

Name: _____

Date: _____

Lab Partner(s): _____

Kidney Dissection Lab

Keep this background to study

In this lab activity fresh pig kidneys will be dissected. Hygiene is crucial when dealing with fresh specimens. Vinyl gloves will be provided and hand washing with soap and warm water must be performed before leaving the class.

Evaluation

You will be evaluated based on the following criteria:

1. **Respect** for the specimen you are studying. If you treat the specimen in a disrespectful way, you will be removed from the lab and assigned a mark of 0.
2. **Safety**. Your lab tools should be cleaned, dried and returned at the end of the class. Your group is solely responsible for your scalpel. Show your equipment to the teacher before returning it to the cart. Always wash your hands and your work area when you are finished. Handle dissecting tools carefully (don't cut directly towards yourself or your lab partner(s)). You should wear gloves and safety goggles. Lab aprons are available if you choose to use them.
3. **Participation**. Every member of your team should contribute to learning from the dissection.
4. **Careful dissection**. Try to follow all directions to the best of your ability, and to cut carefully in order to observe whole organs. Use your reference materials and/or the teacher to assist you.
5. **Disposal**. Any tissues removed should be placed in a special garbage bag, not down the sink or in the regular garbage
6. **Checkup questions**. At the end of the activity, the teacher will have questions to ask you about the actual dissection. (eg. Where is the renal capsule? What is this dark red area?) Each person in your group will have to answer one or more questions. Call the teacher over by raising your hand when your group is ready for the questions.
** It is YOUR GROUP'S RESPONSIBILITY to ensure that you get a chance to answer these questions before you dispose of your specimen!**
7. **Lab report**. For this activity, the report will consist only of biological drawings and answers to questions in this handout. Each student will hand in their own report.

Background Information

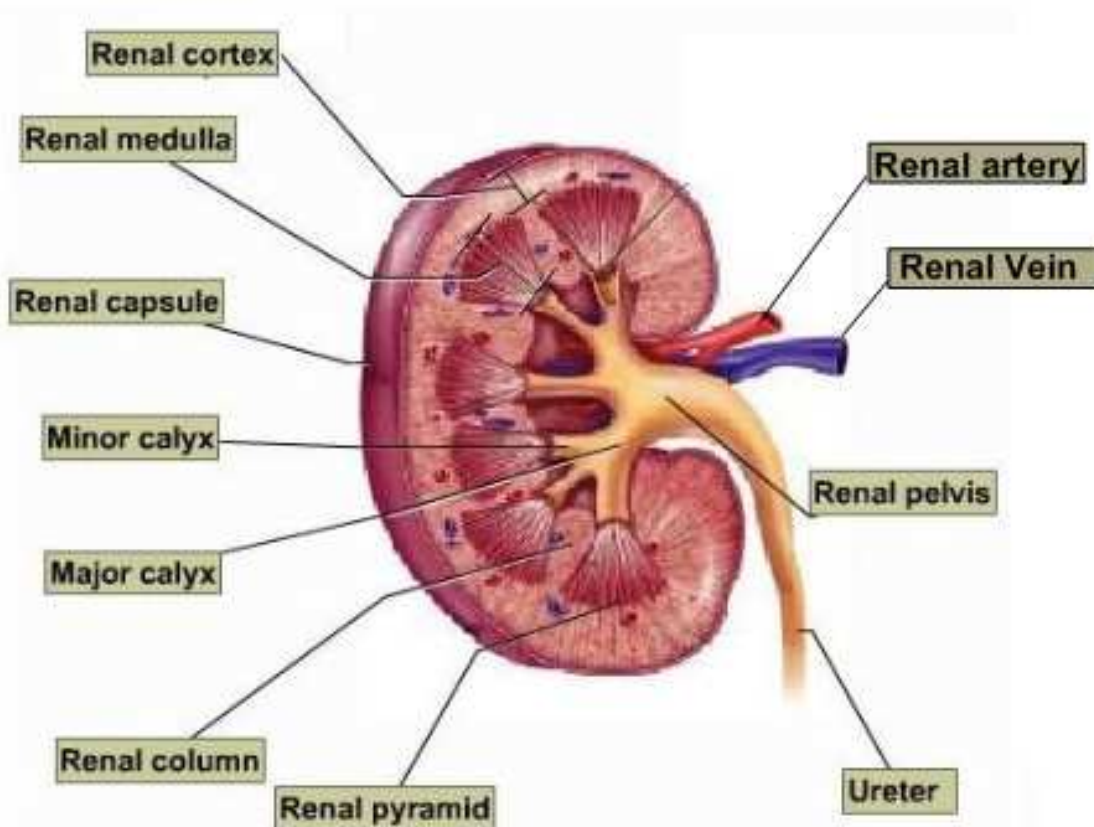
The human urinary system consists of two kidneys, two ureters, one urinary bladder, and one urethra. This system has two basic functions, both of which occur in the kidneys. The first function is to remove nitrogenous wastes (such as creatine, urea, and uric acid) from the body. The second function is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

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 colour 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 colour 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**.



