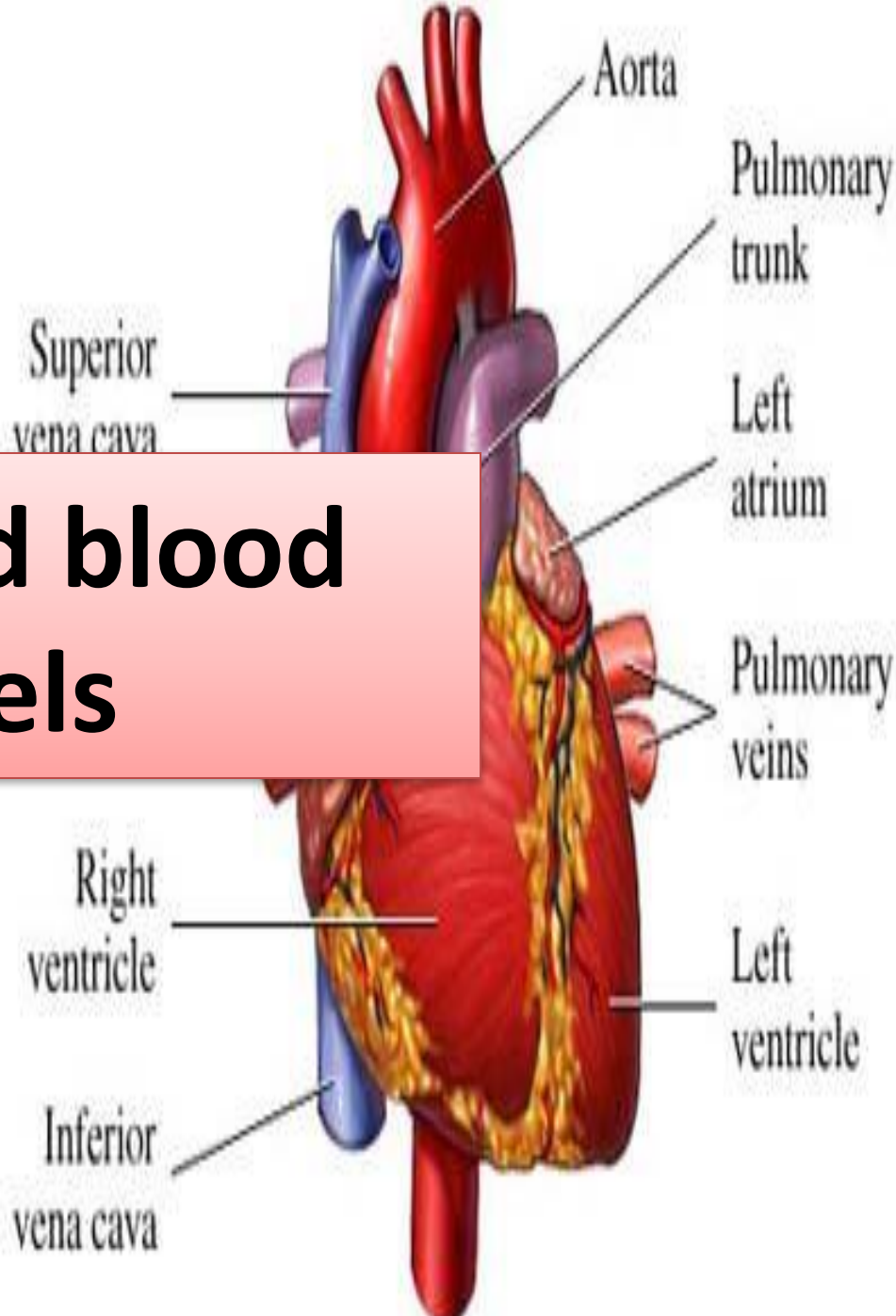
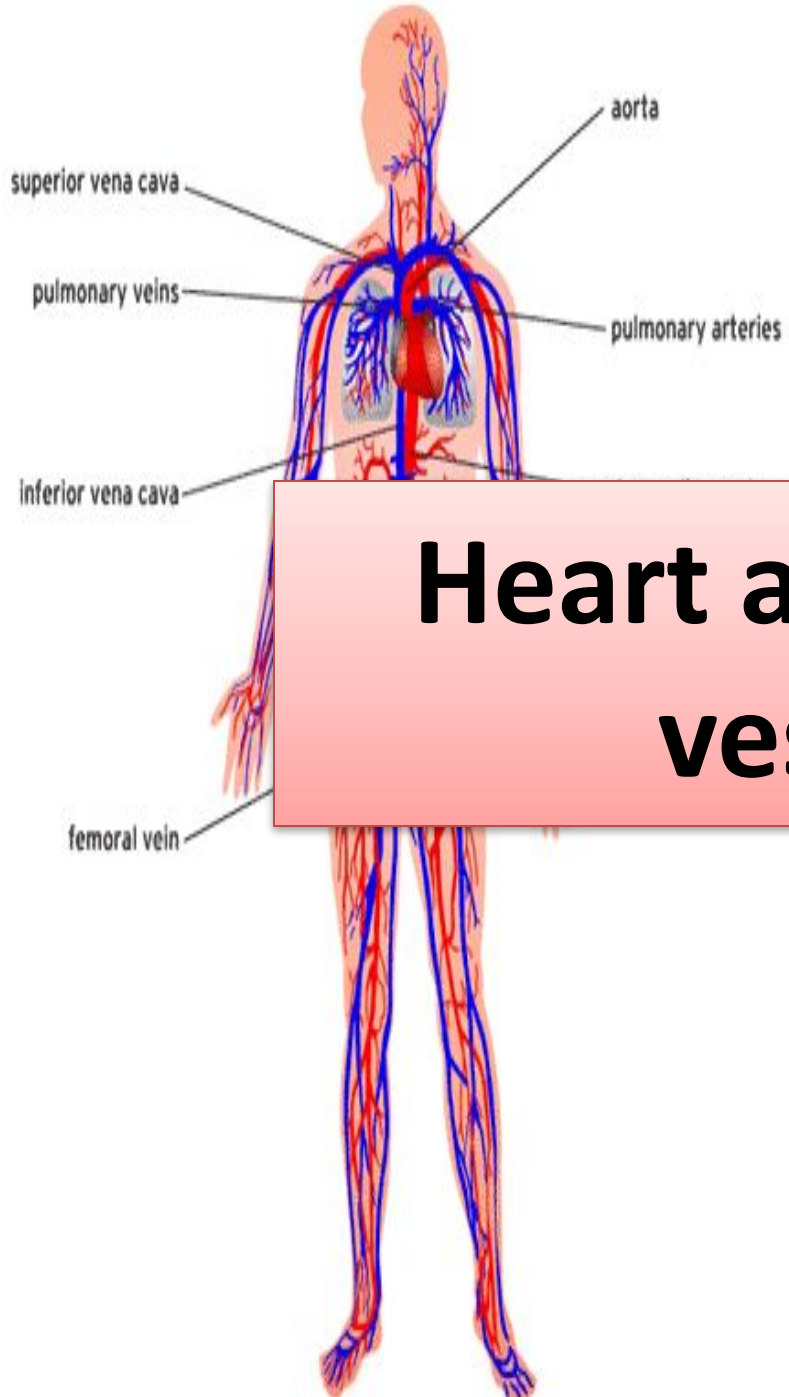


Heart and blood vessels



You will:

- Describe the structure of the heart and blood vessels in animals;
- Establish the relationship between the structures of the walls of blood vessels and their functions

Key terms

- **Heart** is a muscular organ, which pumps the blood;
- **Arteries** are blood vessels that transport blood from the heart;
- **Capillaries** are blood vessels that connect arteries and veins;
- **Veins** are blood vessels that transport blood to the heart.

