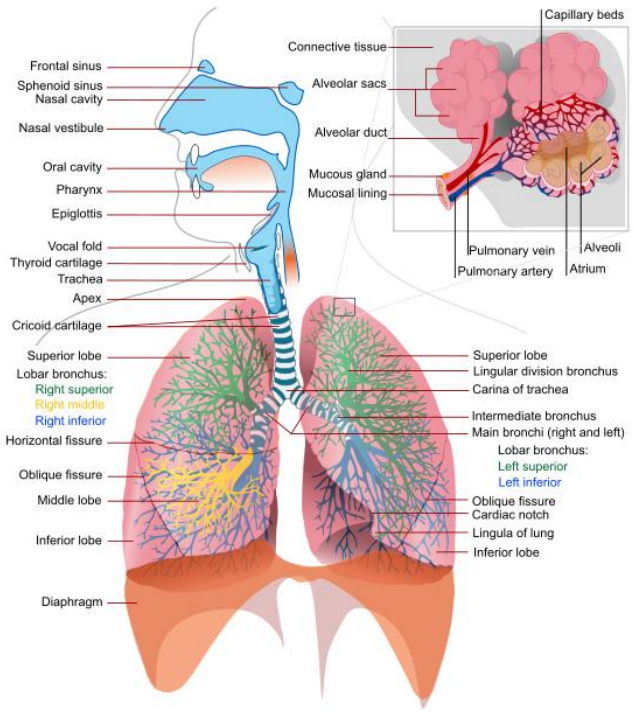
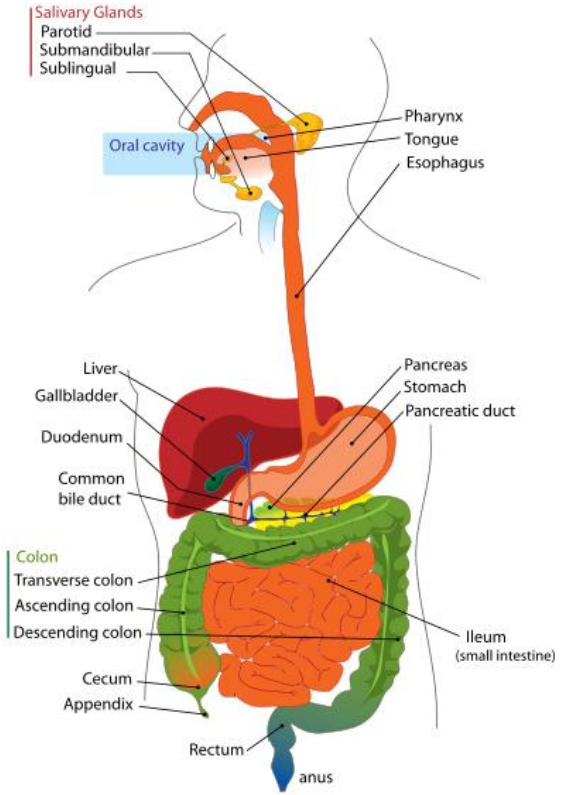
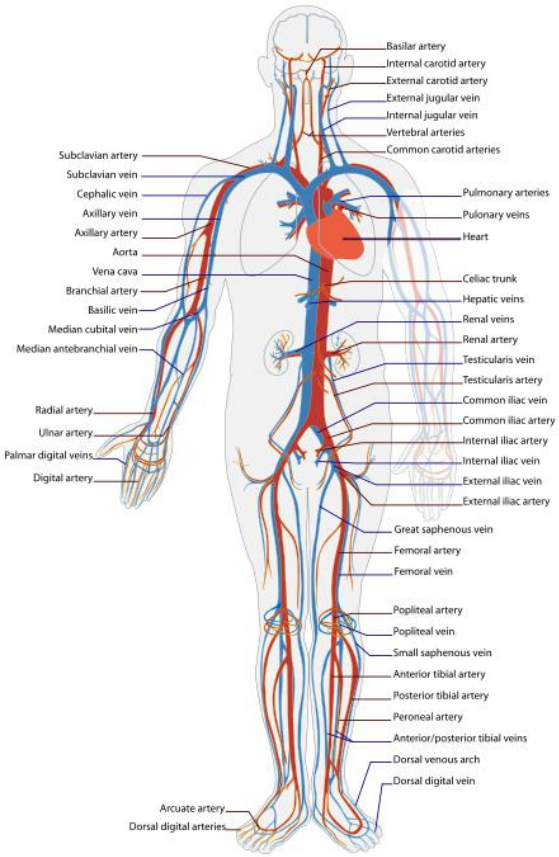






Body Systems Interactions:

Absorption and Distribution

Cellular Respiration

$$C_6H_{12}O_6 + 6O_2 \longrightarrow 6H_2O + 6CO_2 + \text{energy}$$

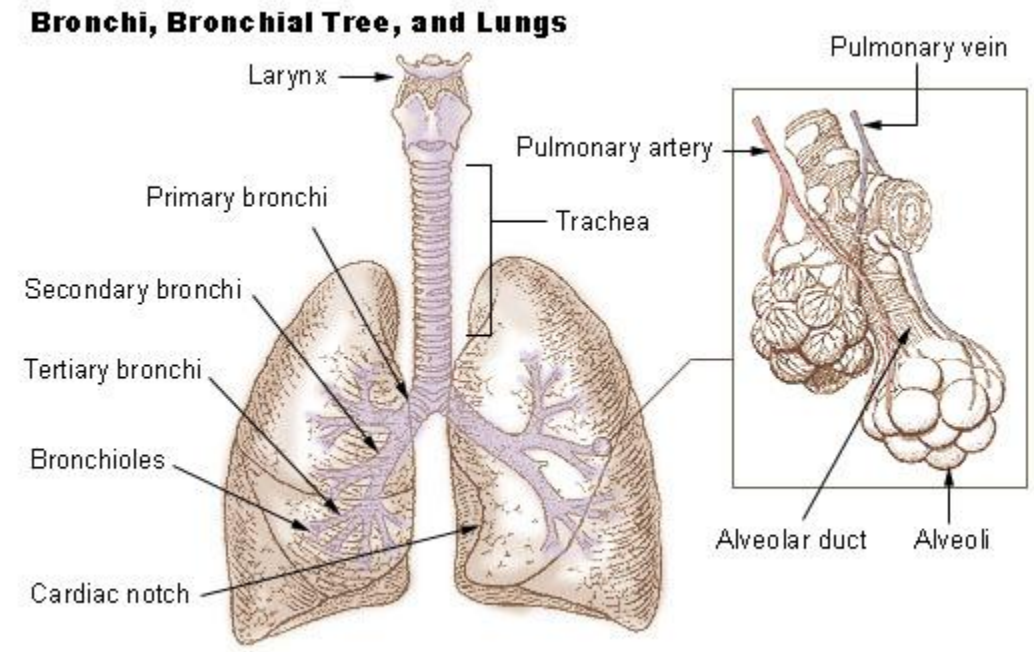
Glucose Oxygen Water Carbon Dioxide

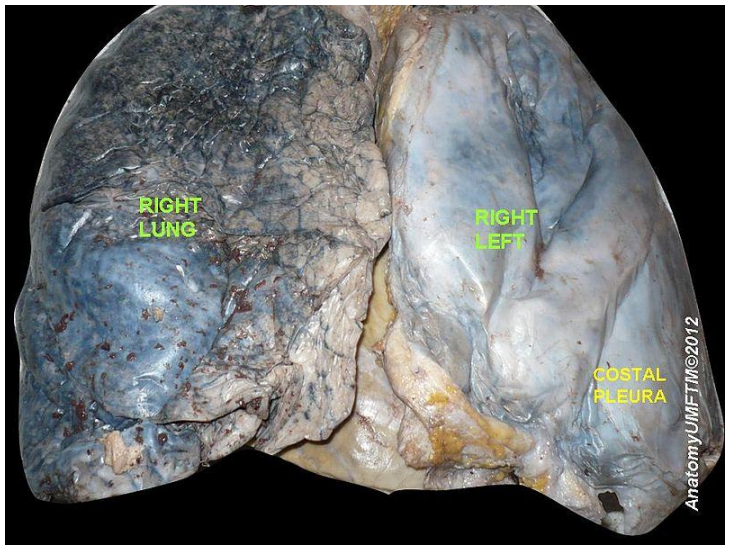
Your body is made of cells, and every cell in your body needs oxygen and food so that they can maintain homeostasis. They also need a steady supply of nutrients to make proteins, copy DNA, and expand membranes.

