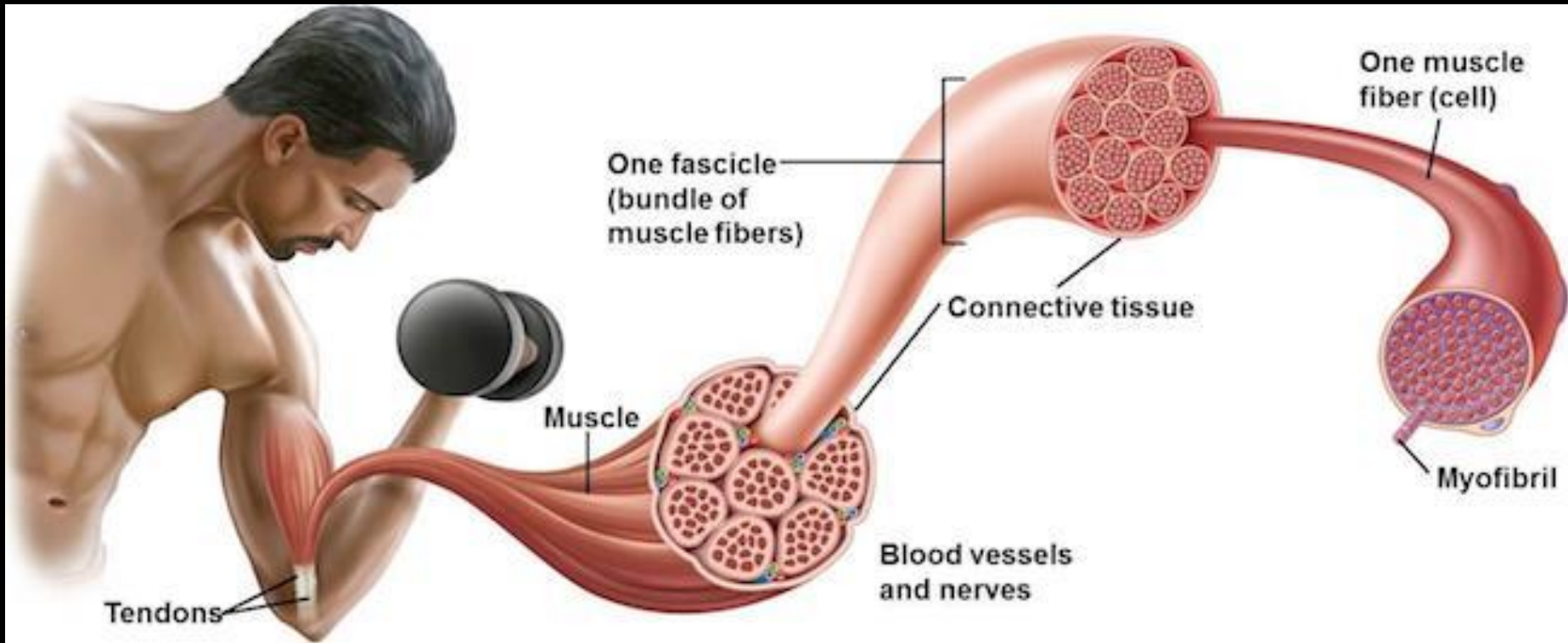


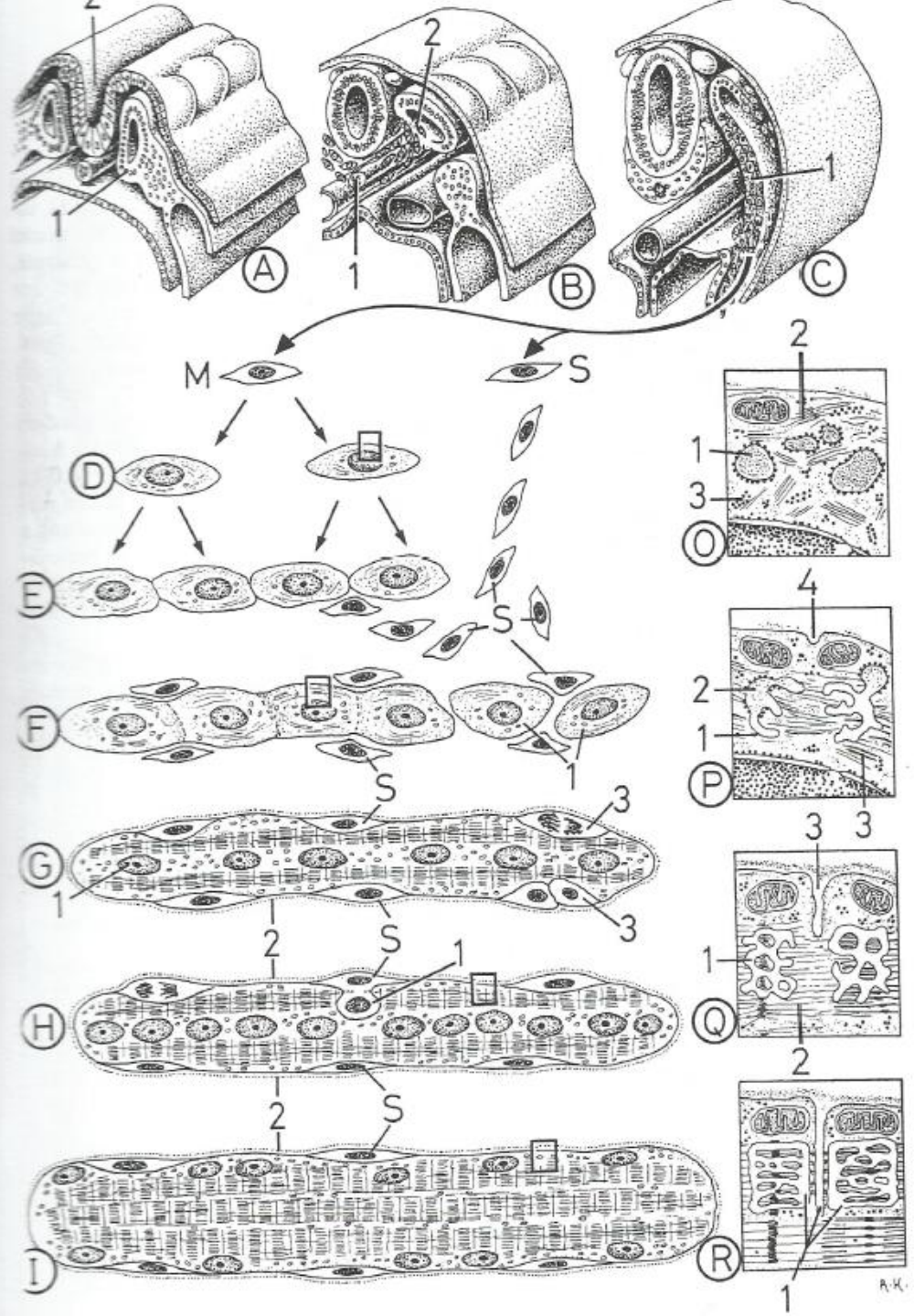
Muscle tissue

Skeletal muscle

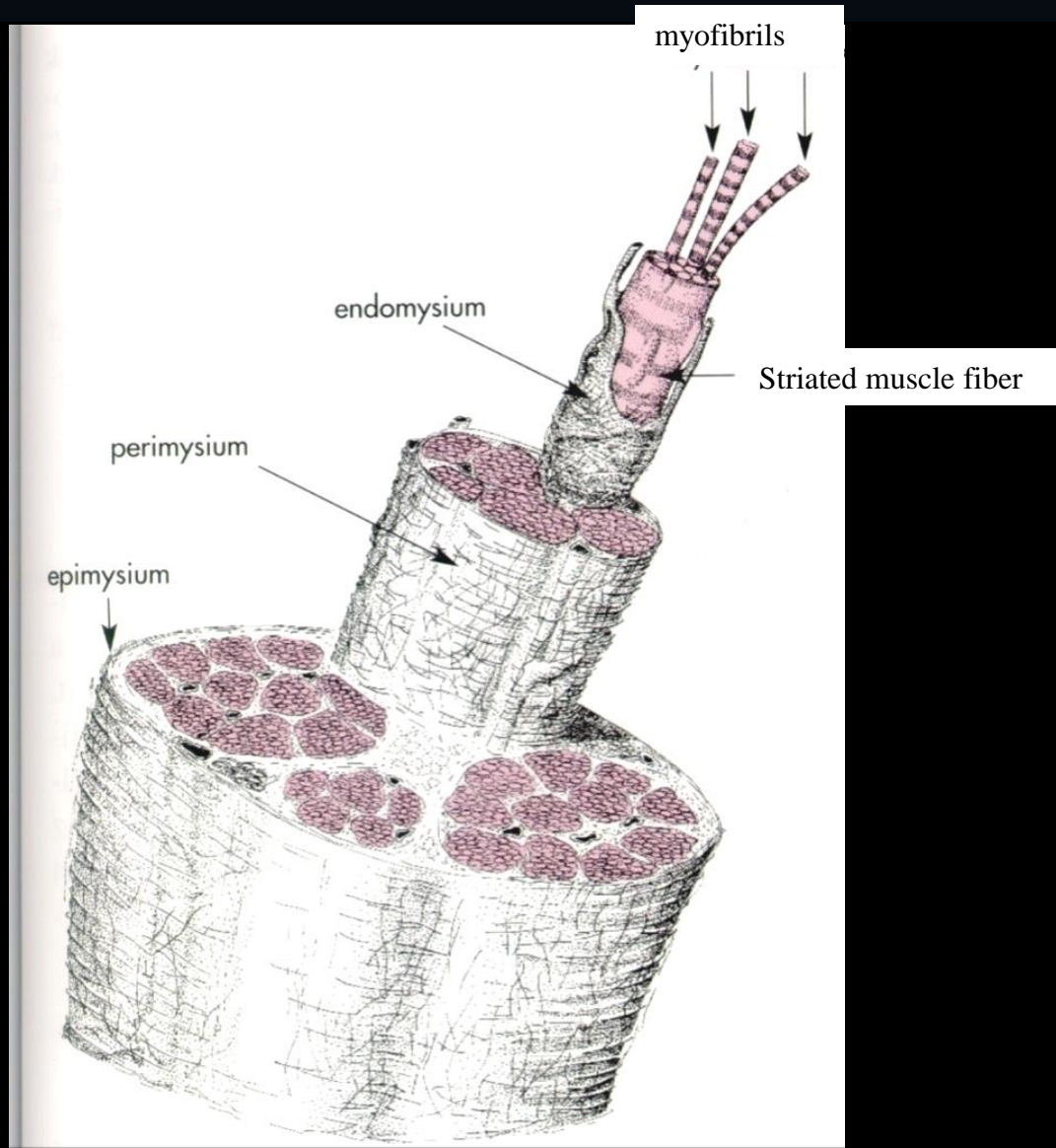


Development of the striated muscle fibers

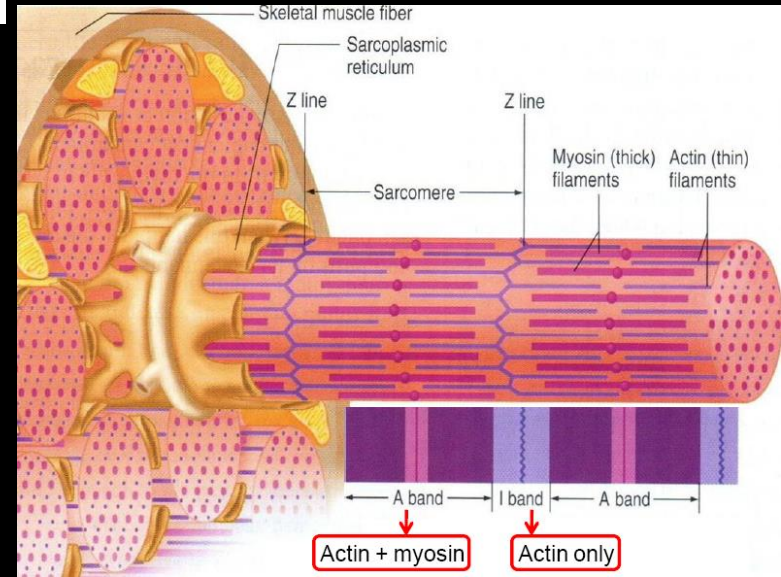
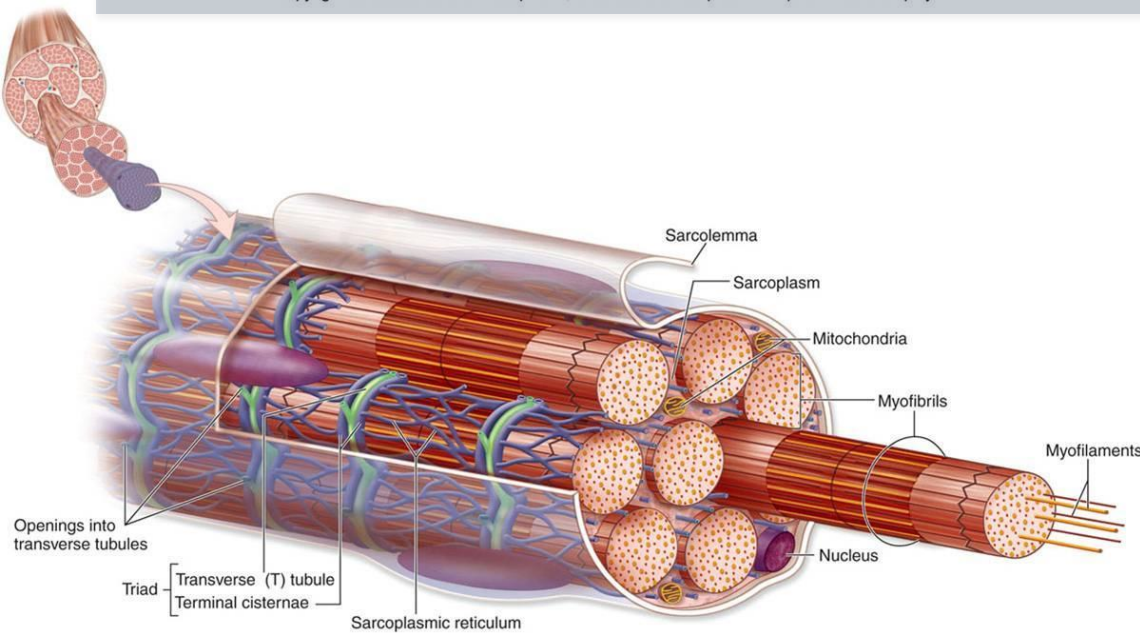
1: myotome
 M: myoblast
 S: satellite cell



