

Goldfish Tail Circulation Lab

Materials:

Medium-sized goldfish

2 halves of a microscope slide

Dip net

Medicine dropper/dropper bottle w/H₂O

Half of a Petri dish

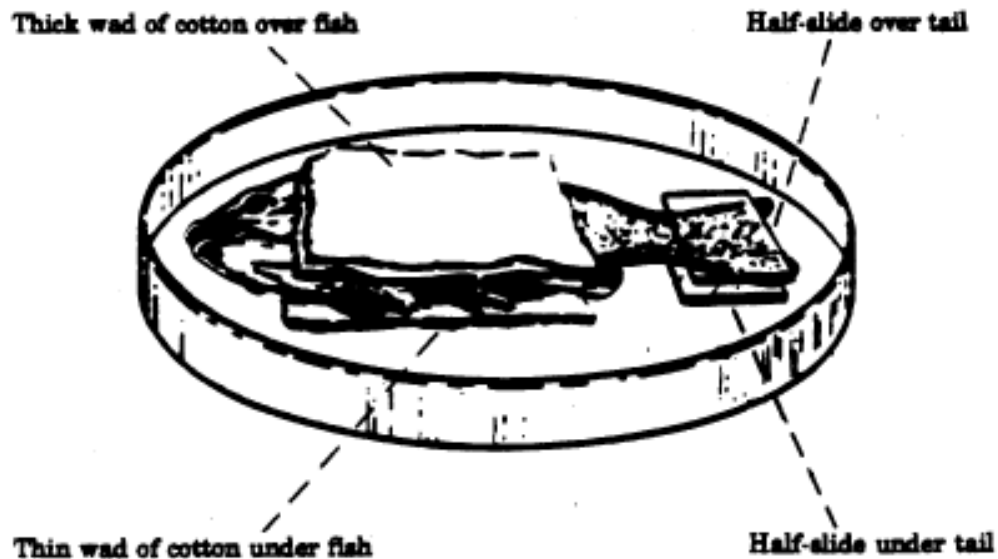
Compound microscope

2 wads of cotton (1 thick/1 thin)

Procedure:

1. Soak a thin wad of cotton in water and spread it toward one end of the bottom of a Petri dish. At the other end, place a clean half-slide. Soak a thick wad of cotton in water and have it ready for the next step.
2. Using a net, remove a fish from the water. Place the fish in the Petri dish with its head and body peacefully laying on the wet cotton. Its tail should lie on the half-slide.
3. Now place the thick, soaked wad of cotton over the body of the fish. Place another half-slide over the tail. The setup should look like the figure below (except you very likely have the fish head also covered in cotton, so he can't stare at you. ☺)

If the fish flips its tail out, as it may, just put it back between the glass slides. Remember to keep the cotton wet.



4. Remove the clips from the stage of your microscope. Place the Petri dish on the stage so that the fish's tail is over the hold in the stage.

Analysis:

Focus on the tail. Then move the dish around until you find a part of the tail in which you clearly see flowing blood. The smallest of the blood vessels you can see here are capillaries. (RBC's will be going through in single file.) Look for a small artery (arteriole) at a point where it divides. The two forks of this division are the capillaries.

1. Does blood flow more rapidly in the capillaries or in the arteries?
2. The small objects moving through the capillaries are red blood cells. What is their shape? Draw one here:
3. How many red blood cells can pass side by side through the capillaries?
4. Formulate a hypothesis to account for any advantage in having red blood cells pass through the capillaries as they do.

Trace a capillary in the direction of the blood flow until it joins with another to form a slightly larger vessel, a small vein called a venule.

5. Does the blood move more rapidly or less rapidly after it flows from the capillaries into a vein?
6. Why is it an advantage that the capillaries have thin walls?
7. Would you expect much exchange between red blood cells and body cells in arteries or veins? Why or why not?

8. Draw and label the five vessels listed below in your microscope's field of view (make sure they are in sequence!), and with arrows, show the direction that the blood is flowing. Remember, this is a microscopic view!

Artery → Arteriole → Capillary → Venule → Vein

Continue to draw more vessels so that your illustration looks like what you saw under the microscope; you do not label anymore vessels.

- Label the head and tail outside the field of view.
- Color the illustration with shades of orange and red.

Title _____

