

Circulatory System

The circulatory system is composed of two separate but related components: **the cardiovascular system and the lymphatic vascular system.**

The function of the cardiovascular system is to carry blood in both directions between the heart and the tissues.

The function of the lymphatic vascular system is to collect lymph,

Cardiovascular System

- Blood vessels

Blood vessels are basically tubular organs found within other organs.

Larger blood vessels may even have smaller vessels within their walls (the vasa vasorum). Histologically, blood vessels consist of concentric layers or "tunics" of different tissue types.

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Veins

Veins have a wall similar to that of arteries but with a thinner tunica media.

- The walls of the smallest veins (sometimes called "venules") do not include smooth muscle.

The thickness of vein walls is typically much thinner than arteries carrying a similar volume. With inch thin walls, veins tend to appear flattened or collapsed in cross-section in histological preparations (in contrast to arteries which tend to appear more round)

•Capillaries and sinusoids

Capillaries and sinusoids are the smallest (microscopic) vessels, providing communication between arteries and veins.

●Capillaries,

definition, are vessels whose diameter is so small (less than $10\mu\text{m}$) that red blood cells must pass through in single file.

Capillaries often form an interconnected plexus.

●Heart

The lining of the heart is similar to that of blood vessels, with an intima including endothelium. The pericardium (the heart's outer surface) is a serosa lined by mesothelium.

The bulk of the heart consists of cardiac muscle, one of the three distinct types of muscle in the body. (The other two muscle types are skeletal muscle and smooth muscle)

Lymphatic System

The lymphatic system consists of:

- lymphocytes -- characteristic cells of the immune system;
- lymph vessels -- channels which eventually drain into the thoracic duct and hence into the vena cava;
- lymph nodes -- specialized organs along lymph vessels, where lymphocytes proliferate;
- mucosa-associated lymphoid tissue -- like lymph nodes, sites where lymphocytes proliferate;

spleen -- another site where lymphocytes proliferate, and where worn-out red blood cells are recycled;

thymus (and bone marrow) -- organs •
where lymphocytes originate.

The lymphatic system serves two principal functions.

.The lymphatic system provides a route for excess interstitial fluid ("lymph") to return to the blood

Lymphatic vessels

lymphatic vessels (often just called lymphatics) are channels which drain excess fluid ("lymph") from tissues.

. lymphatic vessels eventually lead "downstream" to the thoracic duct, which empties into the Ana cava

while examining a histological specimen, you encounter a flattened, endothelially-lined passage that seems too delicate to be a vein but too large to be a capillary, it is probably a lymphatic.