

Unit 4 Pictures

BIOL 213 Online Lab PowerPoint

Hint: Slides with colored backgrounds help to divide content into different days.

Urinary Gross Anatomy and Histology

Use the following pictures to help you identify terms from the lab term handout.

***You always only need to know the terms listed in the lab term handout!

Another good resource is the Visible Body ATLAS app: <http://atlas.visiblebody.com>

Don't forget that to use the link to download the atlas to a personal device, the device must first be connected to the MCPA Wi-Fi at the Rockville campus.

Urinary Anatomy

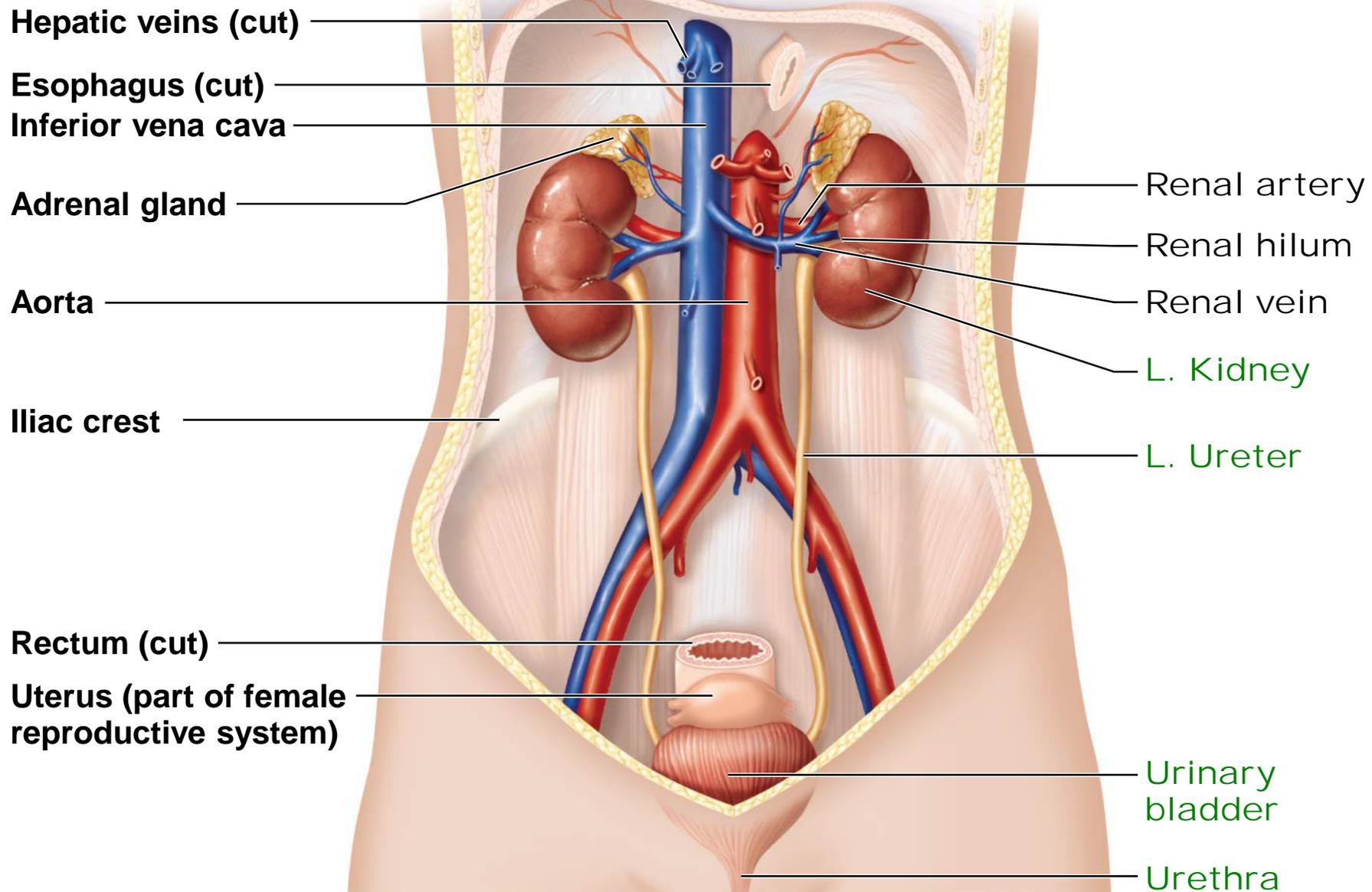
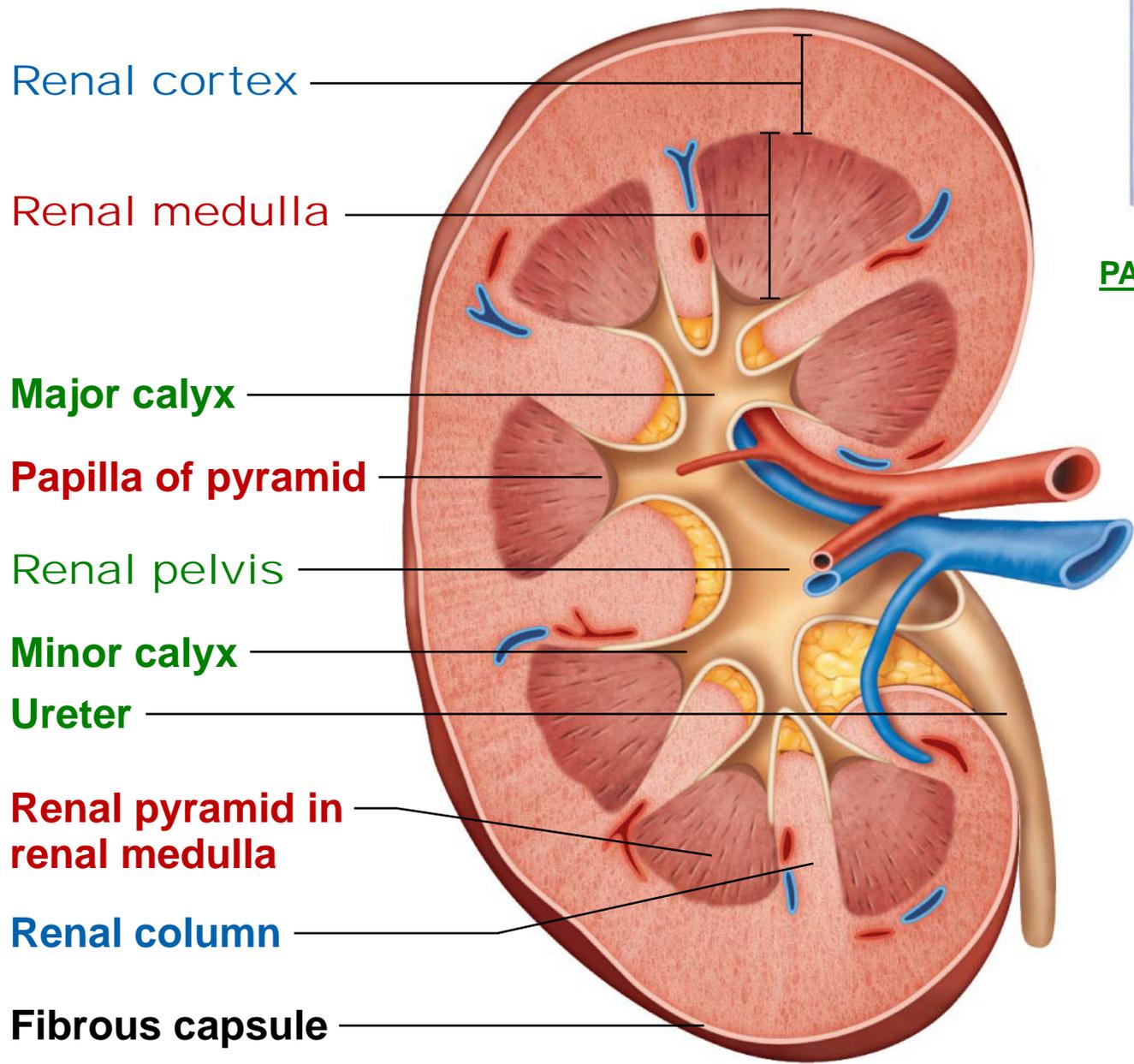


Figure 25.4b Internal anatomy of the kidney.



Renal cortex

Renal medulla

Major calyx

Papilla of pyramid

Renal pelvis

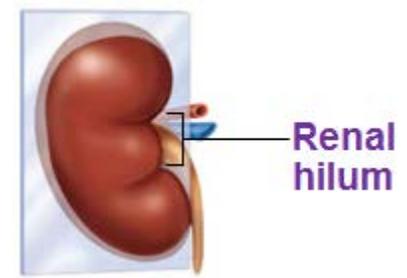
Minor calyx

Ureter

Renal pyramid in renal medulla

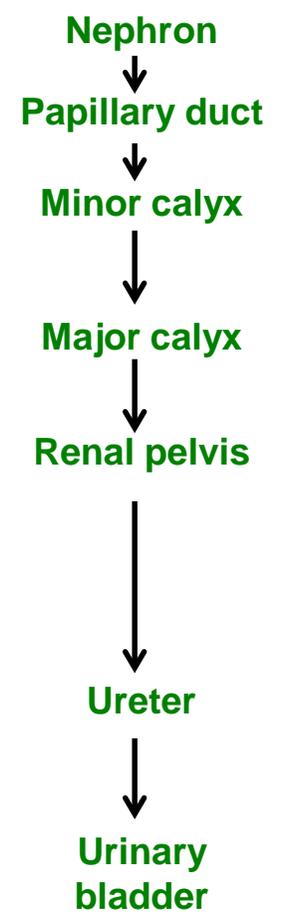
Renal column

Fibrous capsule



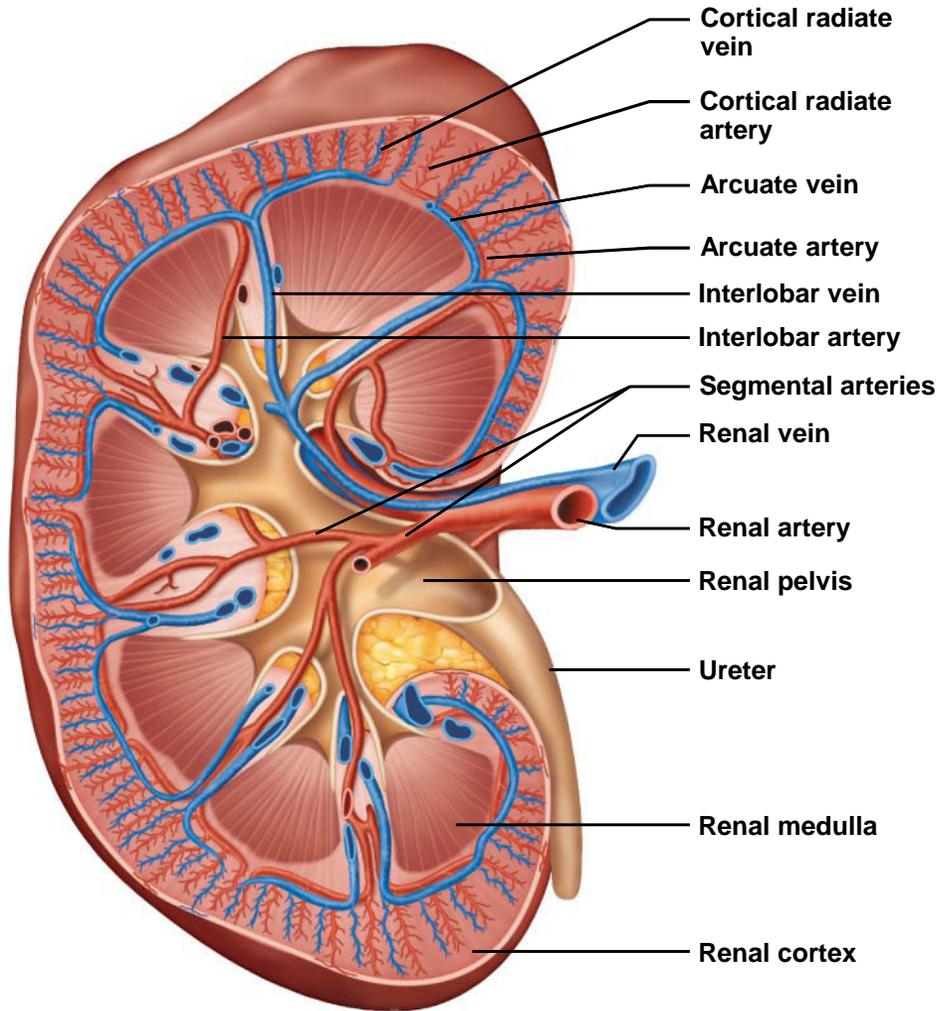
Renal hilum

PATH OF URINE DRAINAGE:



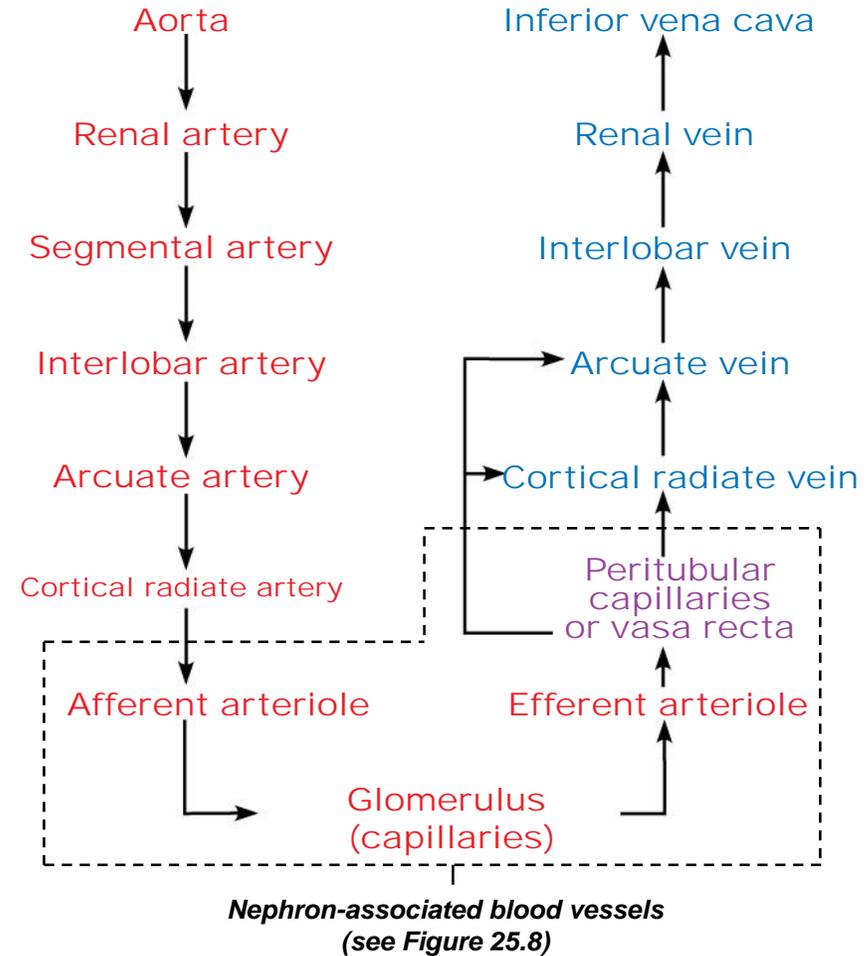
(b) Diagrammatic view

Blood vessel location?



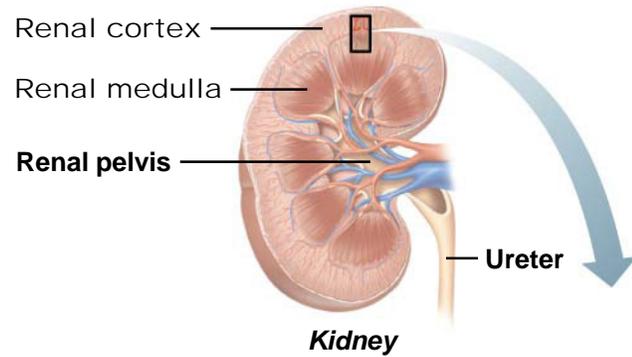
(a) Frontal section illustrating major blood vessels

Blood Flow to & from the Kidney



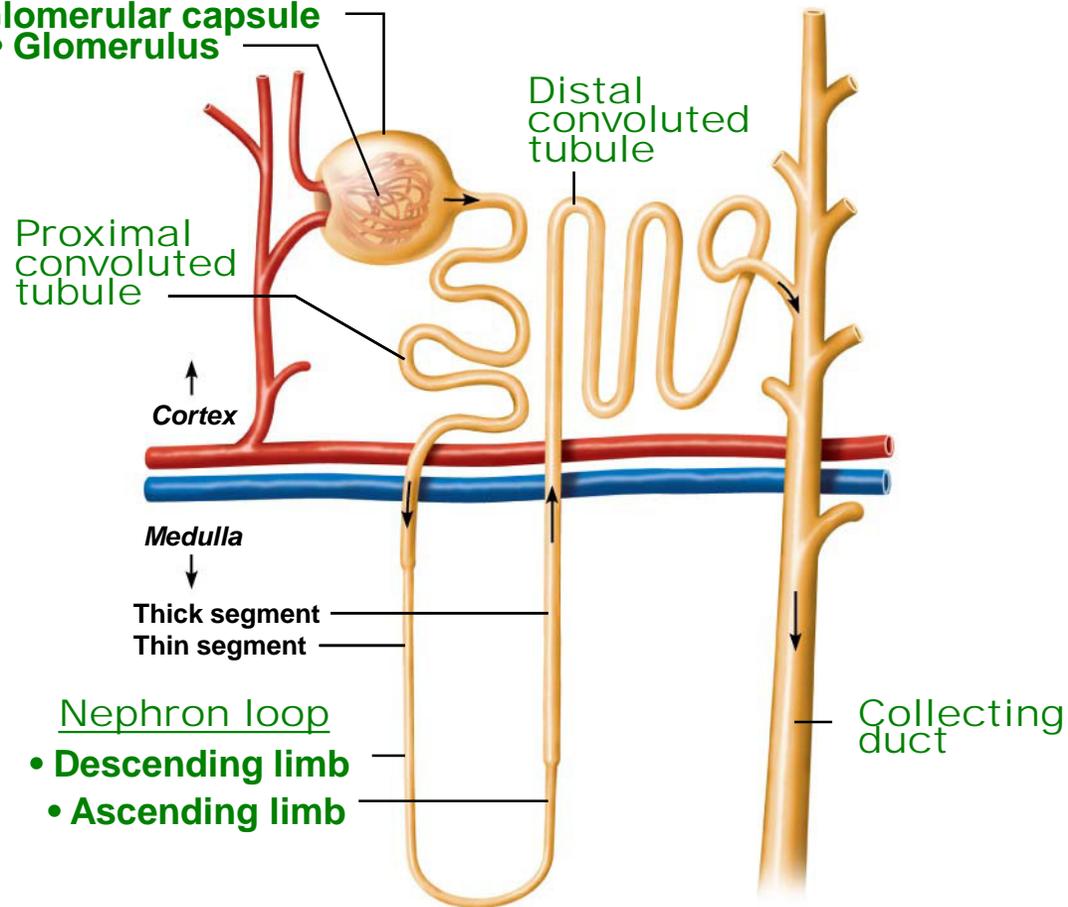
(b) Path of blood flow through renal blood vessels

Figure 25.6-1 Location and structure of nephrons.



Renal corpuscle

- **Glomerular capsule**
- **Glomerulus**

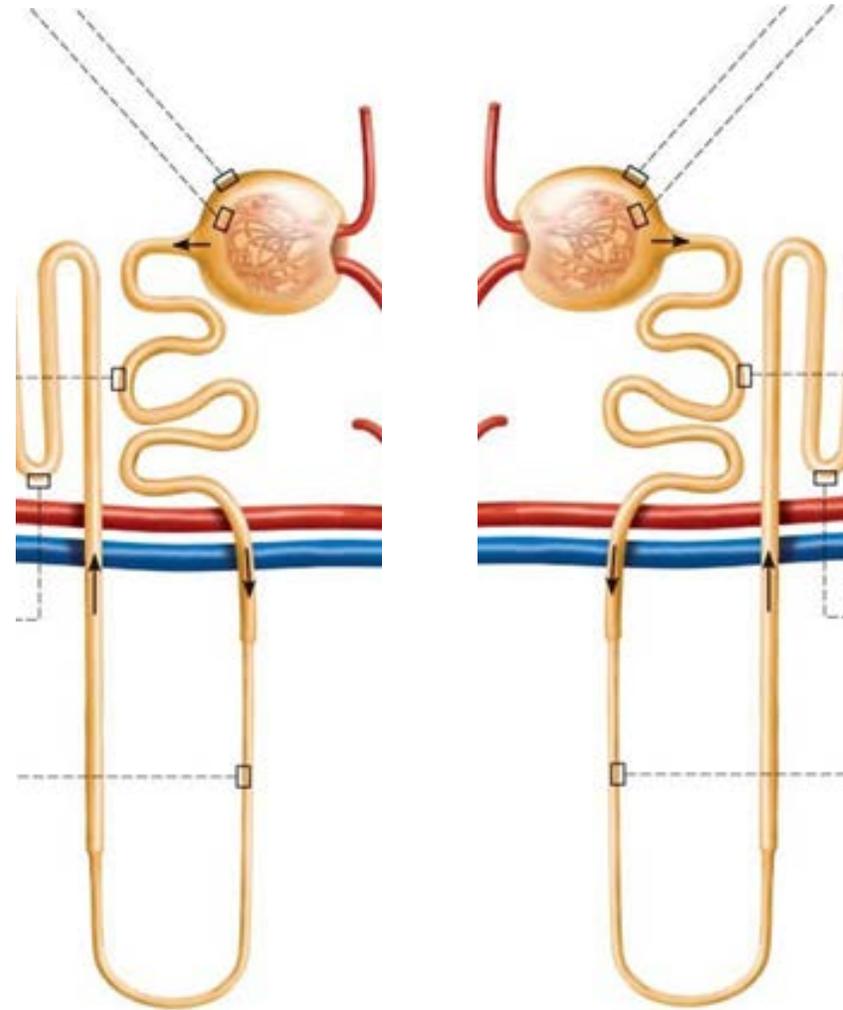


Renal Tubule

- **Loop of Henle** has descending and ascending limbs

Don't forget to study the loop in both orientations!

It helps if you start at Bowman's Capsule and work your way through the nephron from there.

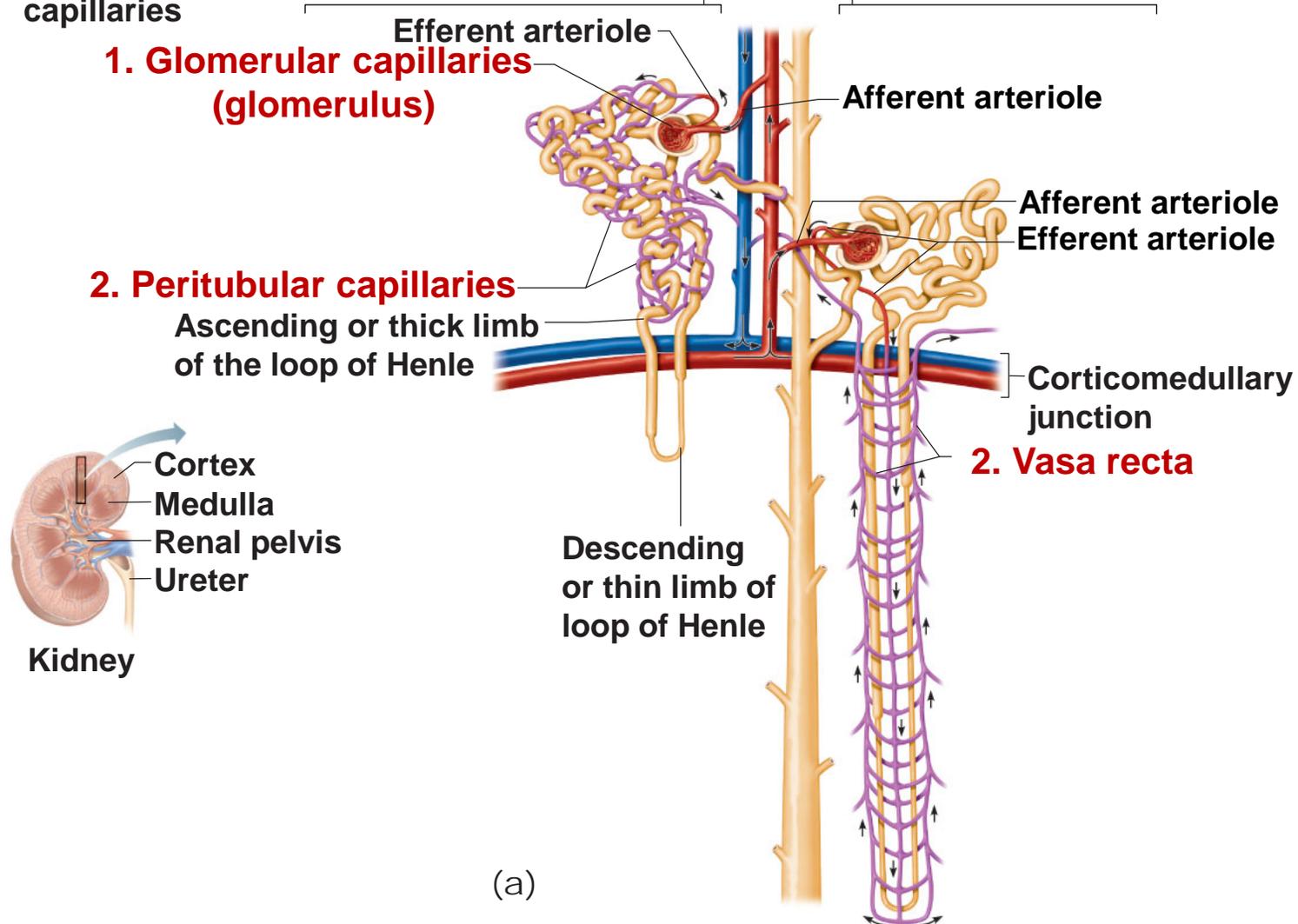


Cortical nephron

- Has short loop of Henle and glomerulus further from the corticomedullary junction
- Efferent arteriole supplies peritubular capillaries

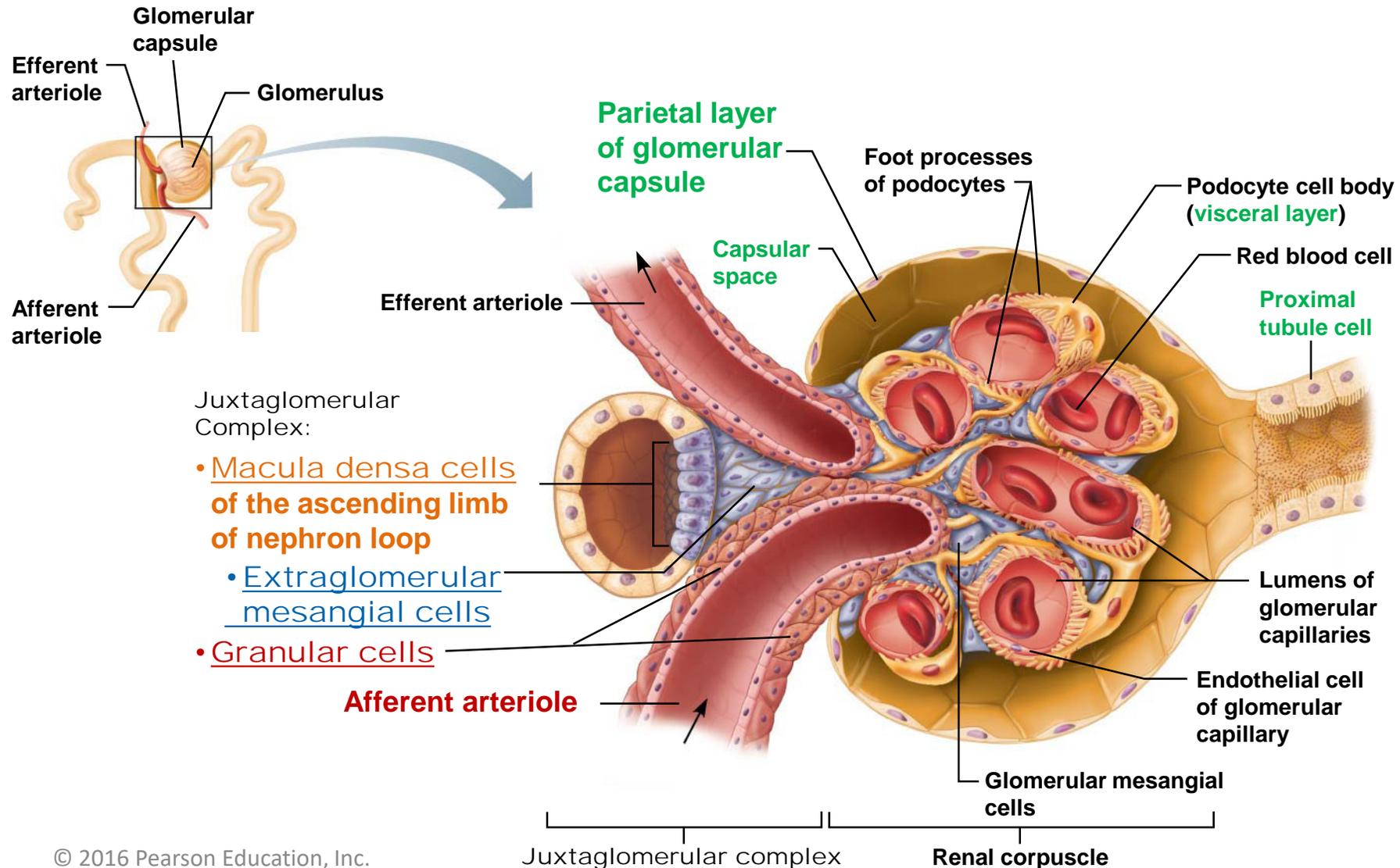
Juxtamedullary nephron

- Has long loop of Henle and glomerulus closer to the corticomedullary junction
- Efferent arteriole supplies vasa recta



Juxtaglomerular Apparatus (JGA) – in orange, blue, and red

***Helpful picture for corpuscle model.



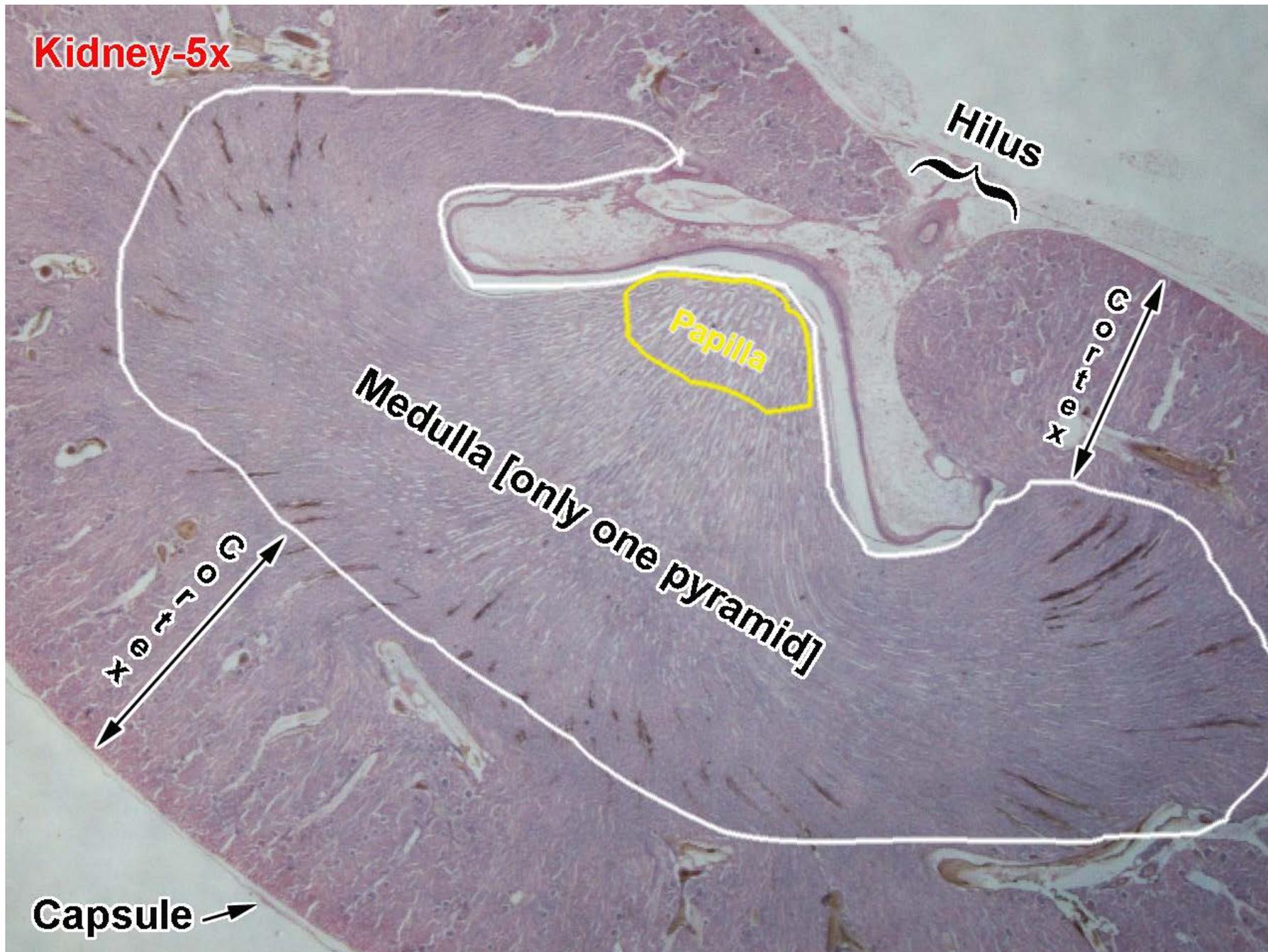
Renal Tubule

- **Proximal convoluted tubule (PCT)**
 - Cuboidal cells with dense microvilli and large mitochondria
 - Functions in reabsorption and secretion
 - Confined to cortex

Don't forget to look for these on the corpuscle model...they help you to know when you have hit the PCT.