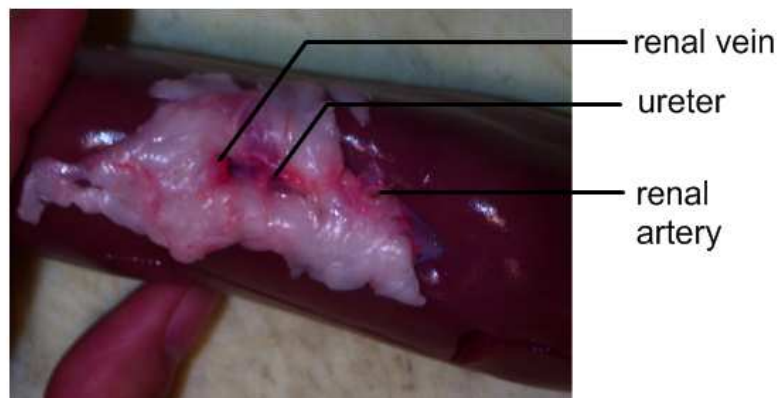
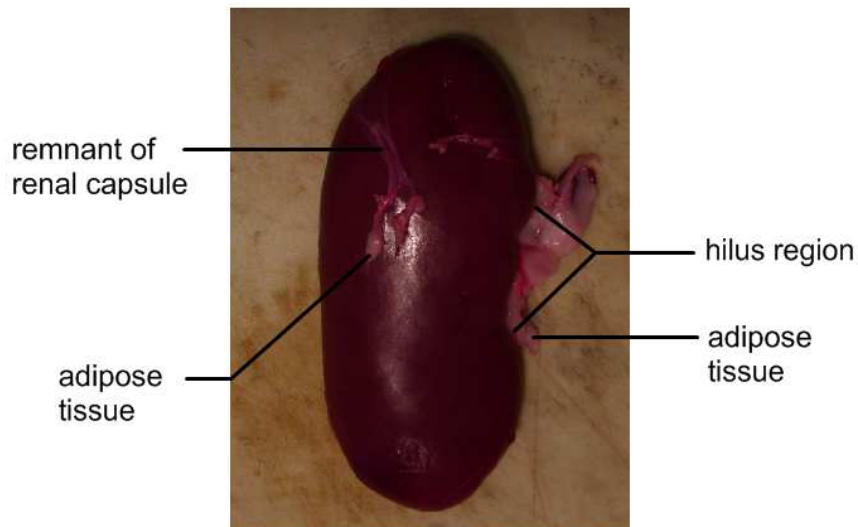
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Kidney Dissection Procedure

(CLASSROOM SET, DO NOT KEEP THIS SECTION)

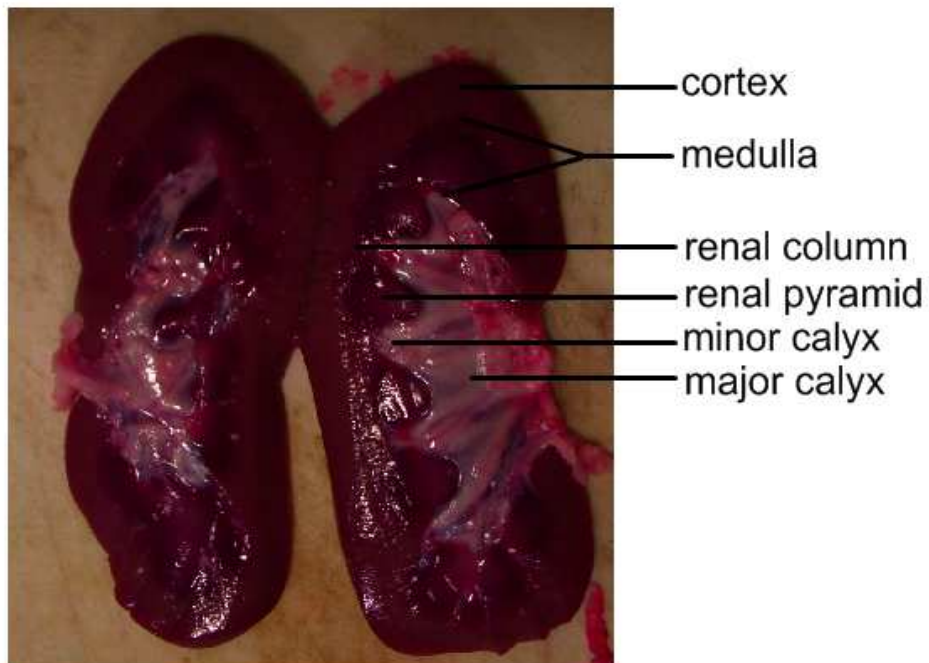
1. Collect dissecting tools, a ruler and a tray for your lab group. Obtain a fresh pig kidney.
2. Observe the whitish adipose (fat) tissue clinging to the renal capsule. These are remnants of the adipose capsule. Use your scissors to remove excess adipose tissue around the hilus region, and the probe 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 calyces, 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. Each student completes a biological drawing of the interior of one half of the kidney.

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.

Questions: (turn this page in, to Showbie: Kidney Lab Questions)

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. Describe 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?

SAFETY: You are responsible for all safety guidelines as described, these and directions given during lab. Read and write your agreement statement on your lab background page, at the bottom of the page.

1. All lab safety rules apply, as reviewed earlier this year, and as you have learned through years of science.
2. Respect – treat kidneys with respect
3. Safety goggles – wear safety goggle over your eyes at all times
4. No food or drinks of any kind
5. Lab aprons, your choice, highly recommended
6. Glove – non latex gloves are provided, but only one pair per person. Be aware! There are no extras.
7. Wash hands with soap and water before you leave, and again before lunch.
8. Sharps – do not cut towards yourself or another person.
9. No horseplay – objects or tools in lab are NOT toys.
10. Listen for directions, follow directions as given.
11. Anyone who cannot follow the safety guidelines will be removed, and will not earn points for the lab.
12. Dispose of all materials as directed:
solids in bags in the trash can.
Utensils washed and on paper towels by the sink,
your group utensils on a paper towel to be checked
tables and desks wiped with Clorox wipes
wash hands with soap!!!

Write this statement and sign below the statement on your paper.

I agree to follow all lab safety guidelines presented here, reviewed here, and given during lab.

Date:

Signature:

class section: