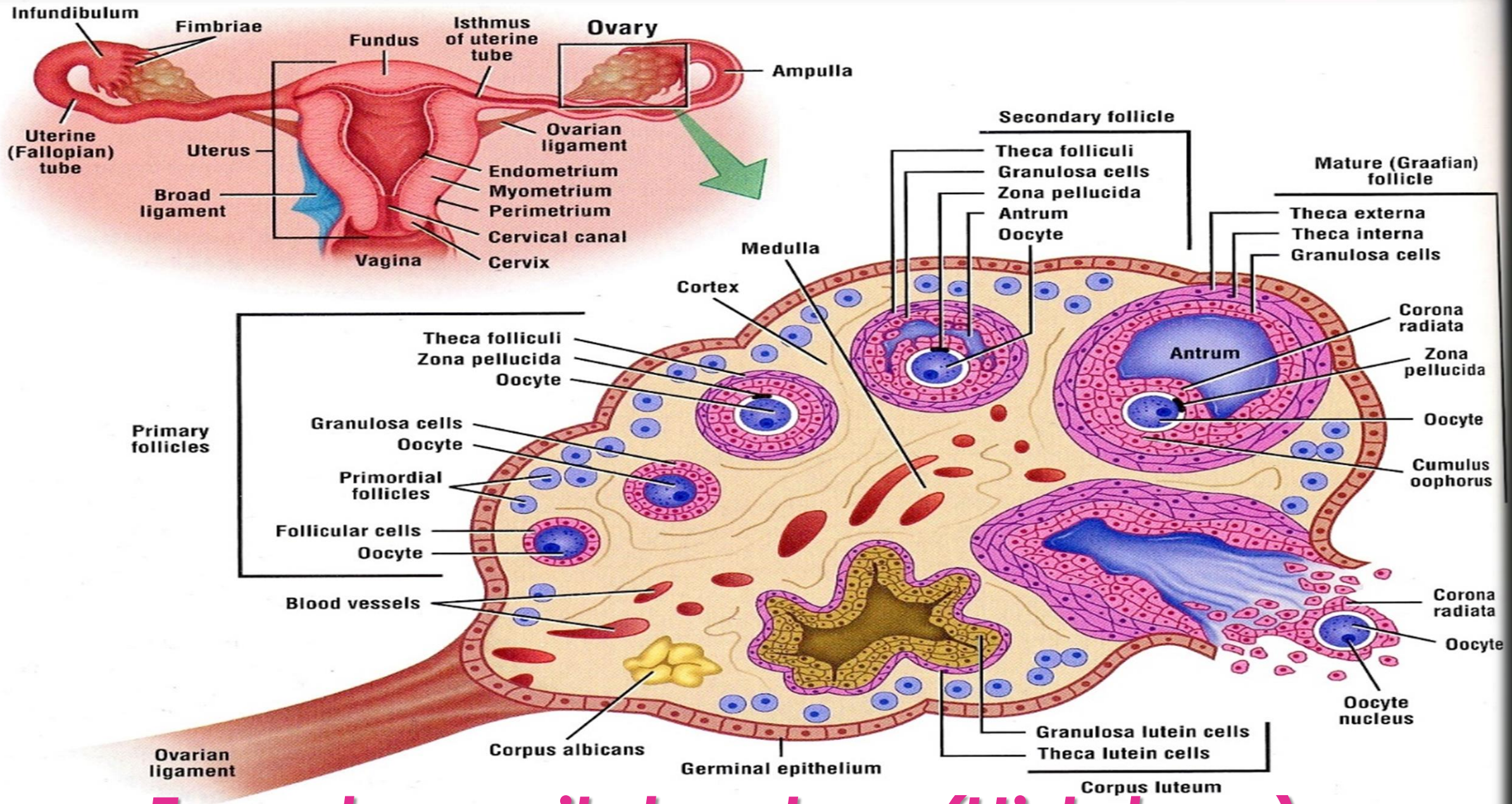
