CIRCULATORY SYSTEM

Function

- TO PROVIDE OXYGEN AND NUTRIENTS TO AND REMOVE WASTE FROM THE ENTIRE BODY BY PUMPING BLOOD TO EACH TISSUE AND ORGAN

Main Organs

◦ HEART

- has a fibrous sac that it sits in filled with slippery fluid - made up of thick muscle
  - has electrical nerve "nodes" and multiple chambers

ARTERIES

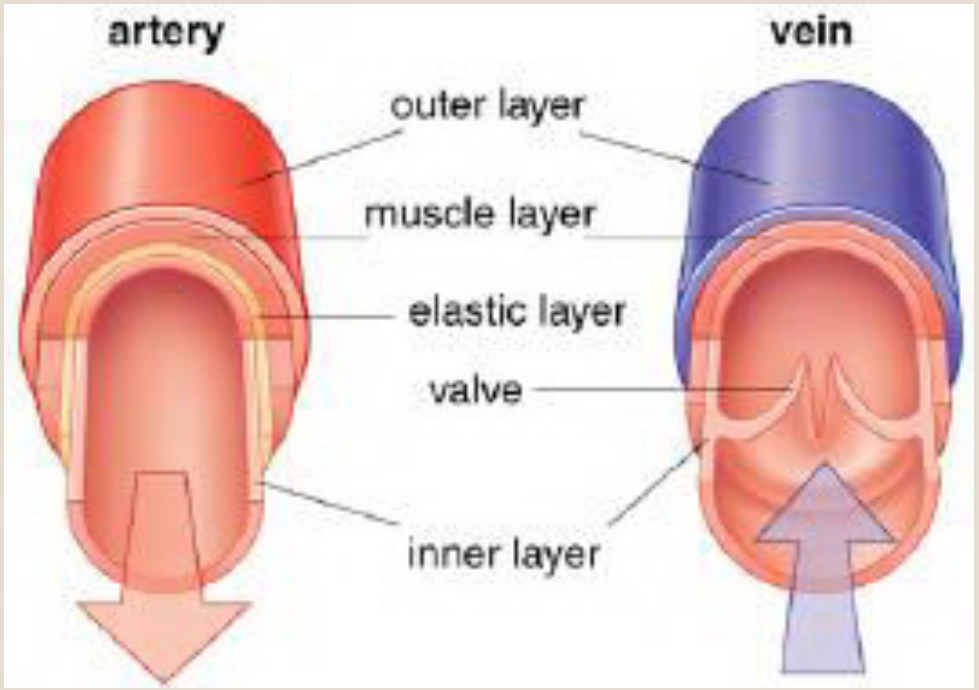
- muscular tubes
  - take oxygenated blood to the body

