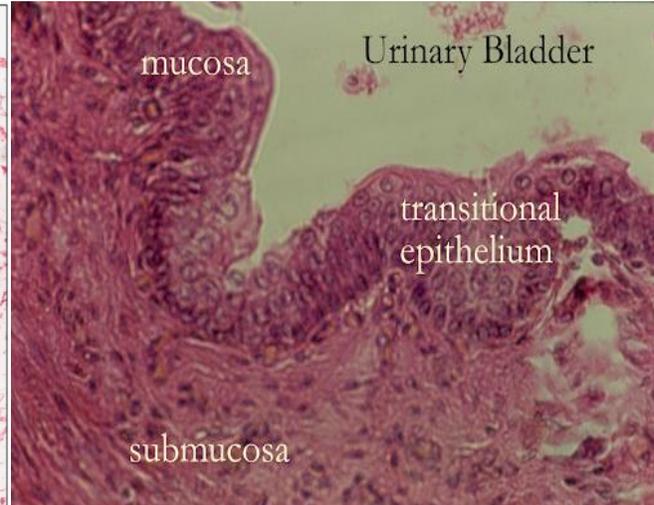


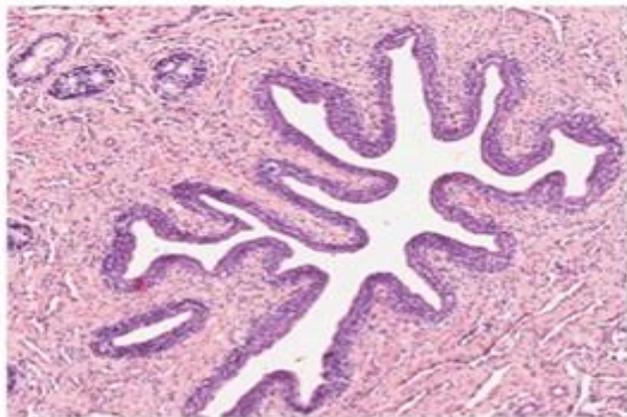


General Histology / Year 2

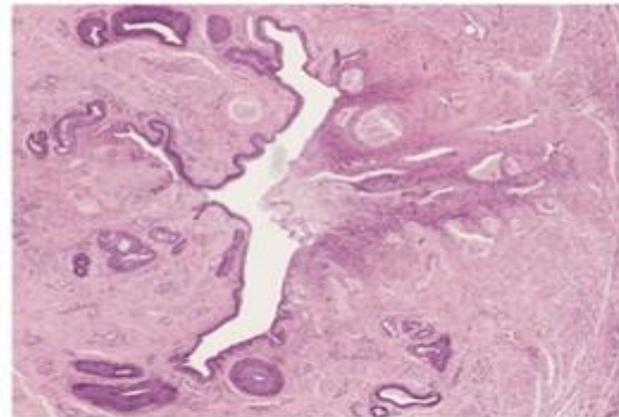


Urinary System Lecture 7

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Male urethra



Female urethra

Ureters

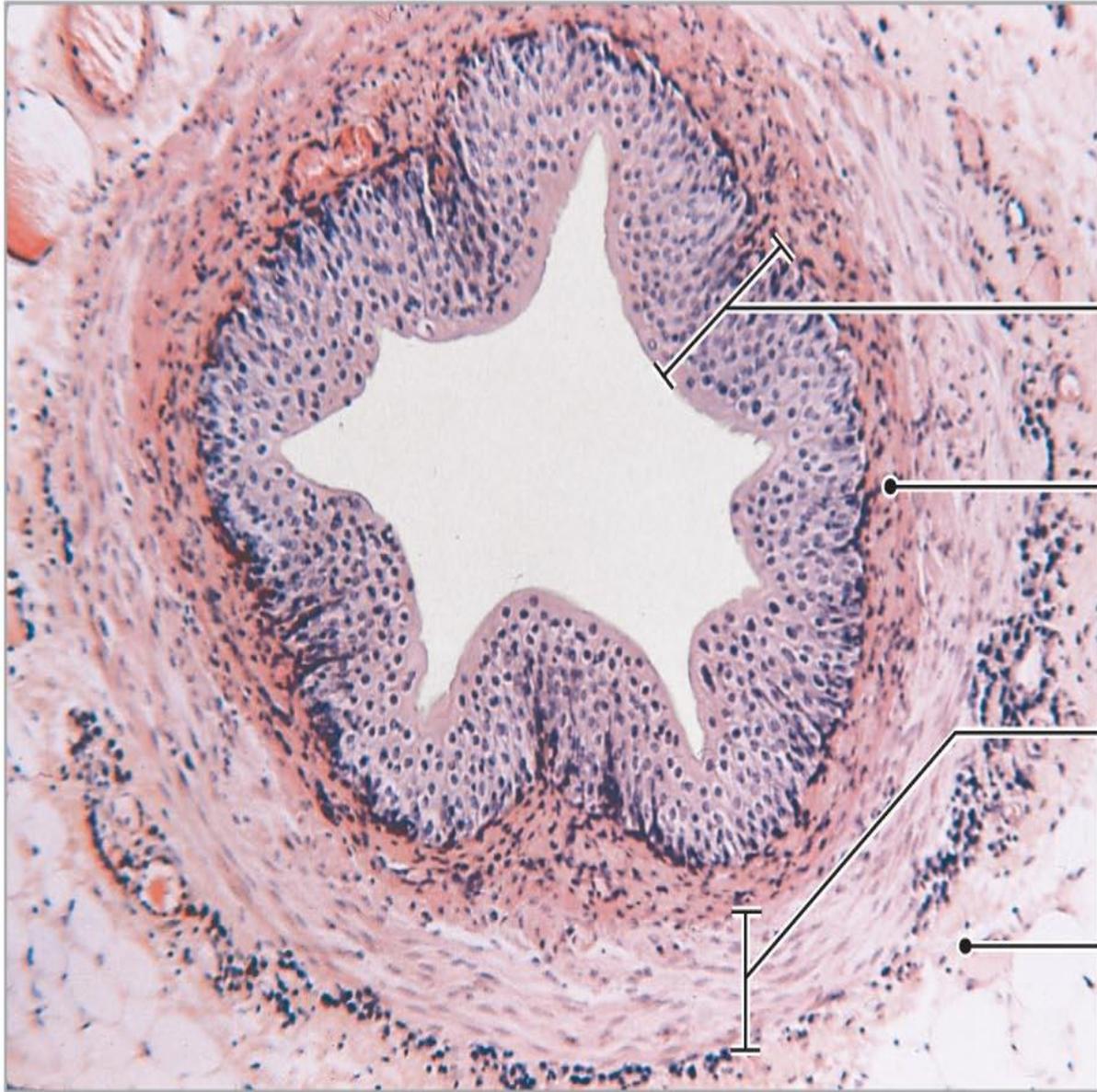
- Each ureter conducts urine from the renal pelvis to the urinary bladder and is approximately 24 to 34 cm long.
- The distal part of the ureter enters the urinary bladder and follows an oblique path through the wall of the bladder.
- Urine is transported by the ureters to the bladder where it is stored until emptied during Urination via the urethra.
- The ureter is consists of Tunica mucosa, Tunica muscularis, and Tunica adventitia.
- **Tunica mucosa:-**
- Transitional epithelium (urothelium) lines the luminal surface of the wall of the ureter. The remainder of the layer is composed of blood vessels and connective tissue.

Transitional Epithelium (urothelium)

- **The urothelium is composed of the following three layers:-**
- **1-A single layer of small basal cells (cuboidal or columnar in form) resting on a very thin basement membrane.**
- **2-An intermediate region containing from one to several layers from polygonal cells.**
- **3-A superficial layer of very large, polyhedral or dome-like cells called umbrella cells which are either mono-nucleated or bi-nucleated and are highly differentiated to protect underlying cells against the cytotoxic effects of hypertonic urine.**

Ureters

- **Tunica Muscularis:-**
 - The smooth muscle is arranged in three layers: an inner longitudinal layer, a middle circular layer, and an outer longitudinal layer.
 - However, the outer longitudinal layer is present only at the distal end of the ureter.
- **Tunica Adventitia:**
 - Usually, the ureter is embedded in the retroperitoneal adipose tissue. The adipose tissue, vessels, Lymphatics and nerves form the adventitia of the ureter.