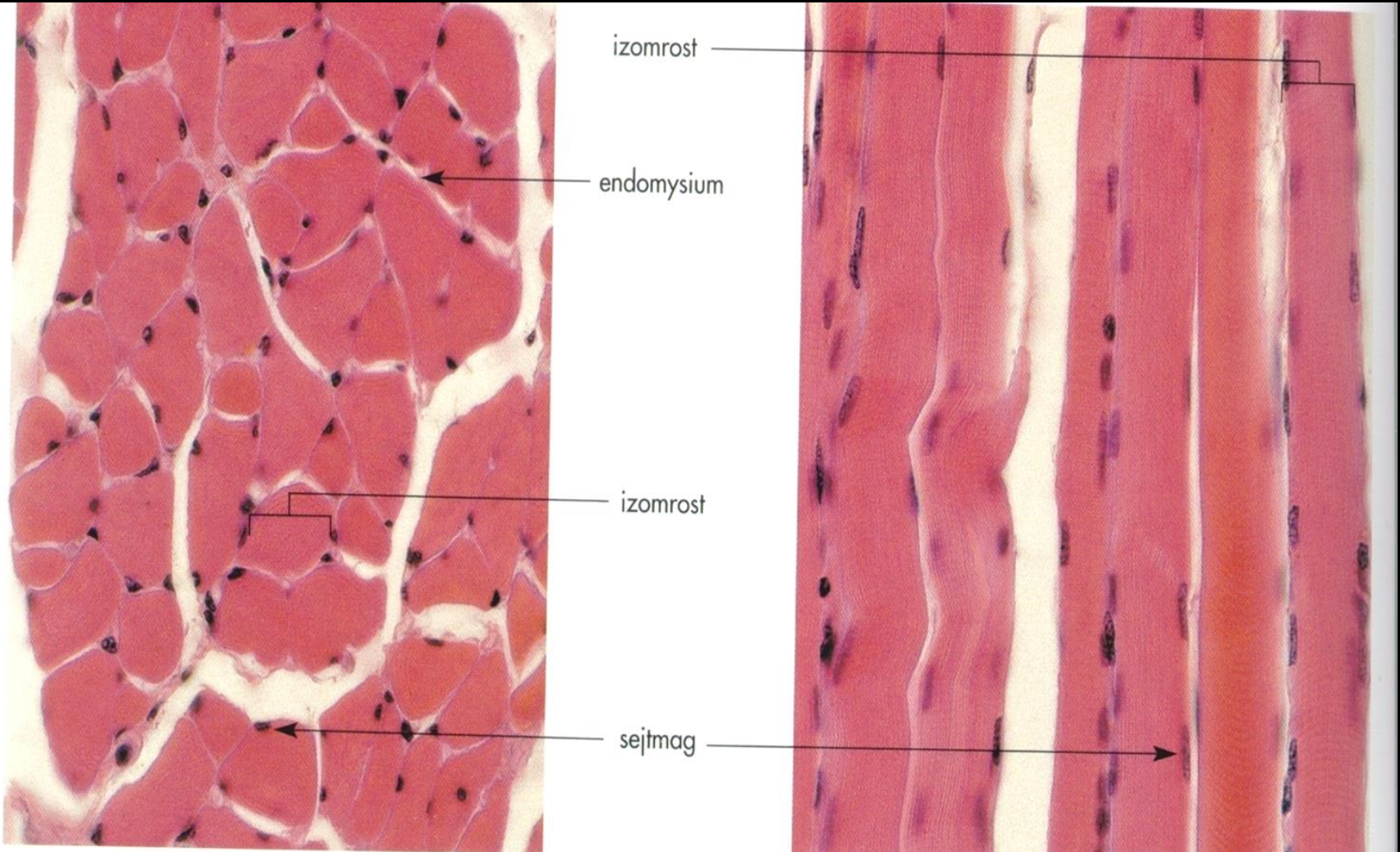
Coats of the skeletal muscle



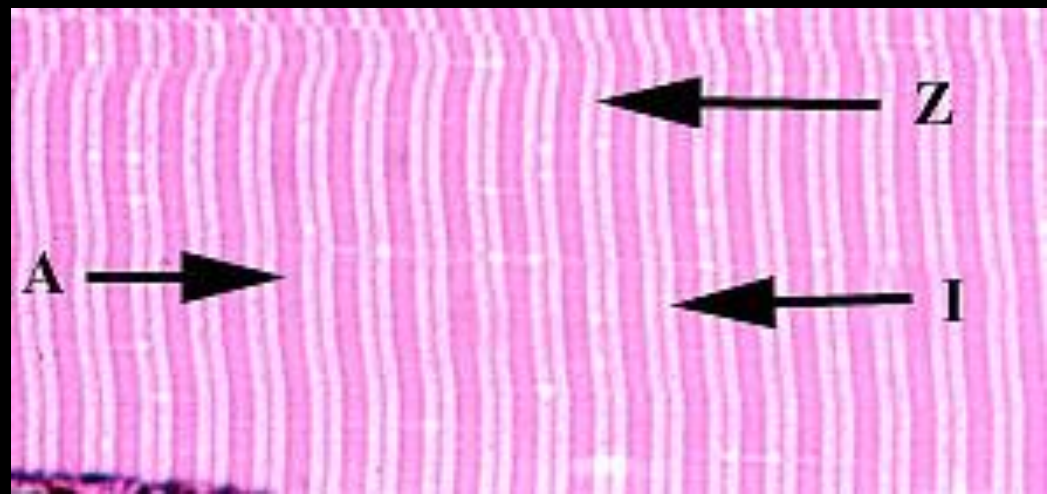
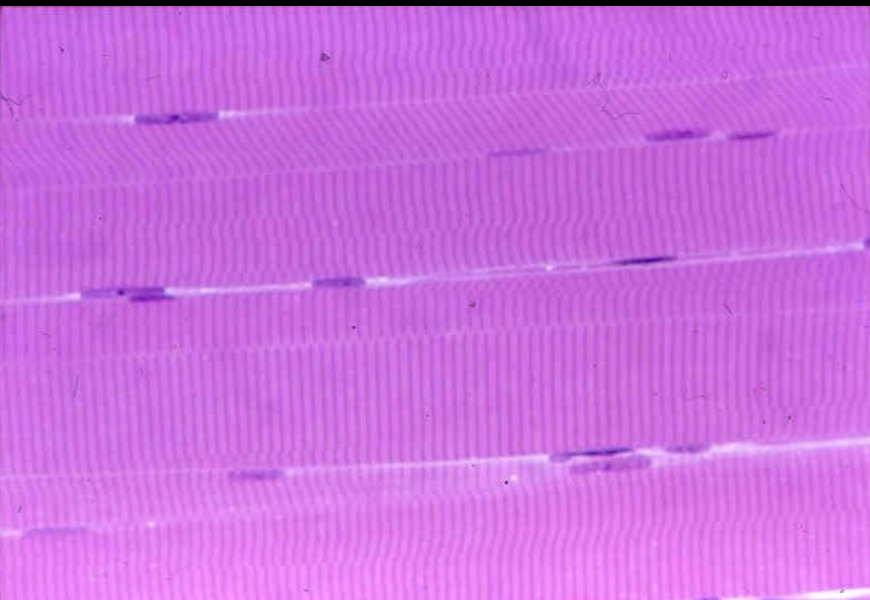
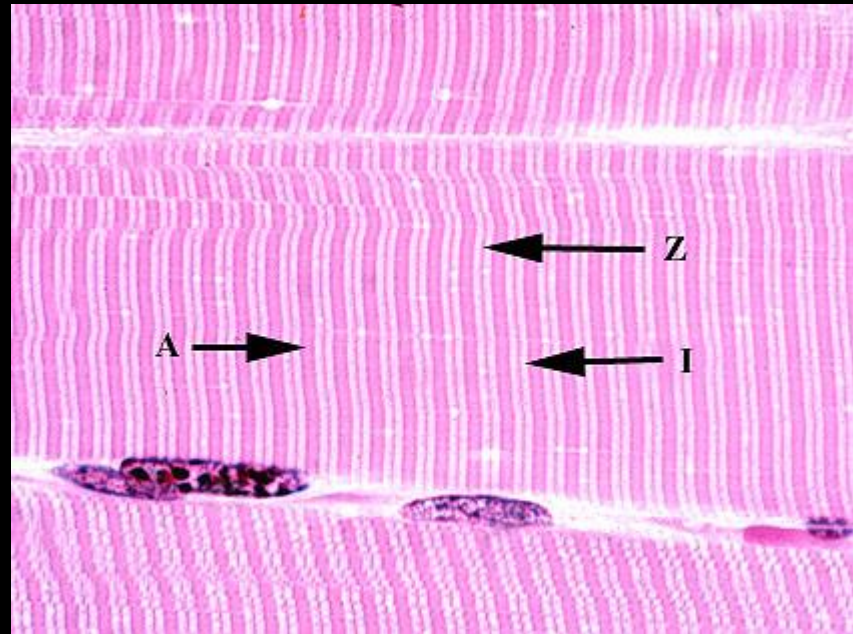
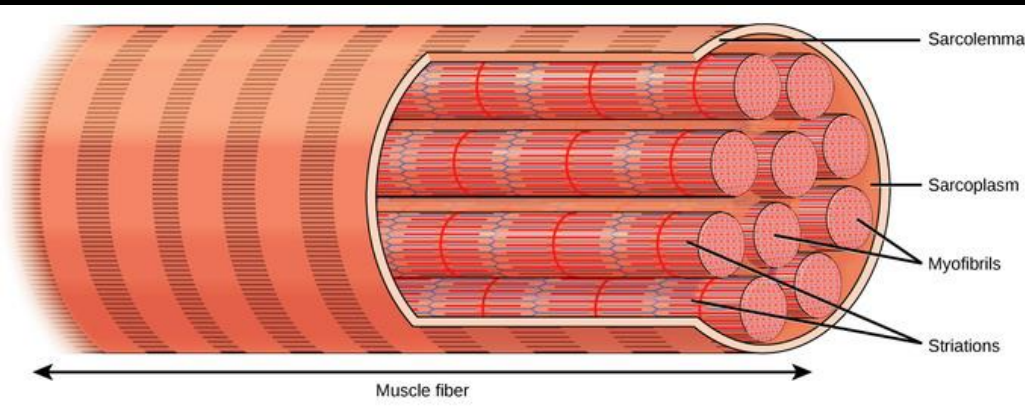
Skeletal muscle



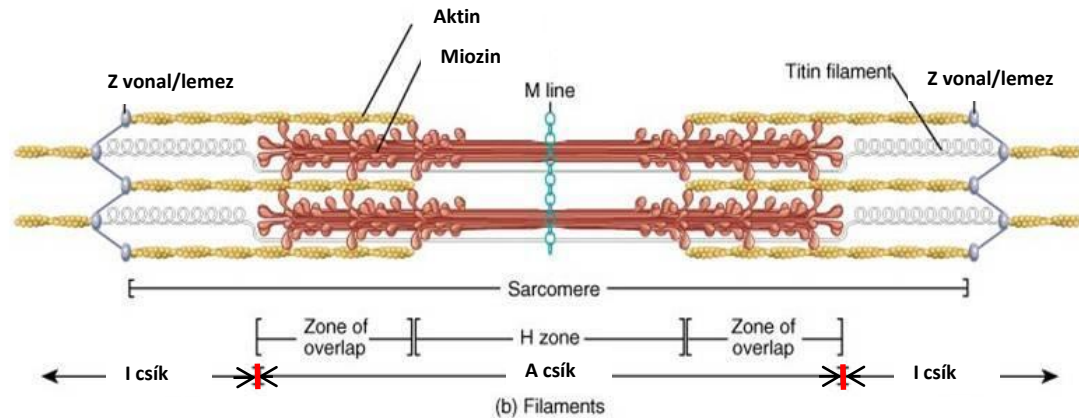
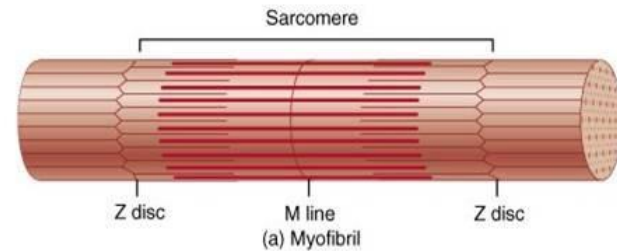
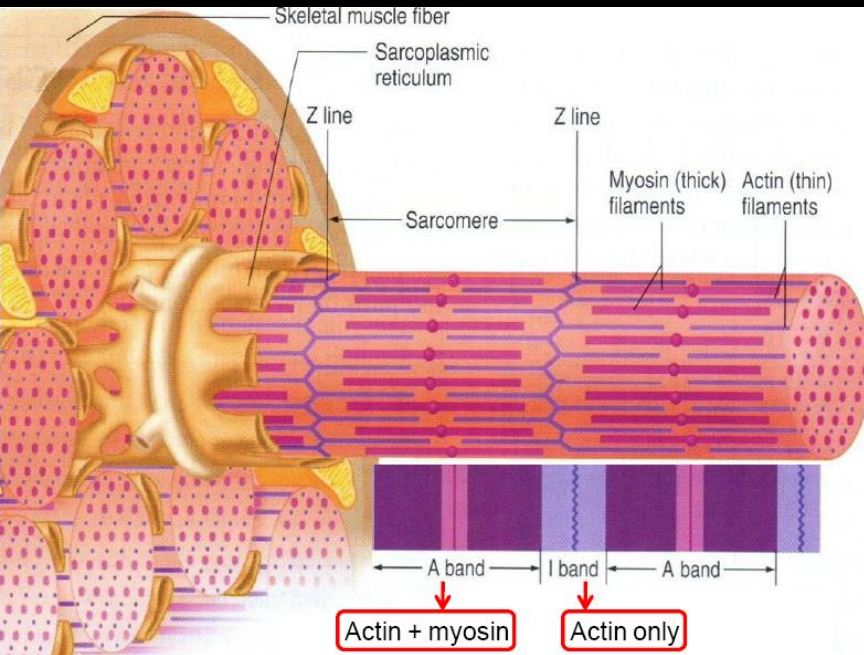
Skeletal muscle cross- and longitudinal section



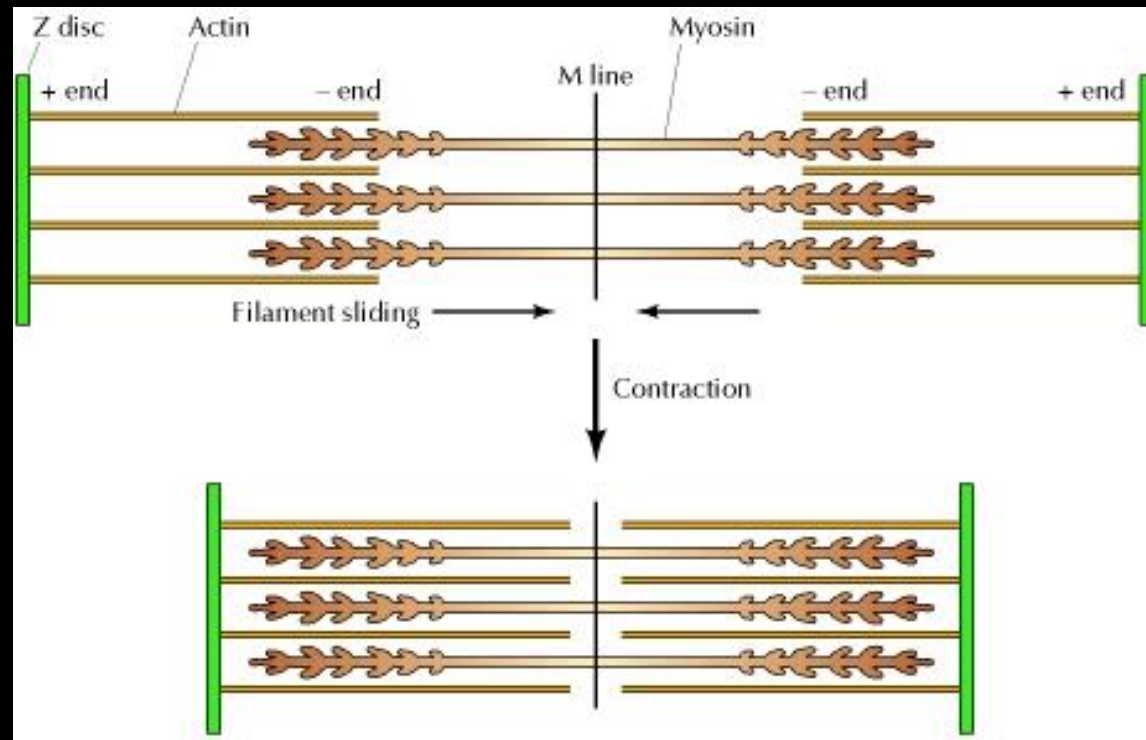
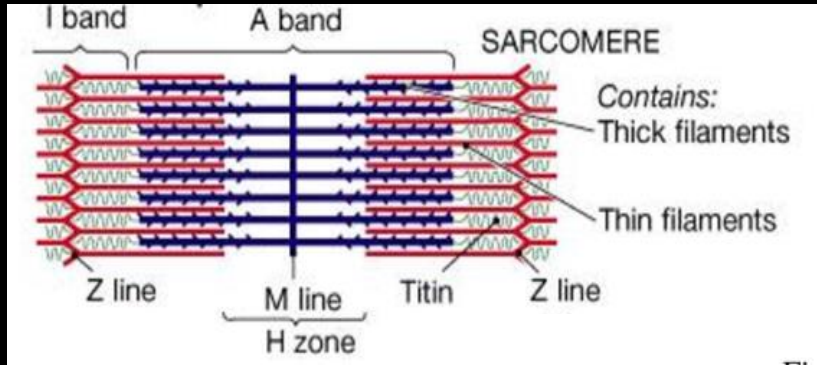
Striation



Skeletal muscle fiber

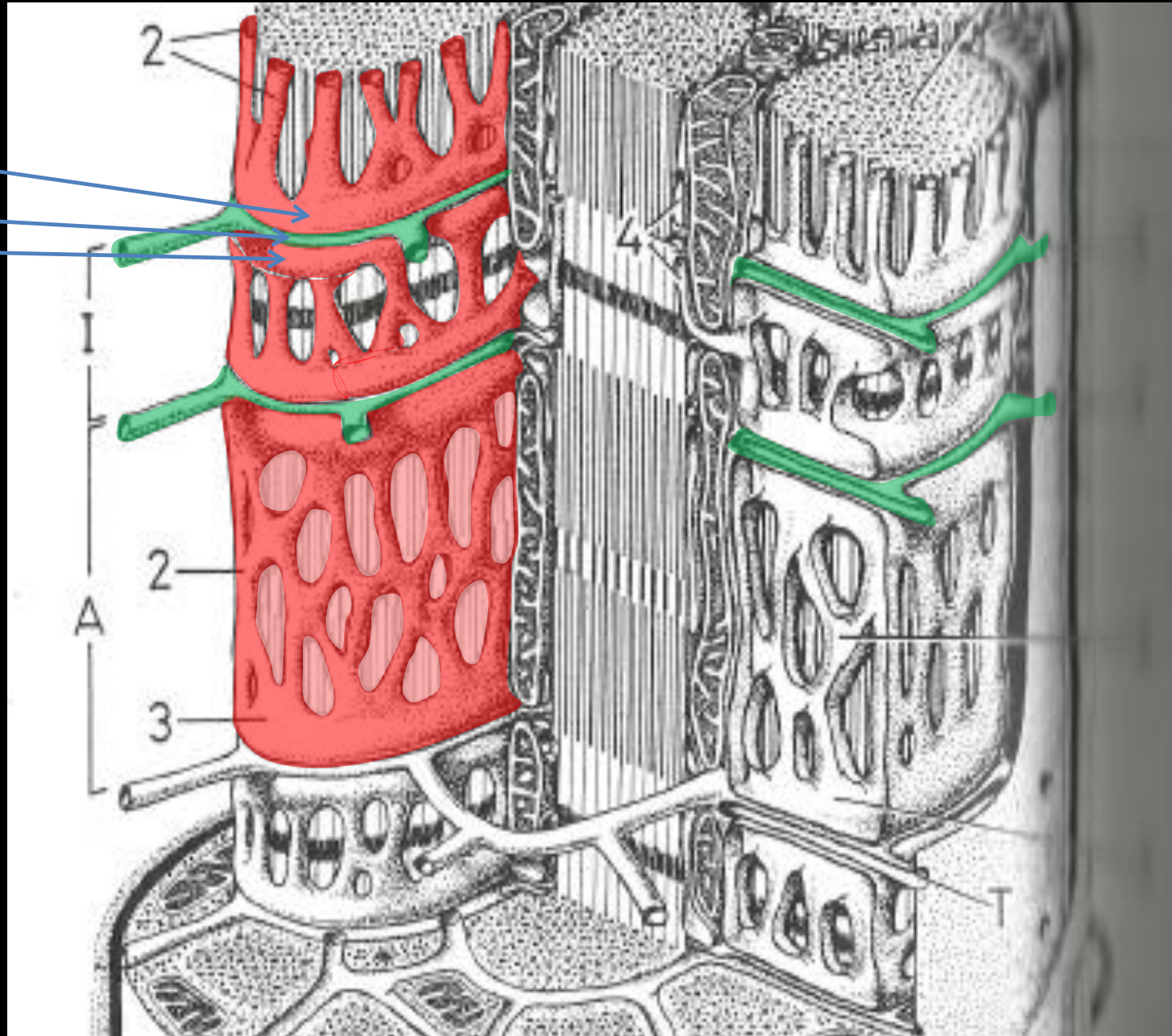


Mechanism of the contraction



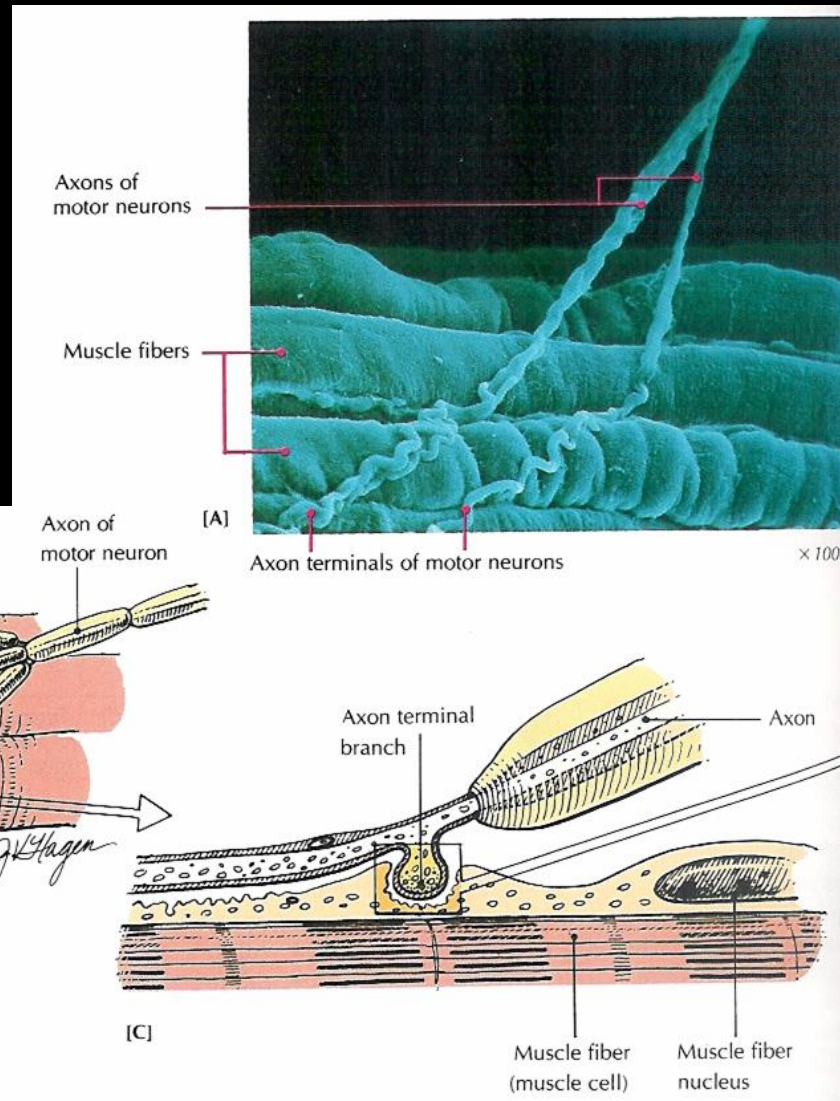
Triad

T-tubule + 2 cisterns

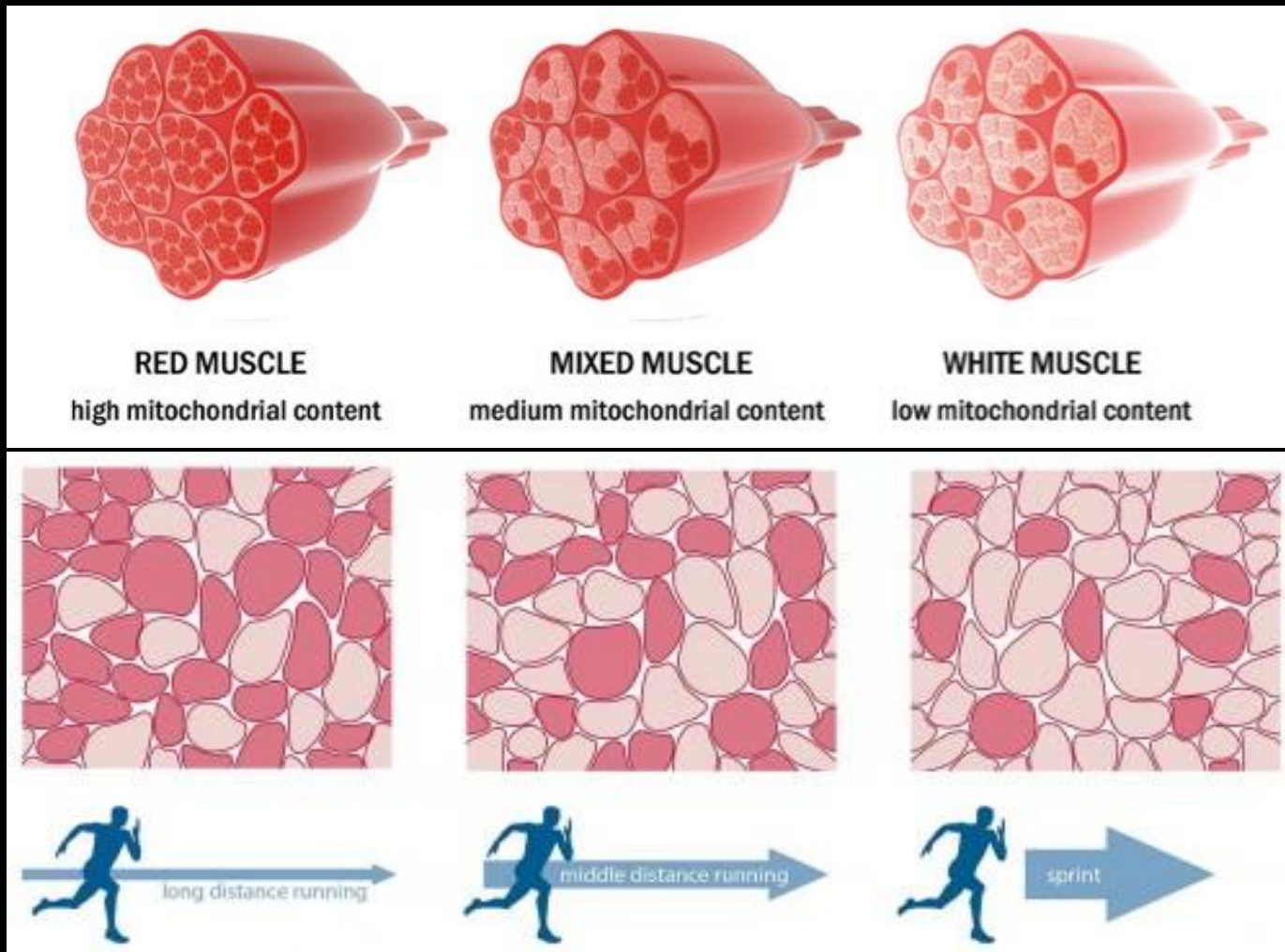


Innervation of the skeletal muscle

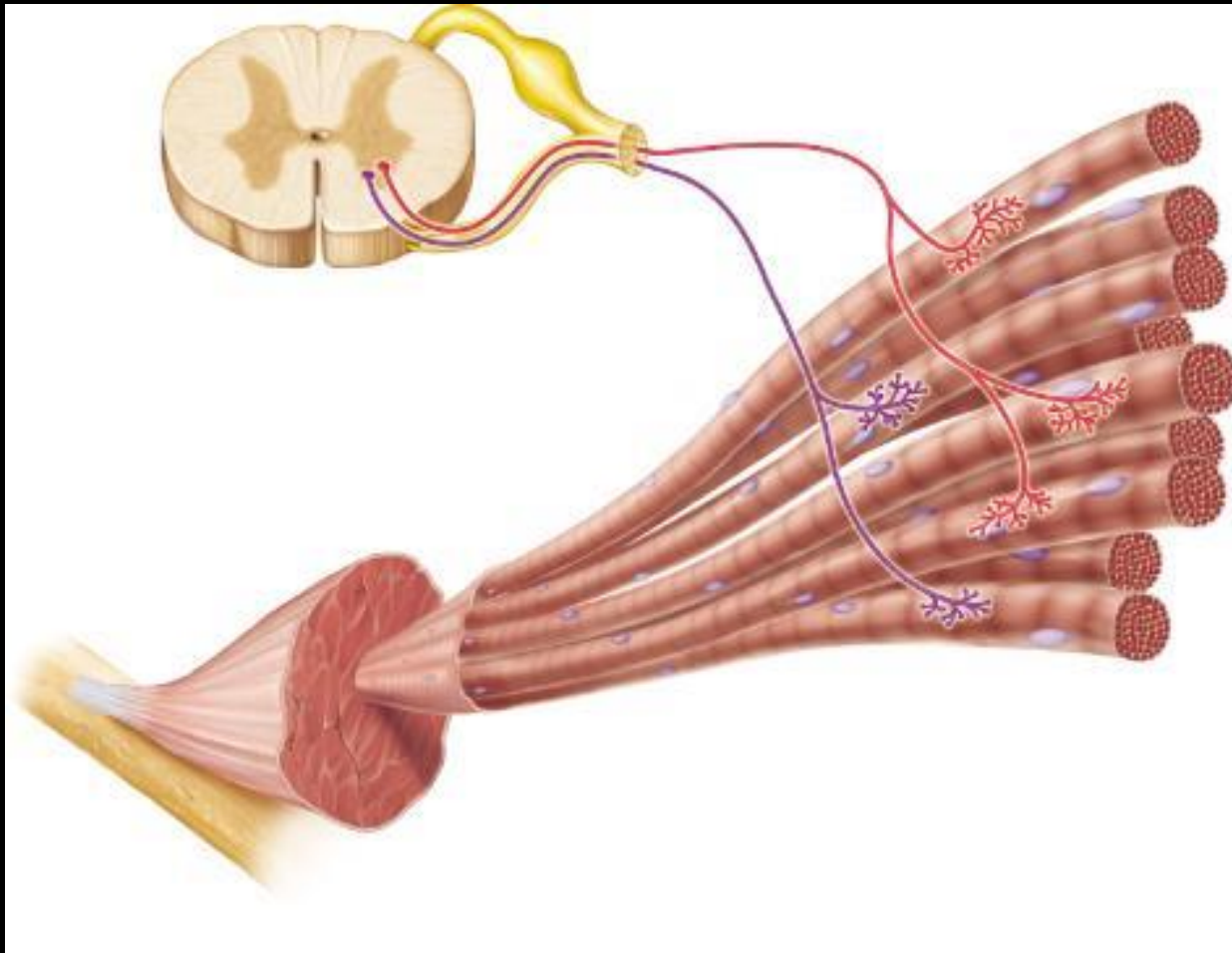
Motor end-plate



Types of skeletal muscle fibers



Motor unit



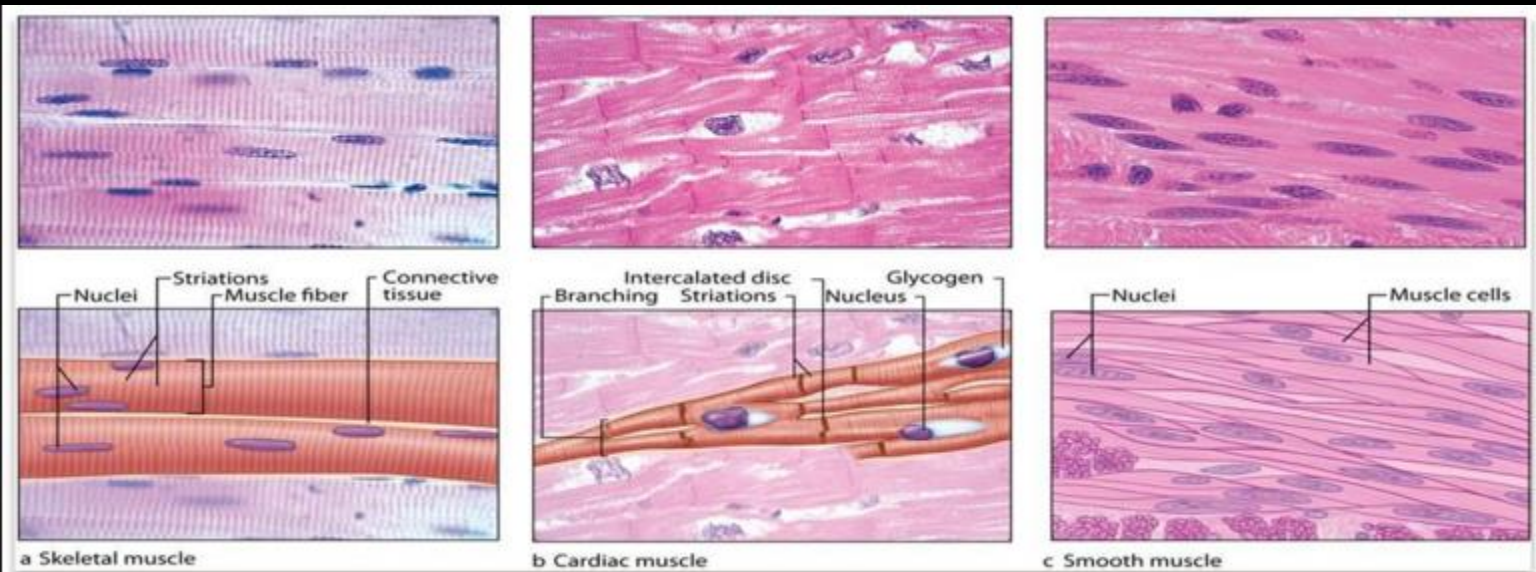
Three types of muscle tissue

Smooth muscle

Striated muscle

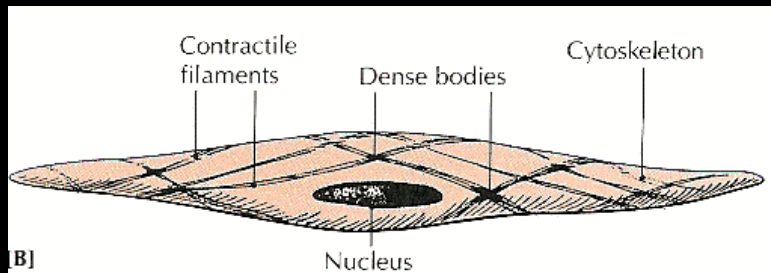
Skeletal muscle

Cardiac muscle

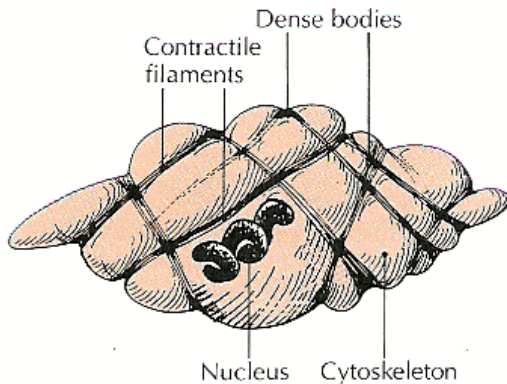


Three types of muscle tissue

unit of smooth muscle



B)



D)

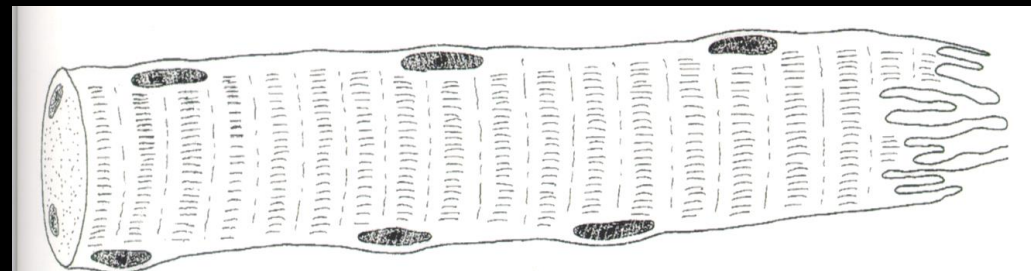
Smooth muscle cell

unit of cardiac muscle



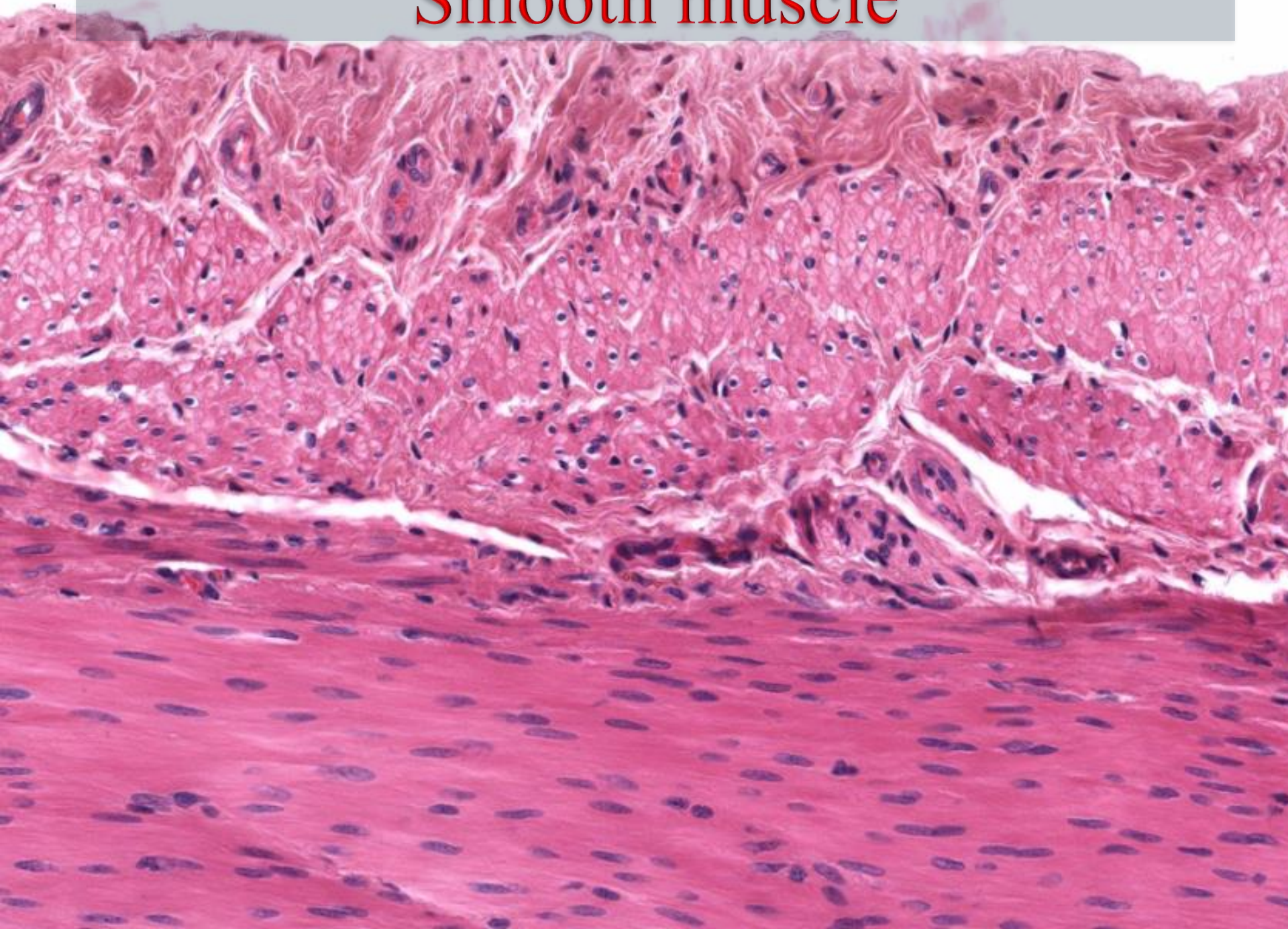
Cardiac muscle cell

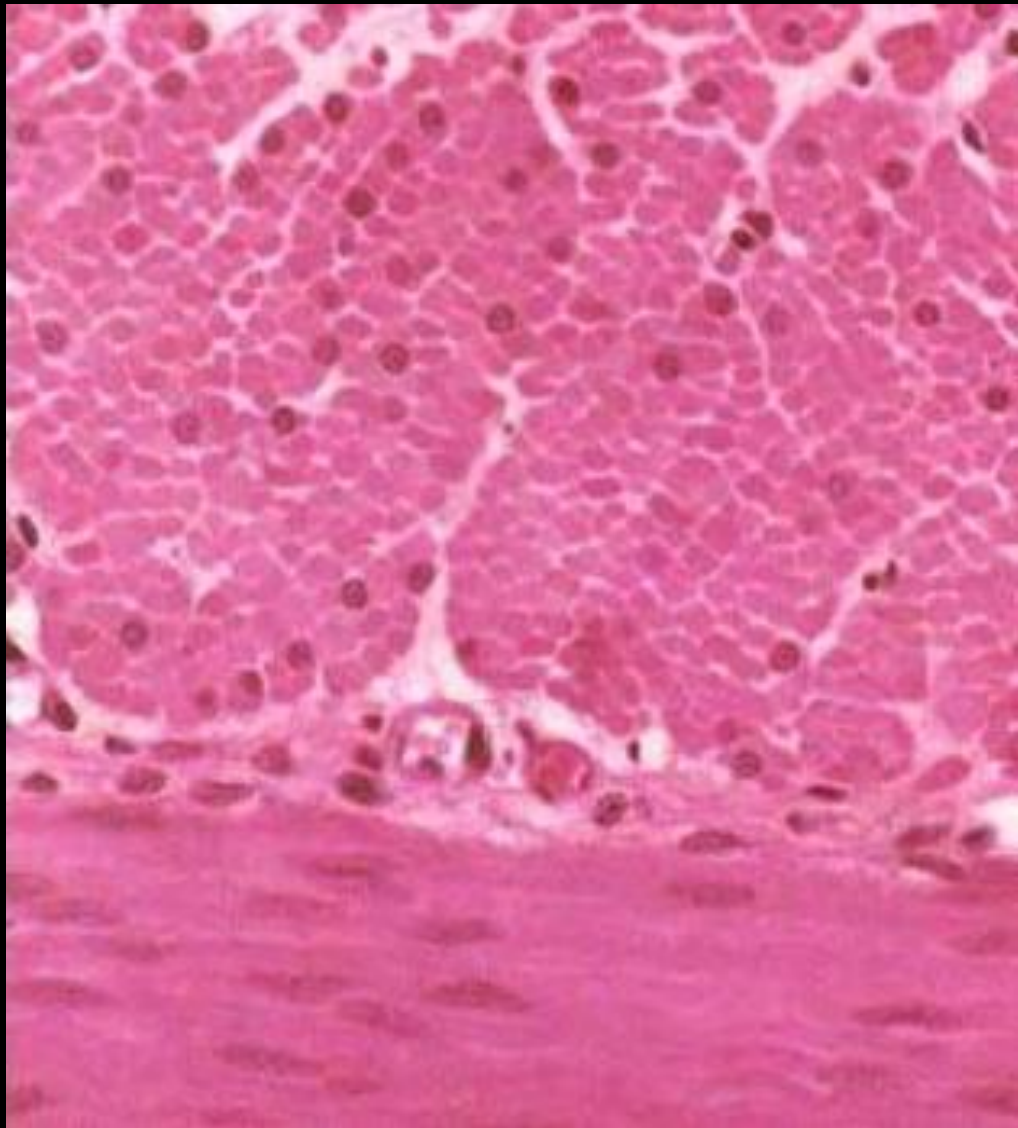
unit of skeletal muscle

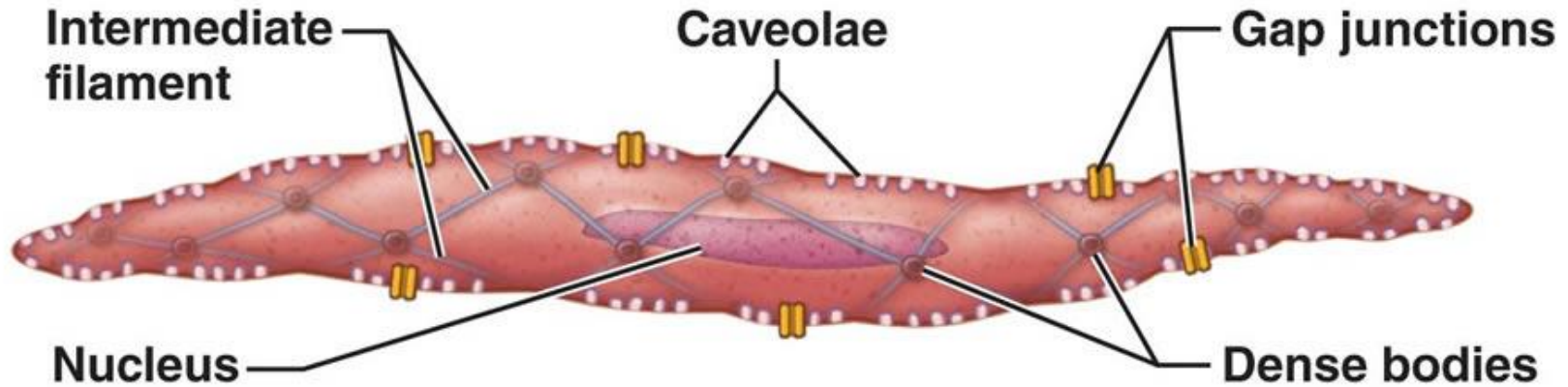


Striated muscle fiber

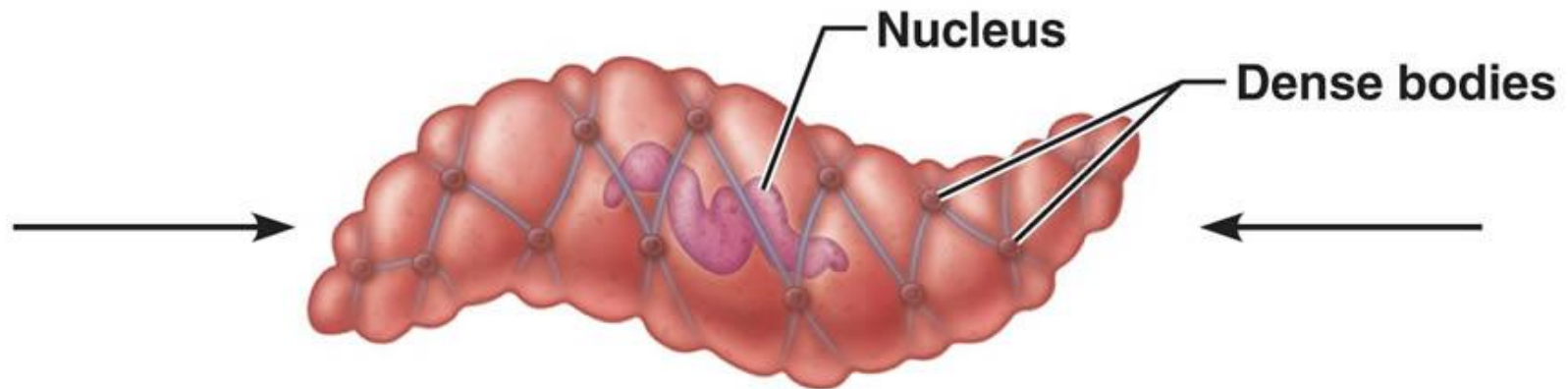
Smooth muscle





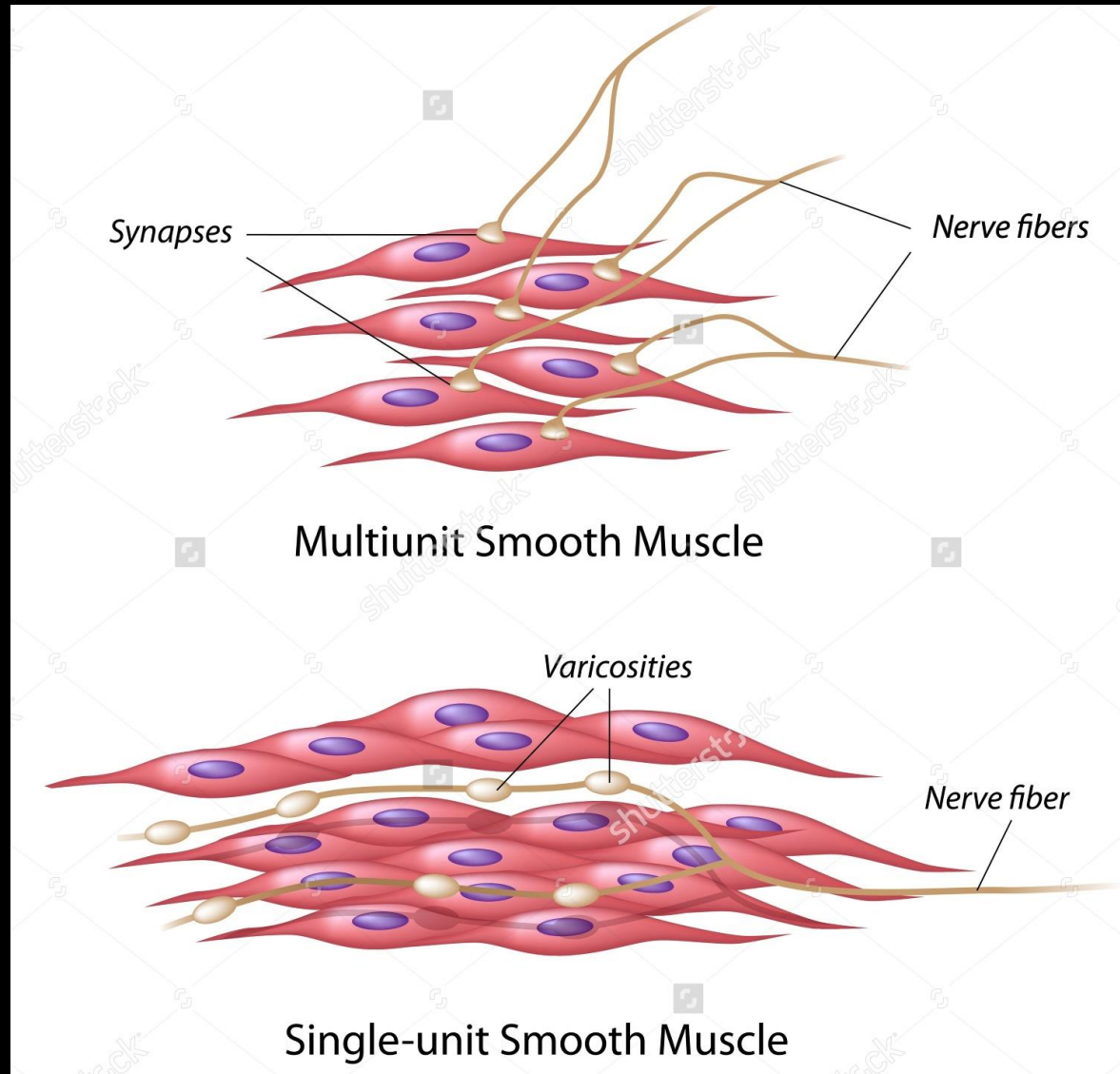