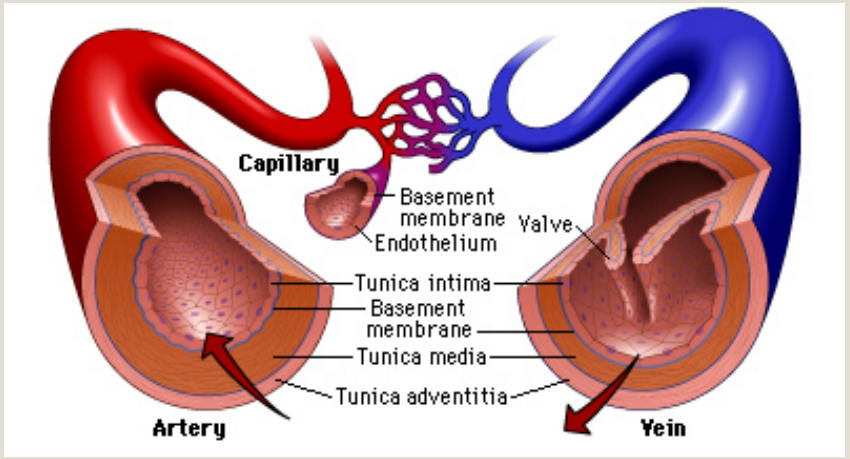
◦ VEINS

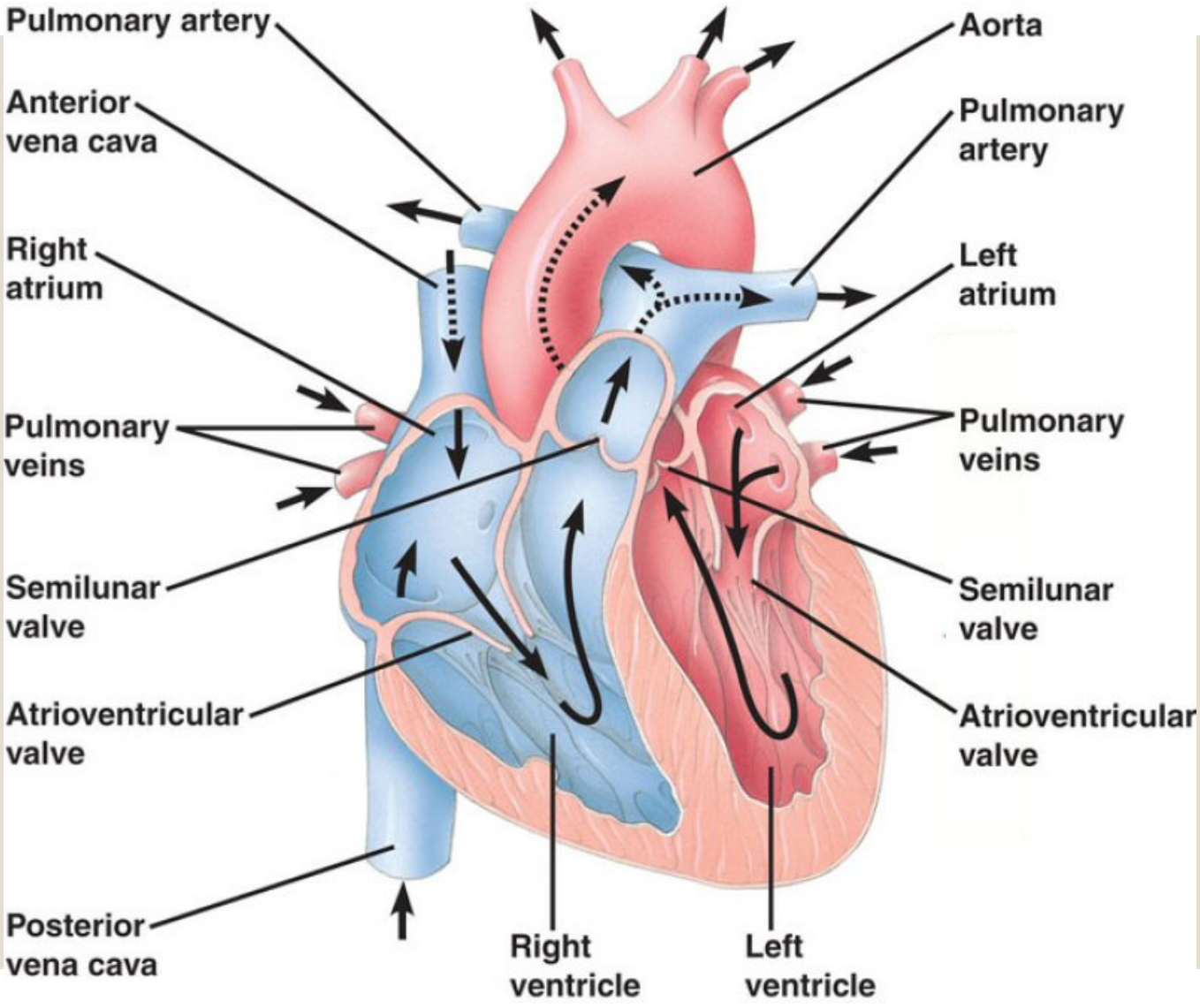
- thin, collapsible tubes surrounded by thin layers of muscle
- embedded in between muscles and other tissues - take deoxygenated blood back to heart
  - have valves to prevent backflow