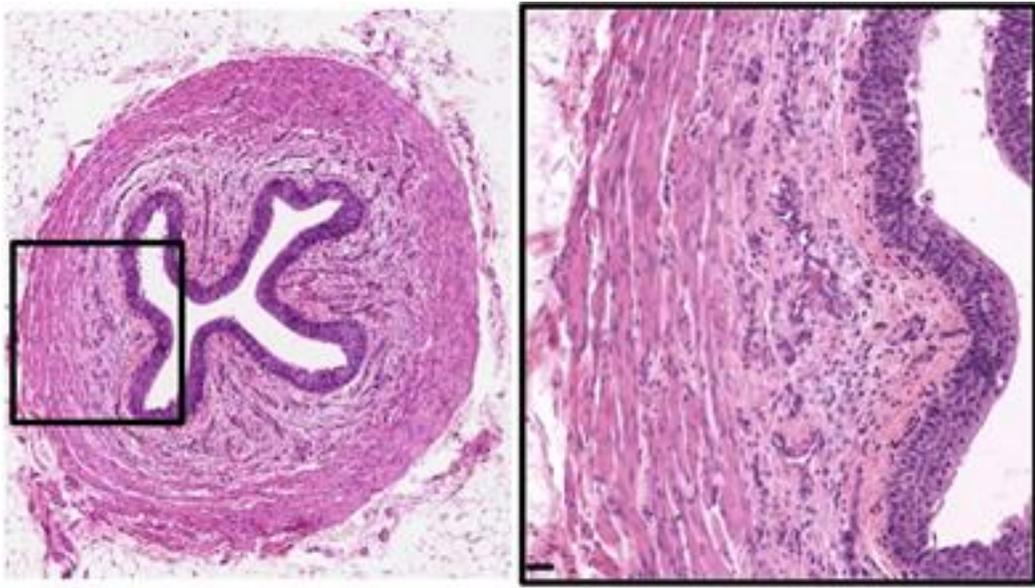
**Transitional
epithelium**

**Lamina
propria**

