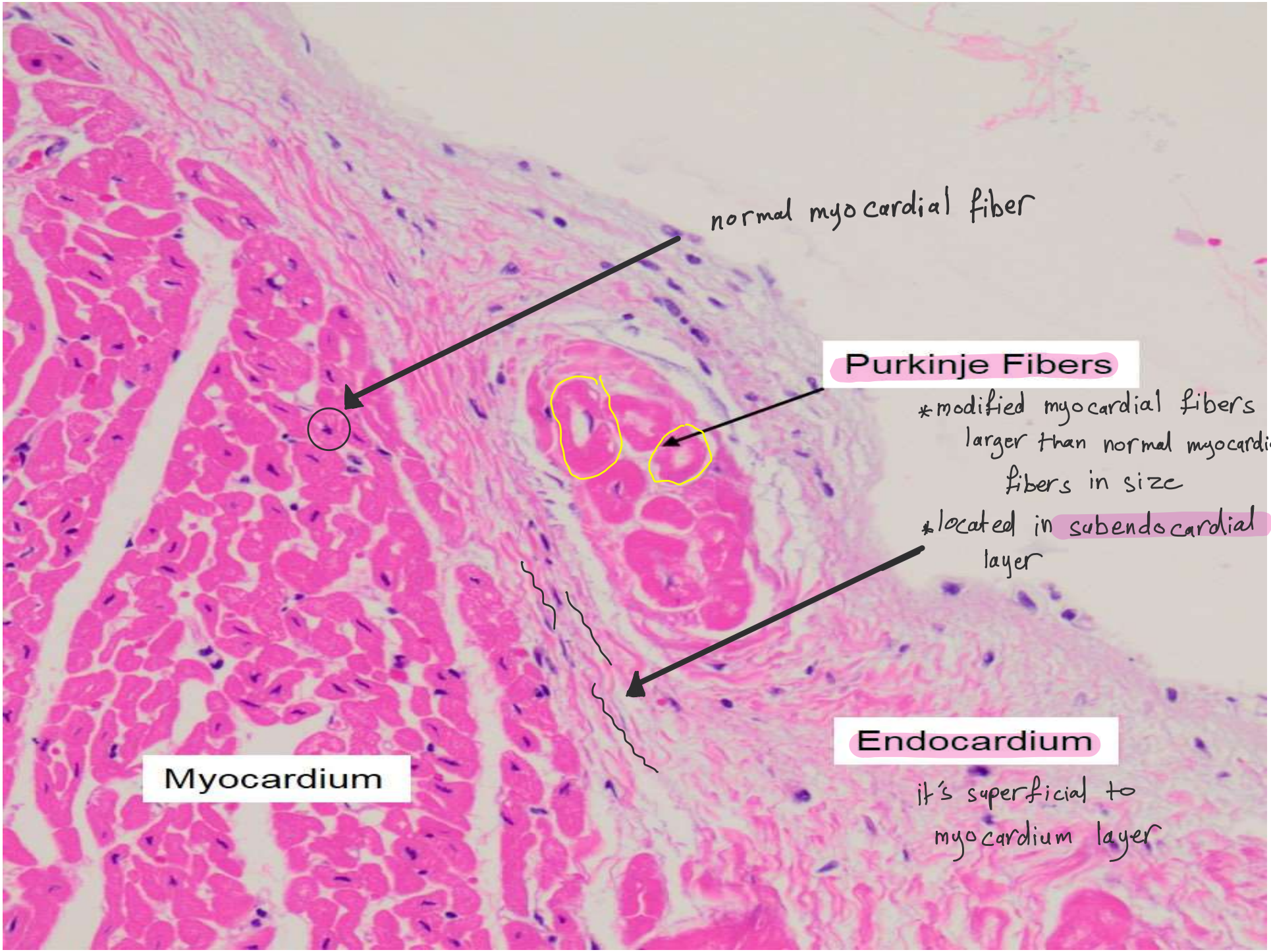
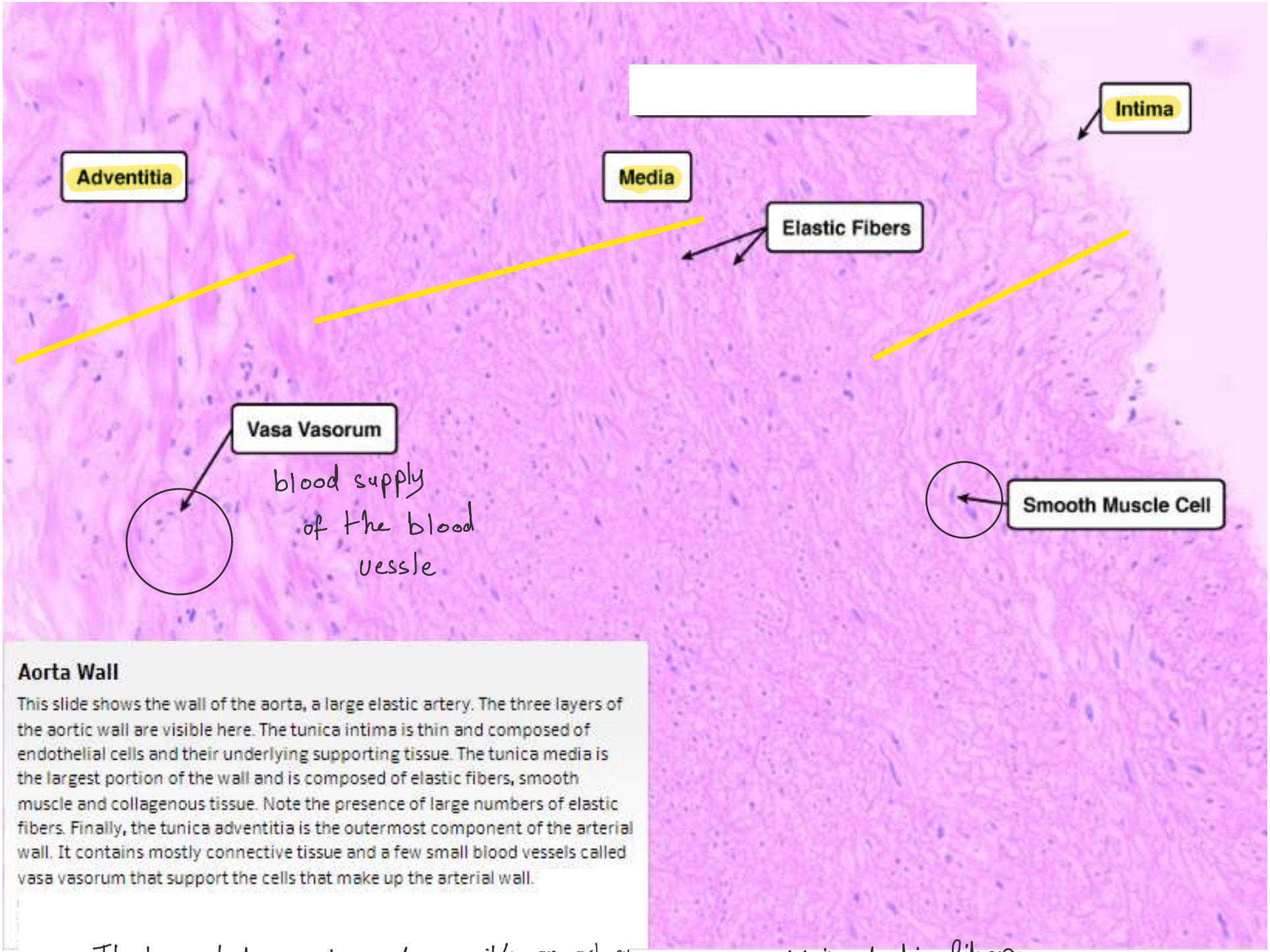
The University of Jordan
Faculty Of Medicine