Kidney-5x

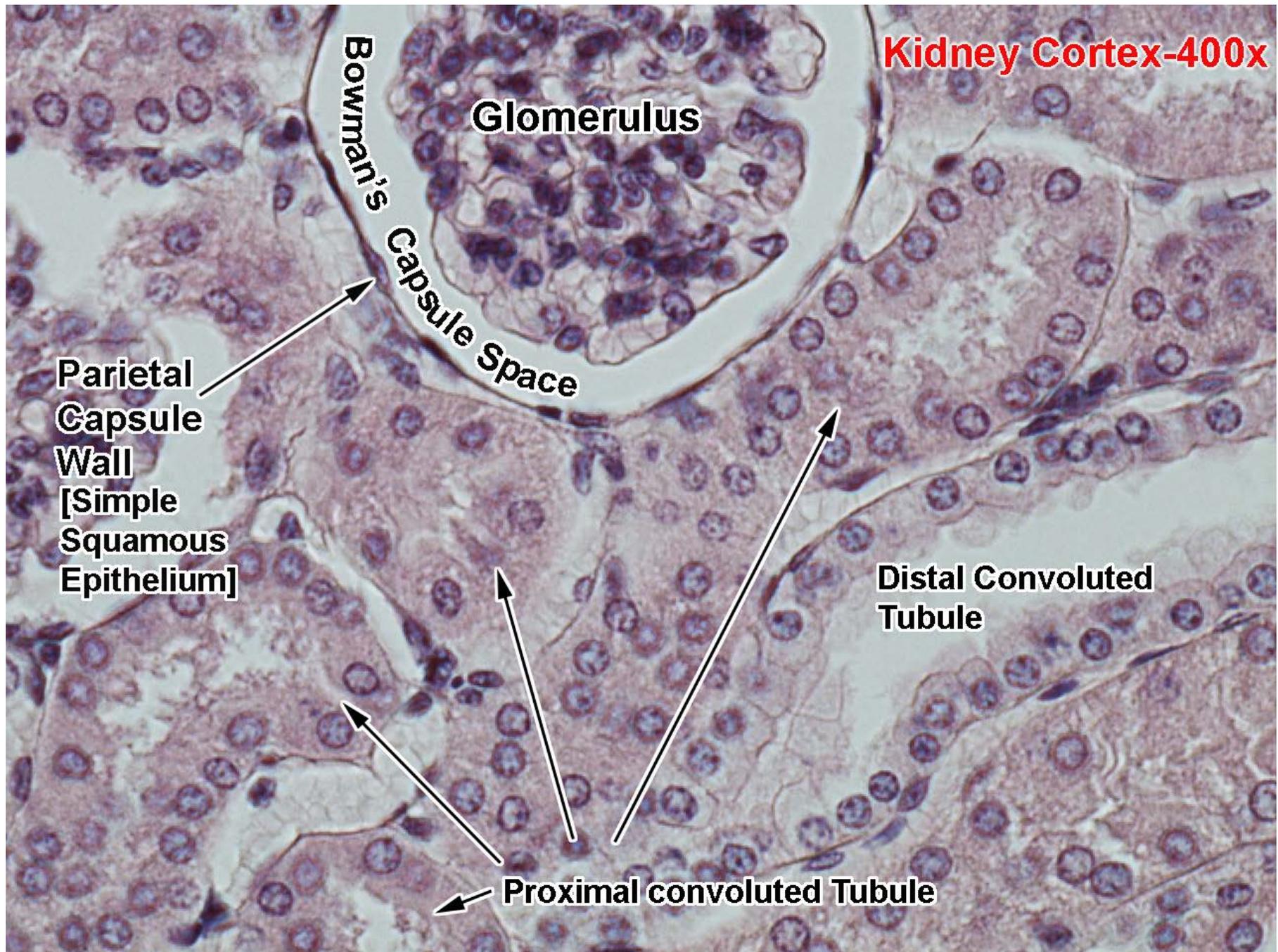


Hilus

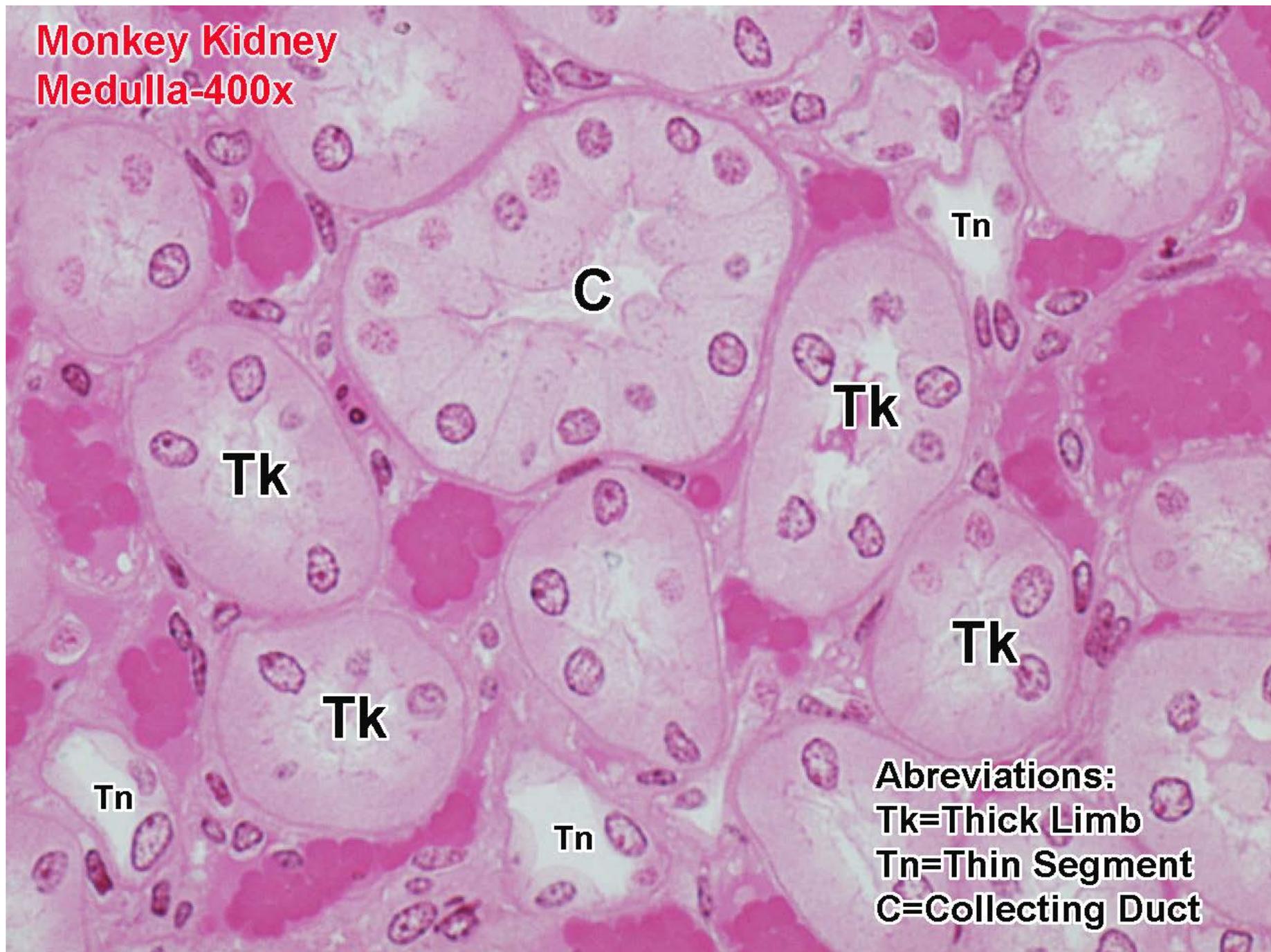
Papilla

Medulla [only one pyramid]

Capsule →



**Monkey Kidney
Medulla-400x**

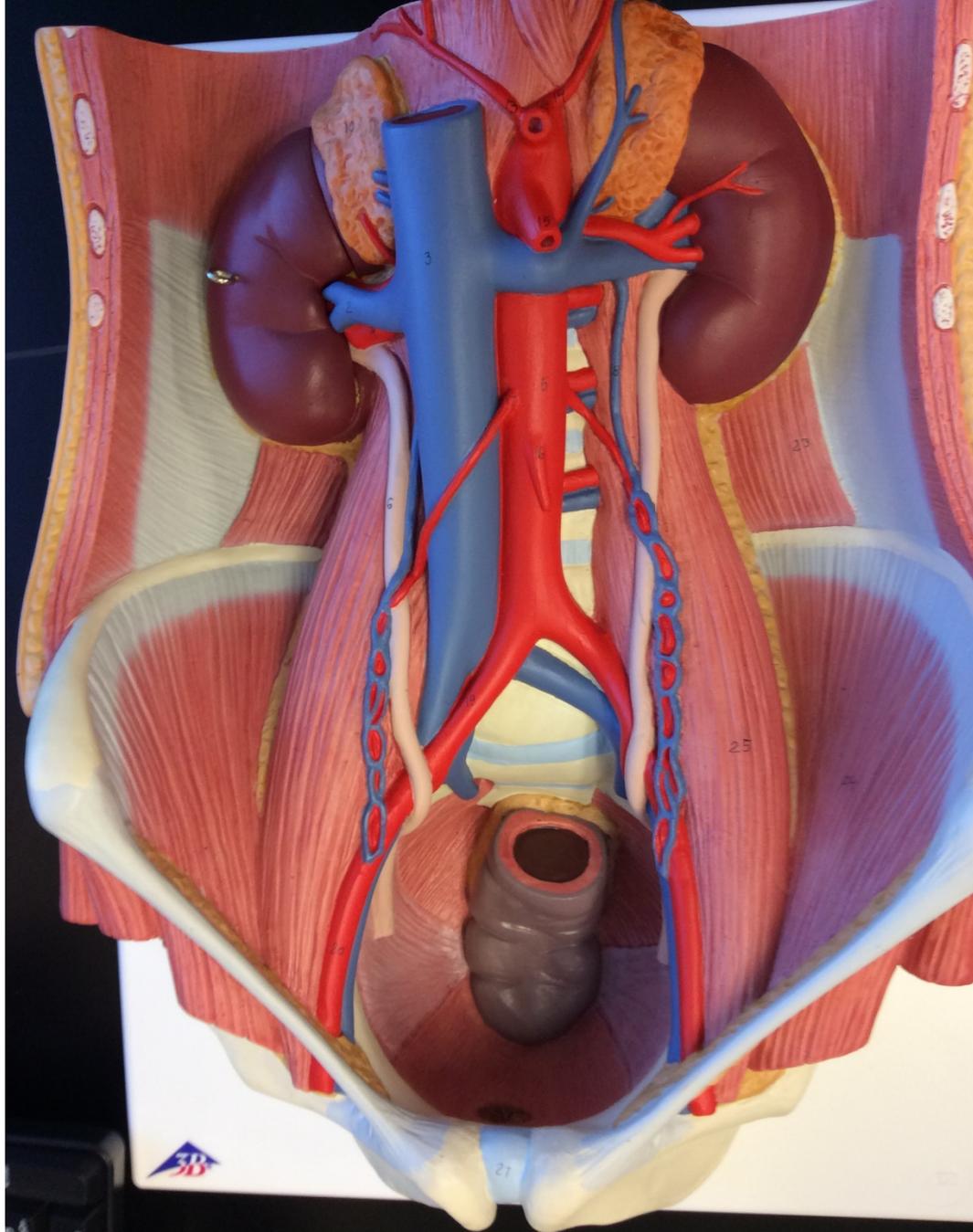


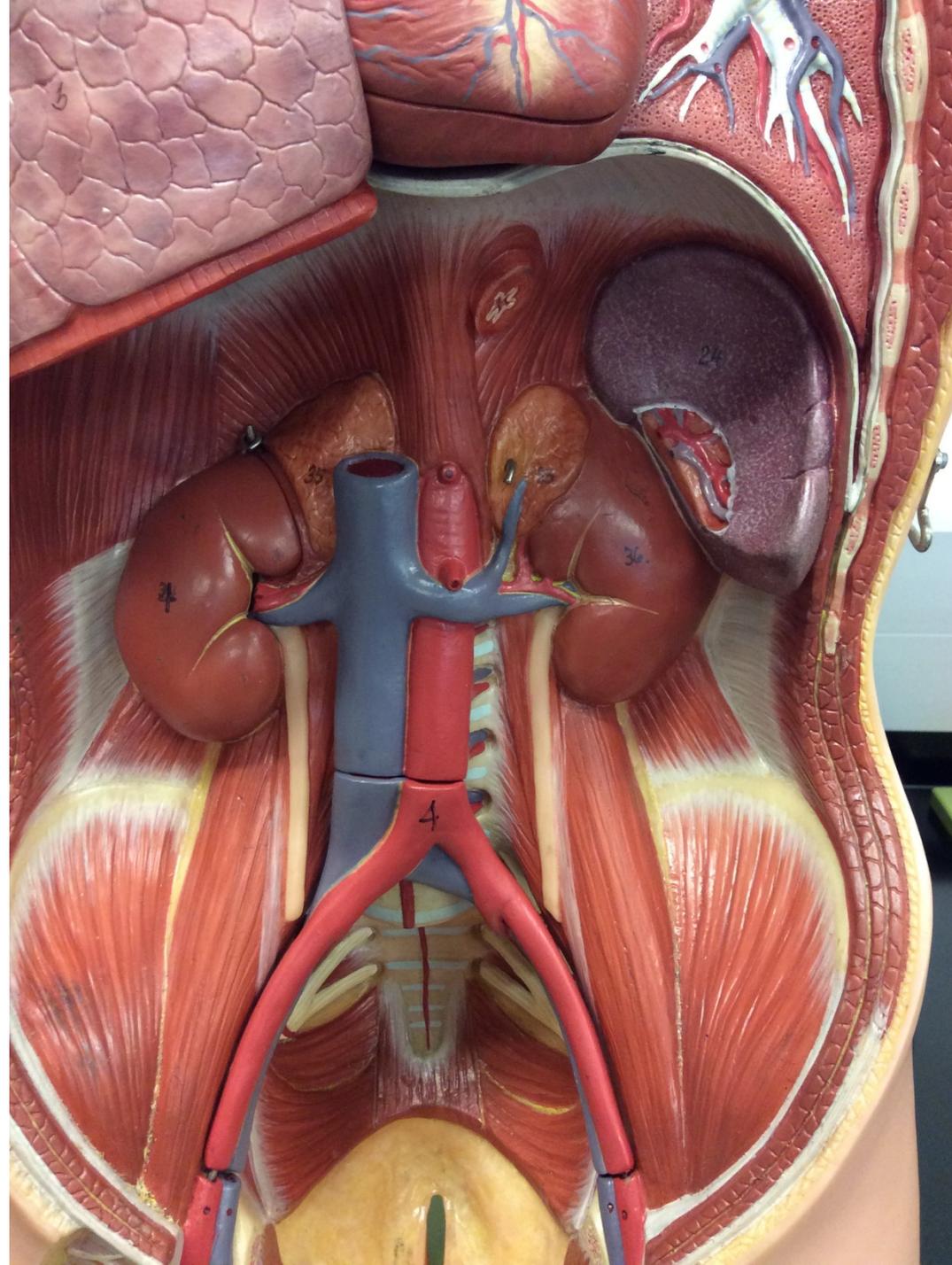
Abbreviations:
Tk=Thick Limb
Tn=Thin Segment
C=Collecting Duct

**Use the following pictures to help
you practice finding the terms from
the lab term handout on unlabeled
images.**

- Remember, you won't learn them if you don't take plenty of time to practice on pictures with NO labels (including no labels for what type of slide it is on histology pictures)!
- Also, be sure to mix up the order once you get comfortable with the unlabeled slides.
- Over the weekend, once you are feeling confident with the pictures here, do the histology quizzes in PAL (from the Pearson website) to get practice with new pictures that you haven't seen.

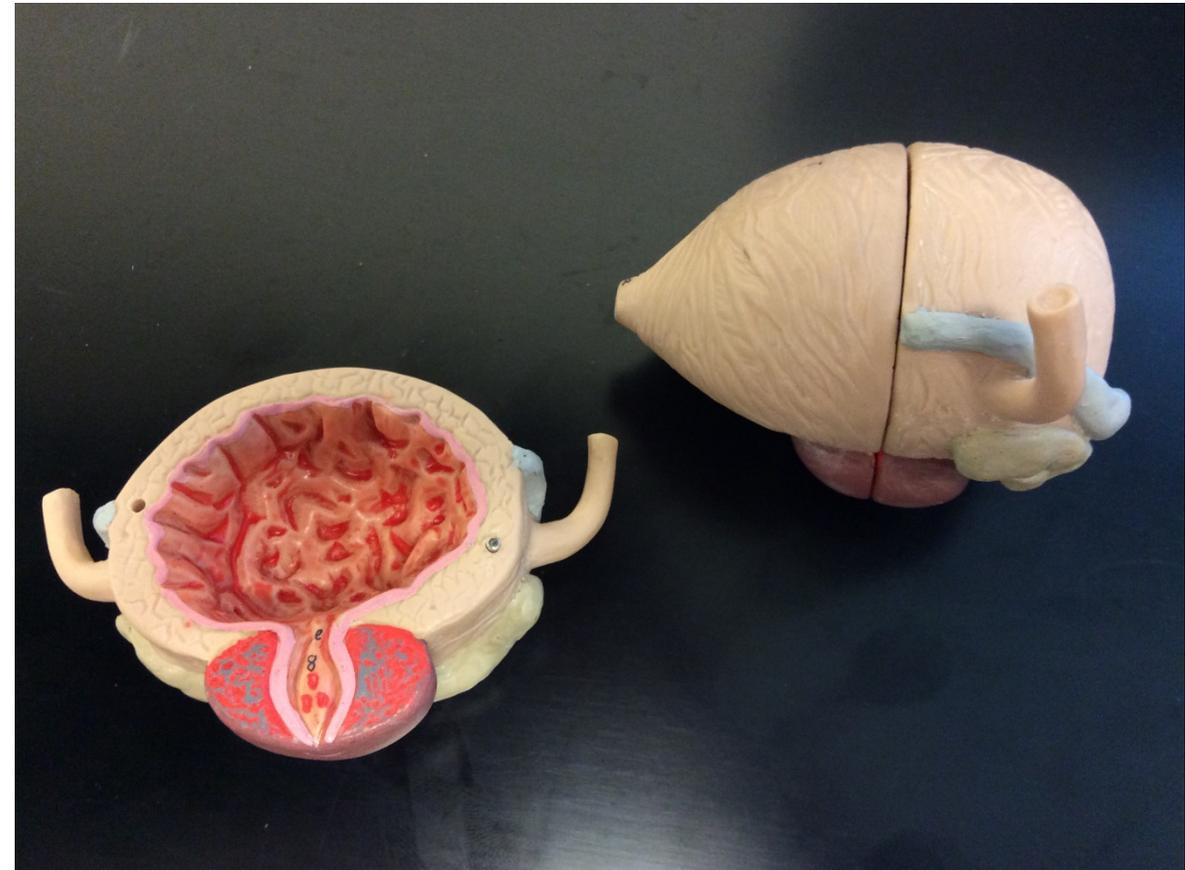
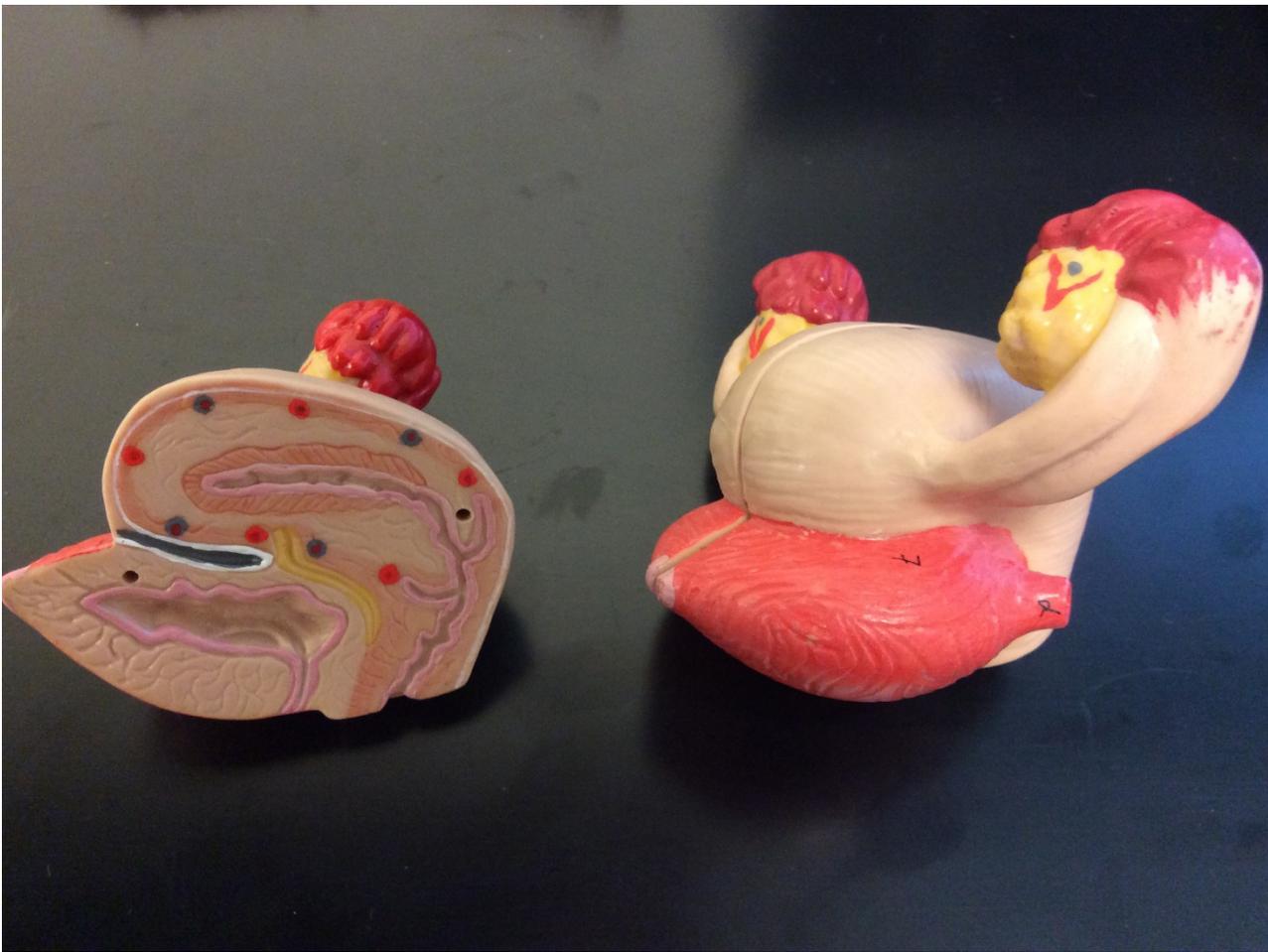
Pelvic Model



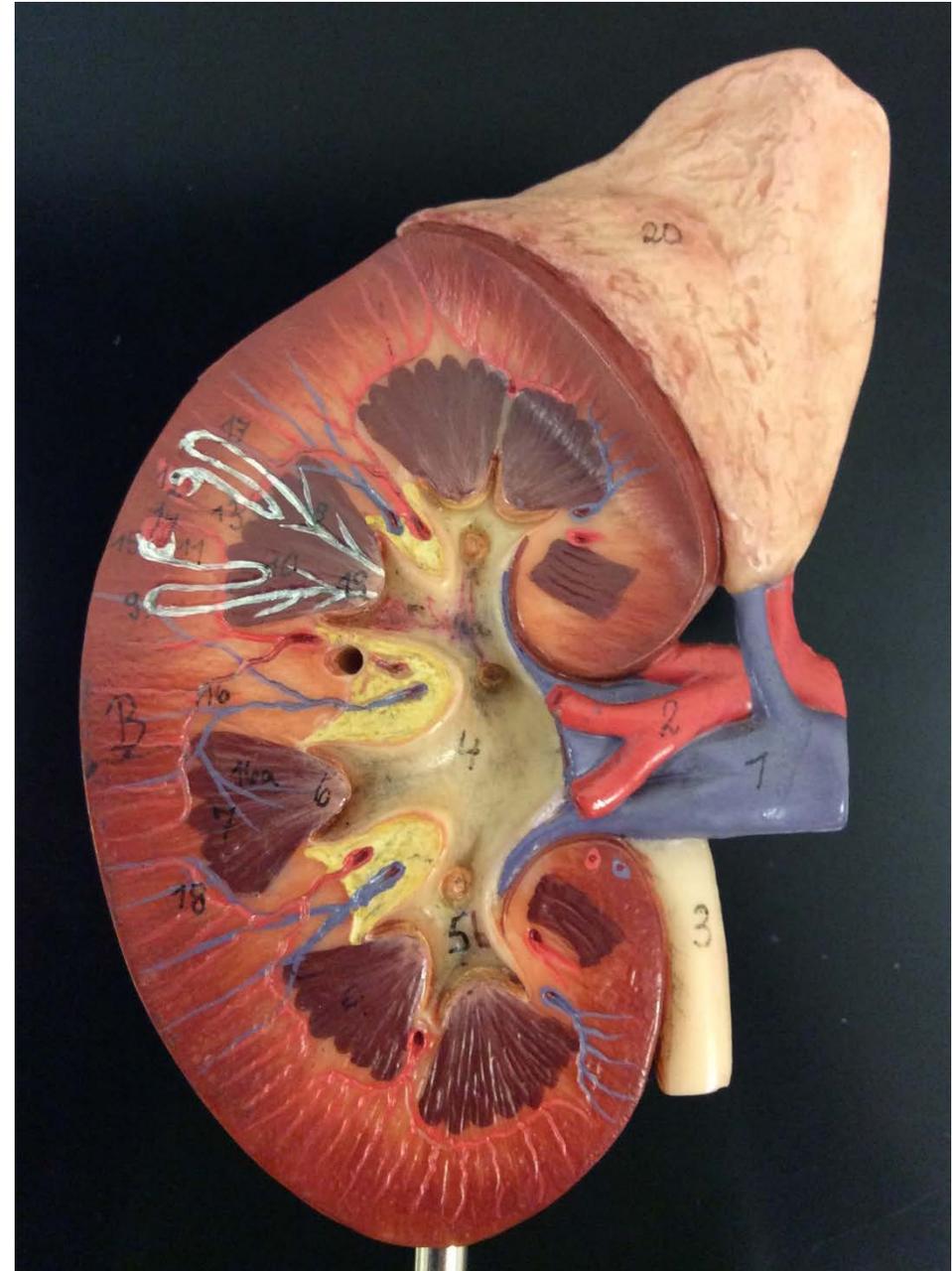
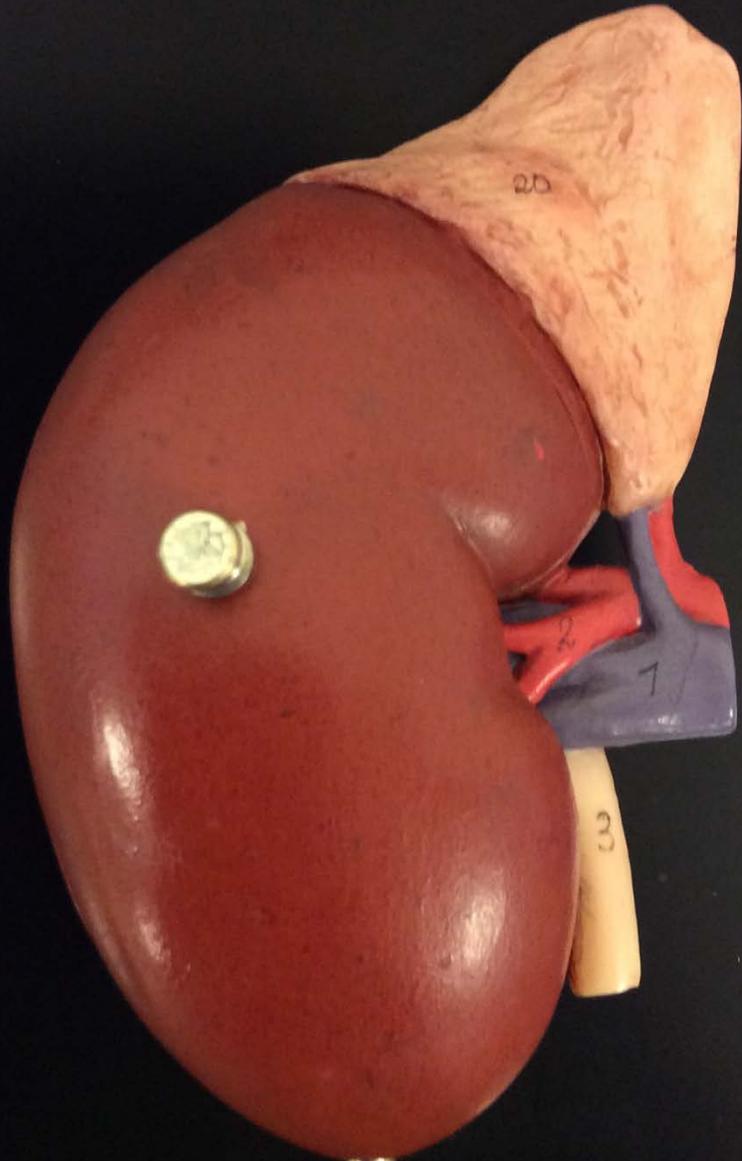


Bladder Models

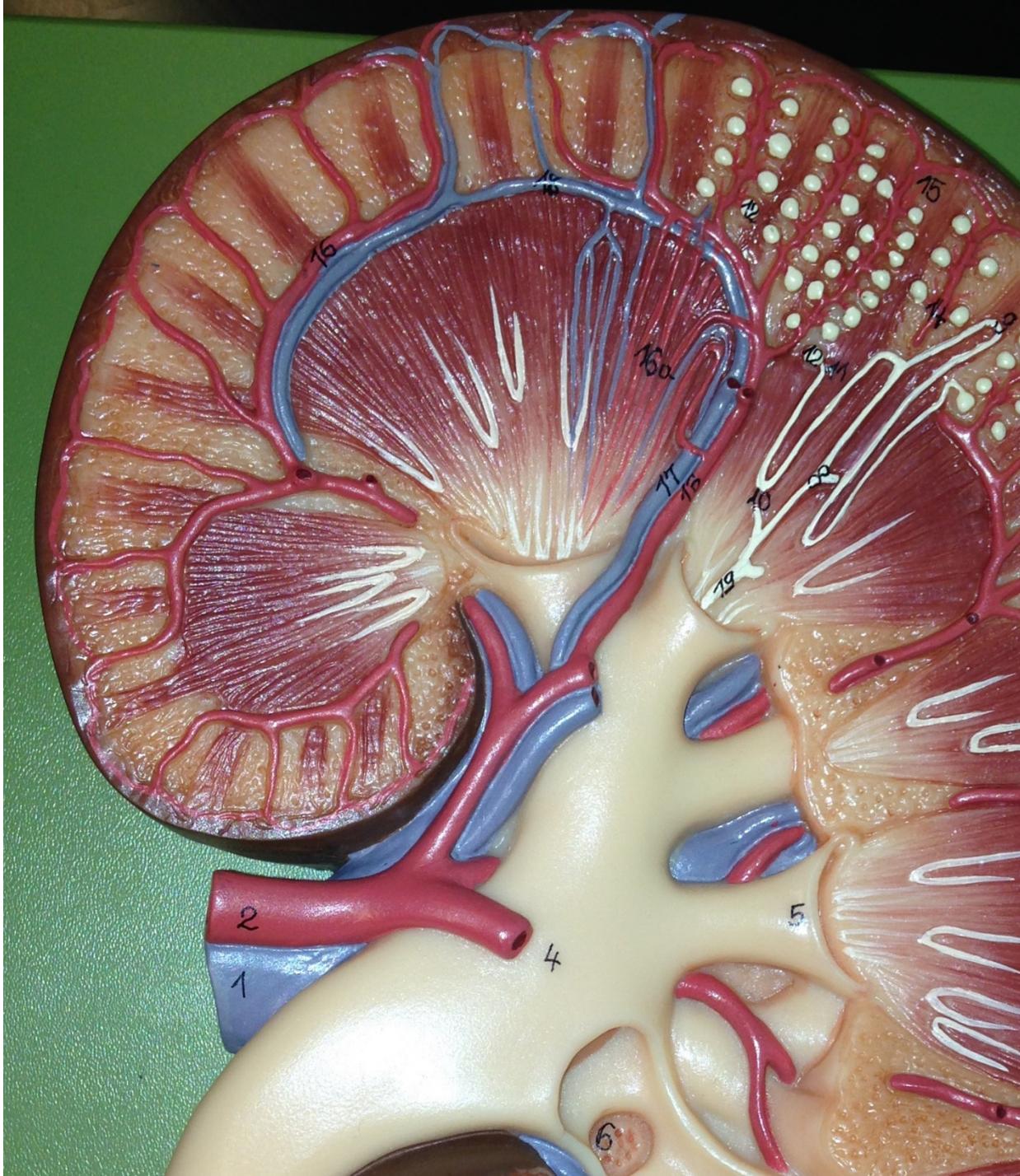
Which is male and which is female?



