

## Overview

The human circulatory system is divided into 3 main routes for blood flow.

Cardiac circulation: refers to blood flow within the heart

Pulmonary circulation: refers to blood flow between heart and lungs

Systemic circulation: refers to blood flow from the heart to the rest of the body

# Transport

- It pumps oxygen-rich blood to the different parts of the body. The blood's journey through the body is an extensive trip through three types of blood vessels: veins, arteries, and capillaries.

## Veins: Structure

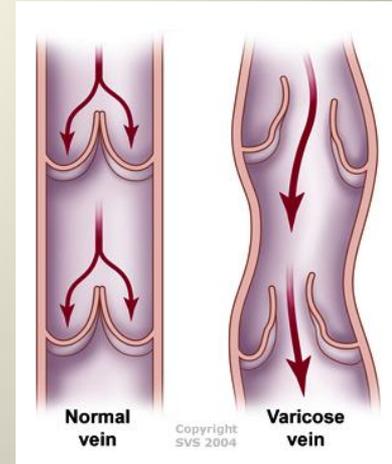
Thin walls that are not elastic/stretchy

Larger circumference which means that they have a greater volume

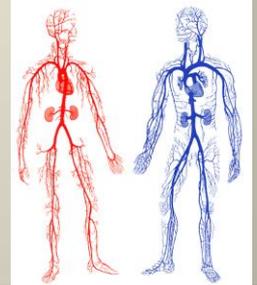
## Veins: Function

Transports blood towards the heart .

Carry Deoxygenated blood except for the \_\_\_\_\_?



# Transport System

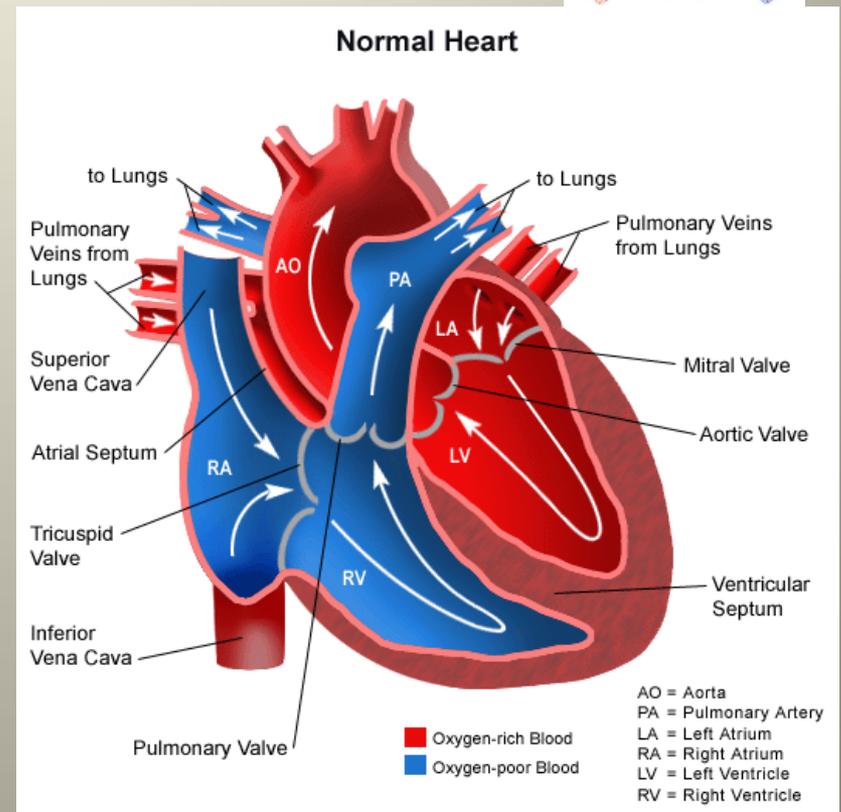


## Arteries: Structure

- Thick walls that are very elastic/stretchy
- Small circumference
- Tubes that transport blood from the heart to all the parts of the body.