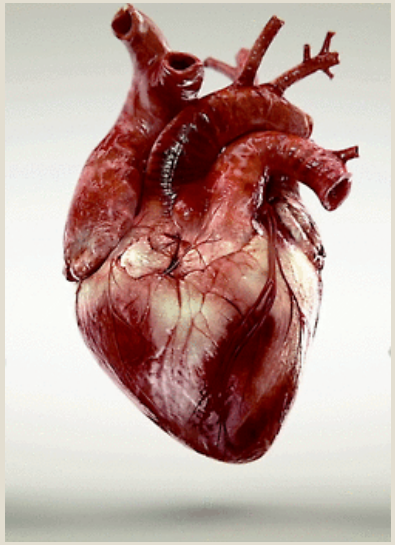
- CAPILLARIES

◦ - extremely thin walls
  - connect arteries and veins

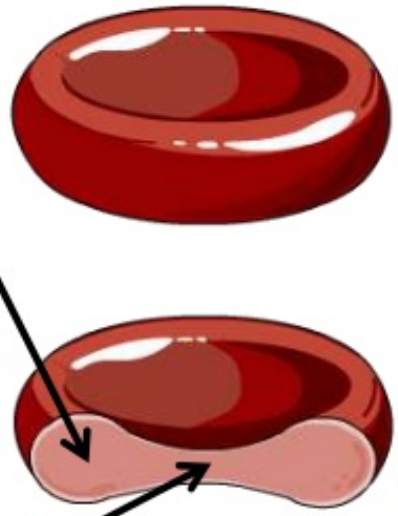

artery
vein
outer layer
muscle layer
elastic layer
valve
inner layer


Capillary
Basement membrane
Endothelium
Valve
Tunica intima
Basement membrane
Tunica media
Tunica adventitia
Artery
Vein


Pulmonary artery
Anterior vena cava
Right atrium
Pulmonary veins
Semilunar valve
Atrioventricular valve
Posterior vena cava
Right ventricle
Left ventricle
Aorta
Pulmonary artery
Left atrium
Pulmonary veins
Semilunar valve
Atrioventricular valve



Features of a red blood cell



Contains **haemoglobin**, a special pigment that combines/carries oxygen.

Disc-shaped, with a dent on each side, creates a **large surface area** for gas exchange.

No nucleus - more space for haemoglobin and so more oxygen.

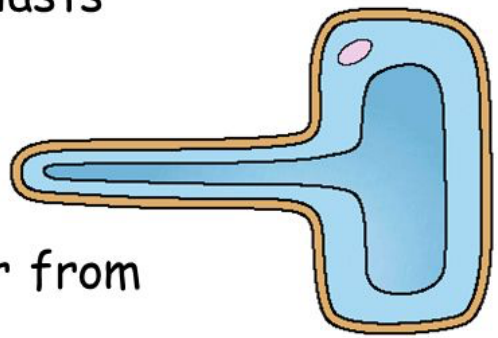
A **large surface area** compared to volume, so oxygen is always close to the surface.

Comparative Anatomy

Root Hair Cell

Structure:

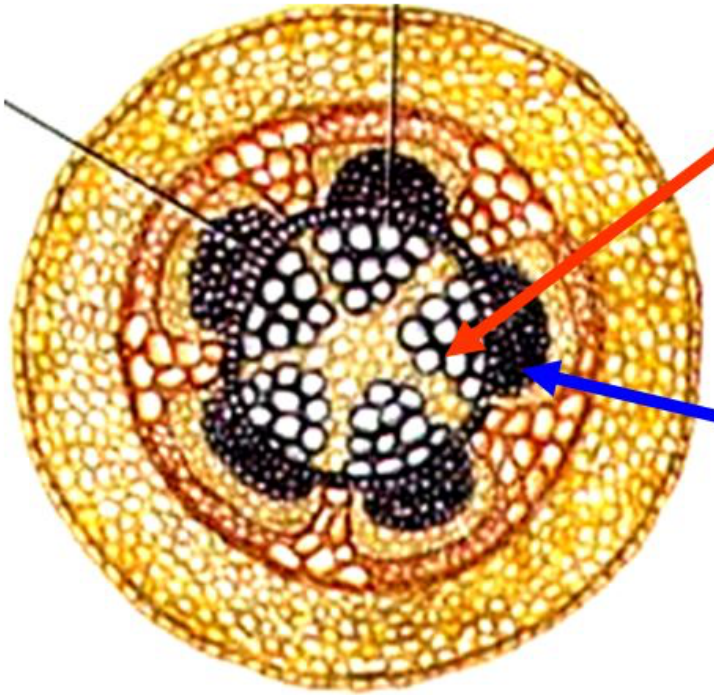
- Large surface area to absorb lots of water
- Thin cell wall to allow water to pass through easily
- Doesn't contain any chloroplasts unlike all other plant cells



Function:

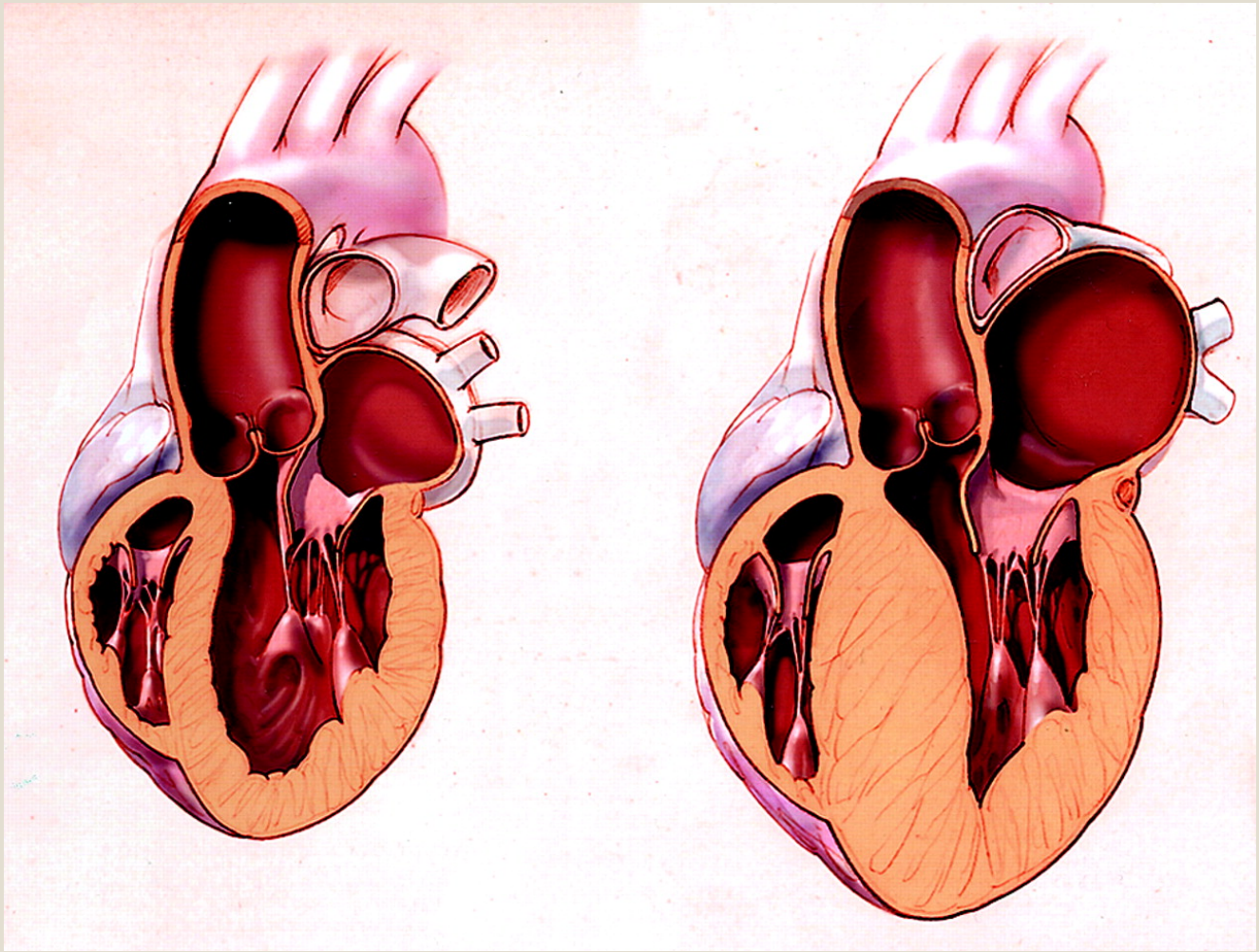
- Absorbs minerals and water from soil

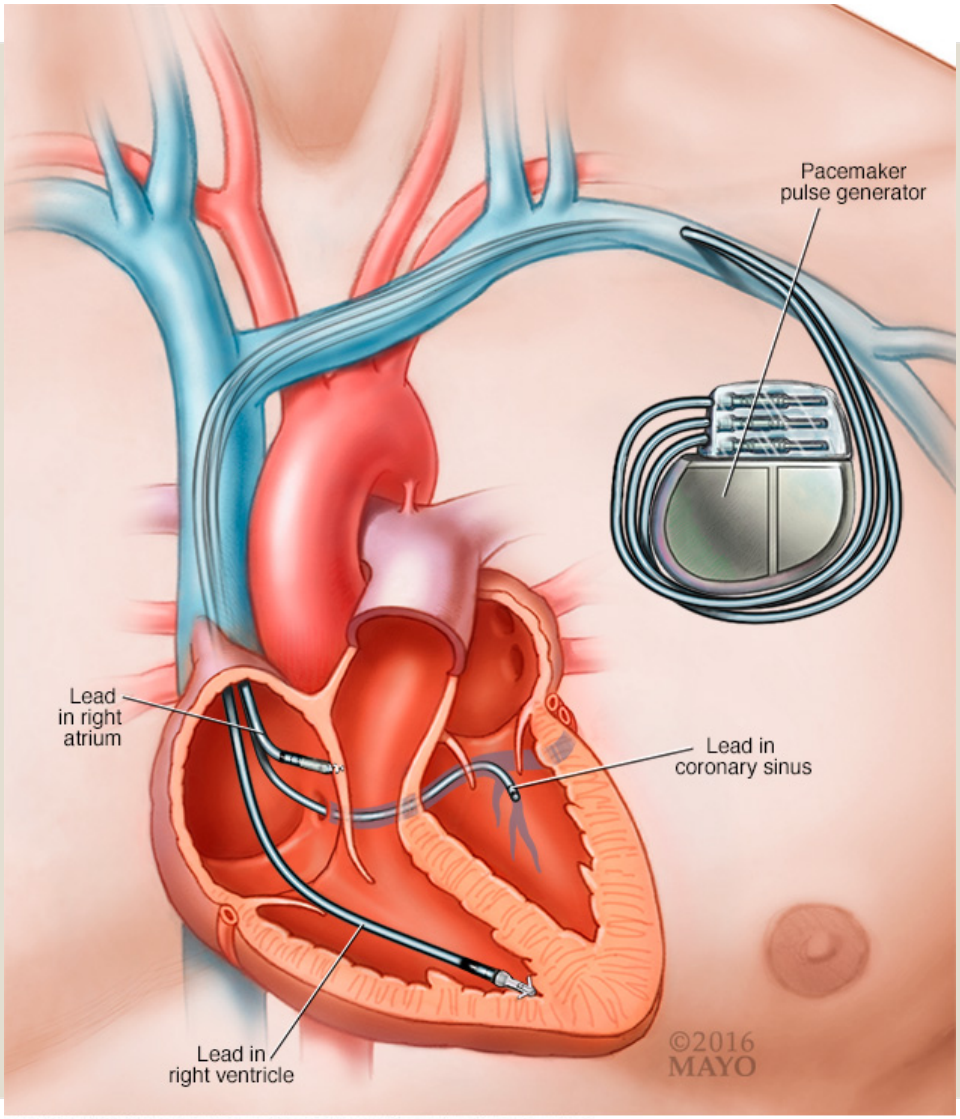