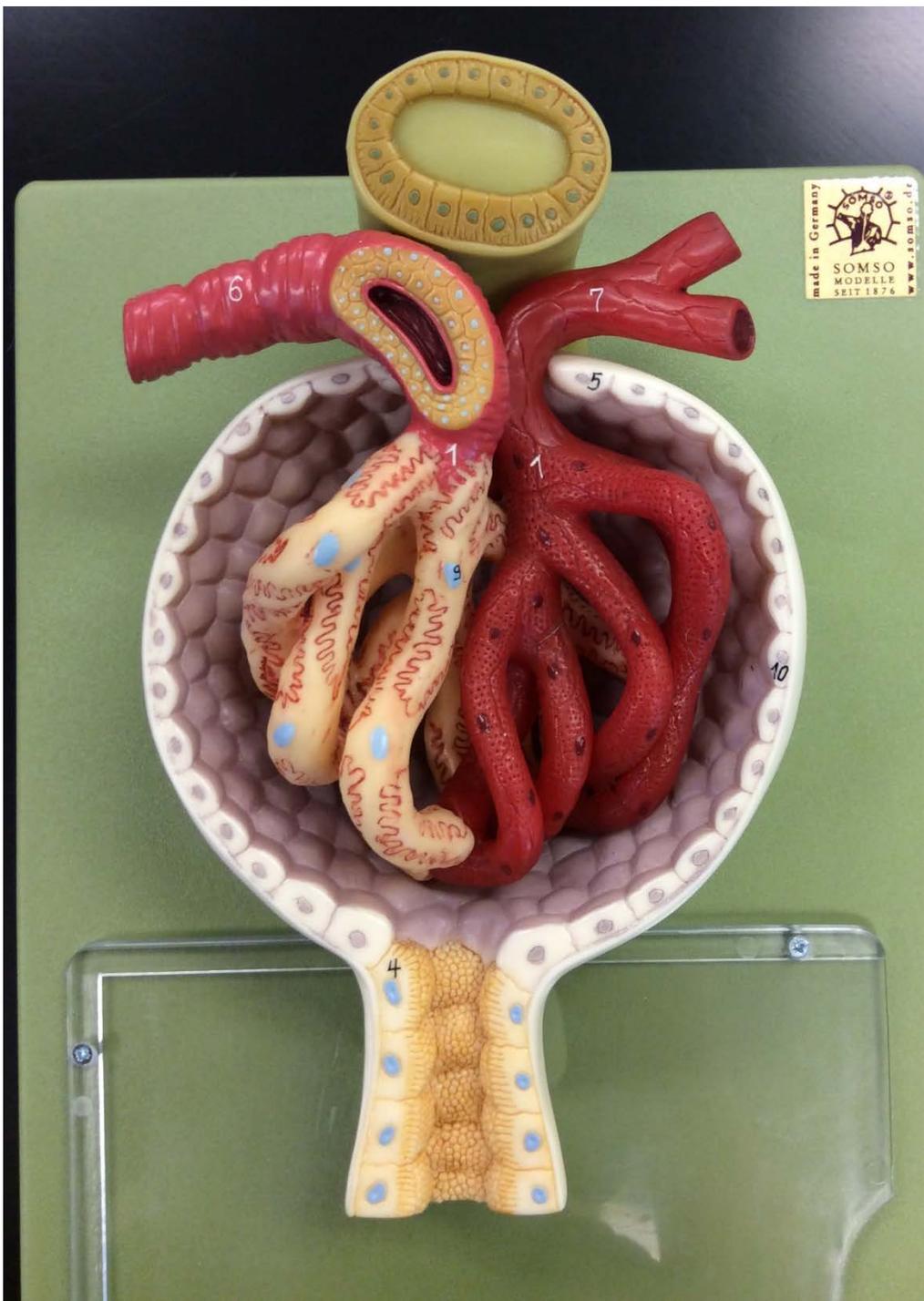
Human Sized Kidney Model



Enlarged Kidney Model

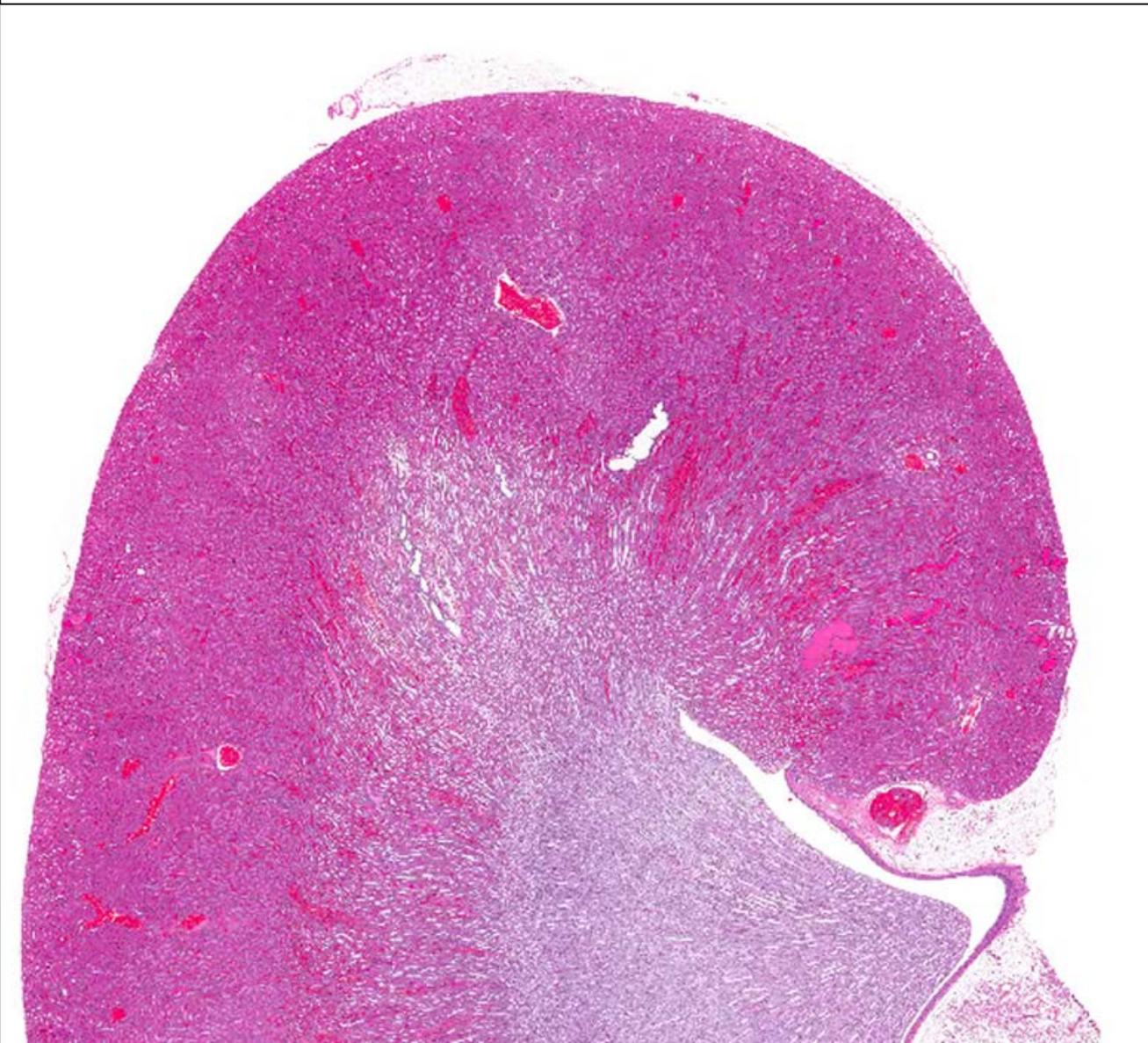


Corpuscle Model

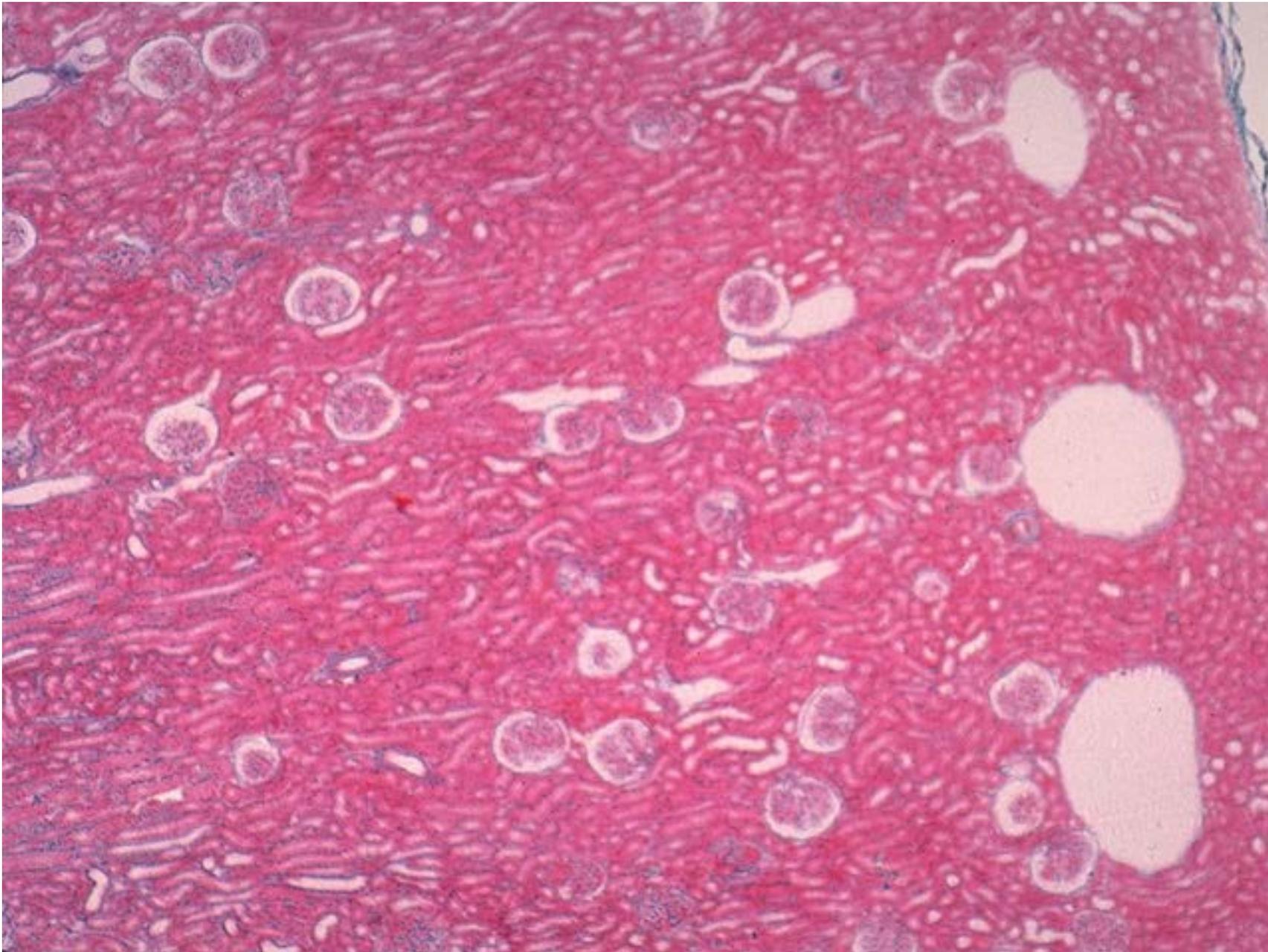




Same image at a higher power:

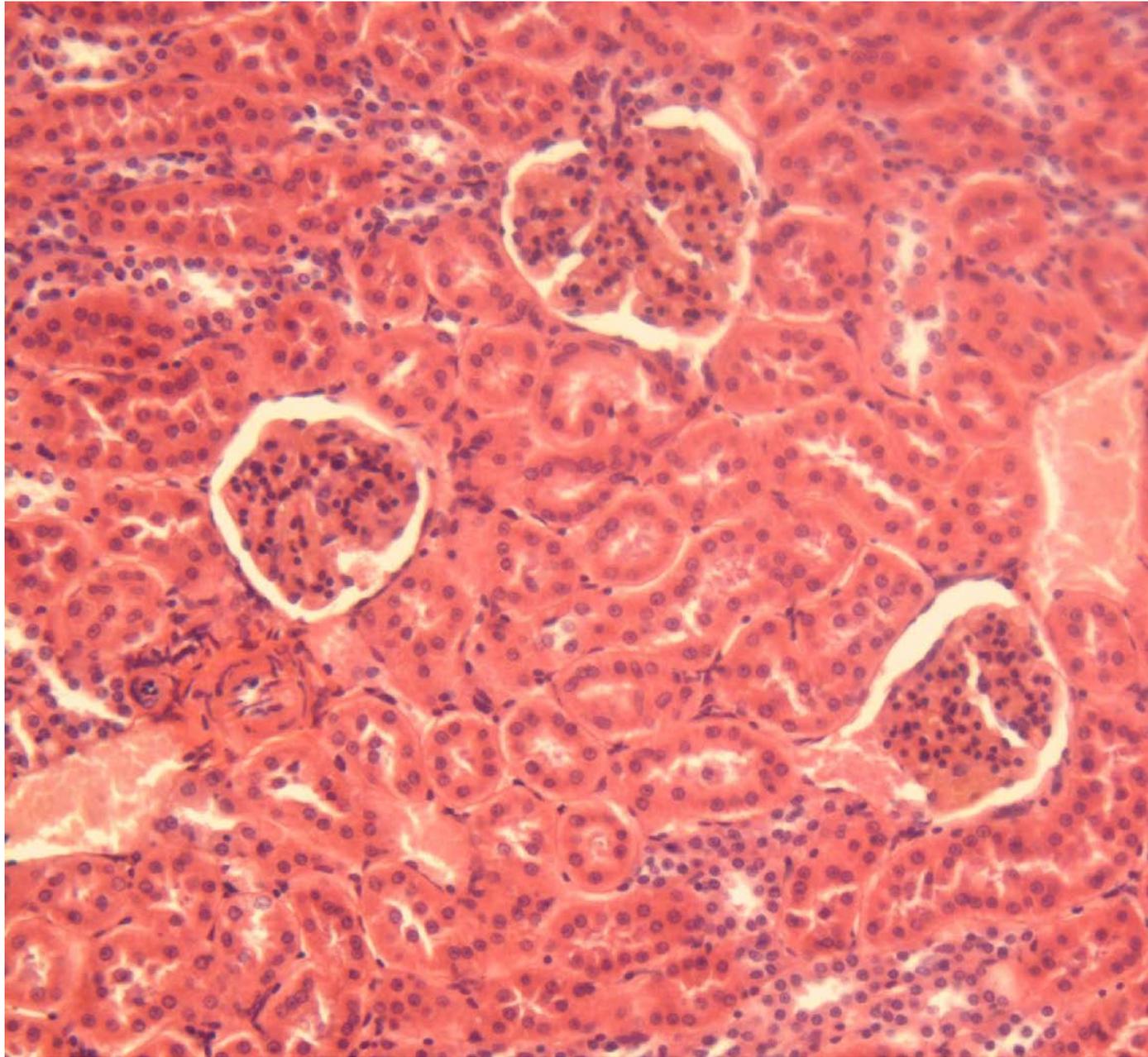


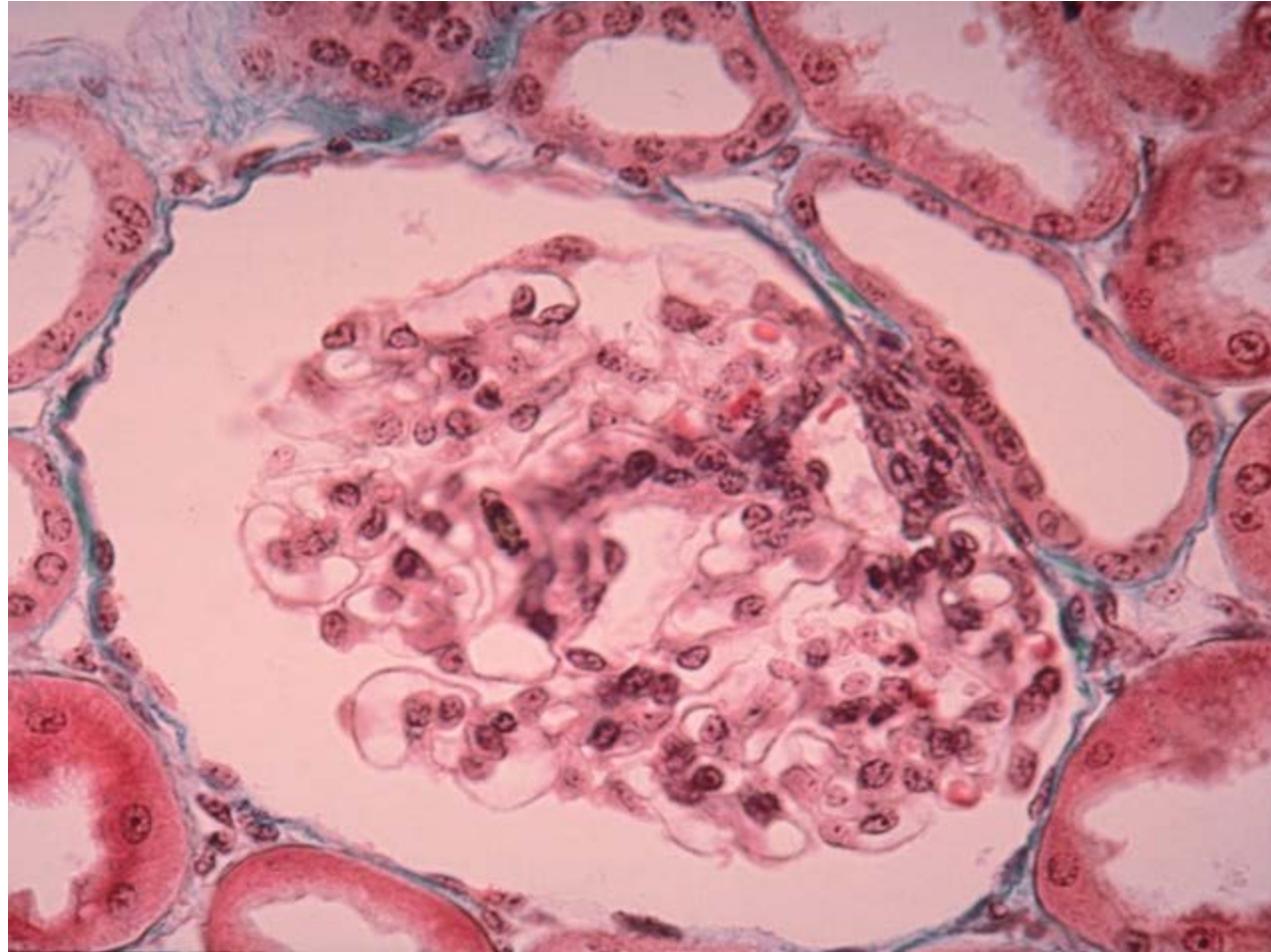
Kidney, median slide



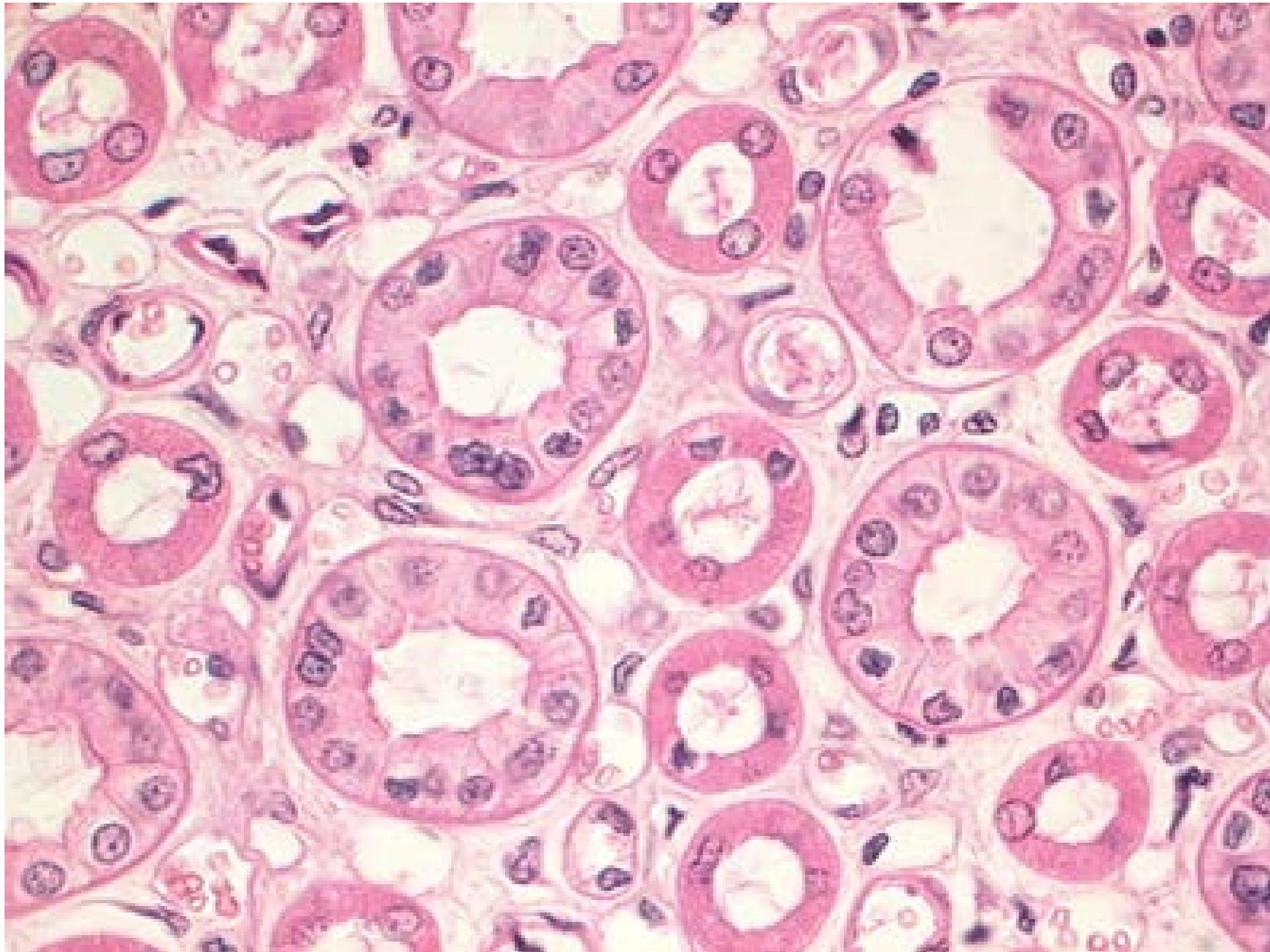
Interactive Website with labels: <https://medpics.ucsd.edu/index.cfm?curpage=image&course=hist&mode=browse&lesson=47&img=905>

Kidney, median slide

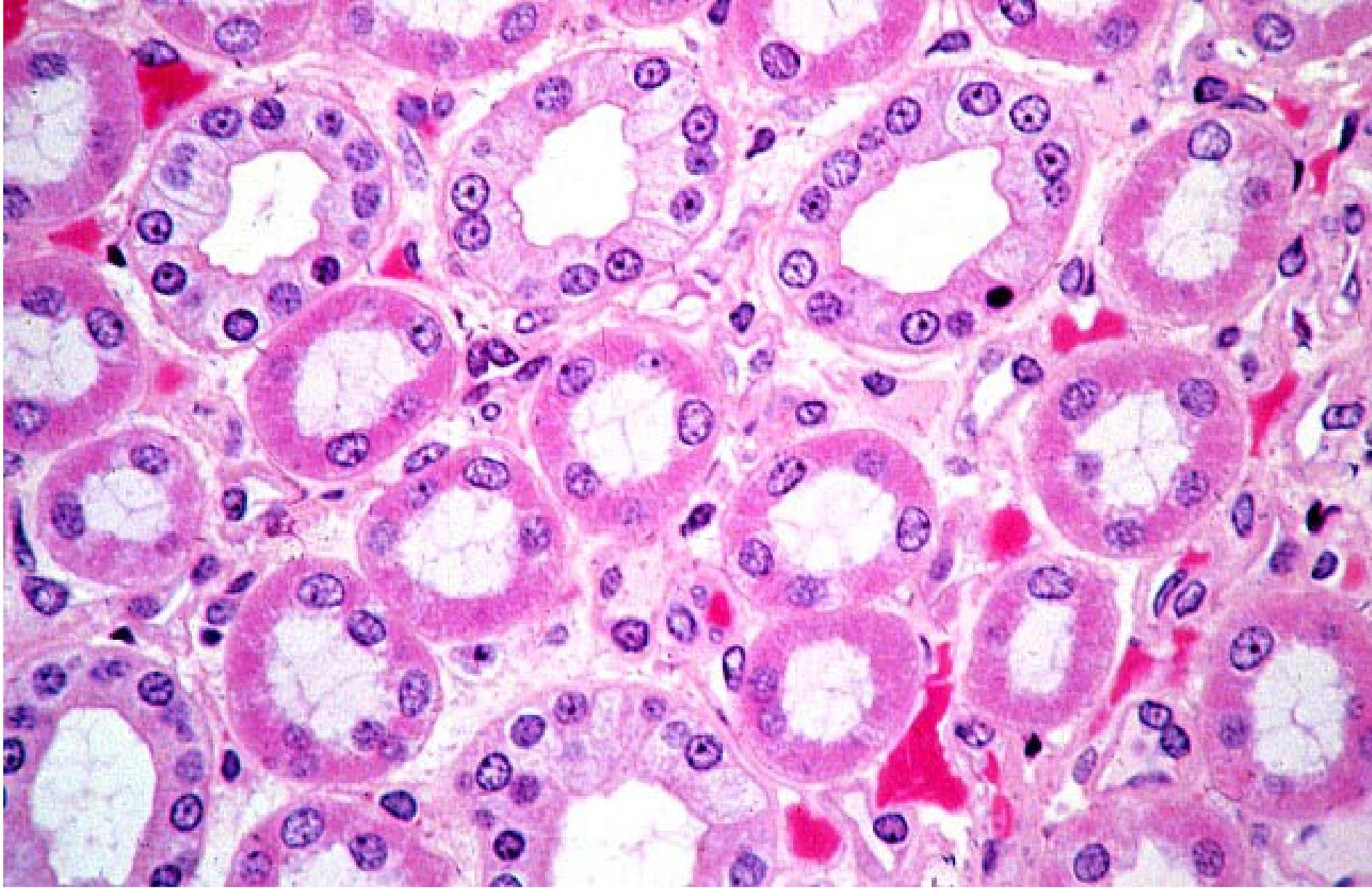




**Kidney,
primate slide**



**Kidney,
primate slide**



Virtual Microscope - good for cortex:

http://virtualslides.med.umich.edu/Histology/Urinary%20System/210_HISTO_40X.svs/view.apml?cwidth=860&cheight=733&chost=virtualslides.med.umich.edu&csis=1&listview=1

Virtual Microscope - OK for medulla (upper edge):

http://virtualslides.med.umich.edu/Histology/Urinary%20System/203-N_HISTO_40X.svs/view.apml?cwidth=860&cheight=733&chost=virtualslides.med.umich.edu&csis=1&listview=1

Virtual Kidney Dissection

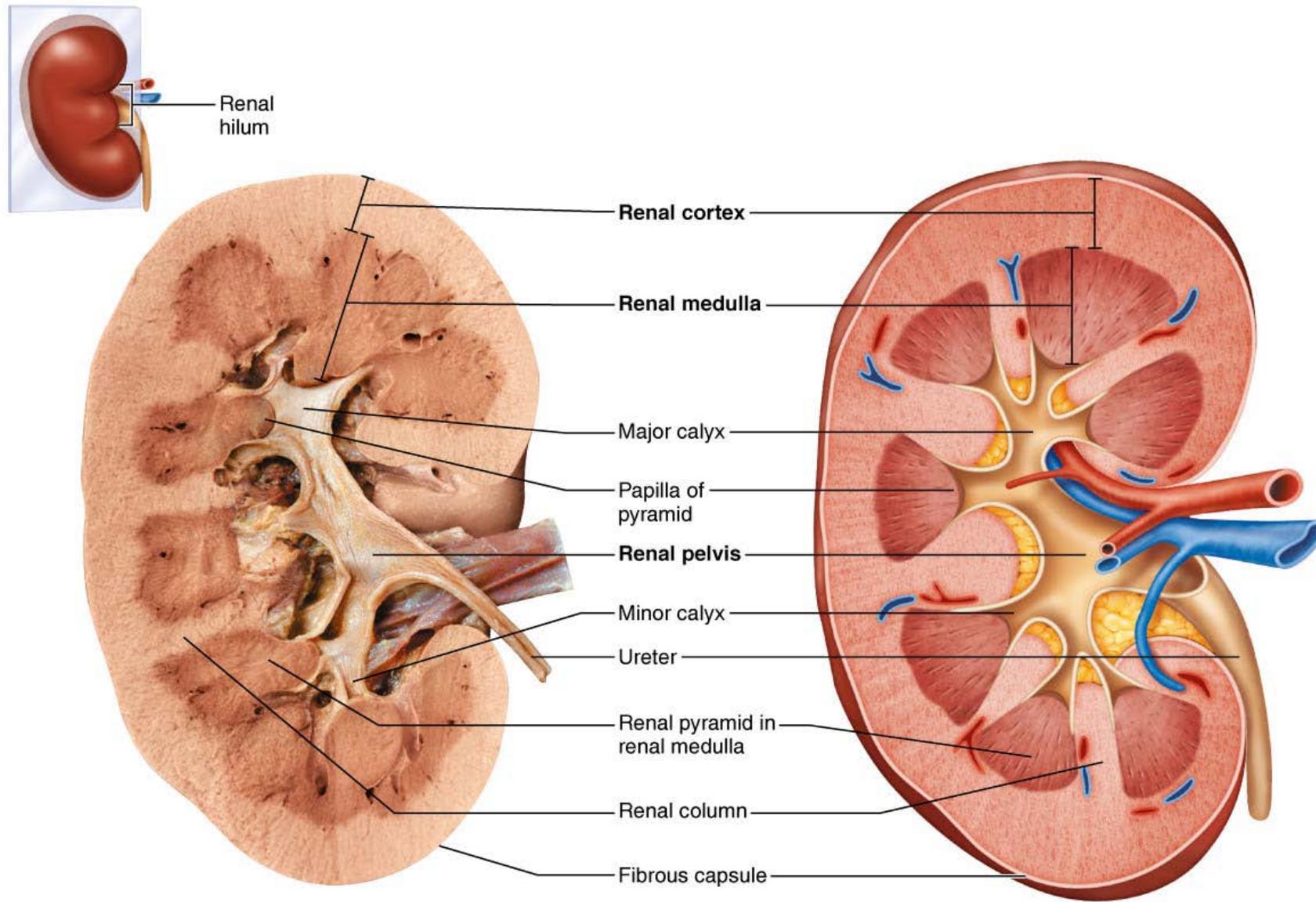
Use the following pictures to help you identify terms from the lab term handout.

***You always only need to know the terms listed in the lab term handout!

Another good resource is the Visible Body ATLAS app: <http://atlas.visiblebody.com>

Don't forget that to use the link to download the atlas to a personal device, the device must first be connected to the MCPA Wi-Fi at the Rockville campus.

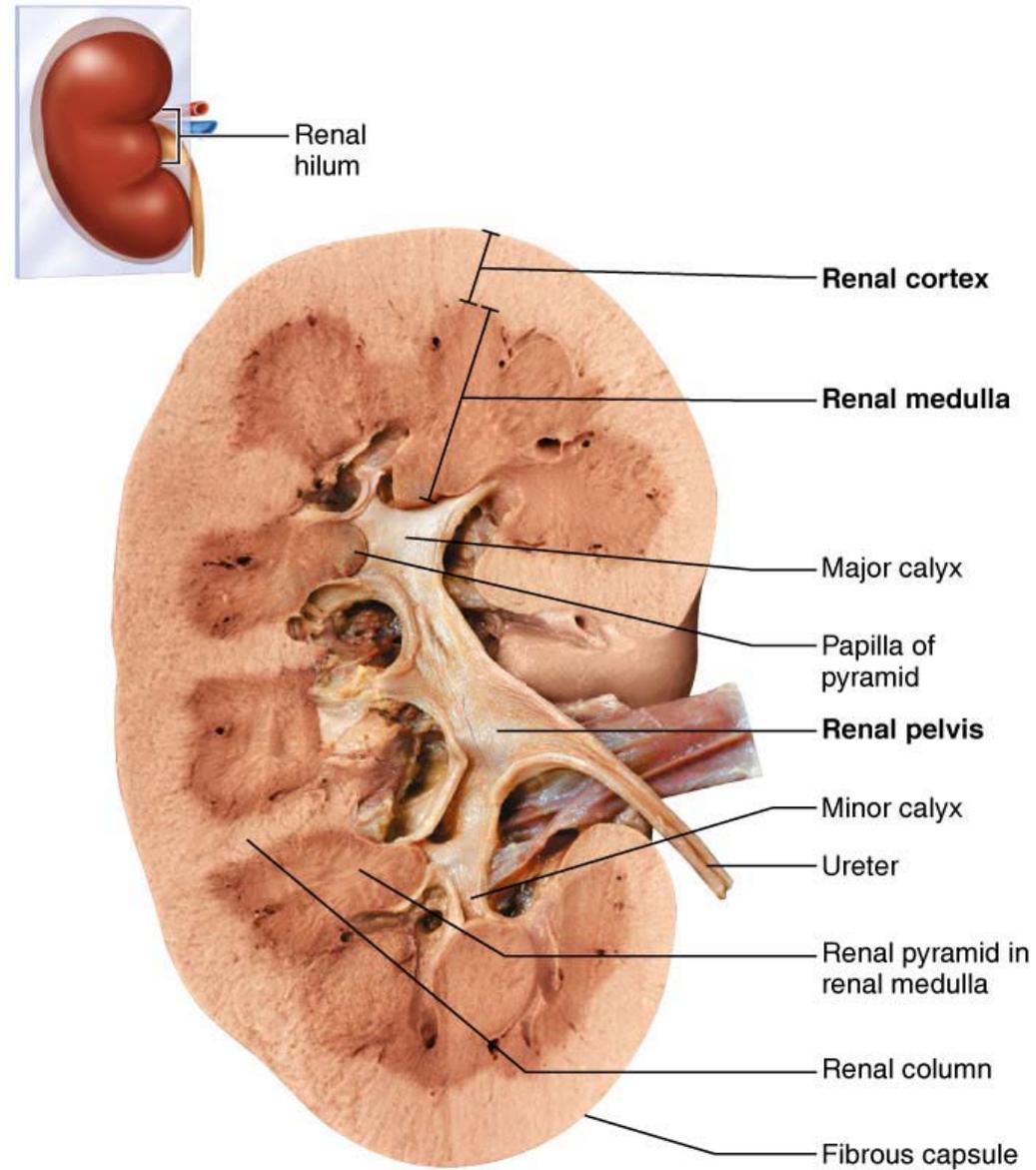
Figure 25.4 Internal anatomy of the kidney.



(a) Photograph of right kidney, frontal section

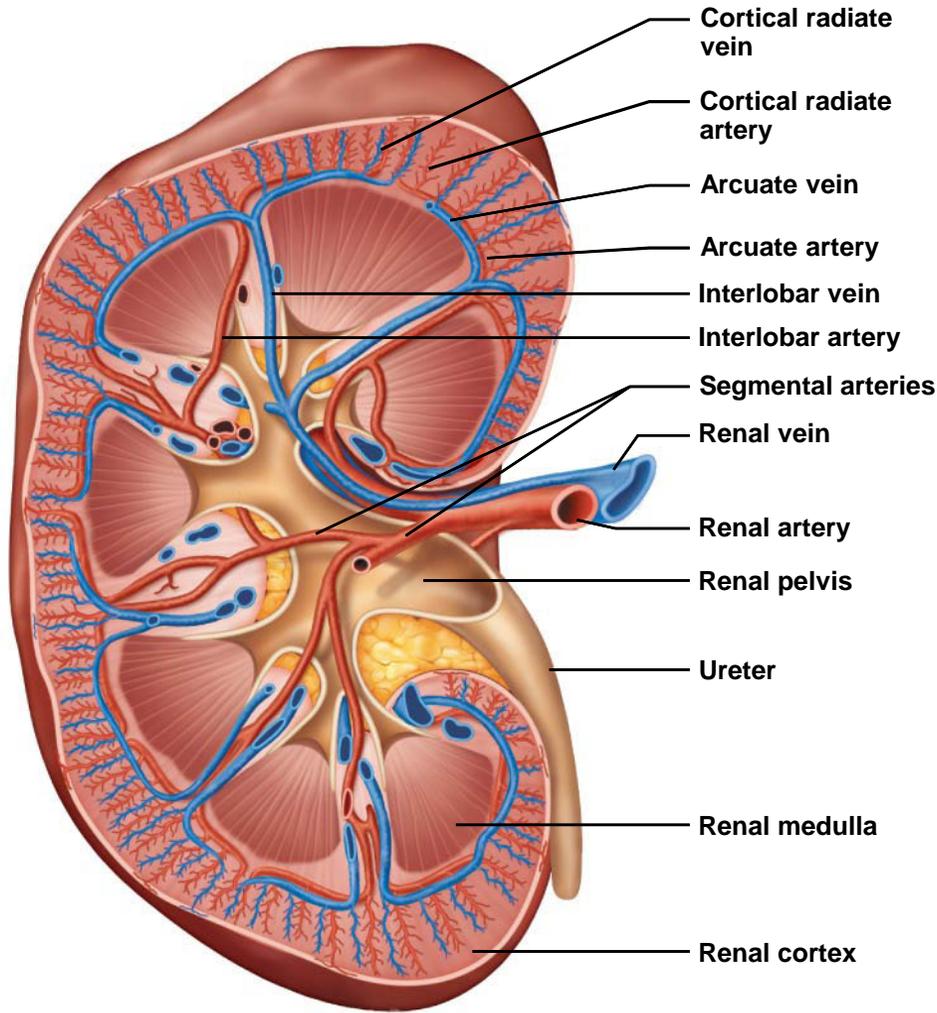
(b) Diagrammatic view

Figure 25.4a Internal anatomy of the kidney.



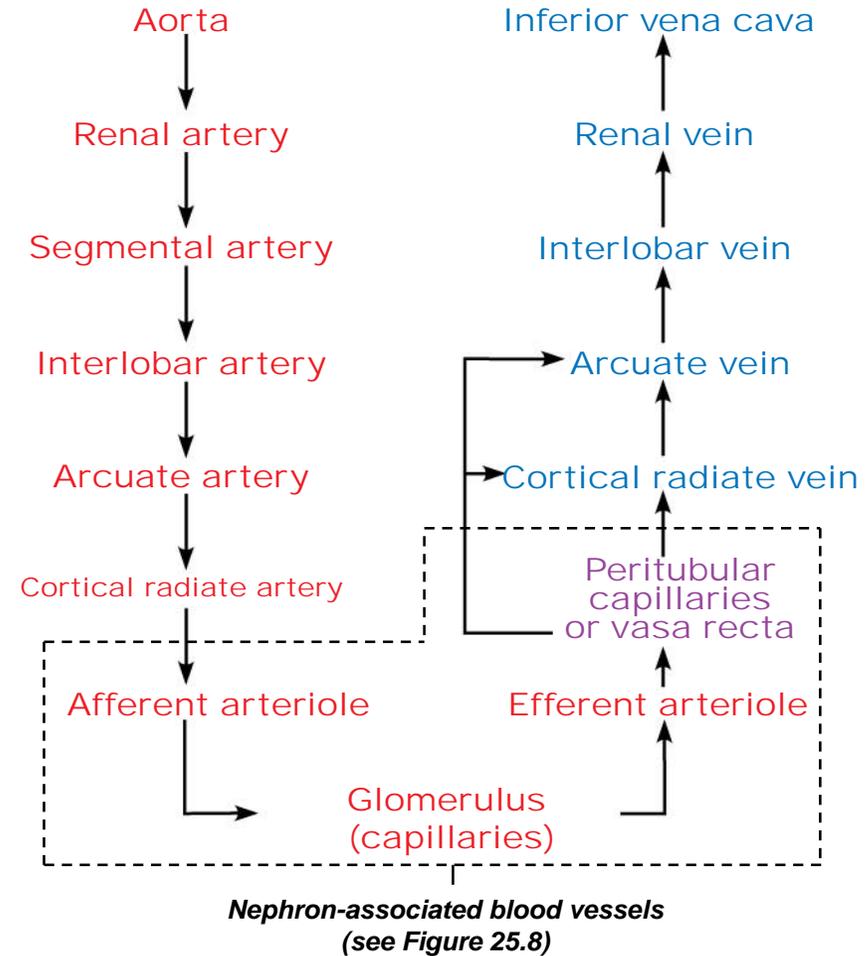
(a) Photograph of right kidney, frontal section

Blood vessel location?