Your body has organ systems that *absorb* and *distribute* O_2 and nutrients for all of your cells!

Respiratory System

The respiratory system absorbs oxygen for your body. The main organs of your respiratory system are your lungs. Air moves in and out of the lungs as you breathe.

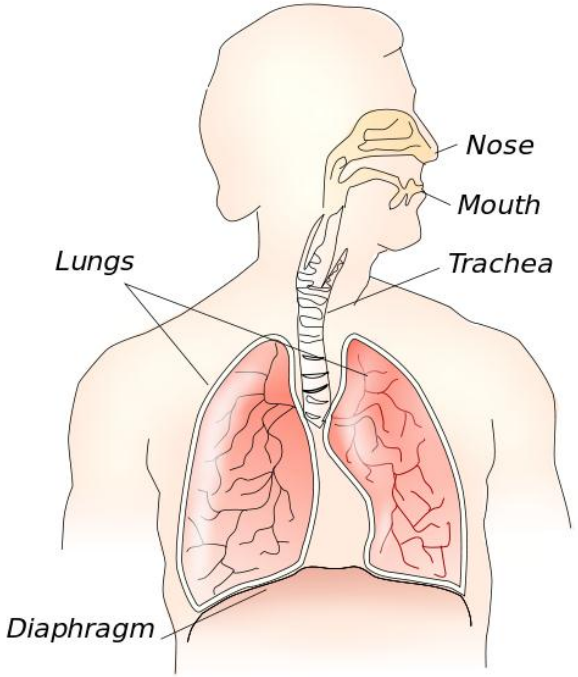


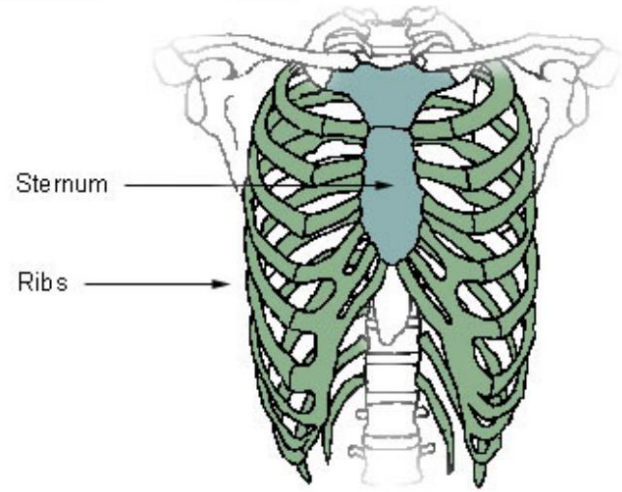


Respiratory System

The diaphragm contracts and the ribcage expands to open up the lungs and draw in the air.

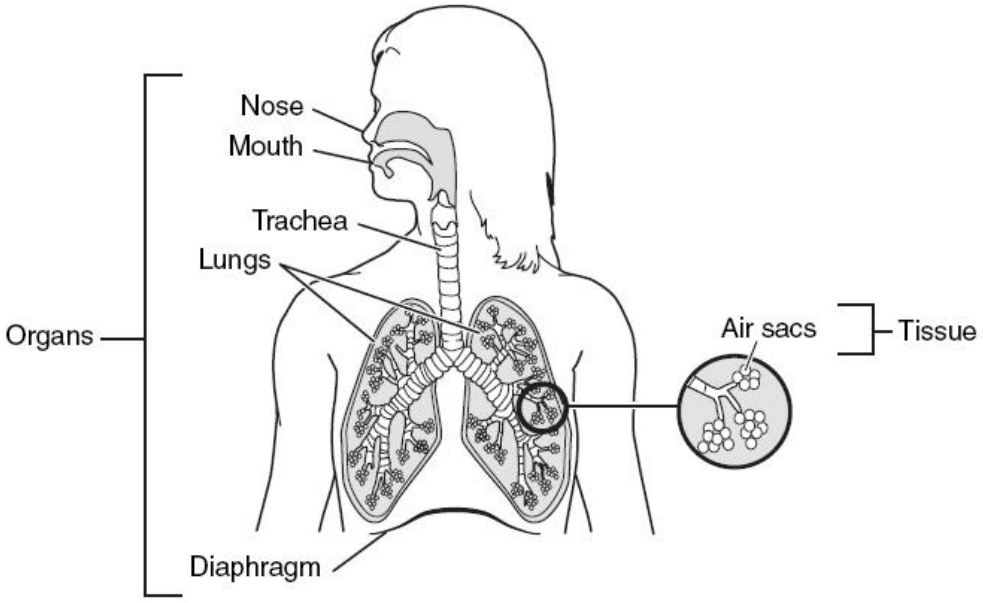
The muscular (diagphragm) and skeletal (ribcage) systems both interact with the respiratory system to allow for breathing.

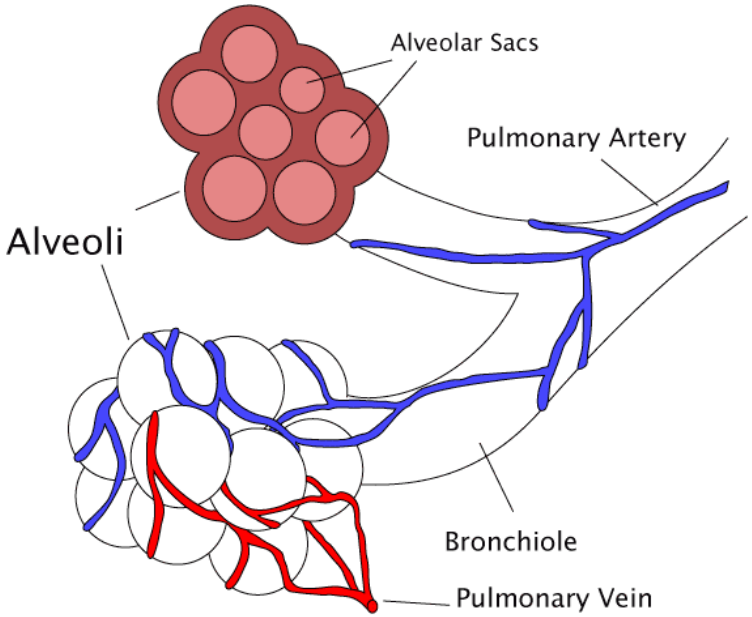




Respiratory System

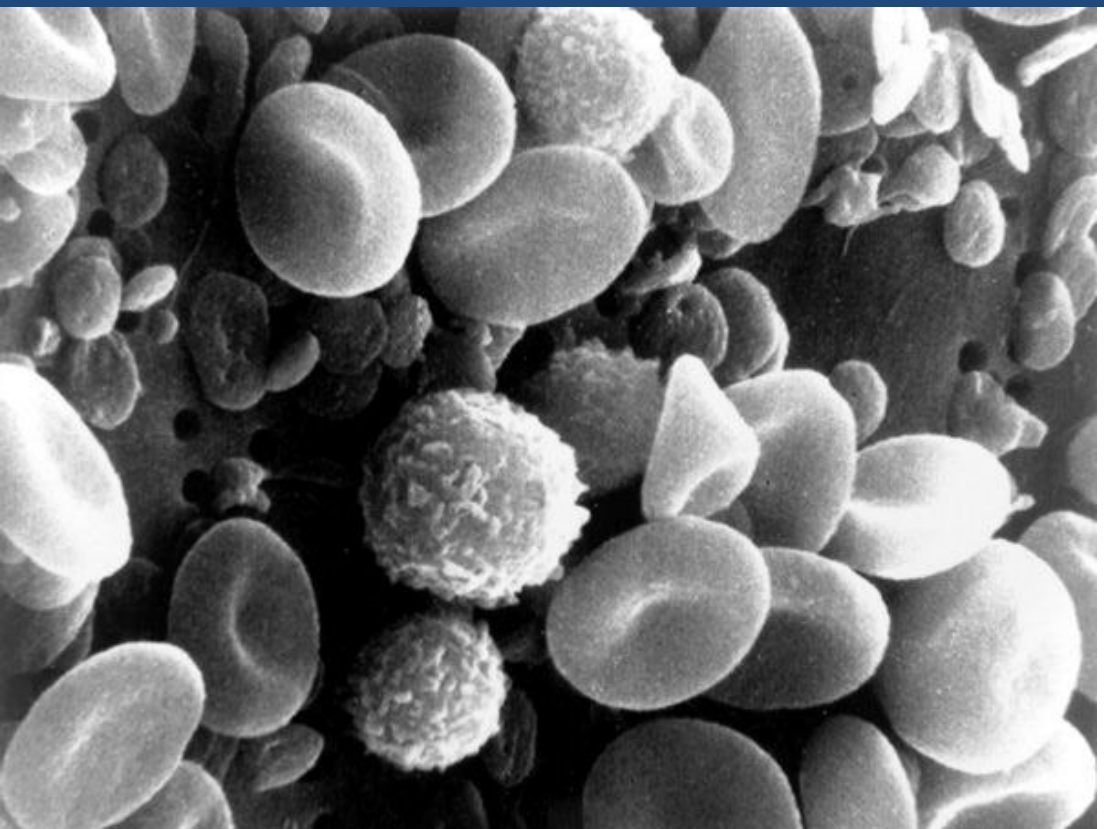
The lungs are filled with tiny air sacs known as alveoli. These sacs are covered with blood vessels, and they fill with air so oxygen can diffuse into the blood.

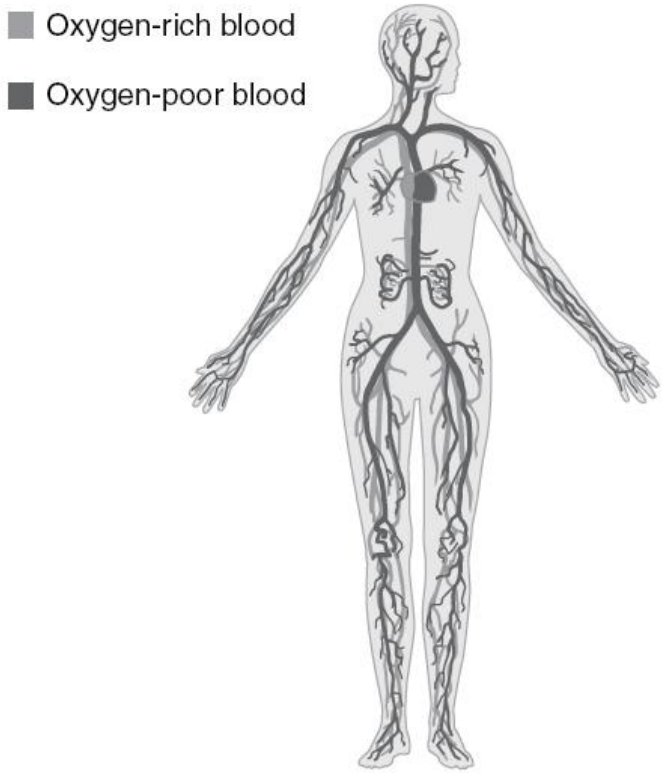




Respiratory System

Once in the blood, O_2 attaches to hemoglobin molecules found in the red blood cells. Blood is the main tissue of the circulatory system.





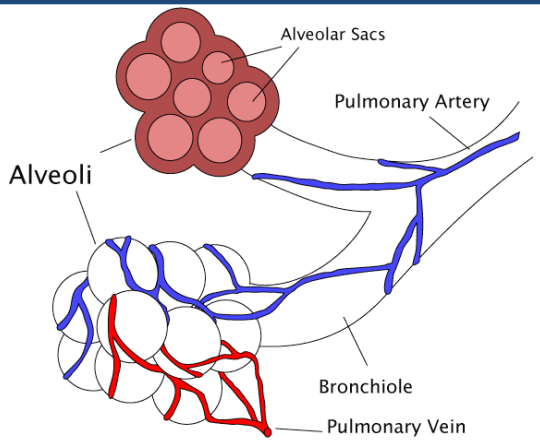
Respiratory System

Carbon dioxide (CO_2) is a waste product made in the cells. CO_2 diffuses into the lungs from the blood so it can be *exhaled*.

Cellular Respiration

$$C_6H_{12}O_6 + 6O_2 \longrightarrow 6H_2O + 6CO_2 + \text{energy}$$

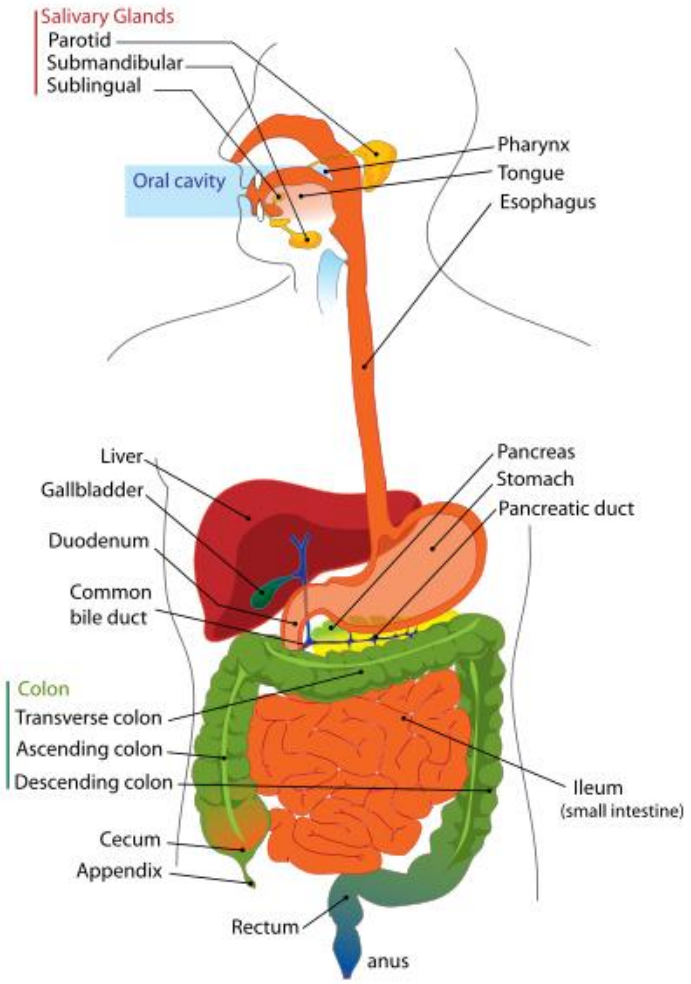
Glucose Oxygen Water Carbon Dioxide



Removing carbon dioxide from the body is the job of the respiratory system.

Digestive System

The digestive system breaks down and absorbs nutrients for your body. The main organs of your digestive system are found along the gastrointestinal tract. These include your *stomach* and your *small and large intestines*.

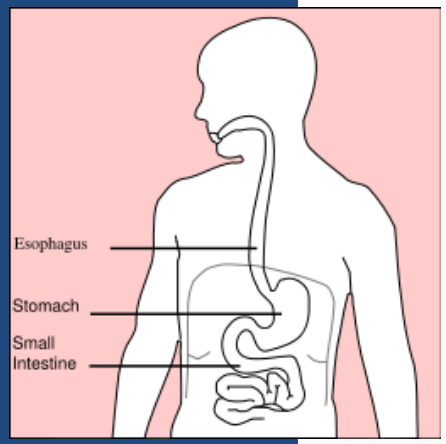


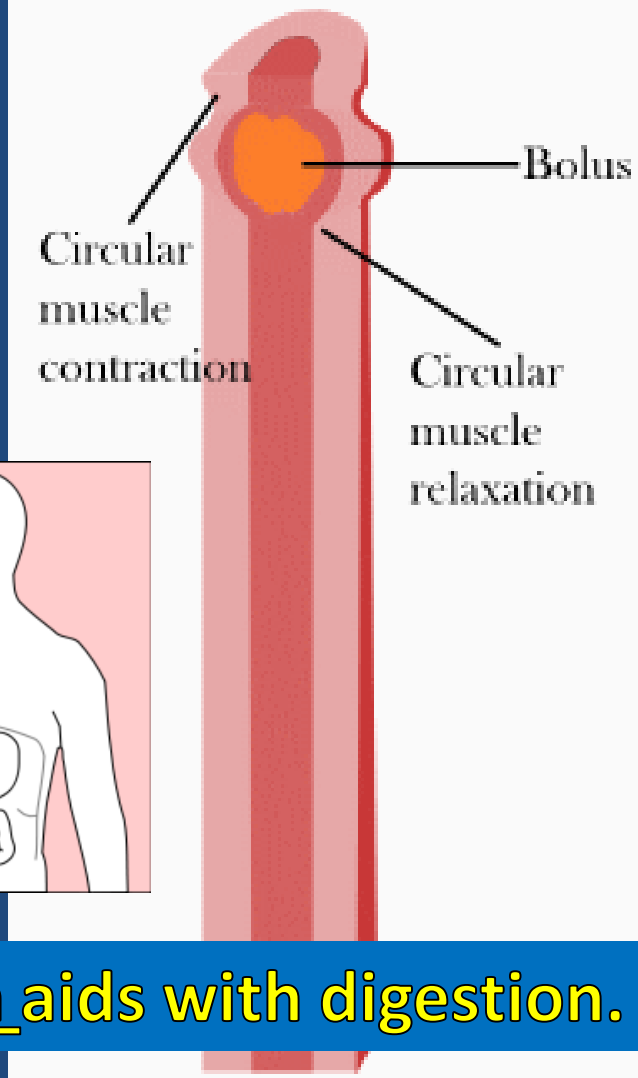
Gastro- means ***stomach***

Digestive System

Digestion begins in the mouth as you chew food into small pieces.

Food is moved through the digestive system by a series of *muscle contractions* known as peristalsis.

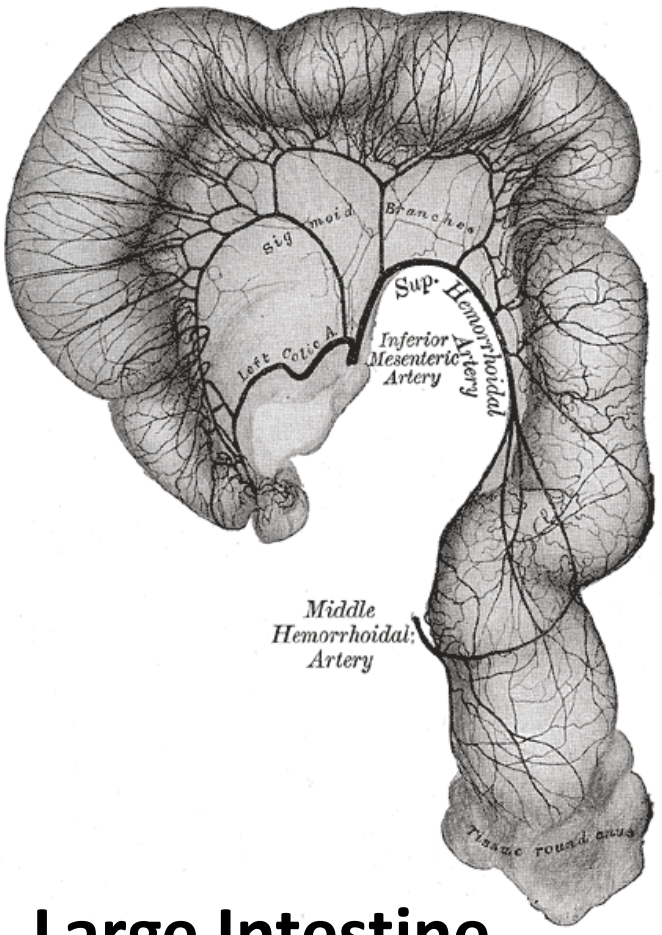




This shows how the muscular system aids with digestion.

Digestive System

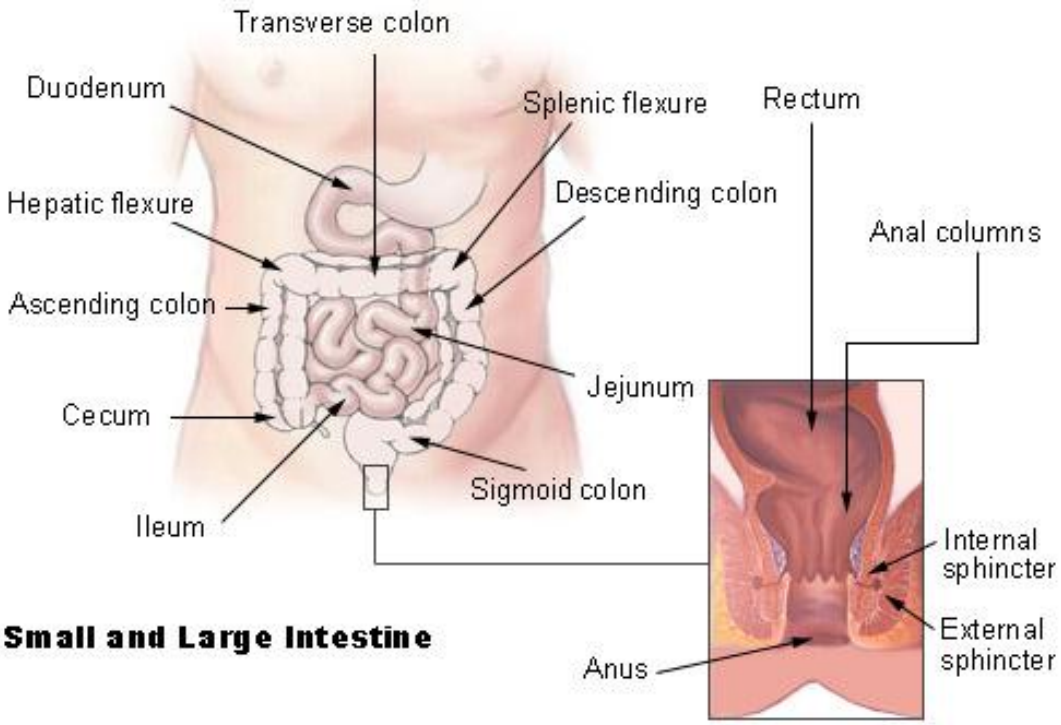
In your stomach and intestines, enzymes break apart large molecules into small monomers that your body can absorb. These small particles, along with water, diffuse through the wall of the intestines into the blood.