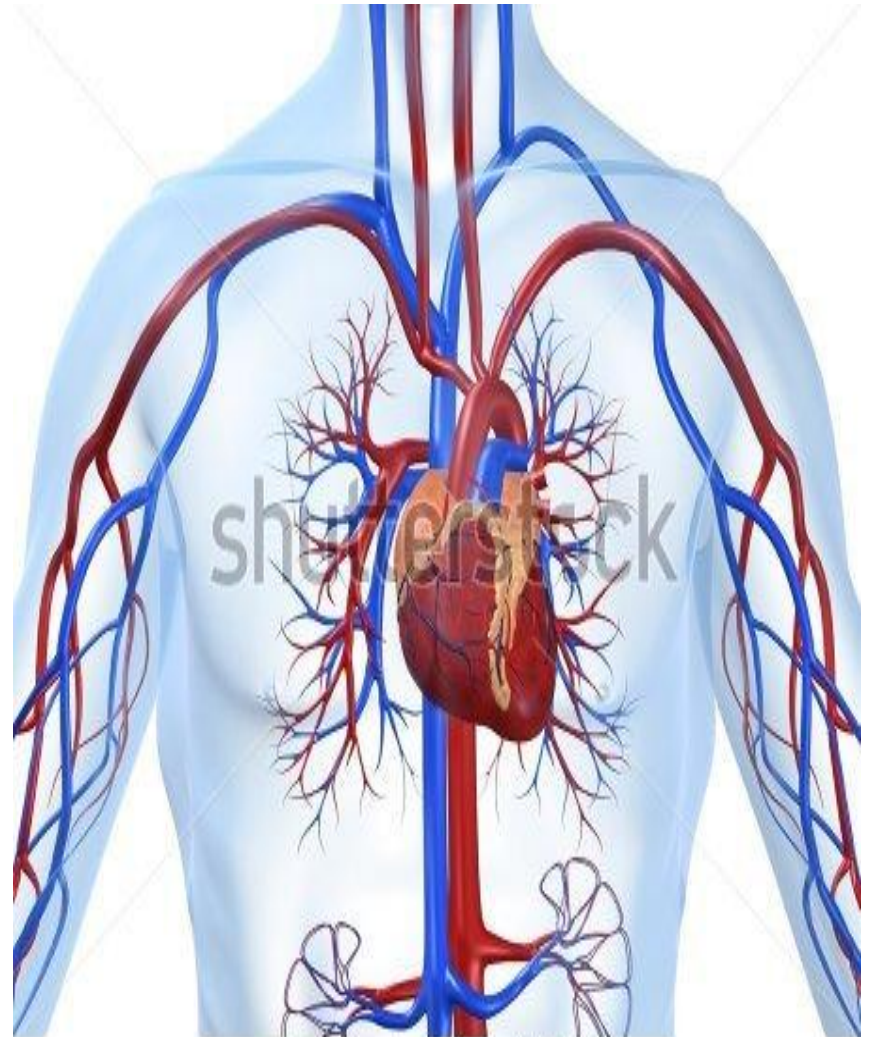
Circulatory system

- HCS transports materials throughout the body
- -Oxygen
- -Carbon dioxide
- -Digested food
- -Hormones
- -Waste chemicals – urea
- -Heat

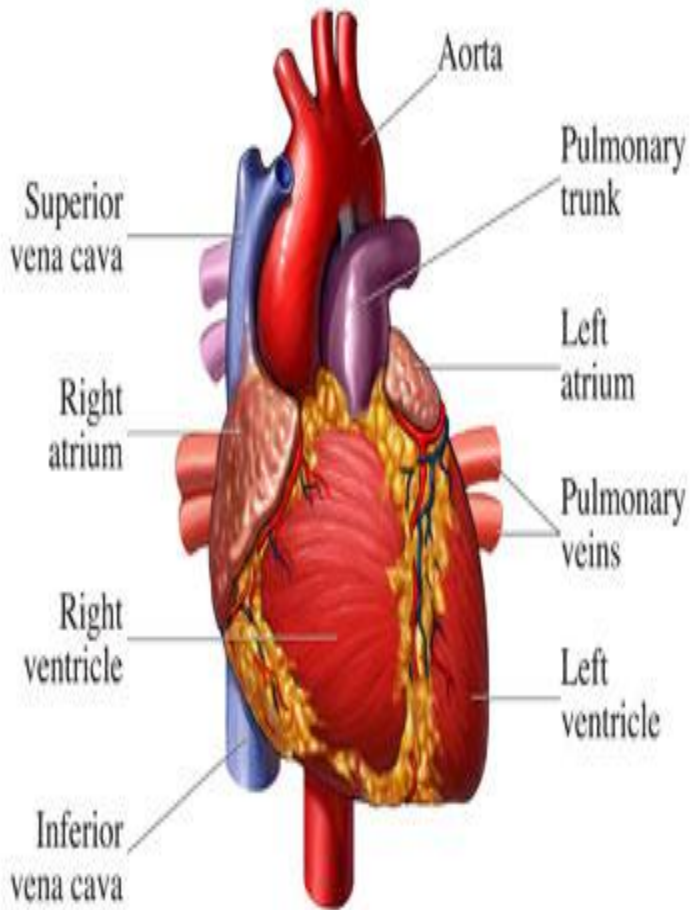


HCS

- HCS is composed of the heart and blood vessels
- Heart and vessels form an internal transport system within the body for substances (nutrients and oxygen) to and from the cells
- This system is also known as the **cardiovascular system** (cardio- means heart, while vascular means vessels)