Practical Histology of Cardiovascular system

Dr. Ahmed Salman

Associate professor of anatomy & embryology


normal myocardial fiber
Purkinje Fibers
*modified myocardial fibers larger than normal myocardial fibers in size
*located in subendocardial layer
Endocardium
it's superficial to myocardium layer
Myocardium

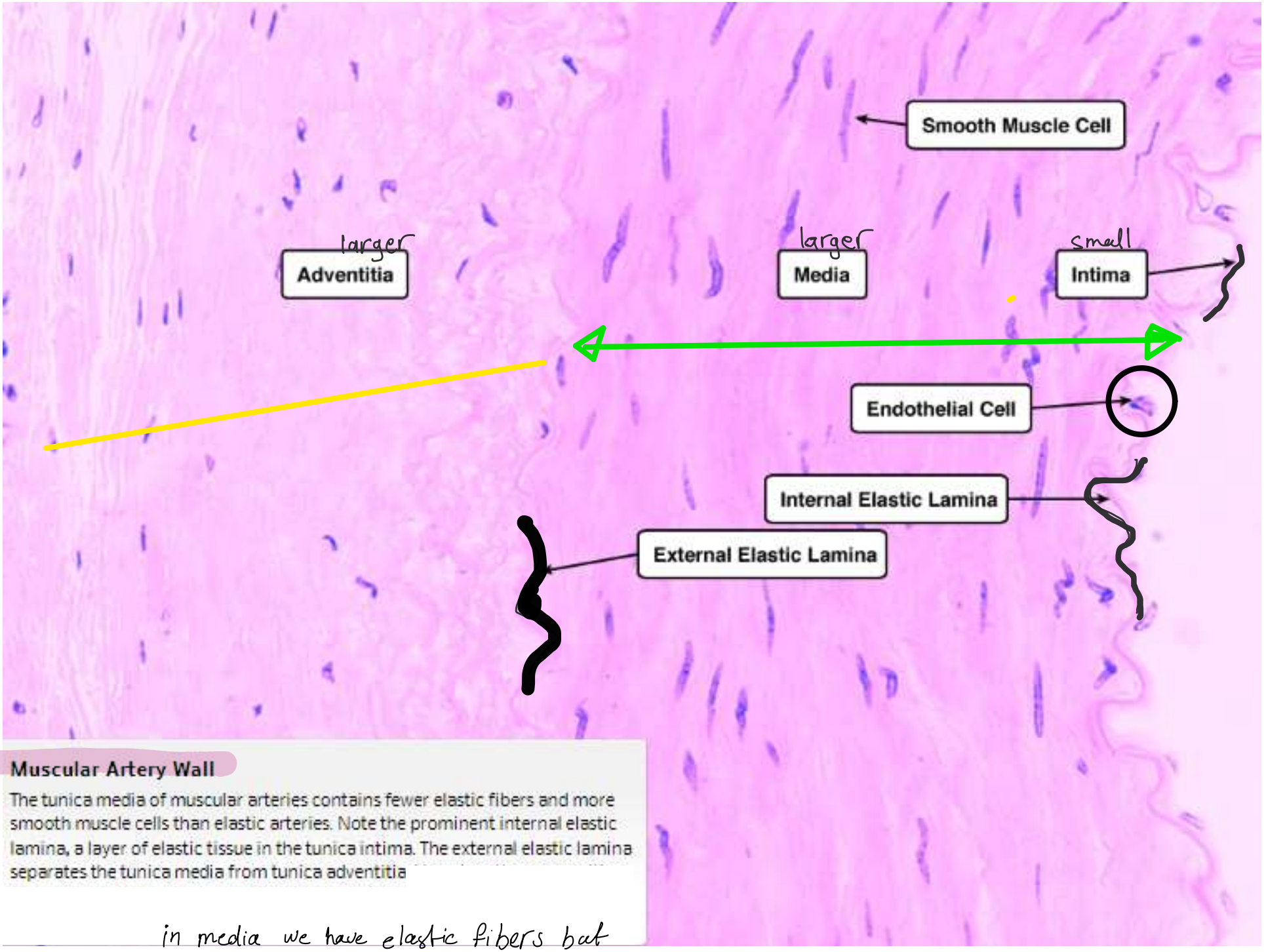


Aorta Wall

This slide shows the wall of the aorta, a large elastic artery. The three layers of the aortic wall are visible here. The tunica intima is thin and composed of endothelial cells and their underlying supporting tissue. The tunica media is the largest portion of the wall and is composed of elastic fibers, smooth muscle and collagenous tissue. Note the presence of large numbers