## Function:

- Arteries contain oxygenated blood with the exception of the pulmonary artery
- **Arteries always carry blood away from the heart**



# Transport System

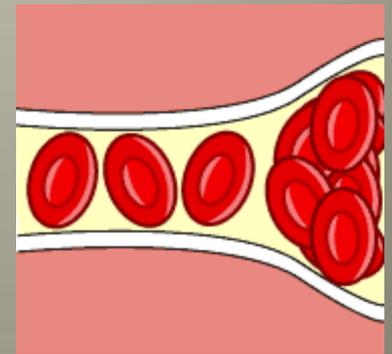
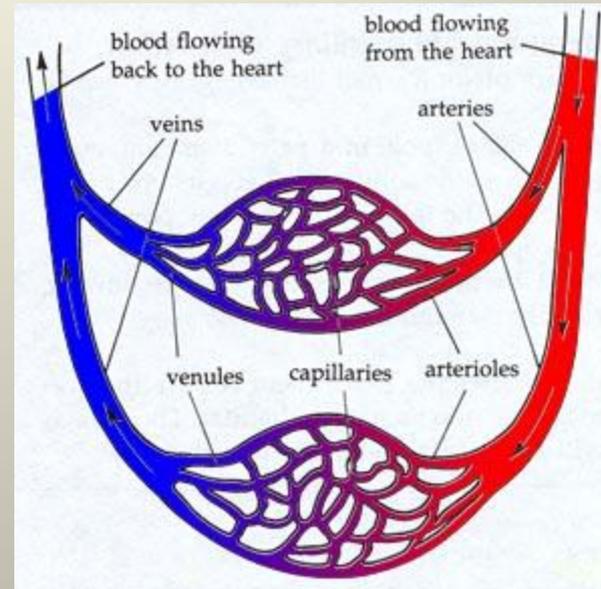
## Capillaries: Structure

- The smallest blood vessels in the body
- Capillaries are only large enough for one red blood cell to move through
- Capillaries are made up of a single layer of endothelial cells

## Function:

Capillaries function to slow blood flow so that the normal transfer of oxygen between blood and body tissue can take place.

- Allows transport of materials between the blood and the cells along the blood vessels
- Examples of materials that are transported into or out of the blood: CO<sub>2</sub>, O<sub>2</sub>, sugar

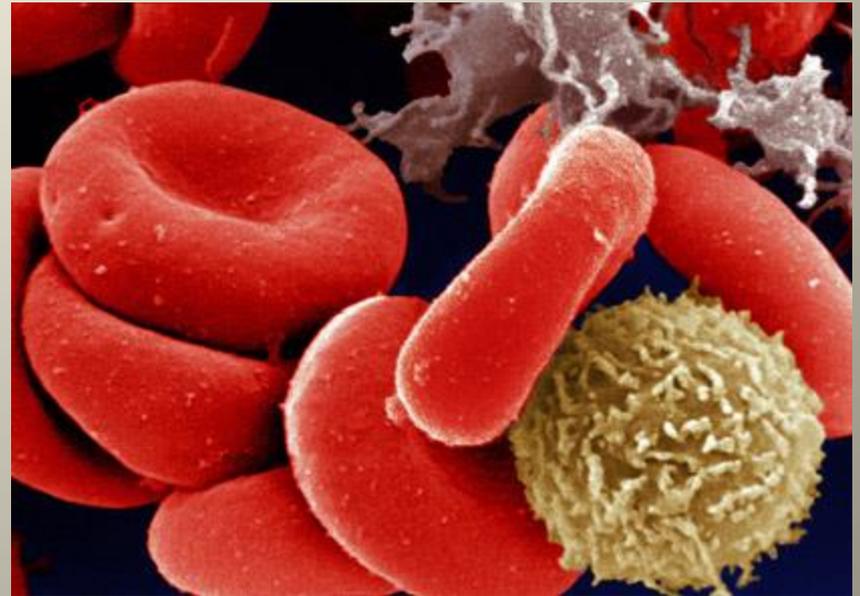


# Blood

(3-5 litres for an average grown person)

The blood is composed of:

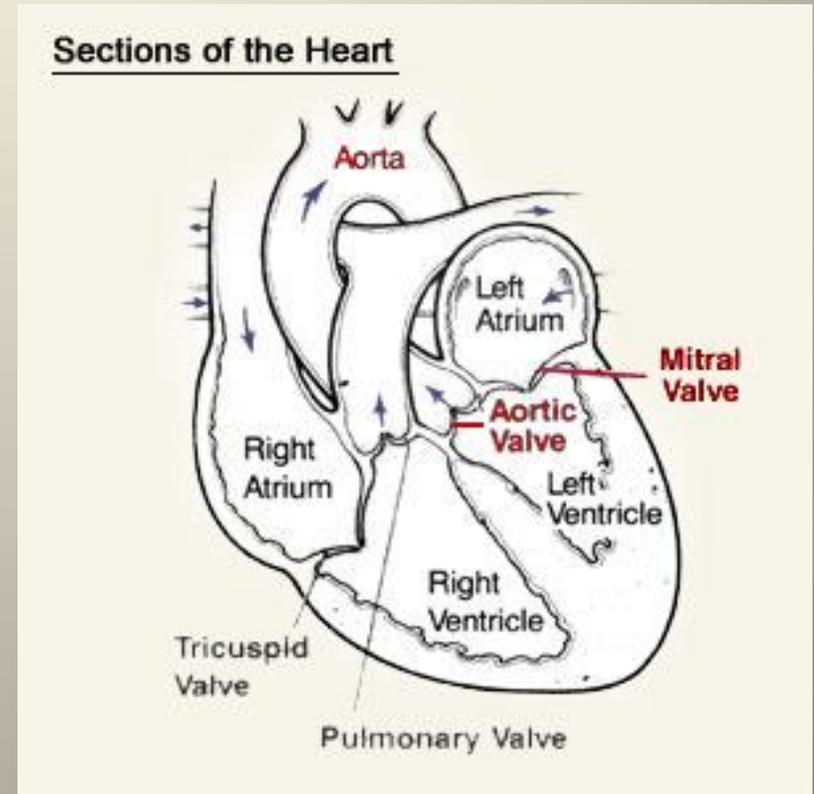
- red blood cells (erythrocyte)
  - white blood cells (leucocytes)
  - platelets
  - plasma
  - water.
- 
- The red blood cells carry the oxygen.
  - The white blood cells are part of the immune system.
  - Platelets are used when blood clots, to stop the bleeding.
  - Plasma is the remaining portion of the blood, the water in which the blood cells are suspended and contain the nutrients (amino acids, glucose).



# The structure of the Heart

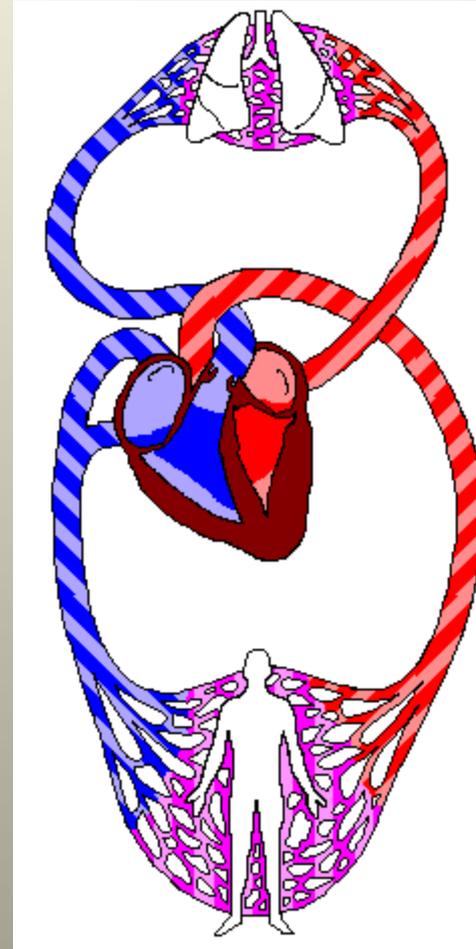
The heart is divided into four chambers:

The left and right atria, and the left and right ventricle. The atria are on the upper half of the heart and the ventricles make up the lower portion.