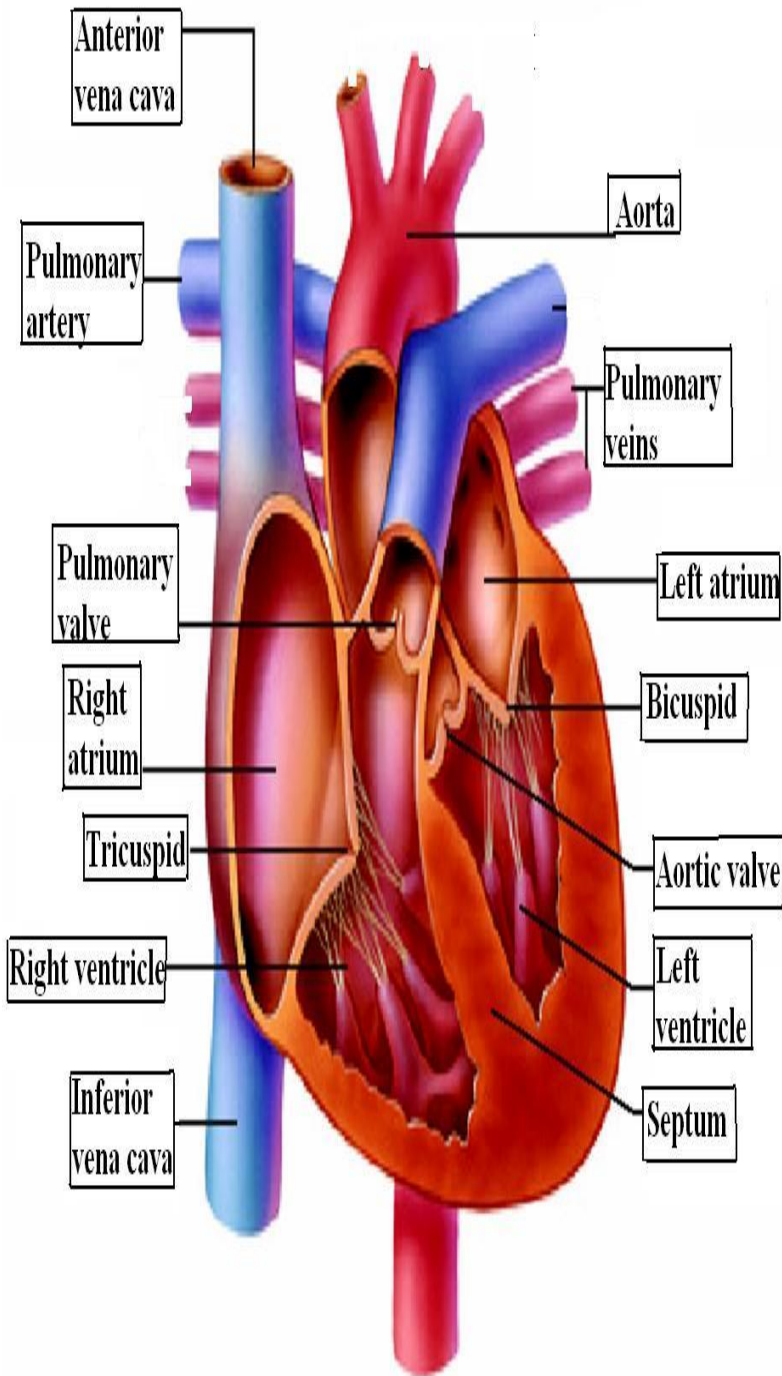


Heart



- Each day the human heart sends 7000 liters of blood through the body, and it contracts more than 2.5 billion times in a lifetime

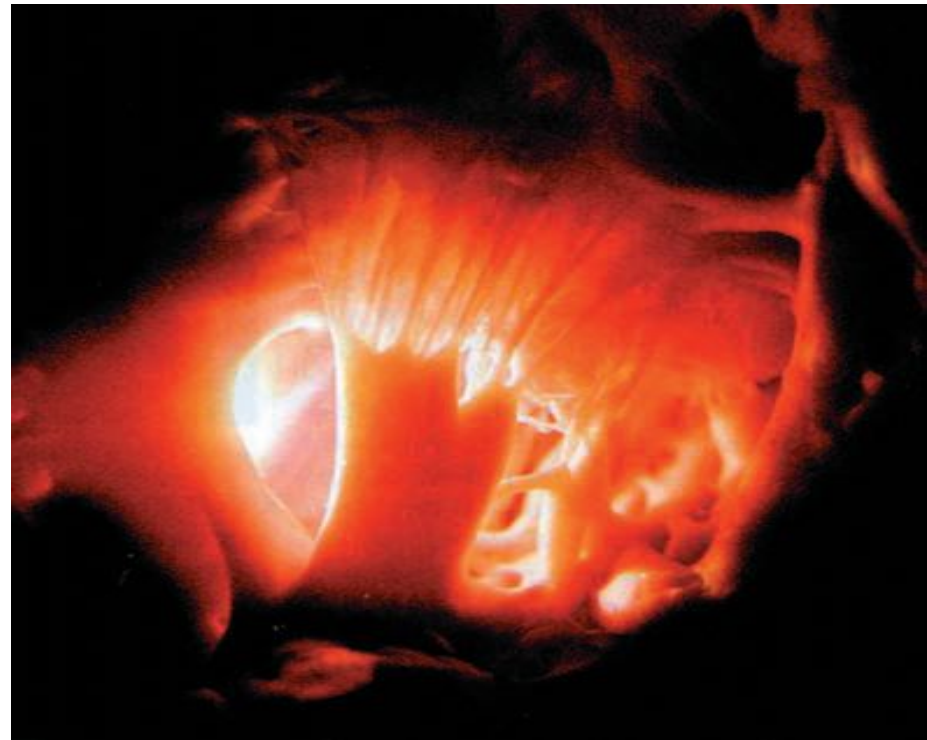
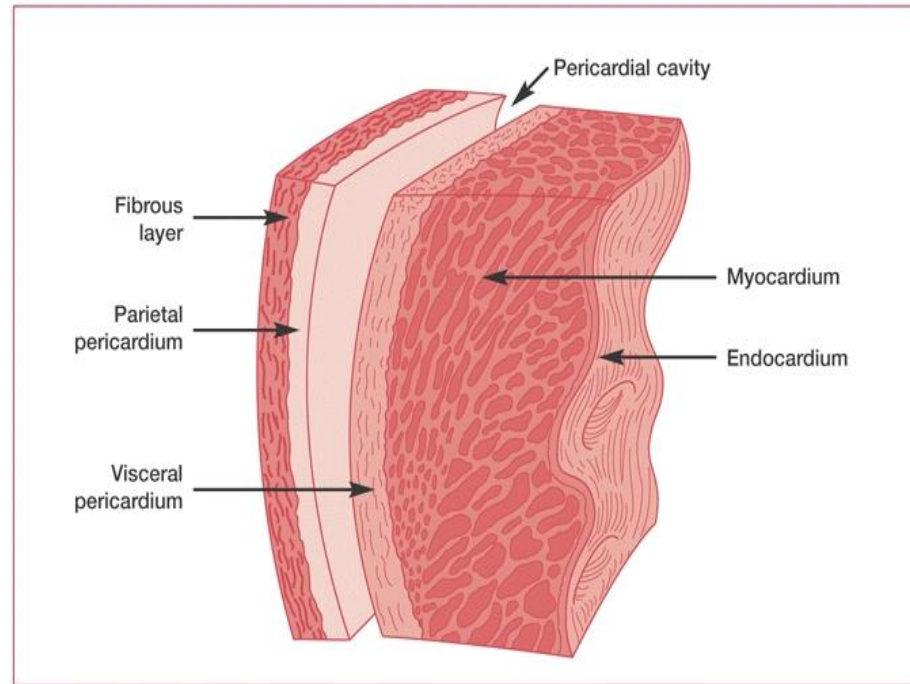
MAIN STRUCTURE OF HEART



- The heart is divided into left and right hemispheres separated by a muscular wall, the septum
- Each half of the heart has two chambers: an atrium (2) and a ventricle (2)