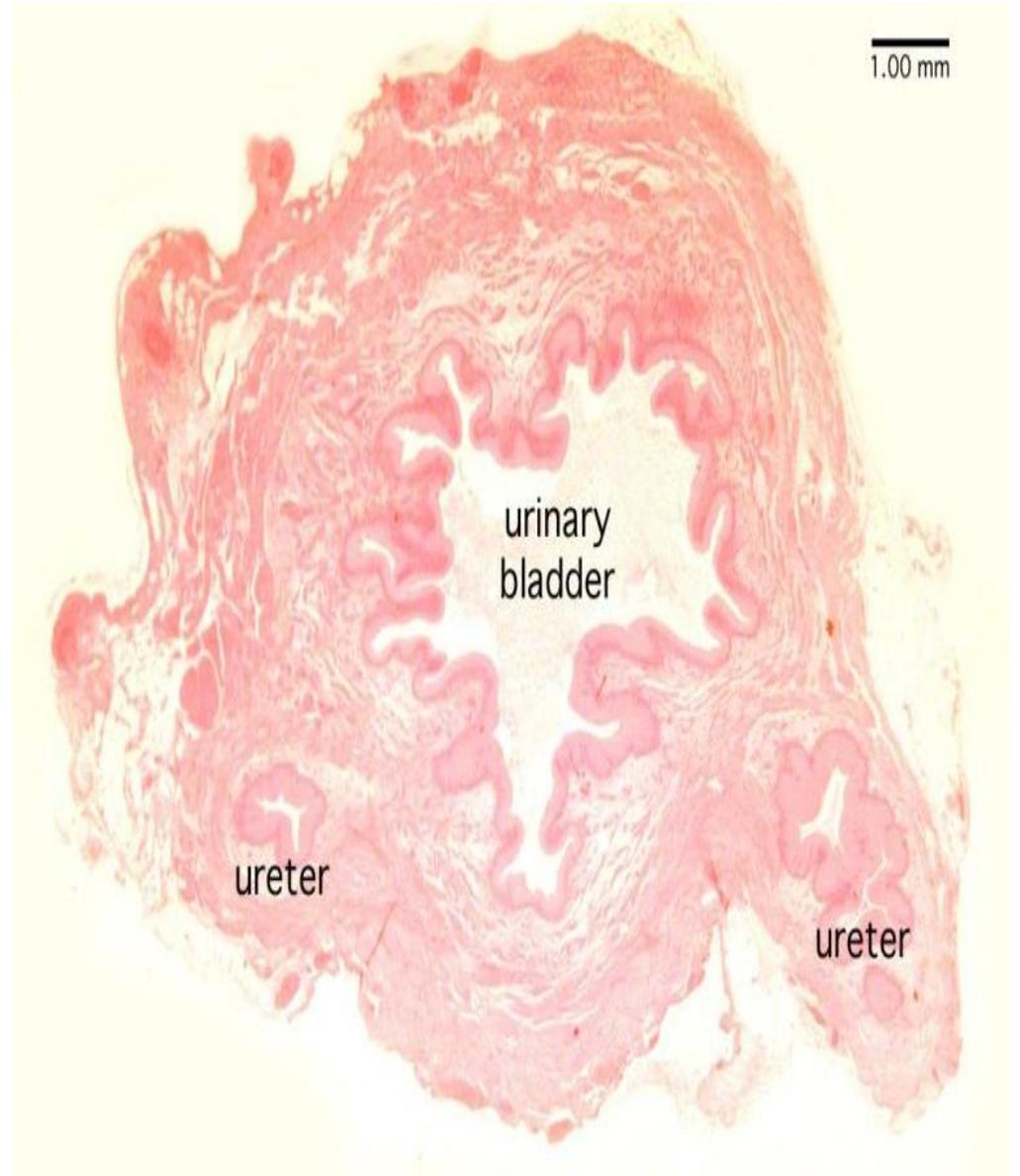
Mucosa

**Smooth
muscle**

**Outer connective
tissue layer**



Ureter

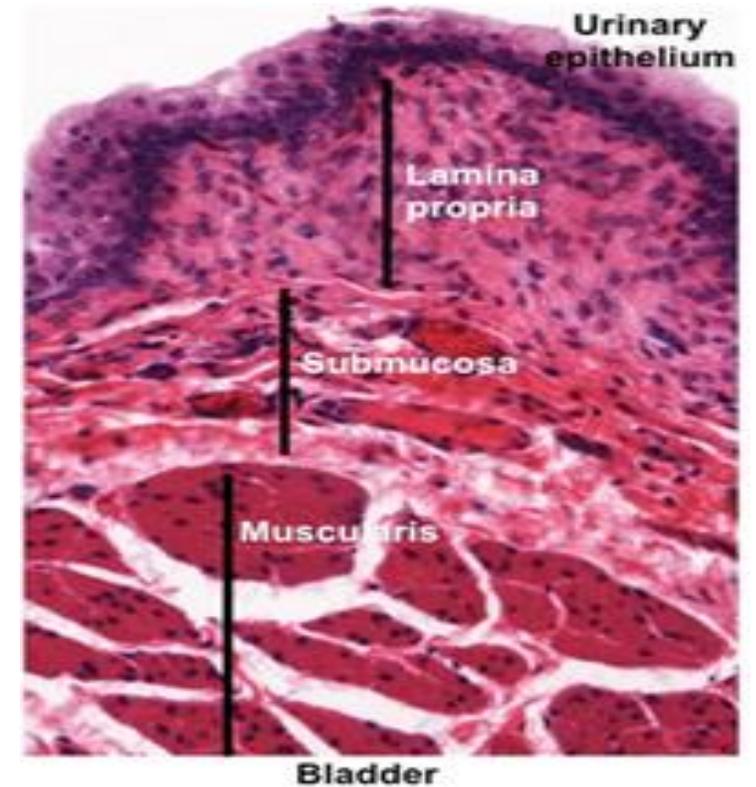
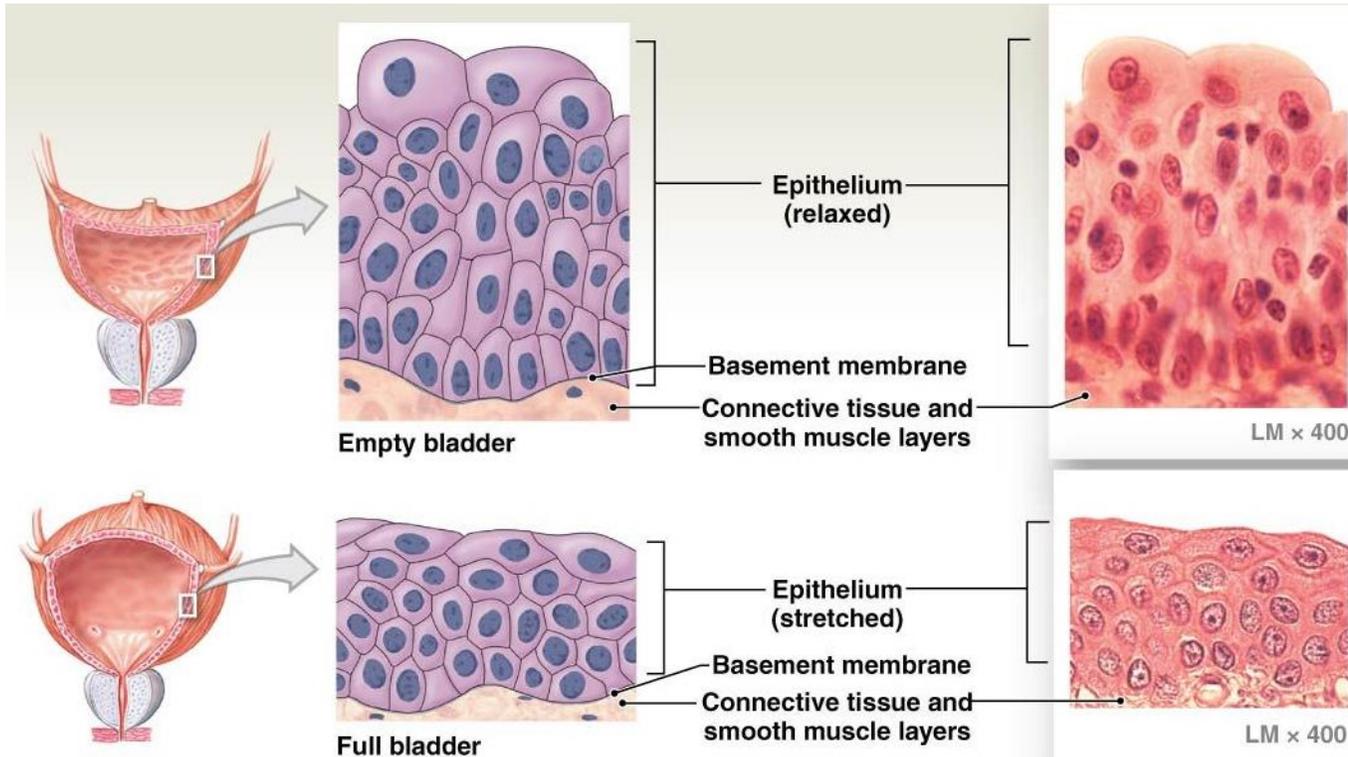
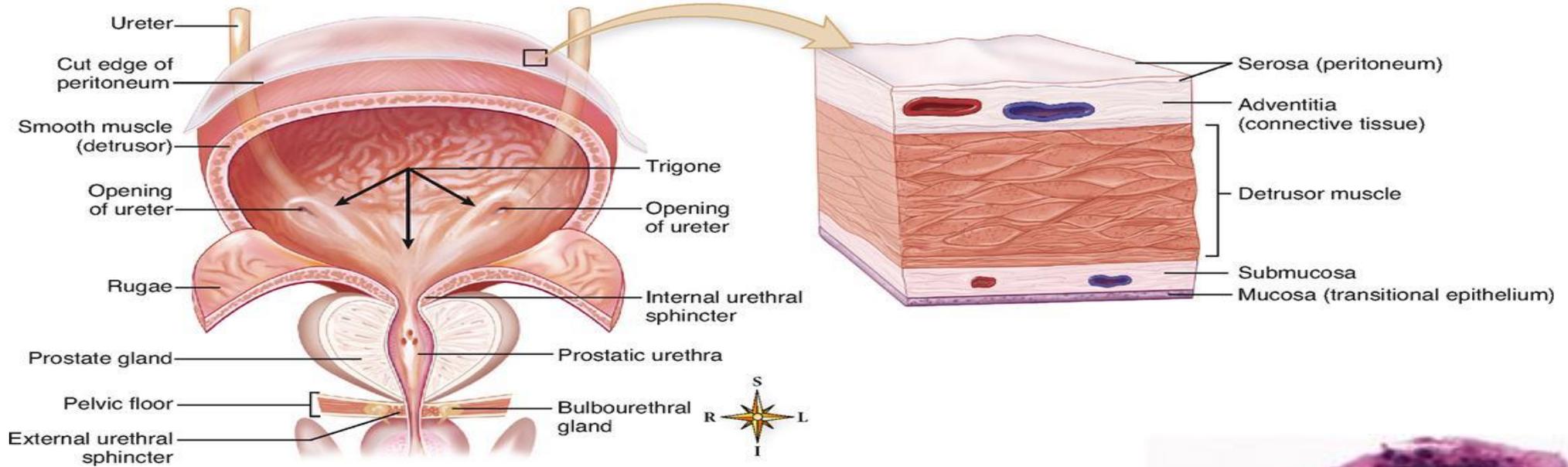


