**FUNDACIÓN EDUCATIVA DE MONTELÍBANO**

**Laboratory guide**

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**KIDNEY DISSECTION**

**THROUGHLINE: How is the kidney related to its function?**

**UNDERSTANDING GOAL:** To explain the excretory system with its parts and functions.

**BACKGROUND INFORMATION**

The human urinary system consists of two kidneys, two ureters, one urinary bladder, and one urethra. This system has two basic functions, both of which occur in the kidneys. The first function is to remove nitrogenous wastes (such as creatine, urea, and uric acid) from the body. The second function is to maintain the ion, pH, and water levels in the blood.

One product of these processes is urine, a pale yellow fluid containing water, and particles such as urea, sodium, potassium, creatine, and uric acid. Urine moves from the kidneys to the urinary bladder via the ureters, which are essentially tube shaped extensions of the renal pelvis. Urine is stored in the urinary bladder until it leaves the body via the urethra.

**Basic Kidney Anatomy**

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| http://dickinsonn.ism-online.org/files/2010/01/kidney-by-kidneynotes-on-flickr.jpg | http://www.buzzle.com/images/diagrams/human-body/nephron-structure.jpg |

There are four primary components to a kidney:

1. **Renal Capsule**: A smooth semitransparent membrane that adheres tightly to the outer surface of the kidney.

2. **Renal Cortex**: The region of the kidney just below the capsule. In a fresh kidney the color of the cortex will be reddish brown.

3. **Renal Medulla**: The region deeper into the kidney, beneath the cortex layer. In a fresh kidney it is more red in coIor than the cortex. It is segregated into triangular and columnar regions. The triangular regions are the **renal pyramids**, which should be striated (or striped) in appearance due to the collecting ducts running through them. The columnar regions between the pyramids are the **renal columns**. These renal columns are where the interlobar arteries are located.

4. **Renal Pelvis**: A cavity within the kidney that is continuous with the ureter, which exits from the **hilus**. The pelvis has portions that extend towards the apexes of the renal pyramids. The primary (large) extensions are the **major calyces** and the smaller extensions are the **minor calyces**.

**MATERIALS**

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| **1 pig or cow kidney**  **Dissecting tools**  **Tray**  **Paper towels** | **Lab coat**  **Latex gloves**  **Mask**  **Cleansing kit. (cloth, soap)** |

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| **SAFETY** | |
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**PROCEDURE**

1. Collect dissecting tools, a ruler and a tray for your lab group. Obtain a fresh pig kidney.

2. Observe the whitish adipose (fat) tissue clinging to the renal capsule. These are remnants of the adipose capsule. Use your scissors to remove excess adipose tissue around the hilus region, and the probe to help you identify the ureter and any blood vessels located in the hilus region. Complete two biological drawings of two views of the exterior of the kidney.

3. Cut the kidney in half longitudinally using the knife or with short repeated strokes of the scalpel.

4. Examine the interior structure of the kidney. Identify the cortex, medulla, renal pyramids, renal columns, the major calyx and minor calyxes, the ureter and any blood vessels present. It may be useful to trace the vessels from the hilus region with a blunt probe to help with identification.

5. Complete a biological drawing of the interior of one half of the kidney describing your observations.

6. Dispose of the kidney in the waste bag provided. Wash all dissecting equipment and return. Wash your hand thoroughly with warm soap and water.

**Extra activity:**

1. What is the smooth semitransparent membrane that adheres tightly to the outer surface of the kidney?   
2. What are the two primary functions of the urinary system?   
3. What structure allows urine to move from the kidneys to the urinary bladder?   
4. Comment on the differences between the walls of the renal artery and the other vessels located at the hilus region.   
5. What gives the renal pyramids their striped appearance?   
6. What are the calyces?

7. What structures are found in the renal columns?

8. What is the cavity within the kidney that is continuous with the ureter?