(a) Relaxed smooth muscle fiber (note that gap junctions connect adjacent fibers)

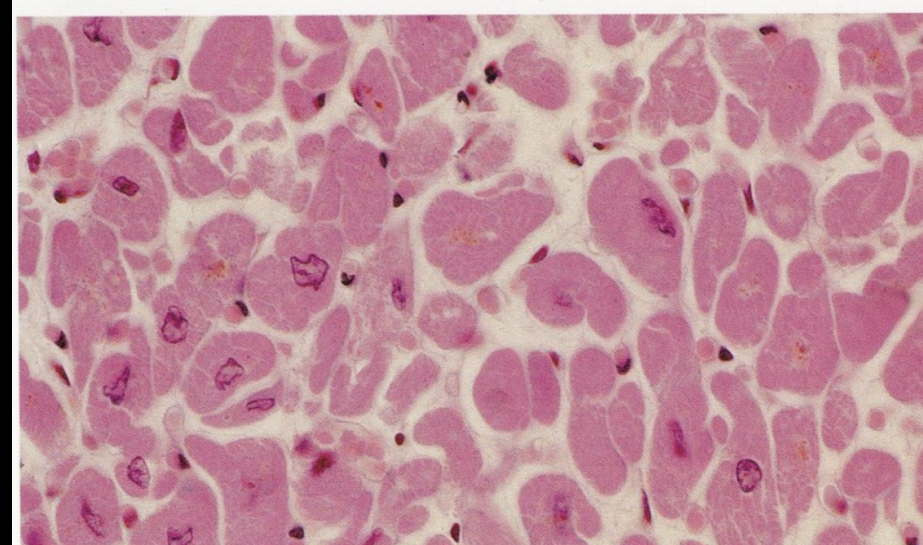
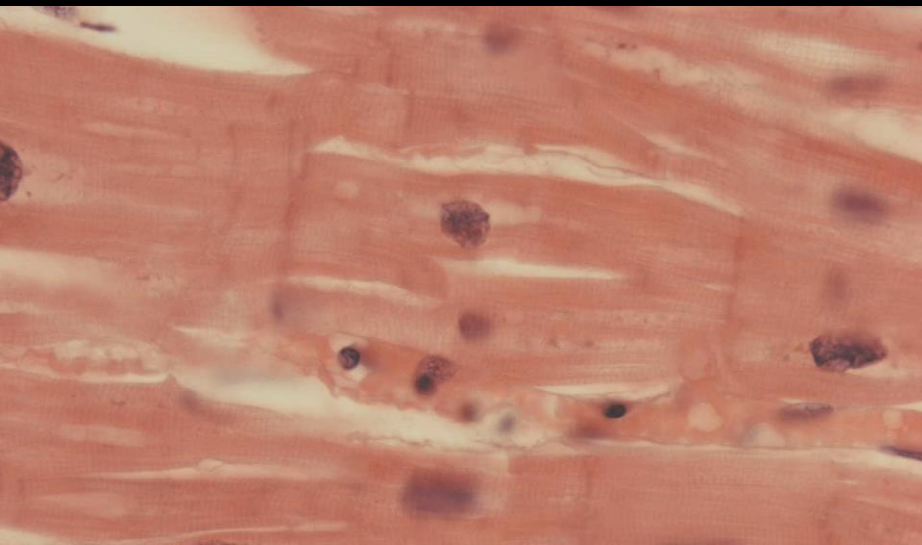
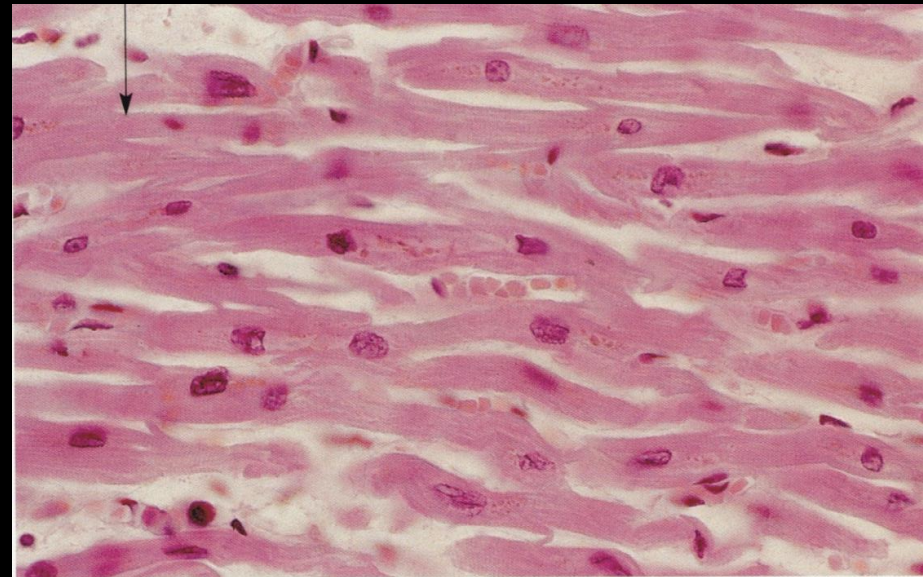
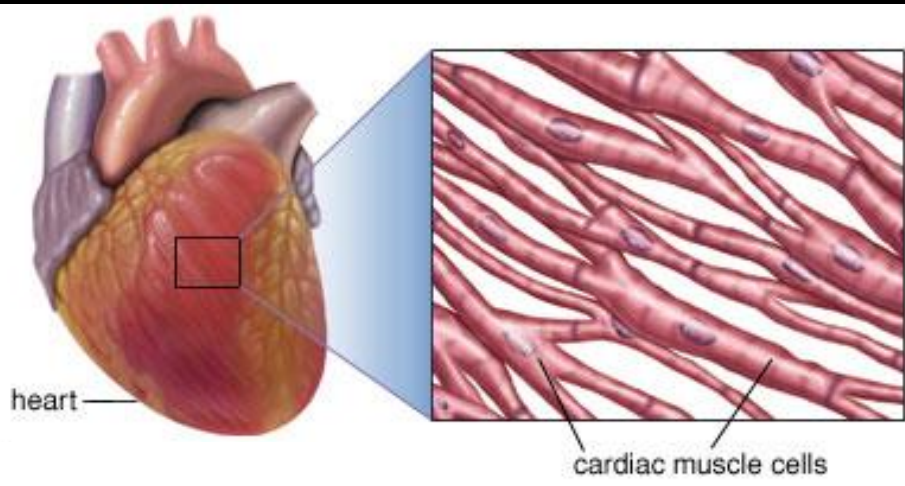


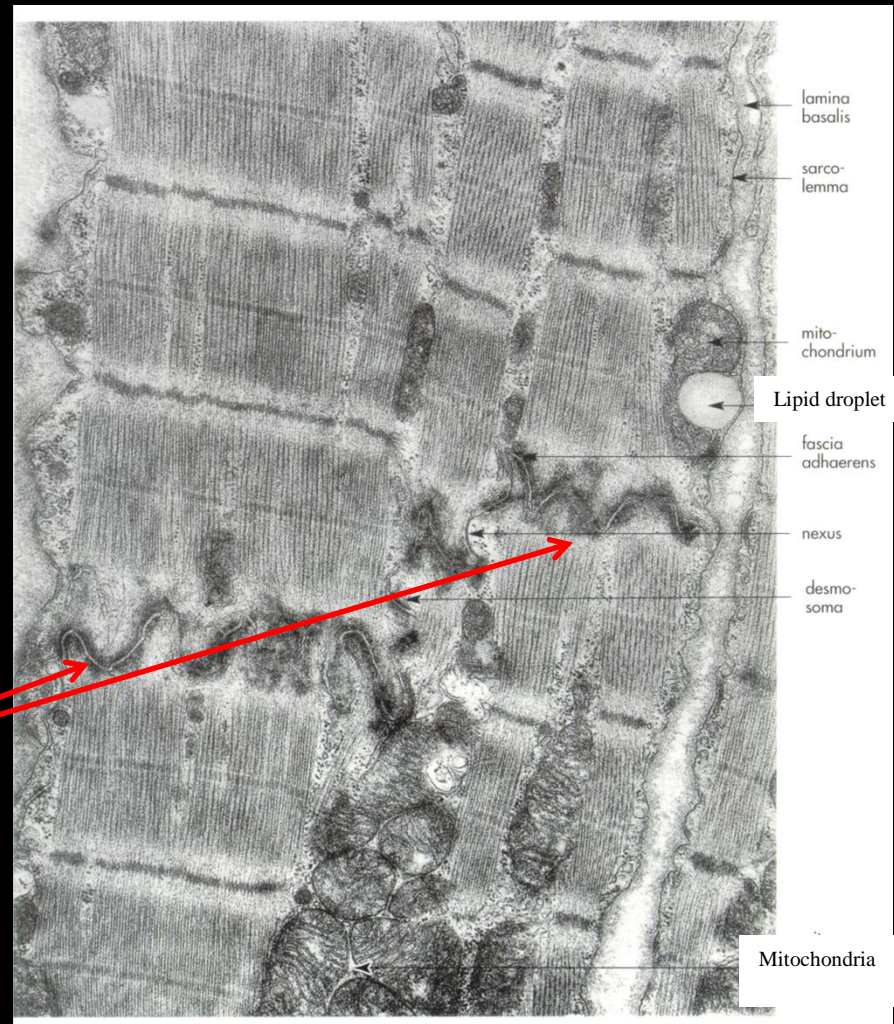
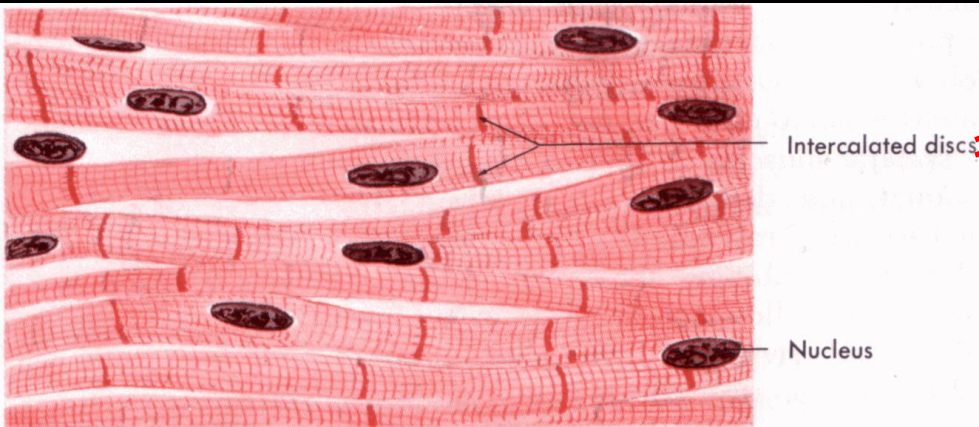
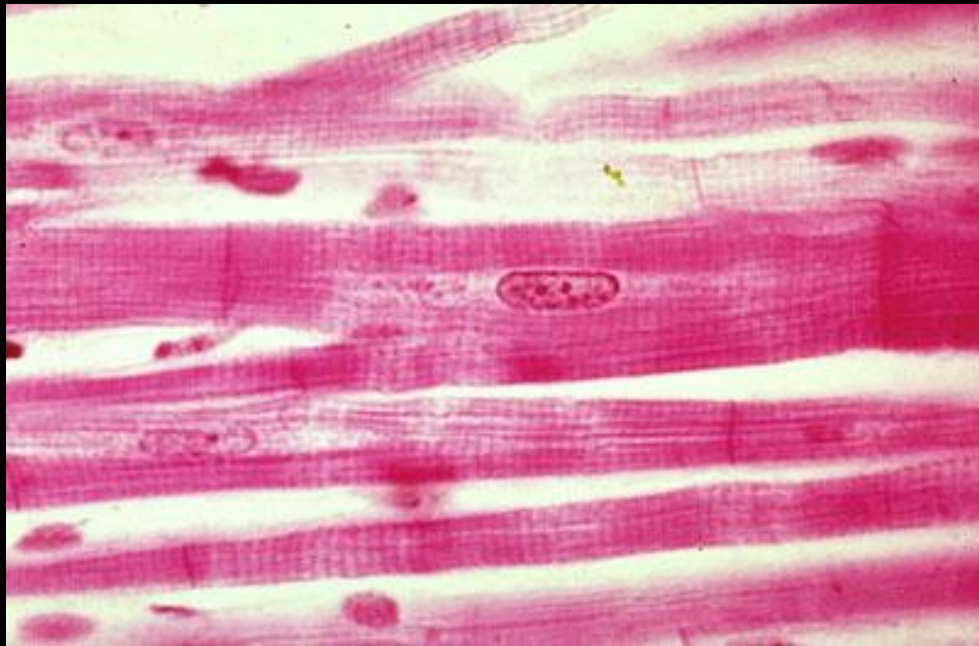
(b) Contracted smooth muscle fiber

Multi unit vs. Single unit smooth muscles

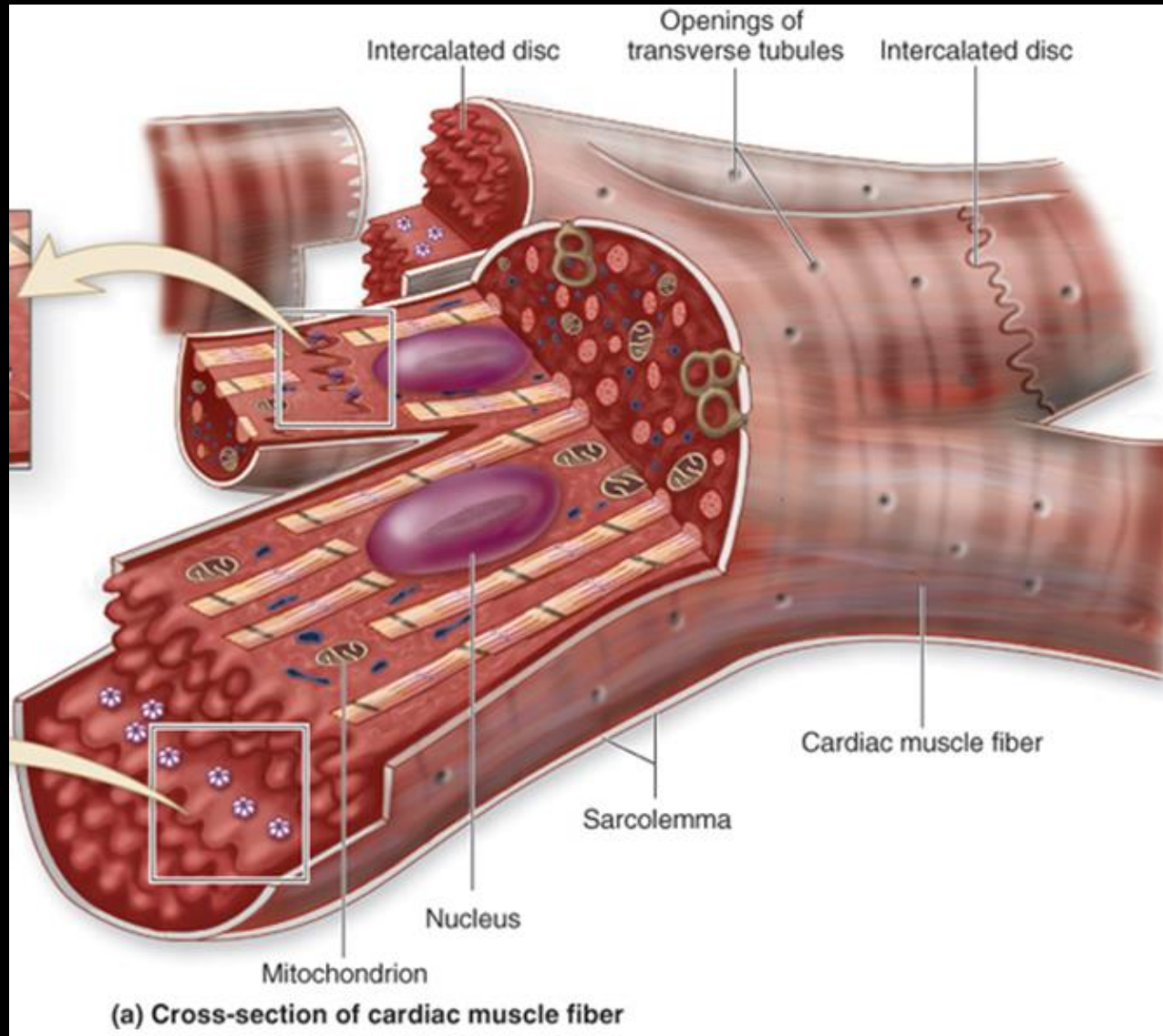


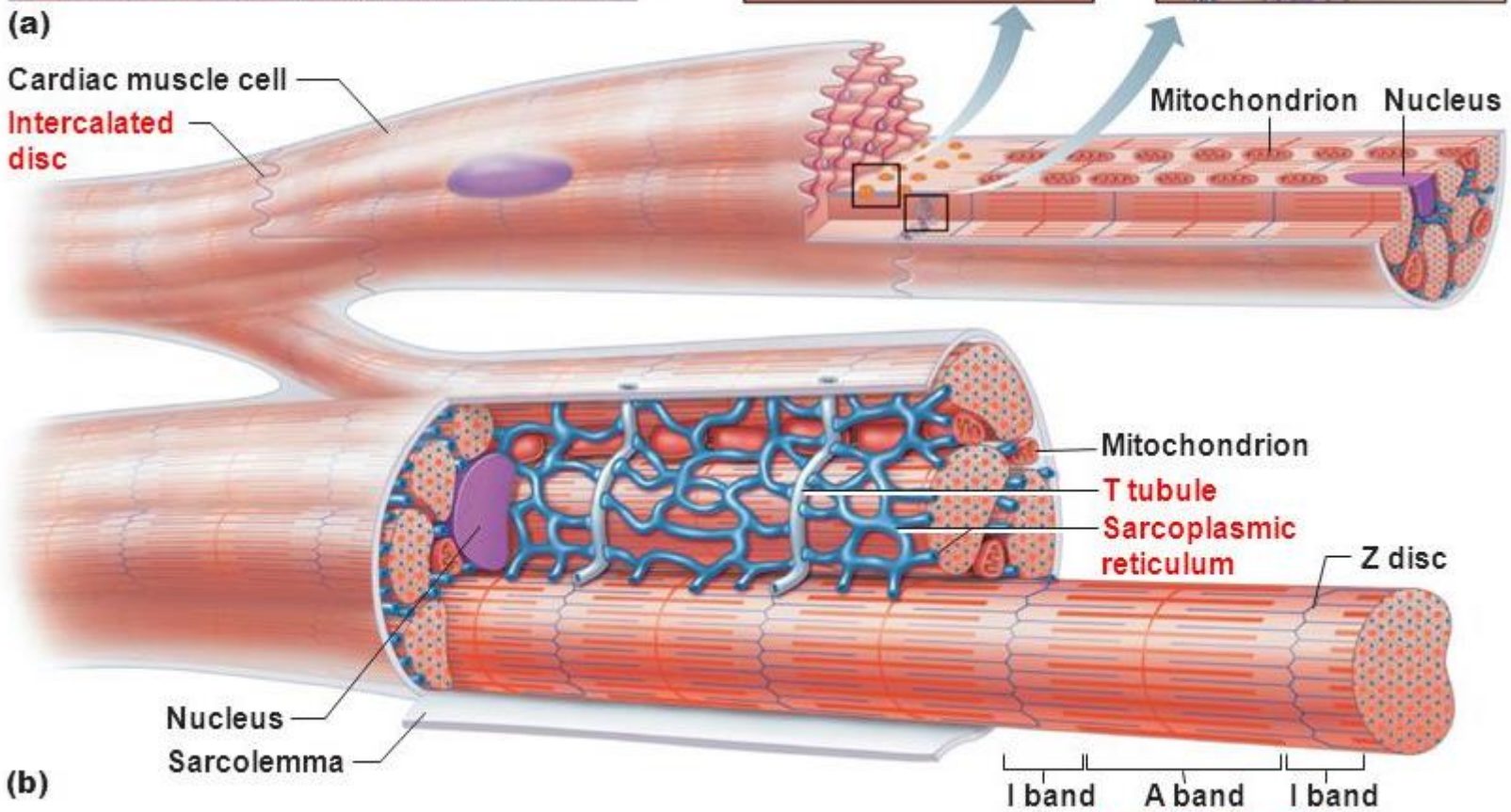
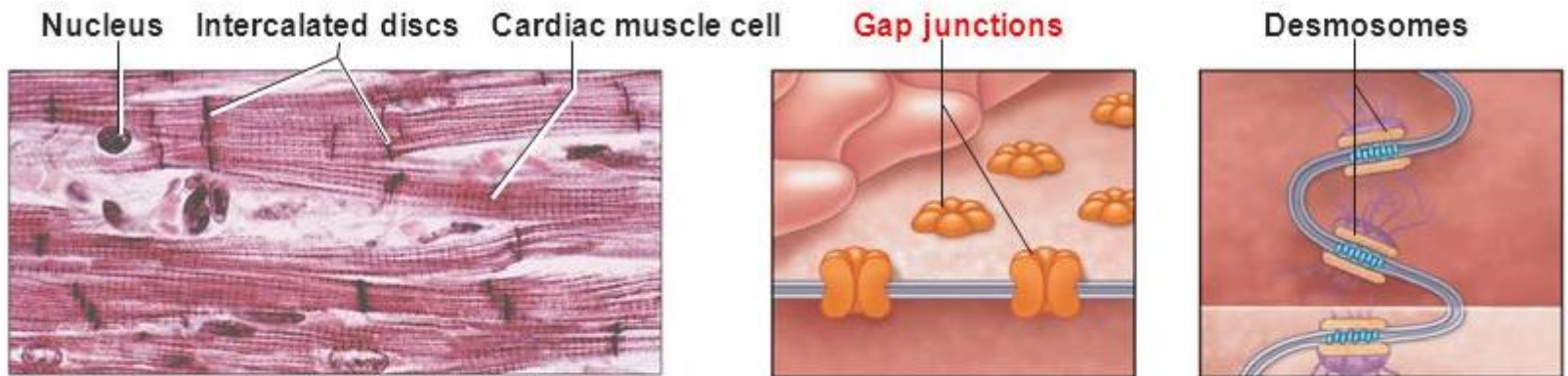
Cardiac muscle





