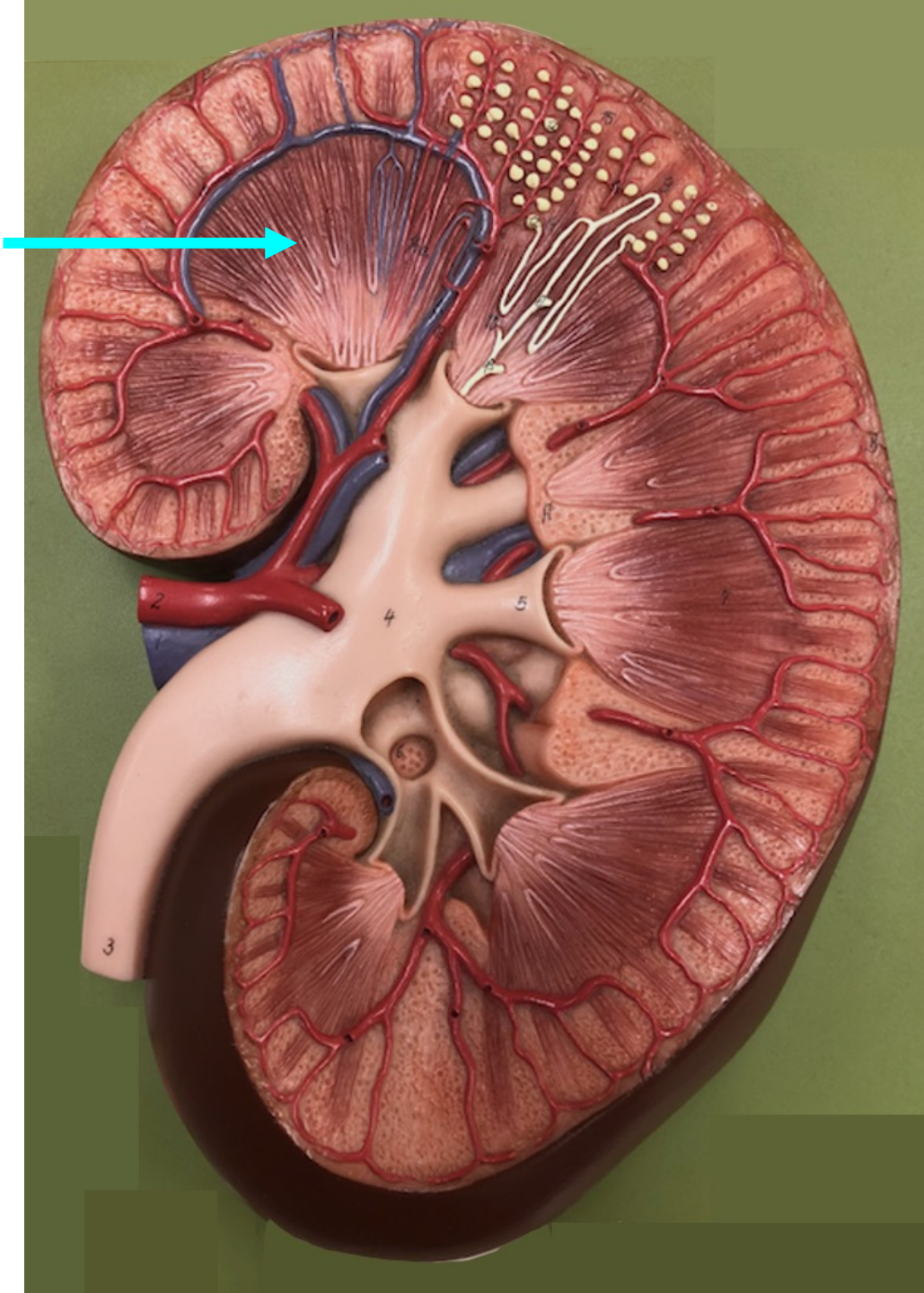
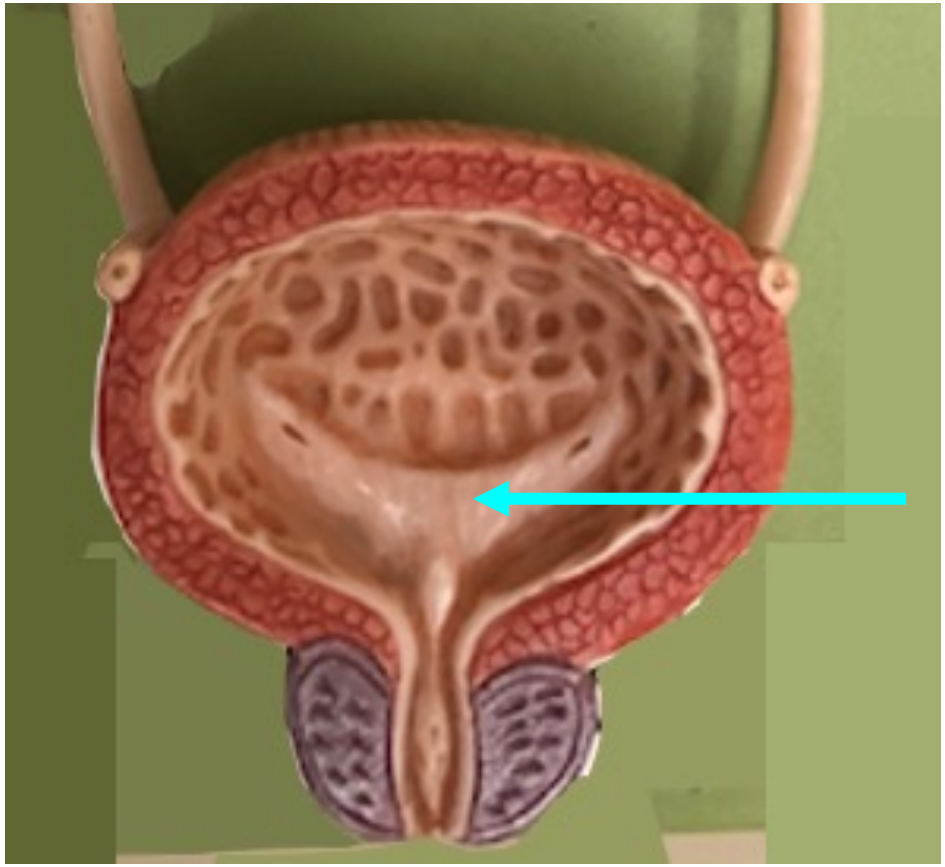
Quiz Section Test 5-AC
Answers are given in red.

