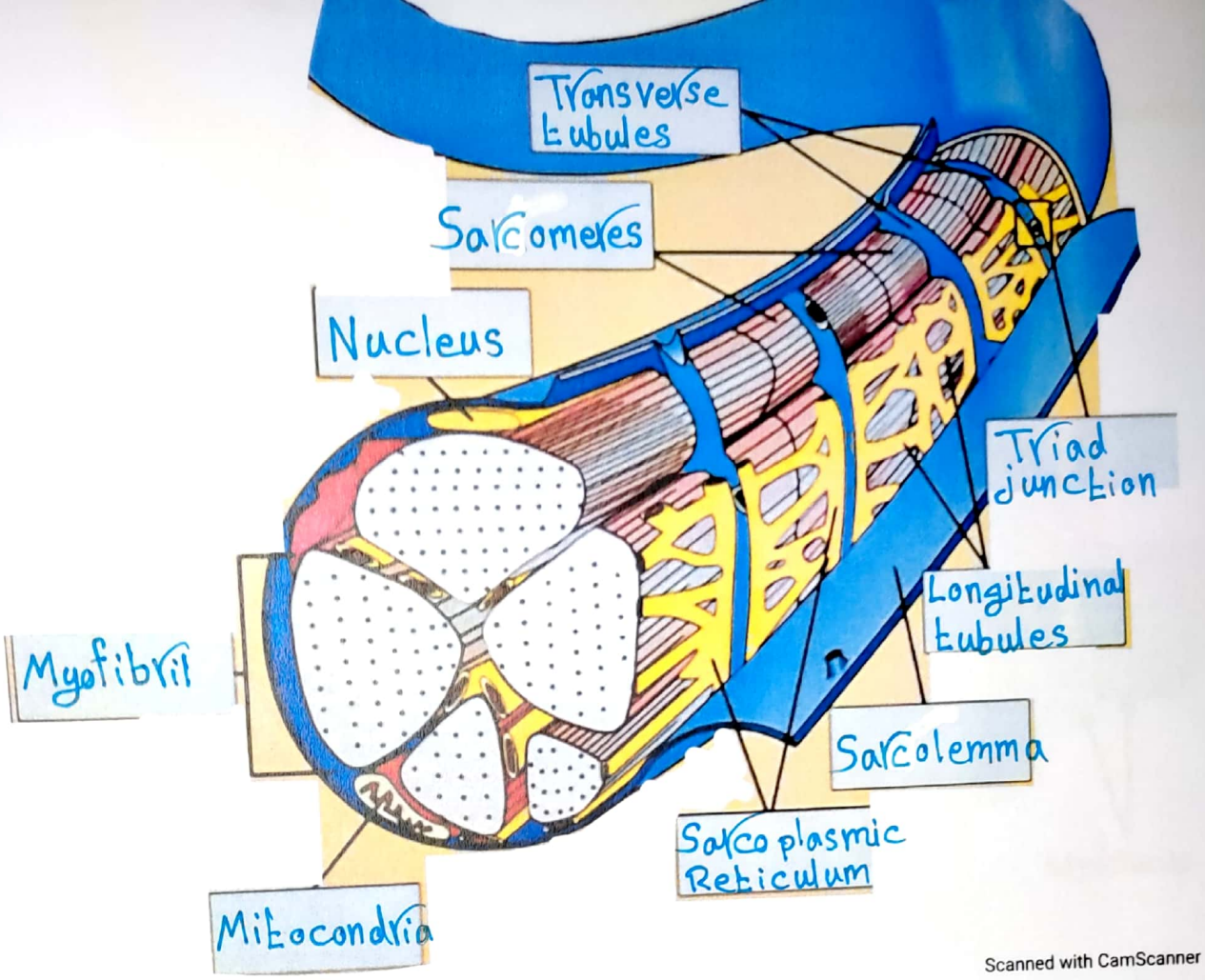
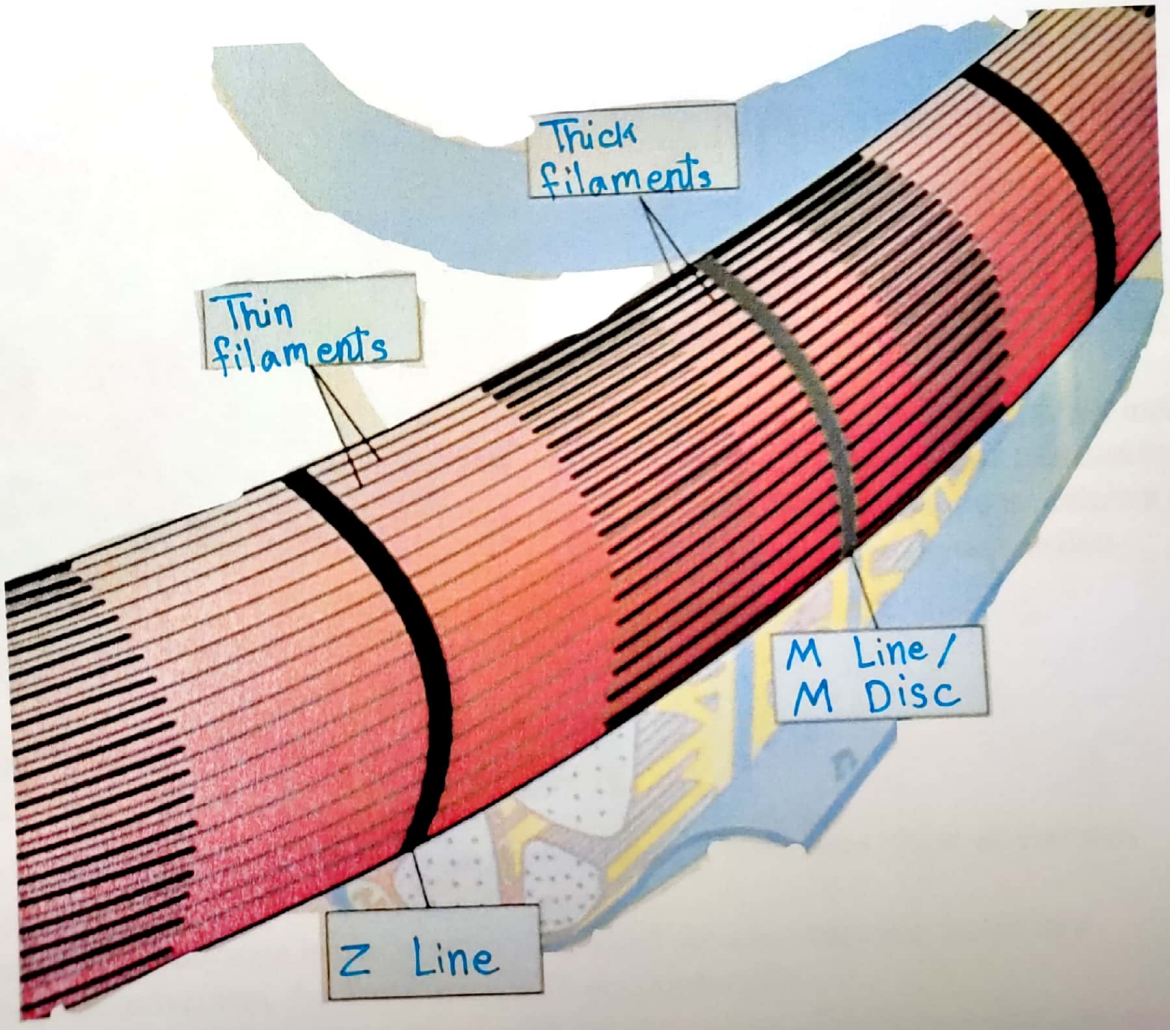
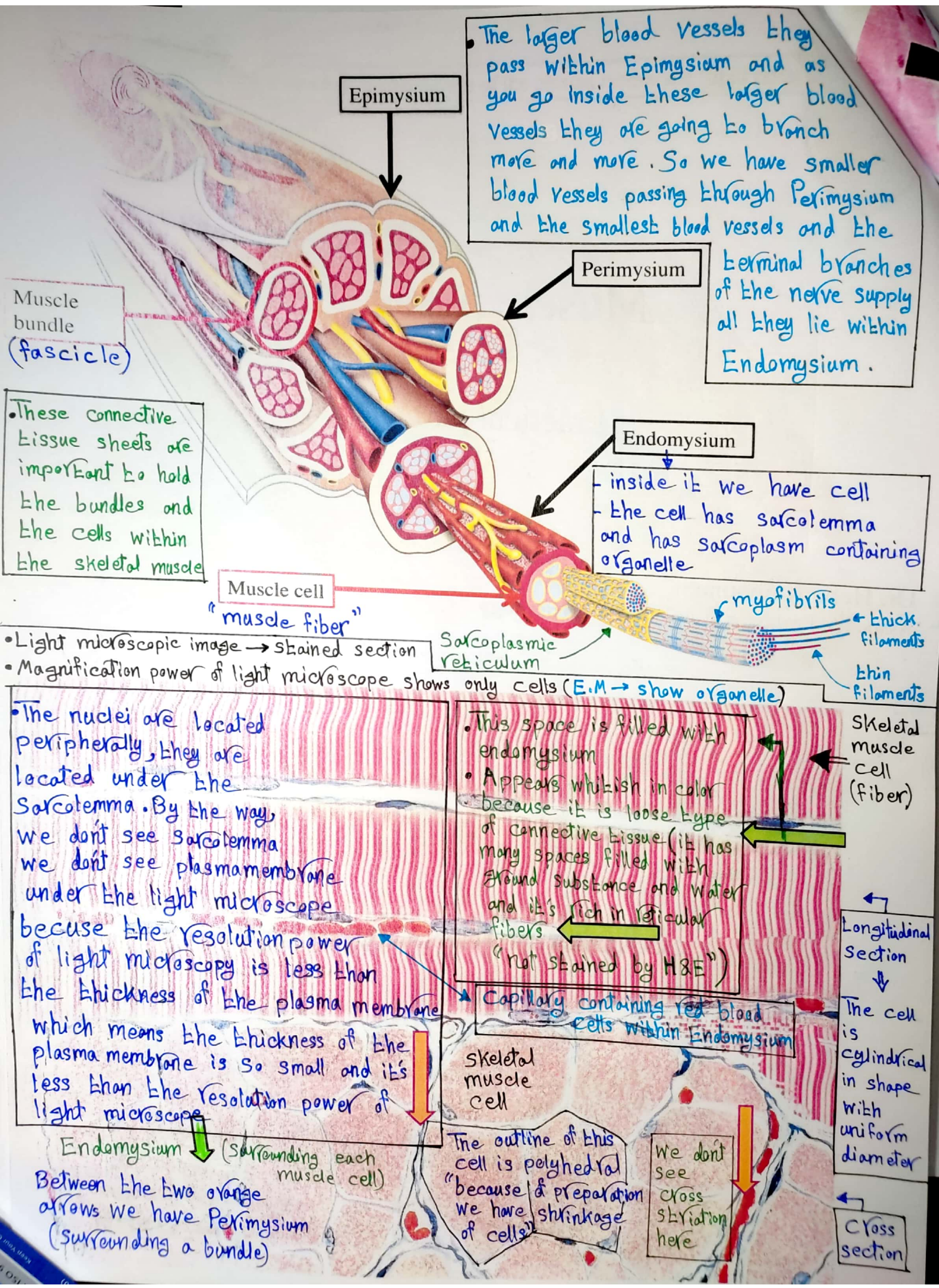






- The larger blood vessels they pass within Epimysium and as you go inside these larger blood vessels they are going to branch more and more. So we have smaller blood vessels passing through Perimysium and the smallest blood vessels and the terminal branches of the nerve supply all they lie within Endomysium.

- These connective tissue sheets are important to hold the bundles and the cells within the skeletal muscle

- inside it we have cell
- the cell has sarcolemma and has sarcoplasm containing organelle

- Light microscopic image → stained section
- Magnification power of light microscope shows only cells (E.M → show organelle)

- The nuclei are located peripherally, they are located under the Sarcolemma. By the way, we don't see sarcolemma we don't see plasmamembrane under the light microscope becuse the resolution power of light microscopy is less than the thickness of the plasma membrane which means the thickness of the plasma membrane is so small and it's less than the resolution power of light microscope

- This space is filled with endomysium
- Appears whitish in color because it is loose type of connective tissue (it has many spaces filled with ground substance and water and it's rich in reticular fibers "not stained by H&E")

Endomysium (surrounding each muscle cell)

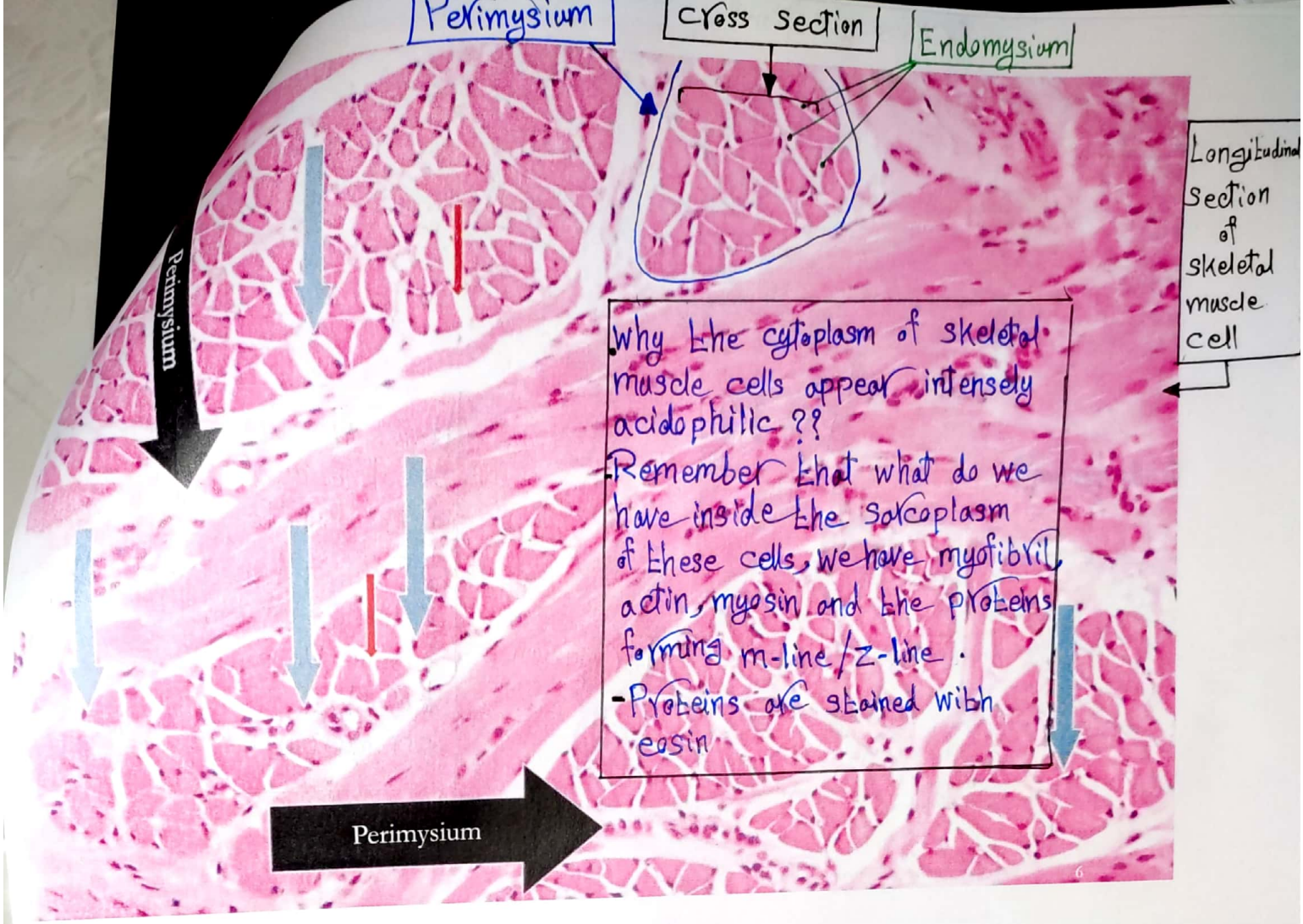
Between the two orange arrows we have Perimysium (surrounding a bundle)

The outline of this cell is polyhedral "because we have of cells" & preparation shrinkage