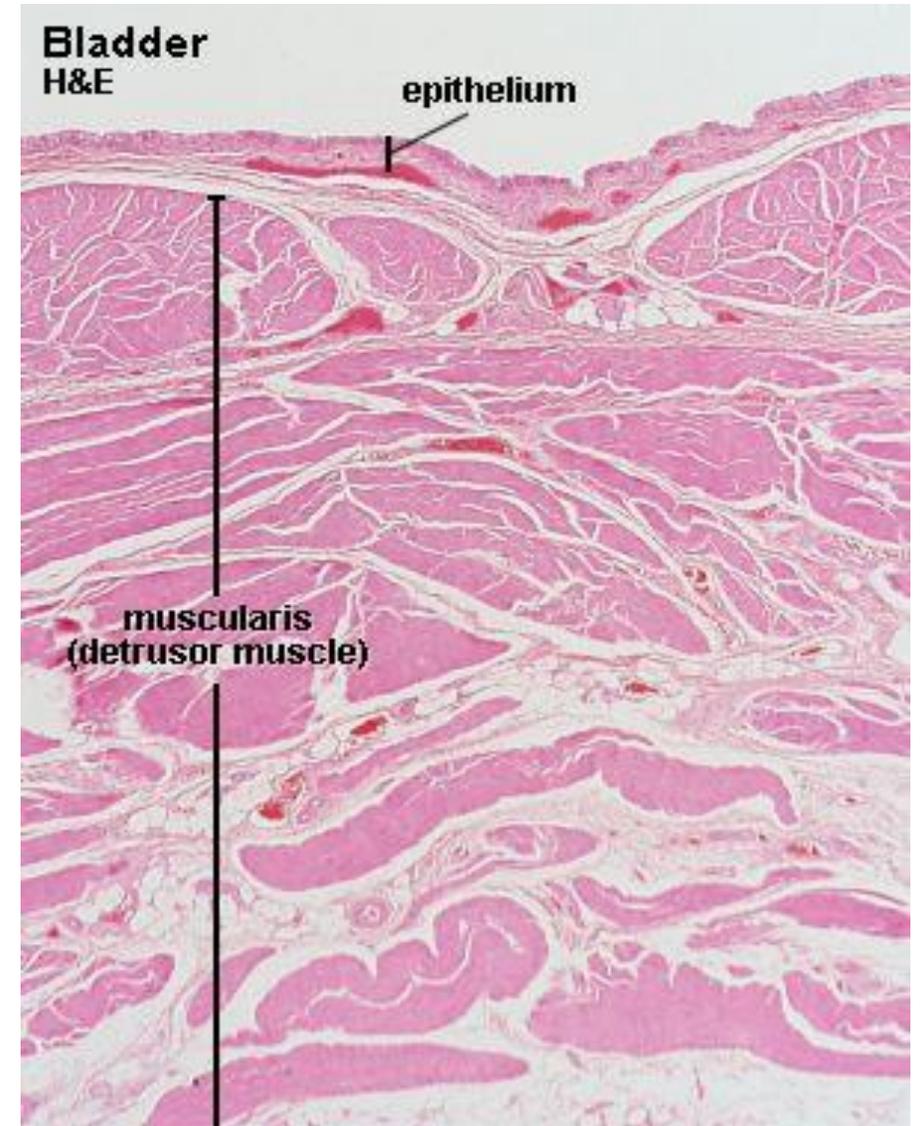
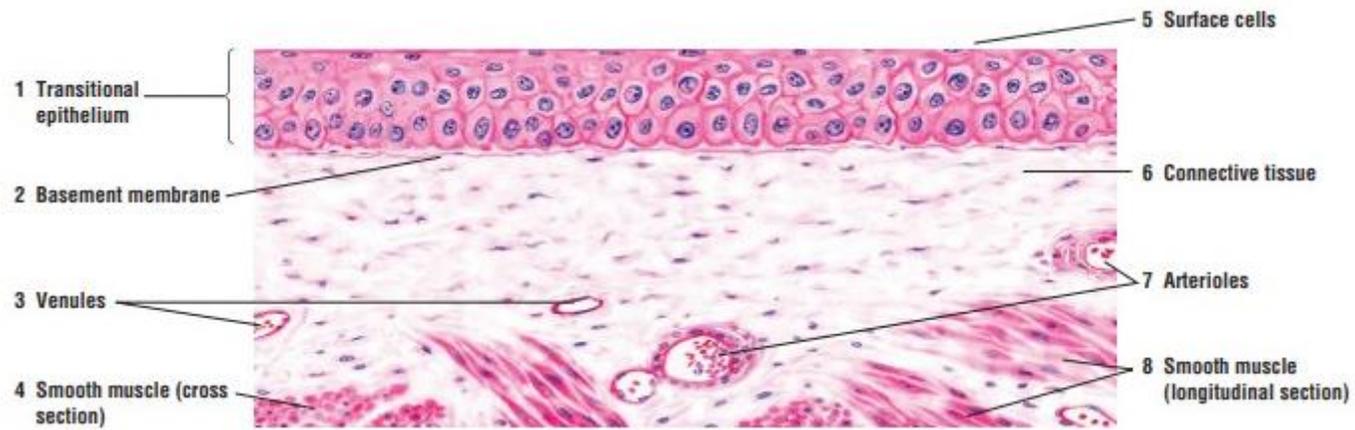
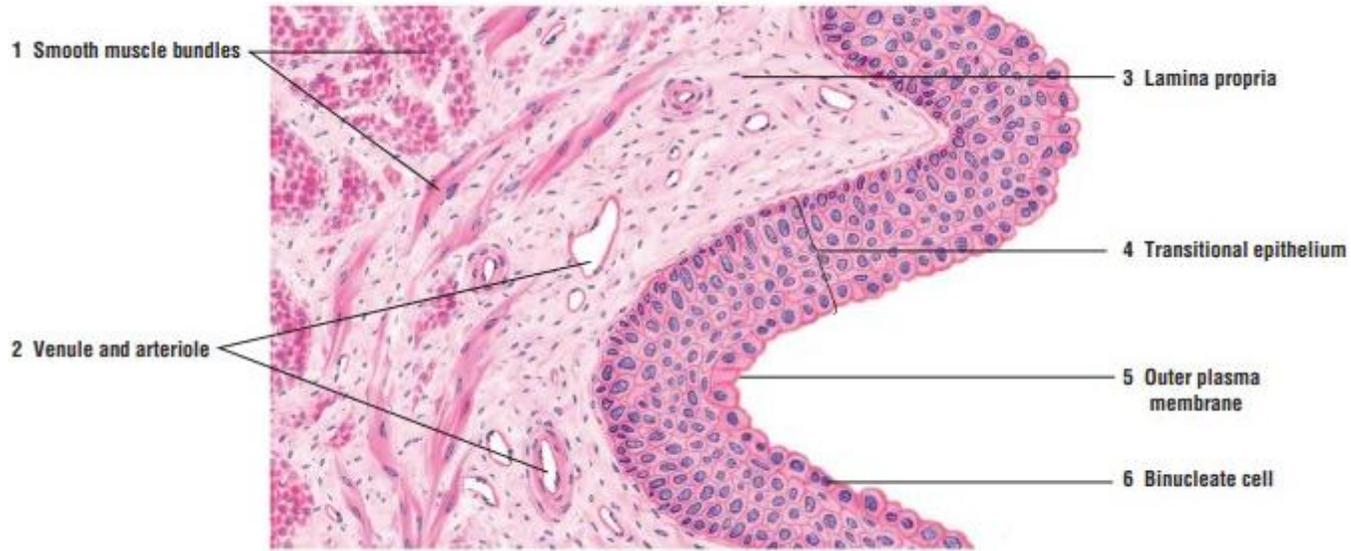
Urinary Bladder

- The urinary bladder is a distensible reservoir for urine, its size and shape change as it fills.
- It contains three openings, two for the ureters (ureteric orifices) and one for the urethra (internal urethral orifice).
- (Triangular region) The defined by these three openings.
- The urinary bladder is consists of Tunica mucosa, Tunica submucosa, Tunica muscularis, and Tunica adventitia.
- **Tunica Mucosa:-**
- Transitional epithelium in empty bladder exhibits about six layers of cells.
- When stretched, transitional epithelium appears stratified squamous.

Urinary Bladder

- **Tunica submucosa:-**
 - The bladder's lamina propria and dense irregular connective tissue of the submucosa are highly vascularized.
- **Tunica Muscularis:-**
 - Thick muscular wall with three indistinct layers of smooth muscle.
 - Collectively called the detrusor muscle which contract to empty the bladder.
- **Tunica Adventitia:-**
 - All the urinary passages are covered externally by an adventitial layer, except for the upper part of the bladder which is covered by serous peritoneum.





Urethra

- The urethra is the fibromuscular tube that conveys urine from the urinary bladder to the exterior through the external urethral orifice.
- The size, structure, and functions of the urethra differ in males and females.
- In the male, the urethra serves as the terminal duct for both the urinary and genital systems.
- The histological details include the basic four layers:-
 - **Tunica mucosa**:- The epithelium is transitional but changes to stratified squamous at the external urethral orifice.
 - **Tunica submucosa**:- It is a connective tissue layer .
 - **Tunica muscularis**:- It has inner and outer longitudinal and a middle circular layer of smooth muscles as in bladder but towards the external urethral orifice, it acquires an external layer of skeletal muscle called Urethralis muscle.
 - **Tunica serosa/ adventitia**:- is a fibrous layer.

