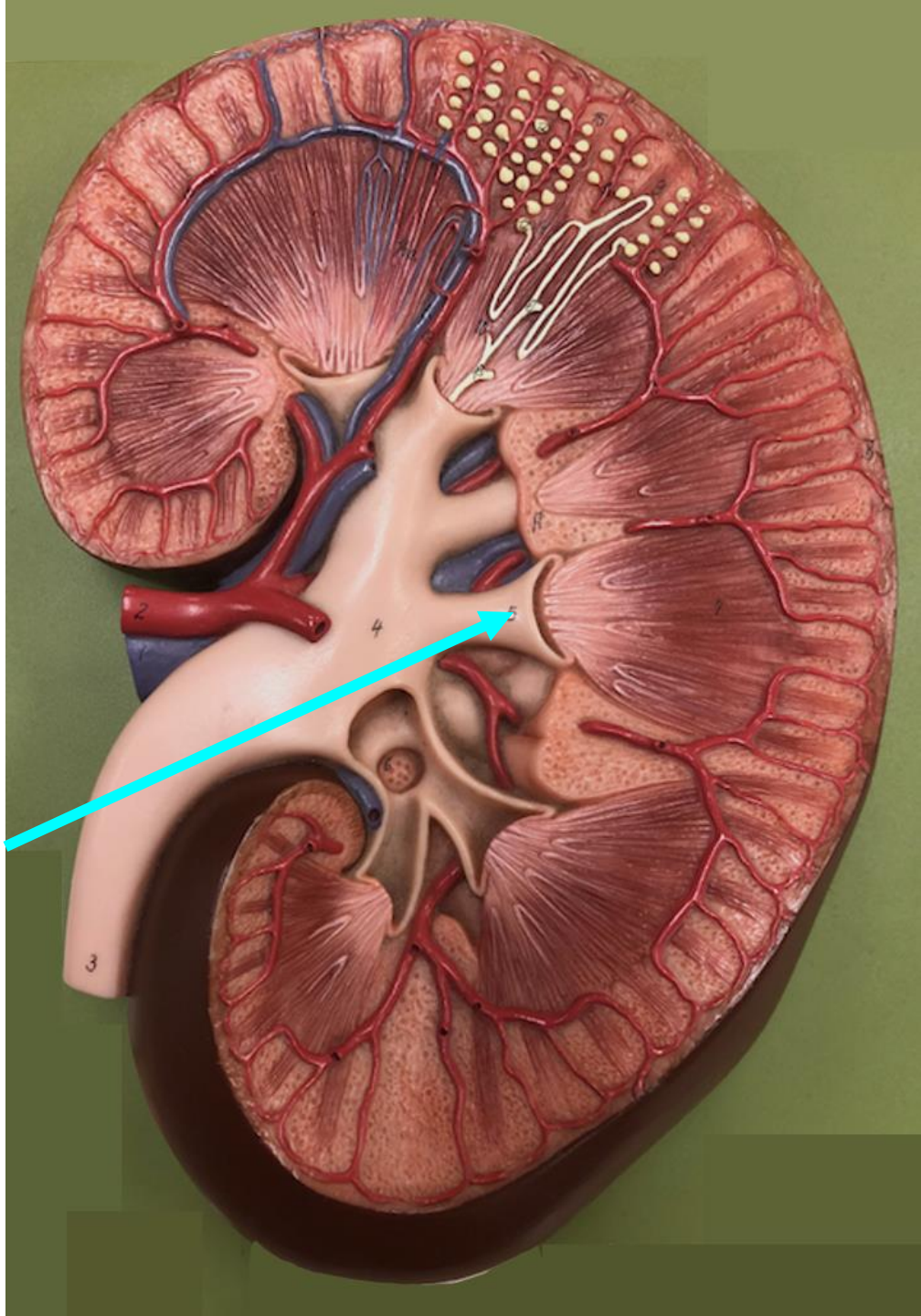
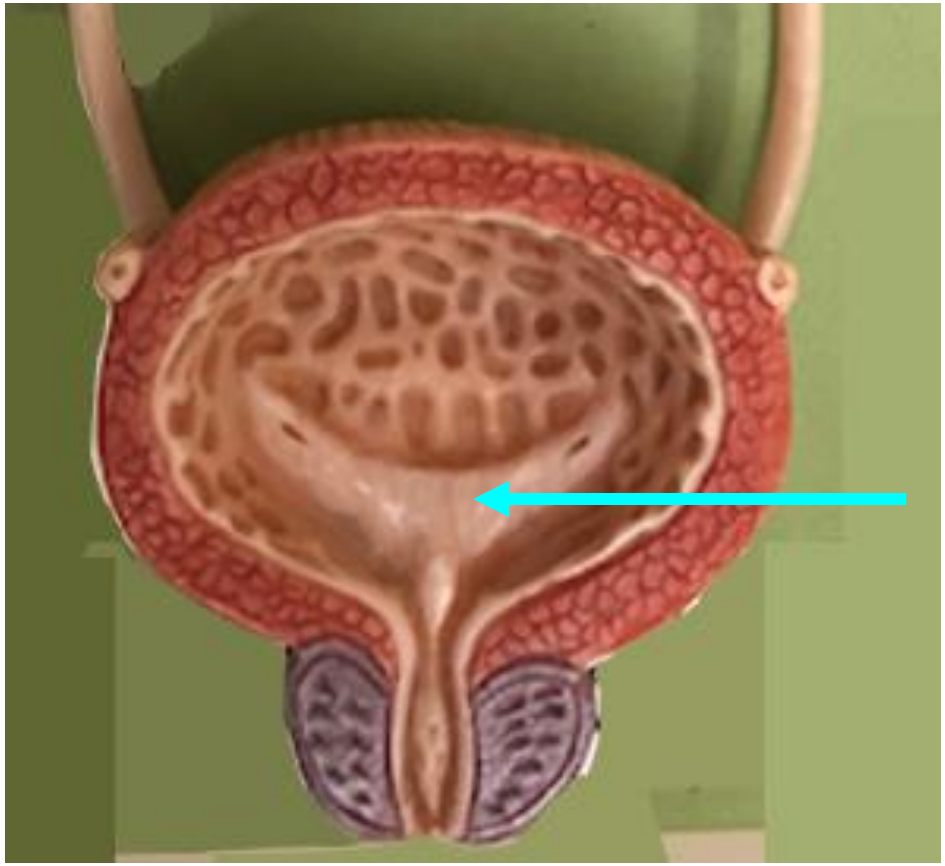
Quiz Section Test 5-AB
Answers are given in red.

