

# Mammalian Kidney Dissection

## Laboratory Questions

1. What role do the kidneys play in homeostasis?

The kidneys play many vital roles in homeostasis. They work with many other systems like the circulatory system to filter blood. They also work with the urinary system to remove wastes from the body by producing urine. The kidneys also produce hormones and absorb minerals. They are able to maintain water level in the body and regulate red blood cell levels and blood pressure.

2. Describe the path blood takes flowing through the kidney.

Oxygenated blood gets pumped by the heart and will pass through the aorta. It will then go towards the kidneys. The renal artery will be the most important component because blood flows into the kidney through the renal artery. The renal artery will branch into smaller blood vessels until blood reaches the nephrons. The nephron will then filter the blood by tiny blood vessels of the glomeruli. After that, the blood will then flow out of the kidneys through the renal veins.

3. Name and describe the functional unit of the kidney. Summarize the functions of each part.

The nephron is the functional unit of the kidney. It is responsible for removing wastes from the body. Each kidney contains more than one million nephrons, and a nephron contains three parts. The first part is the renal corpuscle. The renal corpuscle is located in the renal cortex and it is composed of a network of capillaries called the glomerulus. It also contains a cup-shaped chamber that surrounds the glomerulus called the Bowman's capsule. The function of this section is responsible for filtering blood. It contains a filtration barrier that collects fluid from the blood to pass along the nephron to produce urine. The second part of the nephron is the renal tubule. The renal tubule is a long, convoluted structure that comes out from the glomerulus. It can also be divided into three different parts based on their functions. The first part is the proximal convoluted tubule (PCT), and this part is responsible for reabsorption of the filtrate. The second part is called the loop of Henle or the nephritic loop that goes into the renal medulla. The function for this part is to recover water and sodium chloride from the filtrate and produces a really concentrated urine. The third part of the renal tubule is the distal convoluted tubule (DCT) and it is restricted to the renal cortex. The function of this part is to absorb water and many ions. The third part of the nephron is an associated capillary network, and it connects and empties its filtrate into collecting

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ducts that line the medullary pyramids.

**4.** What impact would low blood pressure have on the kidneys?

The change in blood pressure indicates that there is a change in blood flow throughout the body. When blood flow in the body changes, it can start causing problems with your kidneys. The longer the problem persists, the more fatal and serious the side effects will be. When you are experiencing low blood pressure, the kidneys are the first organs to experience problems. When there is low blood pressure, the kidneys are not receiving enough blood flow for them to function properly. They won't be able to filter the blood properly and they will also lack oxygen. Over time, if this problem continues, the kidneys will start shutting down.

**5.** What symptoms might you expect with a decrease in kidney function?

Some symptoms someone with decreasing functions of their kidneys may experience are decrease in urine output, fatigue, shortness of breath, nausea, confusion, fluid retention, weakness, and irregular heartbeat.