1. Name the region of the kidney shown by the arrow.

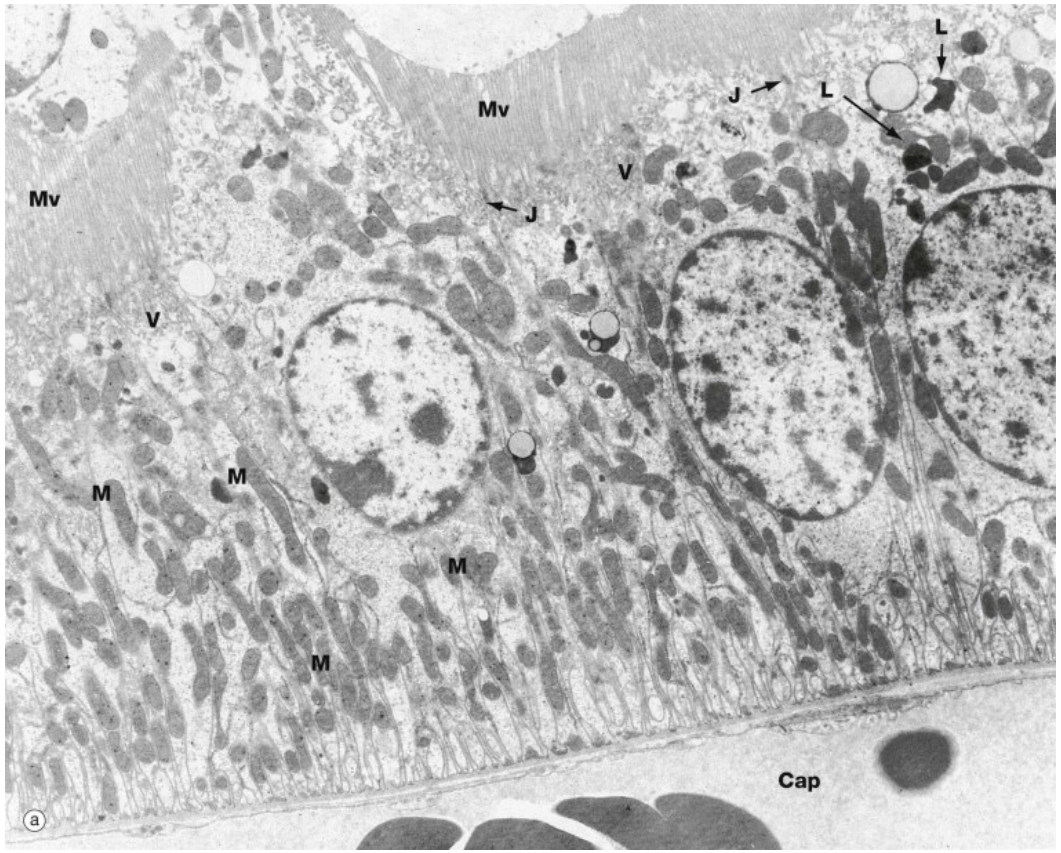
medulla





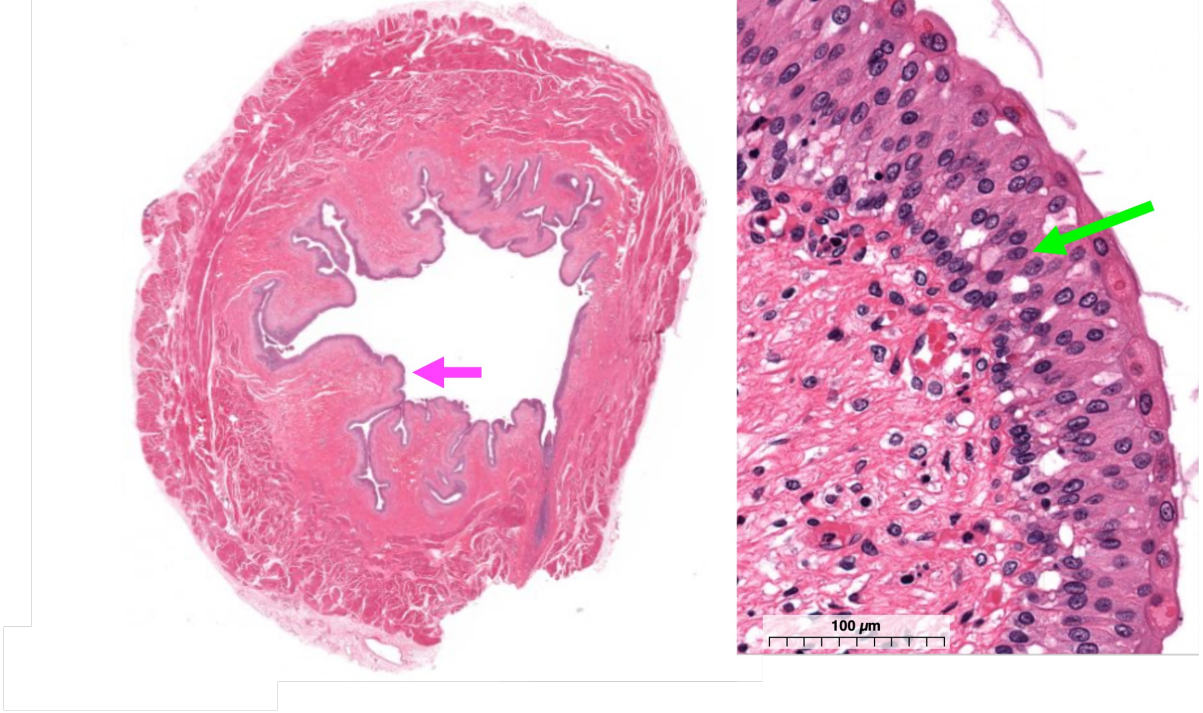
2. Name the structure indicated by the arrow.