We don't see cross striation here

Longitudinal section
The cell is cylindrical in shape with uniform diameter

Cross section

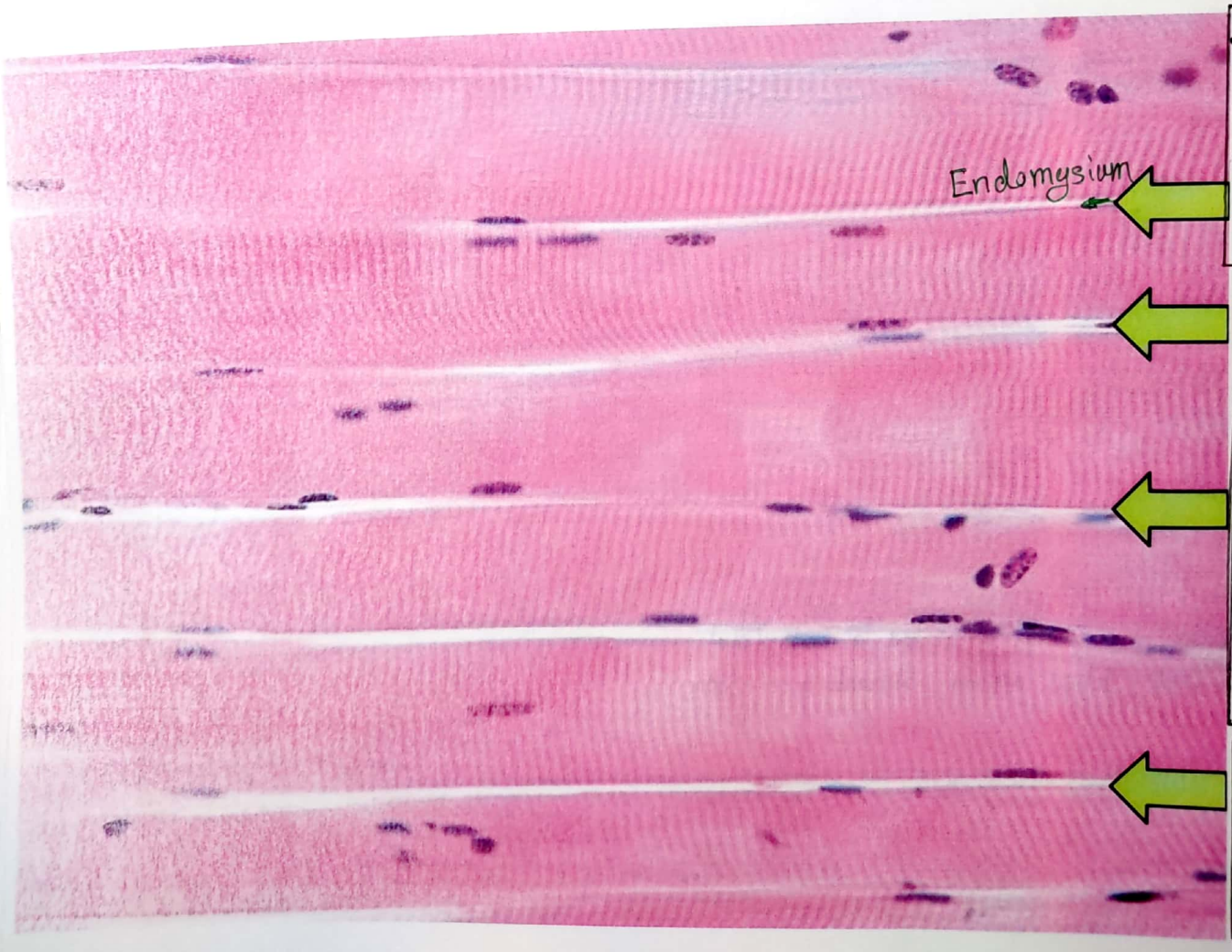


Longitudinal Section of skeletal muscle cell

Why the cytoplasm of skeletal muscle cells appear intensely acidophilic ??

Remember that what do we have inside the sarcoplasm of these cells, we have myofibril, actin, myosin and the proteins forming m-line / z-line.

-Proteins are stained with eosin



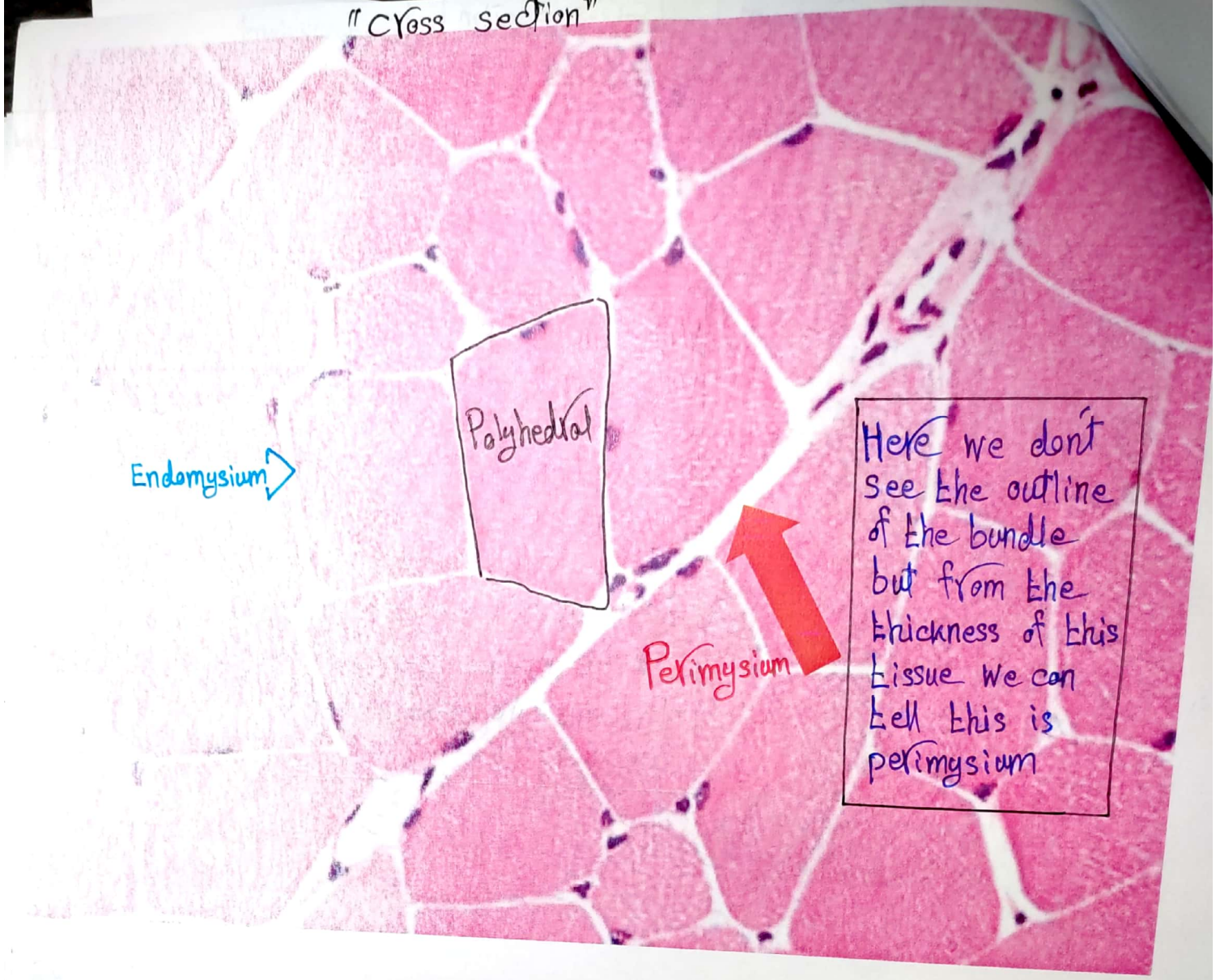
We are viewing cells

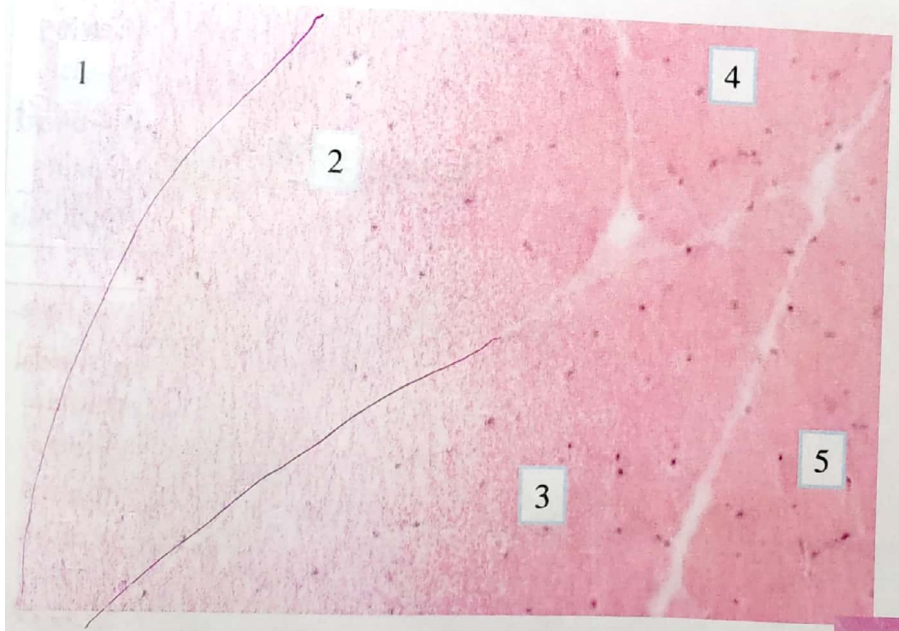
We aren't viewing myofibrils

We have 6 skeletal muscle fibers in this section + في شوية في شوية وشوية تحت

Nuclei are located peripherally

"Cross section"