(a) Frontal section illustrating major blood vessels

Blood Flow to & from the Kidney



(b) Path of blood flow through renal blood vessels

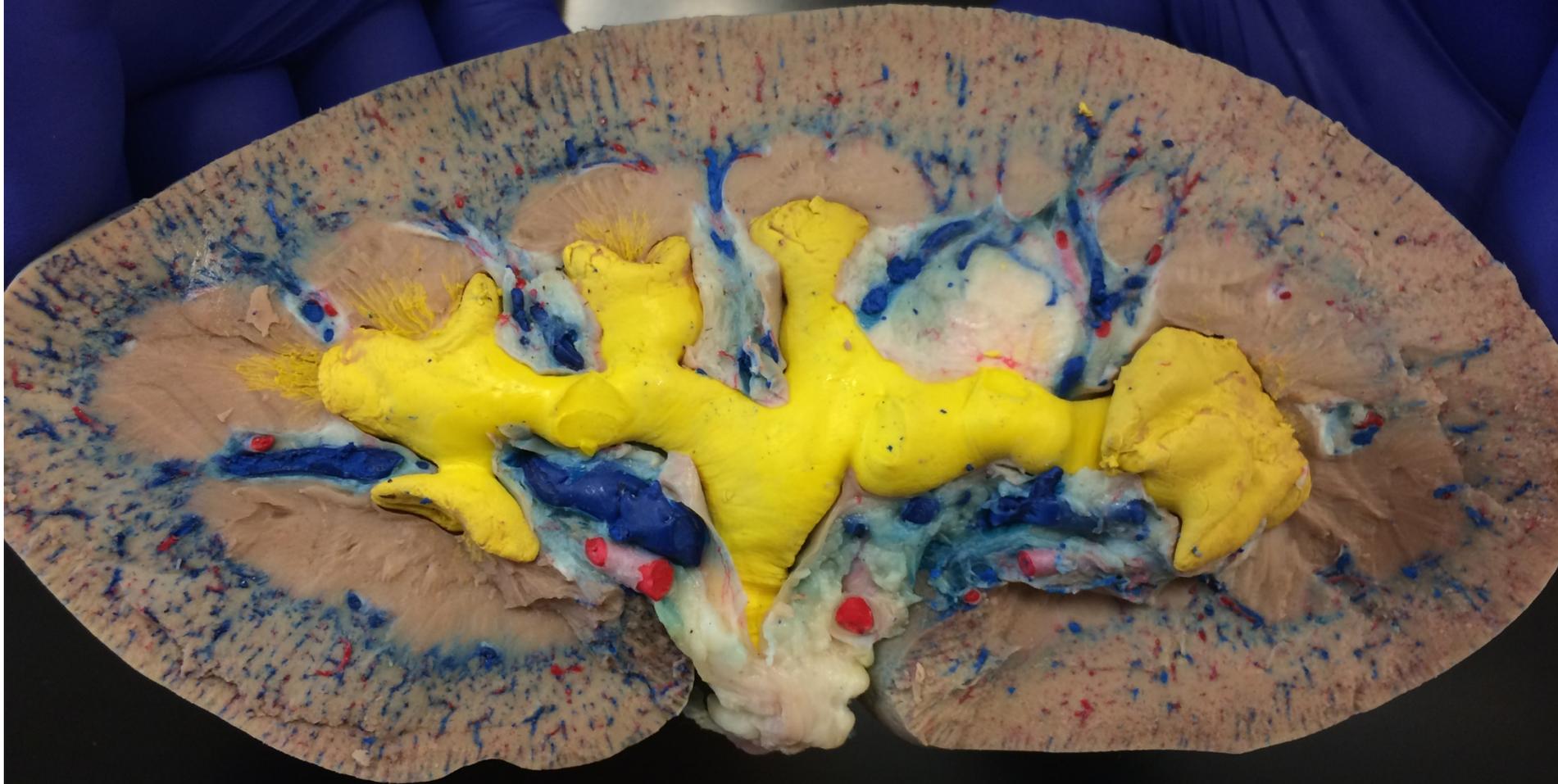
**Use the following pictures to help
you practice finding the terms from
the lab term handout on unlabeled
images.**

- Remember, you won't learn them if you don't take plenty of time to practice on pictures with NO labels (including no labels for what type of slide it is on histology pictures)!
- Also, be sure to mix up the order once you get comfortable with the unlabeled slides.
- Over the weekend, once you are feeling confident with the pictures here, do the histology quizzes in PAL (from the Pearson website) to get practice with new pictures that you haven't seen.

Red = arteries

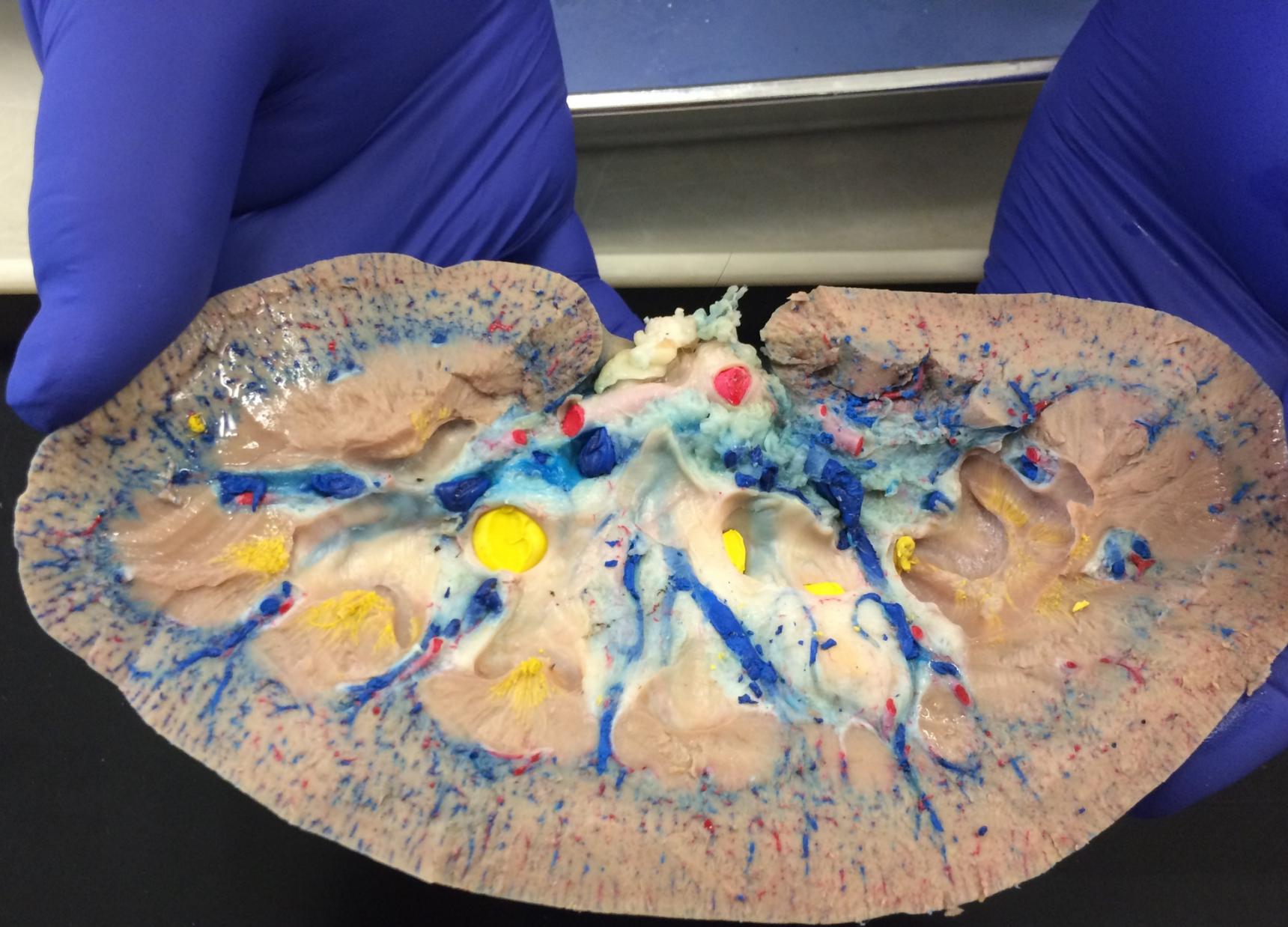
Blue = veins

Yellow = tubing which holds urine



**Enlargement of
previous picture**





Red = arteries
Blue = veins
Yellow = tubing which holds urine, yellow latex is partially removed in this picture to allow you to see into the open spaces that hold urine.

**Enlargement of
previous picture**



Reproductive Anatomy - Female

Use the following pictures to help you identify terms from the lab term handout.

***You always only need to know the terms listed in the lab term handout!

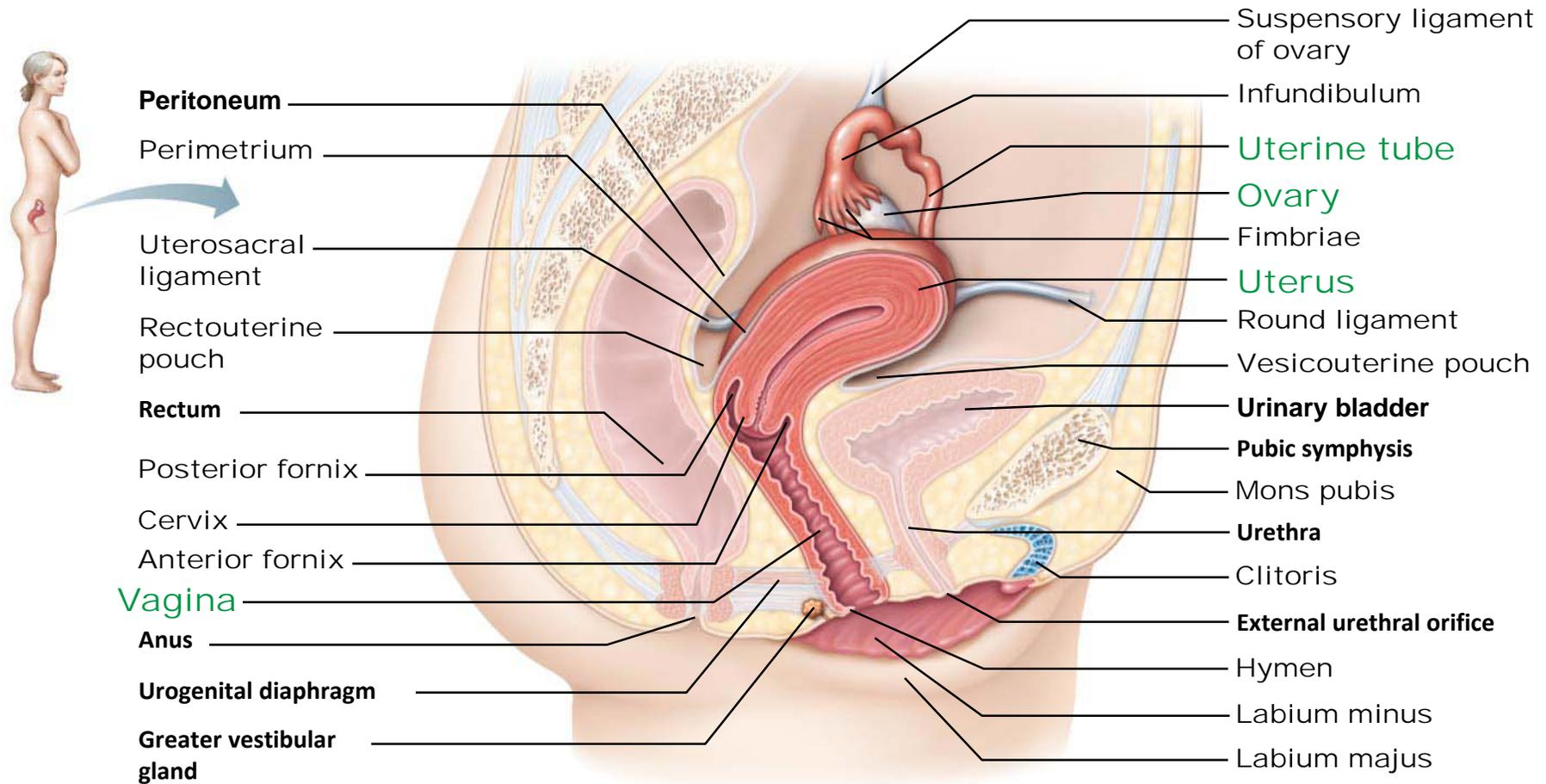
Another good resource for histology is the Olexik website:

http://faculty.montgomerycollege.edu/wolexik/205_histology_page.htm

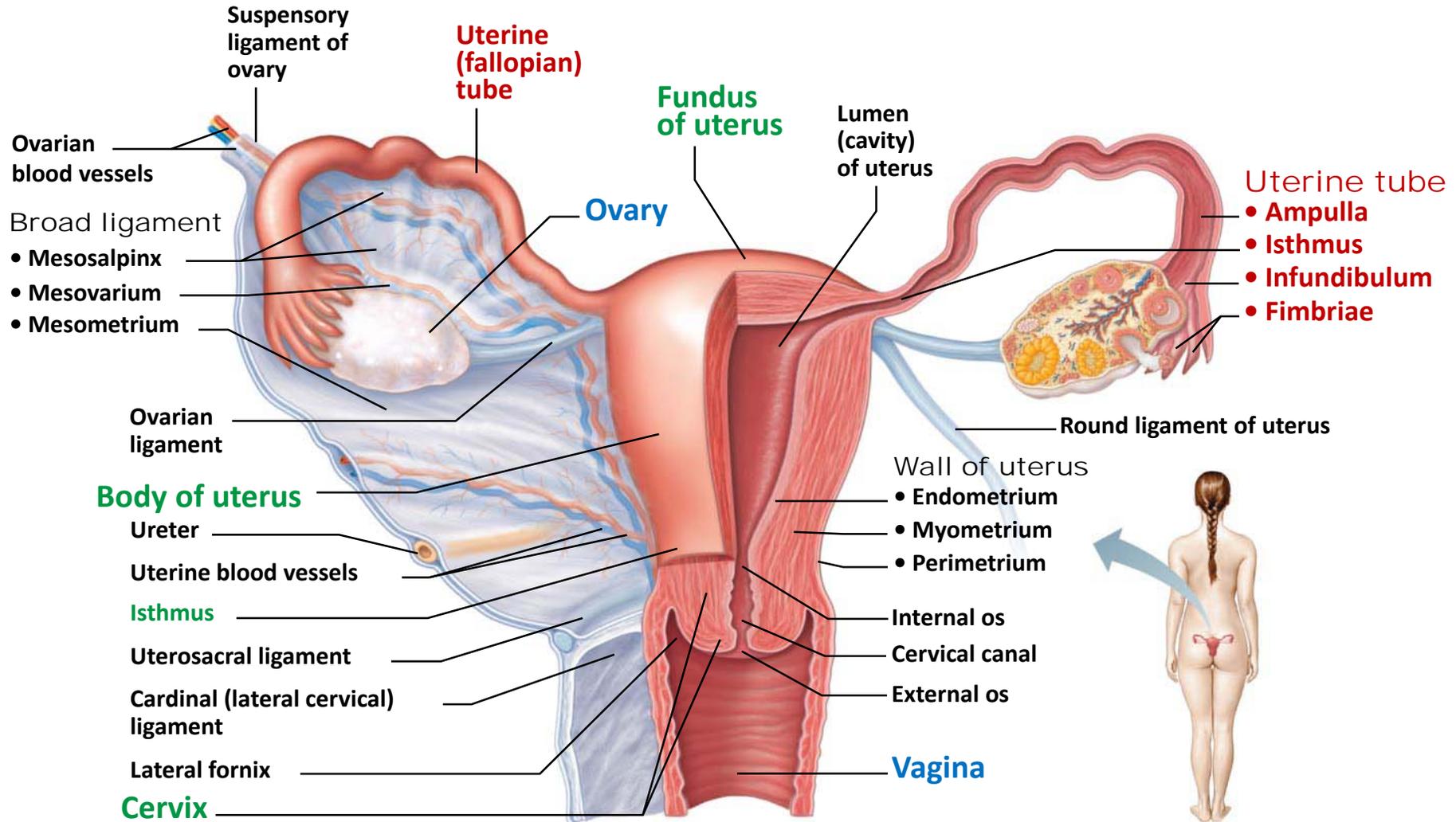
Another good resource is the Visible Body ATLAS app: <http://atlas.visiblebody.com>

Don't forget that to use the link to download the atlas to a personal device, the device must first be connected to the MCPA Wi-Fi at the Rockville campus.

Female Reproductive Anatomy: Internal Genitalia

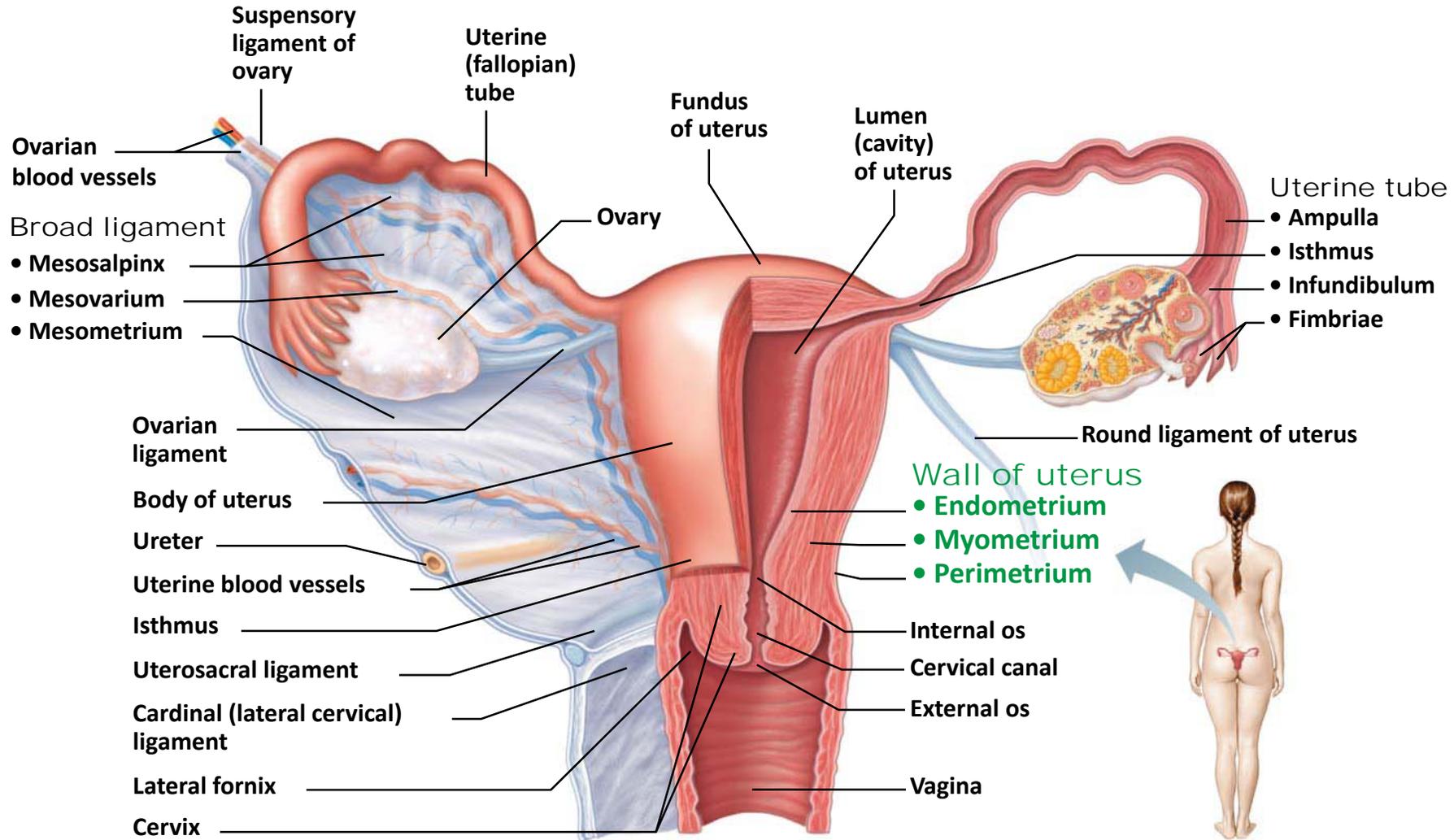


Female Reproductive Anatomy: Internal Genitalia

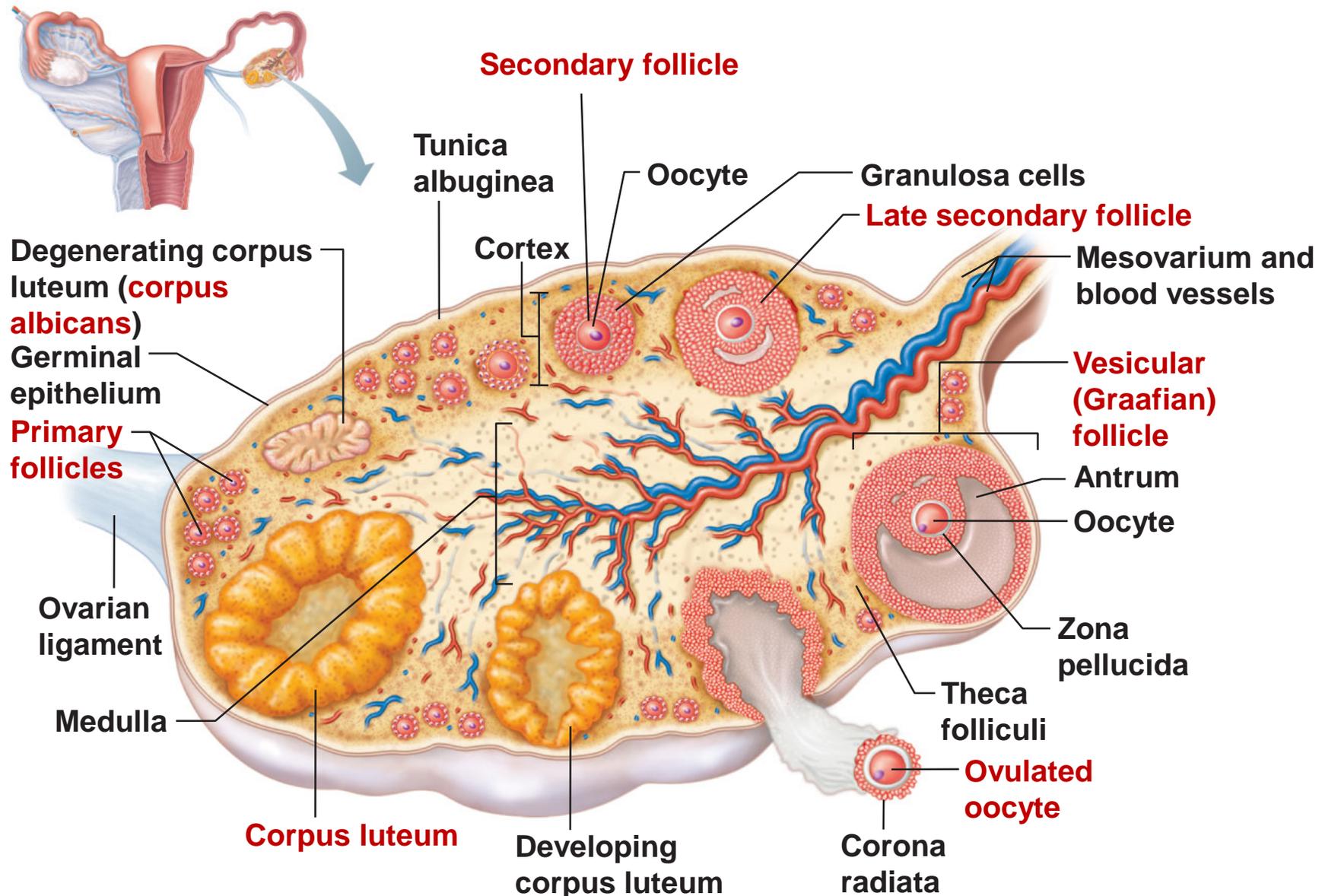


(a) Posterior view

Uterine Wall has 3 Layers



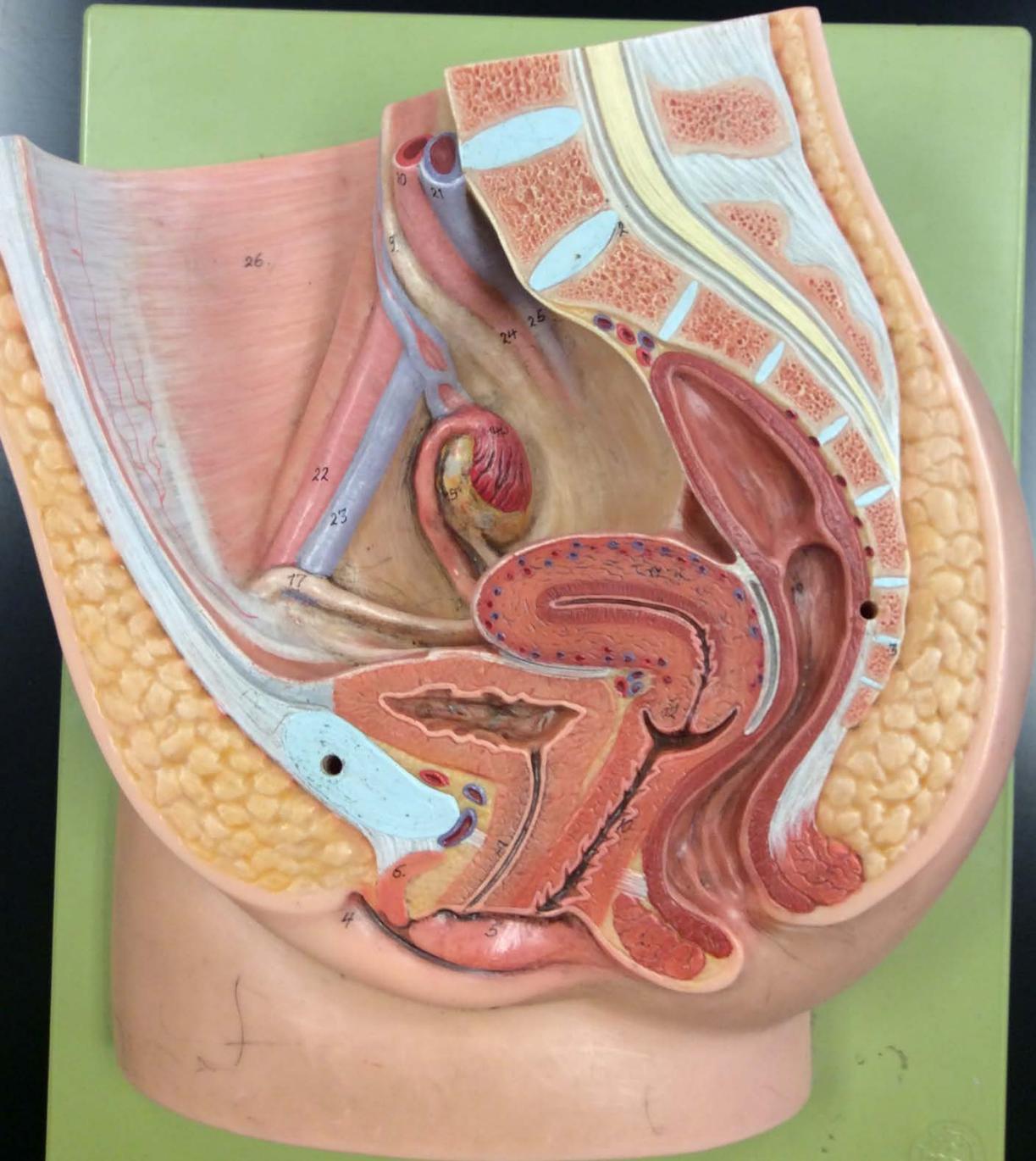
(a) Posterior view



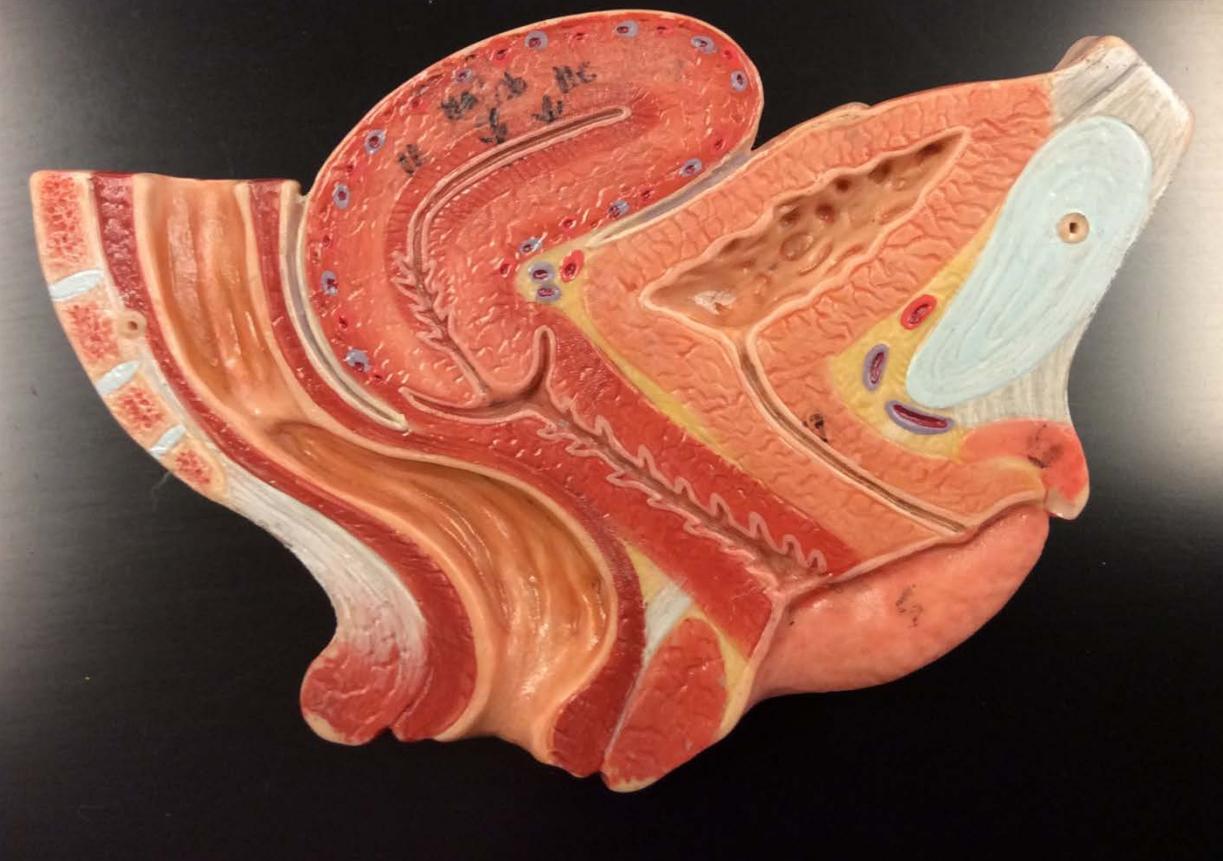
(a) Diagrammatic view of an ovary sectioned to reveal the follicles in its interior

**Use the following pictures to help
you practice finding the terms from
the lab term handout on unlabeled
images.**

- Remember, you won't learn them if you don't take plenty of time to practice on pictures with NO labels (including no labels for what type of slide it is on histology pictures)!
- Also, be sure to mix up the order once you get comfortable with the unlabeled slides.
- Over the weekend, once you are feeling confident with the pictures here, do the histology quizzes in PAL (from the Pearson website) to get practice with new pictures that you haven't seen.