Vascular bundles: xylem & phloem

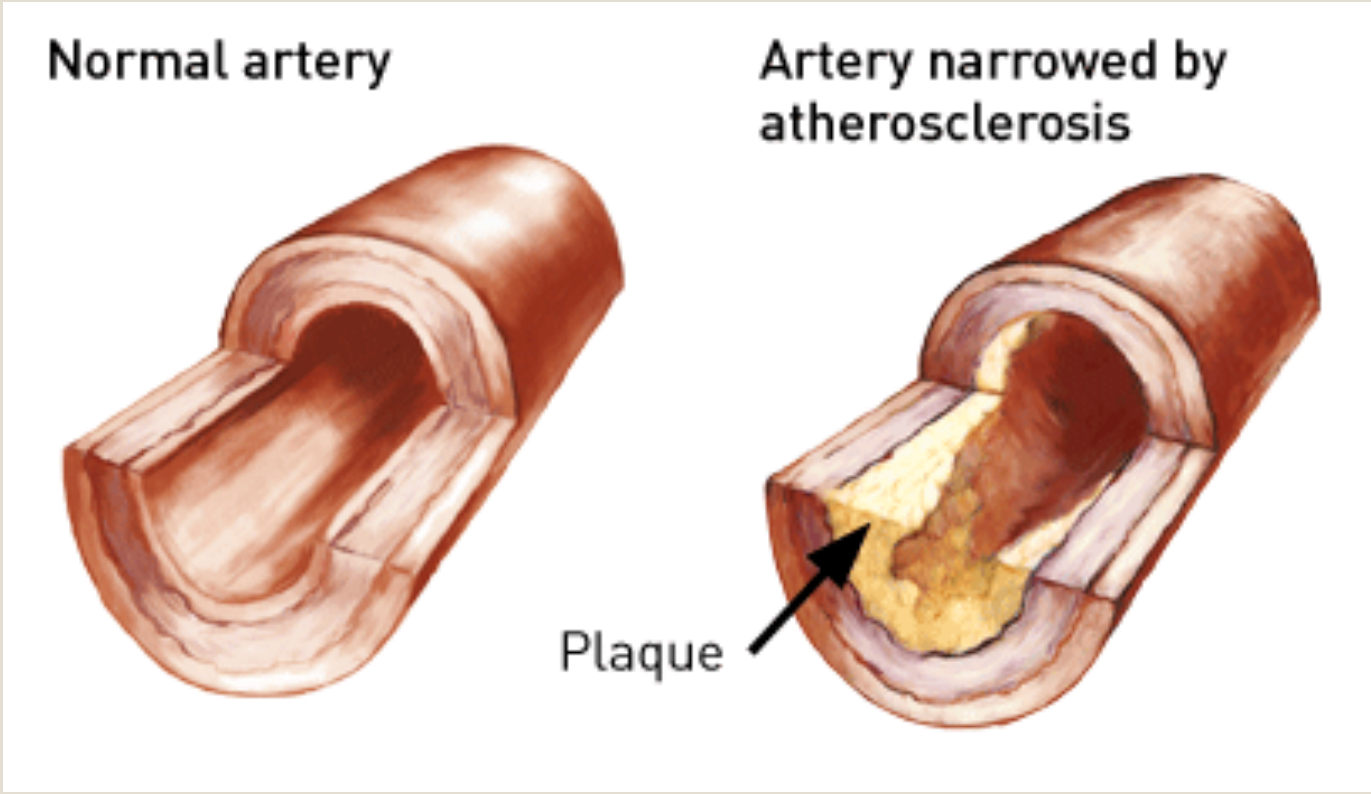