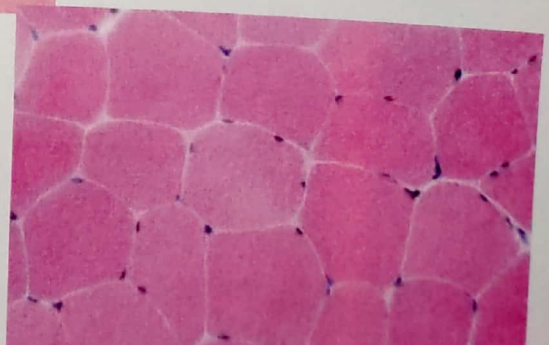


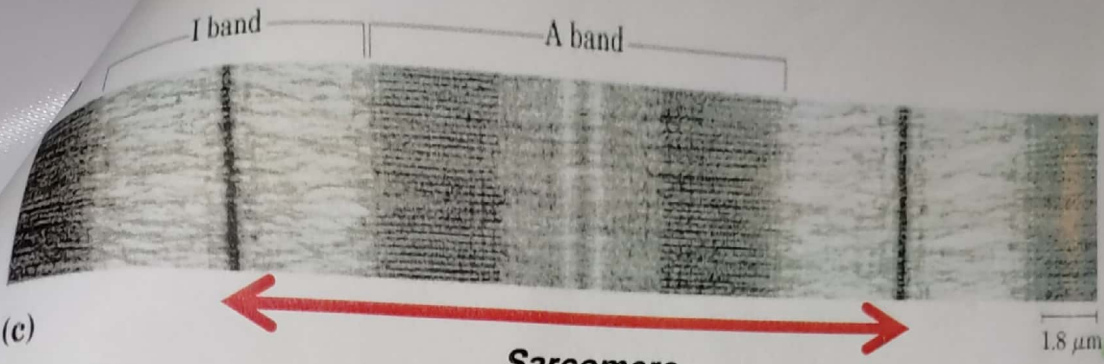


⇒ 5 fascides in this section

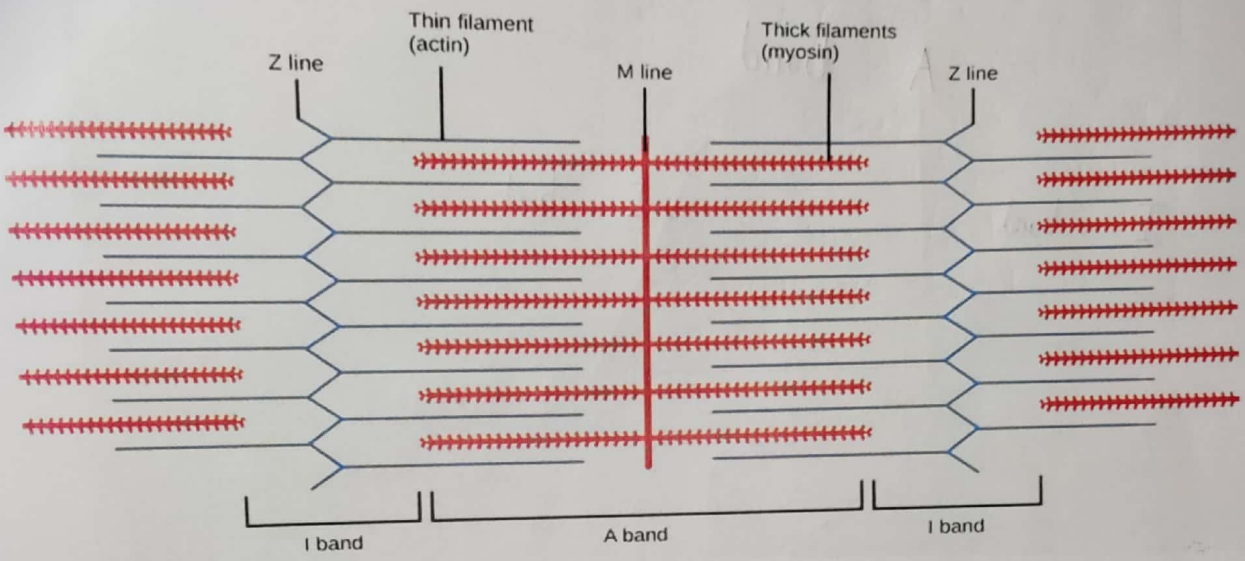
- The cross-sectional profiles of skeletal muscle cells they appear almost the same size

How many fascicles in this section??

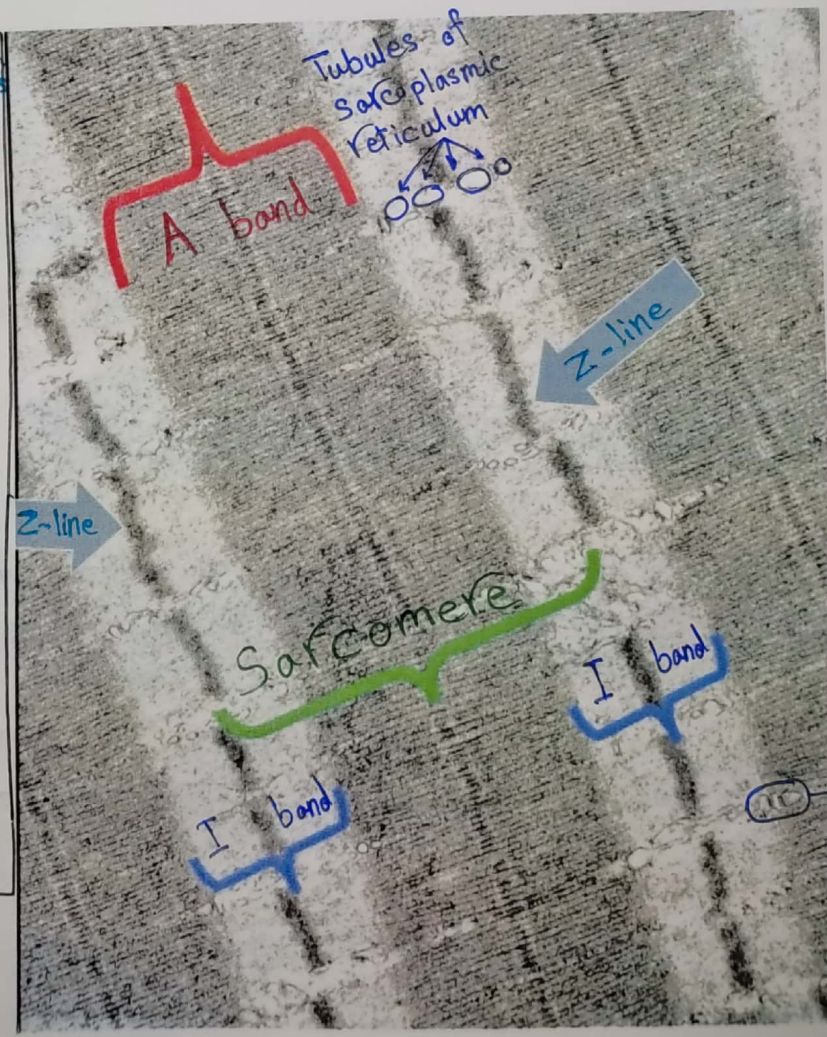




Sarcomere

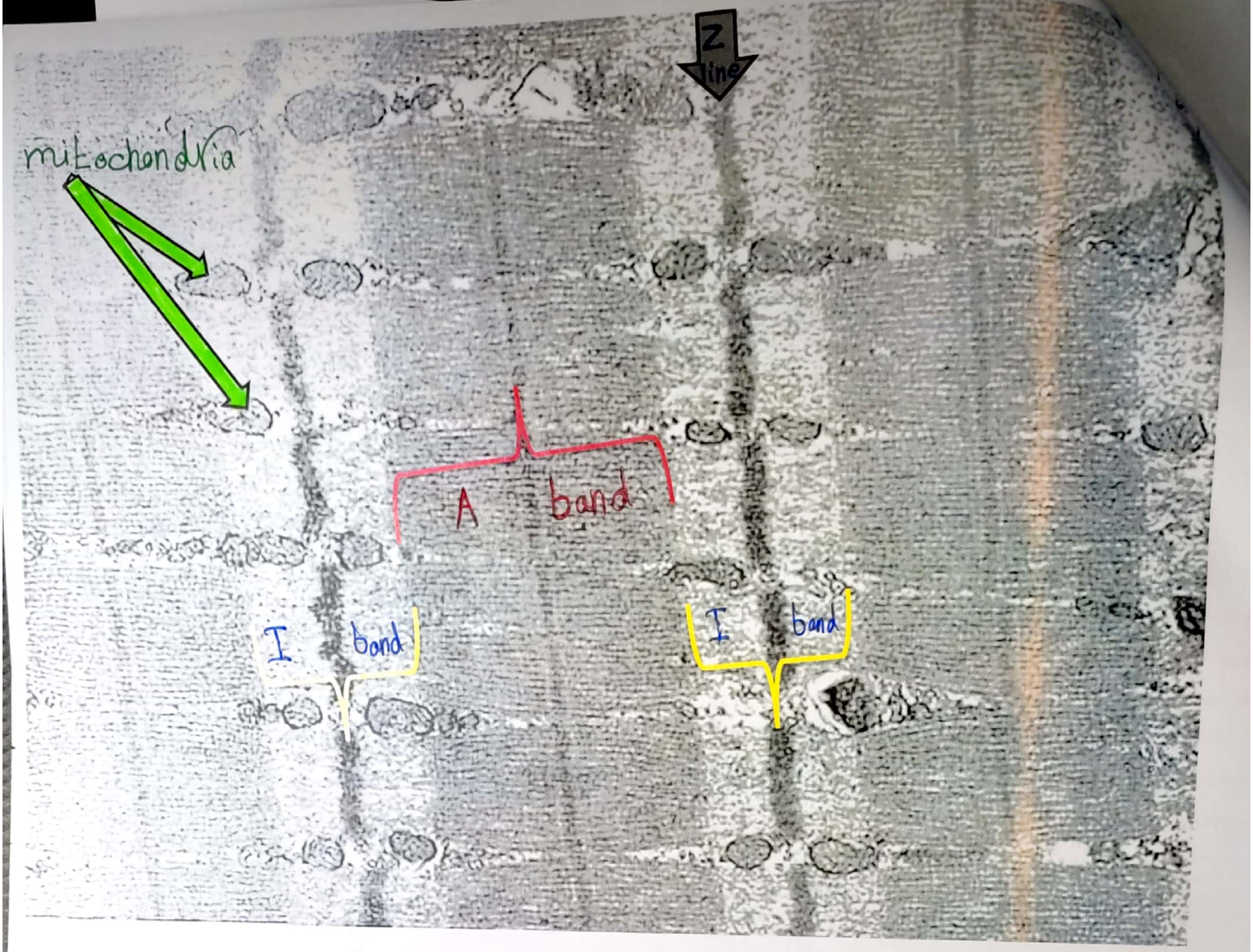


- These myofibrils lie parallel to each other
- They are oriented above each other in order to produce cross striations inside the skeletal muscle cell