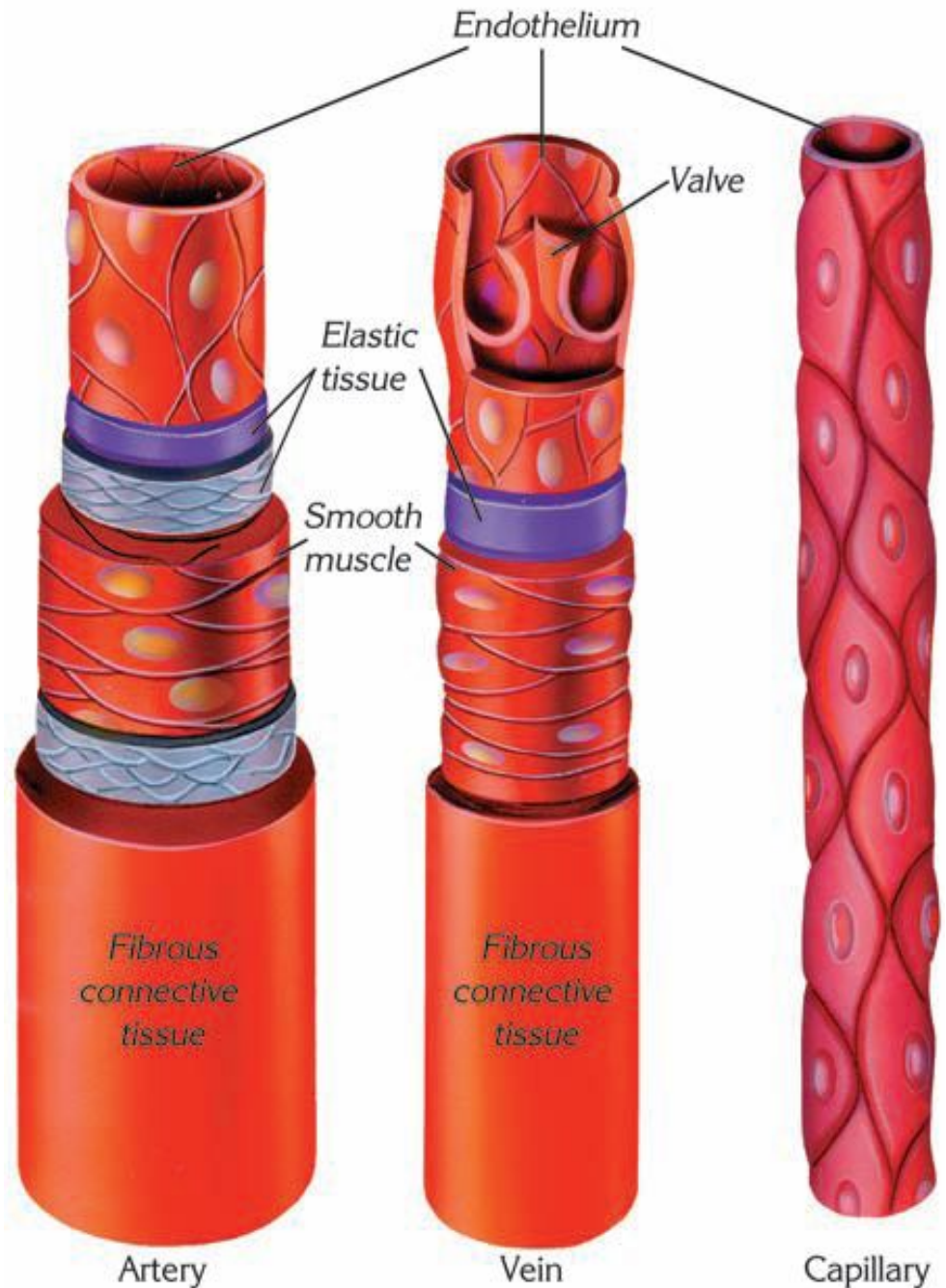
Structure of the Heart

- **The heart is composed of three main layers:**
- **Endocardium** - prevents the erosion of the heart during contraction and relaxation
- **Myocardium** – composed of cardiac muscle and main function is pumping, and there are blood vessels
- **Pericardium** - facilitates heart function and protects it from external hazards



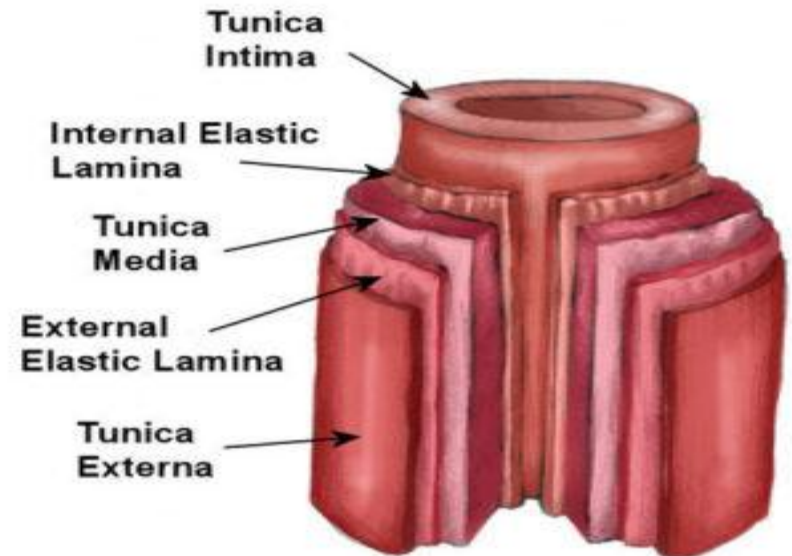
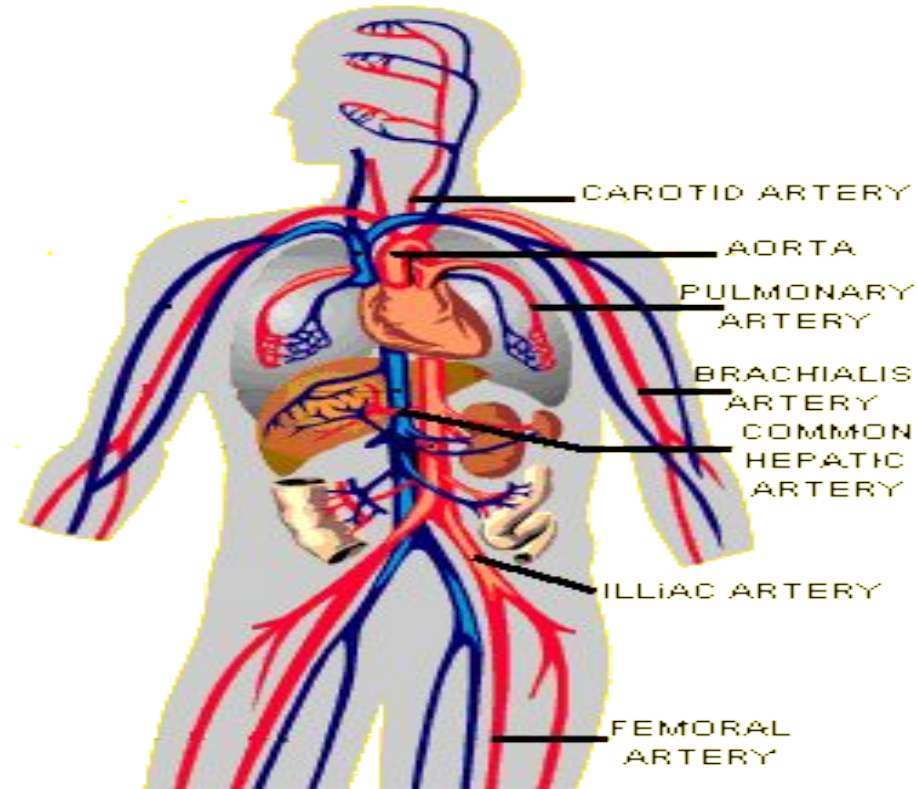
Blood Vessels

- The human circulatory system consists of arteries, veins and capillaries



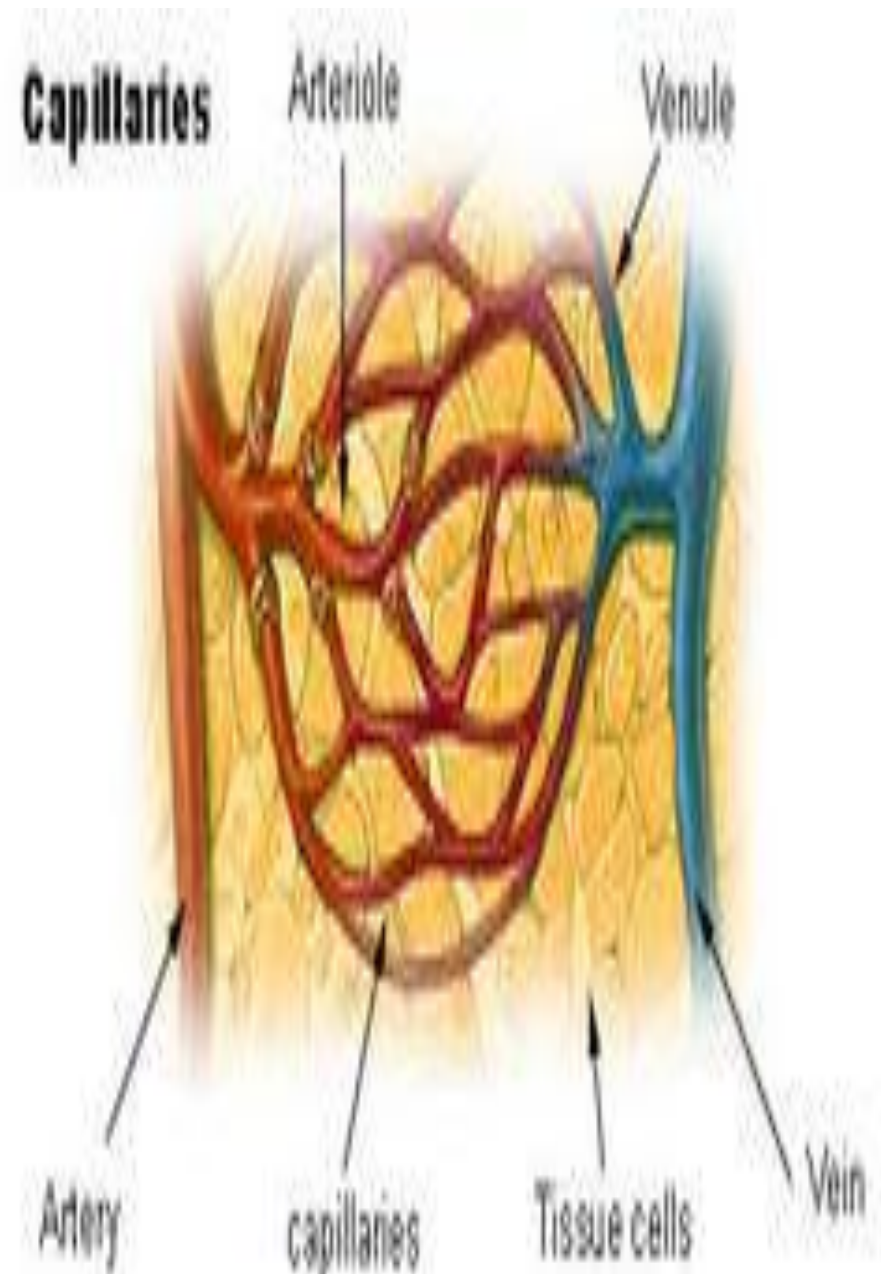
Arteries

- Transport blood from the heart to the different tissues of the body
- All arteries, with the exception of the pulmonary arteries, carry **oxygenated blood**
- Artery walls are stronger, thicker and more elastic



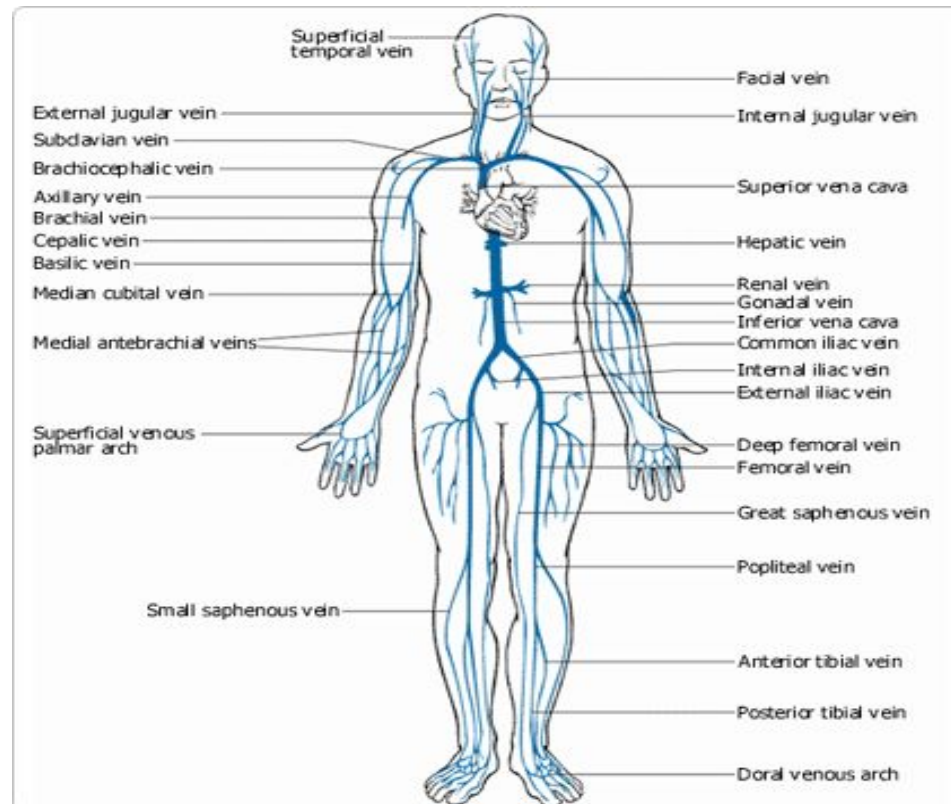
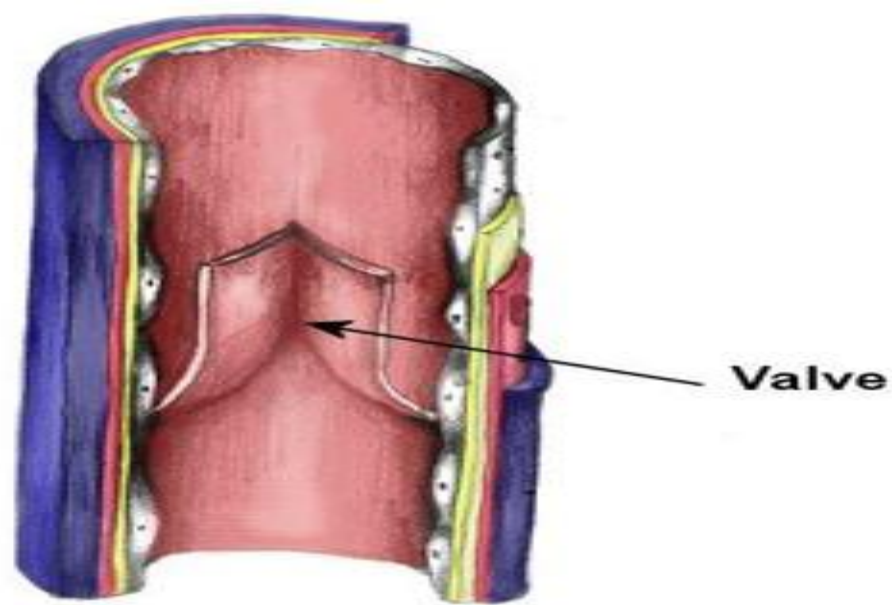
Capillaries

- Non-muscular in structure, are located between arteries and veins
- Small molecules pass easily into or from the capillaries through thin walls
- **Material exchange** between blood and tissues is carried out at the capillaries



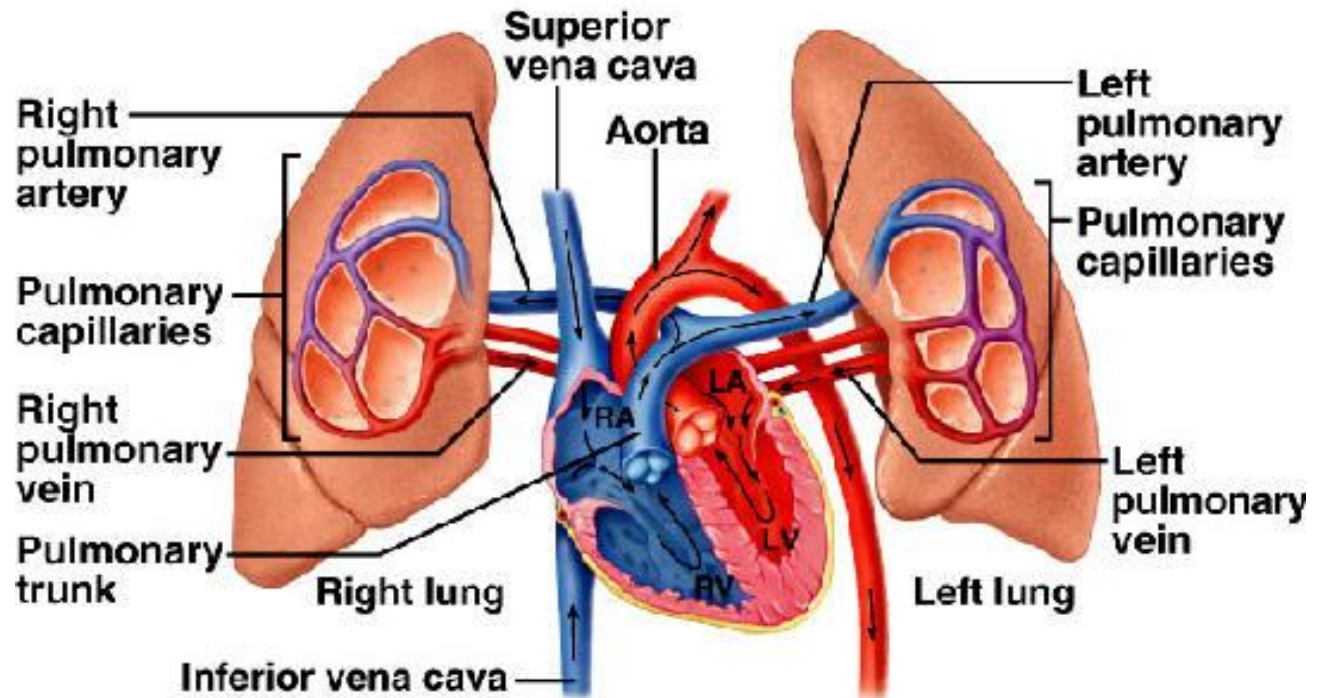
Veins

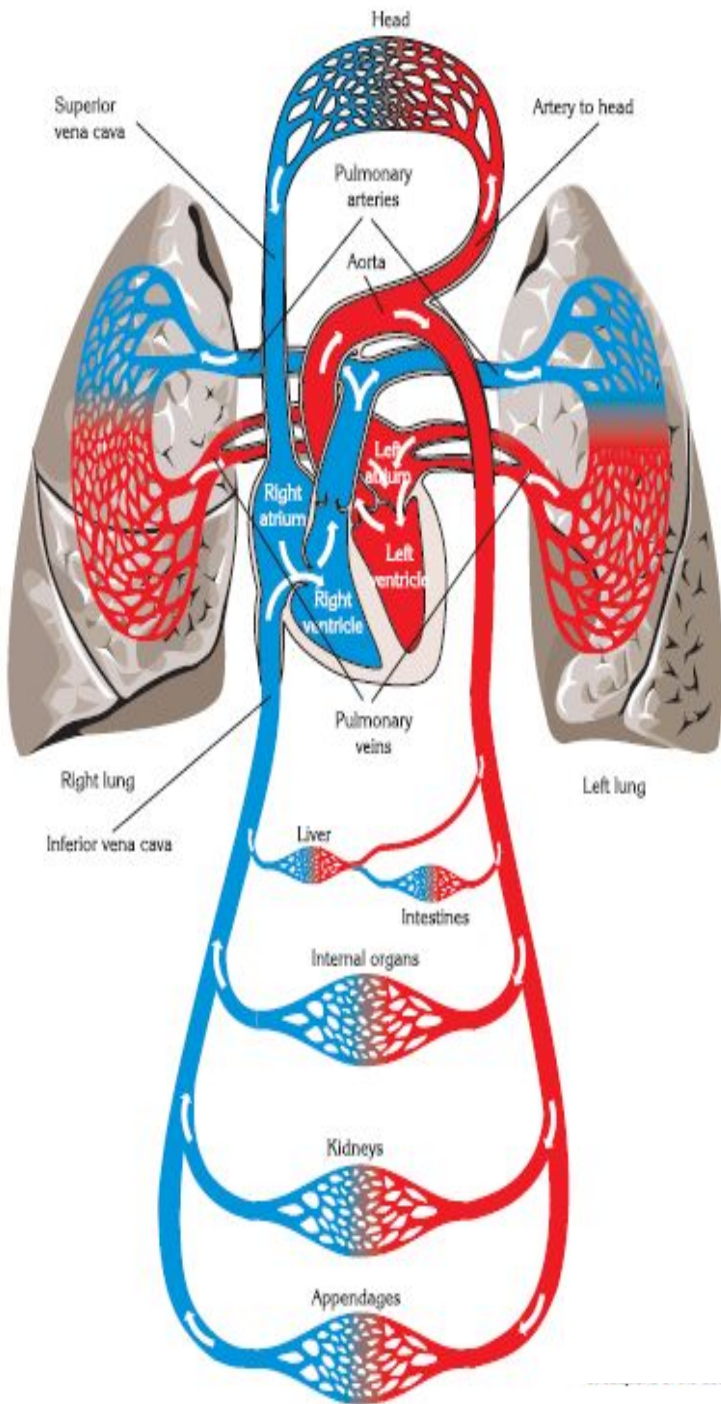
- The walls of veins are thinner than those of arteries
- The veins force the blood to move in one direction due to the presence of valves
- Veins carry **deoxygenated blood**
- Carry blood to heart



Pulmonary circulation - малый круг кровообращения

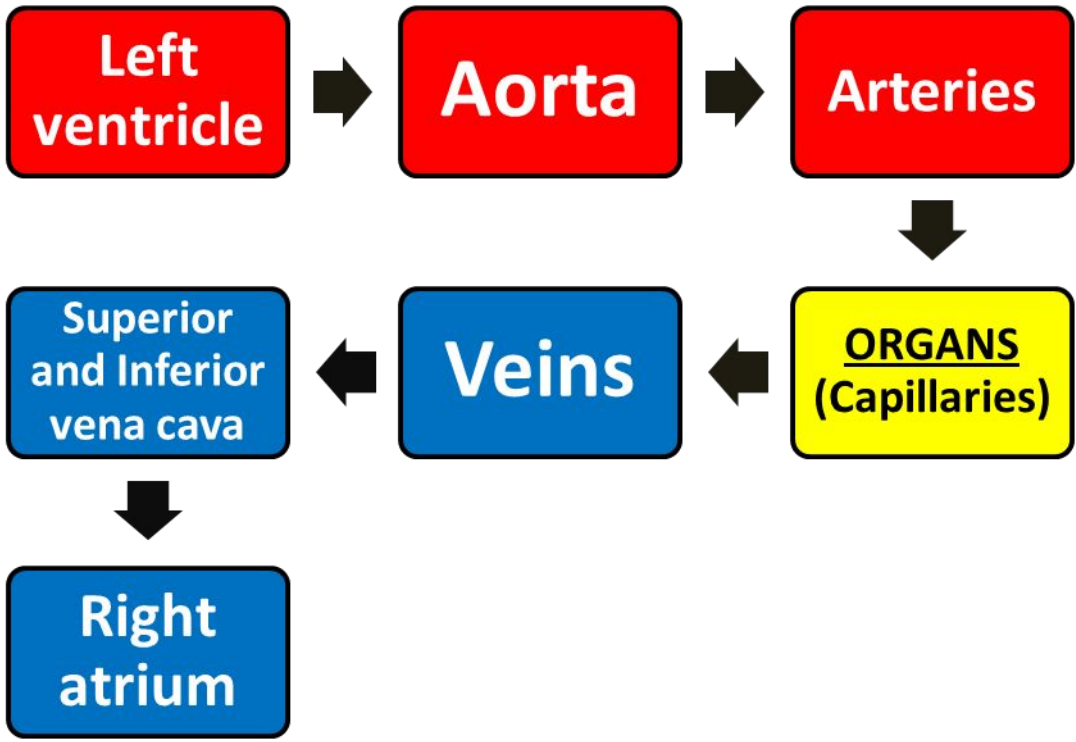
- Occurs between the heart and the lungs