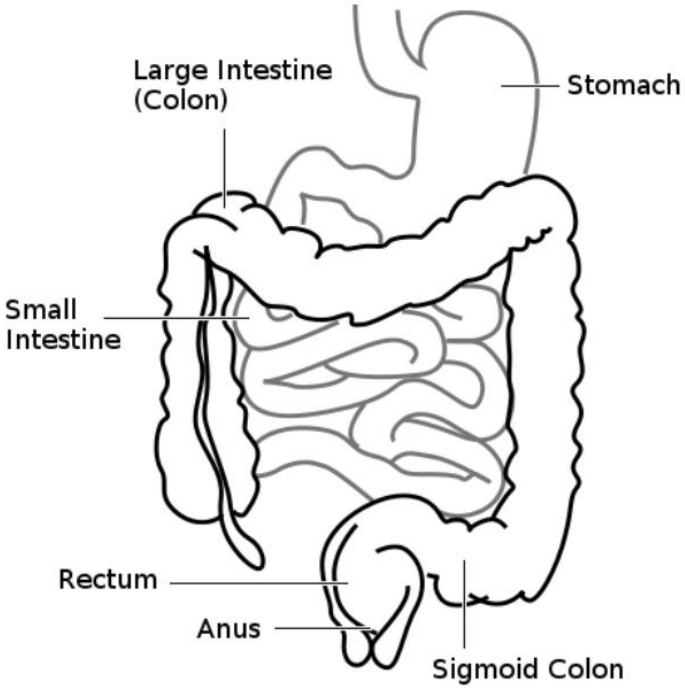


Large Intestine

The digestive system interacts directly with the circulatory system as nutrients diffuse into the blood!


Important Fact: There are bacteria in your intestines that help you digest your food!
Scanning electron micrograph of *E. coli*,
one of the many bacteria present in the intestines.





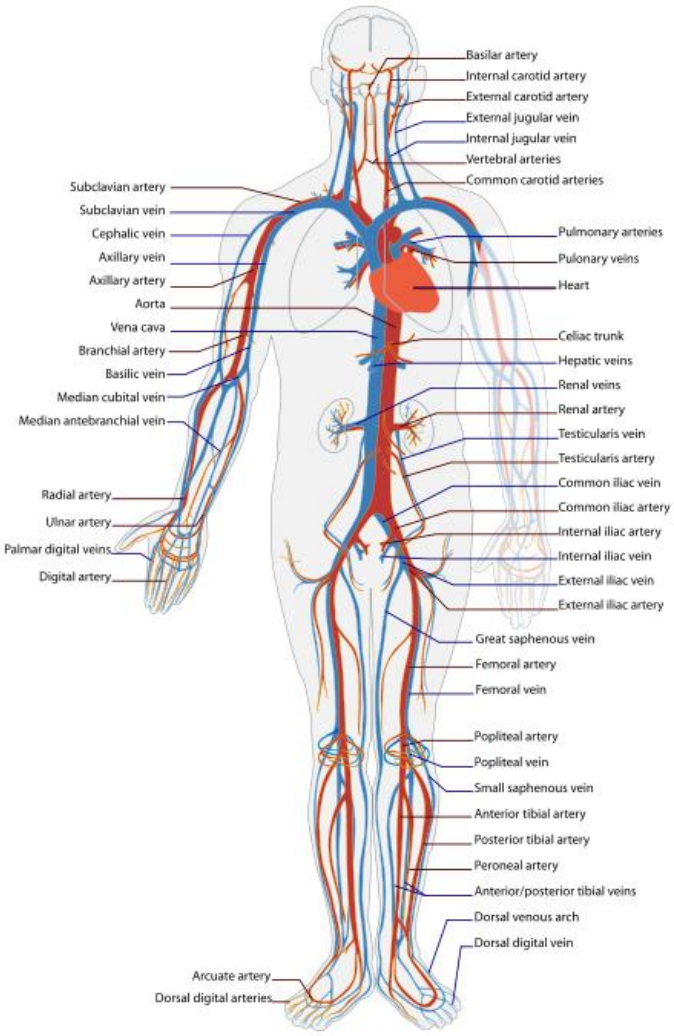
The last section of the large intestines, the colon, absorbs water and salts from food. It also stores the remaining *solid waste* until it is eliminated from the body.

This shows how the digestive system interacts with the excretory system!

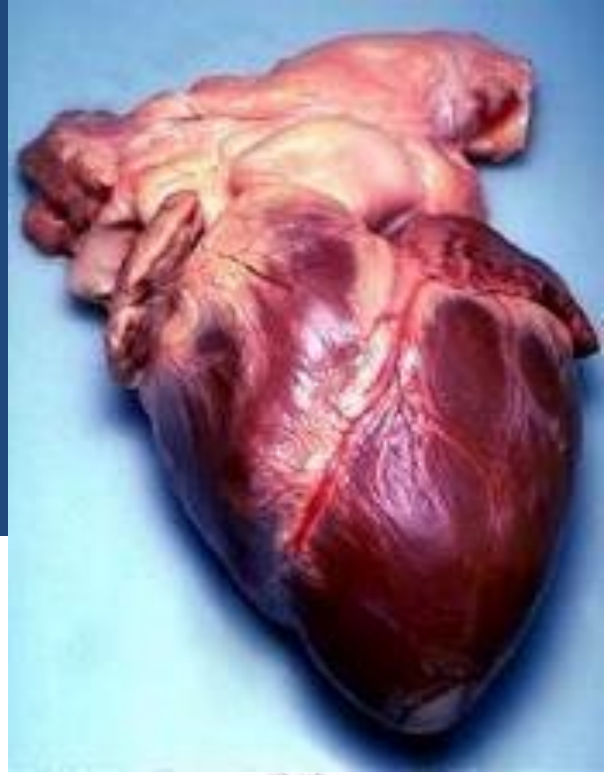
Circulatory System

The circulatory system distributes oxygen and nutrients to your body. The main organs of your circulatory system are your heart and blood vessels.

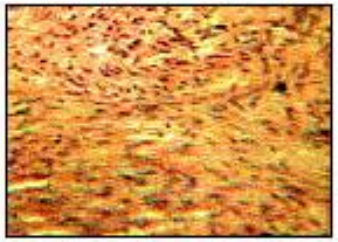
Blood is the main *tissue* which flows through your circulatory system.



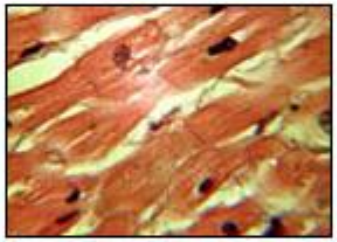
The heart is made of a special type of muscle tissue known as cardiac muscle. *Cardiac* is a word that means *heart*.



Skeletal muscle



Smooth muscle

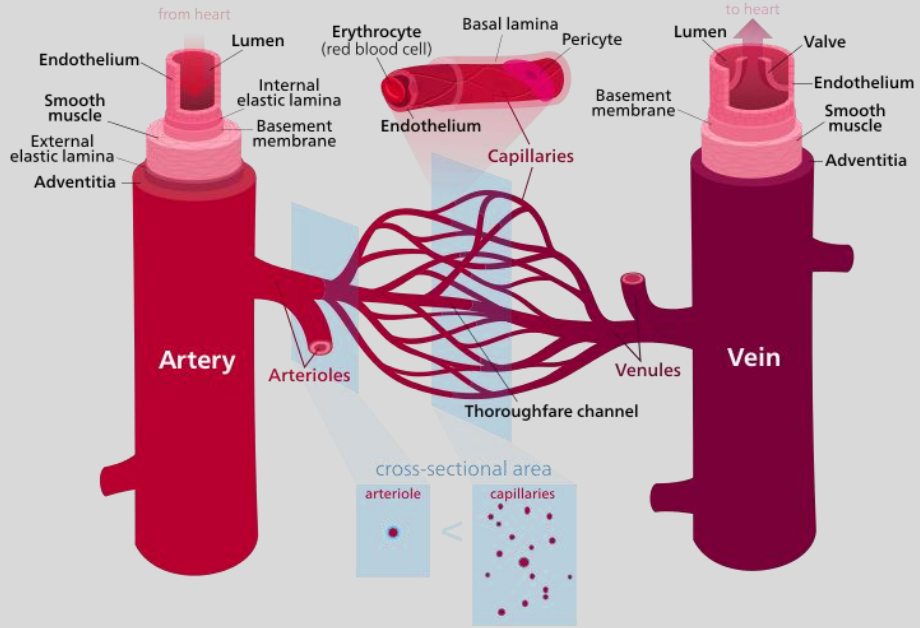


Cardiac muscle

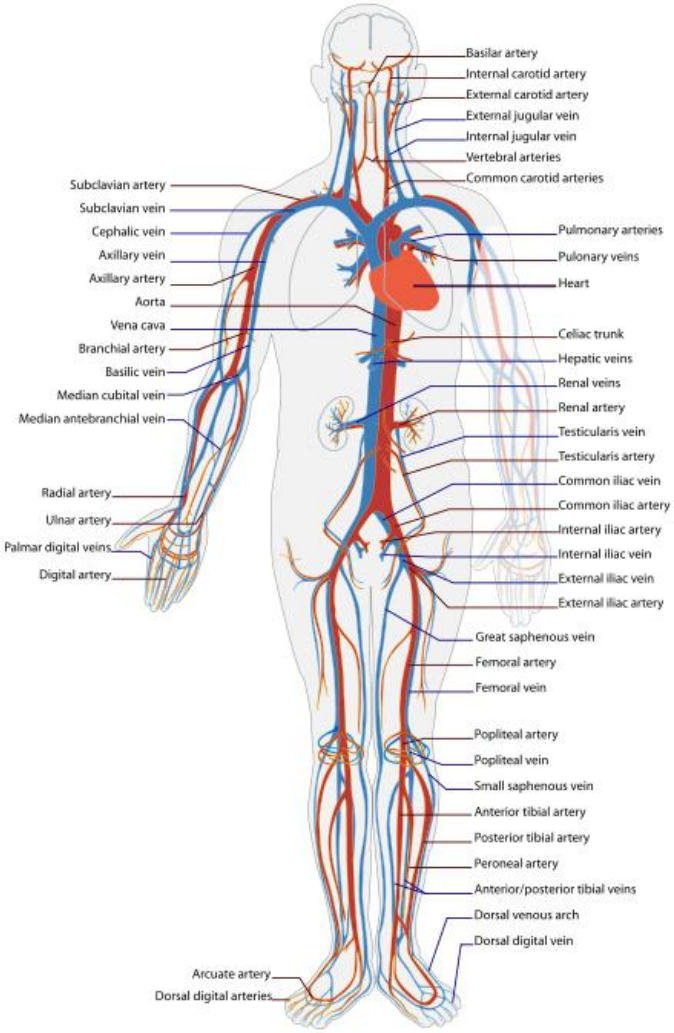
This is one way that the muscular system interacts with the circulatory system.

Circulatory System

Blood vessels help blood travels through the body.



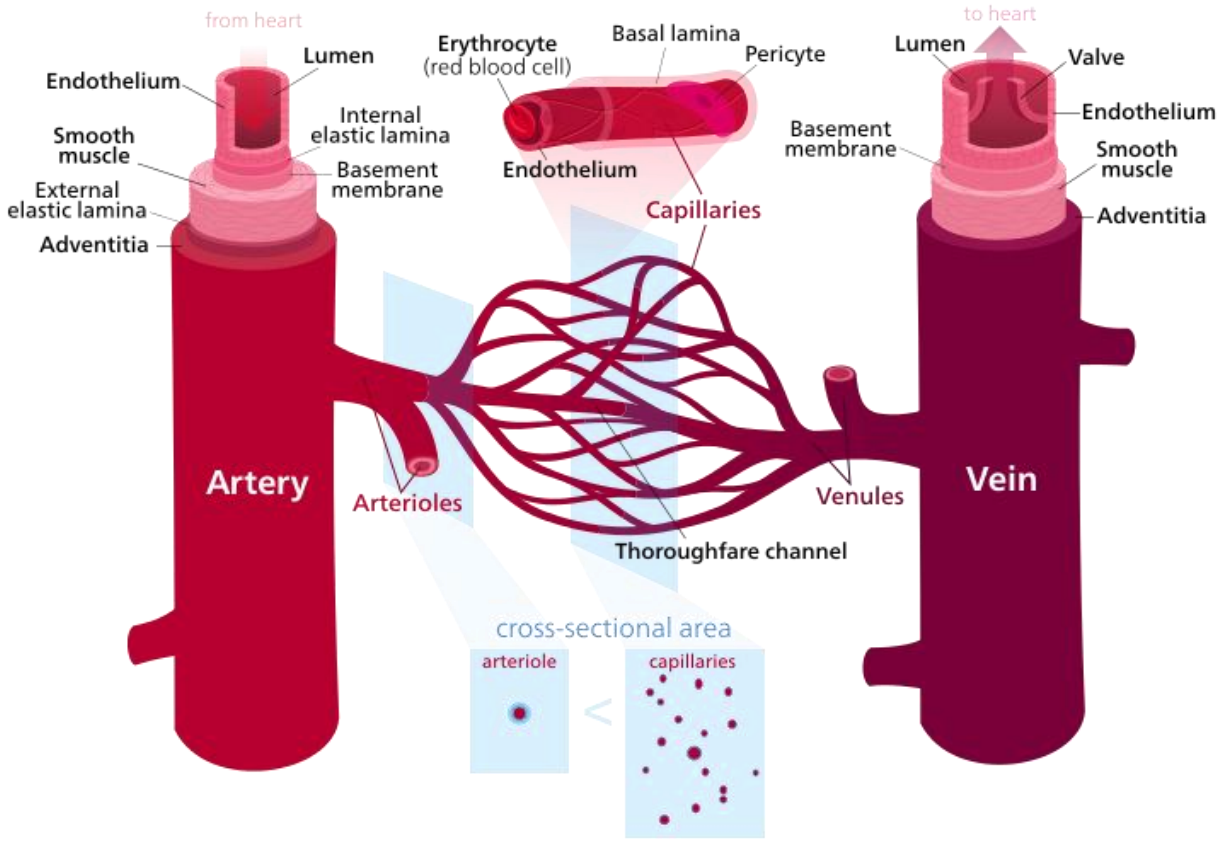
Blood vessels are surrounded by a layer of muscle which controls blood pressure.