# Heart

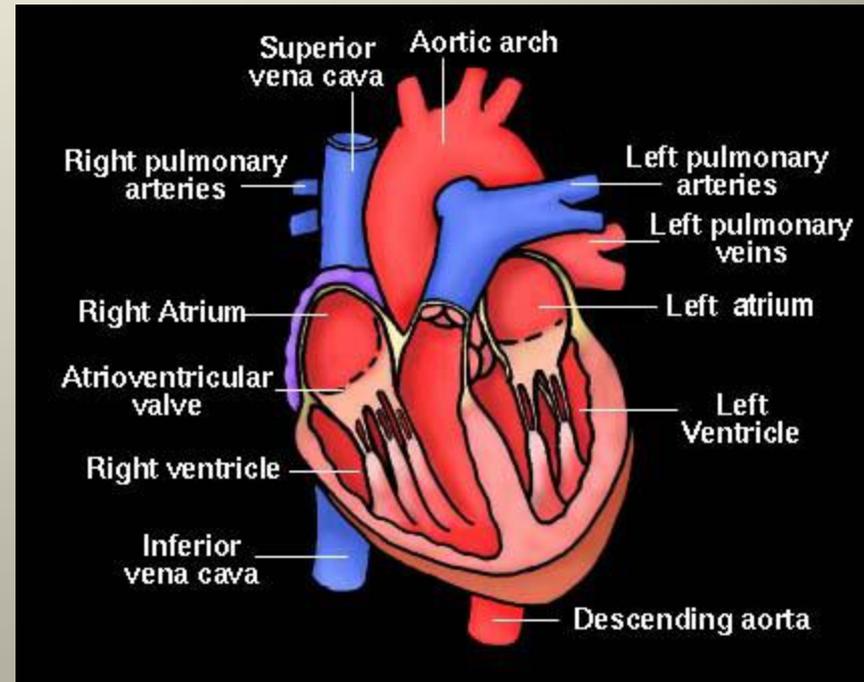
The objective of the blood is to circulate oxygen for the growth and development of cells.



# Heart

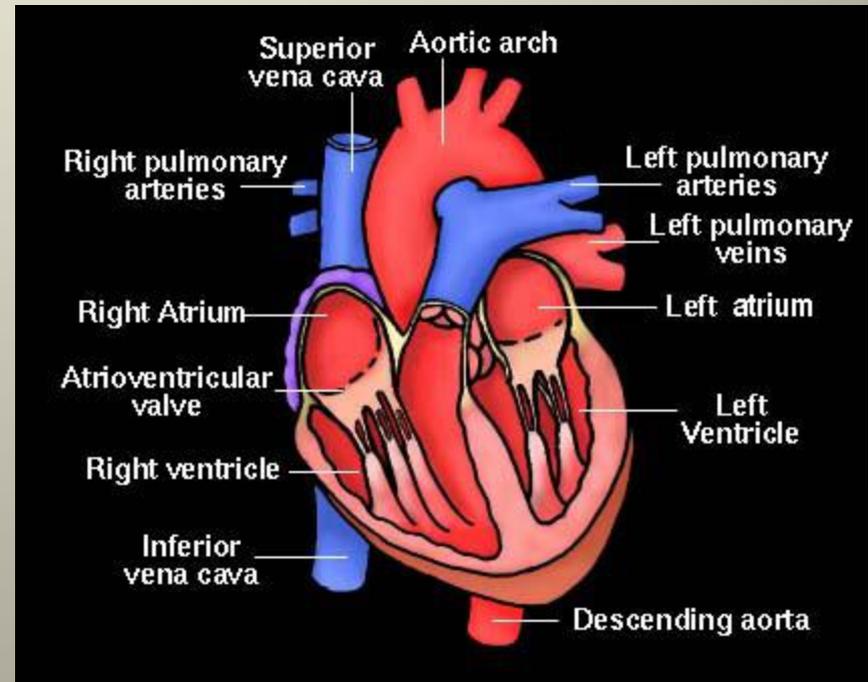
Once the blood has finished circulating through the body, the blood goes into the **right atrium** through the **superior and inferior vena cava**.

At this point is the blood oxygenated or deoxygenated?