of elastic fibers. Finally, the tunica adventitia is the outermost component of the arterial wall. It contains mostly connective tissue and a few small blood vessels called vasa vasorum that support the cells that make up the arterial wall.

The largest layer is media so it's an artery
(large elastic artrey for example : Aorta)

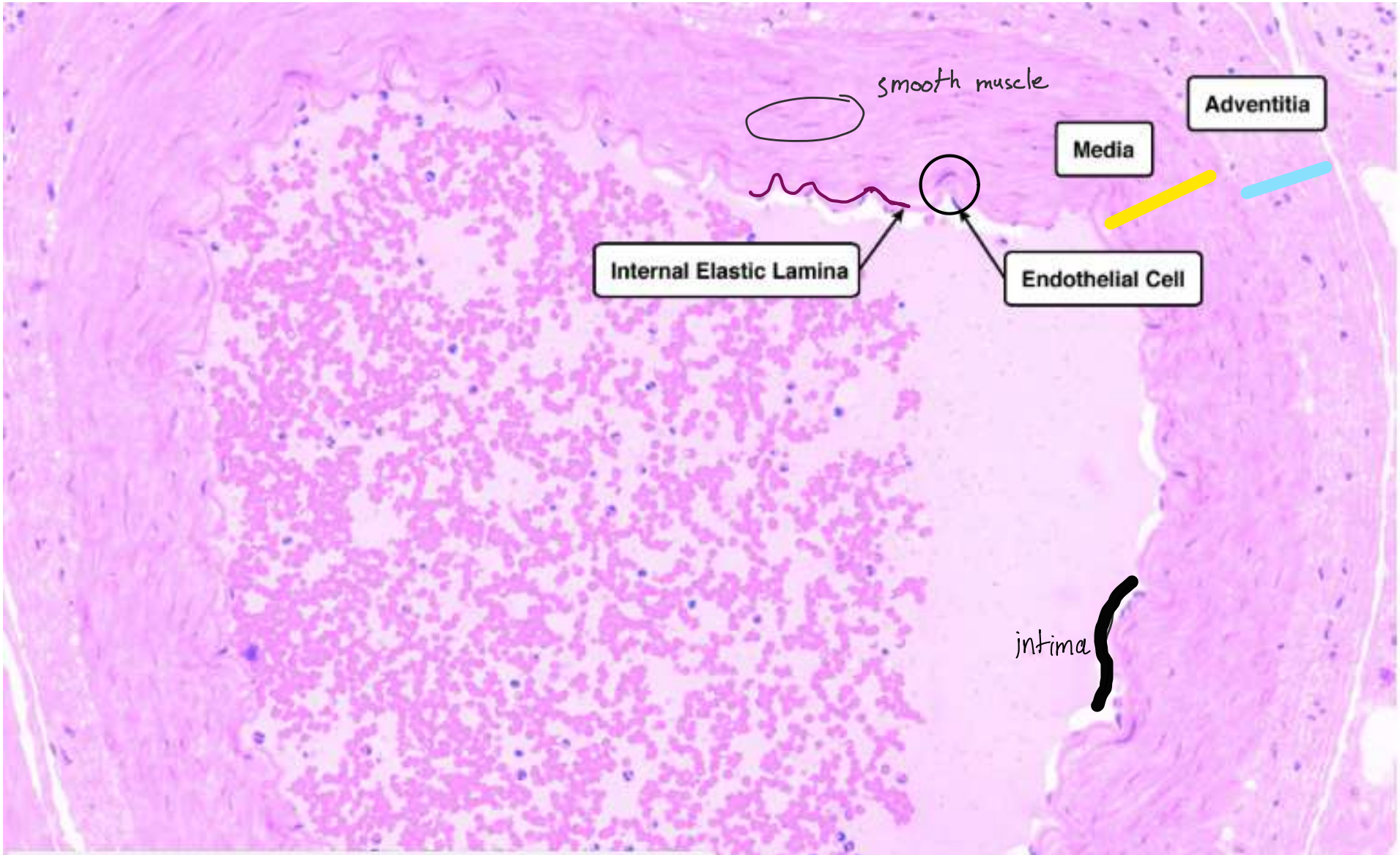
→ rich in elastic fibers
→ lower number of smooth muscle cell



Muscular Artery Wall

The tunica media of muscular arteries contains fewer elastic fibers and more smooth muscle cells than elastic arteries. Note the prominent internal elastic lamina, a layer of elastic tissue in the tunica intima. The external elastic lamina separates the tunica media from tunica adventitia