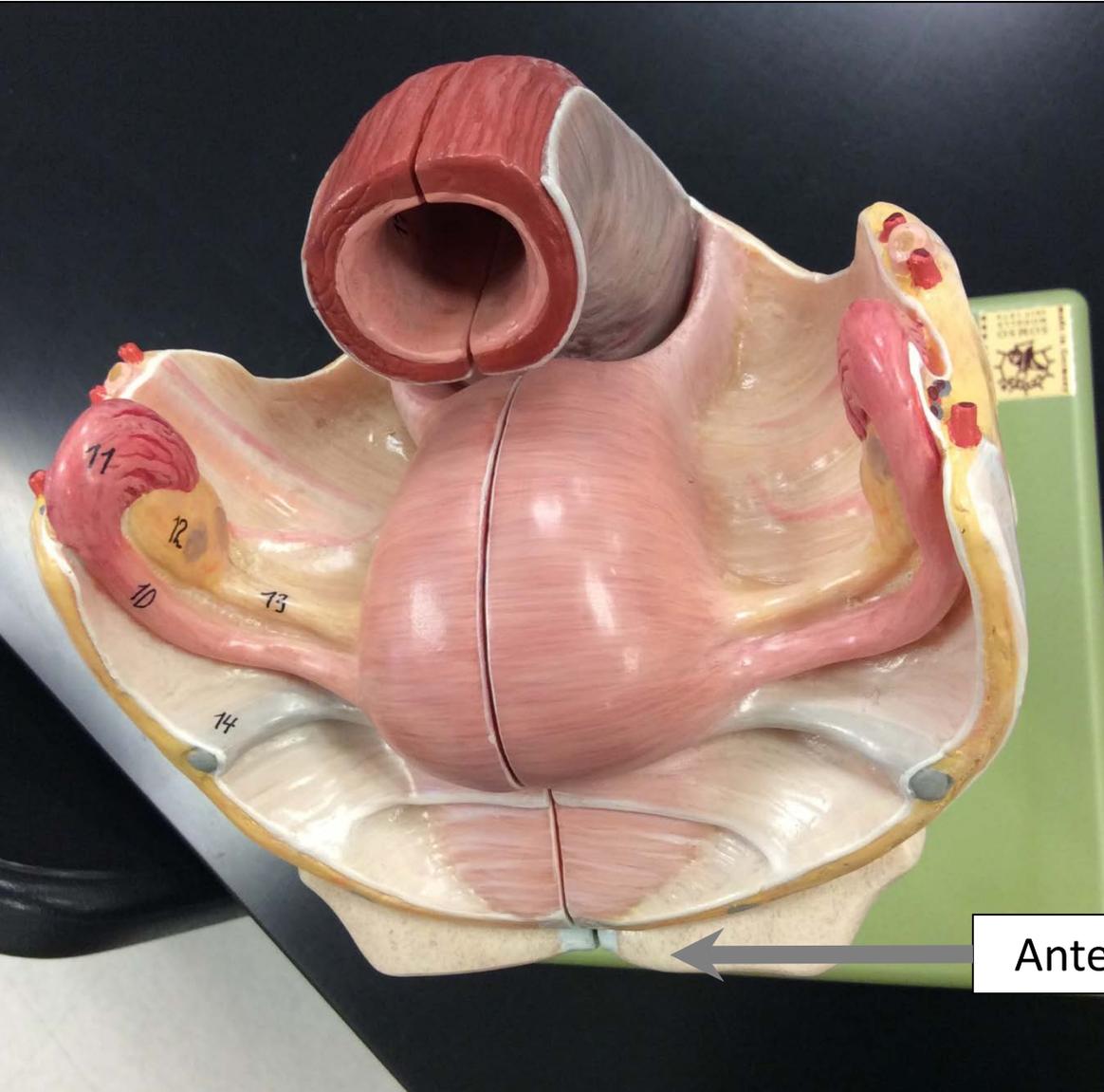


The piece that was removed from the model to the left to give a midsagittal view:

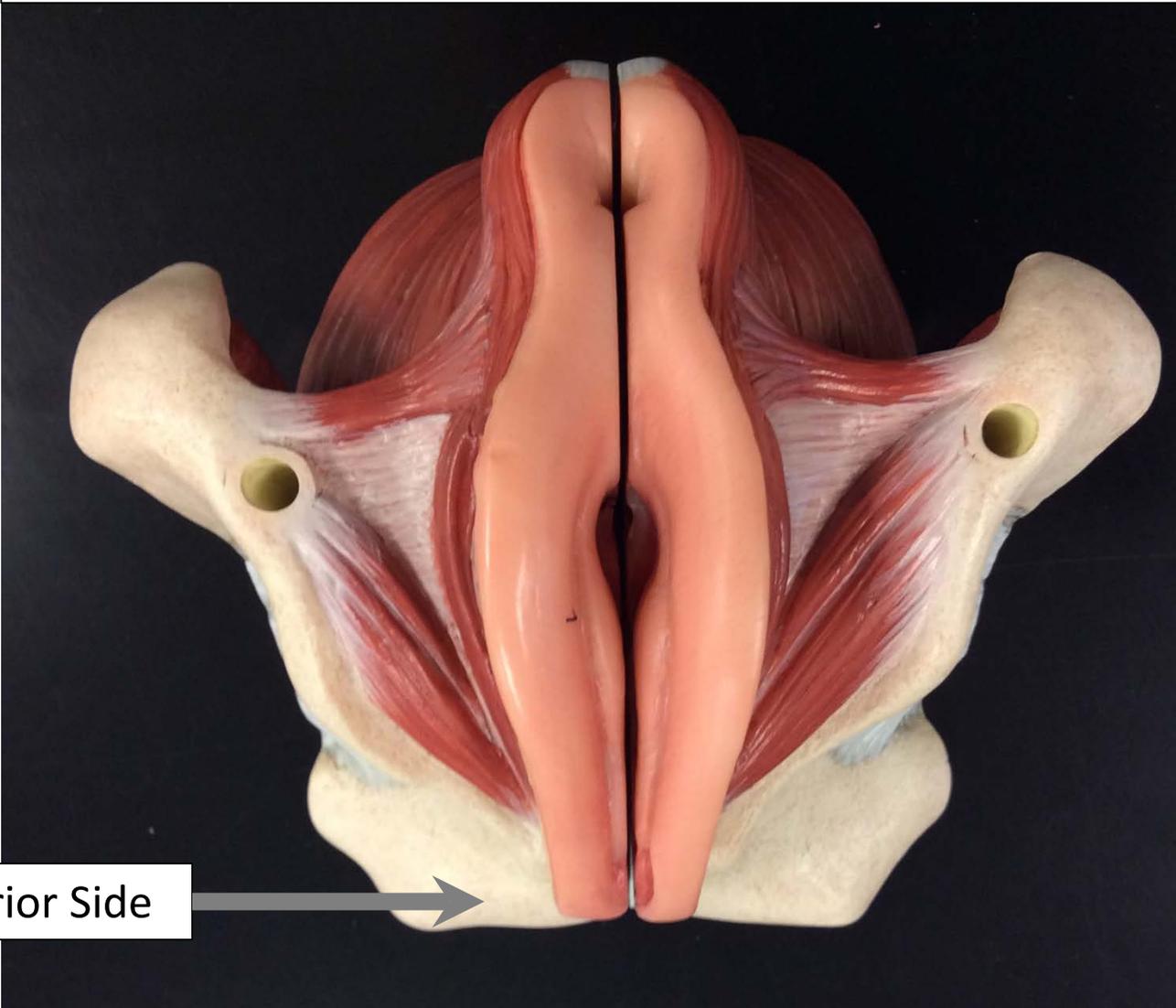


Different model that comes apart in more pieces...the following pictures are of this same model:

Superior view:



Inferior view:



Anterior Side

Midsagittal view of previous model.



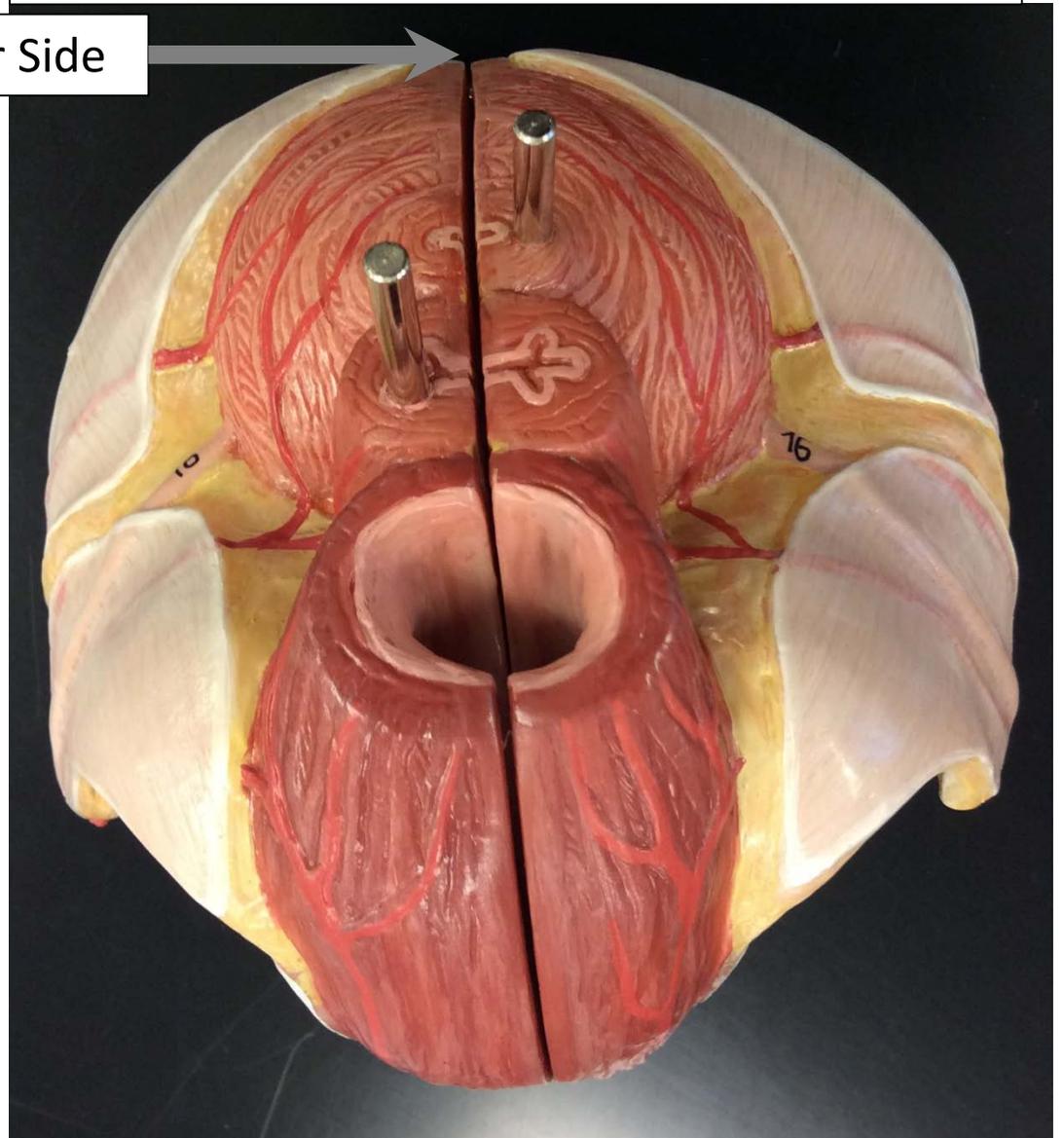
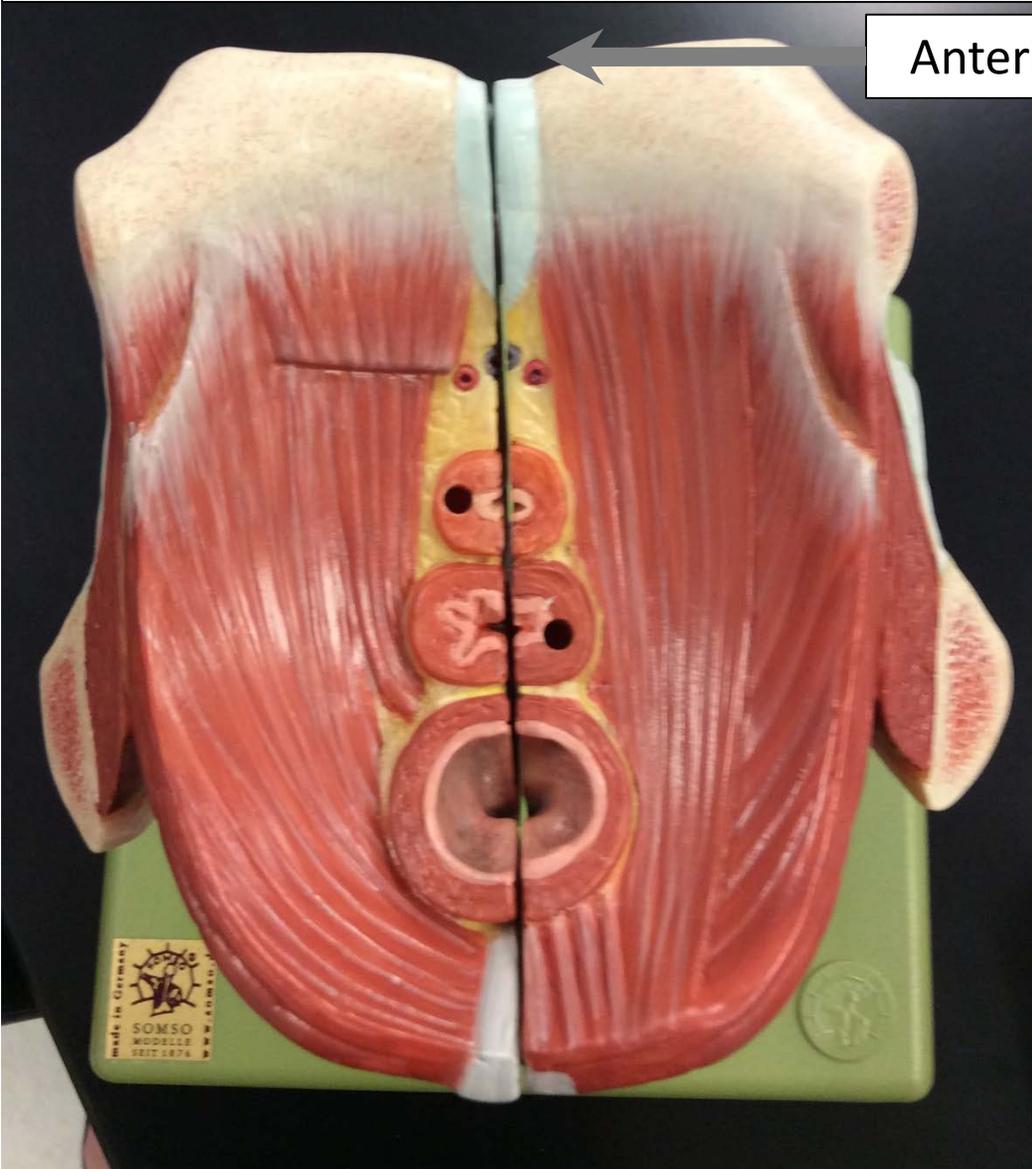
Notice the line where this one can be pulled apart!

The model was pulled apart at the line from the previous picture

Looking down toward the outside of the body:

Looking up into the body:

Anterior Side



Reproductive Anatomy - Male

Use the following pictures to help you identify terms from the lab term handout.

***You always only need to know the terms listed in the lab term handout!

Another good resource for histology is the Olexik website:

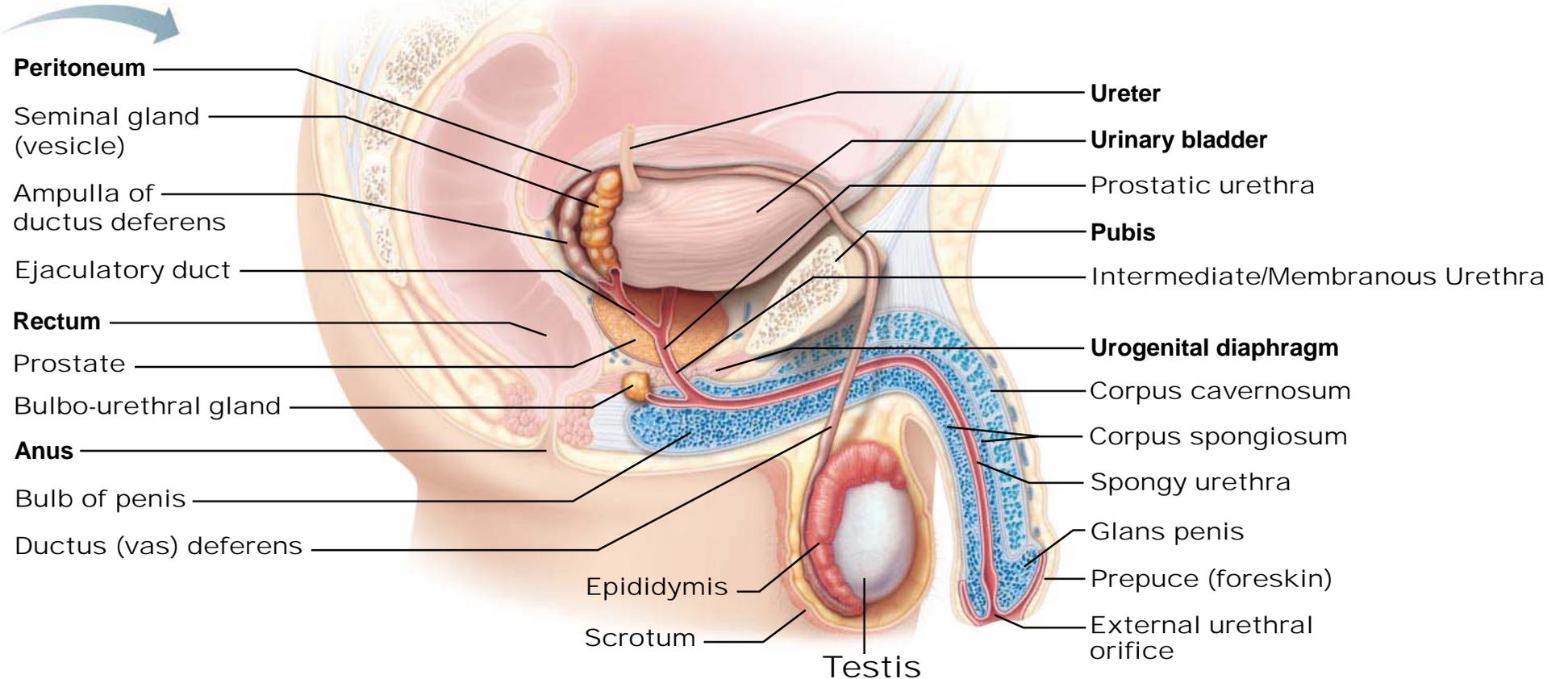
http://faculty.montgomerycollege.edu/wolexik/205_histology_page.htm

Another good resource is the Visible Body ATLAS app: <http://atlas.visiblebody.com>

Don't forget that to use the link to download the atlas to a personal device, the device must first be connected to the MCPA Wi-Fi at the Rockville campus.

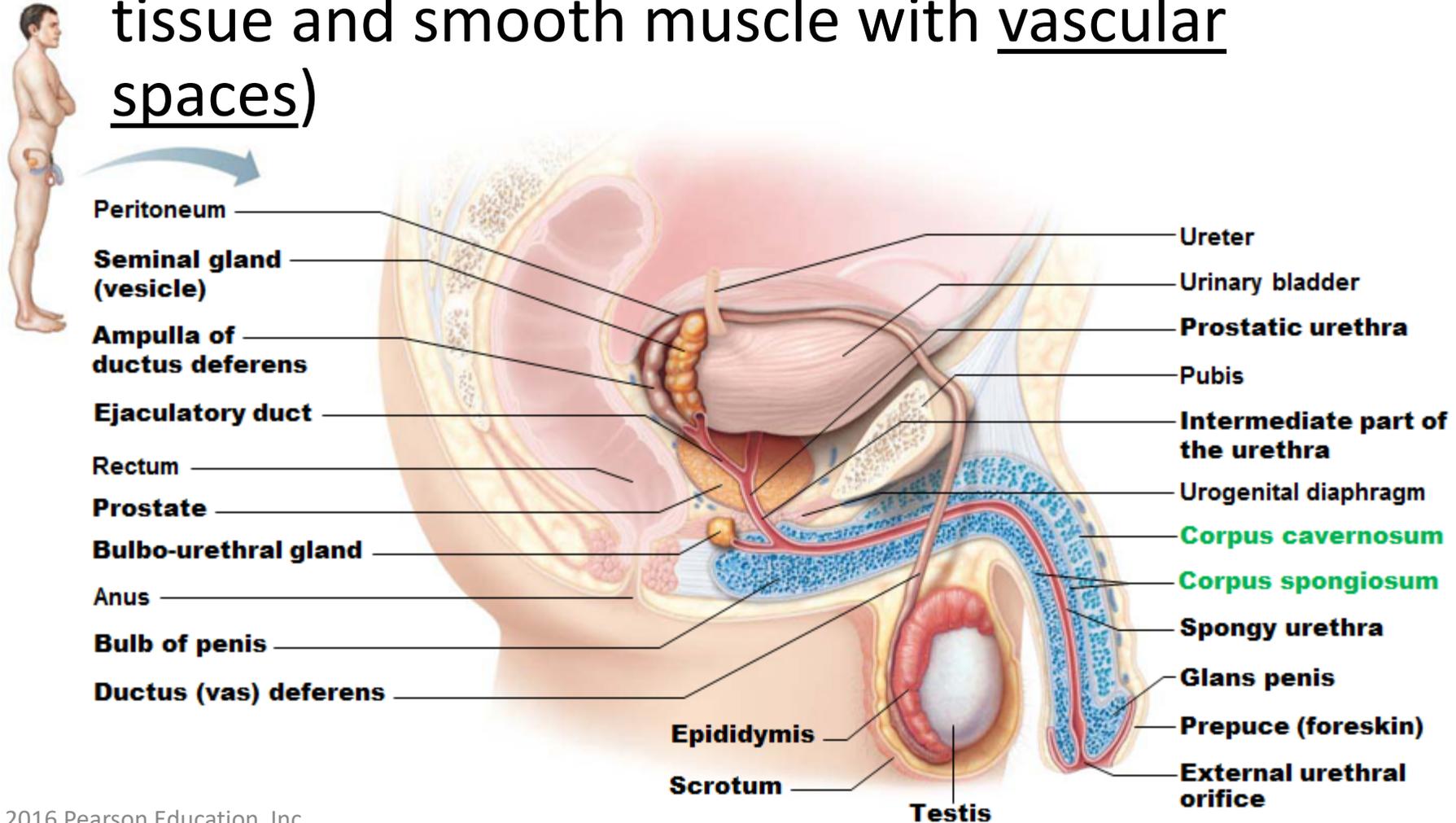
Male Reproductive System

- **Testes (within the scrotum) produce sperm**



The Penis

- Spongy urethra and three cylindrical bodies of erectile tissue (spongy network of connective tissue and smooth muscle with vascular spaces)



Sperm are conveyed through:

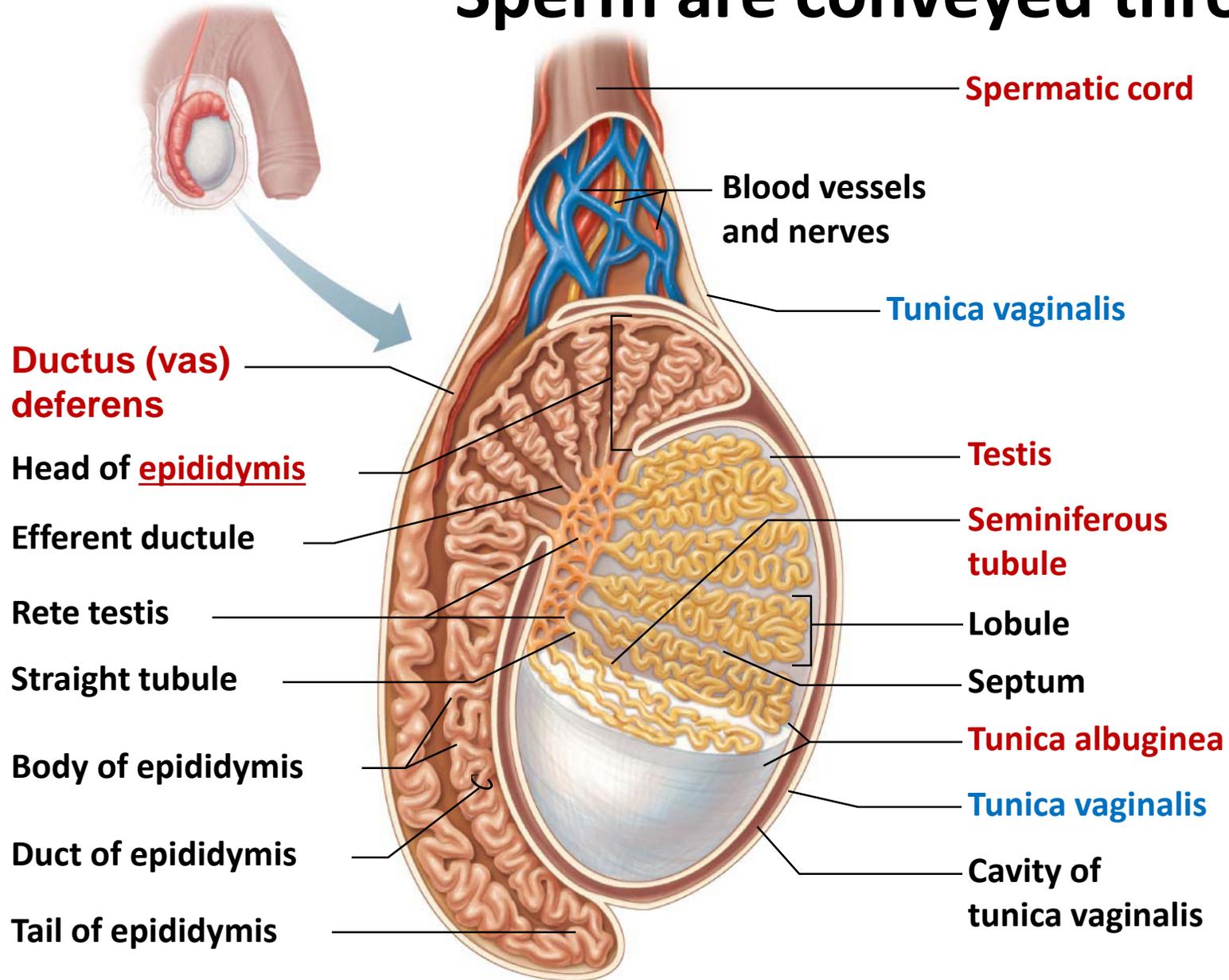
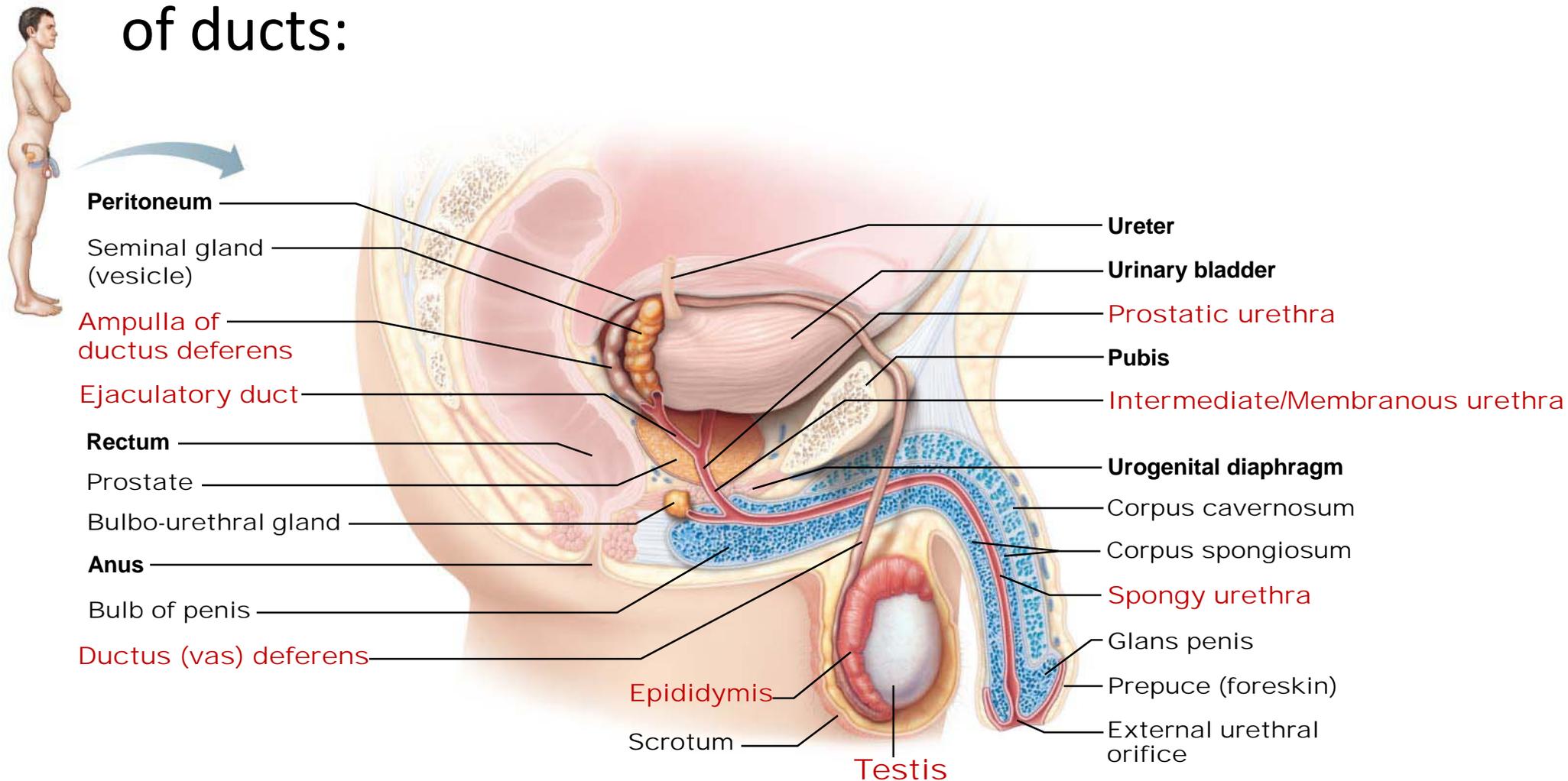
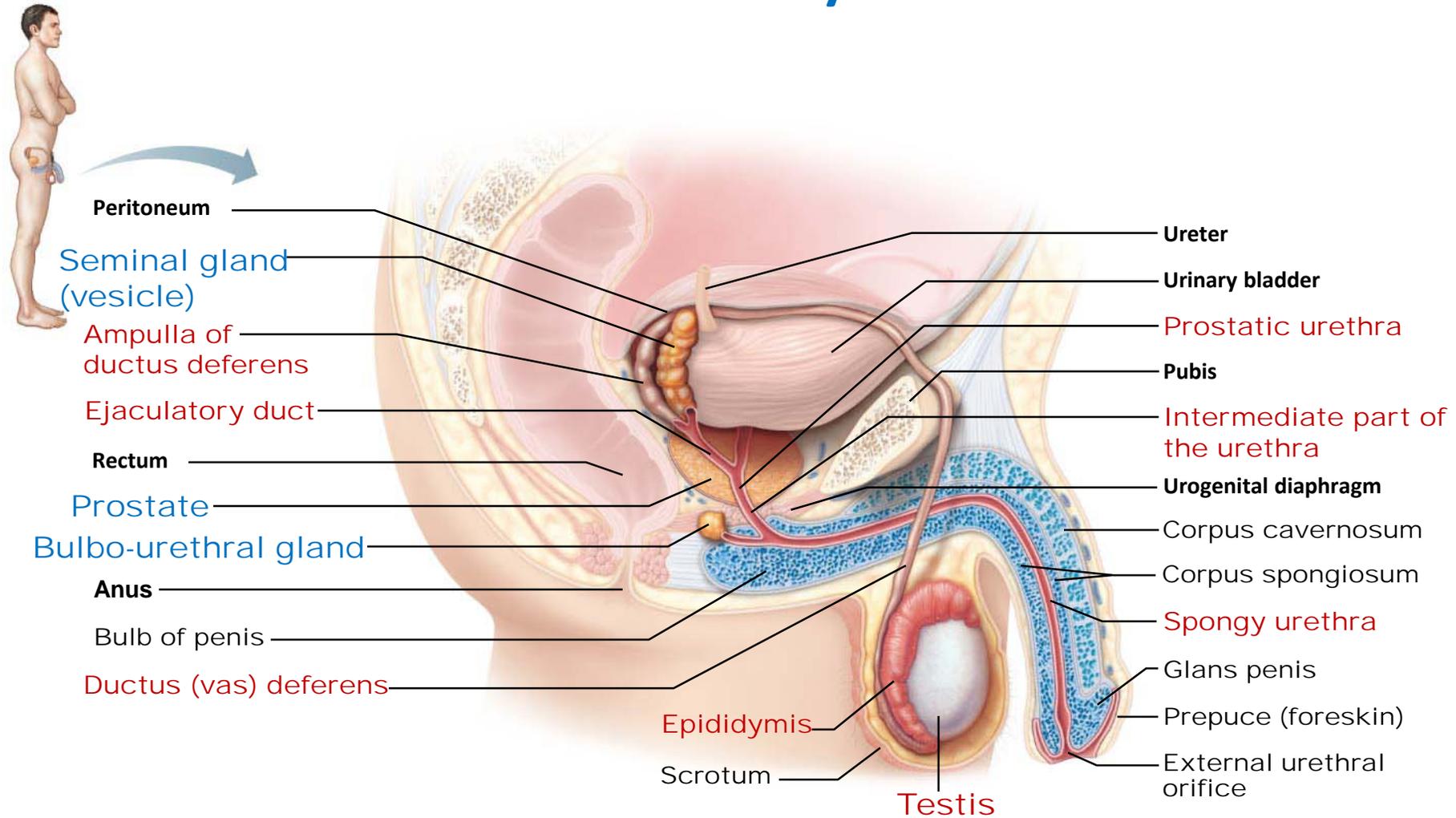


Figure 27.1 Reproductive organs of the male, sagittal view.

- Sperm delivered to exterior through a system of ducts:



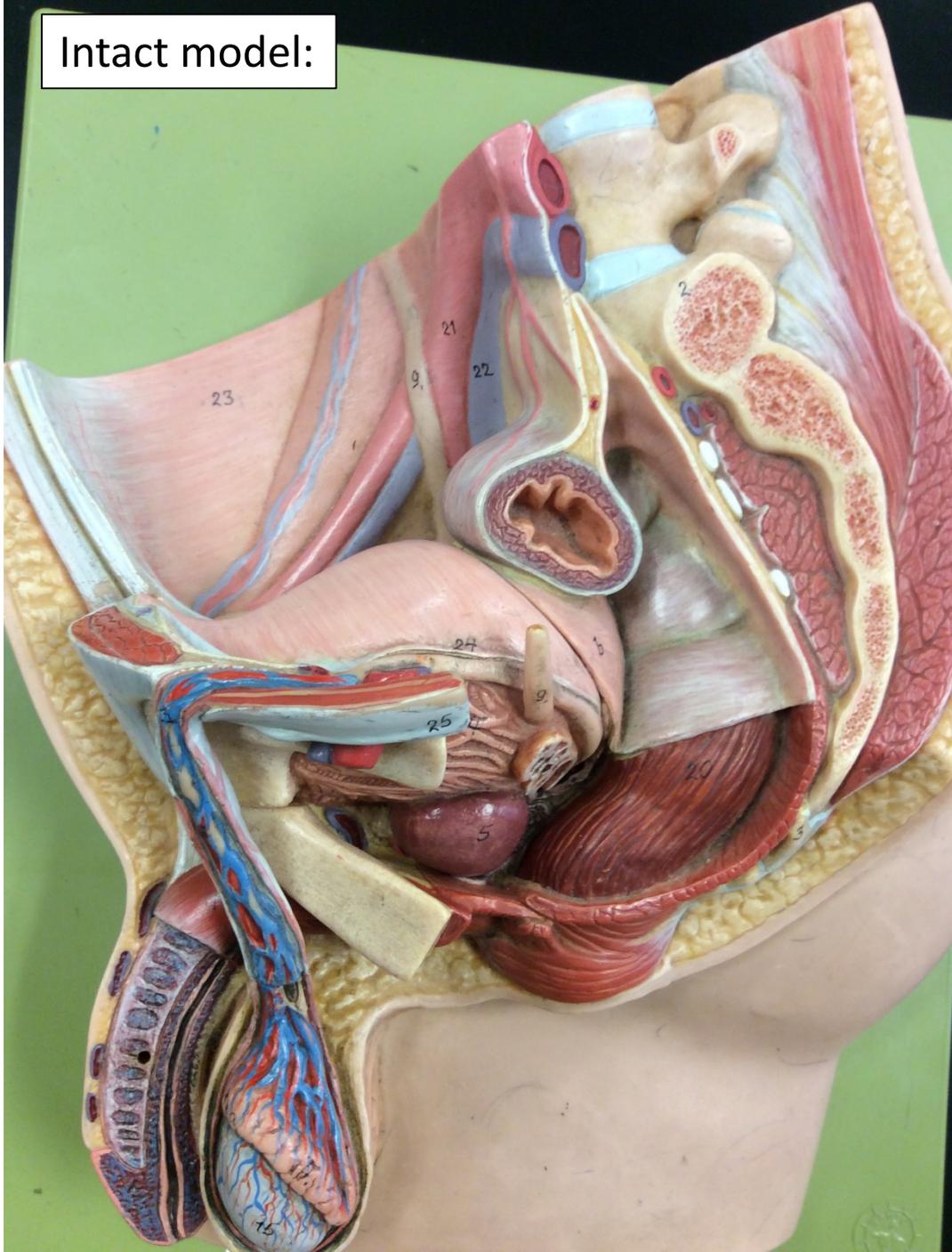
Accessory Glands



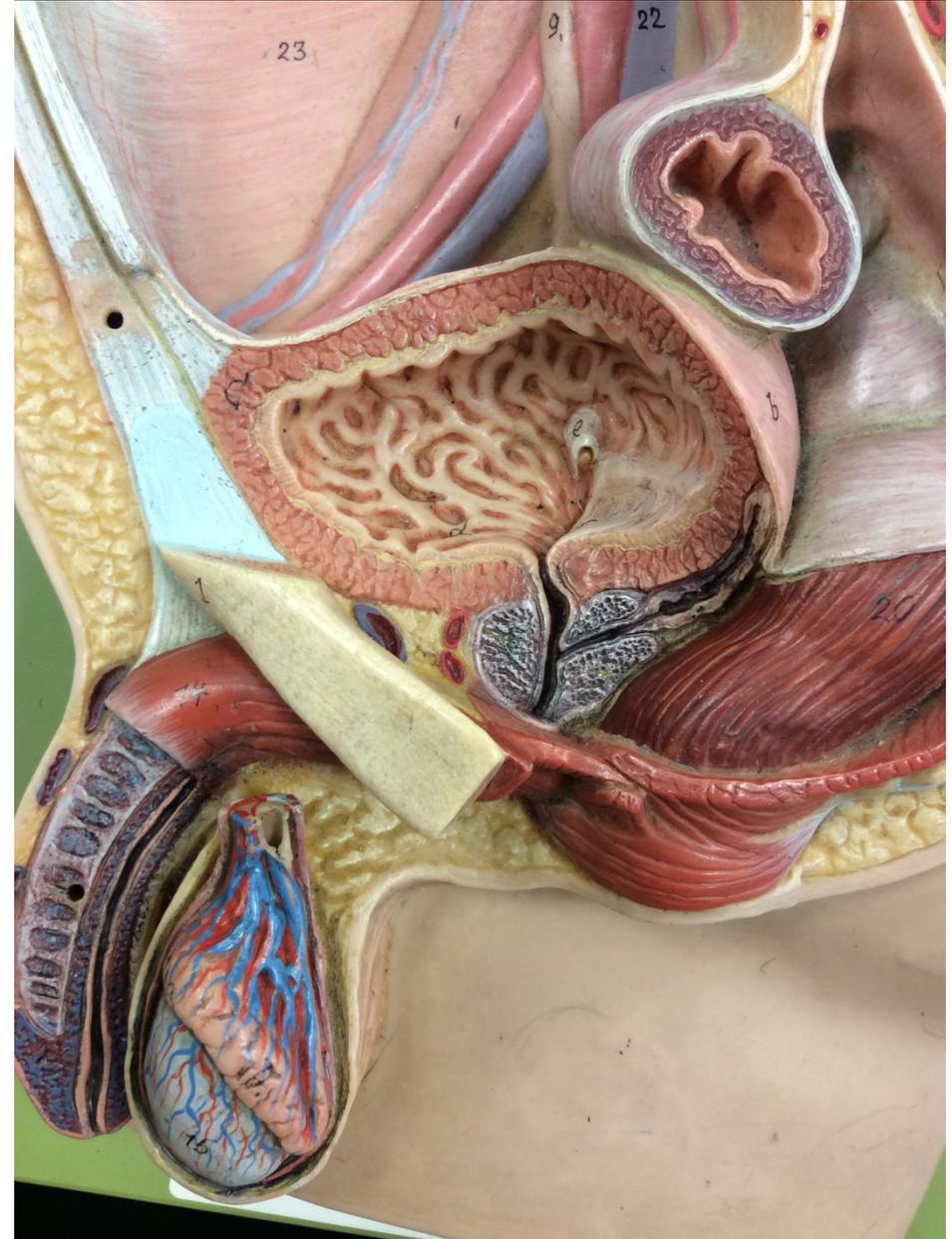
**Use the following pictures to help
you practice finding the terms from
the lab term handout on unlabeled
images.**

- Remember, you won't learn them if you don't take plenty of time to practice on pictures with NO labels (including no labels for what type of slide it is on histology pictures)!
- Also, be sure to mix up the order once you get comfortable with the unlabeled slides.
- Over the weekend, once you are feeling confident with the pictures here, do the histology quizzes in PAL (from the Pearson website) to get practice with new pictures that you haven't seen.