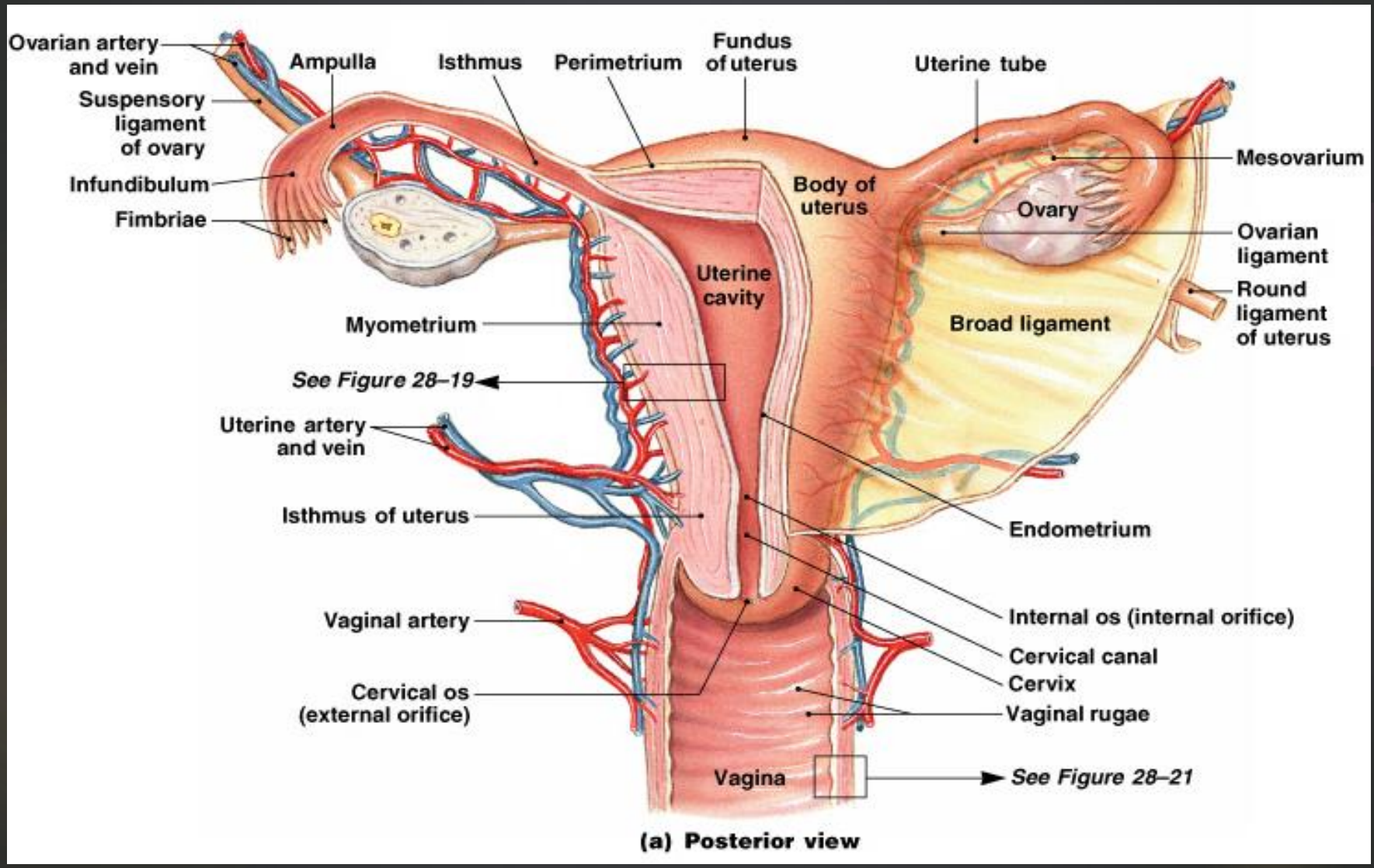

In the name of ALLAH




# Female genital system (Histology)

# Anatomy


Ovarian artery and vein
Ampulla
Isthmus
Perimetrium
Fundus of uterus
Uterine tube
Suspensory ligament of ovary
Mesovarium
Infundibulum
Body of uterus
Ovary
Fimbriae
Ovarian ligament
Uterine cavity
Round ligament of uterus
Myometrium
Broad ligament
See Figure 28–19
Uterine artery and vein
Isthmus of uterus
Endometrium
Internal os (internal orifice)
Vaginal artery
Cervical canal
Cervix
Cervical os (external orifice)
Vaginal rugae
Vagina
See Figure 28–21
(a) Posterior view

# Ovary

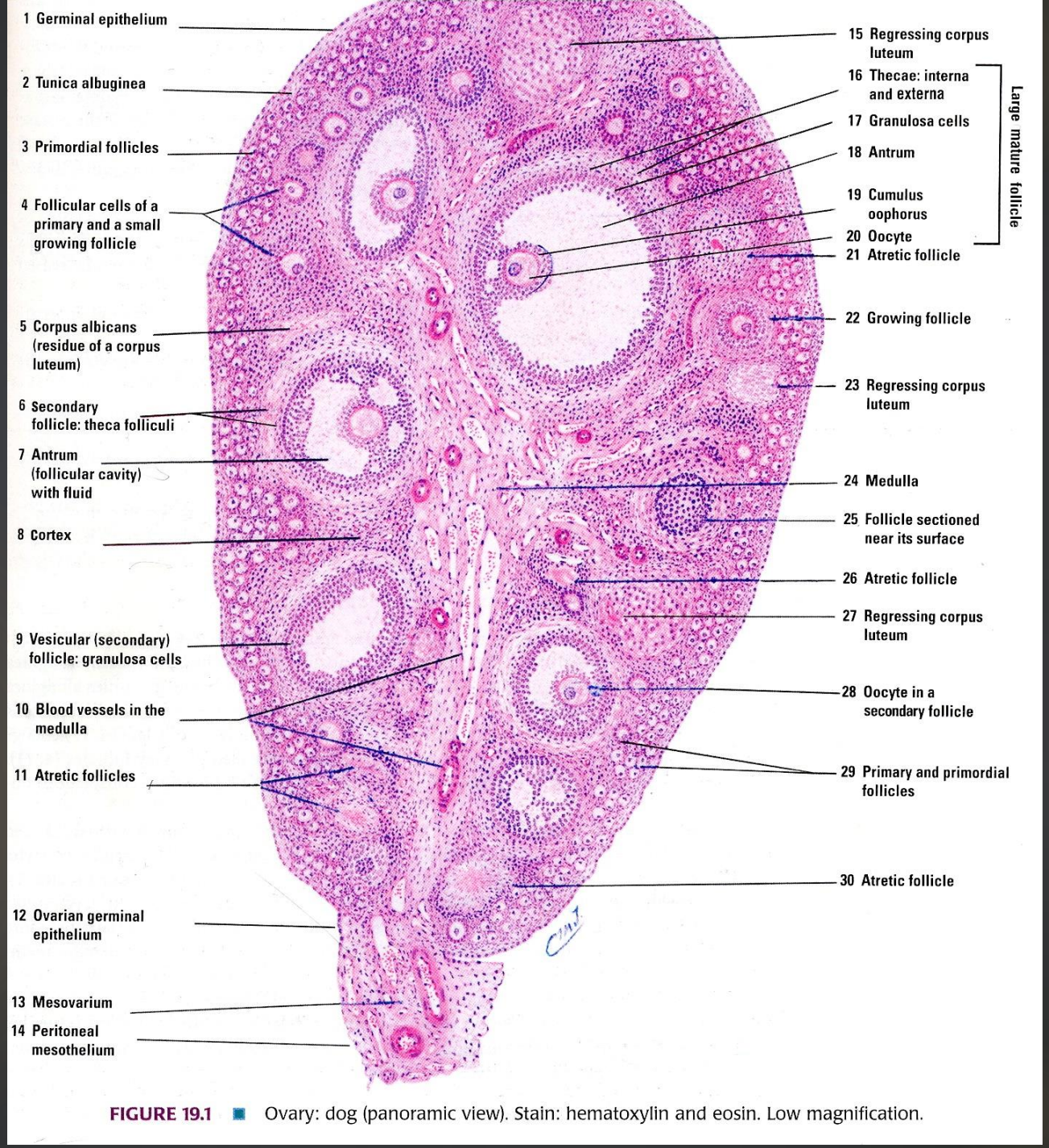



**FIGURE 19.1** ■ Ovary: dog (panoramic view). Stain: hematoxylin and eosin. Low magnification.

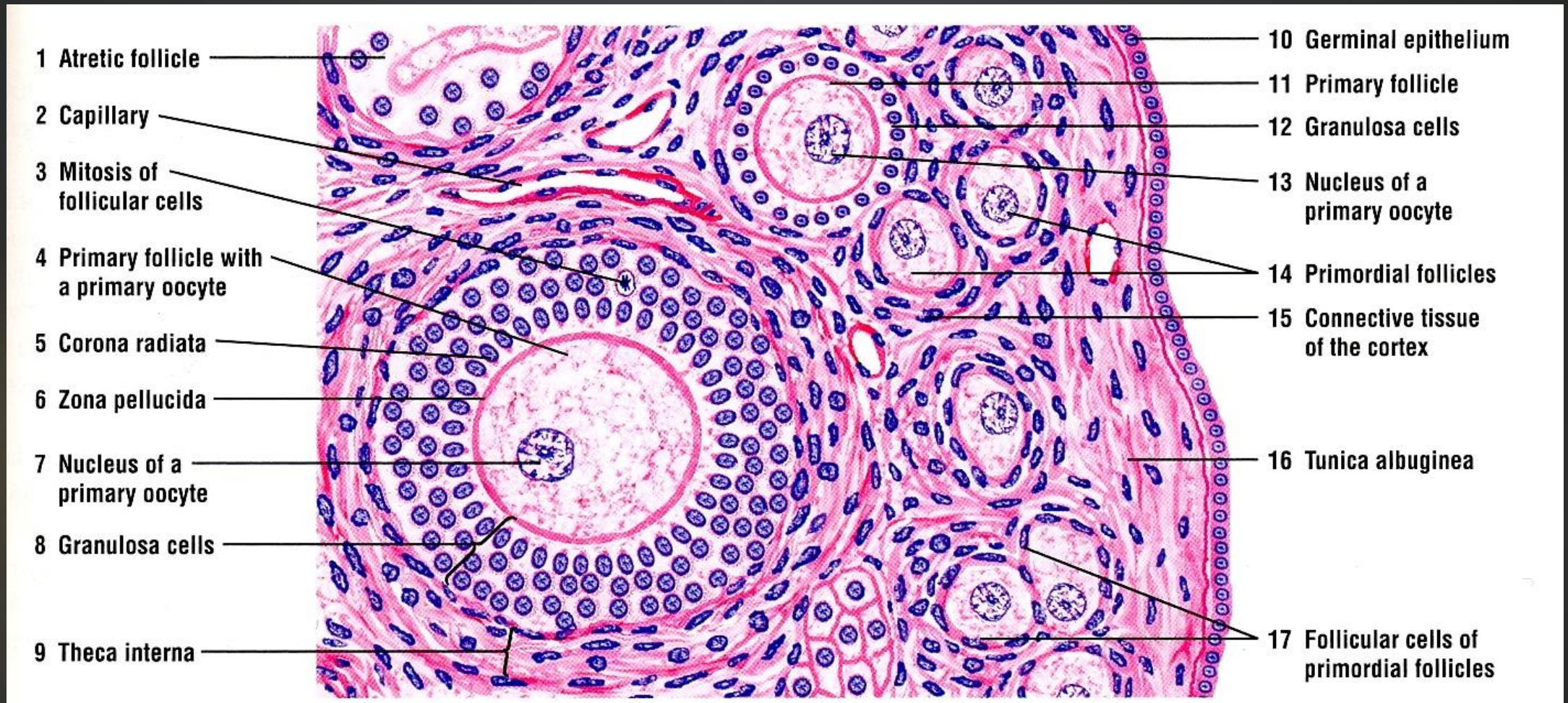
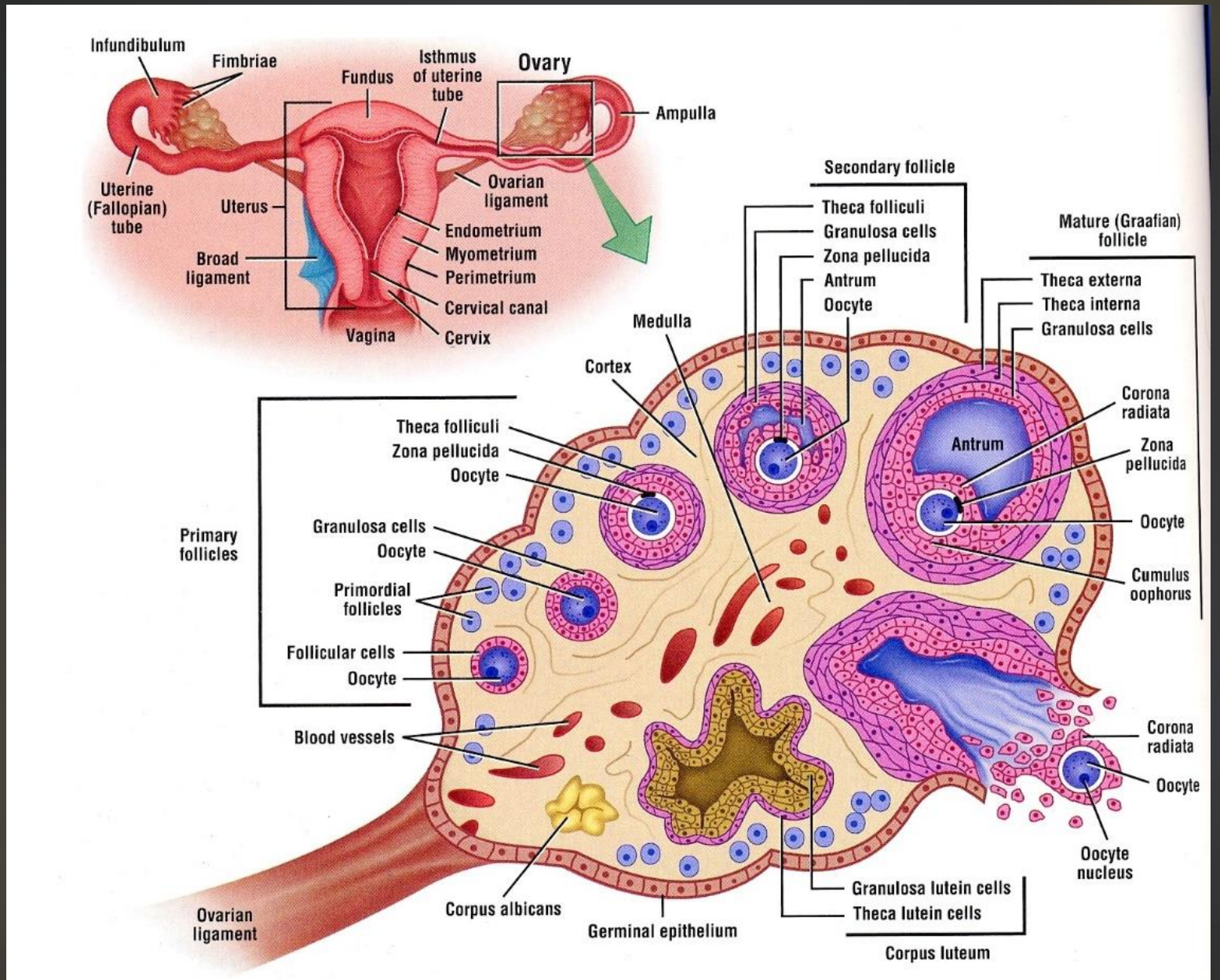



