

LABORATORY 18 - URINARY SYSTEM, CONTINUED, URINARY PASSAGES

OBJECTIVES: (See previous laboratory)

ASSIGNMENT FOR TODAY'S LABORATORY

GLASS SLIDES

[SL 115](#) Kidney - Review all structures observed in previous laboratory

[SL 18](#) Ureter

[SL 179](#) Urinary bladder

[SL 57](#) Urinary bladder

[SL120](#) Female urethra and vagina

POSTED ELECTRON MICROGRAPHS

82 Renal Corpuscle

85 Kidney tubule

86 Kidney tubules

88 Medulla

[Lab 18 Posted EMs](#); [Lab 18 Posted EMs with some yellow labels](#)

HISTOLOGY IMAGE REVIEW - available on computers in HSL

Chapter 18. Urinary System

Frames: 1222 -1268

SUPPLEMENTARY ELECTRON MICROGRAPHS

Rhodin, J. A.G., An Atlas of Histology

Copies of this text are on reserve in the HSL.

Urinary system, pp. 370 - 382

- C. URETER [SL 18 \(low\)](#) – The ureter is composed of three layers; mucosa, that consists of epithelium and connective tissue; muscularis that has two to three layers of smooth muscle organized in bundles and adventitia that is an outer layer of connective tissue. At low magnification longitudinal folds are evident in this cross section of the ureter (J. 19-28; W. 16-25).
1. Mucosa - Identify type of epithelium. Lamina propria varies from loose to dense irregular connective tissue ([approximate region of lamina propria outlined by red line](#)).
 2. Muscularis - Orientation of muscle (two layers until lower third of organ) is inner longitudinal, outer circular. The smooth muscle cells are organized into bundles of fibers. The muscular layer is not as well organized as in G-I tract that will be studied later.
 3. Adventitia - Connective tissue and blood vessels.
- D. URINARY BLADDER - [SL 179](#) (adult), [SL 57](#) (baby). The construction of the bladder is similar to the ureter (J. 19-27; W. 16.26, 16.27).
1. Mucosa - same layers as in ureter, but both epithelium and lamina propria are thicker in [adult](#) organ than in the [baby](#).
 2. Muscularis - ([adult](#), [baby](#)) Bundles of smooth muscle cells are evident. Three layers of muscle are vaguely apparent.
 3. Adventitia (Serosa) - The third layer may be either adventitia or serosa. Is there a layer of mesothelium on the outer surface of this section?
- E. FEMALE URETHRA (and VAGINA) - [SL 120](#). This slide is from the urethra of a 14 year old female. The urethra is composed of a mucosa, a muscularis and an adventitia. Each layer differs to some degree from the ureter. The lumen of the organ is usually crescent-shaped. (The vagina will be studied later, as part of the female reproductive system).
1. Mucosa - The epithelium is variable, pseudostratified columnar and stratified squamous epithelium may occur. Small mucous glands are found within the epithelium. The lamina propria contains an extensive [venous plexus](#).
 2. Muscularis - This consists of an inner layer of longitudinal smooth muscle and an outer layer of circular muscle.
 3. Adventitia - continuous with that of vagina.
- F. MALE URETHRA. To be studied with the male reproductive system.

OBJECTIVES FOR LABORATORY 18: URINARY PASSAGES

1. Using the light microscope or digital slides, identify:

Ureter

Mucosa

Transitional epithelium

Lamina propria

Muscularis

Inner longitudinal layer

Outer circular layer

Outermost longitudinal layer (only in region near bladder)

Adventitia

Urinary bladder

Same layers as in ureter, except

outermost longitudinal layer thicker

outer layer may be serosa (if it includes peritoneum)

Urethra (female)

Variable epithelium

Lamina propria

Venous plexus

Muscularis

Adventitia

REVIEW

1. Compare the pars convoluta with the pars radiata.
2. Relate the light and electron microscopic appearance of the different sections of the uriniferous tubule to its generalized functions.
3. Trace two anatomic pathways followed by red blood cells from the renal artery to the renal vein.
4. What are the functions of the macula densa and juxtaglomerular apparatus?