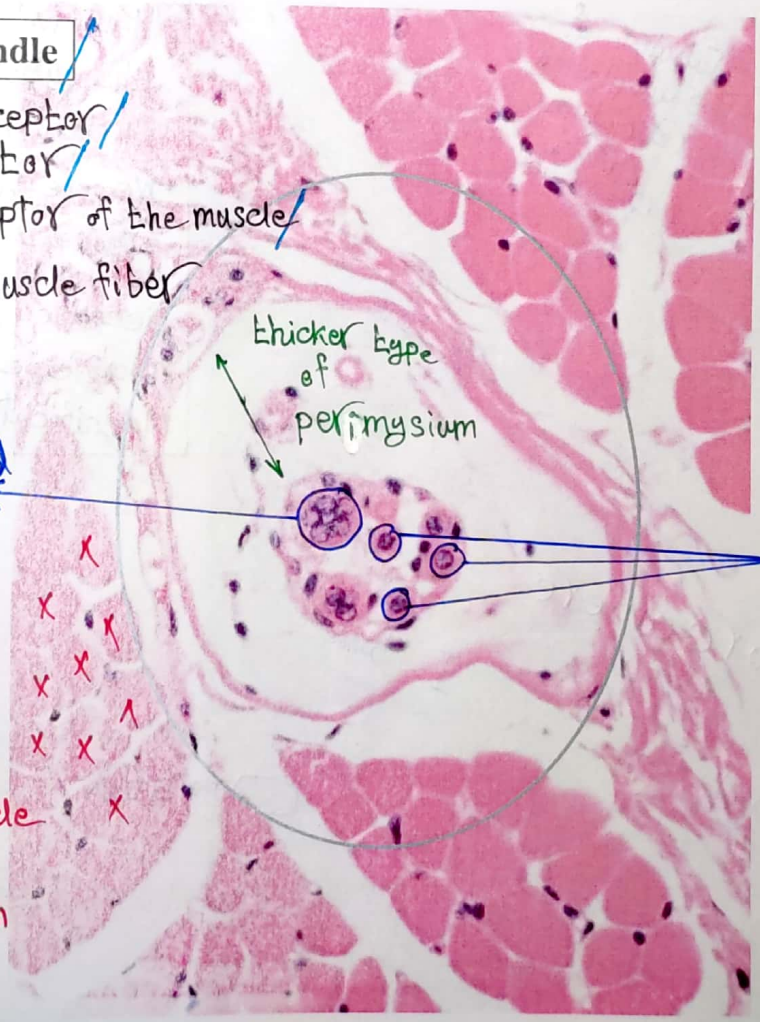
- Here we are viewing the cytoplasm of the skeletal muscle cell
- We are viewing organelles

Because the electron microscope has a high magnification power



Muscle spindle

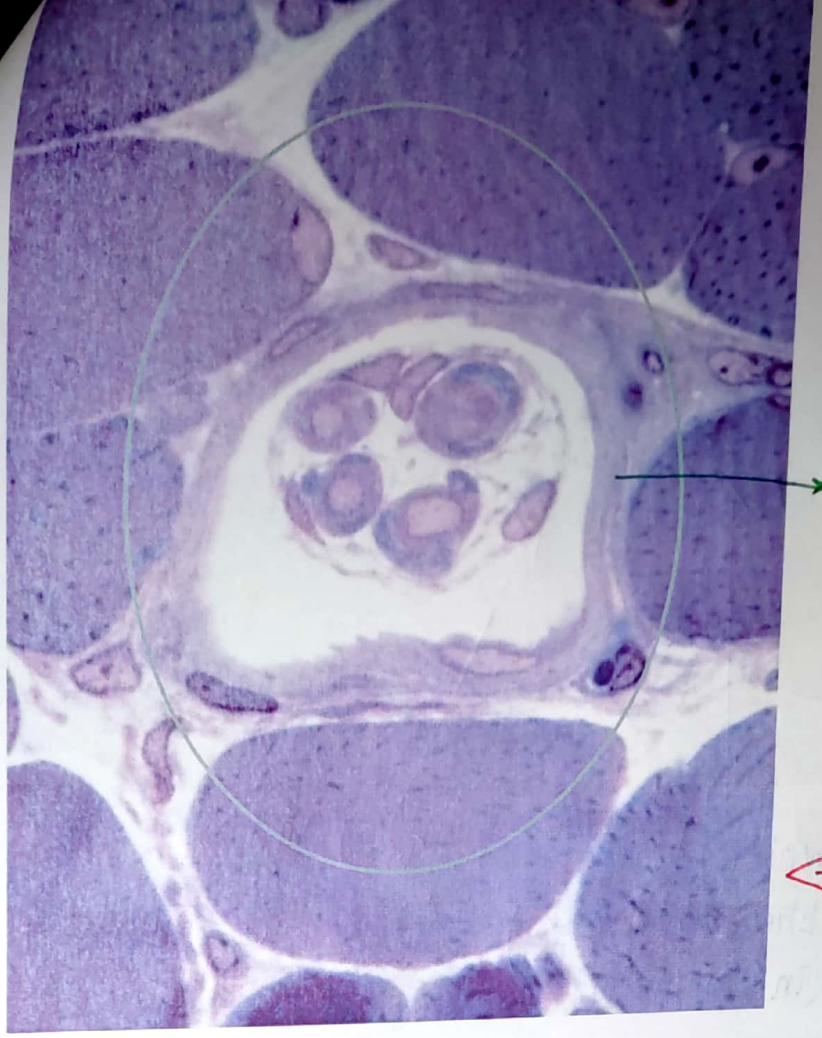
Stretch receptor
proprioceptor
Sensory receptor of the muscle
Intrafusal muscle fiber



multinucleated cell

Produce the contraction of the skeletal muscle "Extrafusal muscle fibers"

few number of skeletal muscle cells
- Small in diameter
- centrally located nuclei



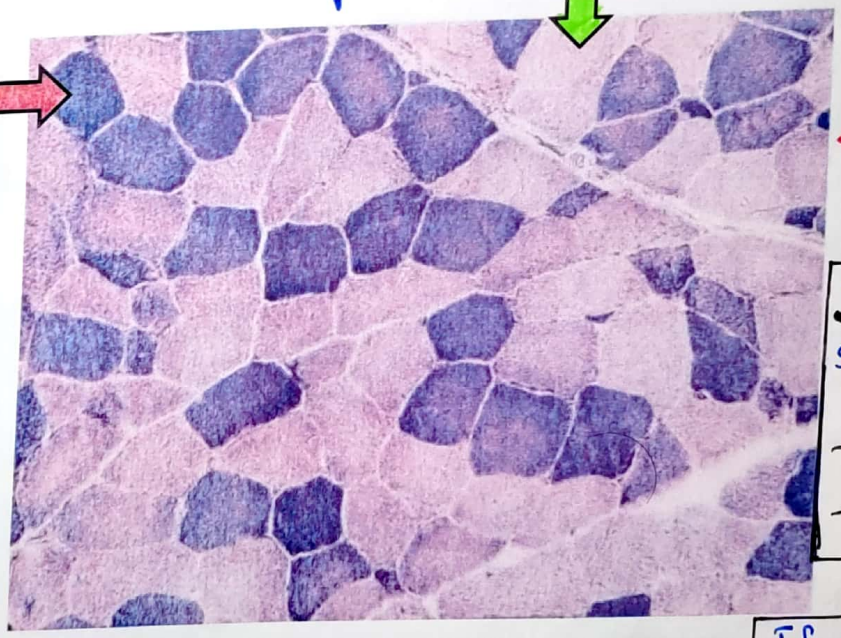
Perimysium

Not H&E

- This stain is specific for mitochondrial enzyme

They have few mitochondria

Rich in mitochondria

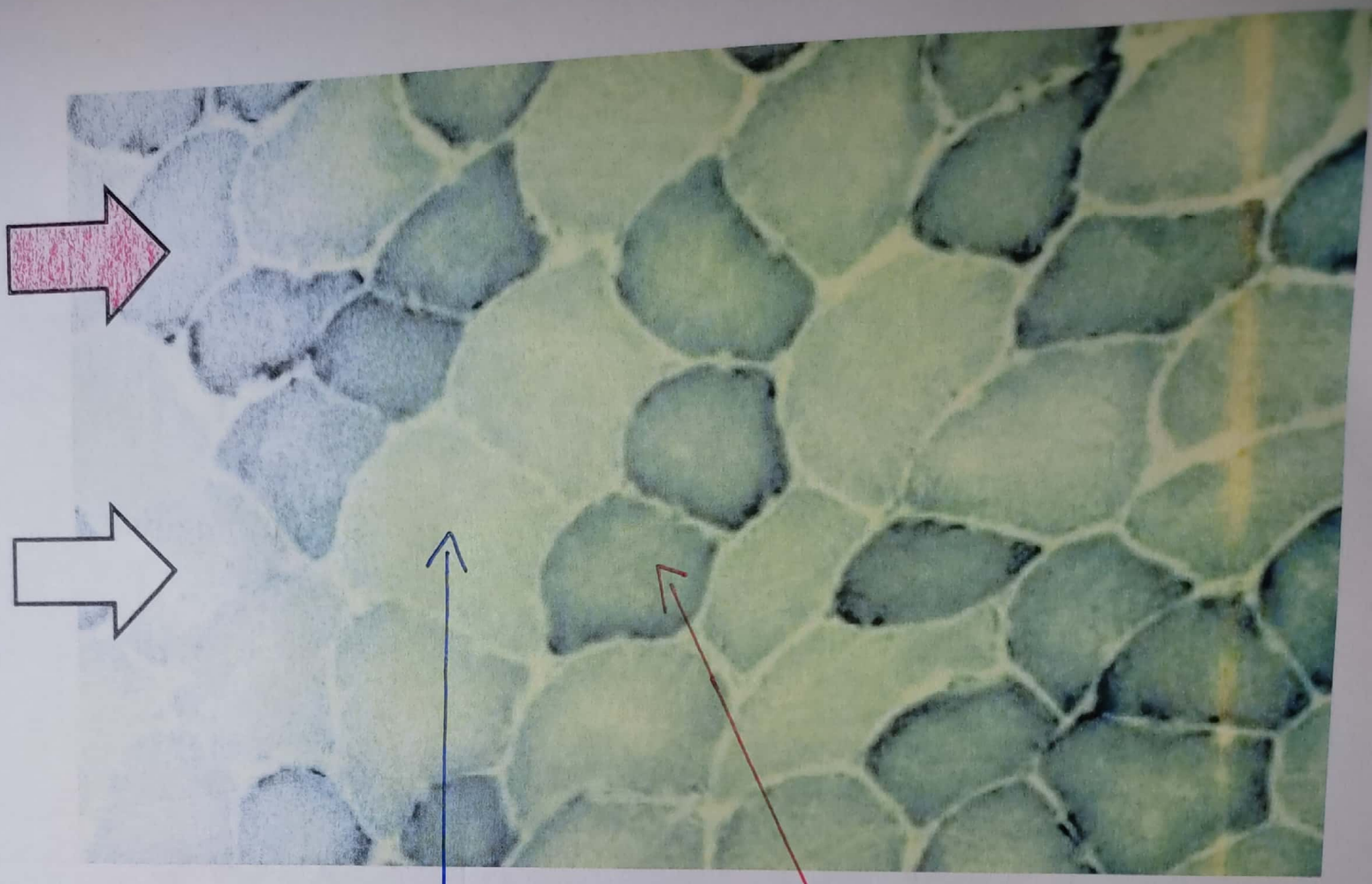


- If we are using specific stain to ATP activity
  - lightly stained are red fiber
  - Darkly stained are white fiber

- With this type of stain, we can differentiate the 2 types of skeletal muscle fibers
  - Darkly stained are red fiber
  - lightly stained are white fiber

  ] according to the type of stain

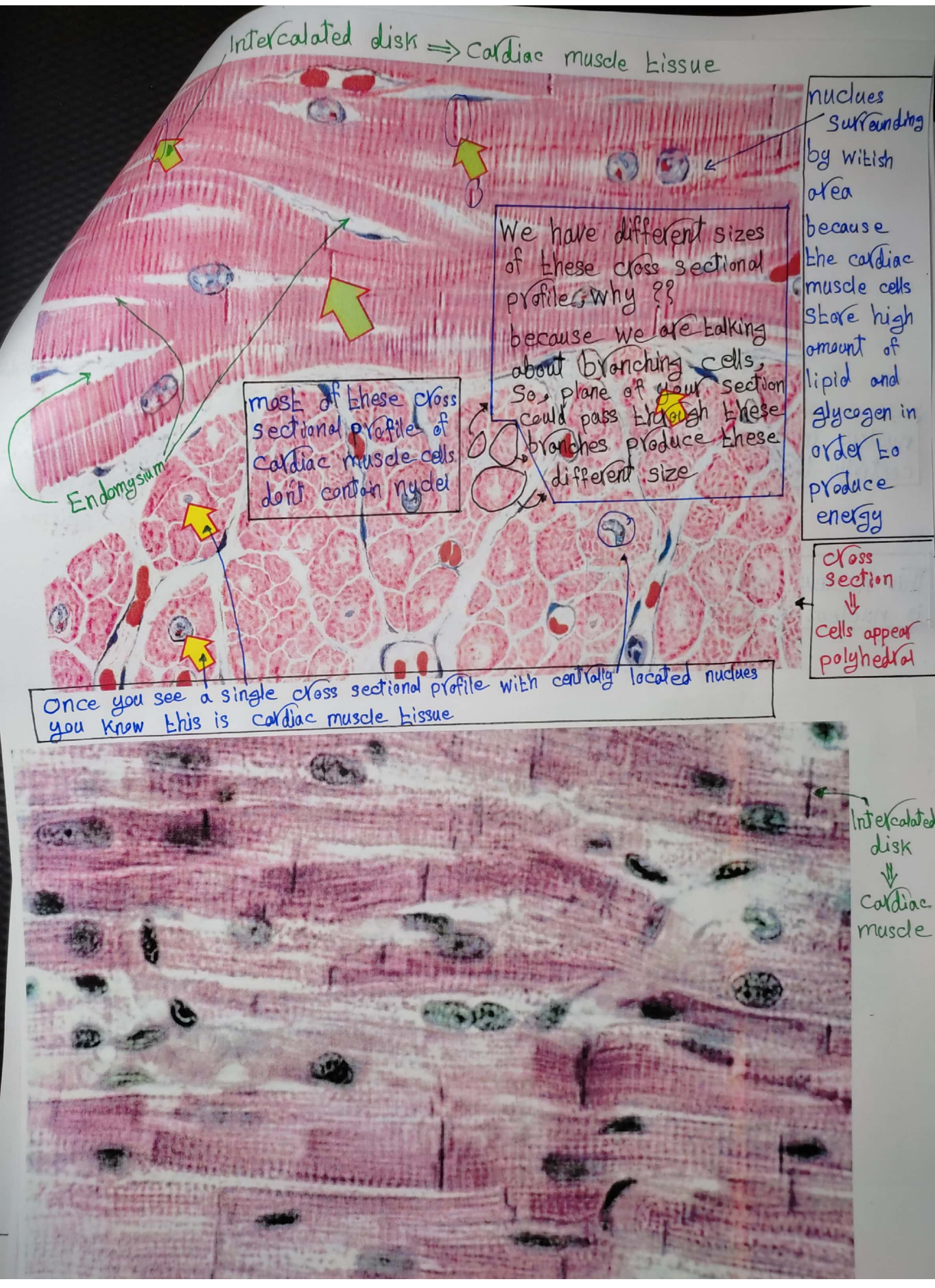
- If we are using PAS stain for example or stain specific for glycogen
  - lightly stained are red fiber
  - Darkly stained are white fiber