Circulatory System: Blood Vessels

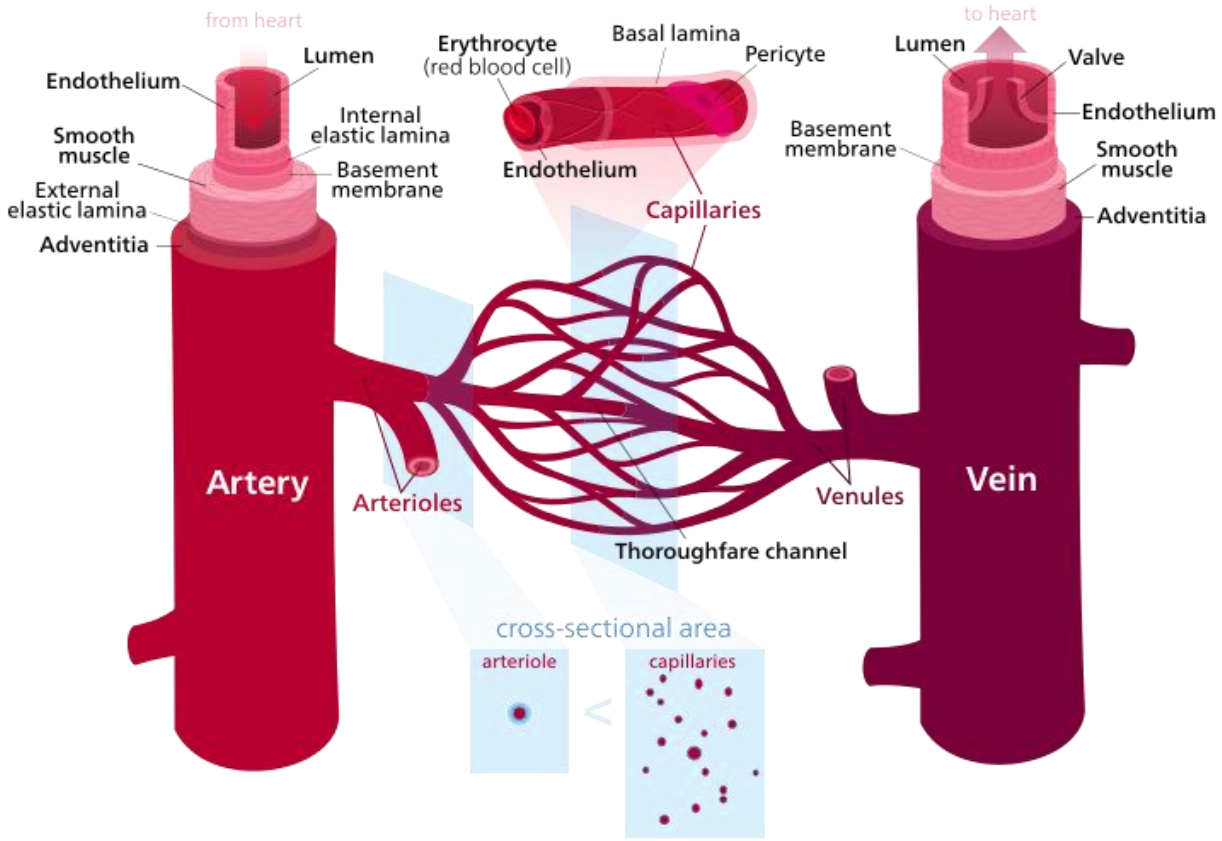
Arteries **take blood away from the heart.**

Veins **return blood to the heart.**



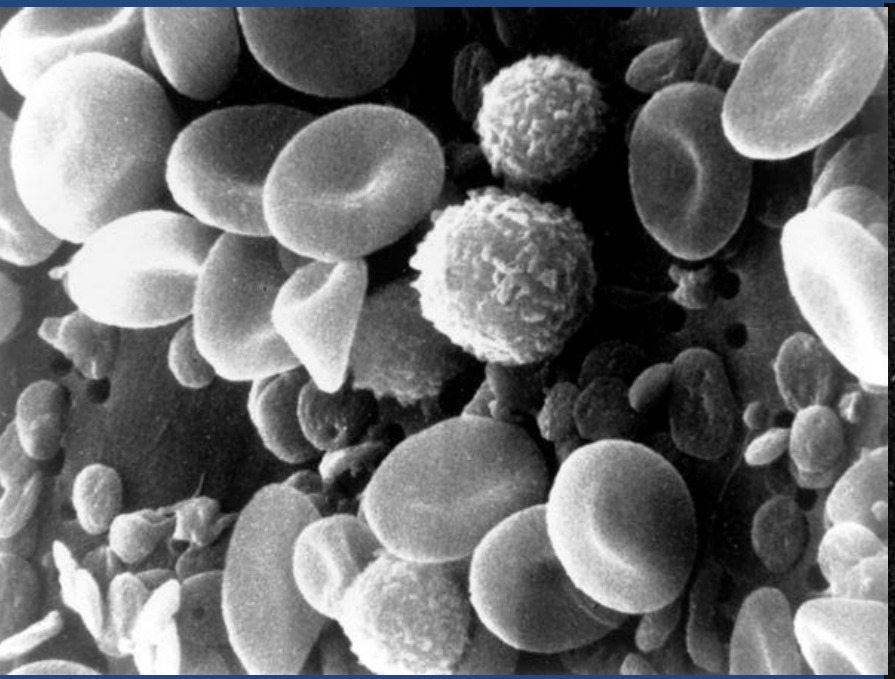
Circulatory System: Blood Vessels

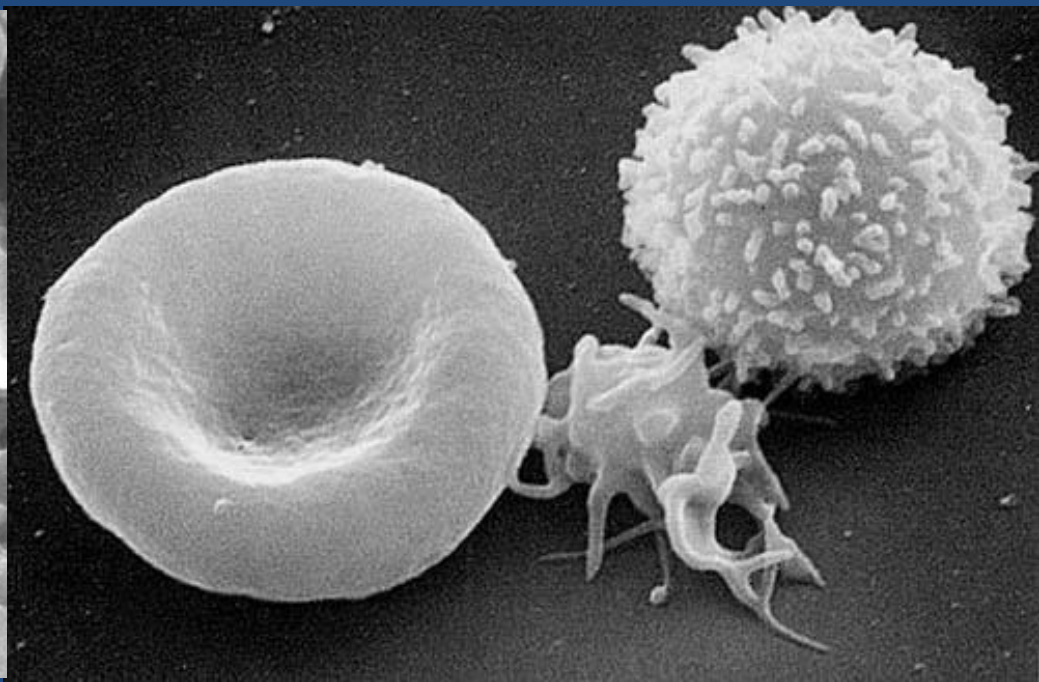
Capillaries **allow your blood to *mix* with the surrounding tissues so that nutrients and wastes can be exchanged.**



Circulatory System: Blood Cells

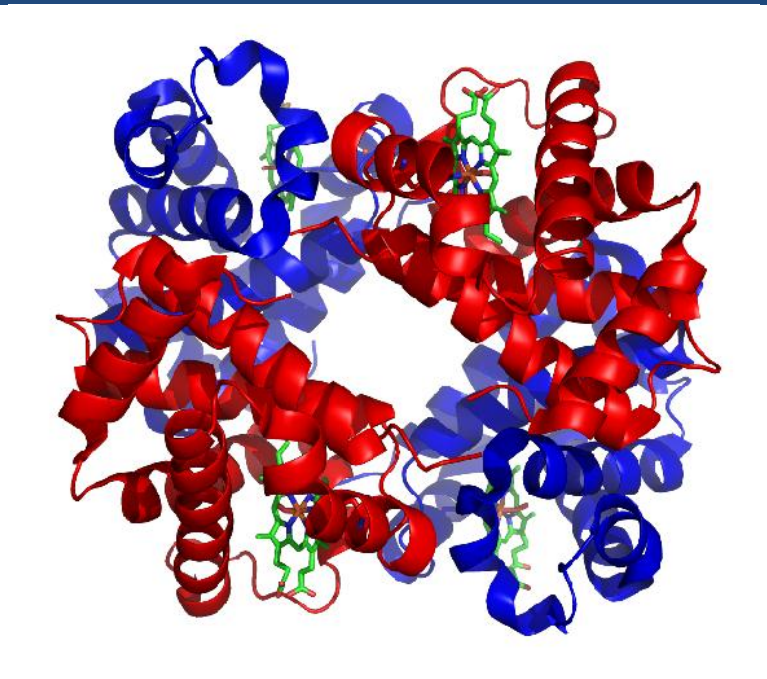
There are 3 types of blood cells that you also need to know and understand. These specialized cells are produced by bone marrow inside the skeletal system.