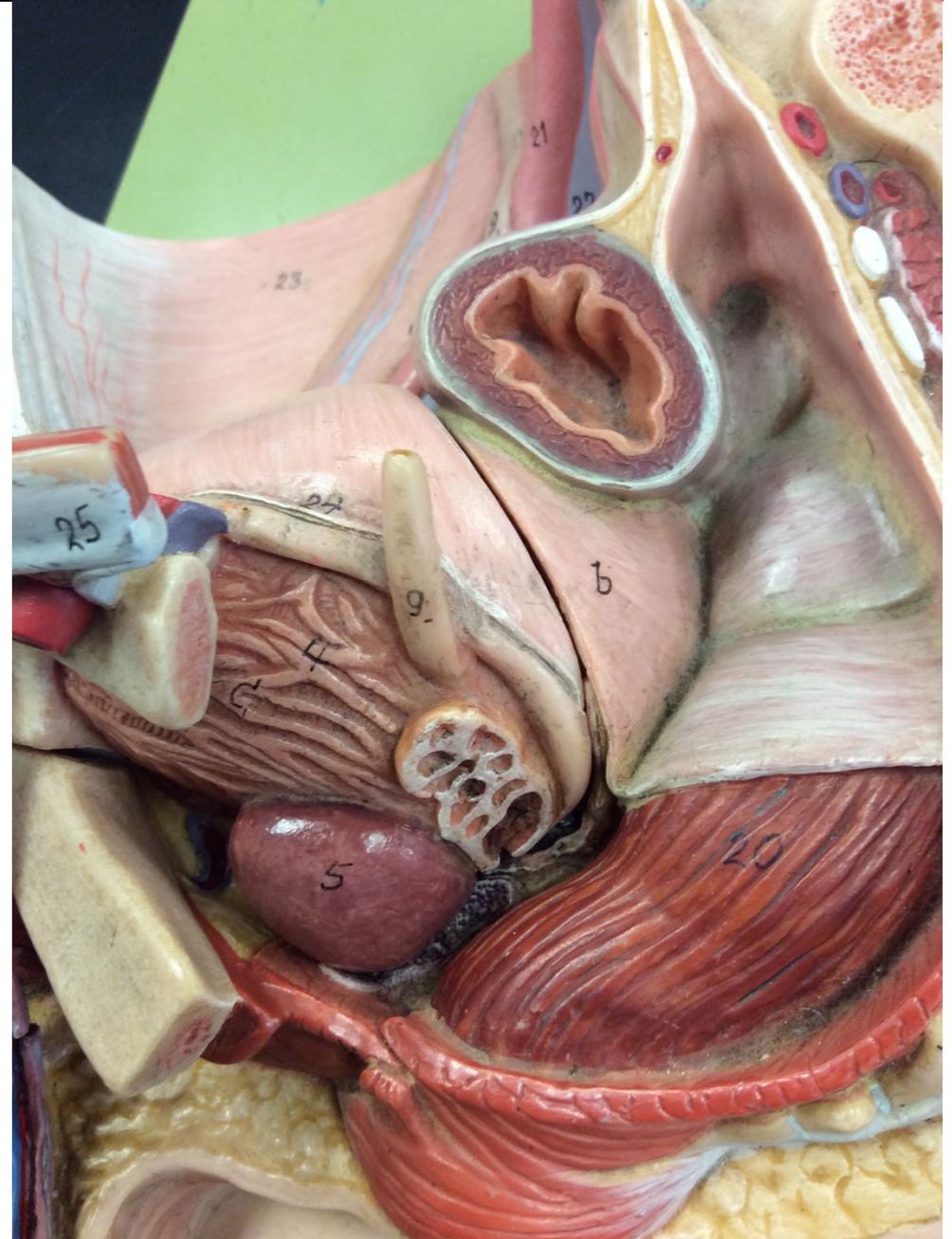
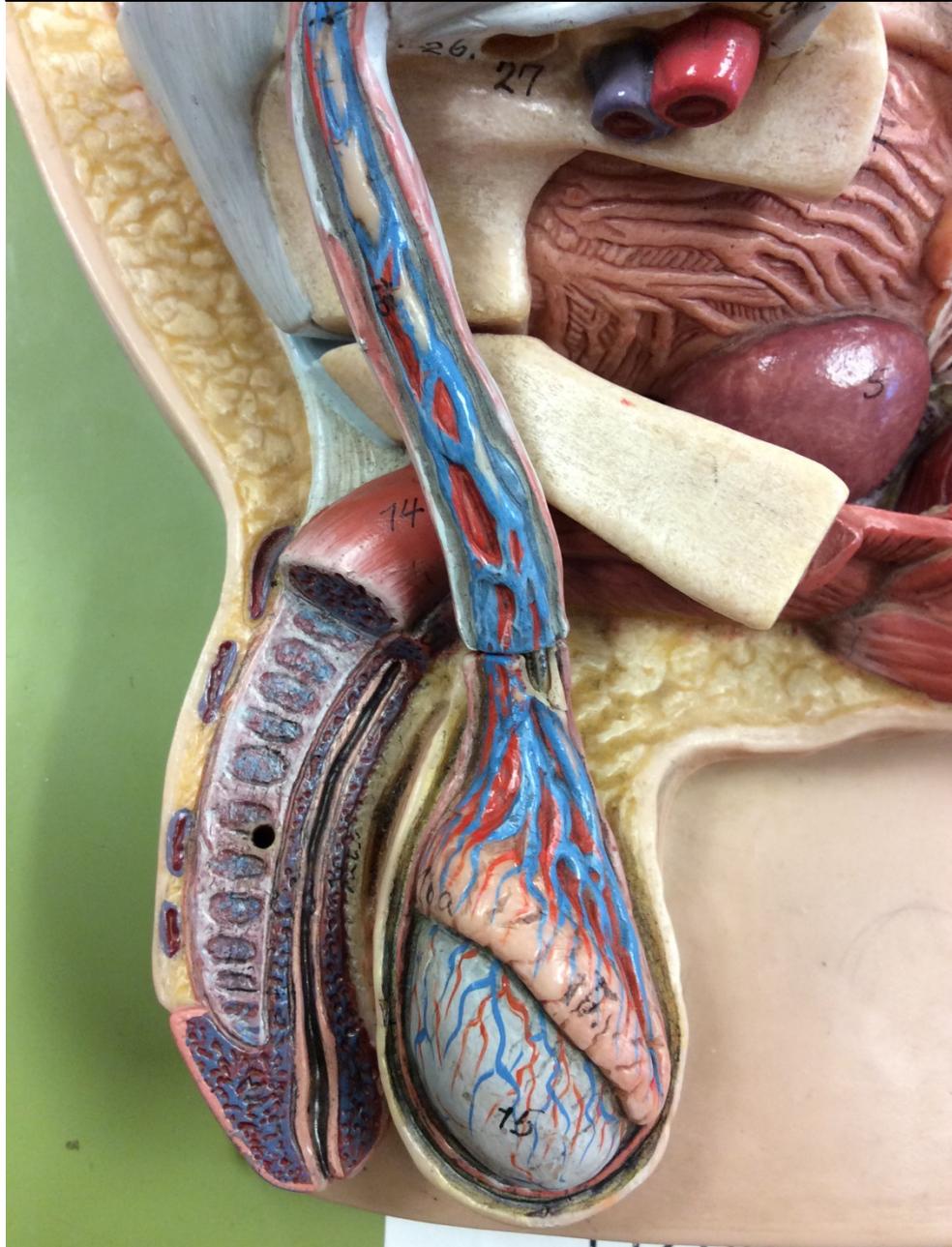
Intact model:



A piece was removed from the model to the left to give a near-midsagittal view:

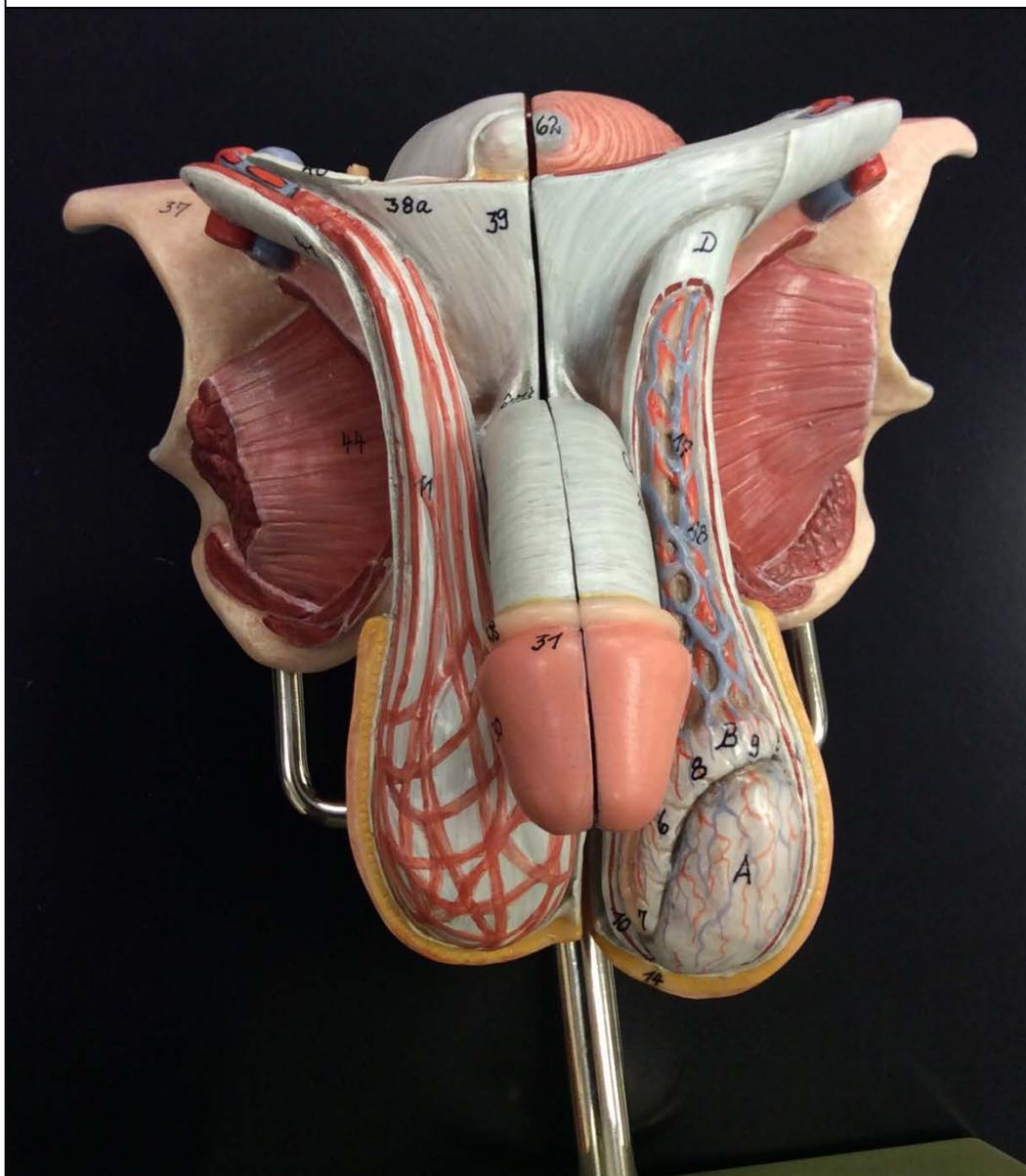


Previous model enlarged:

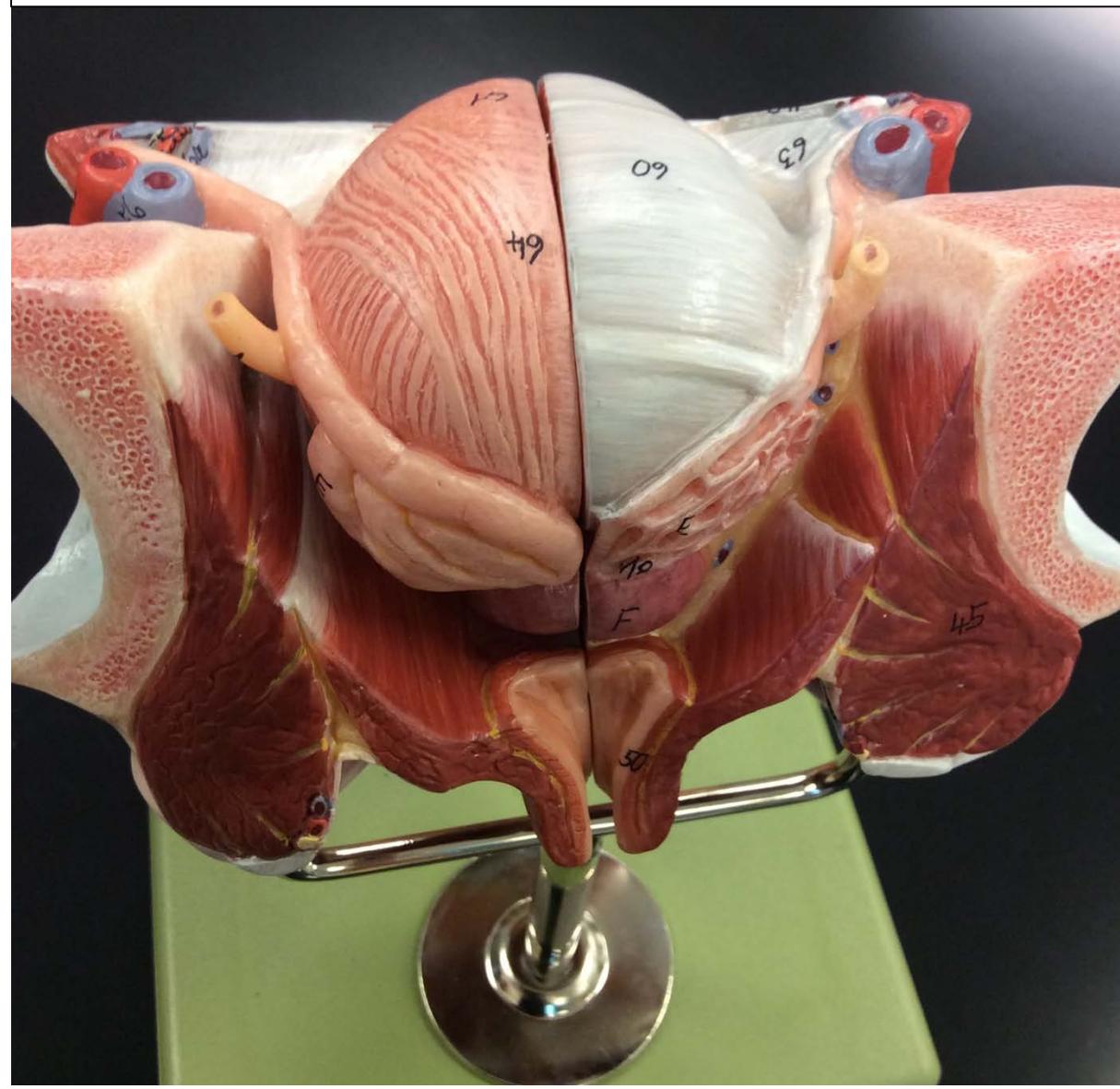


Different model that comes apart in more pieces...the following pictures are of this same model:

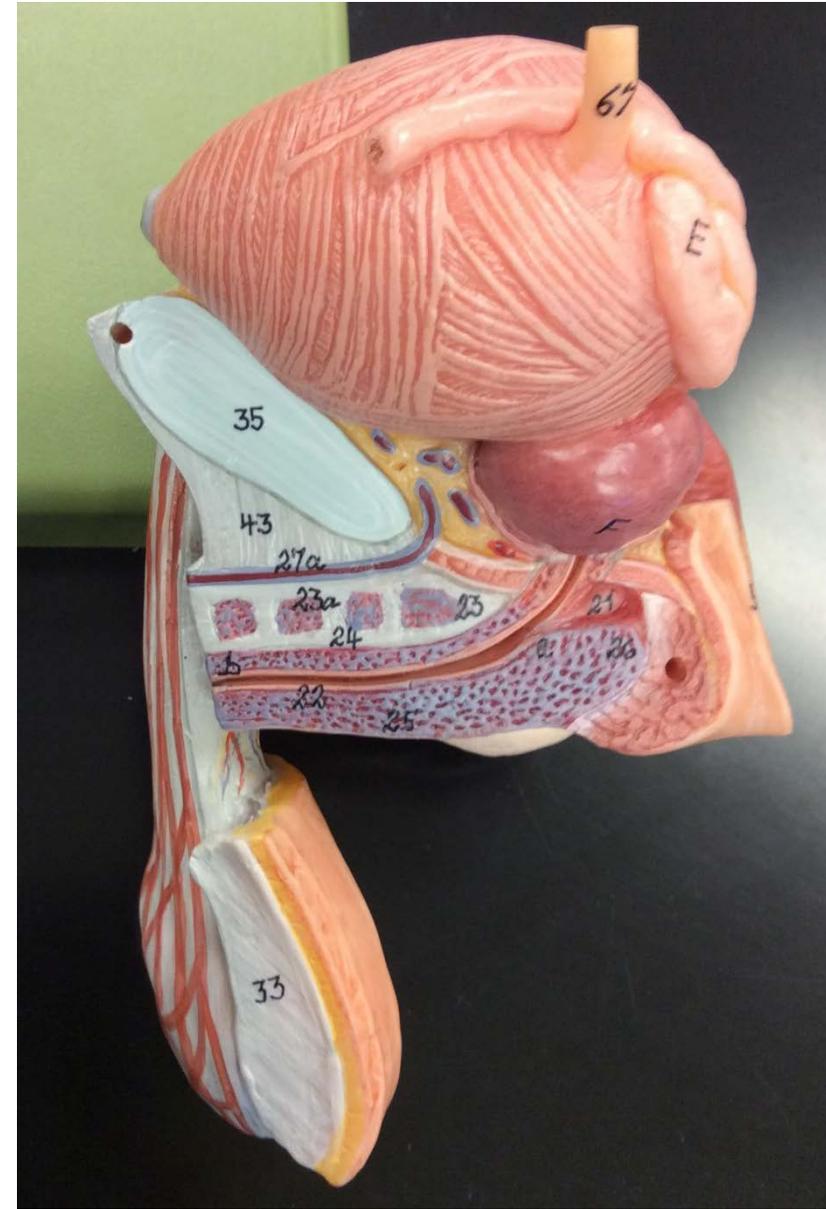
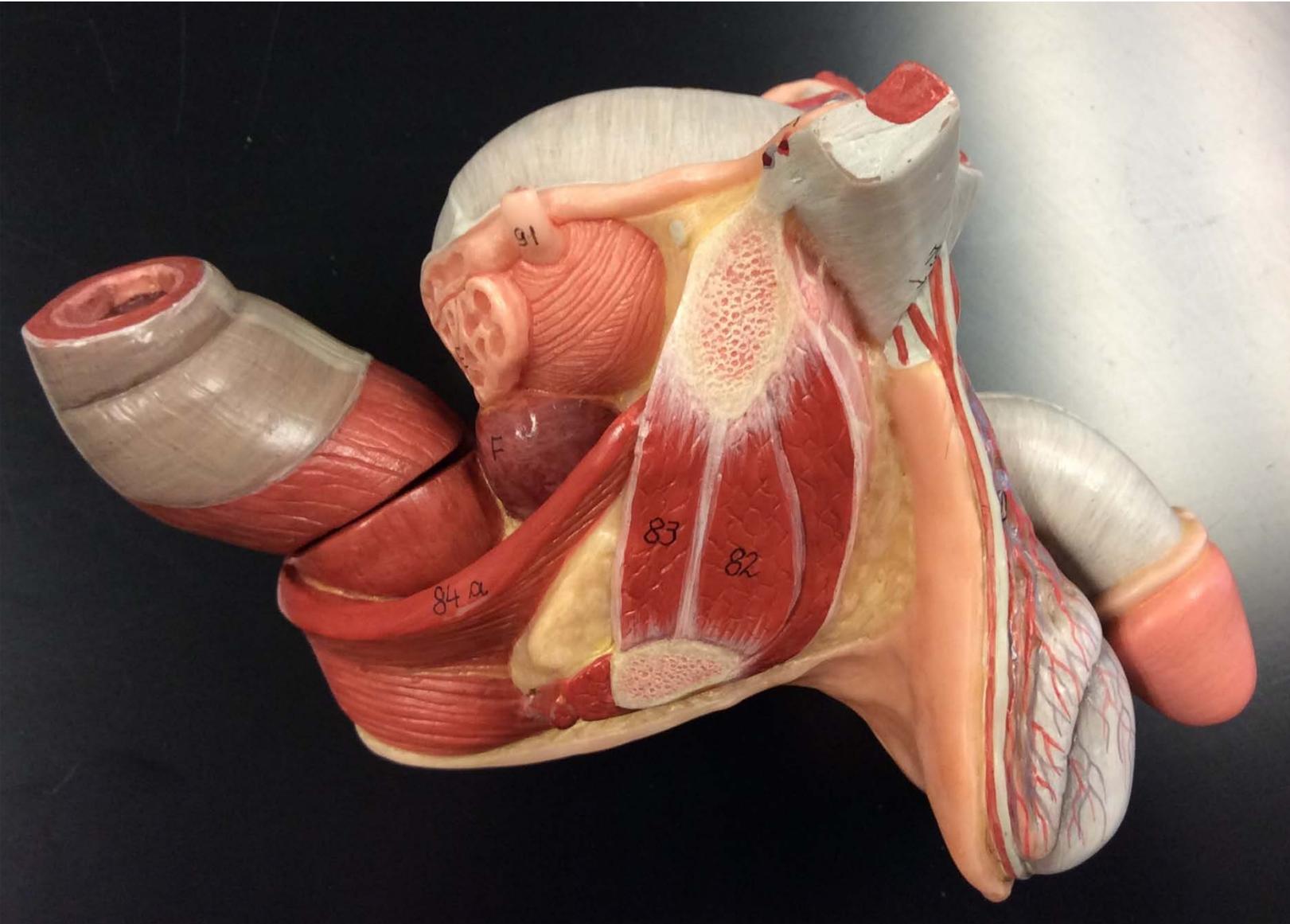
Anterior view:



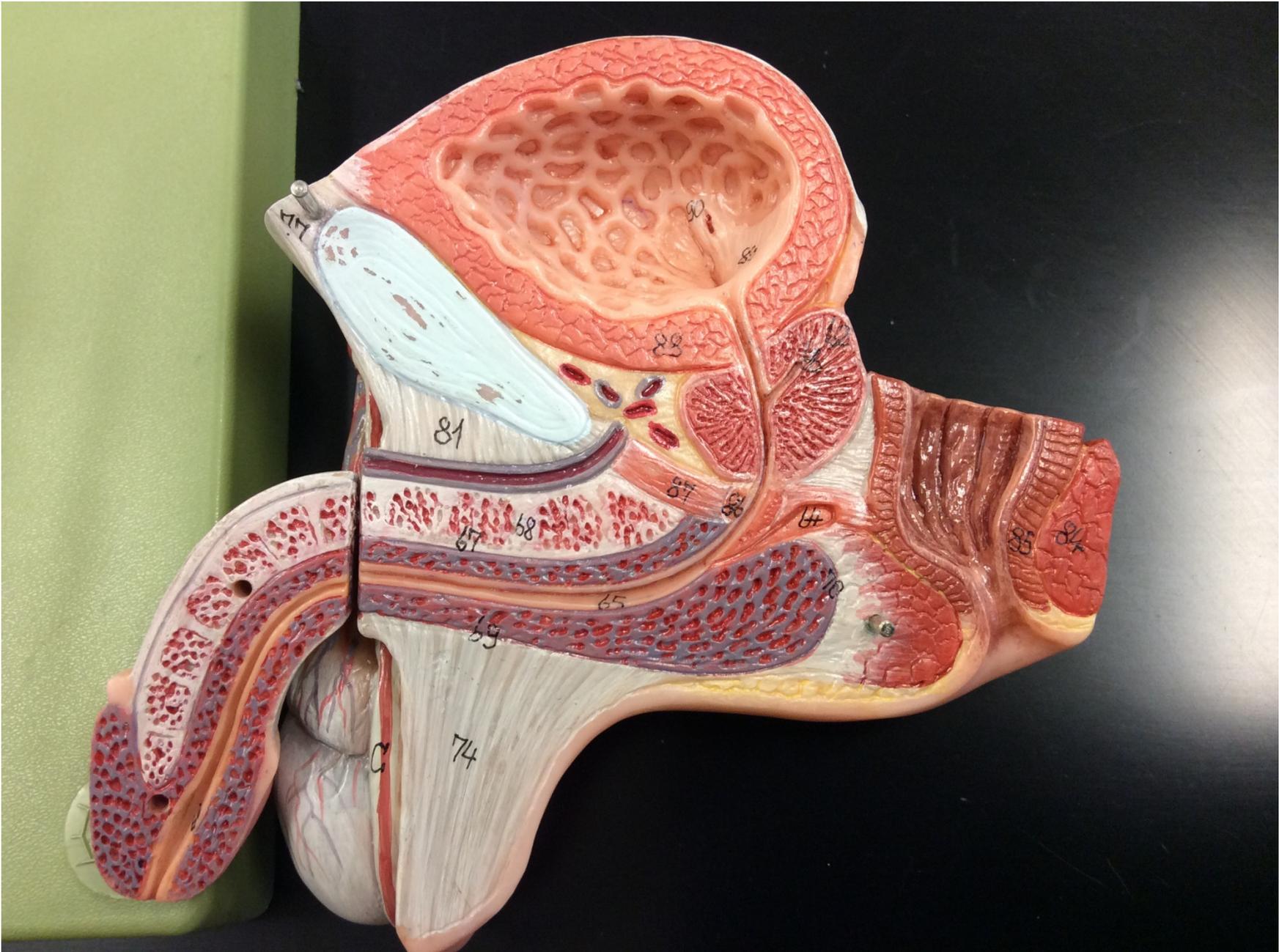
Posterior view:



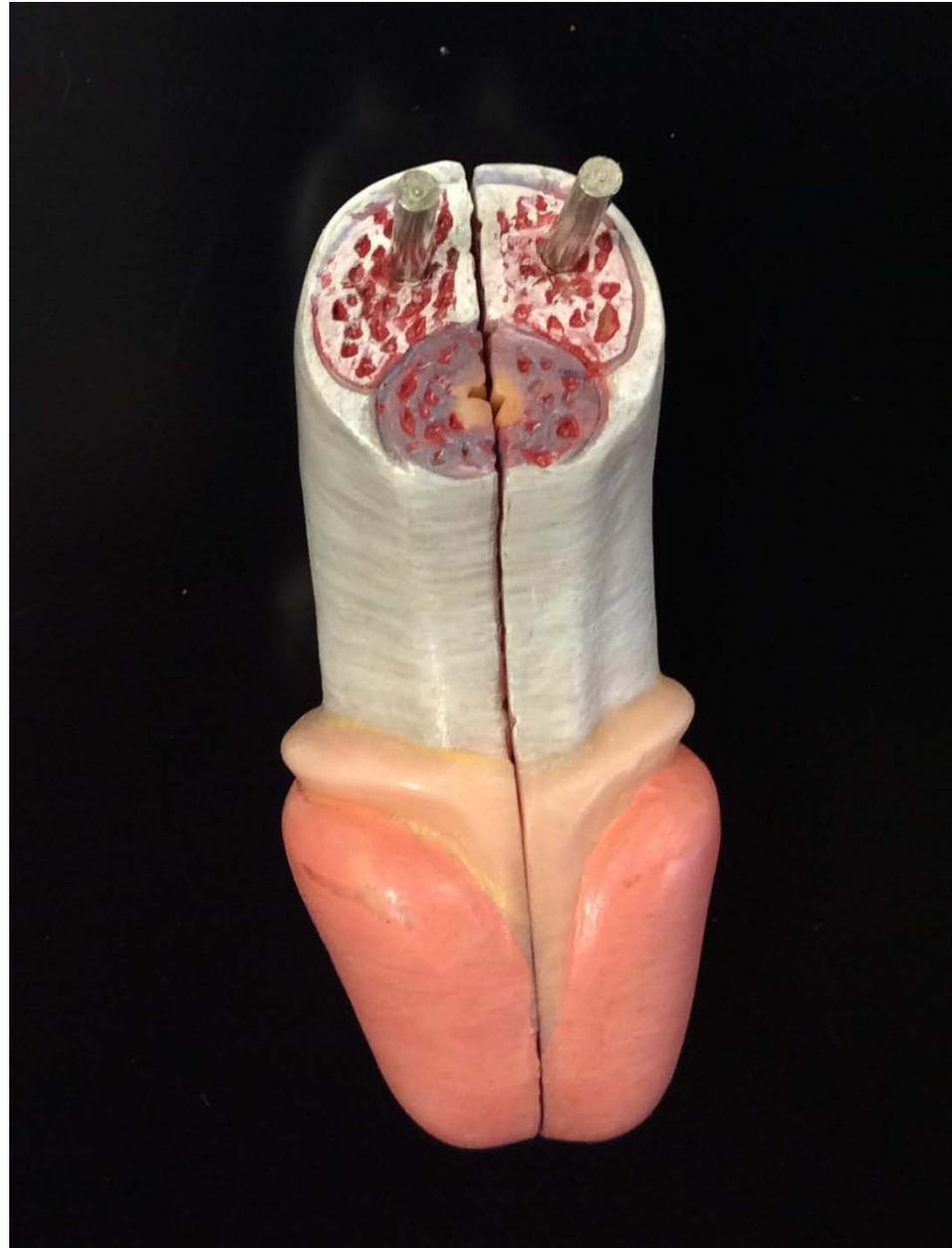
Side views of previous model:



Midsagittal section of previous model:



Penis cross-section of previous model:



Scrotum enlarged - previous model:



Reproductive Histology

Use the following pictures to help
you identify terms from the lab
term handout.

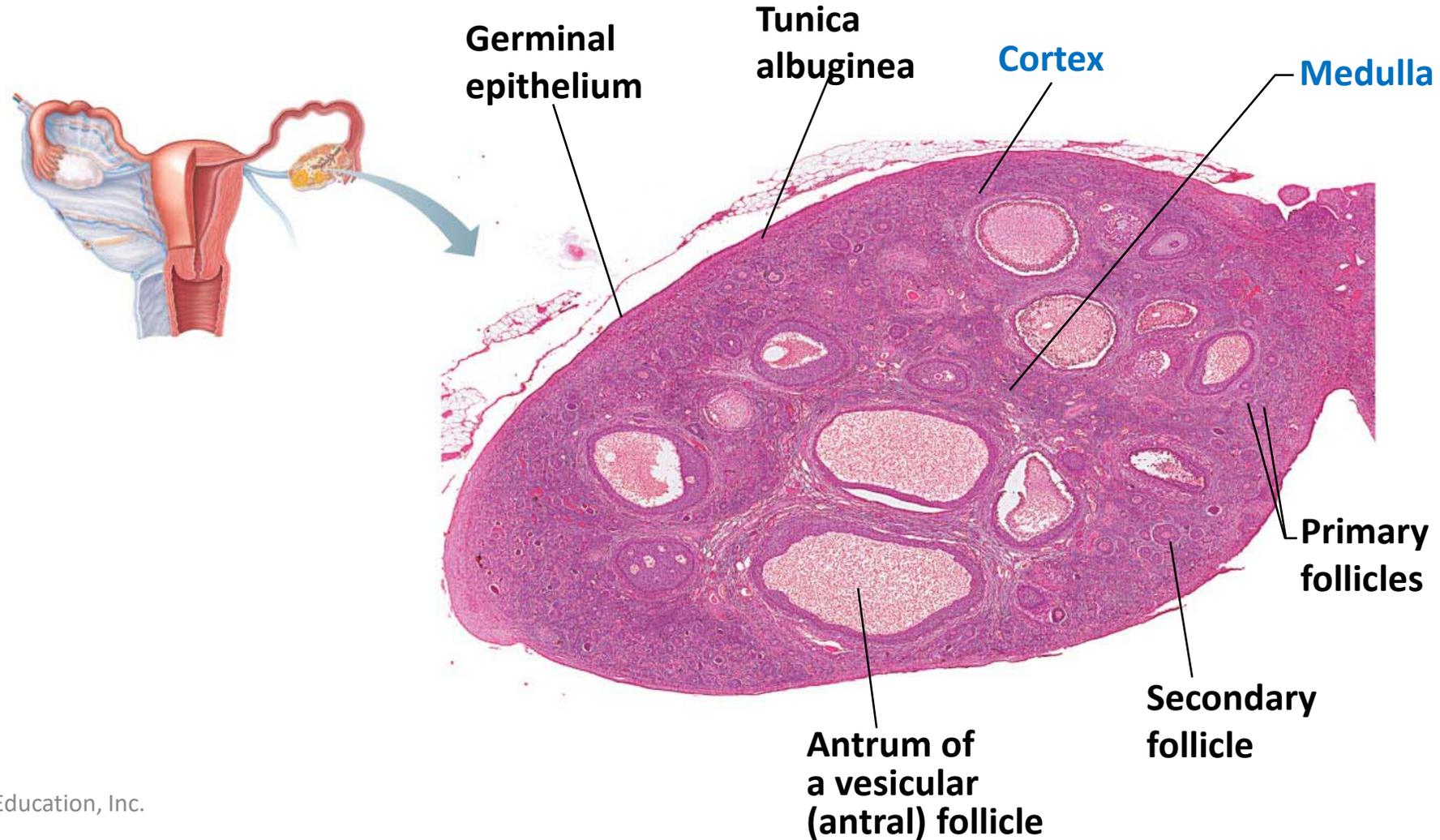
***You always only need to know the terms listed in the lab term handout!

Another good resource for histology is the Olexik website:
http://faculty.montgomerycollege.edu/wolexik/205_histology_page.htm

Female Histology

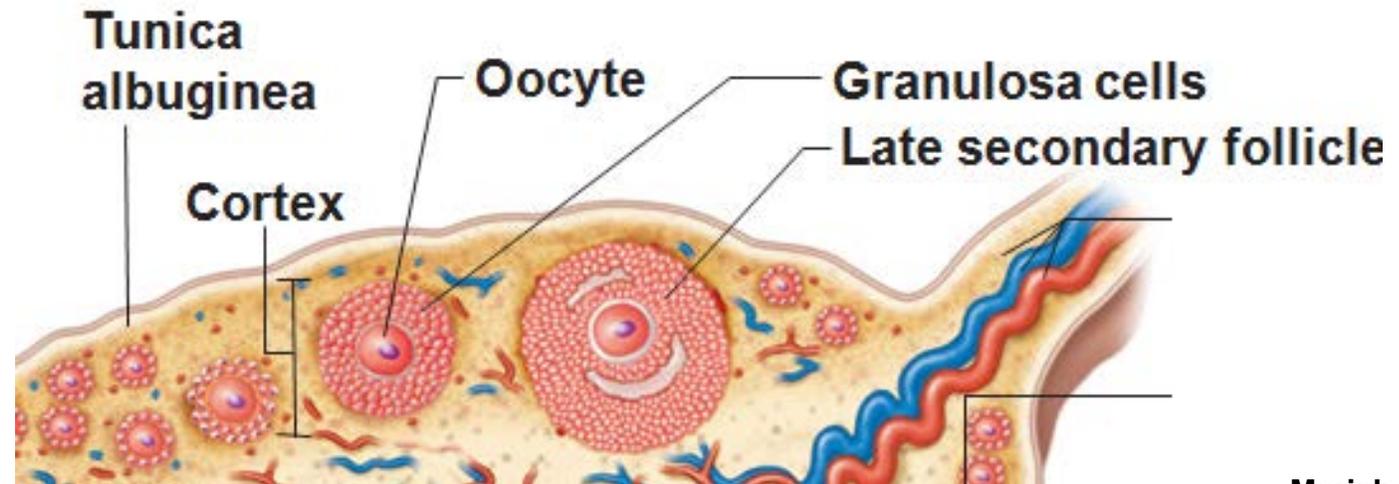
Figure 27.14 Photomicrograph of a mammalian ovary showing follicles in different developmental phases.

- Ovary has 2 regions:
 1. *Cortex*: ovarian follicles
 2. *Medulla*: large blood vessels and nerves



Ovaries

- Follicle
 - Immature egg (**oocyte**) surrounded by
 - **Follicle cells** (if one cell layer thick)
 - **Granulosa cells** (when > one layer thick)



Follicles: several stages of development

- **Primordial follicle:** squamous-like follicle cells + oocyte



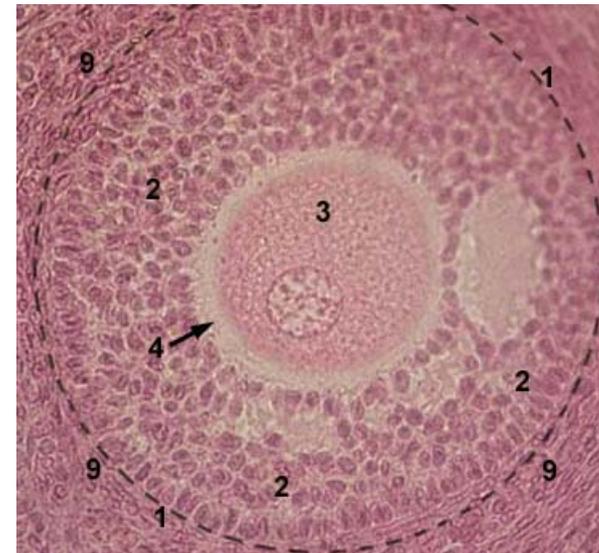
Follicles: several stages of development

- **Primordial follicle:** squamous-like follicle cells + oocyte
- **Primary follicle:** cuboidal or columnar follicle cells + oocyte



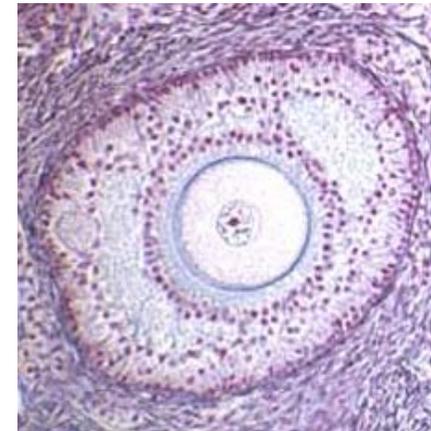
Follicles: several stages of development

- **Primordial follicle:** squamous-like follicle cells + oocyte
- **Primary follicle:** cuboidal or columnar follicle cells + oocyte
- **Secondary follicle:** two or more layers of granulosa cells + oocyte



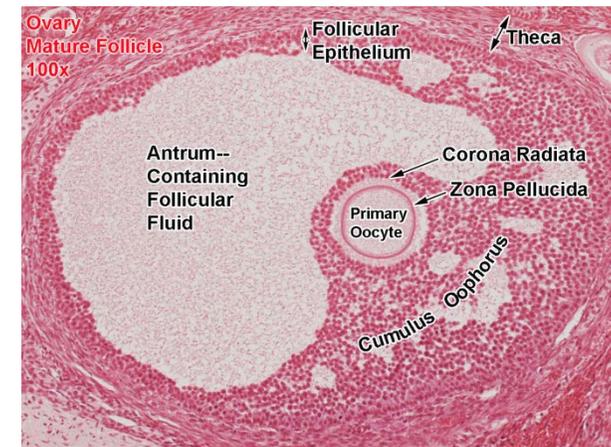
Follicles: several stages of development

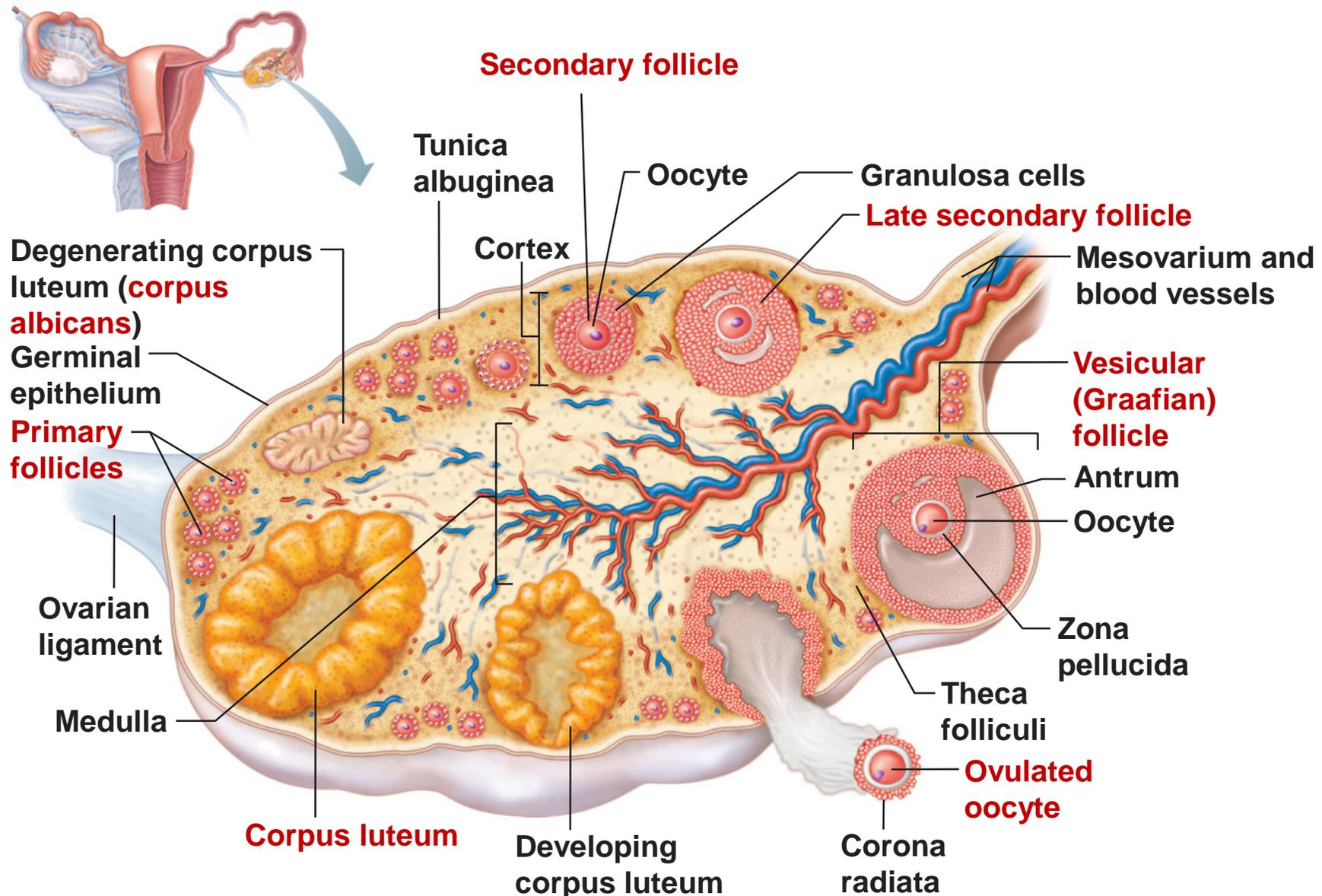
- **Primordial follicle:** squamous-like follicle cells + oocyte
- **Primary follicle:** cuboidal or columnar follicle cells + oocyte
- **Secondary follicle:** two or more layers of granulosa cells + oocyte
- **Late secondary follicle:** contains fluid-filled pockets between granulosa cells; coalesces to form a central antrum



Follicles: several stages of development

- **Primordial follicle:** squamous-like follicle cells + oocyte
- **Primary follicle:** cuboidal or columnar follicle cells + oocyte
- **Secondary follicle:** two or more layers of granulosa cells + oocyte
- **Late secondary follicle:** contains fluid-filled pockets between granulosa cells; coalesces to form a central antrum
- **Vesicular (Graafian) follicle:** fluid-filled central antrum forms; follicle bulges from ovary surface

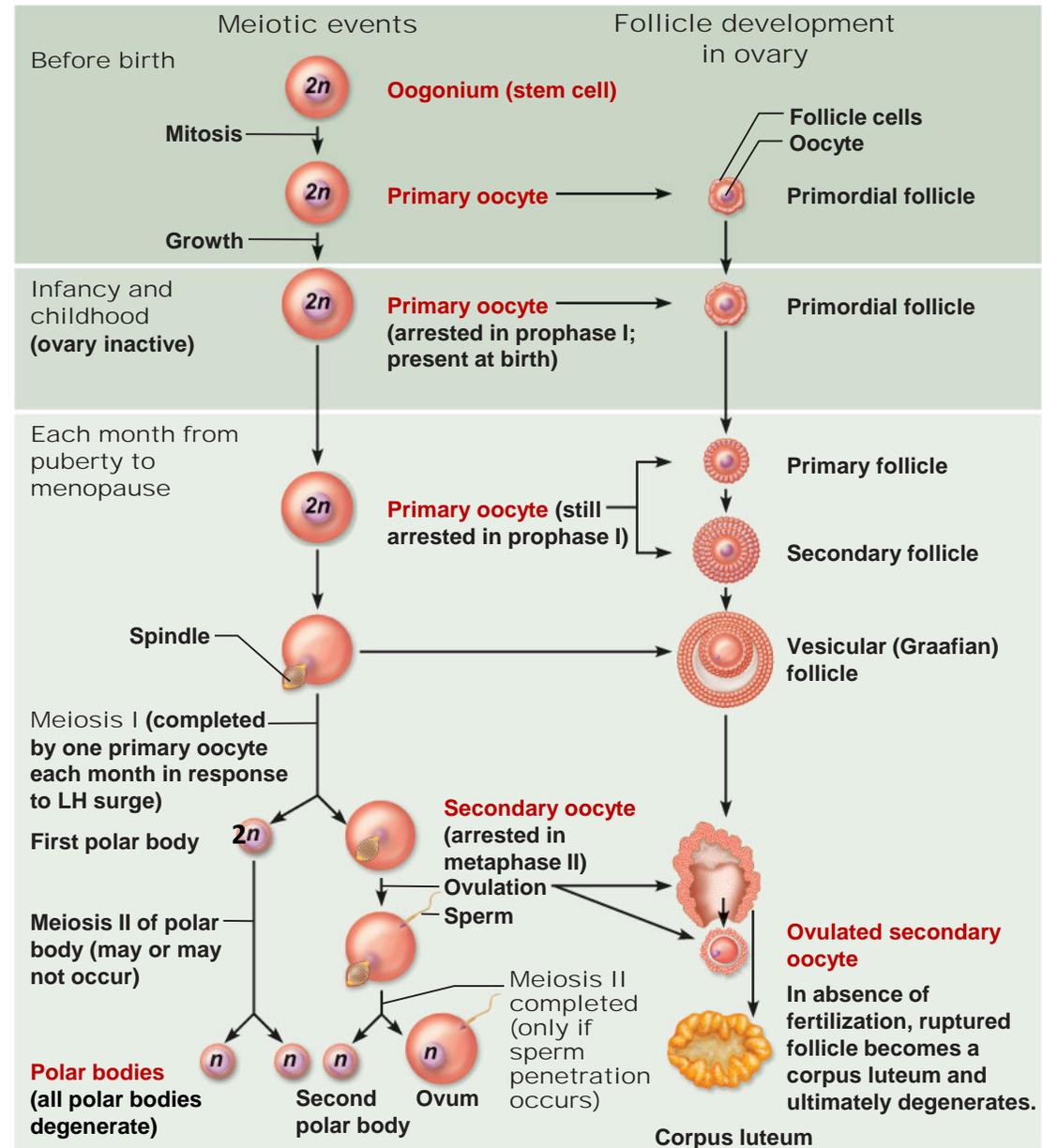




(a) Diagrammatic view of an ovary sectioned to reveal the follicles in its interior

Unequal meiotic division is important:

- Fertilized egg has ample nutrients
- Polar bodies die



Ovary-Follicles-100x

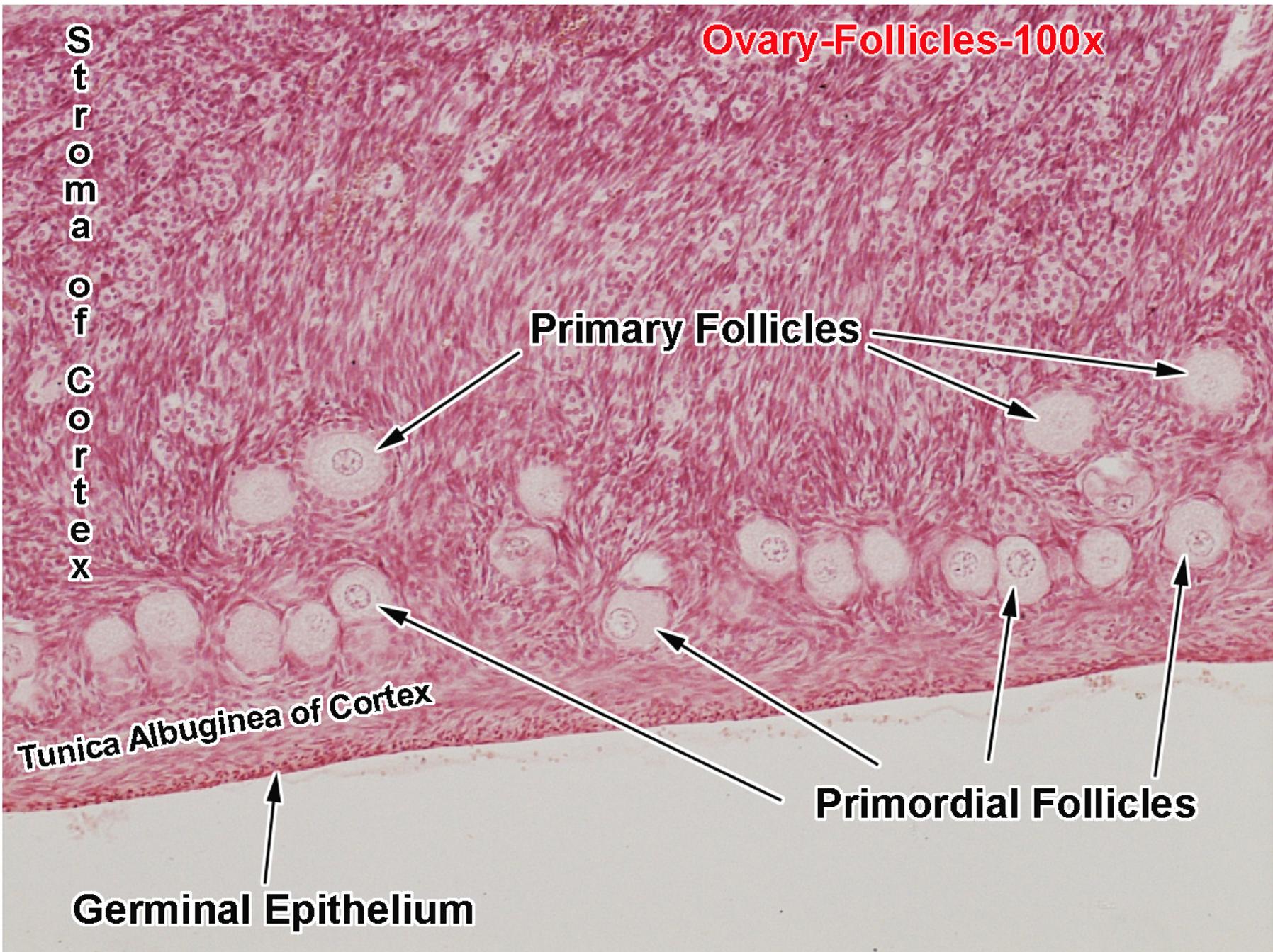
S
t
r
o
m
a
o
f
C
o
r
t
e
x

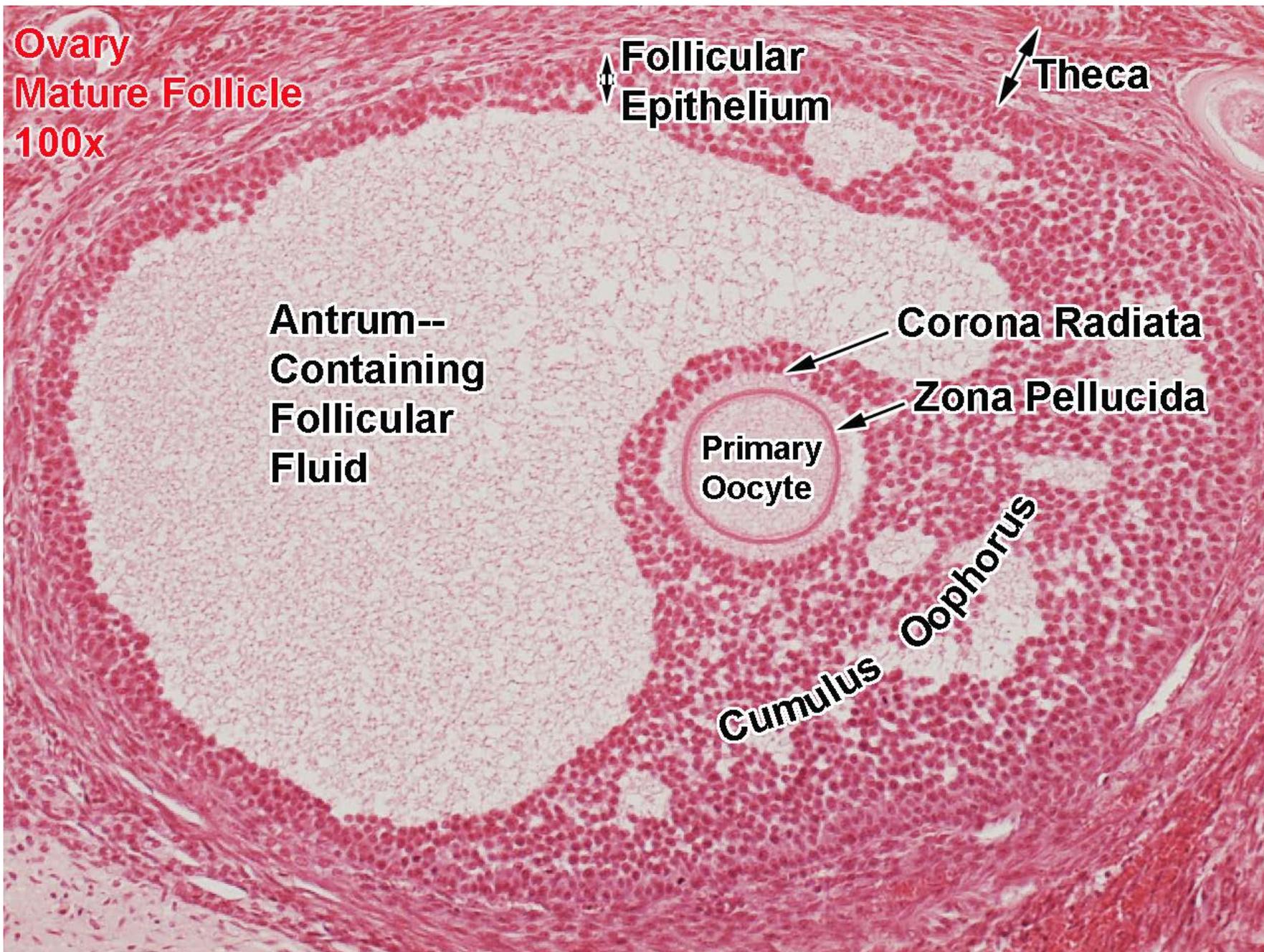
Primary Follicles

Tunica Albuginea of Cortex

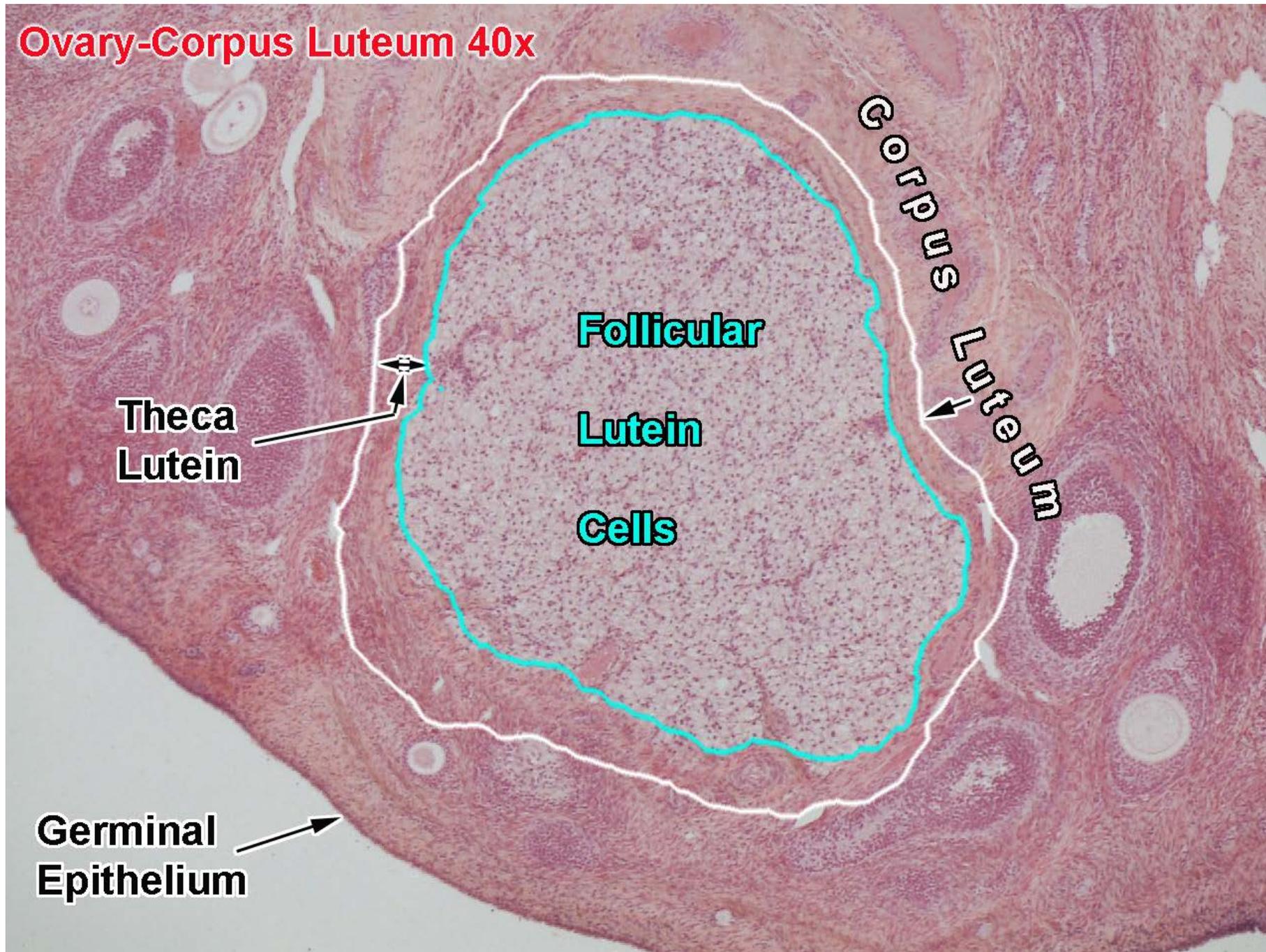
Primordial Follicles

Germinal Epithelium





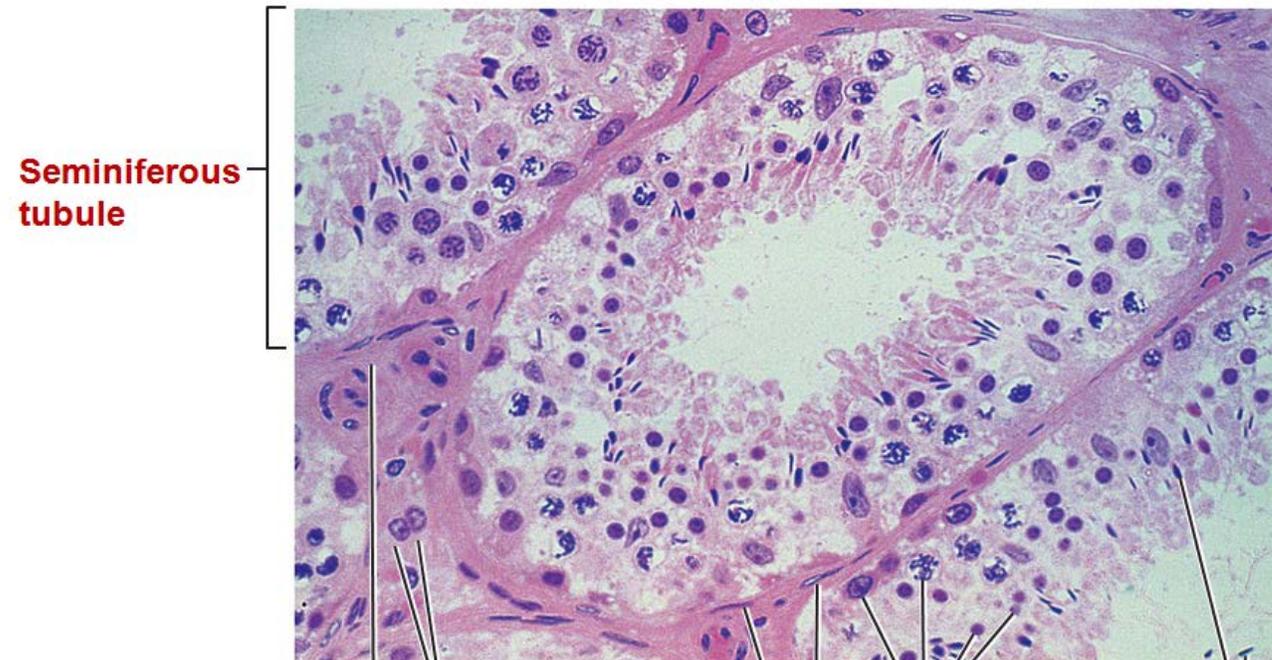
Ovary-Corpus Luteum 40x



Male Histology

The Testes

- **Interstitial cells (*Leydig*)** outside the seminiferous tubules produce androgens



Seminiferous tubule

(c)

Interstitial cells

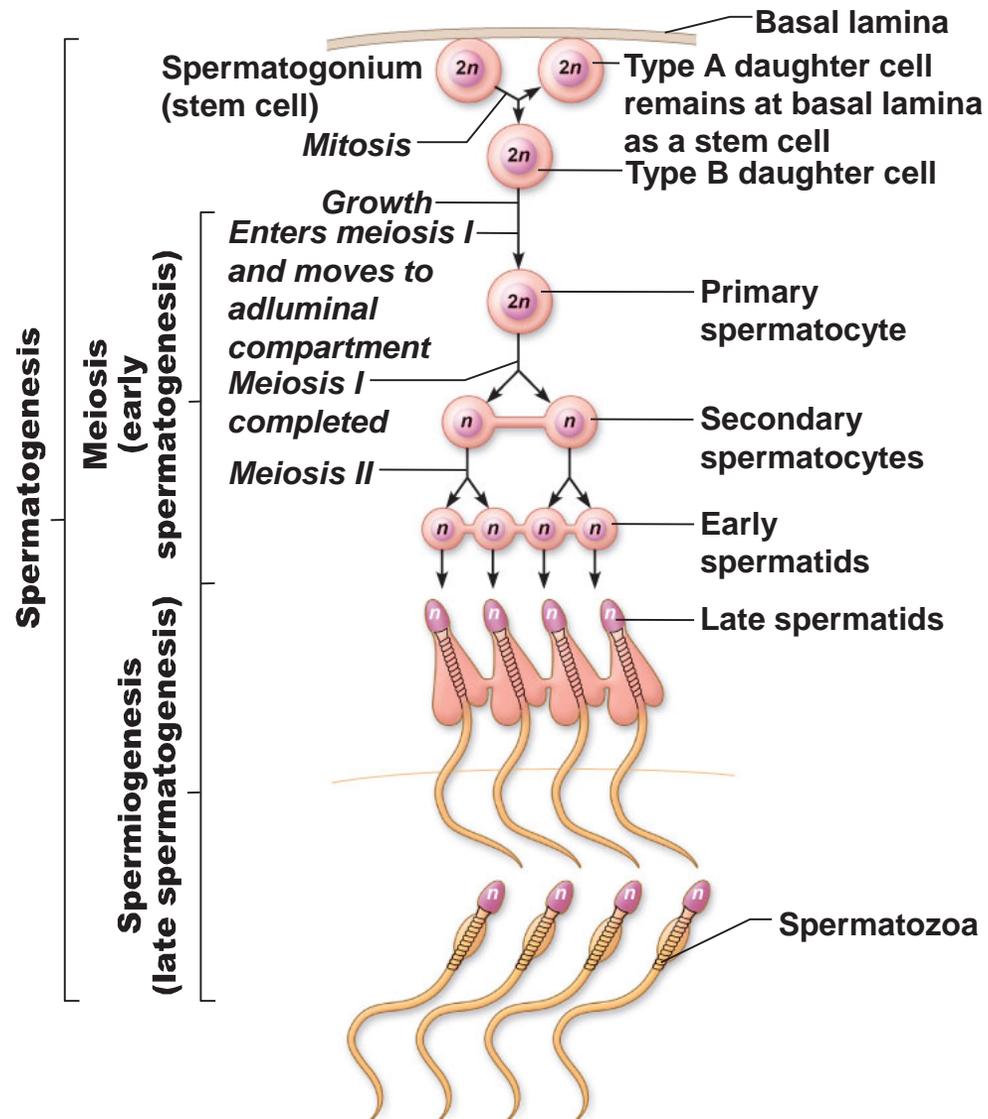
Areolar connective tissue

Myoid cells

Spermatogenic cells in tubule epithelium

Sperm

Marieb

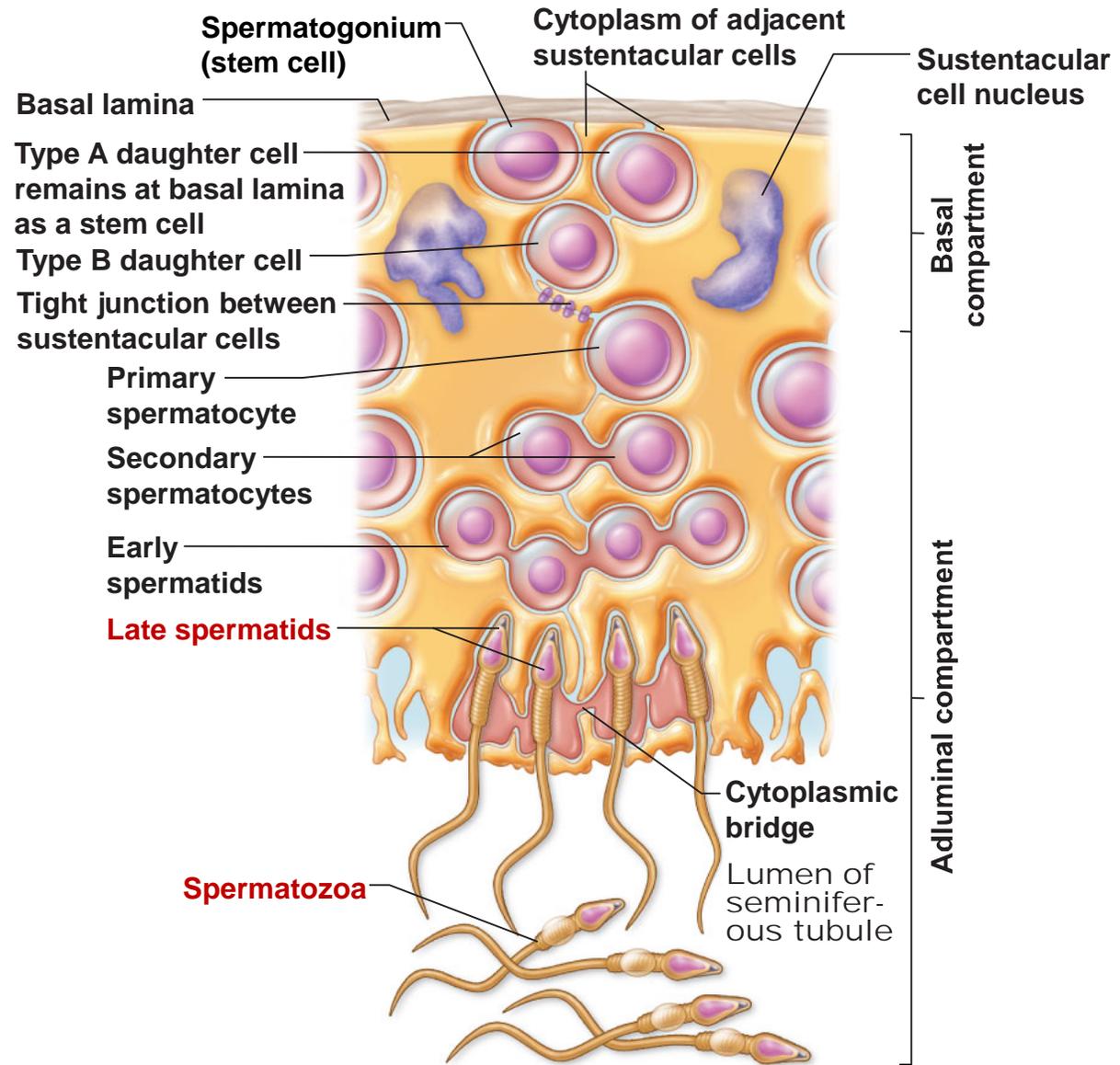


(b) Events of spermatogenesis, showing the relative position of various spermatogenic cells

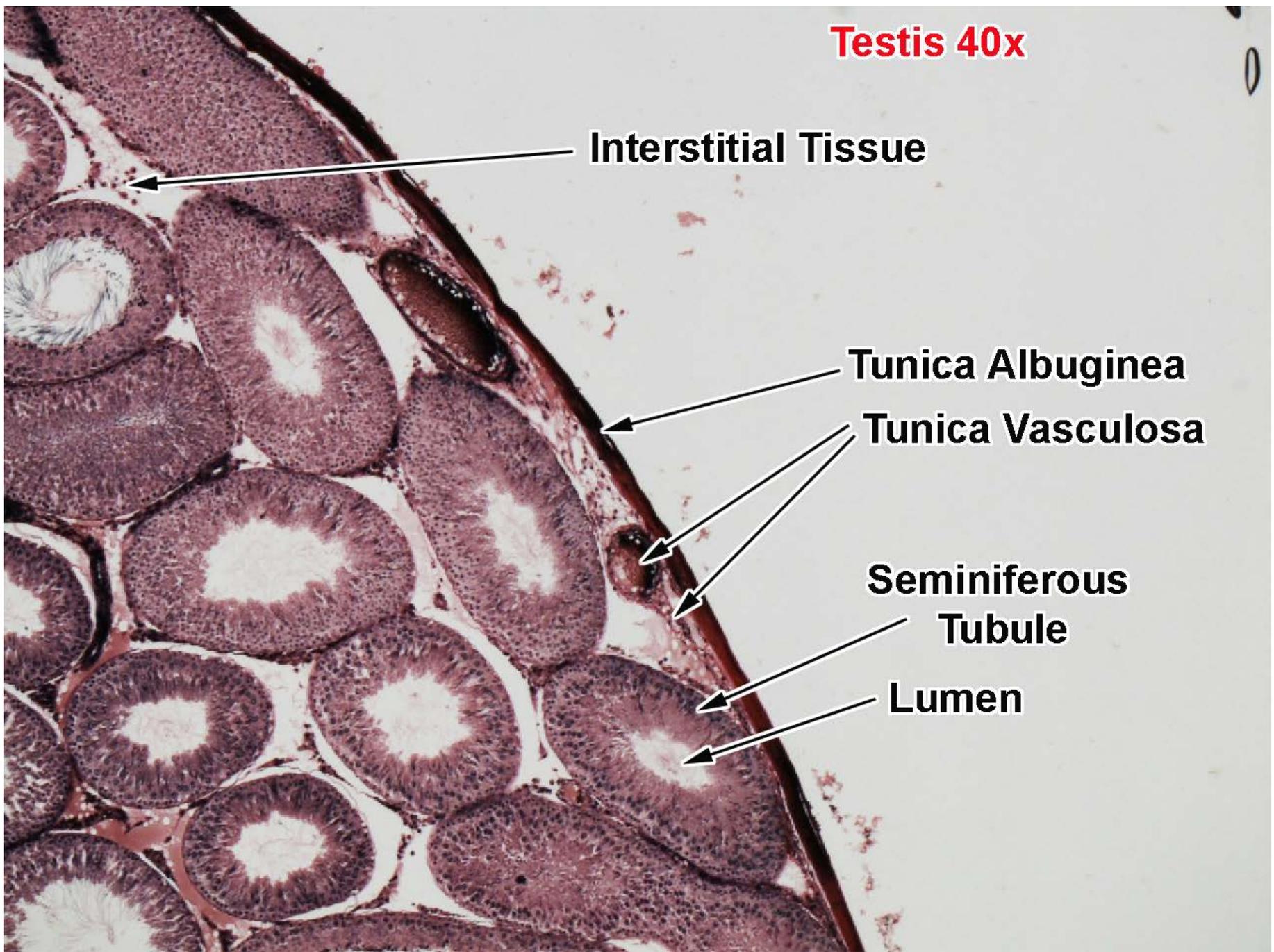
Spermiogenesis:
Spermatids → Sperm

Spermatids lose excess cytoplasm and form a tail, becoming spermatozoa (sperm)

Takes approx. 24 days



Testis 40x



Interstitial Tissue

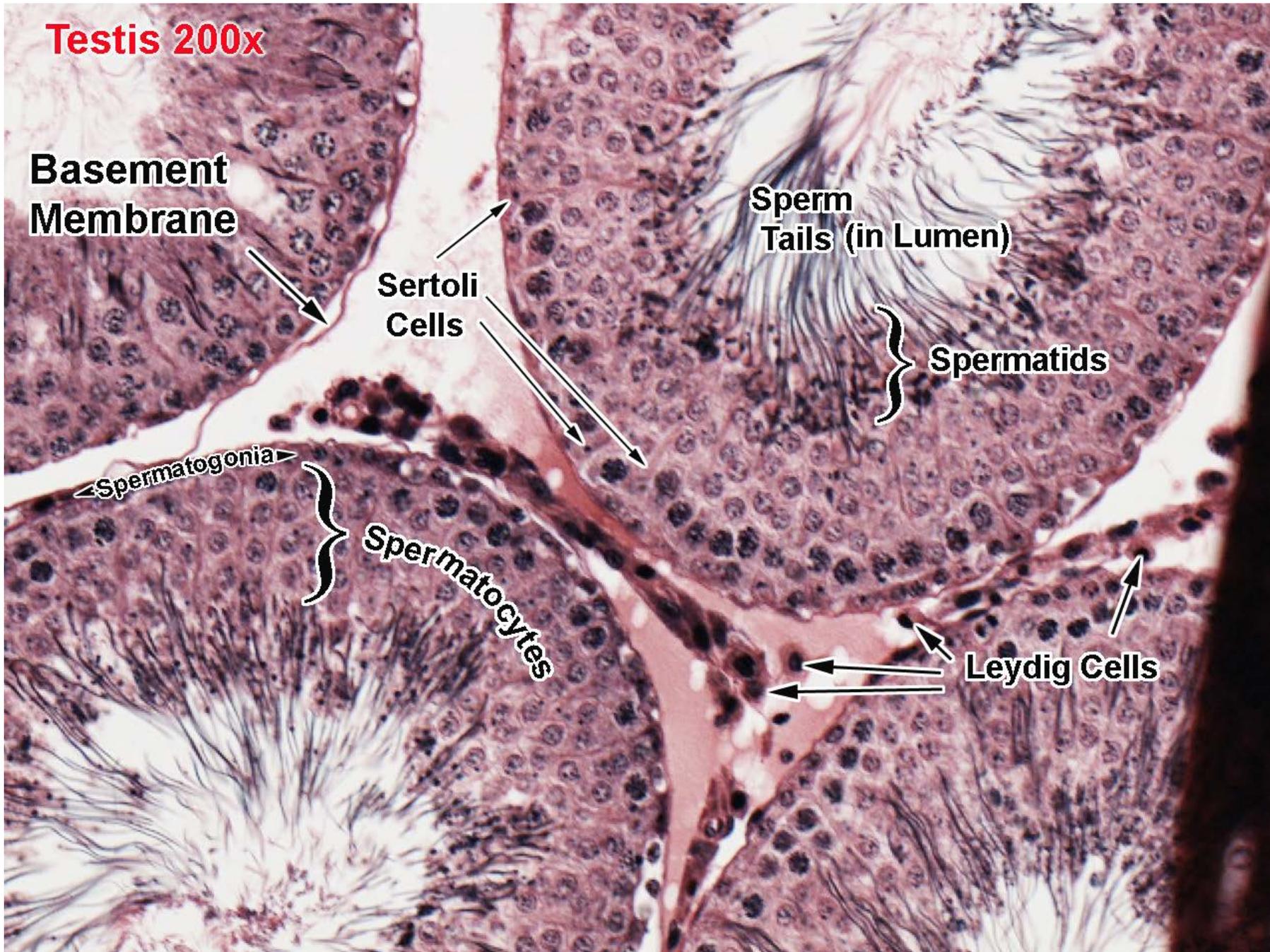
Tunica Albuginea

Tunica Vasculosa

**Seminiferous
Tubule**

Lumen

Testis 200x



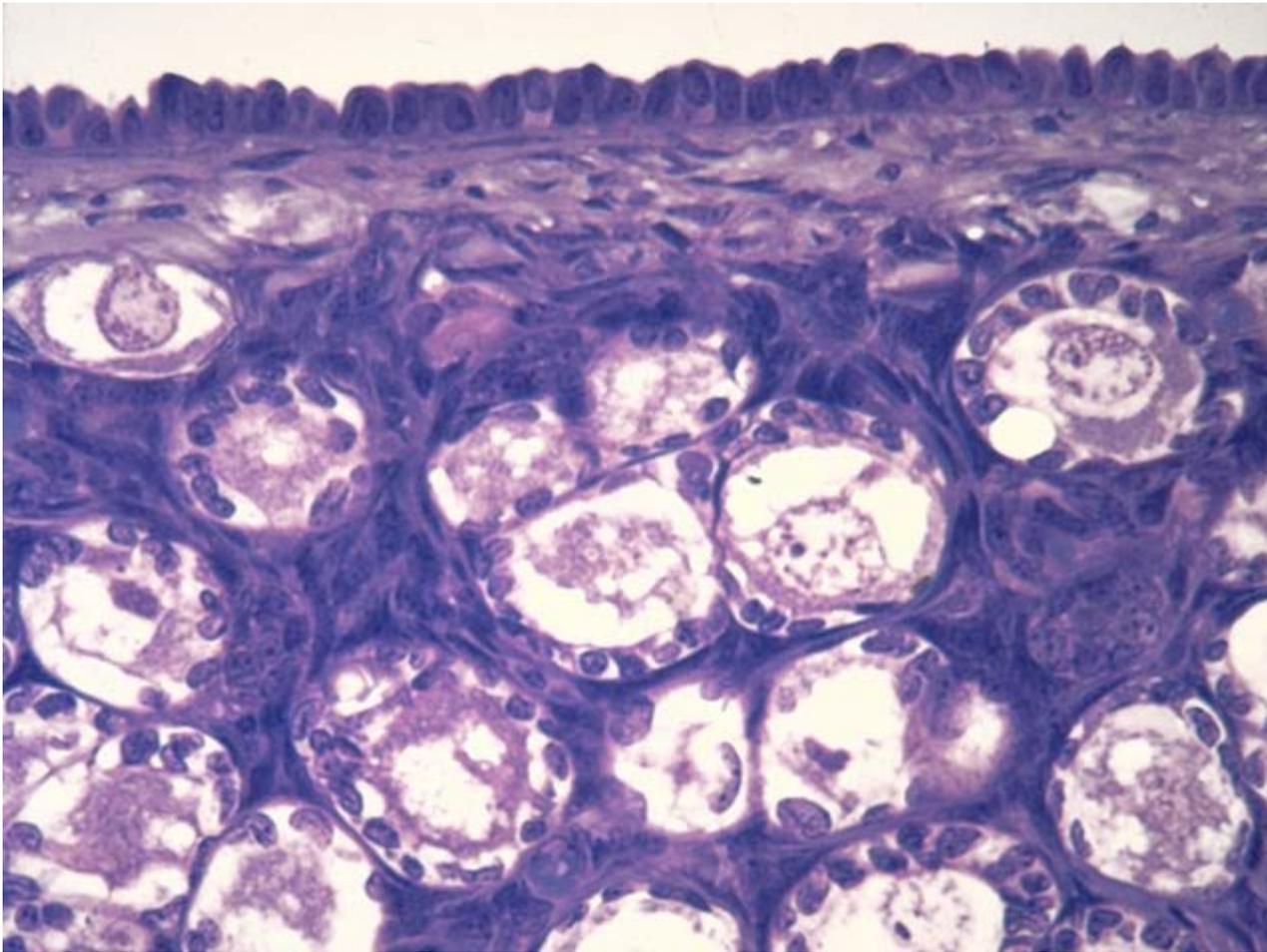
Use the following pictures to help
you practice finding the terms
from the lab term handout on
unlabeled images.

- Remember, you won't learn them if you don't take plenty of time to practice on pictures with NO labels (including no labels for what type of slide it is on histology pictures)!
- Also, be sure to mix up the order once you get comfortable with the unlabeled slides.
- Over the weekend, once you are feeling confident with the pictures here, do the histology quizzes in PAL (from the Pearson website) to get practice with new pictures that you haven't seen.

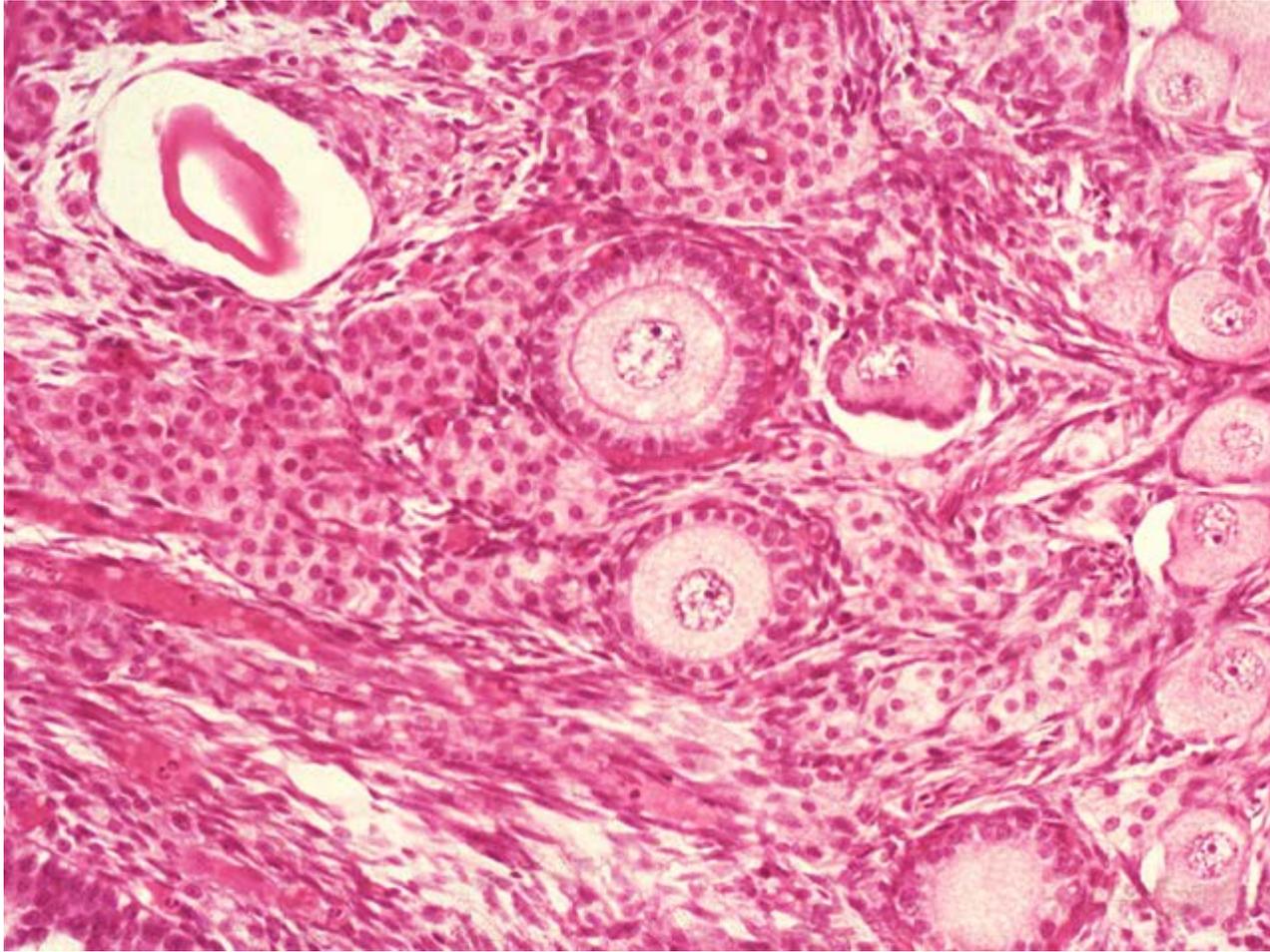
**Ovary Slide
(Find major regions
here.)**



Ovary Slide

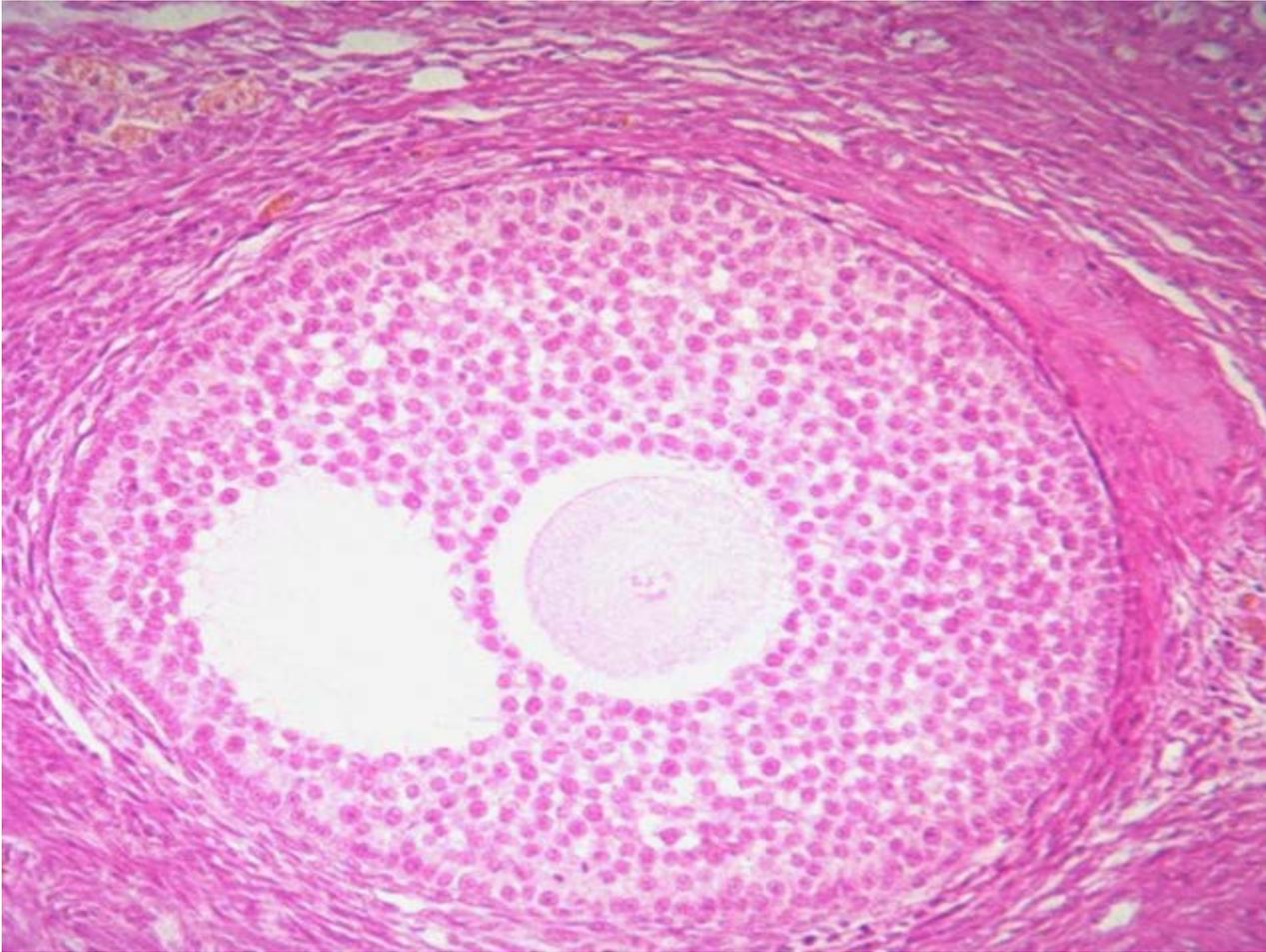


Ovary Slide

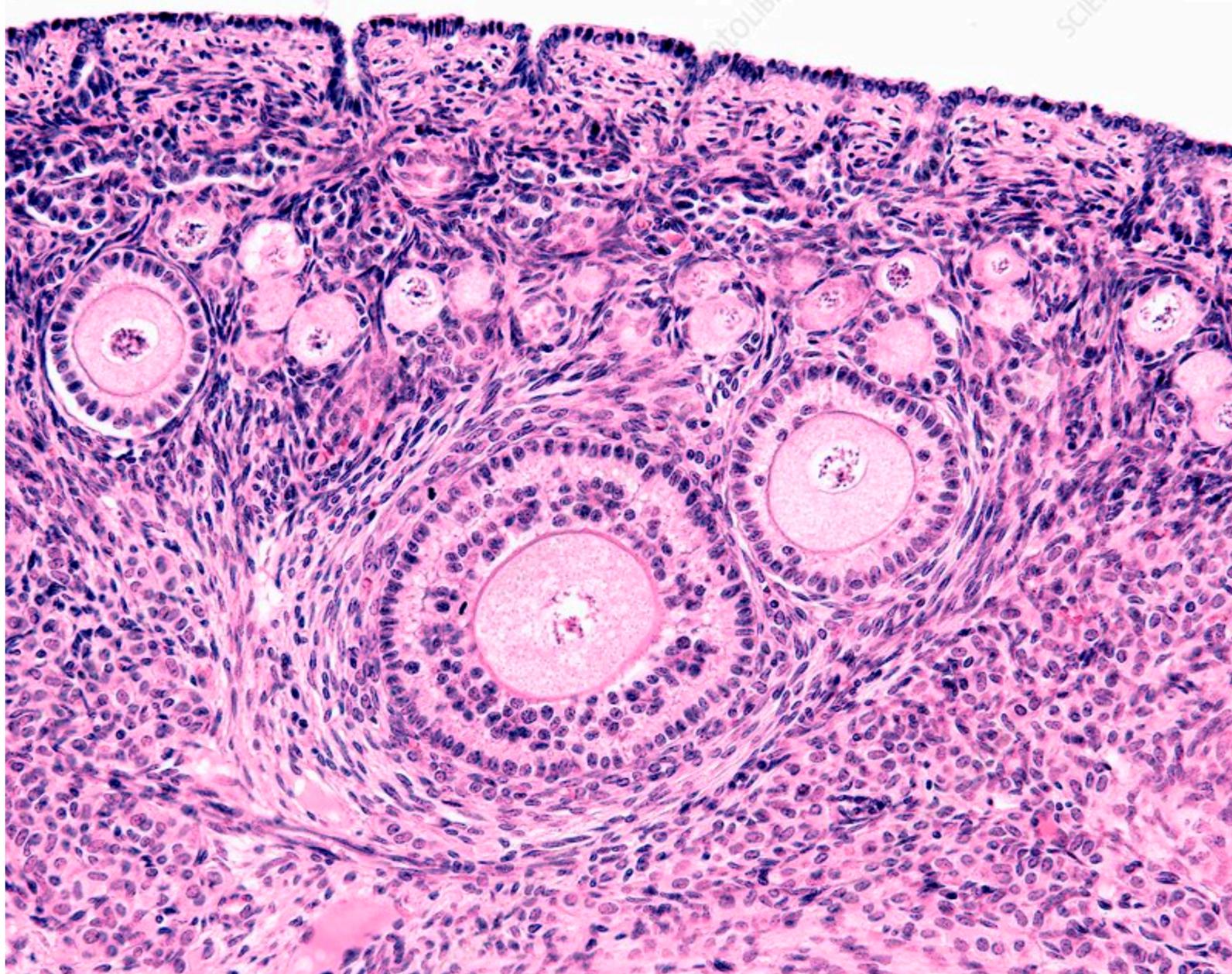


Ovary Slide

(Ignore their “antrum”
label...it is wrong.)



Ovary Slide



Ovary Slide

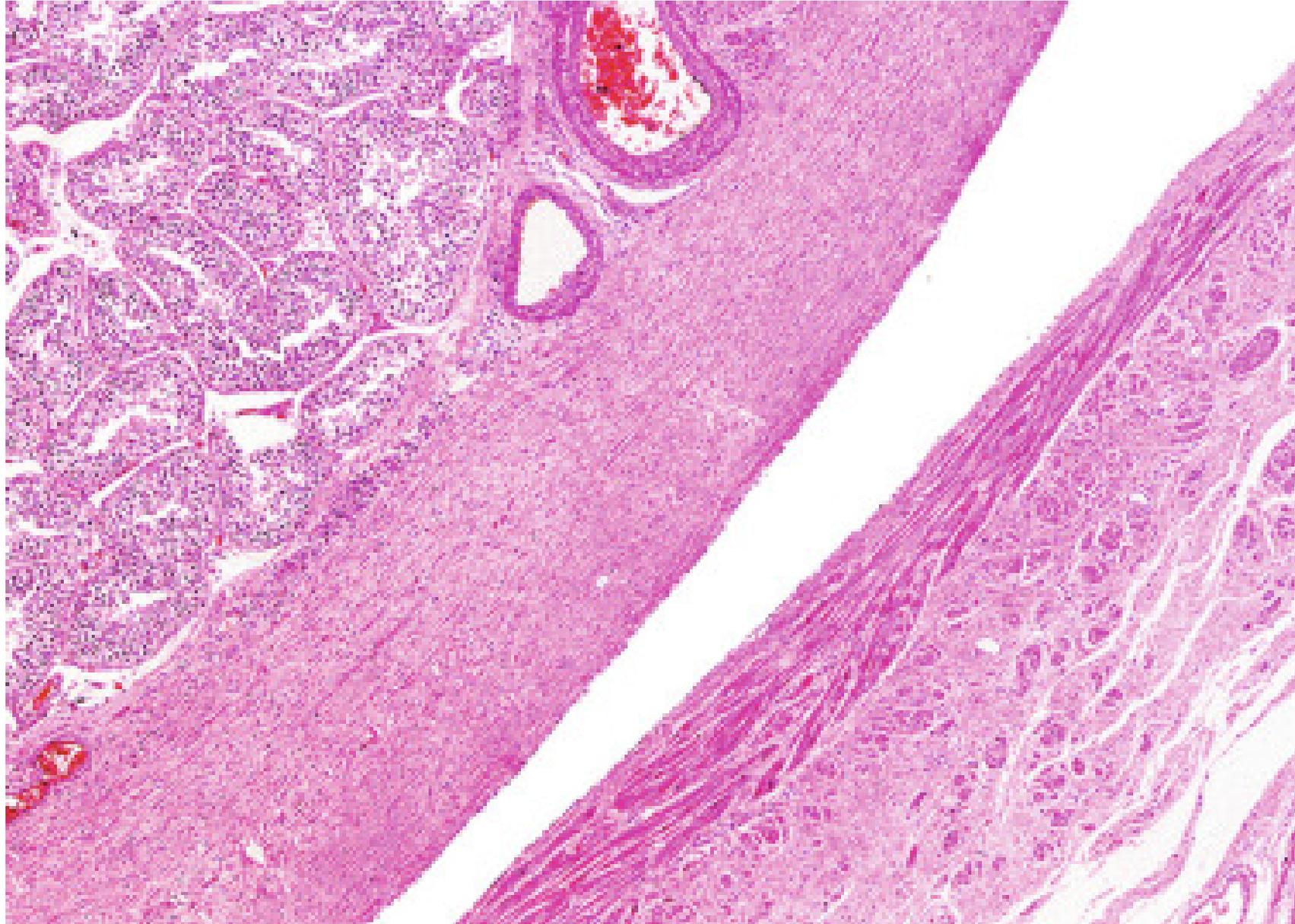
(Their follicle label is wrong....this is a Graafian follicle.)





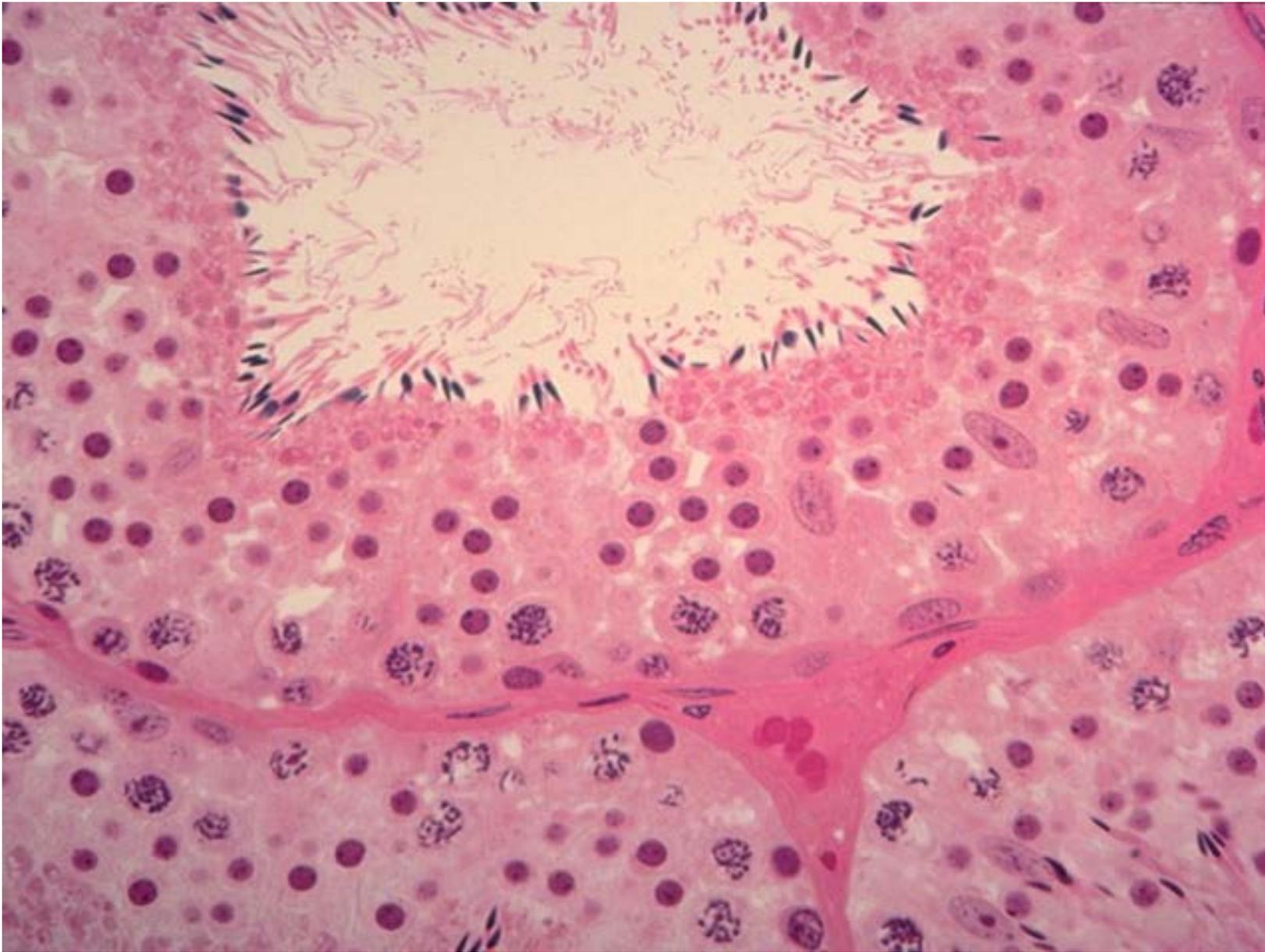
Ovary Virtual Microscope: http://aperio.duhs.duke.edu/DukeHistology/Female_Reproductive_System/0069_1.svs/view.apml?

Testis Slide
(Good for outer layers.)

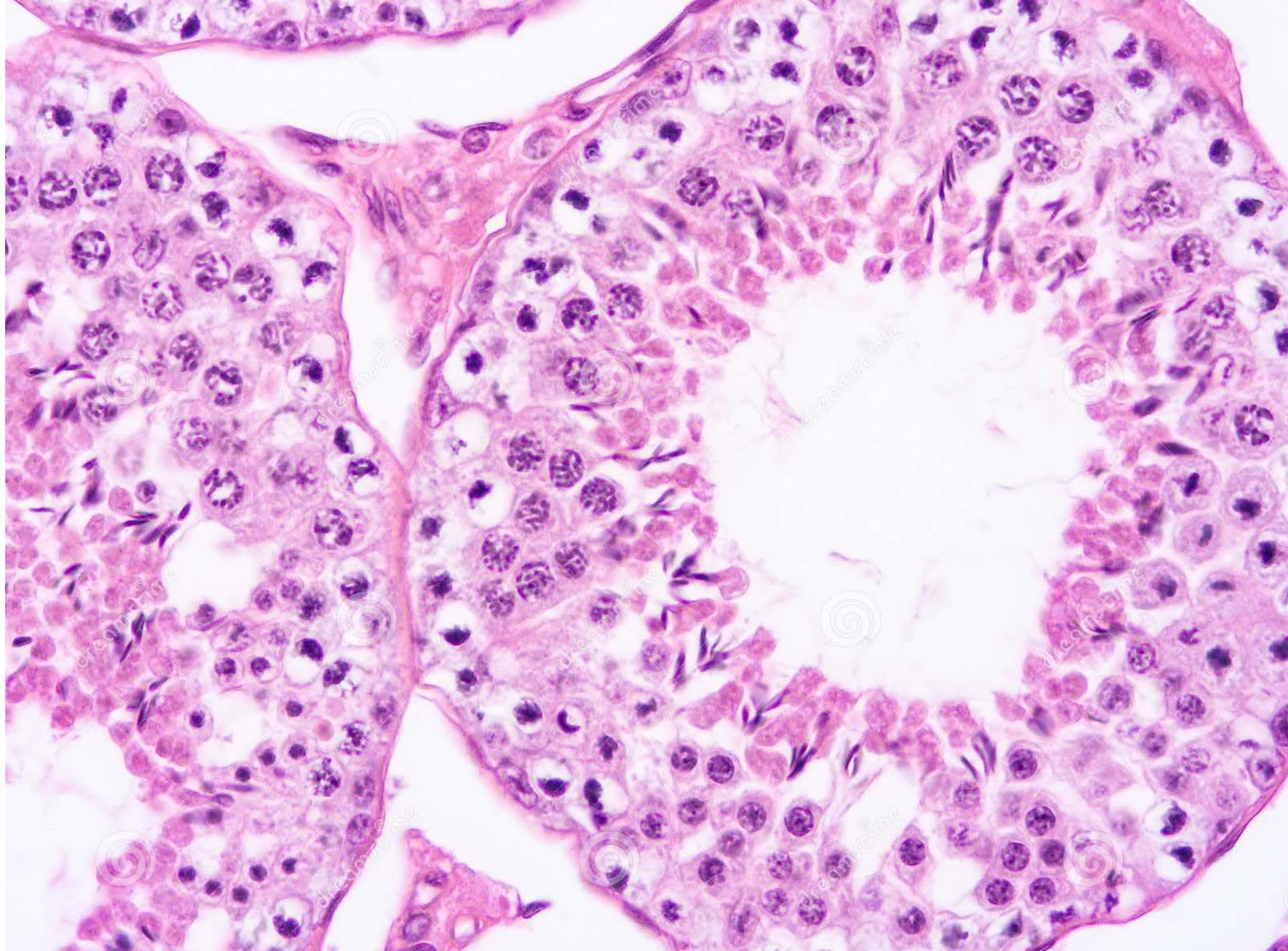




Testis Slide



Testis Slide



Testis Virtual Microscope (focus on the upper chunk of tissue):

http://virtualslides.med.umich.edu/Histology/Male%20Reproductive%20System/270_HISTO_40X.svs/view.apml?cwidth=980&cheight=1045&chost=virtualslides.med.umich.edu&csis=1&listview=1