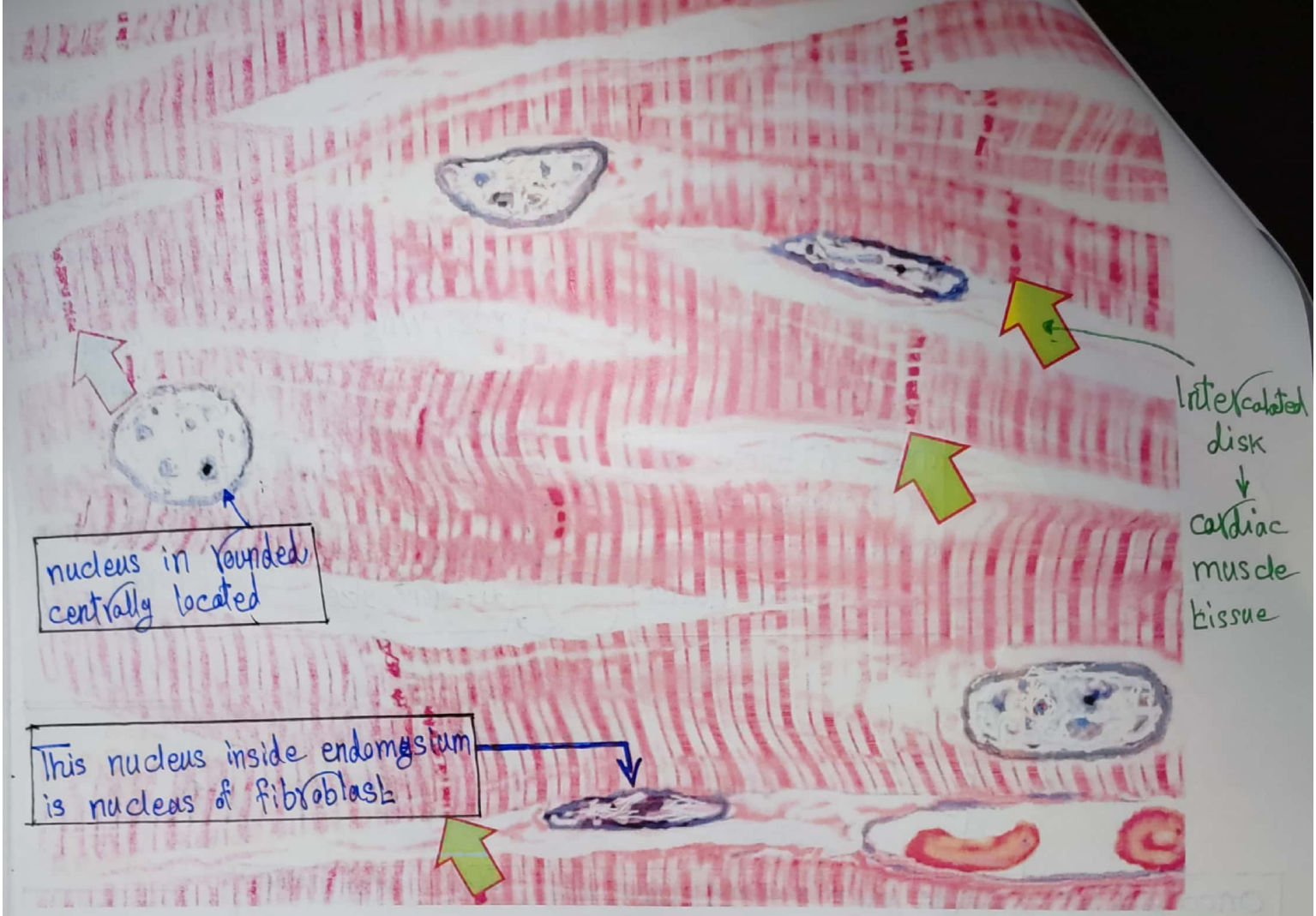


white fibers
(they are larger in diameter)

Red fibers
(they are smaller in diameter)

