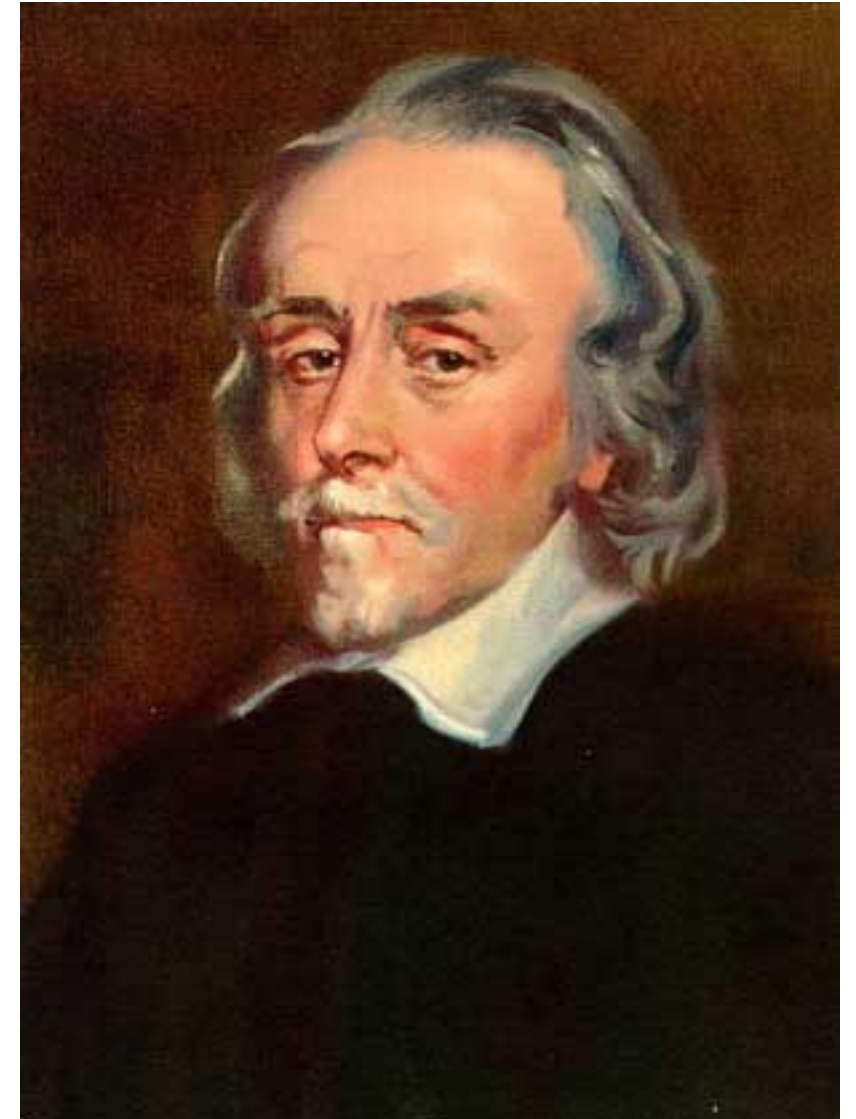
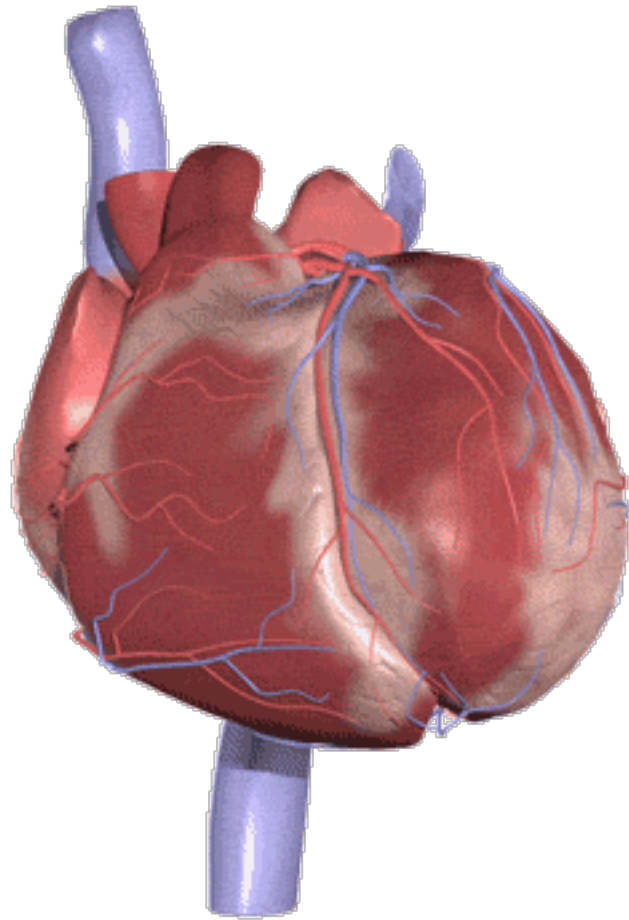


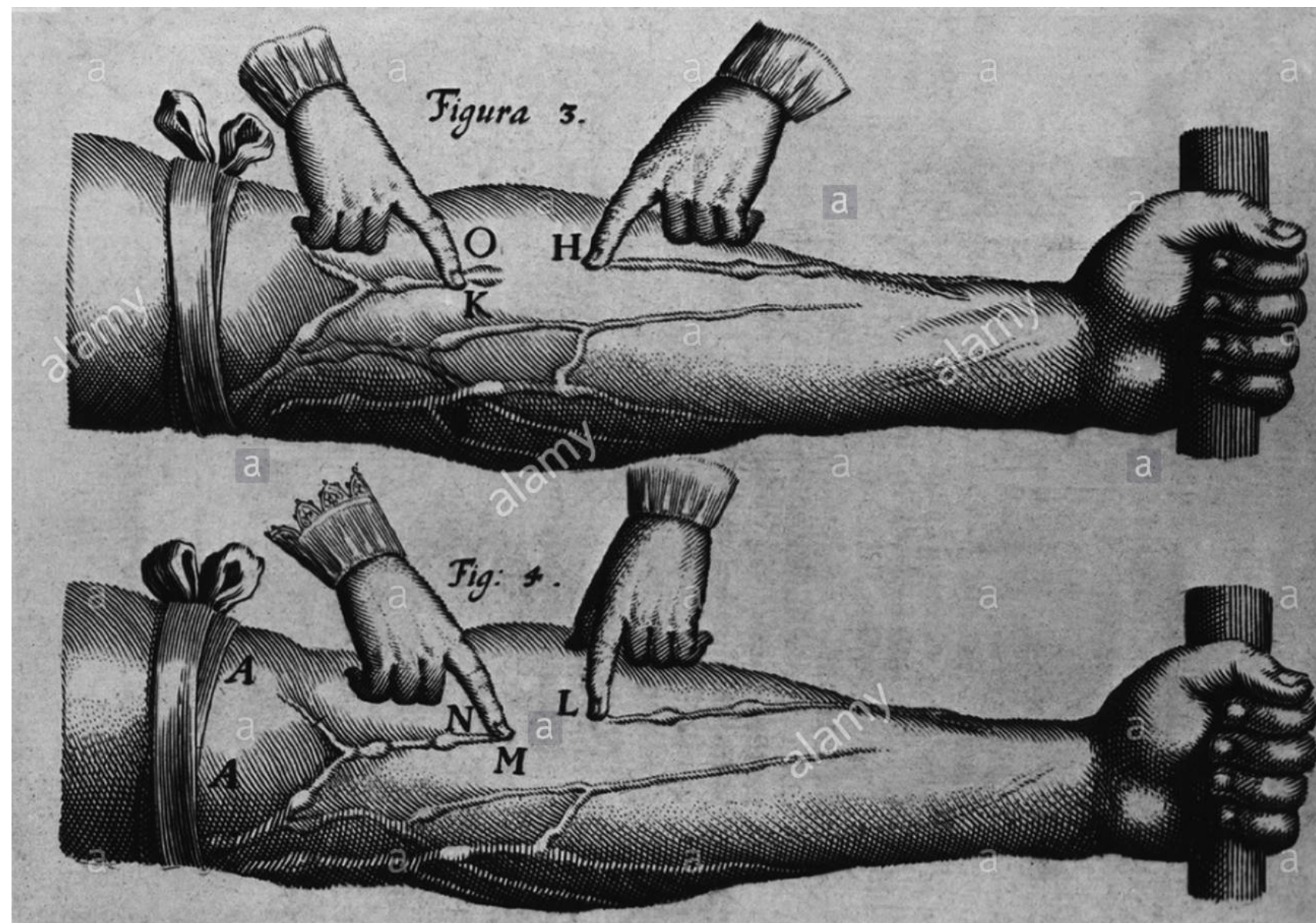
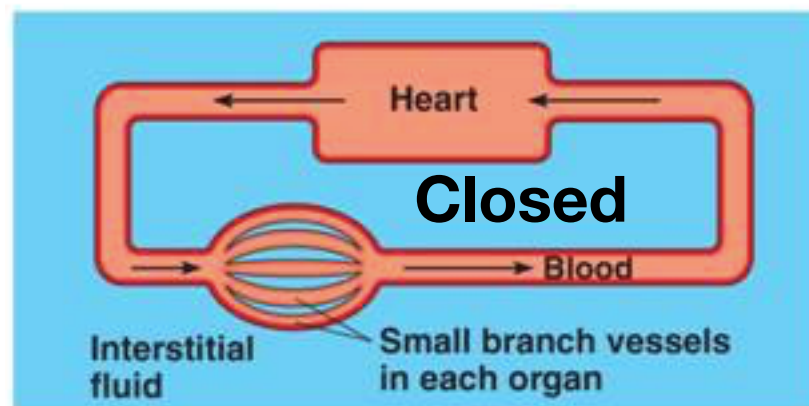
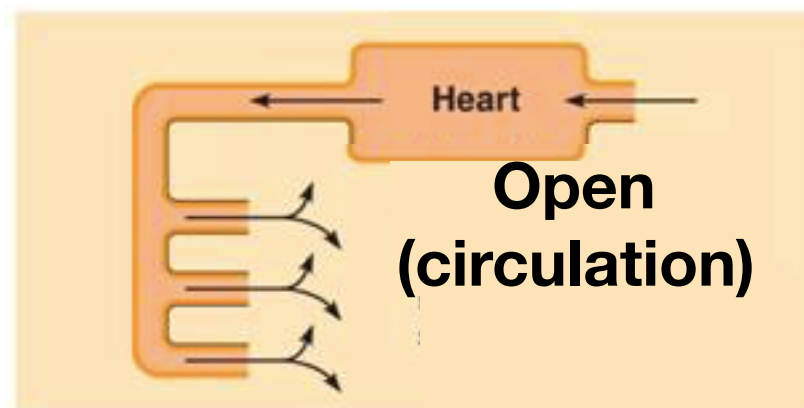
Blood Systems 6.2

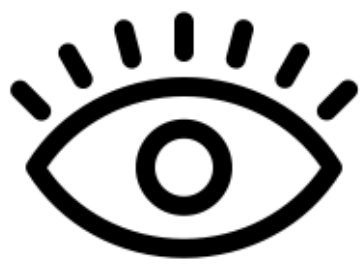


"The method of investigating truth commonly pursued at this time, therefore, is to be held erroneous and almost foolish, in which so many inquire what others have said, and omit to ask whether the things themselves be actually so or not." — William Harvey.