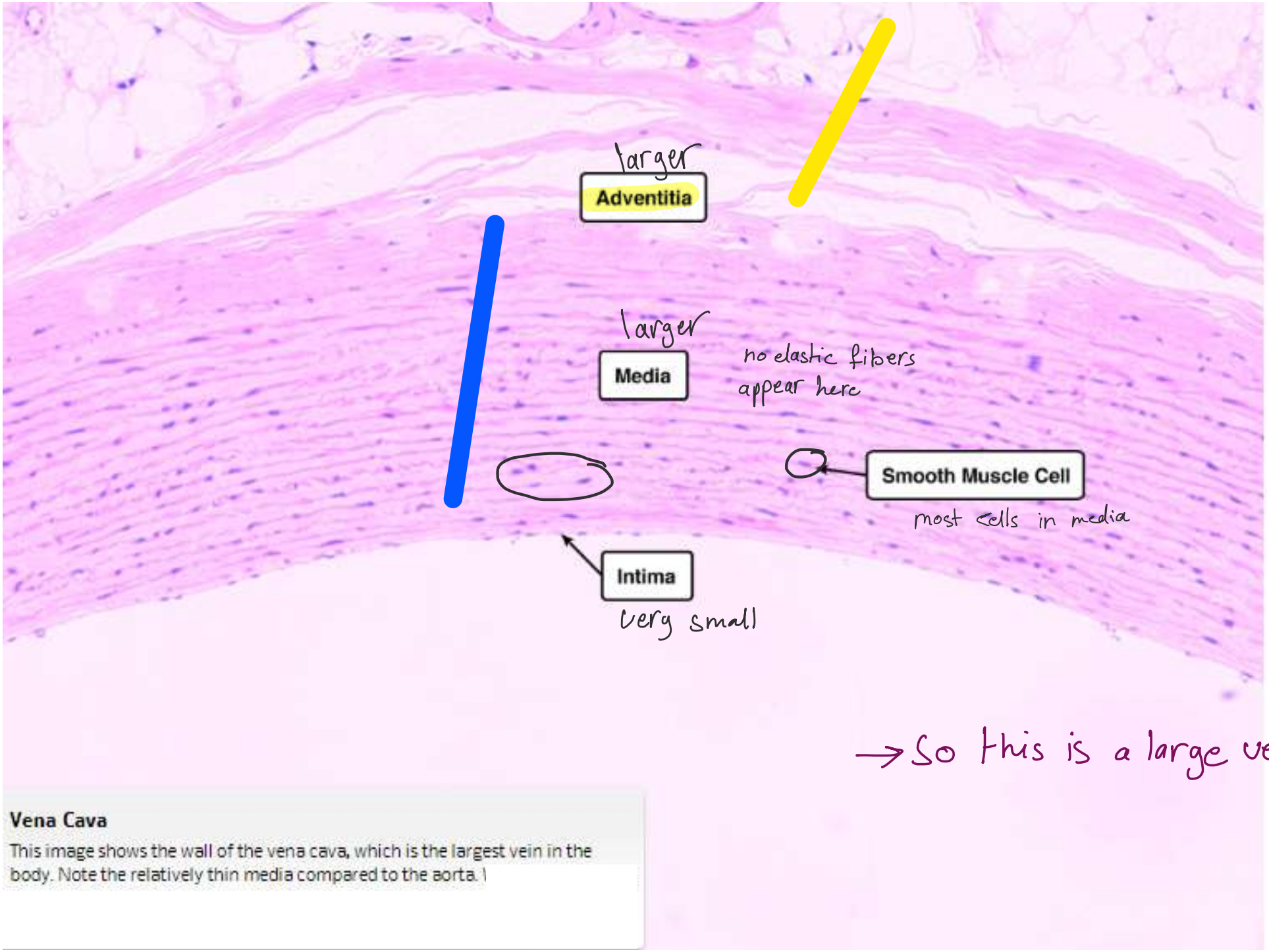
in media we have elastic fibers but the smooth muscles are more than elastic fibers



Muscular Artery

Muscular arteries continue from elastic arteries and control the distribution of blood throughout the body. The tunica media contains 3 or more layers of smooth muscle cells along with collagen fibers and a few elastic fibers.

larger media + larger adventitia + very small internal elastic lamina + media is full of smooth muscles and they're more prominent than elastic fibers

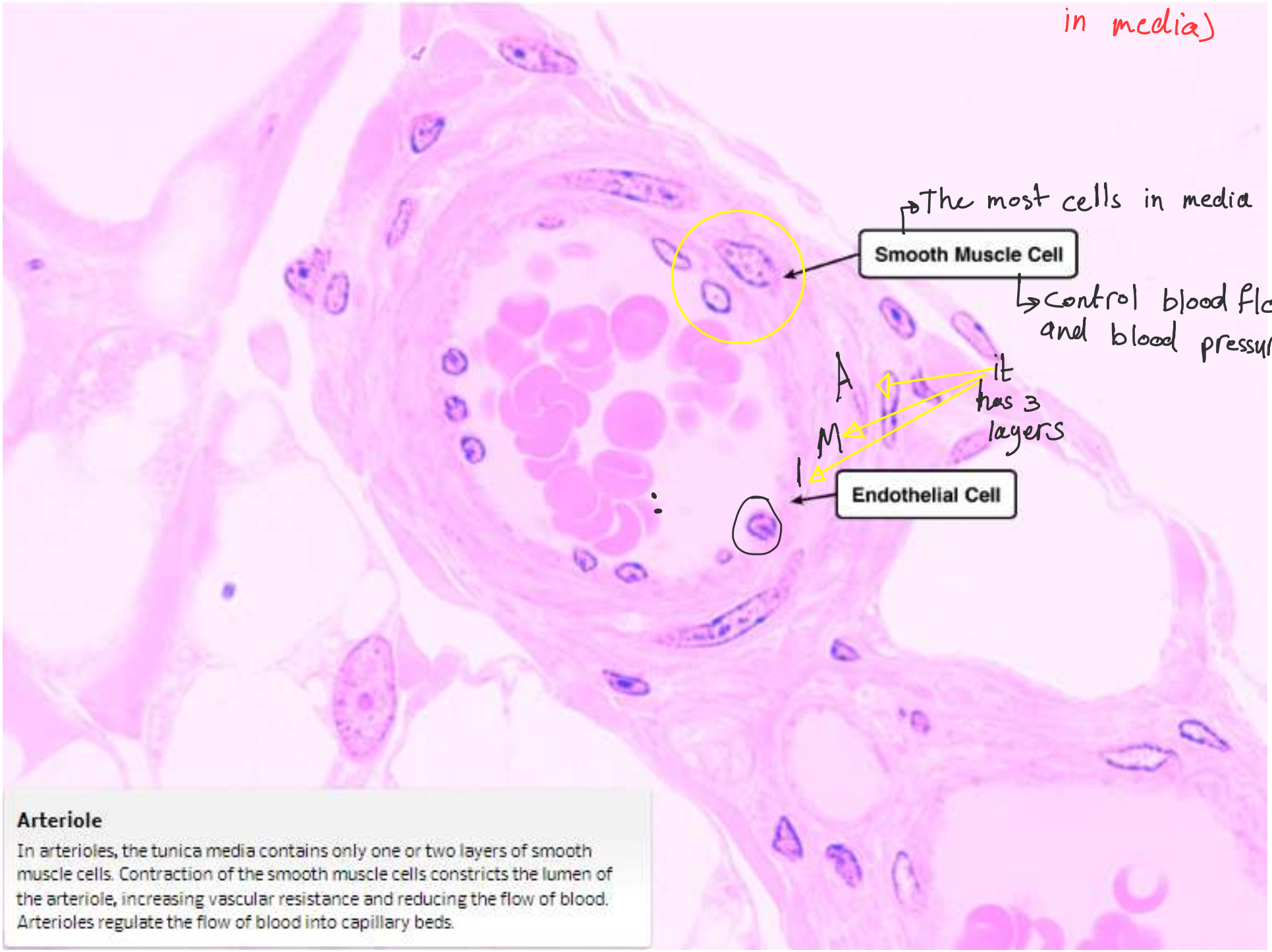


→ So this is a large vein

Vena Cava

This image shows the wall of the vena cava, which is the largest vein in the body. Note the relatively thin media compared to the aorta.

(no elastic fibers in media)



→ The most cells in media

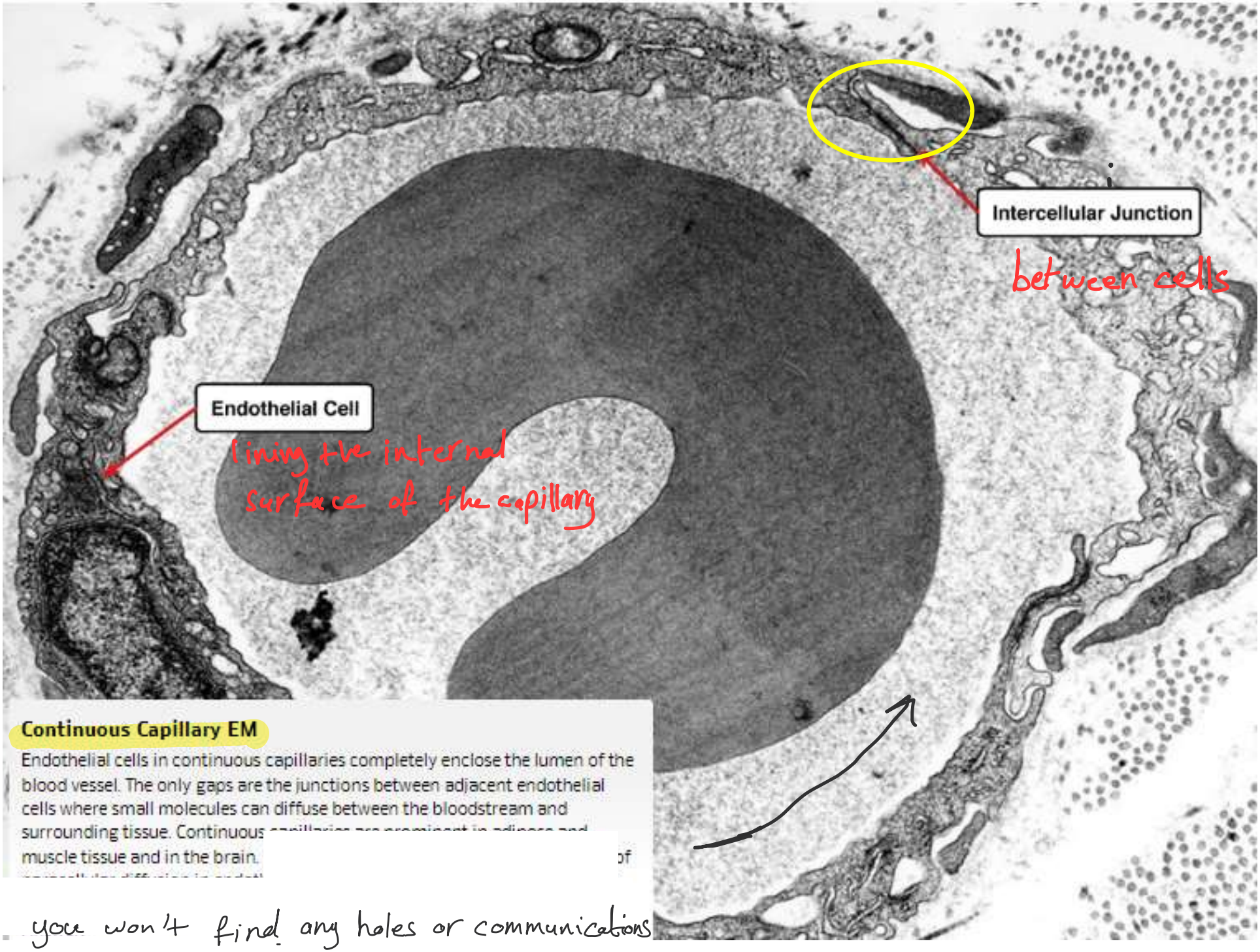
↳ control blood flow and blood pressure

A
M
I

it has 3 layers

Arteriole

In arterioles, the tunica media contains only one or two layers of smooth muscle cells. Contraction of the smooth muscle cells constricts the lumen of the arteriole, increasing vascular resistance and reducing the flow of blood. Arterioles regulate the flow of blood into capillary beds.

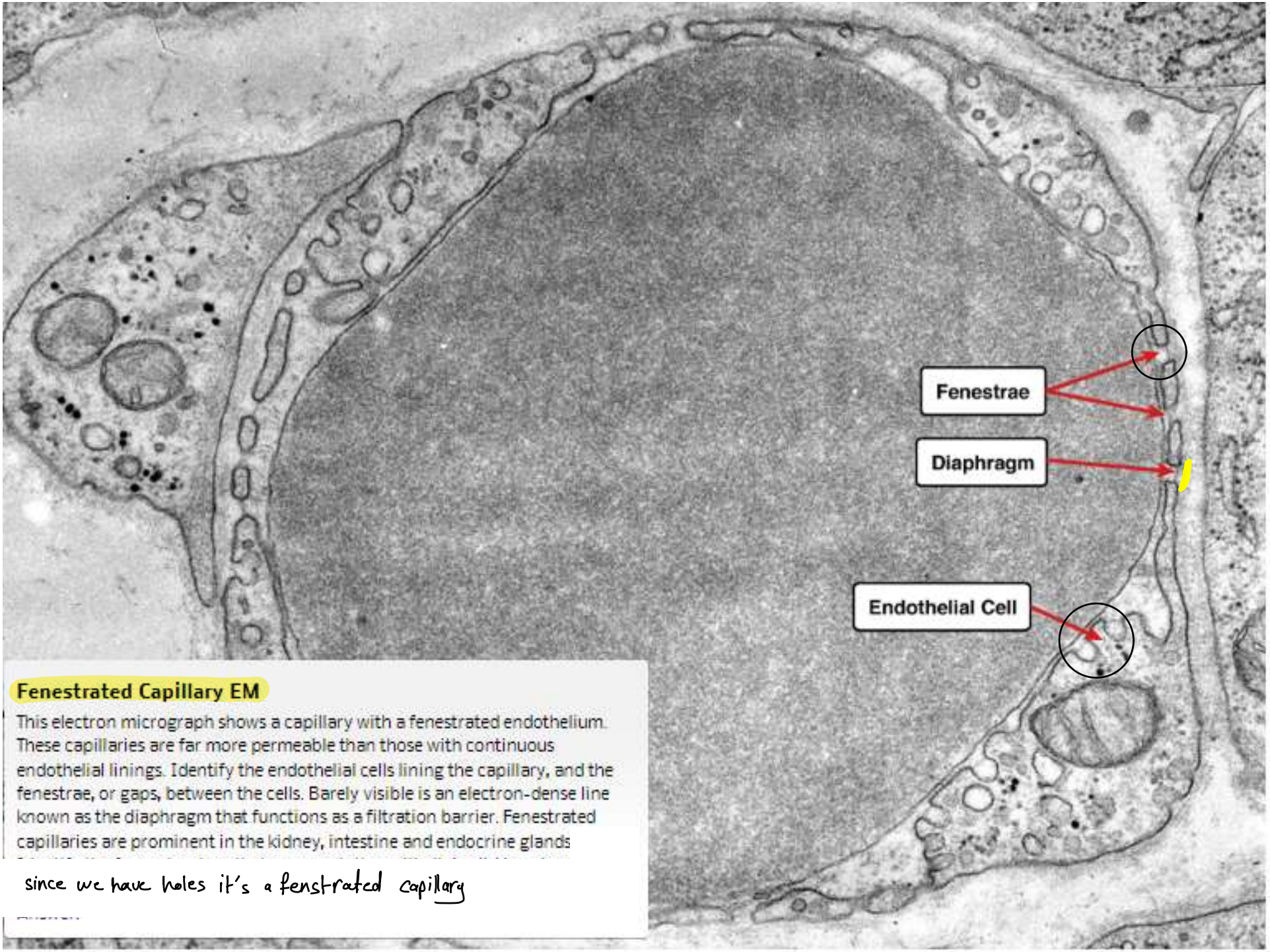


Continuous Capillary EM

Endothelial cells in continuous capillaries completely enclose the lumen of the blood vessel. The only gaps are the junctions between adjacent endothelial cells where small molecules can diffuse between the bloodstream and surrounding tissue. Continuous capillaries are prominent in adipose and muscle tissue and in the brain.