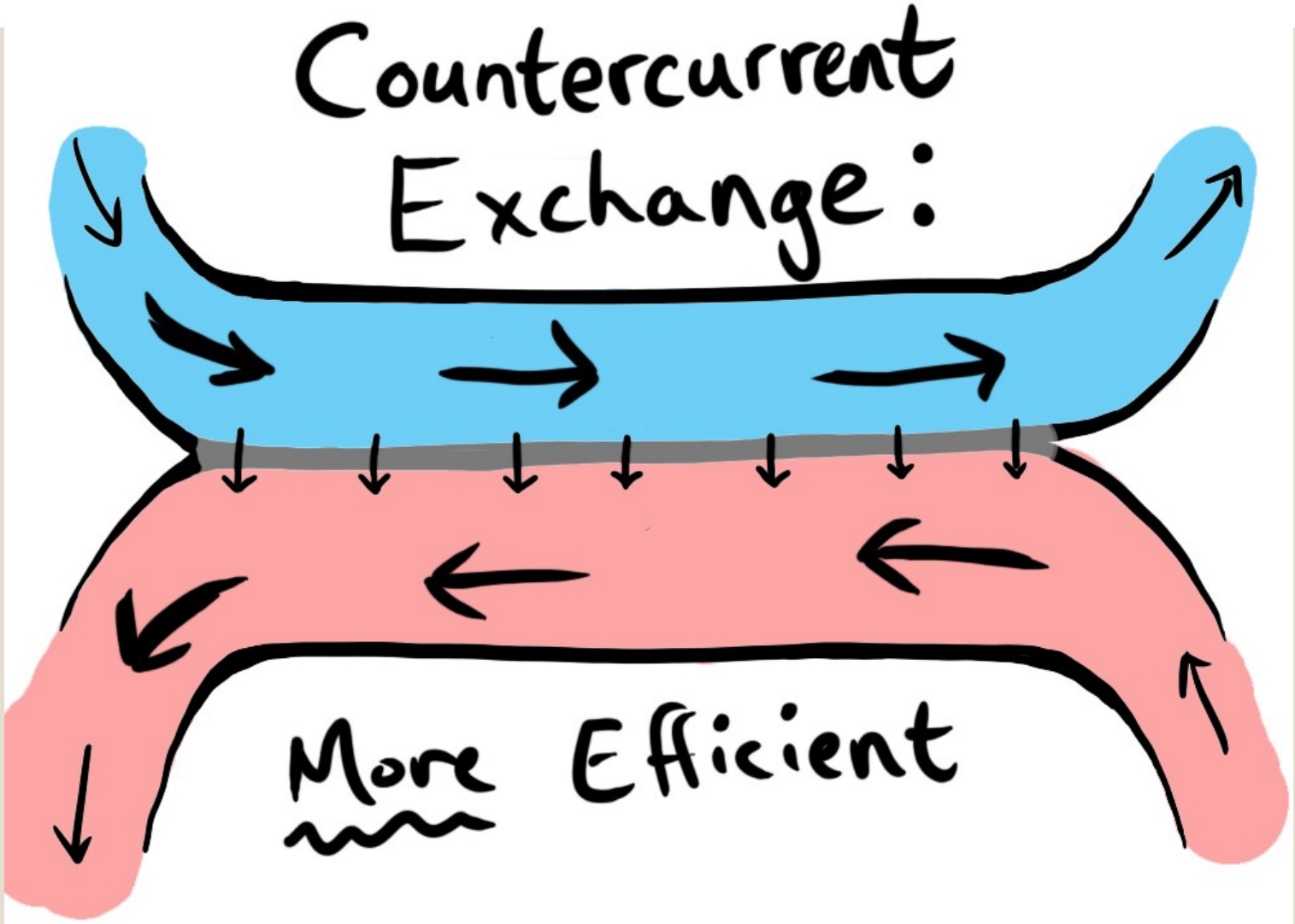
Xylem transports water & dissolved minerals from roots to leaves.