trigone



3. The above micrograph shows epithelial cells from what part of the kidney?

a. proximal tubule
b. papilla
c. calyx
d. collecting duct
e. glomerulus

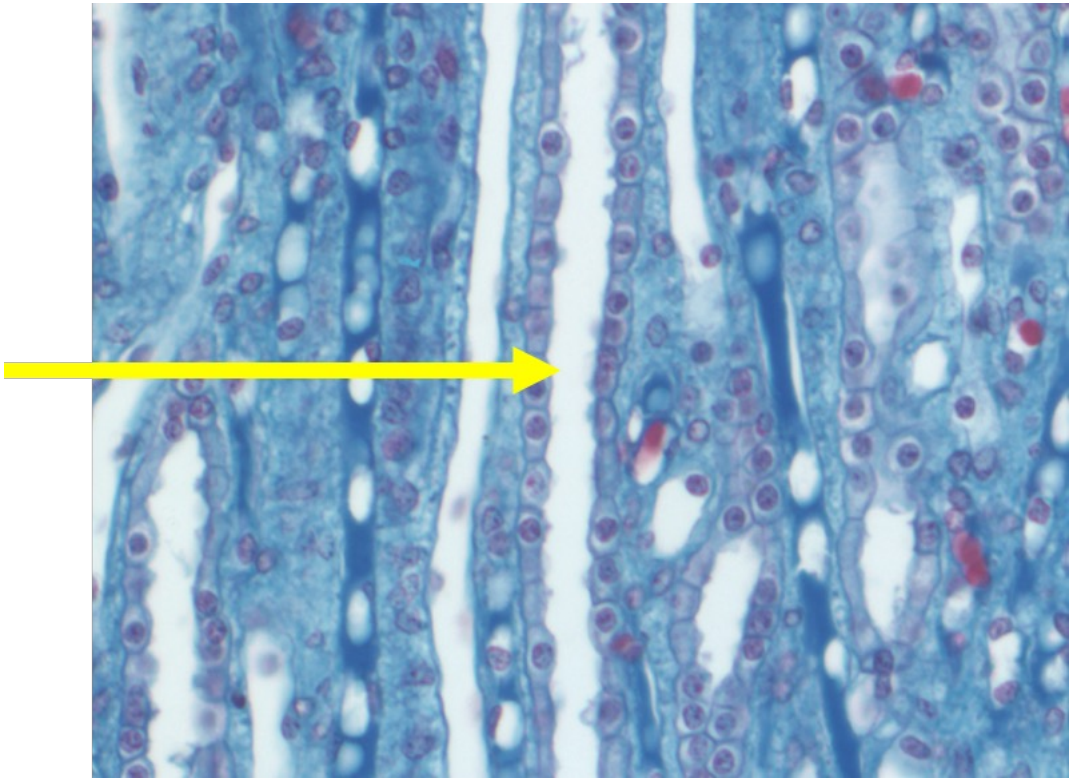


4. The figure on the left shows a cross section through the bladder. The figure on the right is a magnified view of the area indicated by the pink arrow. Which of the following is indicated by the green arrow?

a. loose connective tissue
b. detrusor muscle
c. glomerulus
d. uroepithelium
e. stratified squamous keratinized epithelium

5. Which of the following increases the urinary excretion of glucose?

a. hypertension
b. diet soda
c. treatment with desmopressin
d. treatment with an SGLT2 inhibitor
e. diabetes insipidus



6. Which of the following occurs in the part of the nephron indicated by the arrow?

a. blood flow
b. secretion of vasopressin
c. regulated water reabsorption
d. reabsorption of glucose
e. filtration

7. Which of the following is a substance that is normally found in the blood, and is routinely measured to evaluate kidney function?

a. glucose
b. potassium
c. creatine
d. sodium
e. creatinine

Calculations

NAME Version AC

Be sure to show your work. Full credit will be given for answers that are set up correctly.

DATA for questions #8-10
The following data were collected from a patient with stage 3a chronic kidney disease, in which there is mild to moderate kidney damage.

plasma concentration of creatinine:	1.6 mg/dL
urine flow rate:	1.1 ml/min
urine concentration of creatine:	0.8 mg/ml
plasma concentration of inulin:	0.2 mg/ml
urine concentration of inulin:	9.1 mg/ml

8. Using the above data, convert the **plasma concentration of creatinine** to **mg/ml**. (2 points)

$$\frac{1.6\ mg}{dL} \cdot \frac{1\ dL}{100\ ml} = \boxed{0.016\ mg/ml}$$

9. Using the above data, calculate the **creatinine clearance**. (2 points)

$$Cl_{cr} = \frac{U_{cr}\dot{V}}{P_{cr}} = \frac{\frac{0.8\ mg}{ml} \cdot 1.1\ ml/min}{0.016\ mg/ml}$$

$$= \frac{0.8\ mg}{ml} \cdot \frac{1.1\ ml}{min} \cdot \frac{1\ ml}{0.016\ mg} = \boxed{55\ ml/min}$$

10. Using the above data, calculate the **glomerular filtration rate (GFR)**. (2 points)

GFR = inulin clearance

$$Cl_{in} = \frac{U_{in}\dot{V}}{P_{in}} = \frac{9.1\ mg/ml \cdot 1.1\ ml/min}{0.2\ mg/ml}$$

$$= \frac{9.1\ mg}{ml} \cdot \frac{1.1\ ml}{min} \cdot \frac{1\ ml}{0.2\ mg} \approx \boxed{50\ ml/min}$$