William Harvey is credited with this discovery of blood circulation.

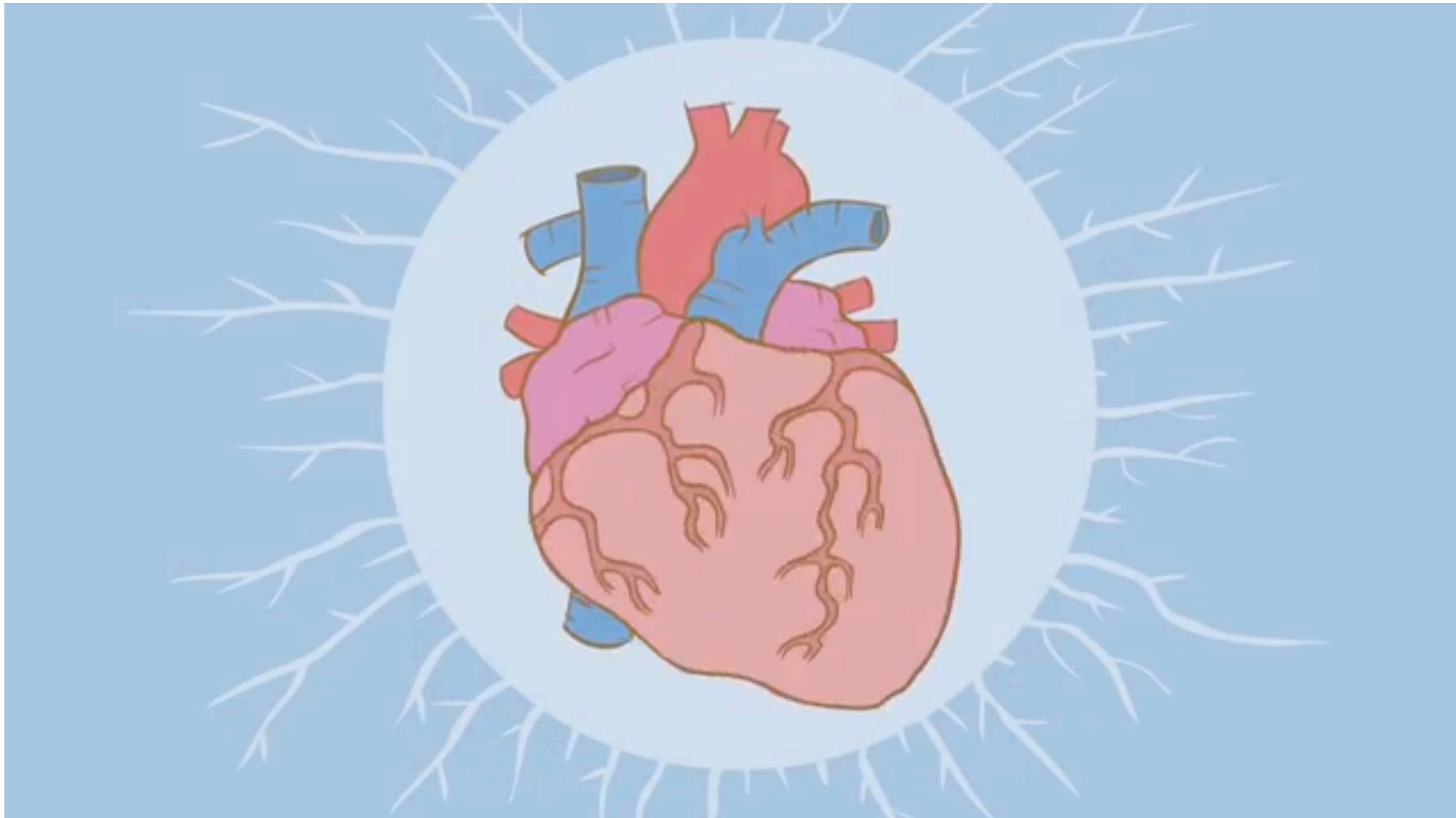
- Demonstrated through experimentation
- Demonstrated unidirectional and blood movement and valves preventing back flow
- Predicted the presence of capillaries, vessels too small to see



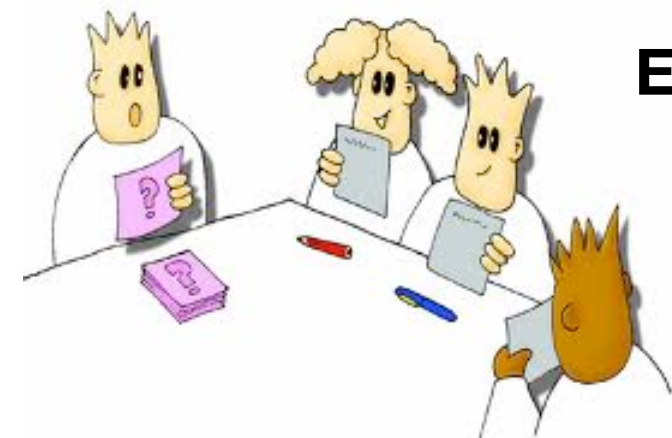


As you watch

- What made studying the heart difficult for centuries?
- How does it work?



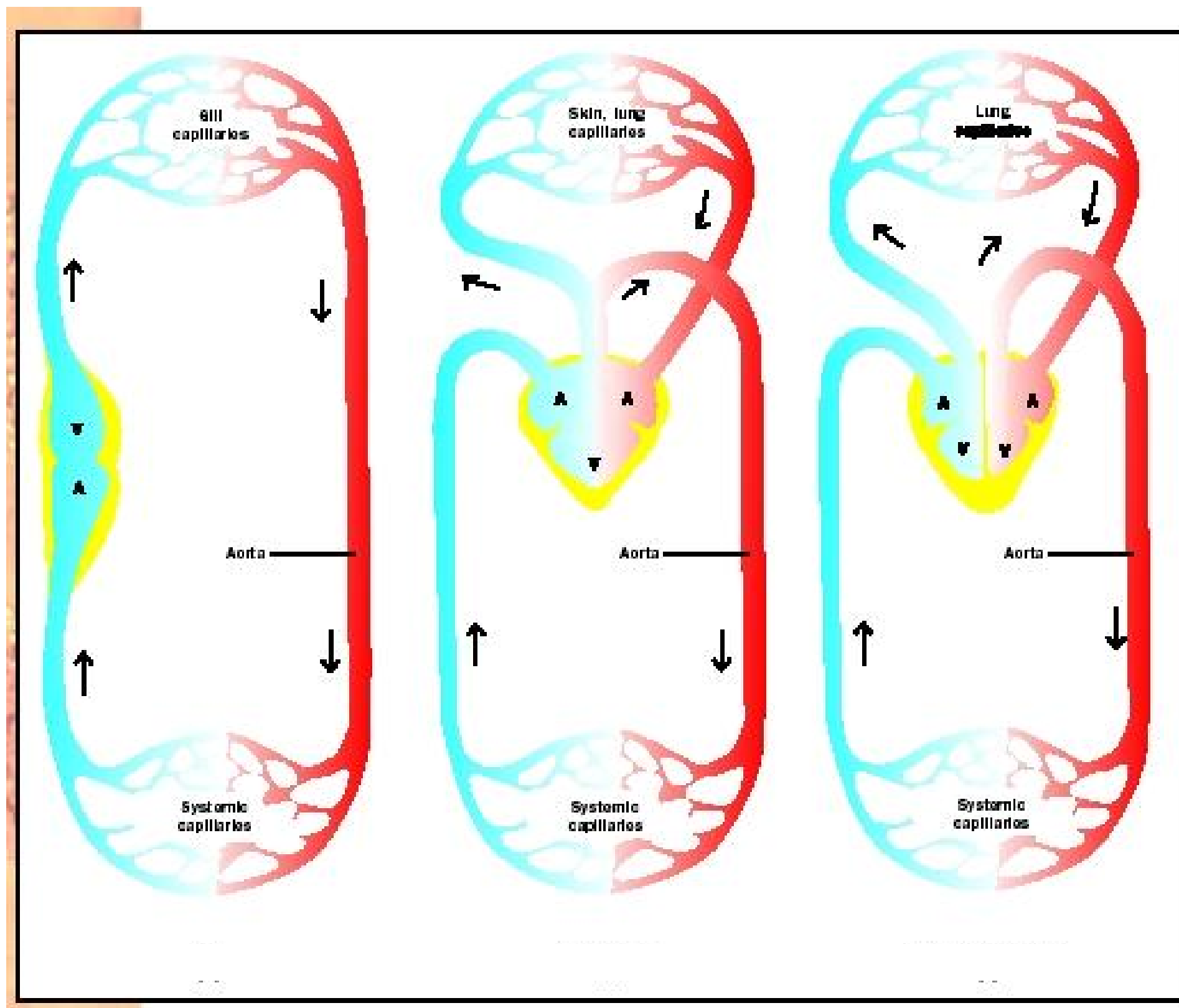
Examine this image and describe major evolutionary changes that have occurred between a fish, frog, and mammal ?



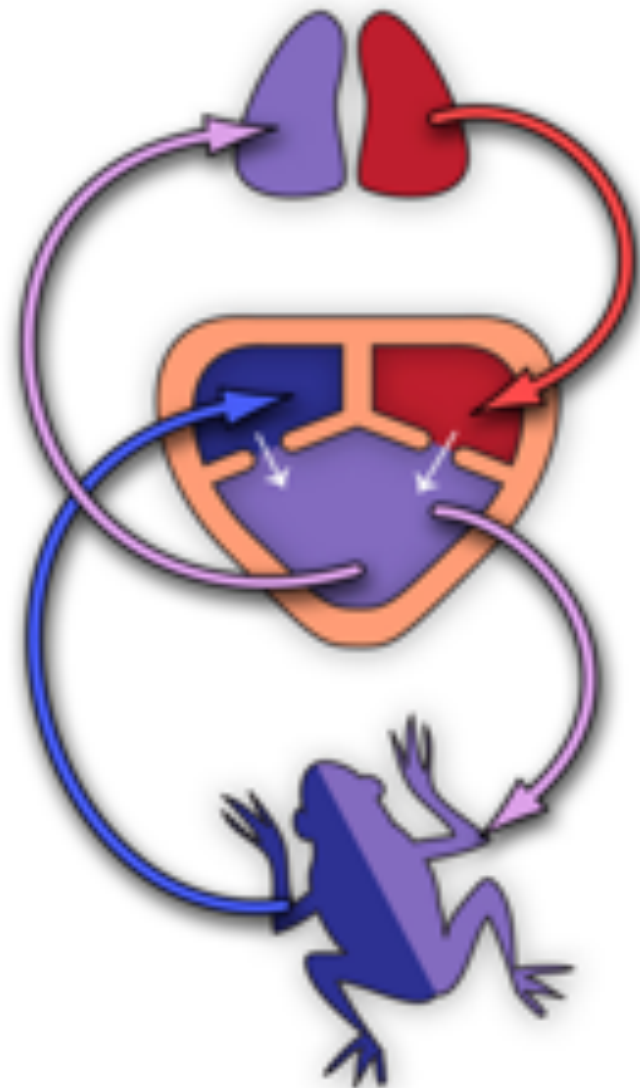
Fish

Amphibian

Mammals



3-CHAMBERED



lungs

heart

body



AMPHIBIANS

4-CHAMBERED



BIRDS AND MAMMALS



Oxygenated
blood



Deoxygenated
blood



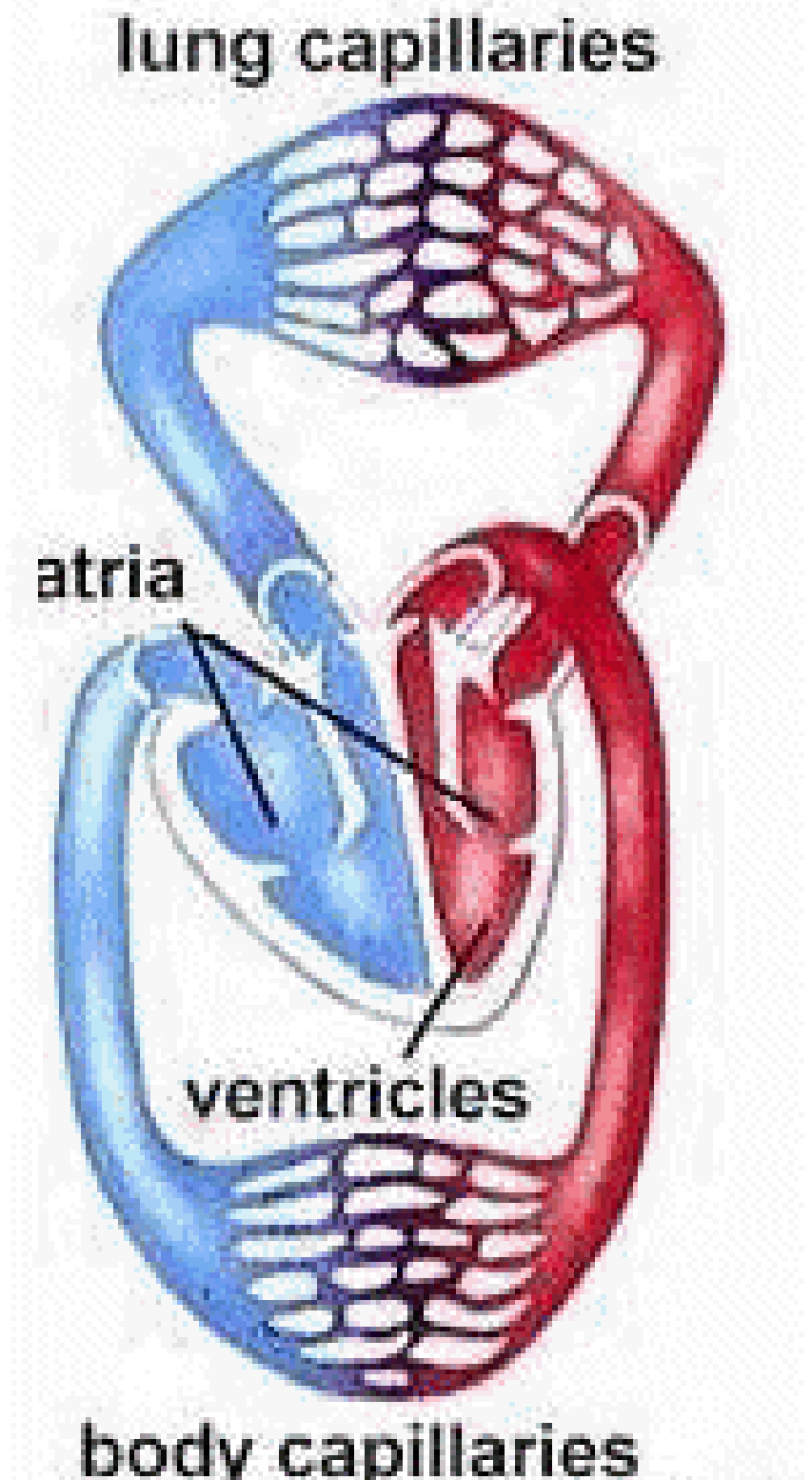
Mixed
blood

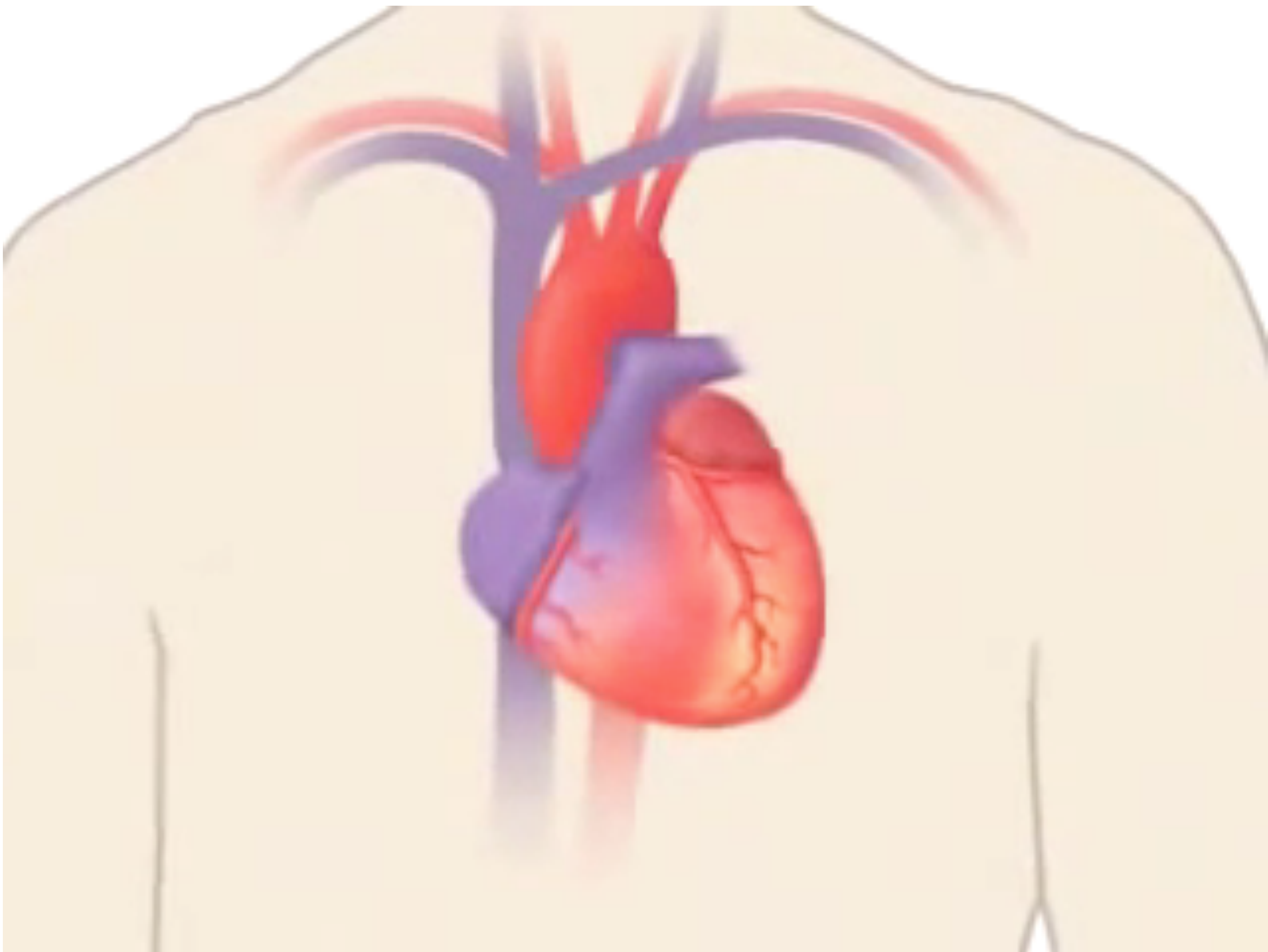
Mammalian Circulation

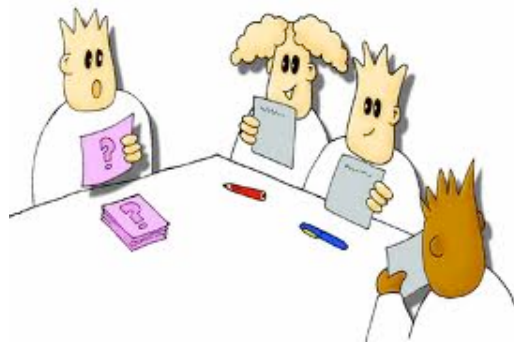
Four Chambered Heart (mammals/
birds)

Complete double circulation

- No mixing of O₂ poor/ O₂ rich blood
- more efficient nutrient transport







What Do You Know About The Human Circulatory System?

What is an artery?

What is a vein?

Which ones carry oxygen?

Which ones have higher pressure?

Name three disorders of blood vessels.

Where do the following blood vessels carry blood?

Carotid Artery

Pulmonary Vein

Aorta

Vena Cava

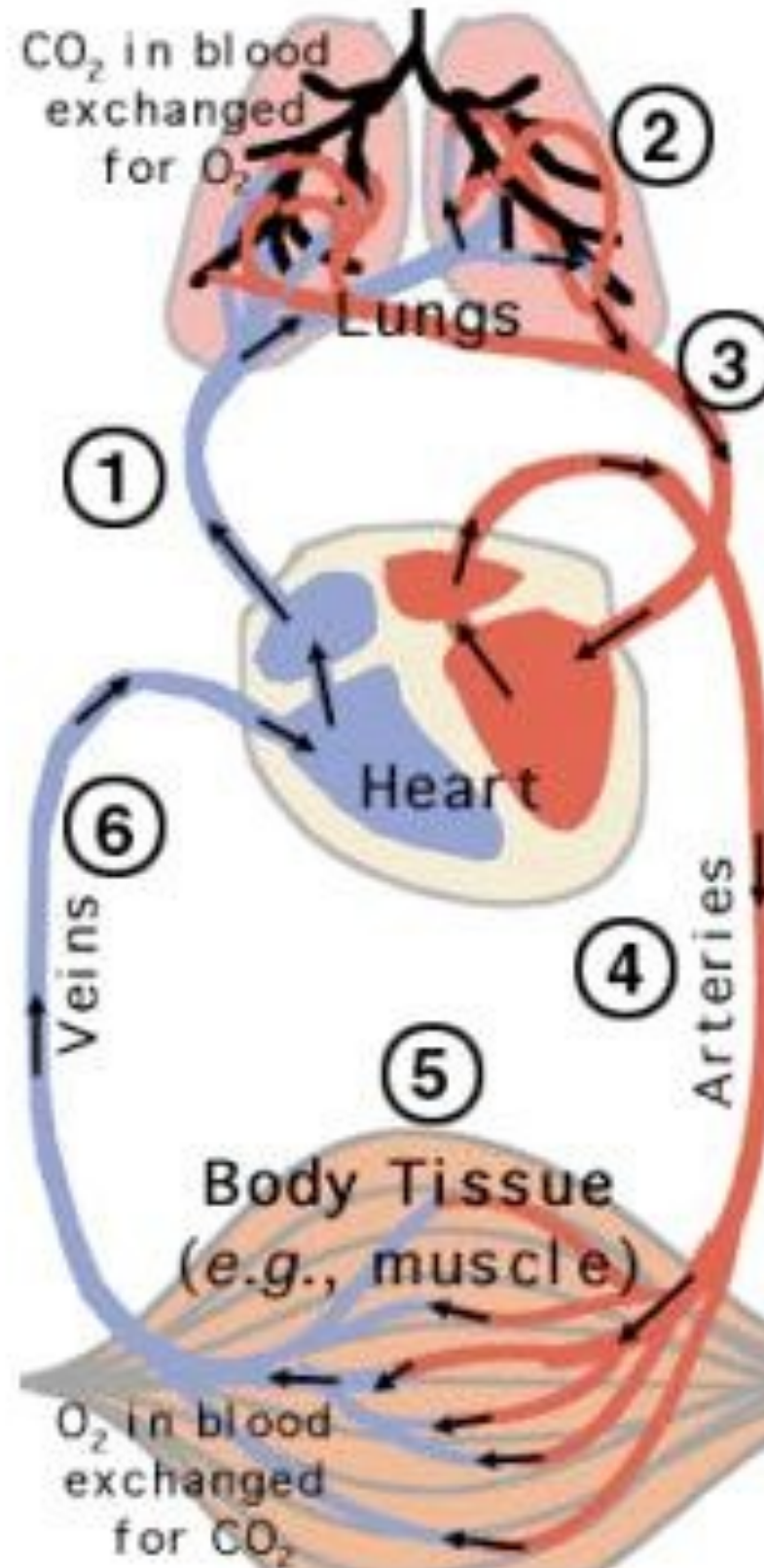
Jugular vein

2 Routes of Blood

1. systemic

2. pulmonary

- (3) cardiac



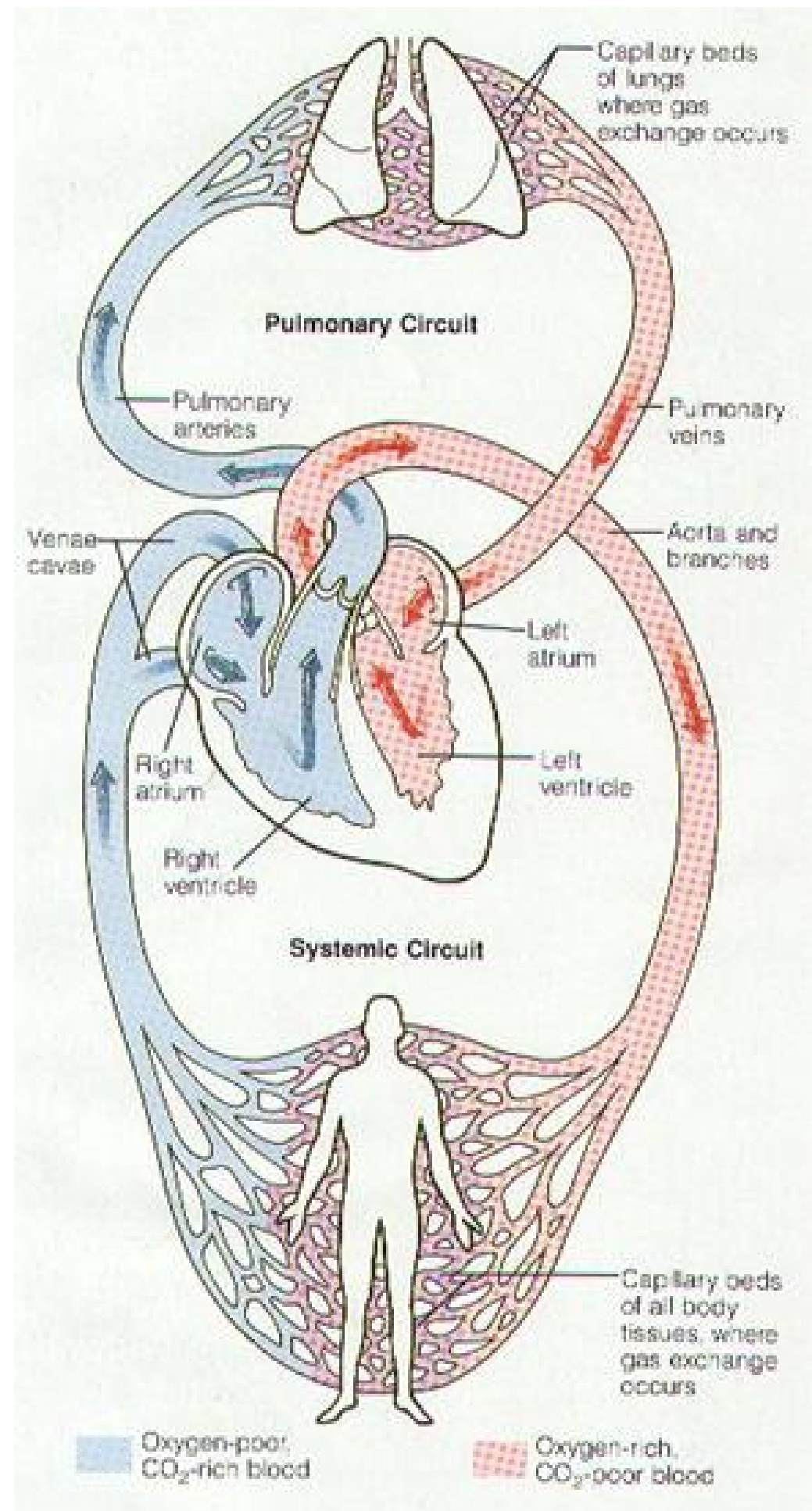
3 Routes of Blood

1 Systemic

- throughout the entire body

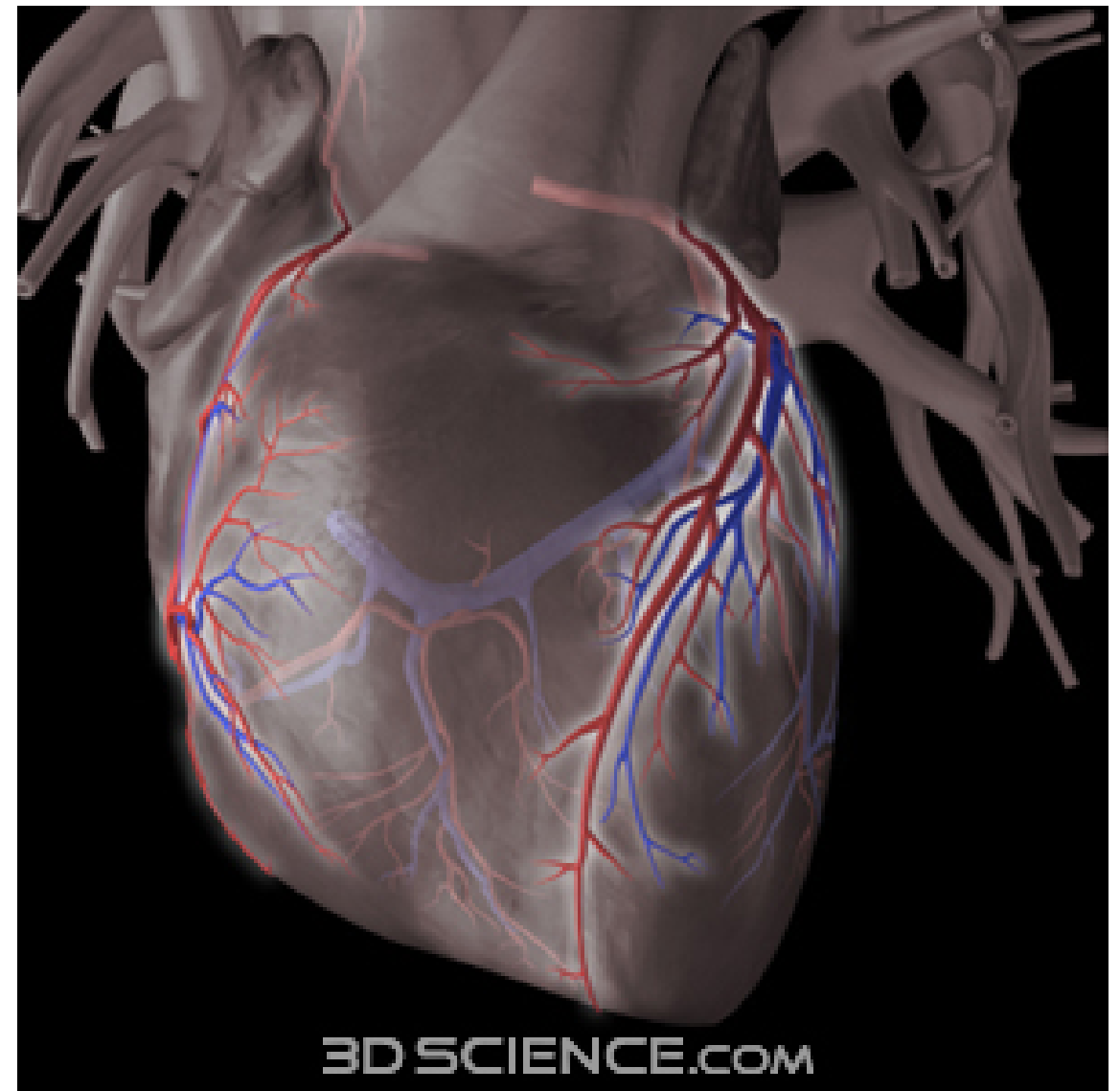
2 Pulmonary

- From the heart to the lungs



Cardiac flow

- Vessels throughout the heart
(the heart needs oxygen as well!)



3 main types of blood vessels:

Arteries

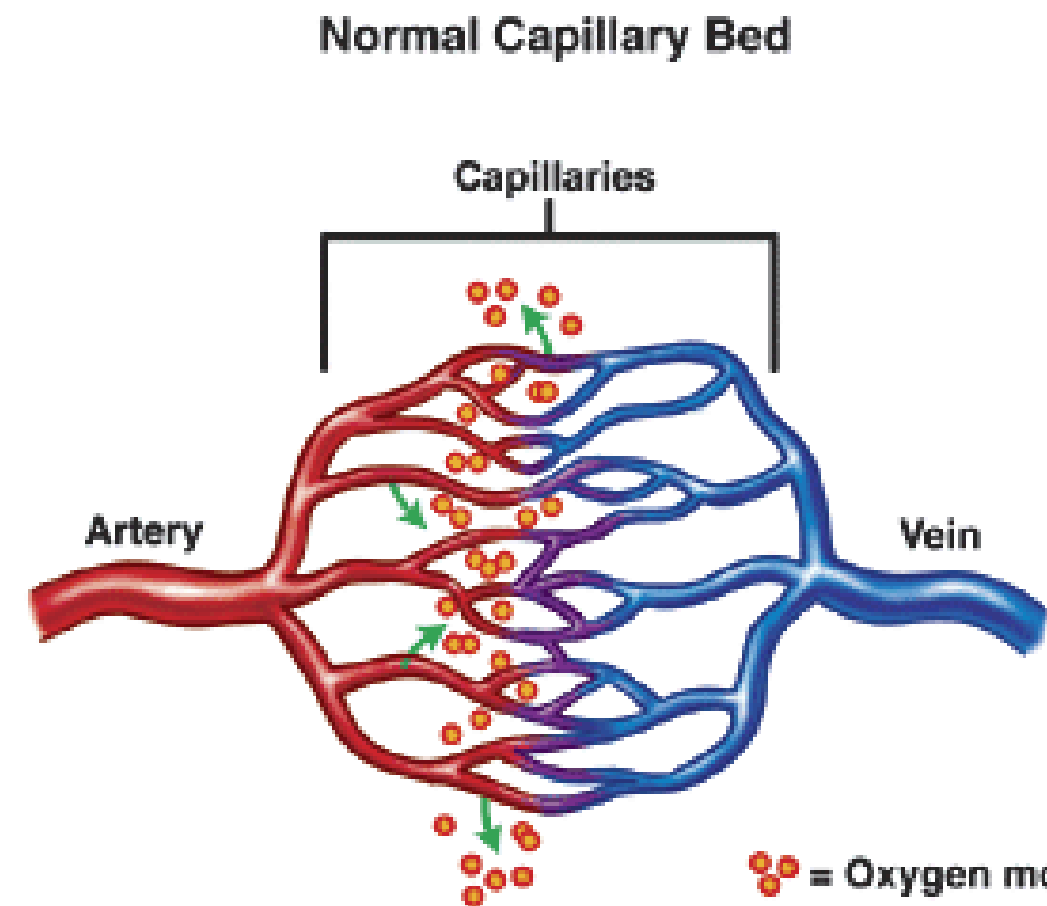
- carry blood away from heart to tissues
- > Usually carry O_2 -rich blood
- (except artery leading to lungs)

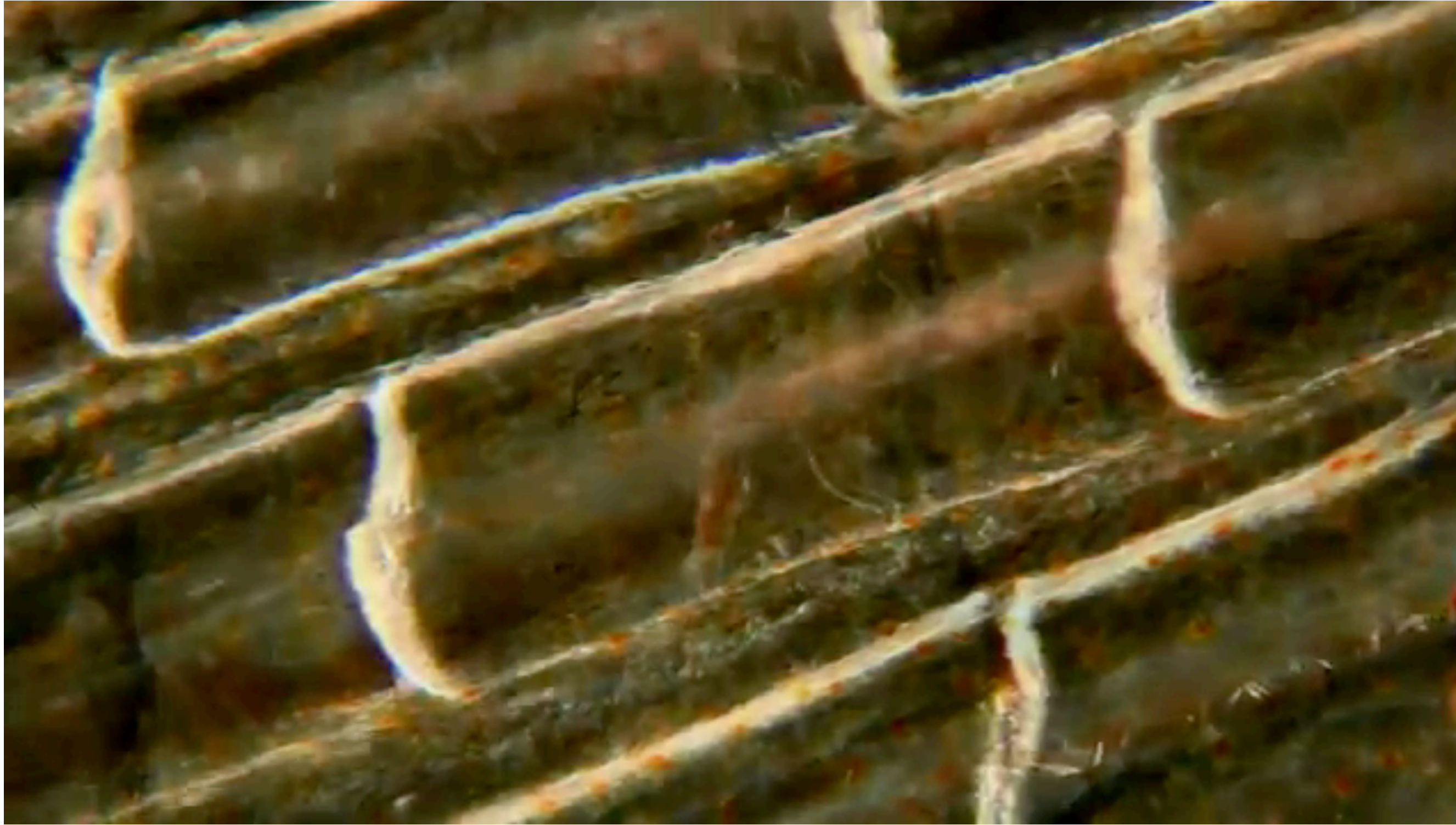
Veins

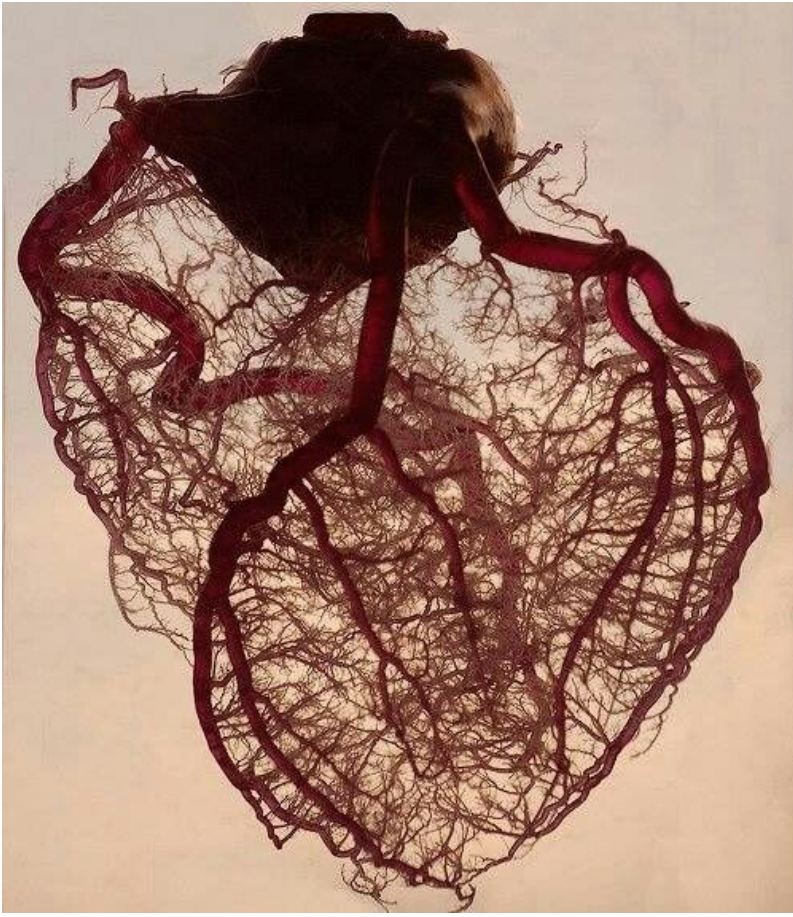
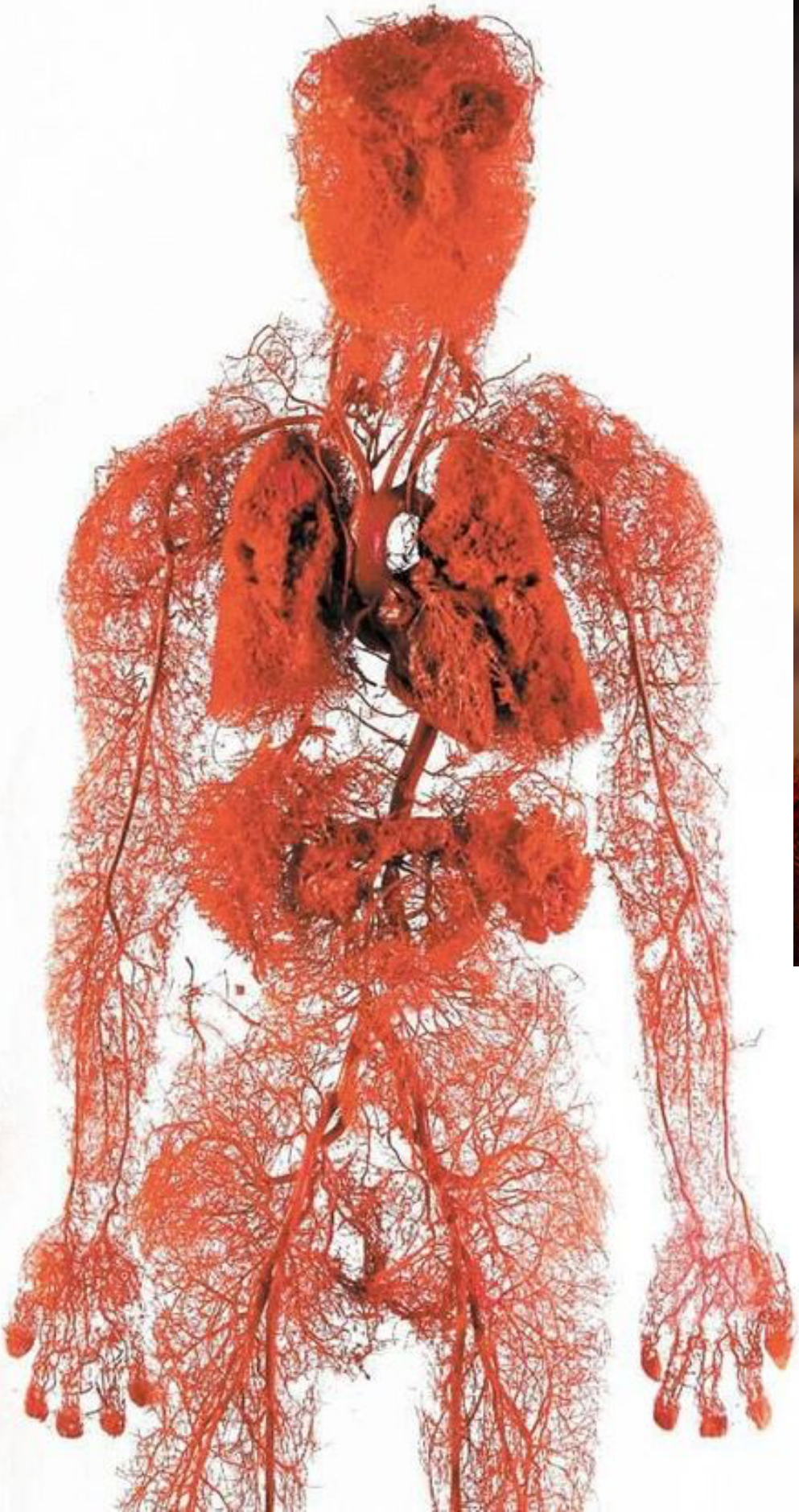
- carry blood from the tissues towards heart
- > Usually carry CO_2 rich blood
- (except vein leaving lungs)

Capillaries

- connect the arteries to veins



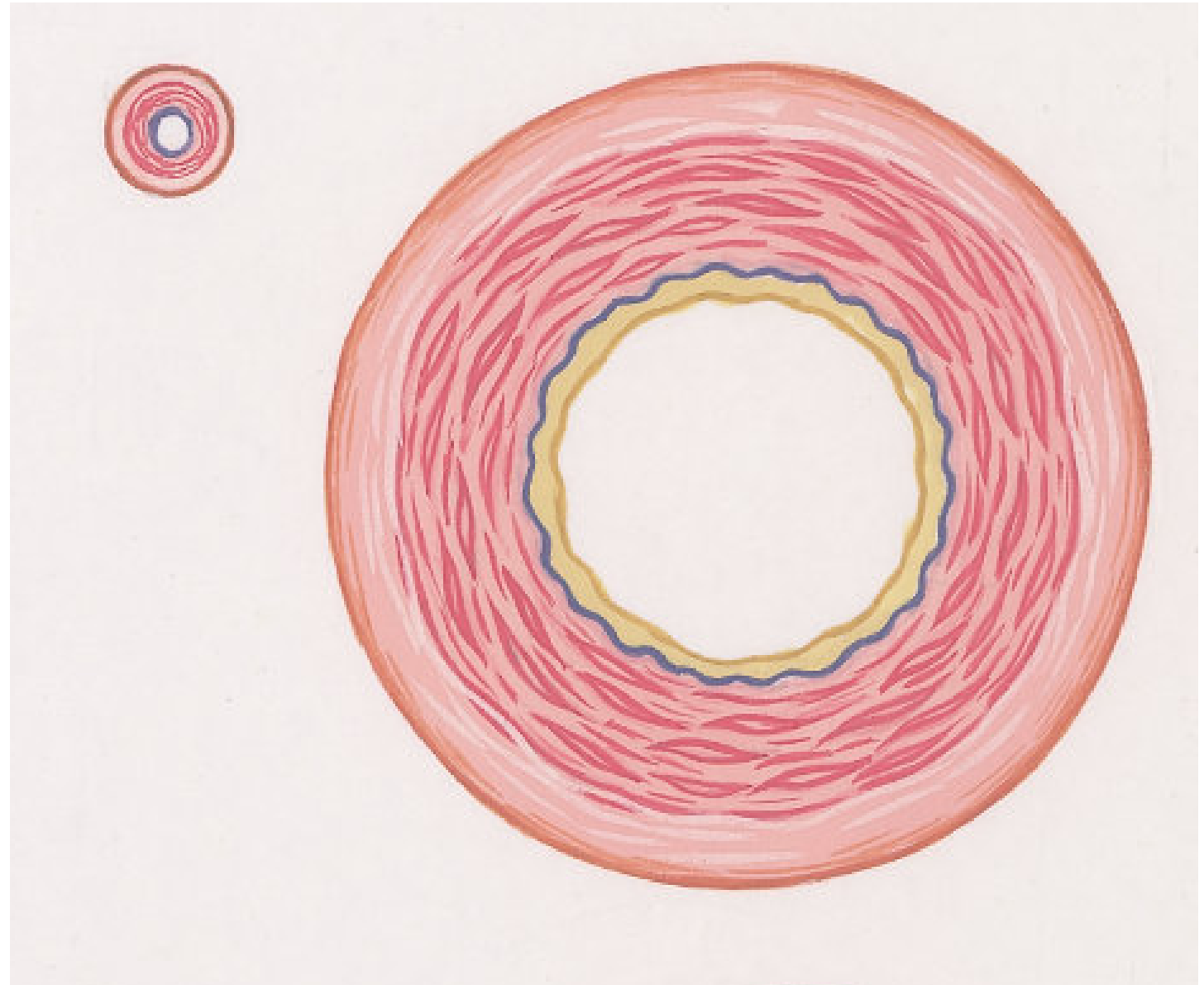


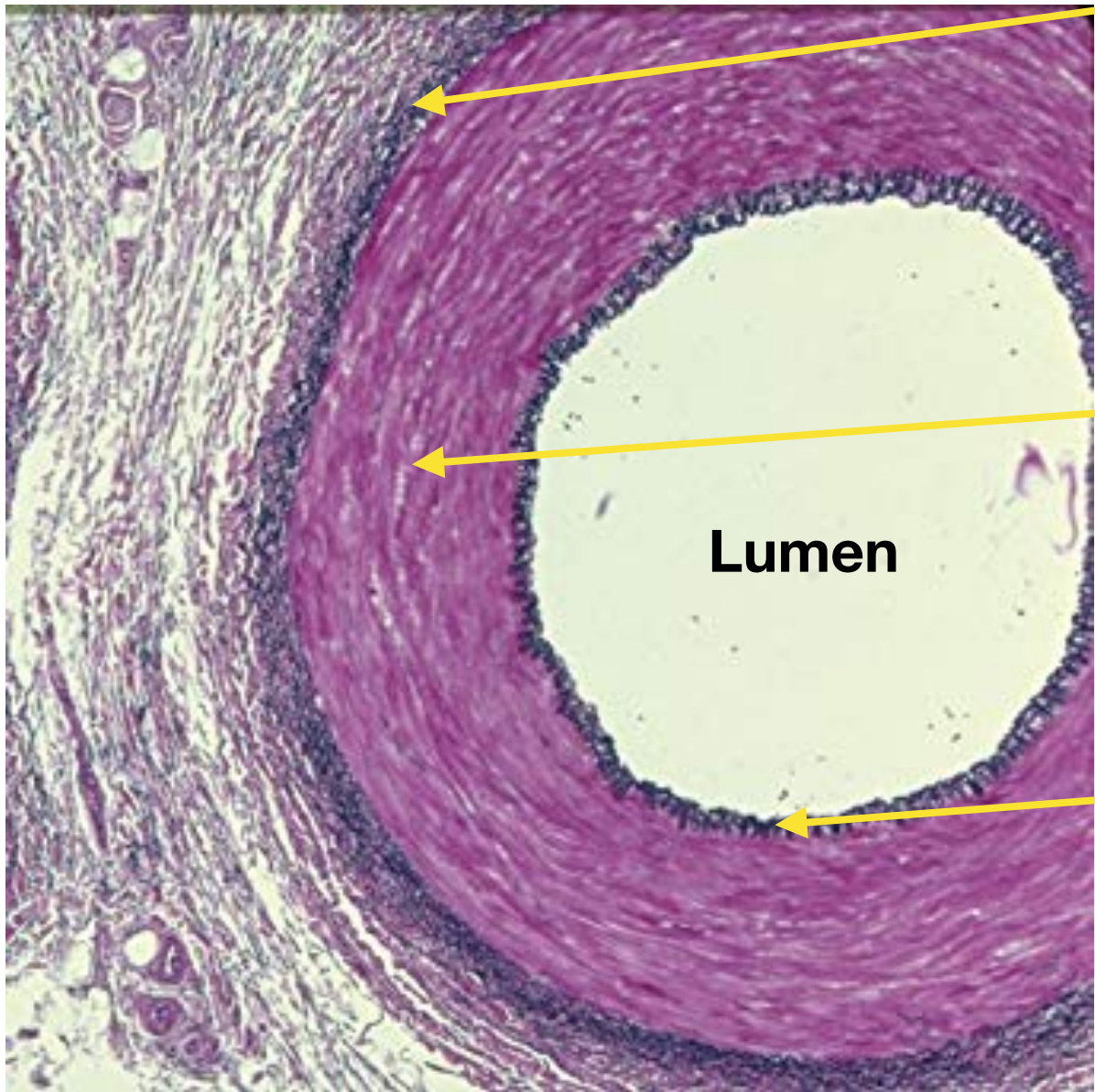


Body Worlds Exhibit

Arteries

- elastic, muscular layers
- elasticity allows vessel to expand as wave of blood passes through intermittently without bulging (aneurysm)
- pulse = rhythmic contraction & expansion of artery
- each organ has one or more



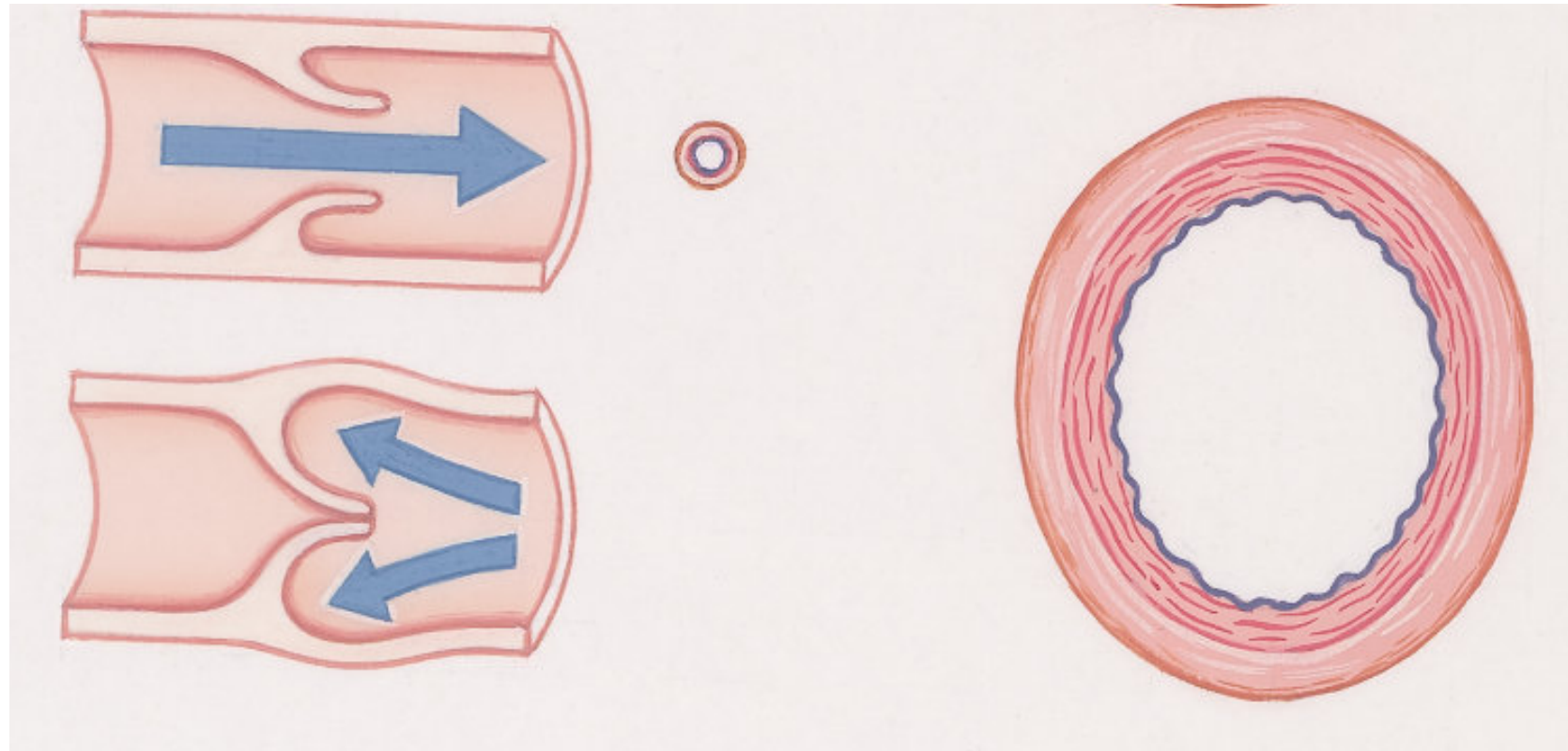


tunica externa- tough outer connective

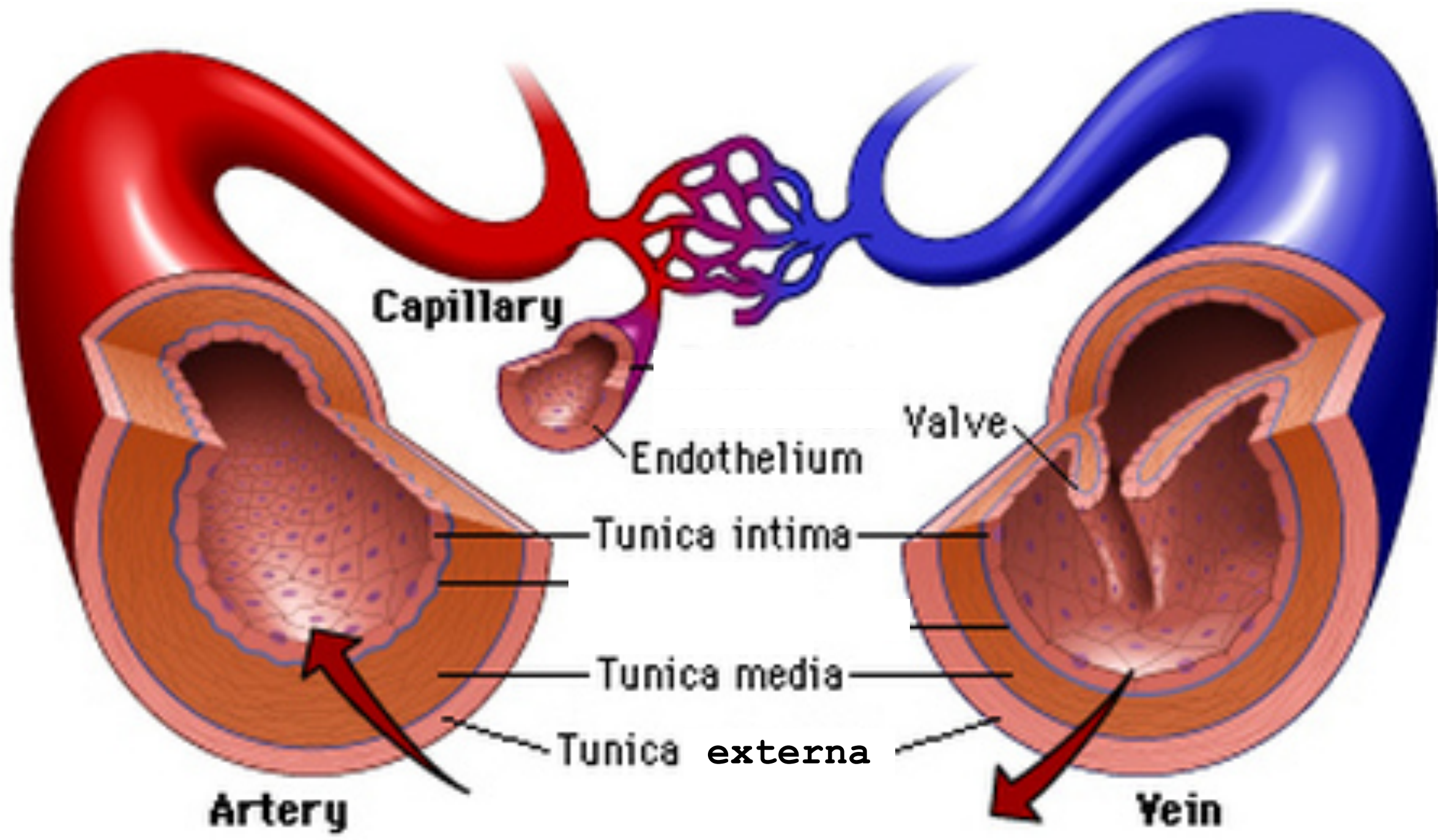
tunica media - thick layer smooth muscle and elastic fibres

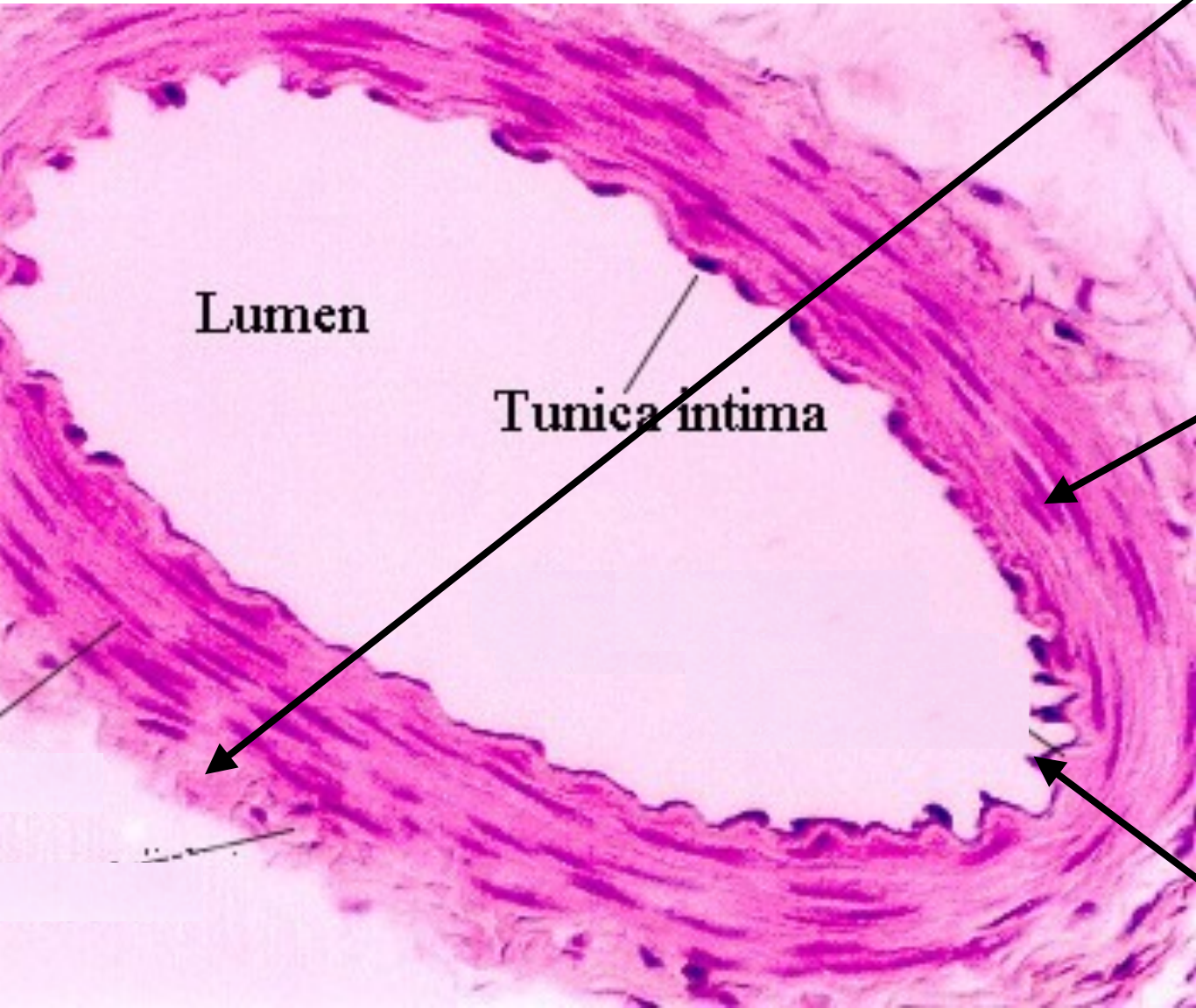
tunica intima- smooth endothelium (lining)

Veins



- Transport back to heart atria
 - lower pressure within
 - slower flow
 - thinner walls - larger interiors
 - can dilate and much wider
 - a person at rest - 80% of blood held in veins
 - gravity can assist flow



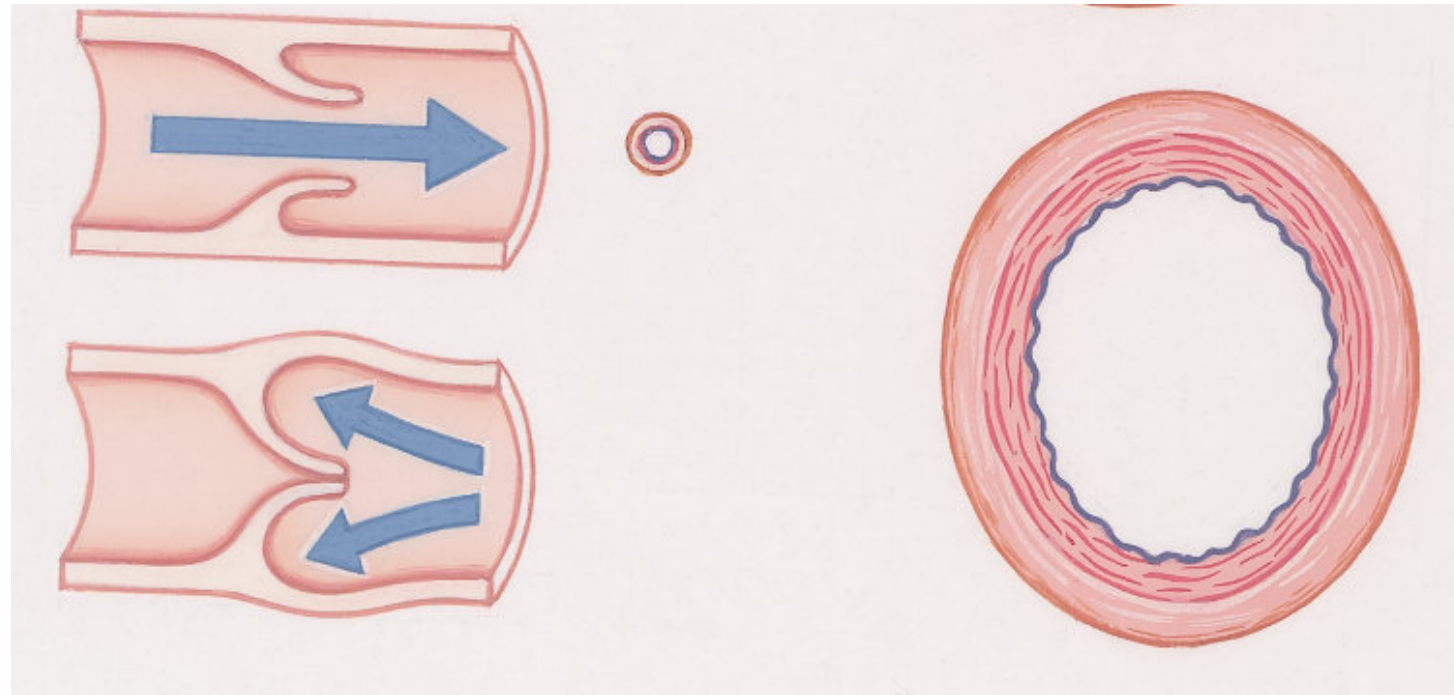


tunica externa- tough outer connective

tunica media - thick layer smooth muscle and elastic fibres

tunica intima- smooth endothelium (lining)

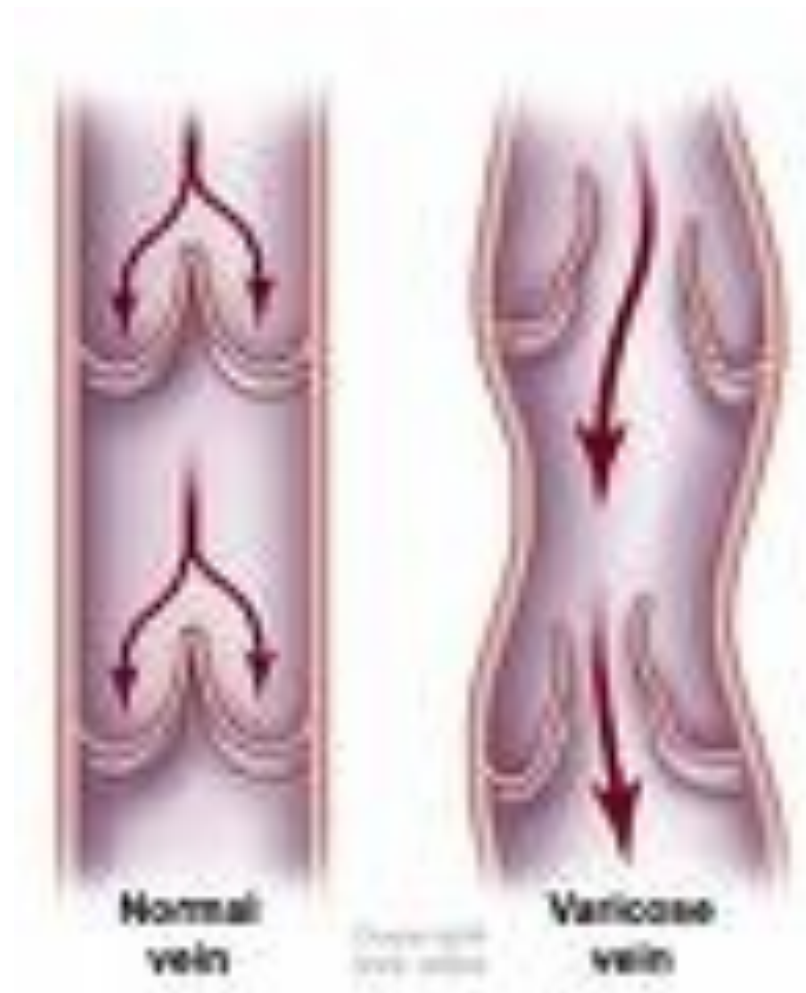
Veins



- blood flowing back to the heart assisted by skeletal muscles surrounding veins (like pumps)
- one-way 3-flap pocket valves present (prevent back flow)
- ensure sufficient flow back to heart

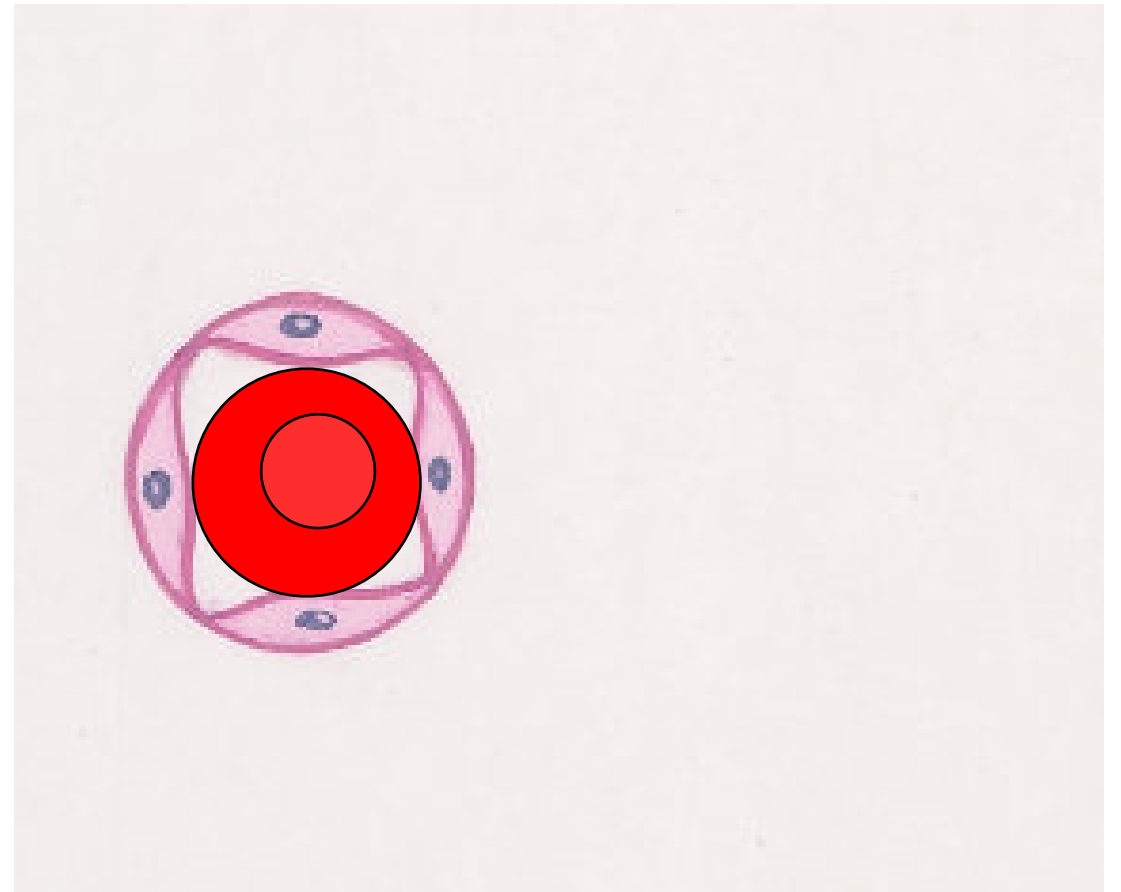
Varicose Veins

- If valves are damaged over time, blood can back flow in veins



Capillaries

- extremely small (10 μm)
- one endothelium cell thick
- wall with protein gel with pores to act as a filter
- allow O_2 , ions, glucose, waste to diffuse in/out of tissues quickly (*and CO_2 in*)
- connect veins & arteries



- i

