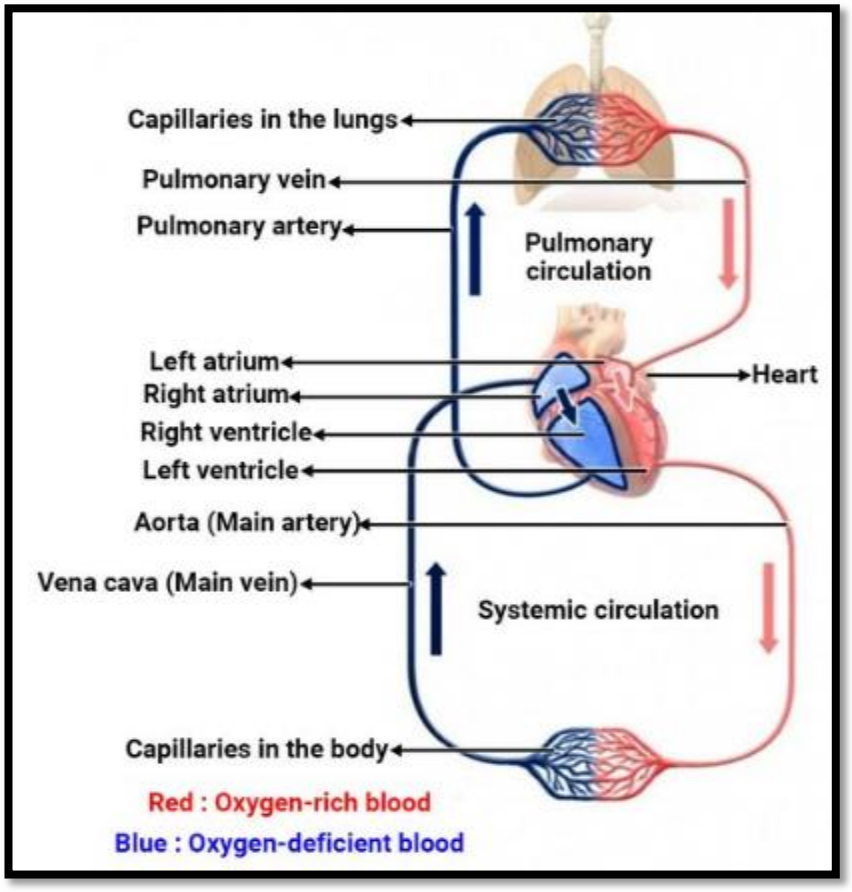
Life Processes

Double Circulation & Blood Pressure

❖ Double Circulation

The circulatory system is responsible for the transportation of nutrients and gases like oxygen, for the body and metabolic waste products away from the body. The heart and the lungs play an important role in circulating and purification of blood throughout the body. But is the heart the only organ that helps in purification? Let's have a brief study on double circulation and the relevant organs involved.



❖ Double Circulation

The heart is the key organ for blood circulation and the double circulation is an efficient way of circulation as it provides an effective way of circulation. The main difference is that the blood follows two routes – one for oxygenated blood and the other for deoxygenated blood. Hence, the name "double circulation." The majority of mammals, including humans utilize a double circulatory system.

The human-heart is divided into four chambers:

1. Left Atria
2. Right Atria
3. Left Ventricles
4. Right Ventricles

Further, the heart is connected to the lungs through the pulmonary artery and vein. In double circulation, there are two pathways in which the blood flows

This type of circulatory system has a separate systemic circulation and pulmonary circulation.

❖ **Systemic circulation** - The flow of oxygenated blood from the left ventricle of the heart to various parts of the body and deoxygenated blood from various parts of the body to the right atrium is called systemic circulation. The systemic arteries arising from the aorta carry oxygenated blood from the left of the ventricle to various parts of the body. The systemic veins carry deoxygenated blood from various parts of the body to the right atrium of the heart.

❖ **Pulmonary circulation** - The flow of deoxygenated blood from the right ventricle to the lungs and the return of oxygenated blood from the lungs to the left atrium is called the pulmonary circulation. The pulmonary trunk (right and left pulmonary artery) carries blood from the right ventricle to the lungs where the exchange of gases takes place. The oxygenated blood from the lungs returns to the left atrium of the heart through two pulmonary veins, one from each lung.

Double circulation supports a strict separation of both oxygenated and deoxygenated blood. Therefore, this circulation ensures that the body always has a dedicated supply of oxygen and also, it improves body efficiency. This is also one of the reasons why mammals can maintain their body temperatures. Apart from the double circulation, a third portal system also exists to improve circulation efficiency.

❖ **Blood pressure**

The force that blood exerts against the wall of a vessel is called blood pressure. This pressure is much greater in arteries than in veins. The pressure of blood inside the artery during ventricular systole (contraction) is called systolic pressure and pressure in artery during ventricular diastole (relaxation) is called diastolic pressure. The normal systolic pressure is about 120 mm of Hg and diastolic pressure is 80 mm of Hg.

Blood pressure is measured with an instrument called sphygmomanometer. High blood pressure is also called hypertension and is caused by the constriction of arterioles, which results in increased resistance to blood flow. It can lead to the rupture of an artery and internal bleeding.