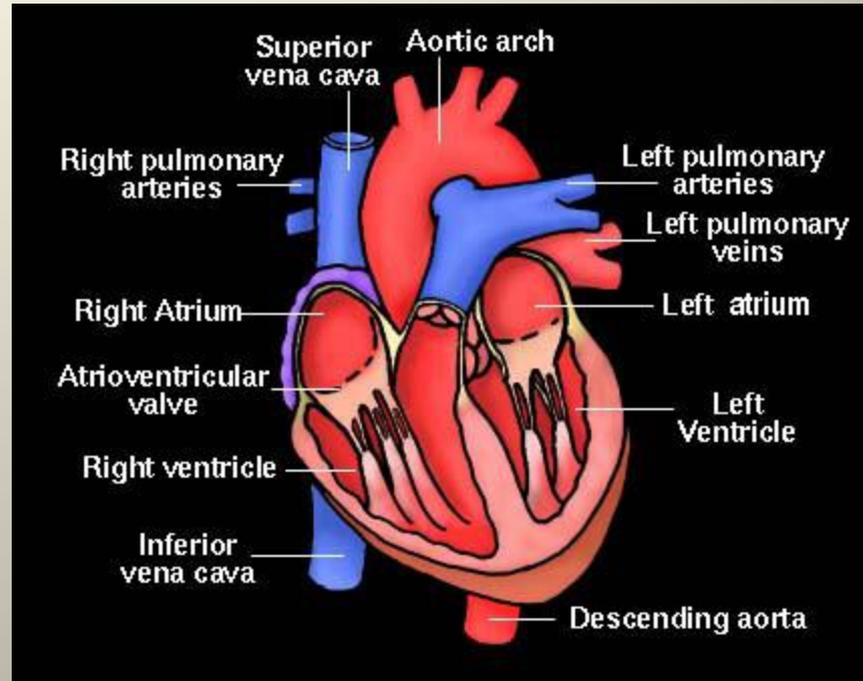
# Heart

The blood then enters the **right ventricle** through the tricuspid valve. Why is it important to have a valve between the two chambers?



# Heart

The deoxygenated blood then enters the **pulmonary artery**, where the **deoxygenated blood** is moved to the lungs. The blood now picks up **oxygen** and releases the carbon dioxide. Waste products are eliminated through breathing.

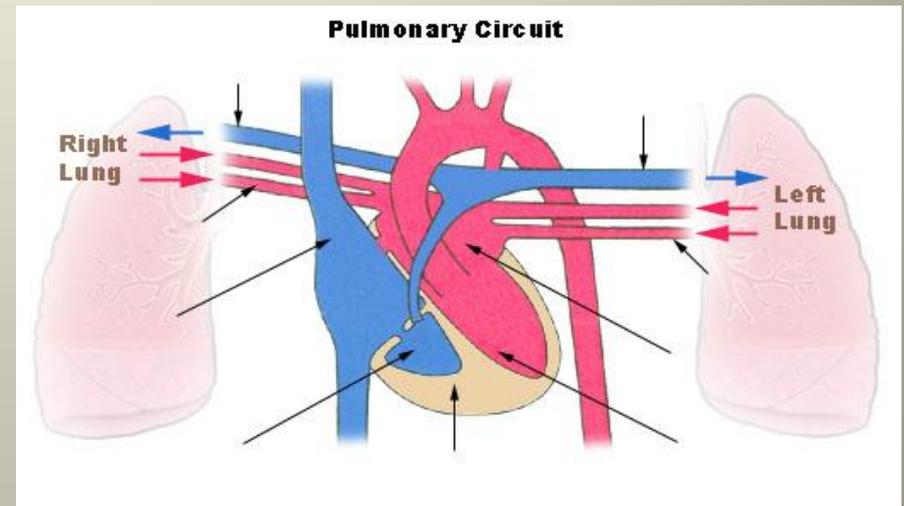




# Heart

The flow of blood from the right ventricle to the lungs and back to the left atrium is called:

**PULMONARY  
CIRCULATION**

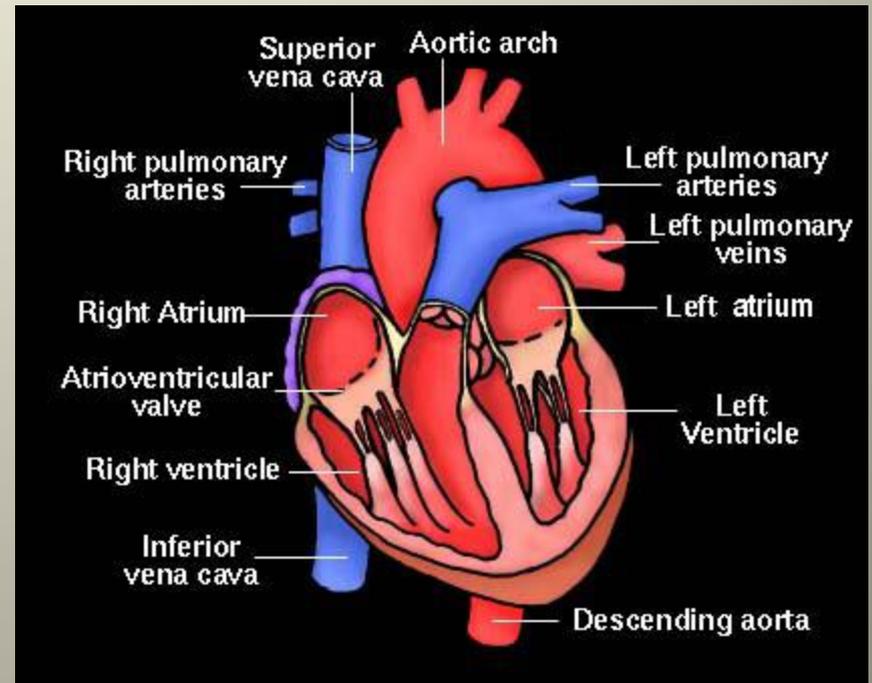


# Heart

Once the oxygenated blood is in the left atrium it enters the left ventricle through a bicuspid valve.

The left ventricle then contracts and pumps the oxygenated blood to all parts of the body.

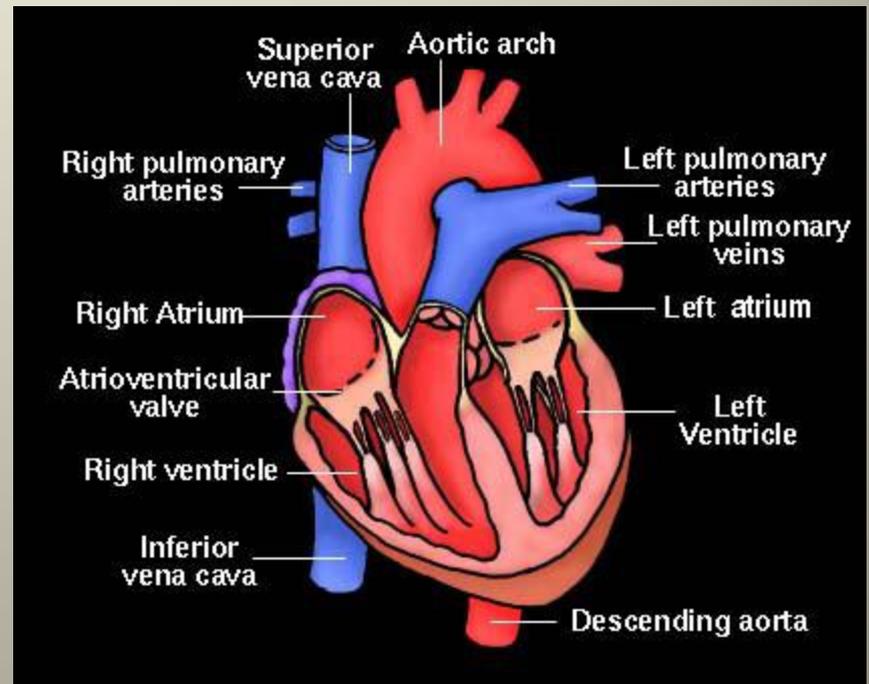
**The left ventricle has the greatest amount of muscle tissue...why?**



# Heart

The flow of blood from the left ventricle to all parts of the body is called:

**SYSTEMIC CIRCULATION**



# Interesting Facts

- Your system of blood vessels – arteries, veins and capillaries – is over 60,000 miles long. That's long enough to go around the world more than twice!
- The adult heart pumps about 5 quarts of blood each minute – approximately 2,000 gallons of blood each day – throughout the body.

# Interesting Facts

- When attempting to locate their heart, most people place their hand on their left chest. Actually, your heart is located in the center of your chest between your lungs. The bottom of the heart is tipped to the left, so you feel more of your heart on your left side of your chest.
- The heart beats about 100,000 times each day.

# Interesting Facts

- In a 70-year lifetime, the average human heart beats more than 2.5 billion times
- An adult woman's heart weighs about 8 ounces, a man's about 10 ounces
- A child's heart is about the size of a clenched fist; an adult's heart is about the size of two fists.
- Blood is about 78 percent water.
- Blood takes about 20 seconds to circulate throughout the entire vascular system.