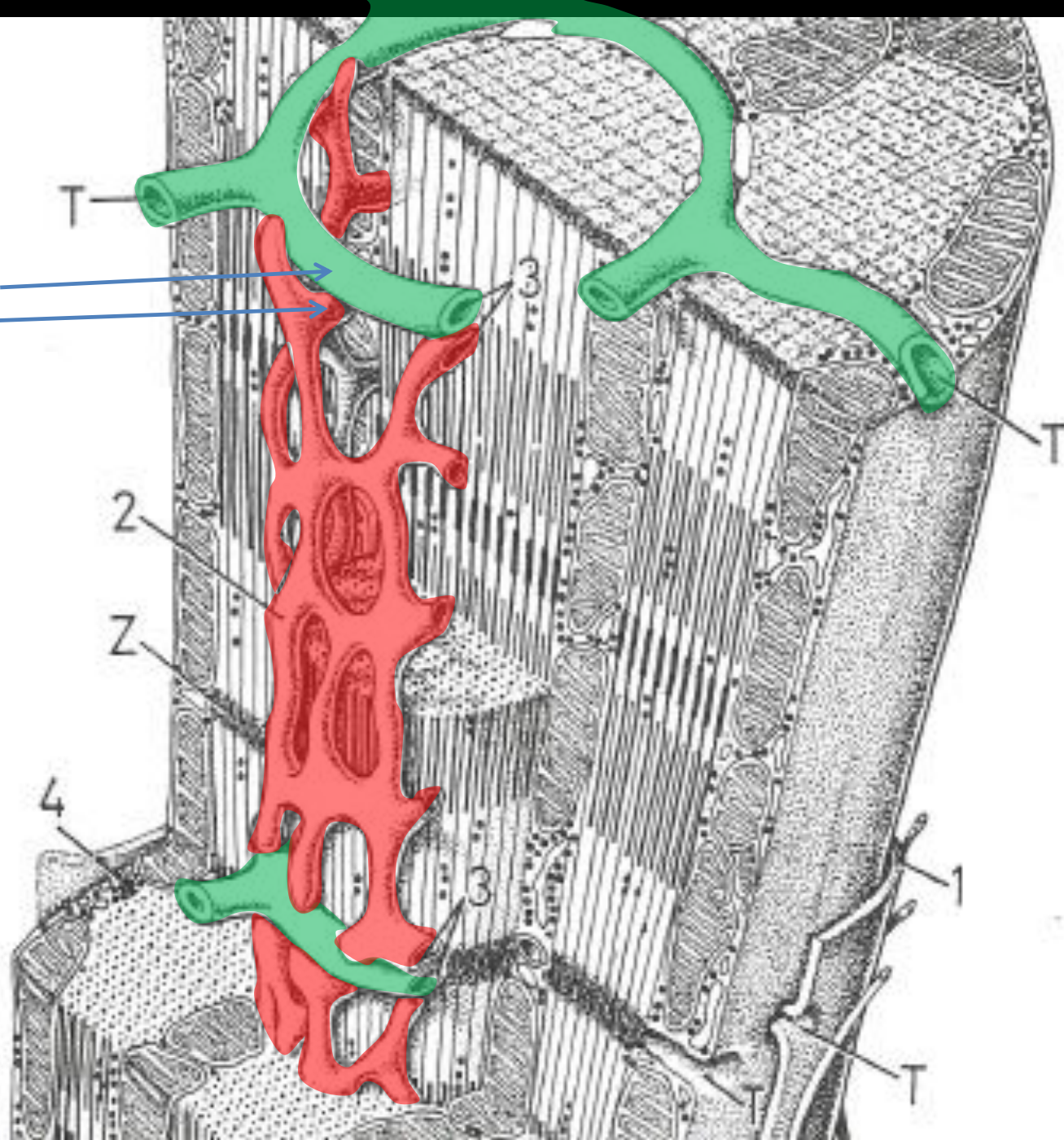
Cardiac muscle cell



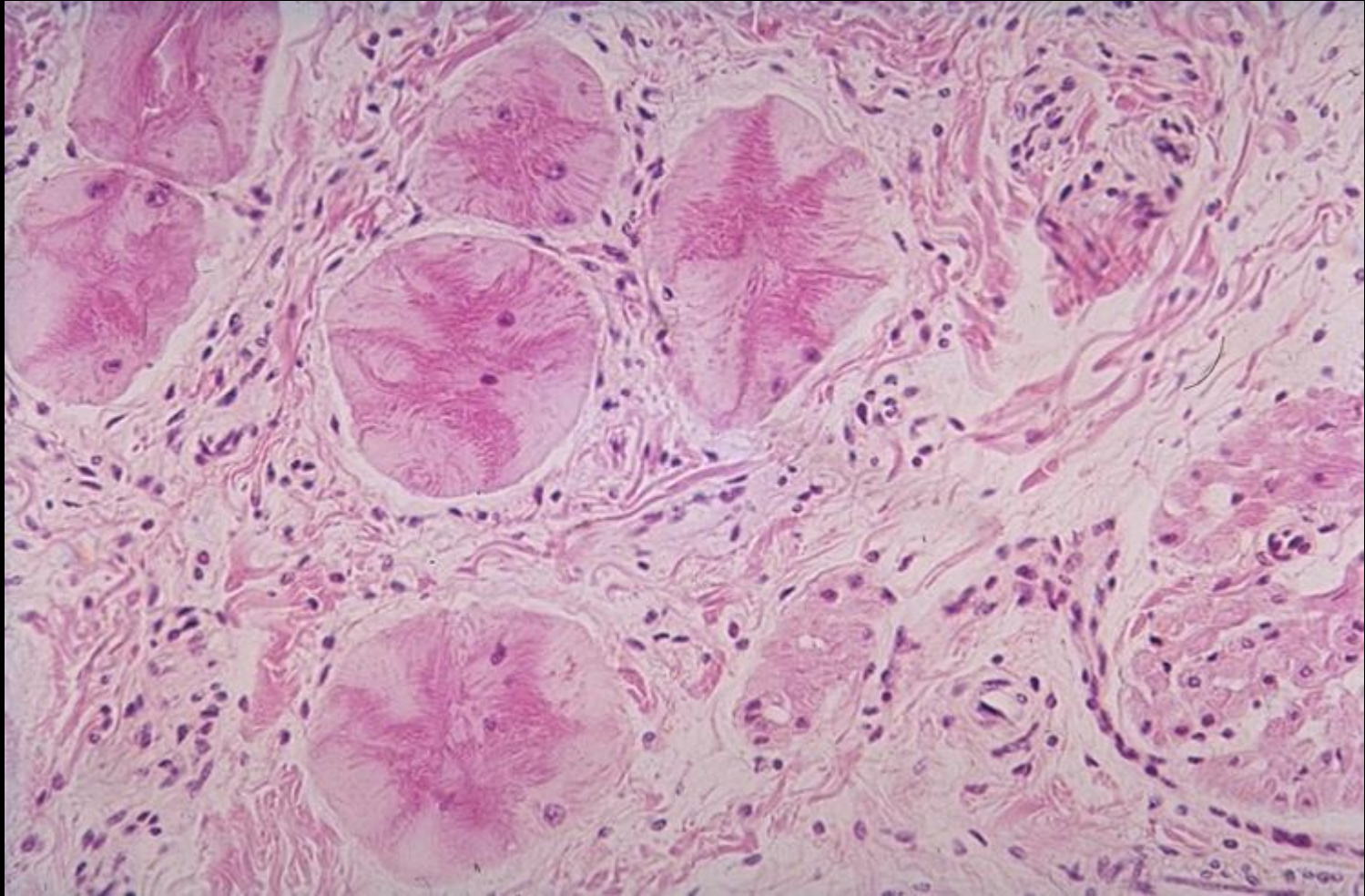


Diad

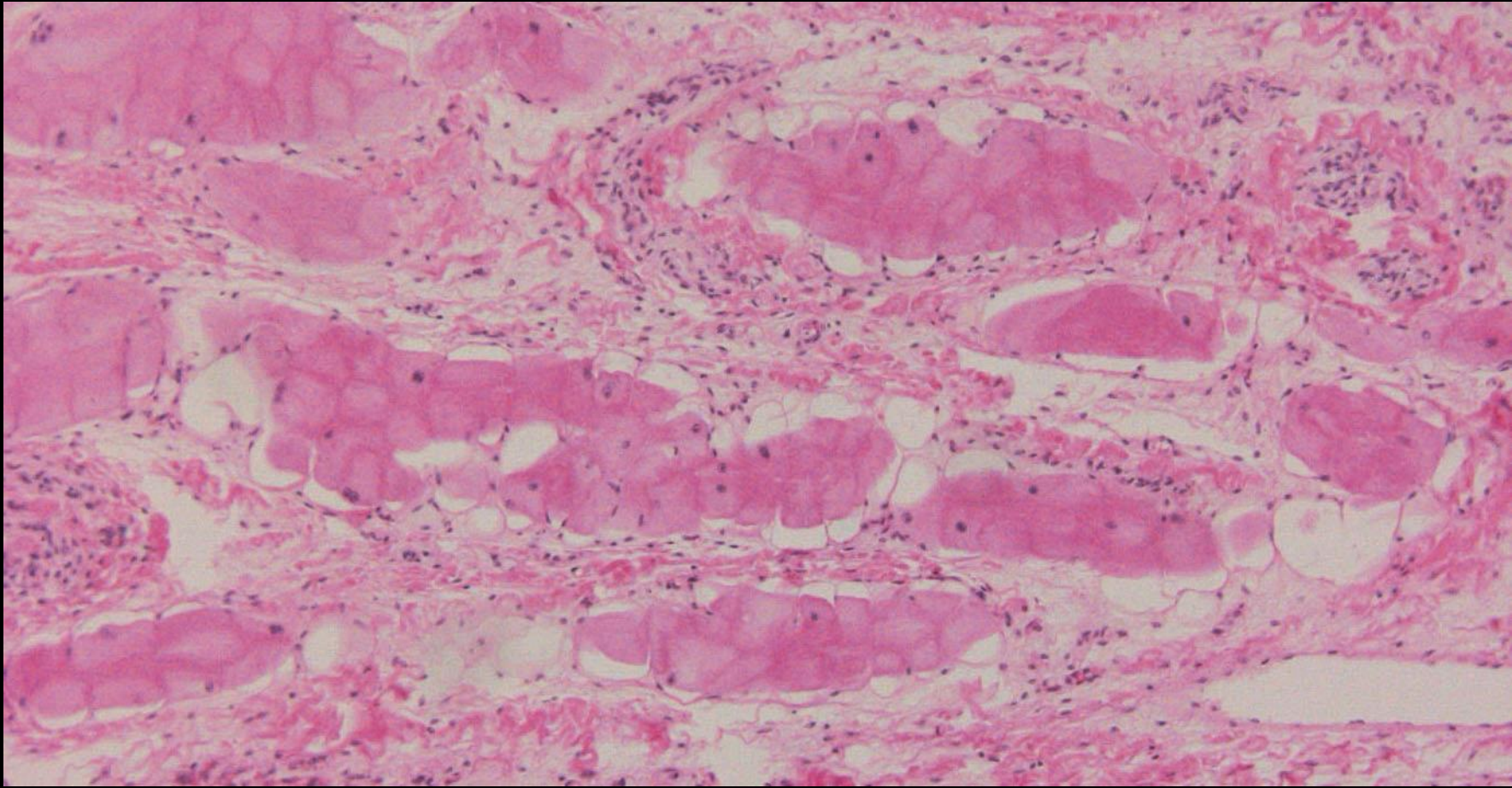
T-tubule + cistern



Impulse conducting system (Purkinje fibers)



Impulse conducting system (Purkinje fibers)

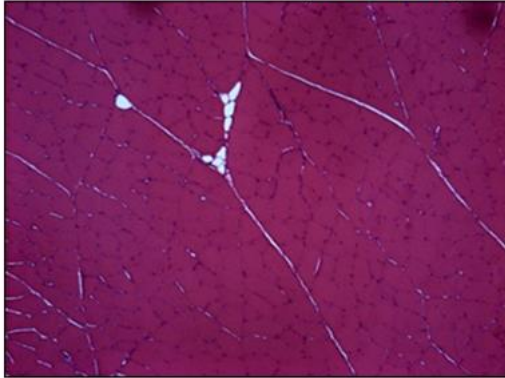


Botox injection

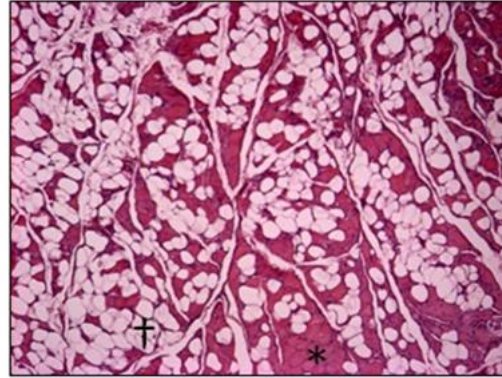


Changes in contractile properties of muscles receiving repeat injections of botulinum toxin (Botox)

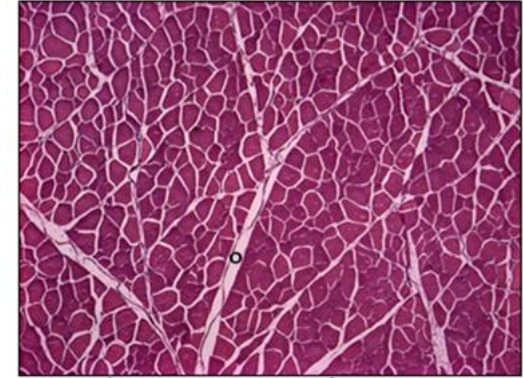
Control muscle (no Botox)



Repeat Botox injections (target muscle)



Repeat Botox injections (non-target muscle)



* muscle tissue; † fat infiltration;
° connective tissue fibrosis

Groups	% of contractile tissue
Control (<u>no Botox</u>)	96.9% ± 2.0
<u>Repeat monthly</u> Botox injections (target muscle)	43.0% ± 9.7 ^x
Three strategies to minimize adverse effects	
1 - Repeat Botox injection + <u>direct muscle stimulation</u>	77.1% ± 14.3 ^x
2 - <u>Single</u> Botox injection + 6 months recovery	59.2% ± 6.0 ^x
3 - Repeat Botox injection (<u>once every 3 months</u>)	59.9% ± 11.8 ^x

^x compared to Control (no Botox)