of

you won't find any holes or communications

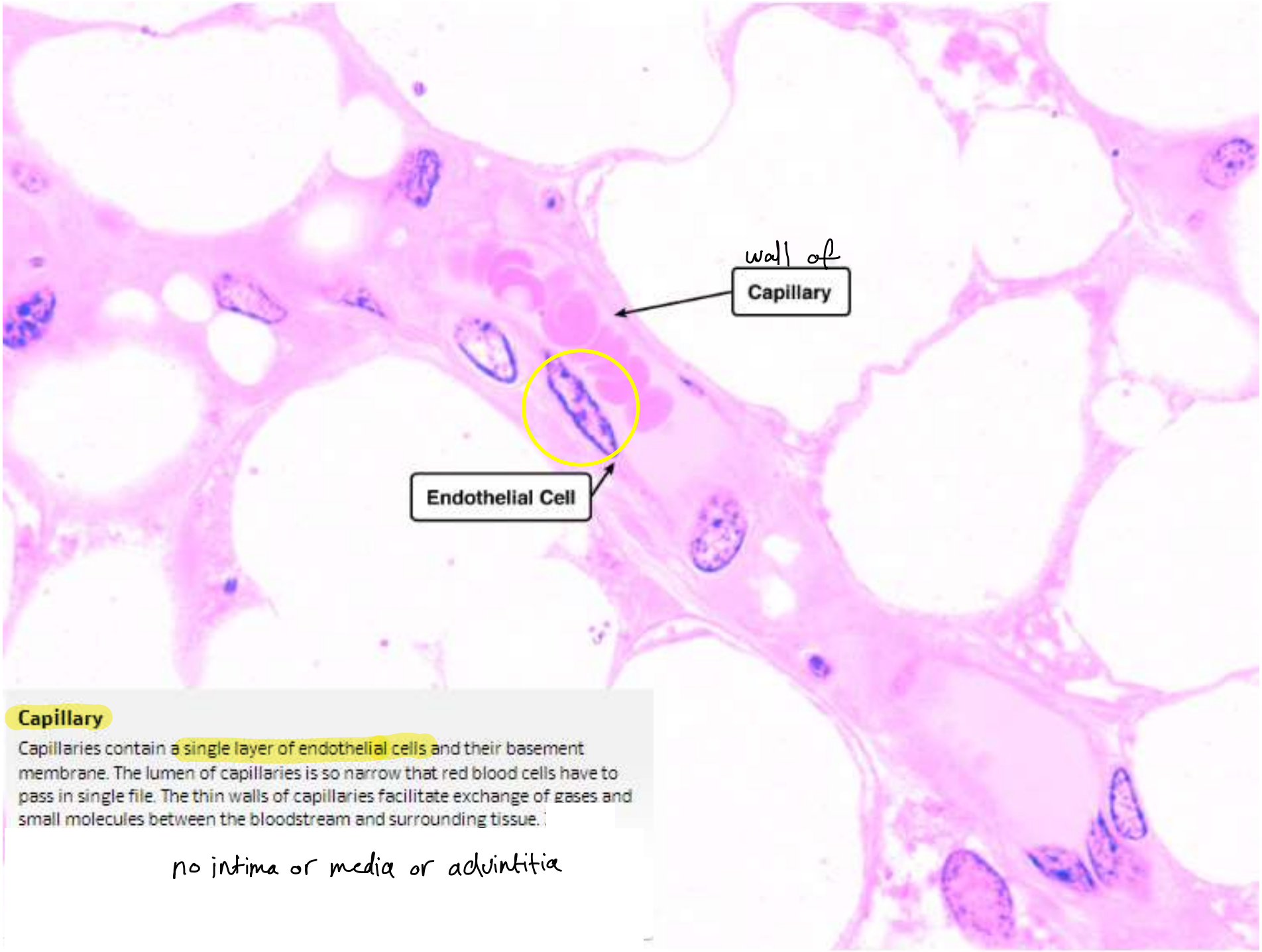


Fenestrated Capillary EM

This electron micrograph shows a capillary with a fenestrated endothelium. These capillaries are far more permeable than those with continuous endothelial linings. Identify the endothelial cells lining the capillary, and the fenestrae, or gaps, between the cells. Barely visible is an electron-dense line known as the diaphragm that functions as a filtration barrier. Fenestrated capillaries are prominent in the kidney, intestine and endocrine glands