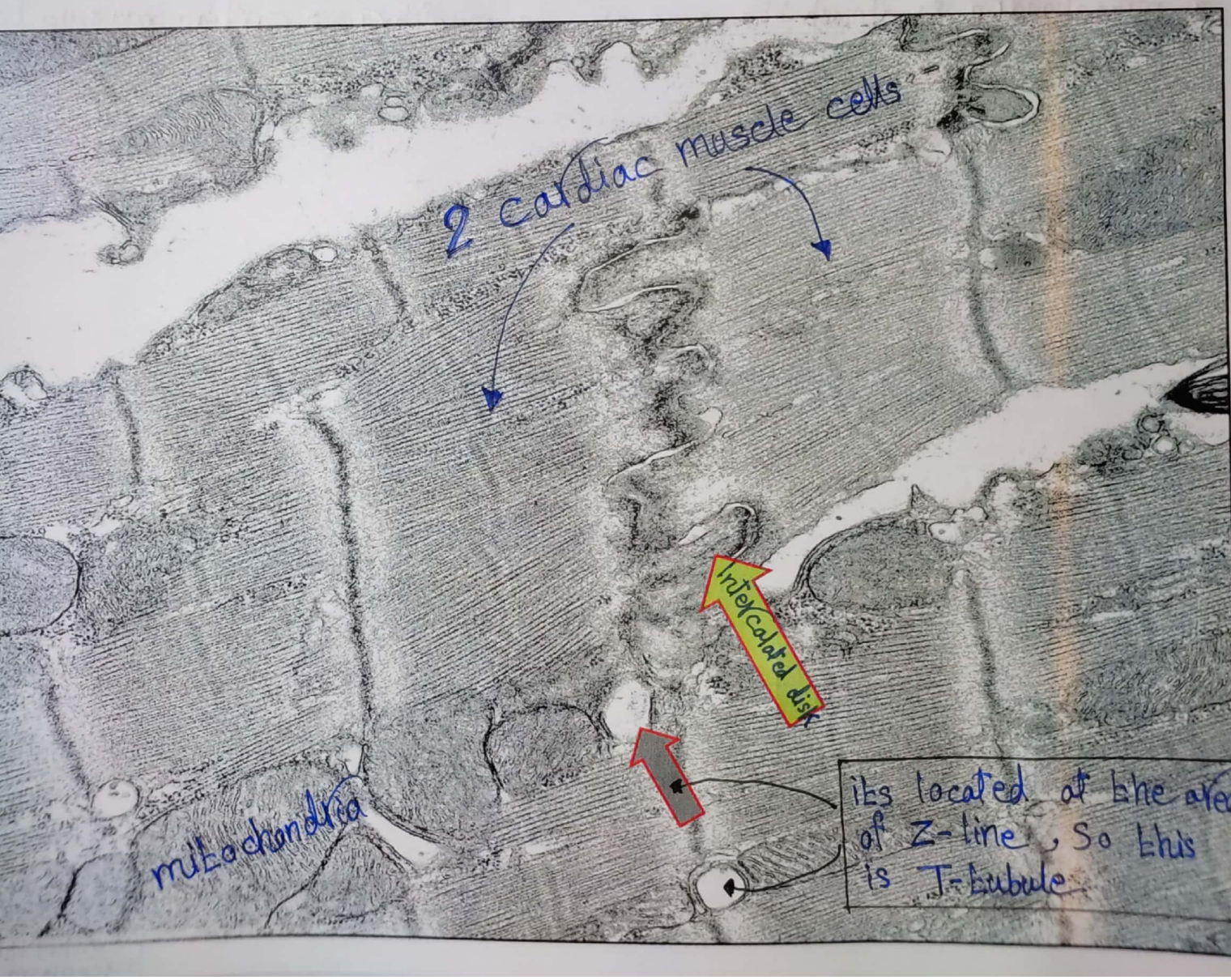
Cardiac muscle

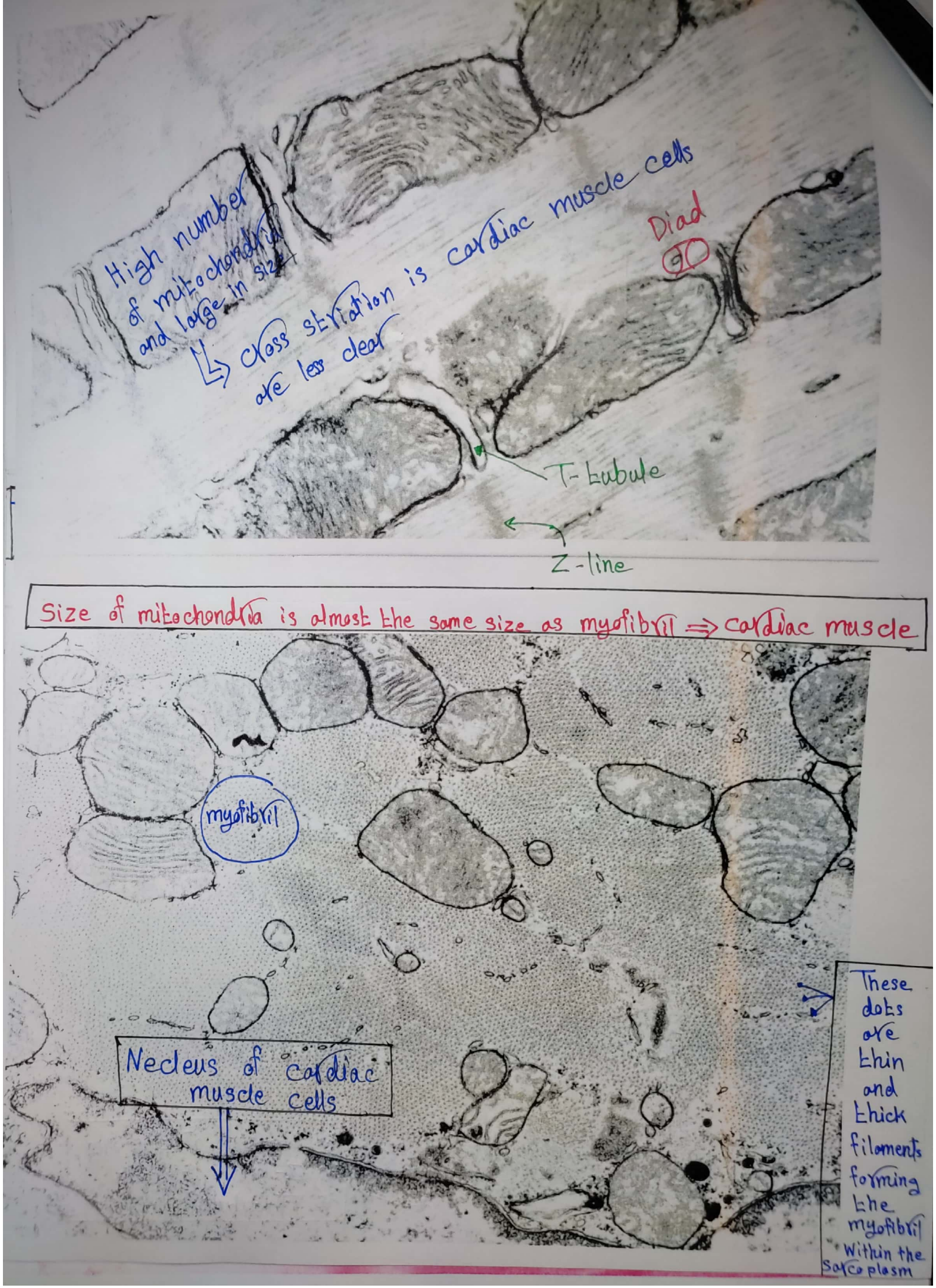




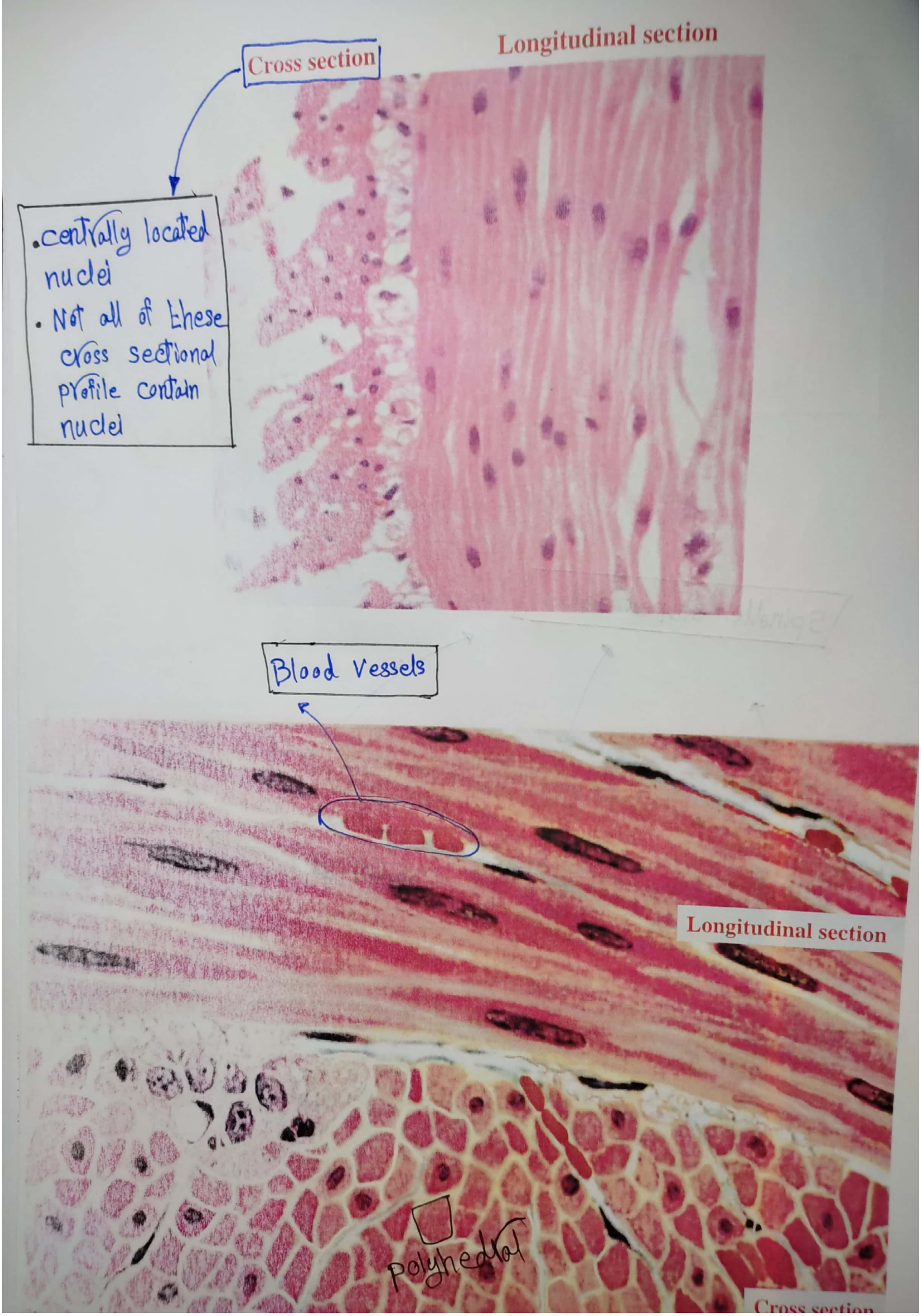
centrally located nucleus

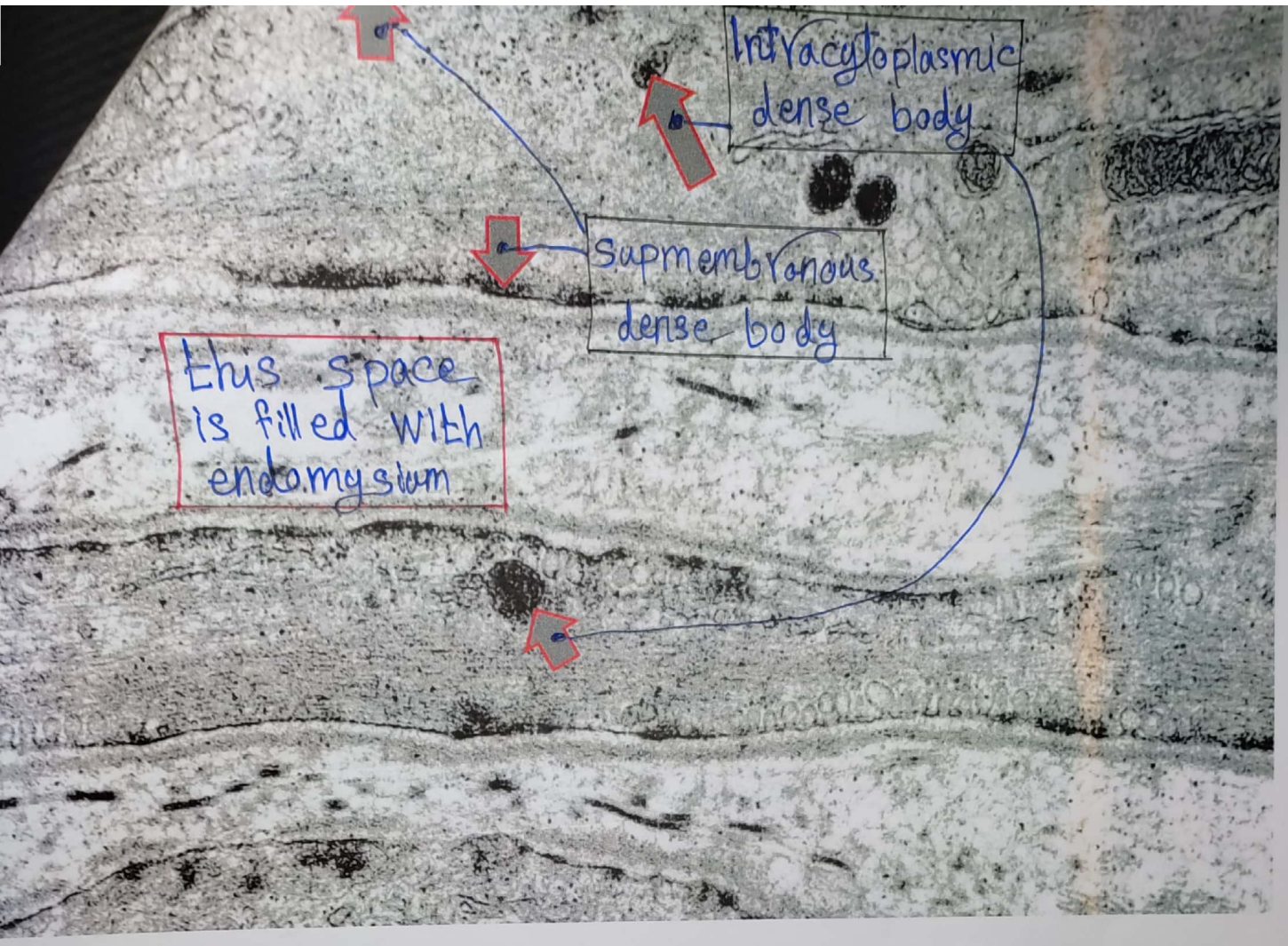
cardiac muscle tissue





Smooth muscle





Comparison of the 3 types of muscles

	Skeletal Muscle	Cardiac Muscle	Smooth Muscle
Sarcomere	Yes	Yes	No
Nuclei	Multinucleated, peripherally located	1 or 2 centrally located	One, centrally located
Sarcoplasmic Reticulum	Well developed with terminal cisterna	Less developed, some small terminals	Rudimentary sER (not involved in calcium storage)
T Tubule	Yes: involved in triad formation	Yes: involved in diad formation	No
Cell Junctions	No	Intercalated disks	Nexus (gap junctions)
Contraction	Voluntary "all or none"	Involuntary: rhythmic and spontaneous	Involuntary: slow, often spontaneous, wavelike and rhythmic
Calcium Binding	Troponin C	Troponin C	Calmodulin
Regeneration	Limited, via satellite cells	No-very poor	Yes, via mitosis
Nerve Fibres	Somatic motor	Autonomic	Autonomic
Connective Tissue	Epimysium; perimysium and endomysium	Connective tissue sheaths and endomysium	Connective tissue sheaths and endomysium
Distinctive Features	Long, cylindrical, many peripheral nuclei	Branched cells, intercalated disks, central nucleus	Fusiform cells, no striations, central nucleus