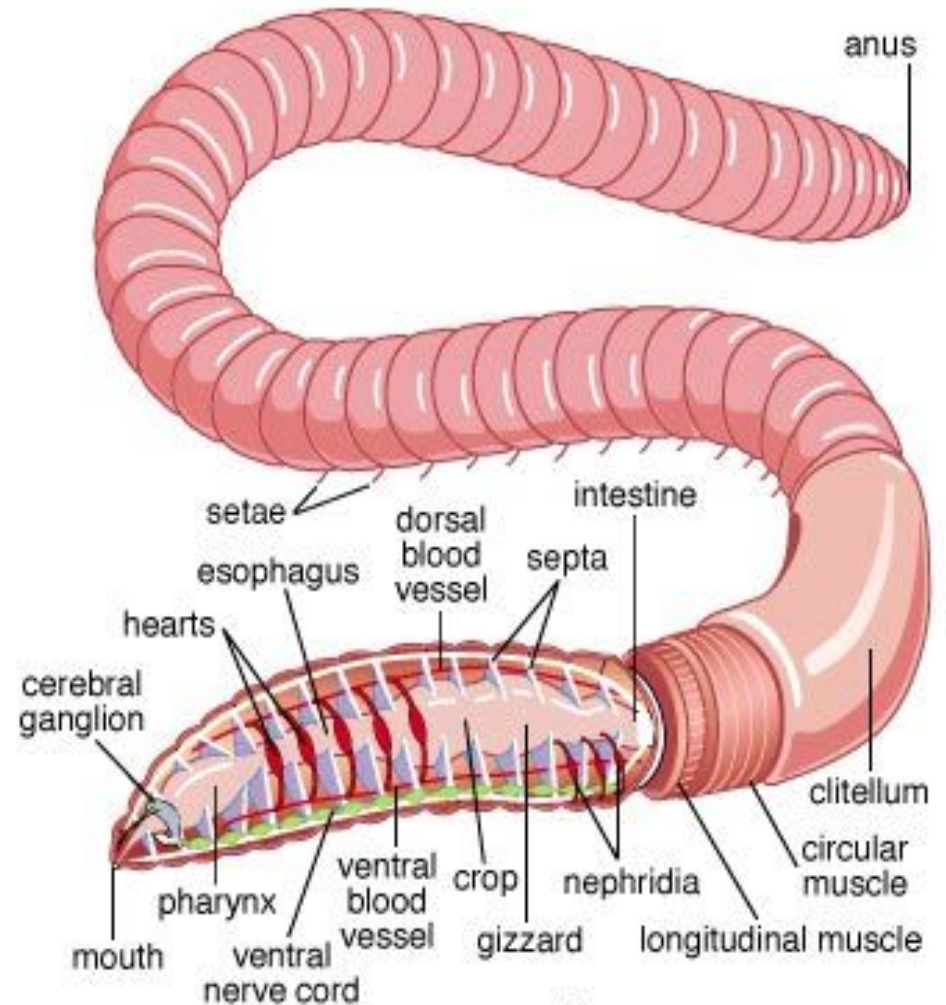
Systemic circulation - большой круг кровообращения

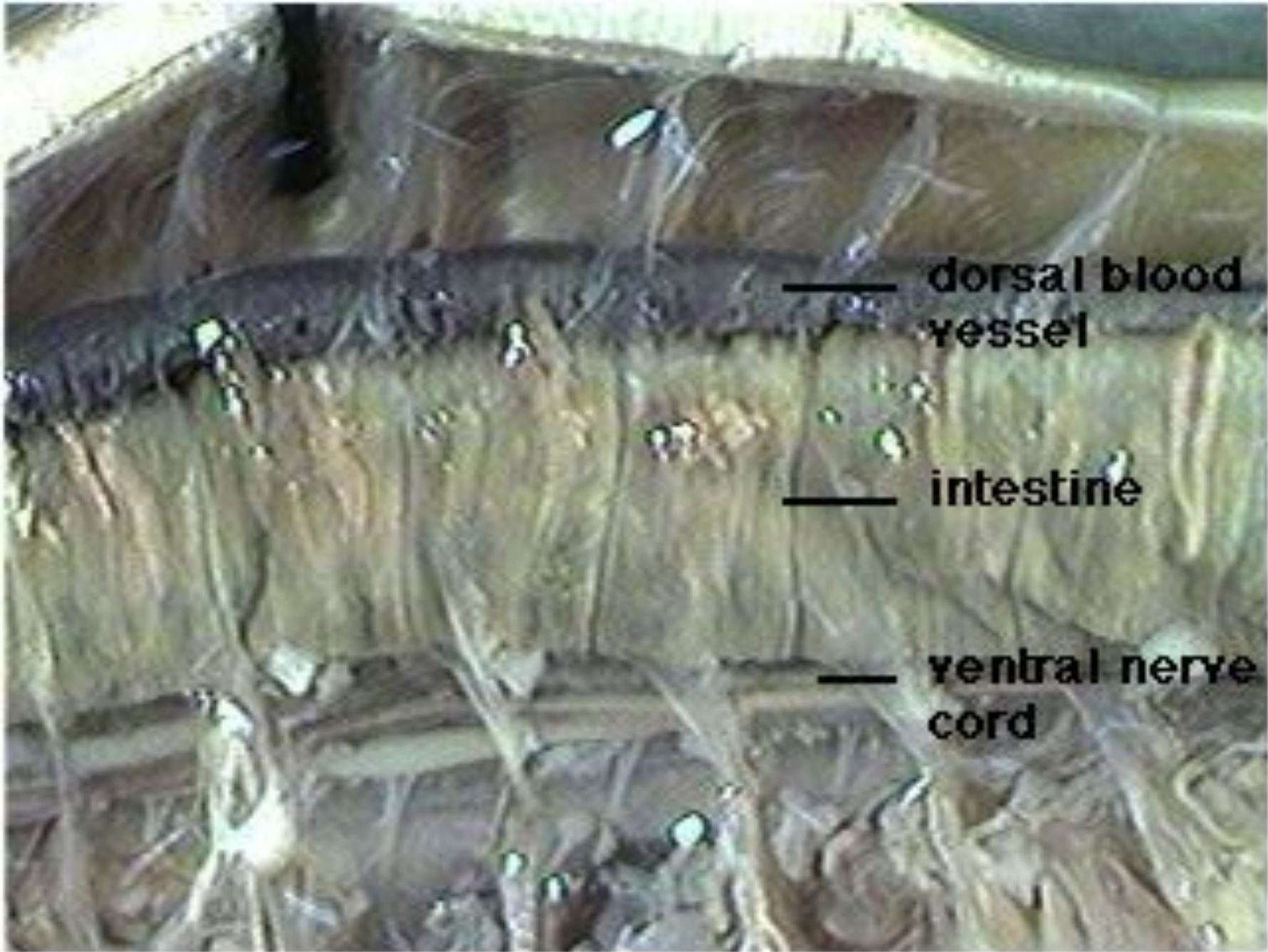
- Occurs between the heart and all other parts of the body (except the lungs) where materials and gases are exchanged



Earthworm circulatory system

Earthworm has very small body. So, it does not have a heart. Instead of the heart earthworm has small blood vessels at posterior end of the body. These vessels pump the blood through the body. Blood passes through two main blood vessels: dorsal and ventral. They are linked by crosspieces.