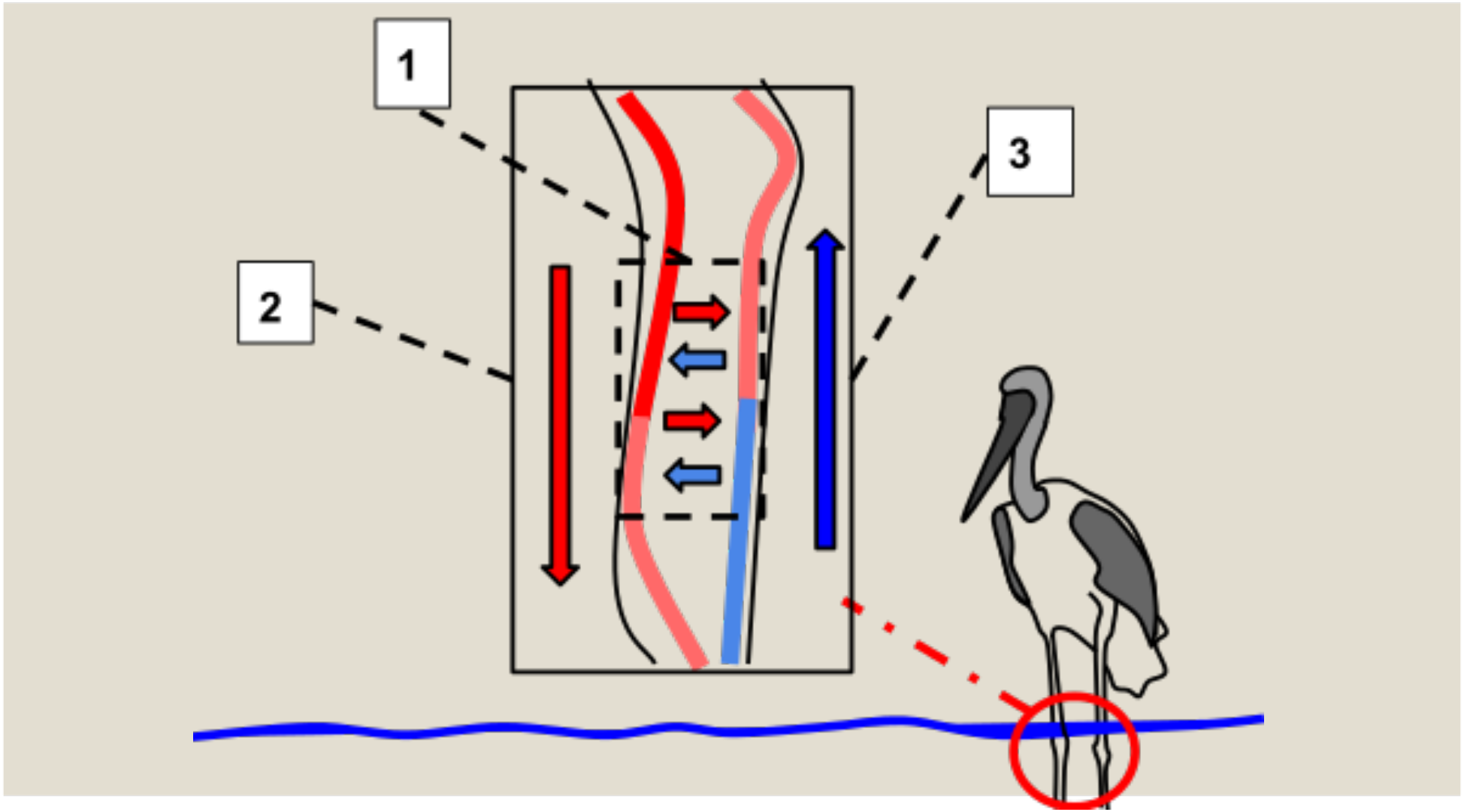
Phloem transports food (sugar) made in leaves to all other parts of the plant.






Normal artery
Artery narrowed by atherosclerosis
Plaque


Countercurrent
Exchange:
More Efficient


1
2
3