1. Name the structure indicated by the arrow.

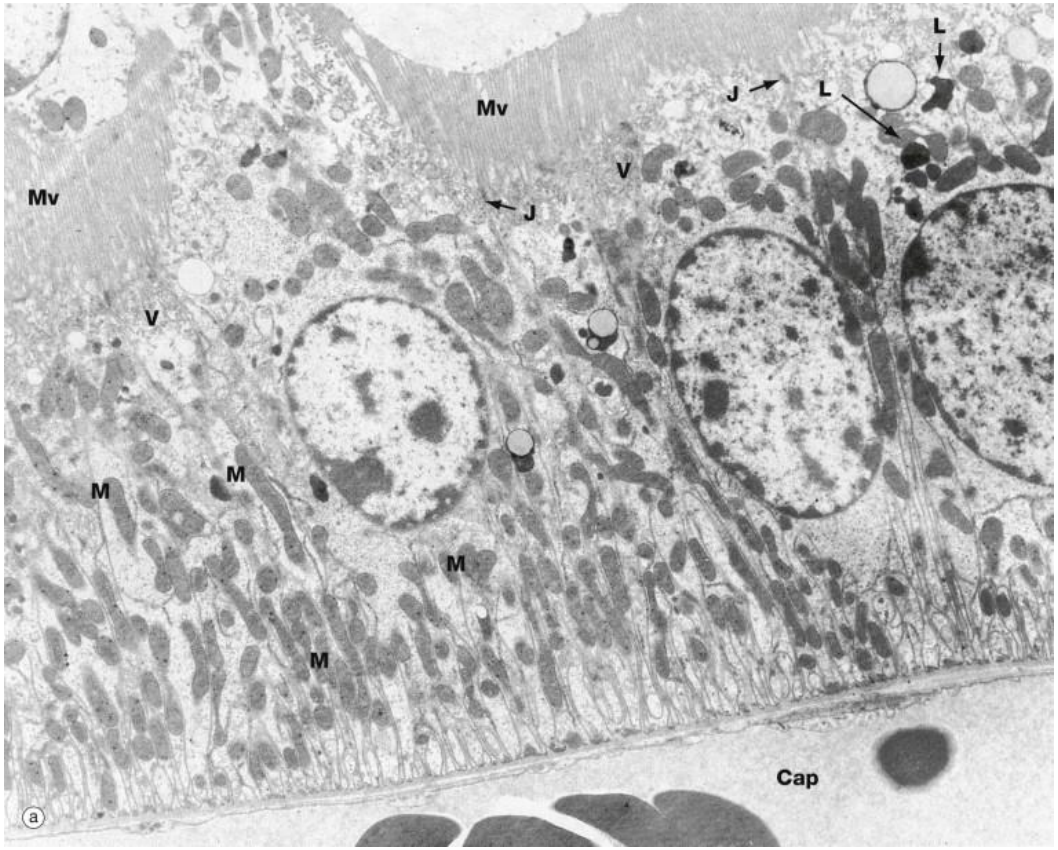
calyx





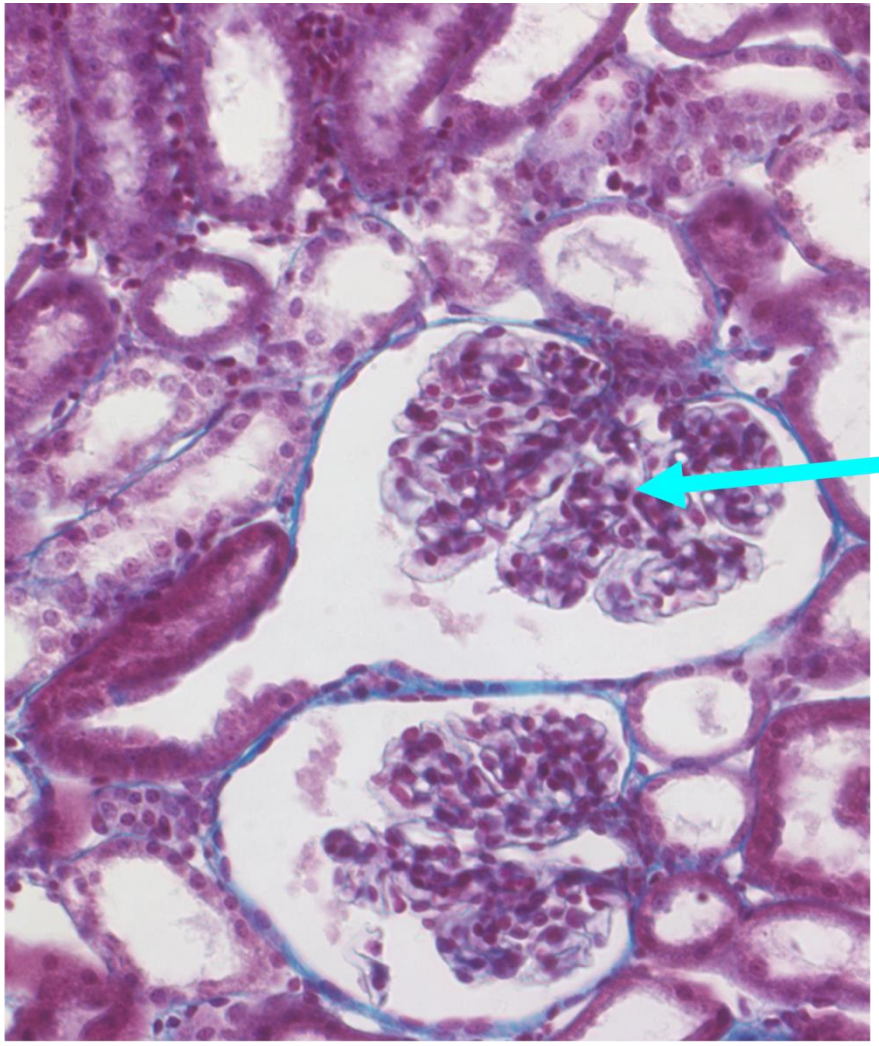
2. Name the specific part of the bladder indicated by the arrow.

trigone



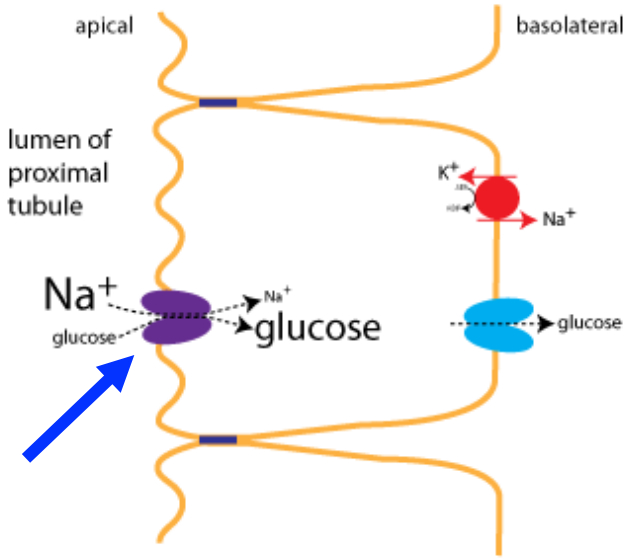
3. The above micrograph shows epithelial cells from what part of the kidney?

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



4. Name the structure indicated by the arrow.

glomerulus



5. Name the protein indicated by the blue arrow, This protein is a target of drugs used to treat type 2 diabetes mellitus. (abbreviation okay)

SGLT2

6. Increased action potential firing by hypothalamic osmoreceptors stimulates secretion of

a. organic molecules in the proximal tubule.
b. renin.
c. aquaporins.
d. vasopressin.
e. insulin.

7. Which of the following makes determining inulin clearance more difficult than determining creatinine clearance?

a. Inulin concentrations in urine are much lower than creatinine concentrations.
b. Inulin concentrations in urine are much higher than creatinine concentrations.
c. Inulin is a plant carbohydrate and needs to be injected.
d. Determining the inulin concentration in urine requires a 24-hour urine collection.

Calculations

NAME Key - AB

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 3b chronic kidney disease, in which there is mild to moderate kidney damage.

plasma concentration of creatinine:	1.8 mg/dL
urine flow rate:	1.1 ml/min
urine concentration of creatine:	0.7 mg/ml
plasma concentration of inulin:	0.4 mg/ml
urine concentration of inulin:	14.0 mg/ml

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

$$1.8\ \frac{mg}{dL} \cdot \frac{1\ dL}{100\ ml} = 0.018\ mg/ml$$

9. Using the above data, calculate the **creatinine clearance**.

$$CL_{cr} = \frac{U_{cr} \cdot \dot{V}}{P_{cr}} = \frac{0.7\ mg/ml \cdot 1.1\ ml/min}{0.018\ mg/ml}$$

$$= 0.7\ \frac{mg}{ml} \cdot 1.1\ \frac{ml}{ml} \cdot \frac{1\ ml}{0.018\ mg} = 42.8\ ml/min$$

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

GFR = clearance of inulin

$$CL_{in} = \frac{U_{in} \cdot \dot{V}}{P_{in}} = \frac{14\ mg/ml \cdot 1.1\ ml/min}{0.4\ mg/ml} = 14\ \frac{mg}{ml} \cdot 1.1\ \frac{ml}{min} \cdot \frac{1\ ml}{0.4\ mg}$$

$$= 38.5\ ml/min$$