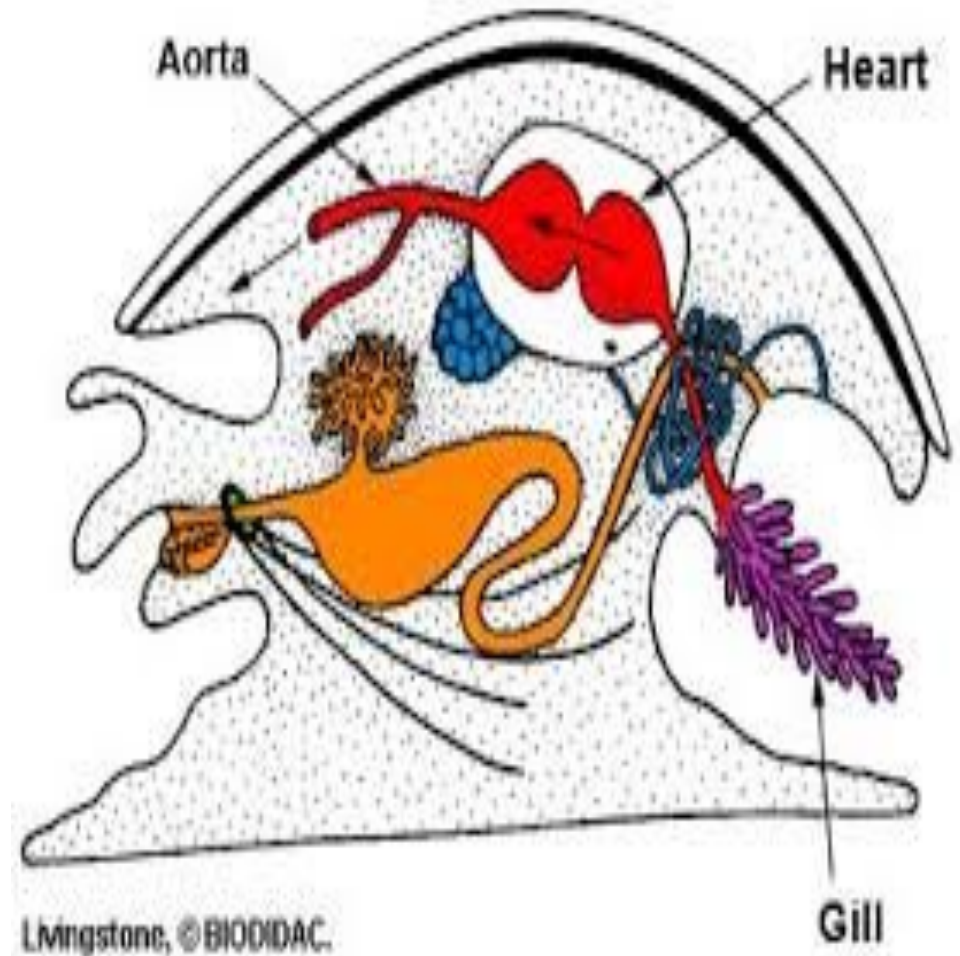
_____ dorsal blood vessel

_____ intestine

_____ ventral nerve cord

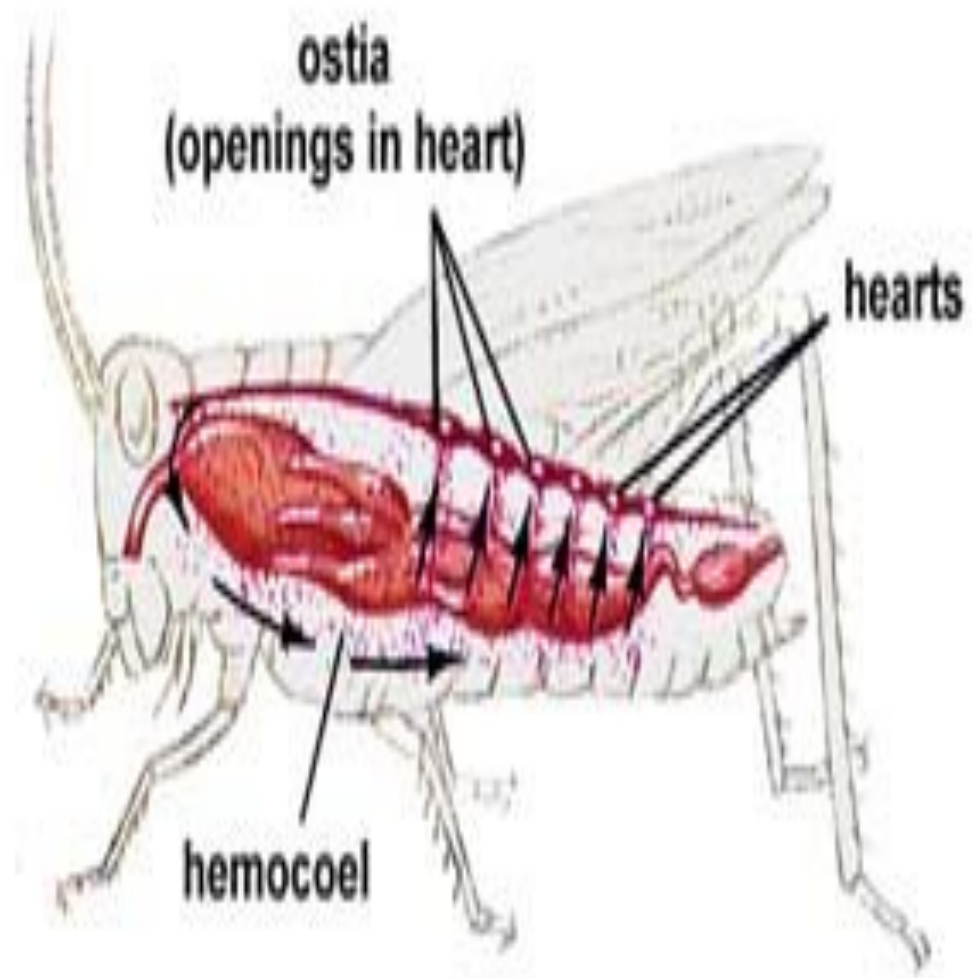
Mollusks circulatory system

Mollusks are bigger than earthworms. So, they have a heart. It consists of one ventricle and one or two atria. Blood vessels pour blood into body cavity, where blood interacts with organs and tissues. Then blood is collected into vessels again.



Arthropods circulatory system

Arthropods have tubular heart on their back. Their blood, does not always move through vessels. Vessels open into body cavity and blood interacts directly with organs and tissues. Then blood is collected into vessels again.



Terminology

English	Russian	Kazakh
Artery	Артерия	Күретамыр
Atria	Предсердие	Жүрекше
Capillary	Капилляр	Қылтамыр
Chamber	Камера	Камера
To establish	Устанавливать	Орнату
Vein	Вена	Көктамыр
Ventricle	Желудочек	Қарынша
Vessel	Сосуд	Тамыр

Terminology

English	Russian	Kazakh
Artery		
		Жүрекше
	Капилляр	
Chamber		
		Орнату
	Вена	
Ventricle		
		Тамыр