since we have holes it's a fenstrated capillary

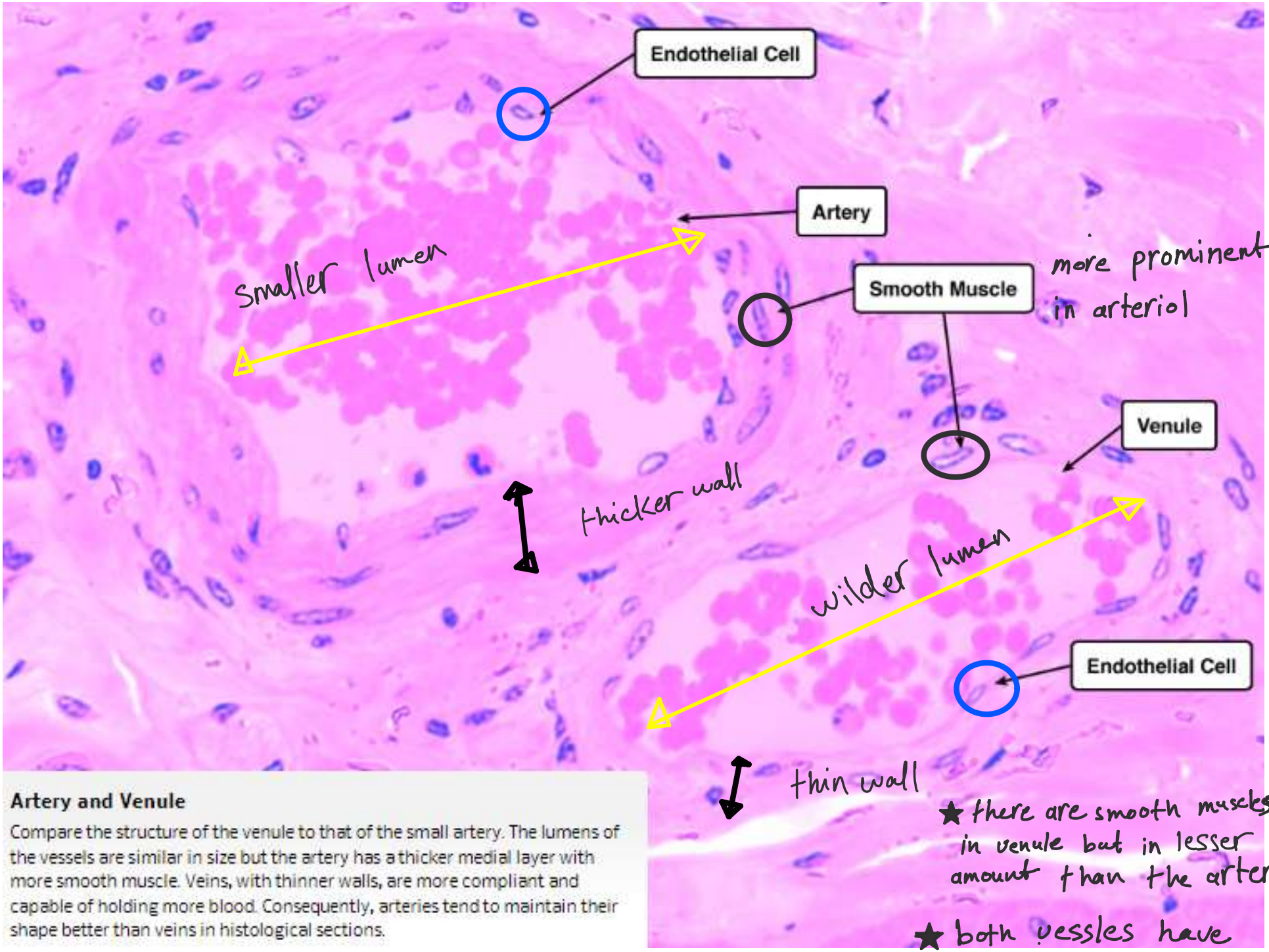
light microscope



Capillary

Capillaries contain a single layer of endothelial cells and their basement membrane. The lumen of capillaries is so narrow that red blood cells have to pass in single file. The thin walls of capillaries facilitate exchange of gases and small molecules between the bloodstream and surrounding tissue.

no intima or media or advintitia

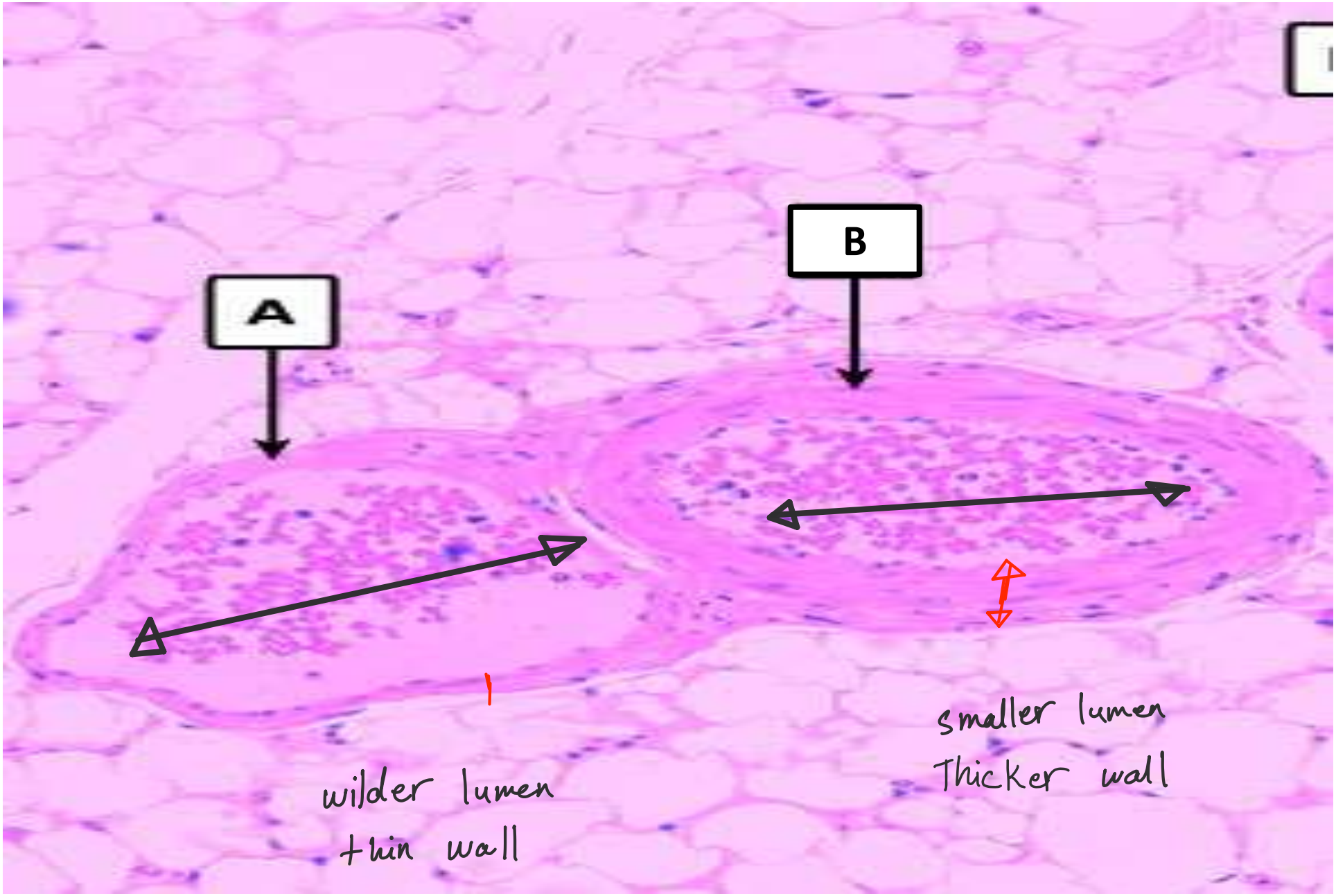


Artery and Venule

Compare the structure of the venule to that of the small artery. The lumens of the vessels are similar in size but the artery has a thicker medial layer with more smooth muscle. Veins, with thinner walls, are more compliant and capable of holding more blood. Consequently, arteries tend to maintain their shape better than veins in histological sections.

★ there are smooth muscles in venule but in lesser amount than the arteriol

★ both vessles have endothelial cells in the inner layer



A = vein, B = artery