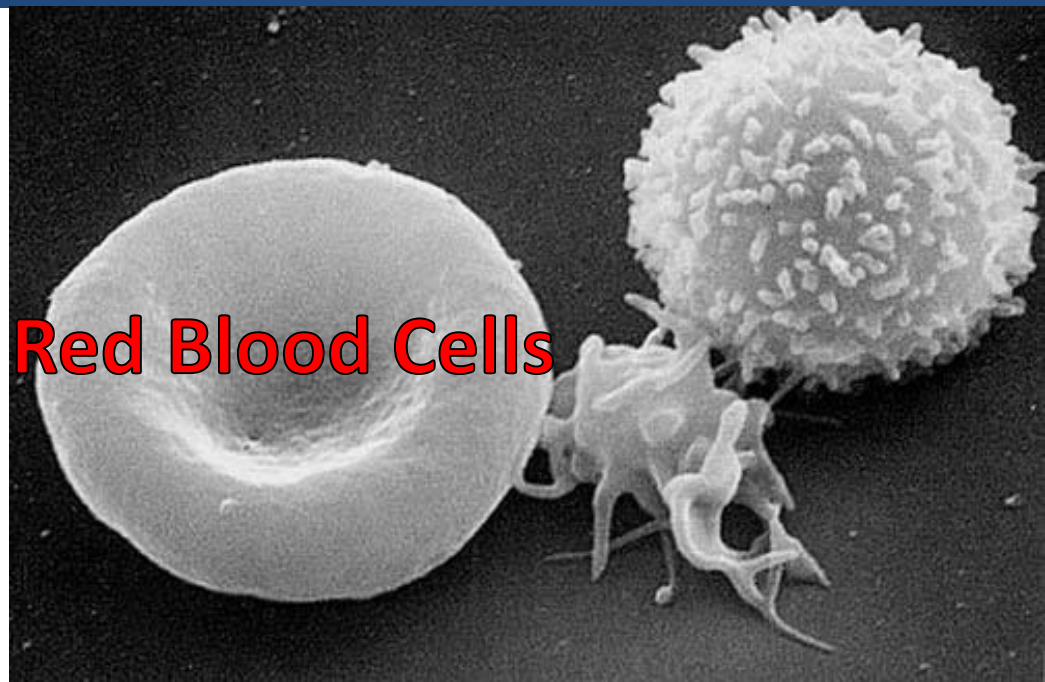




Circulatory System: Blood Cells

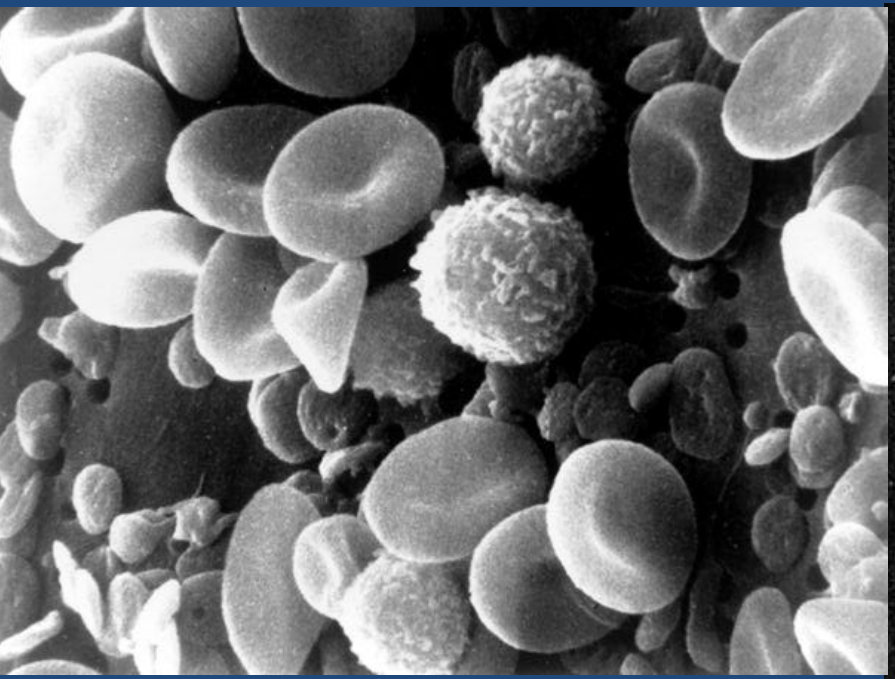
Red blood cells carry oxygen to all the cells. The oxygen is absorbed by the *respiratory system* and enters the blood where it attaches to hemoglobin molecules inside the red blood cells.

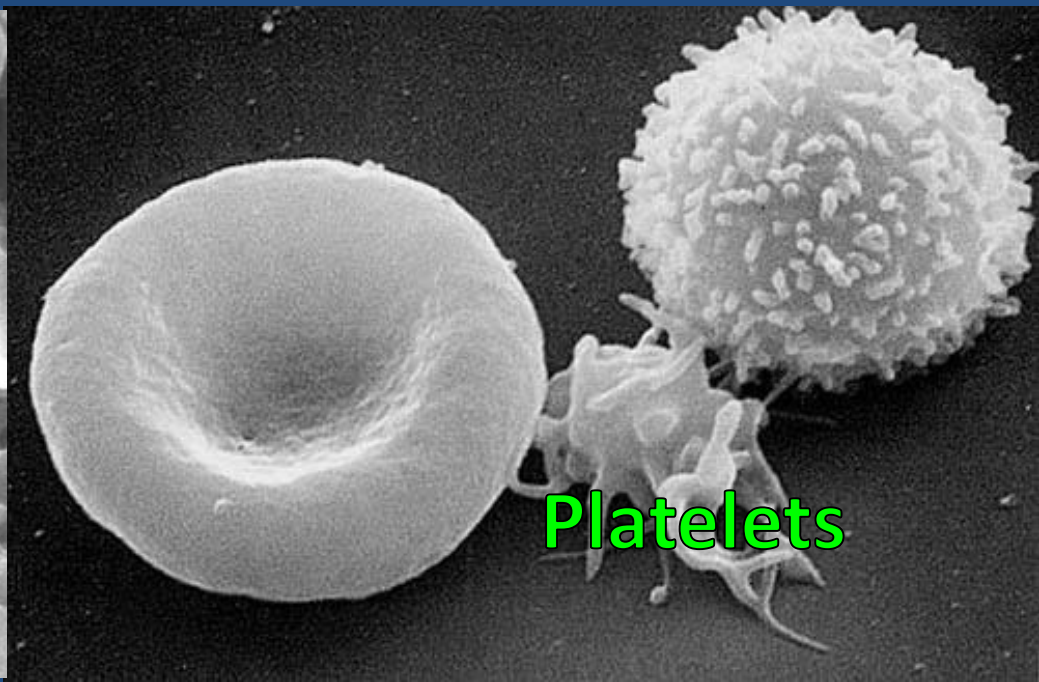




Circulatory System: Blood Cells

Platelets are the blood cells that allow your blood to clot. Whenever you are cut or wounded and bleed, platelets and proteins coagulate. This means they form a clot and *stop the bleeding*.





Circulatory System: Blood Cells

White blood cells are part of the *immune system* and they are responsible for defending the body against pathogens and removing old and dead cells from the body.