**FIGURE 19.2** ■ Ovary: ovarian cortex and primary and primordial follicles. Stain: hematoxylin and eosin. Low magnification


Infundibulum
Fimbriae
Fundus
Isthmus of uterine tube
Ovary
Ampulla
Uterine (Fallopian) tube
Uterus
Ovarian ligament
Endometrium
Myometrium
Perimetrium
Broad ligament
Cervical canal
Vagina
Cervix
Secondary follicle
Theca folliculi
Granulosa cells
Zona pellucida
Antrum
Oocyte
Mature (Graafian) follicle
Theca externa
Theca interna
Granulosa cells
Medulla
Cortex
Corona radiata
Antrum
Zona pellucida
Oocyte
Cumulus oophorus
Theca folliculi
Zona pellucida
Oocyte
Primary follicles
Granulosa cells
Oocyte
Primordial follicles
Follicular cells
Oocyte
Blood vessels
Corona radiata
Oocyte
Oocyte nucleus
Granulosa lutein cells
Theca lutein cells
Corpus luteum
Ovarian ligament
Corpus albicans
Germinal epithelium

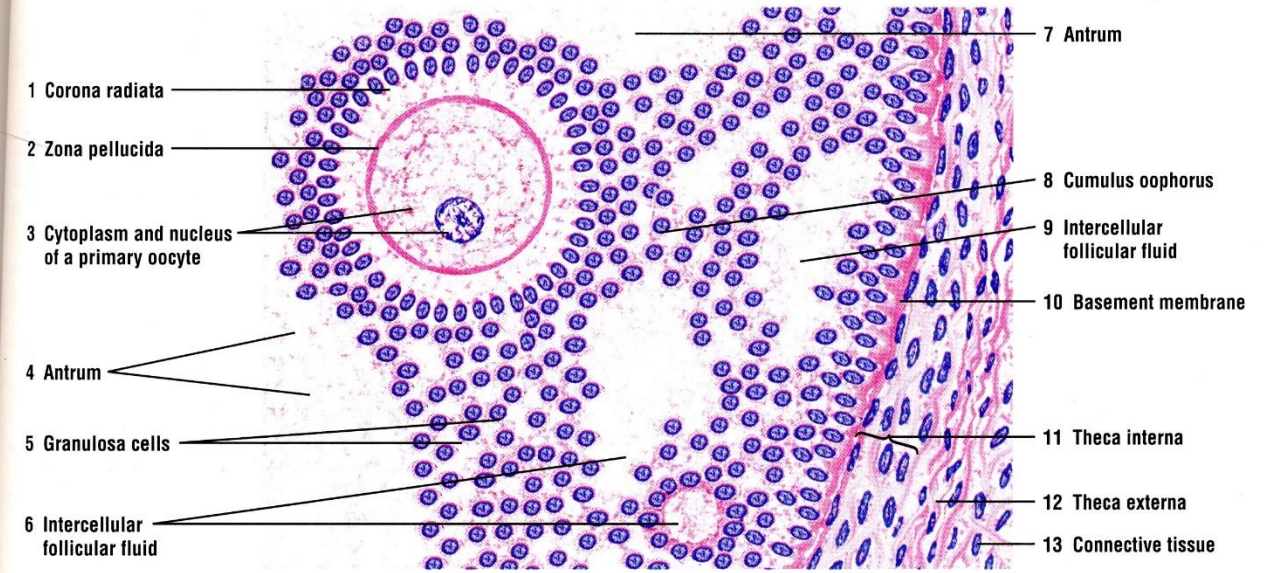



**FIGURE 19.3** ■ Ovary: primary oocyte and wall of a mature follicle. Stain: hematoxylin and eosin. High magnification.

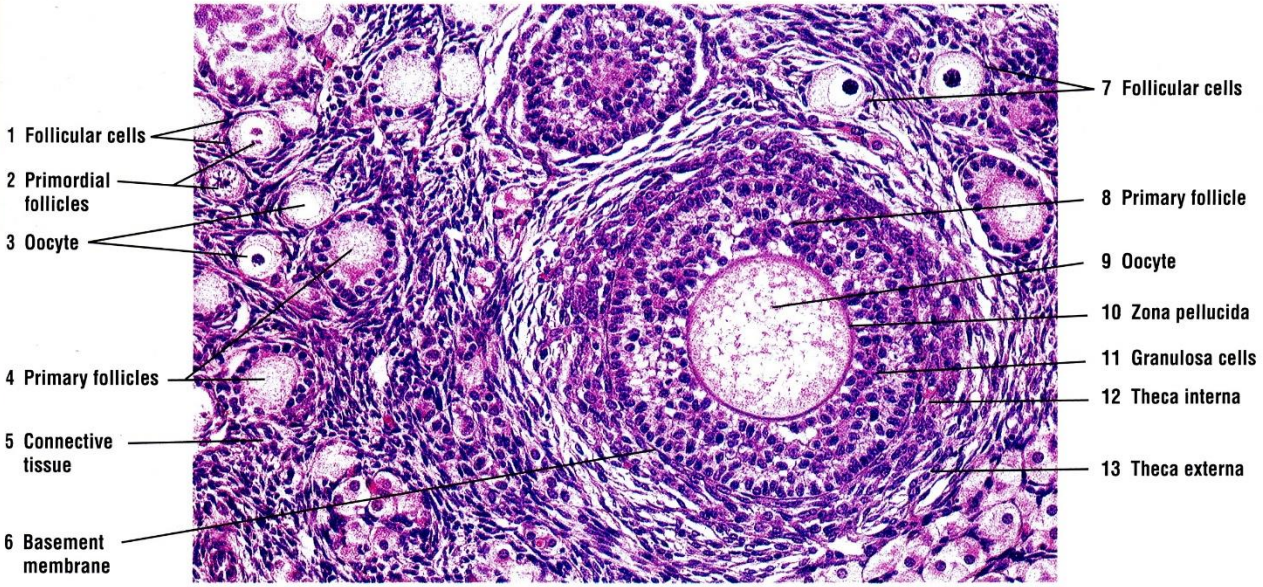
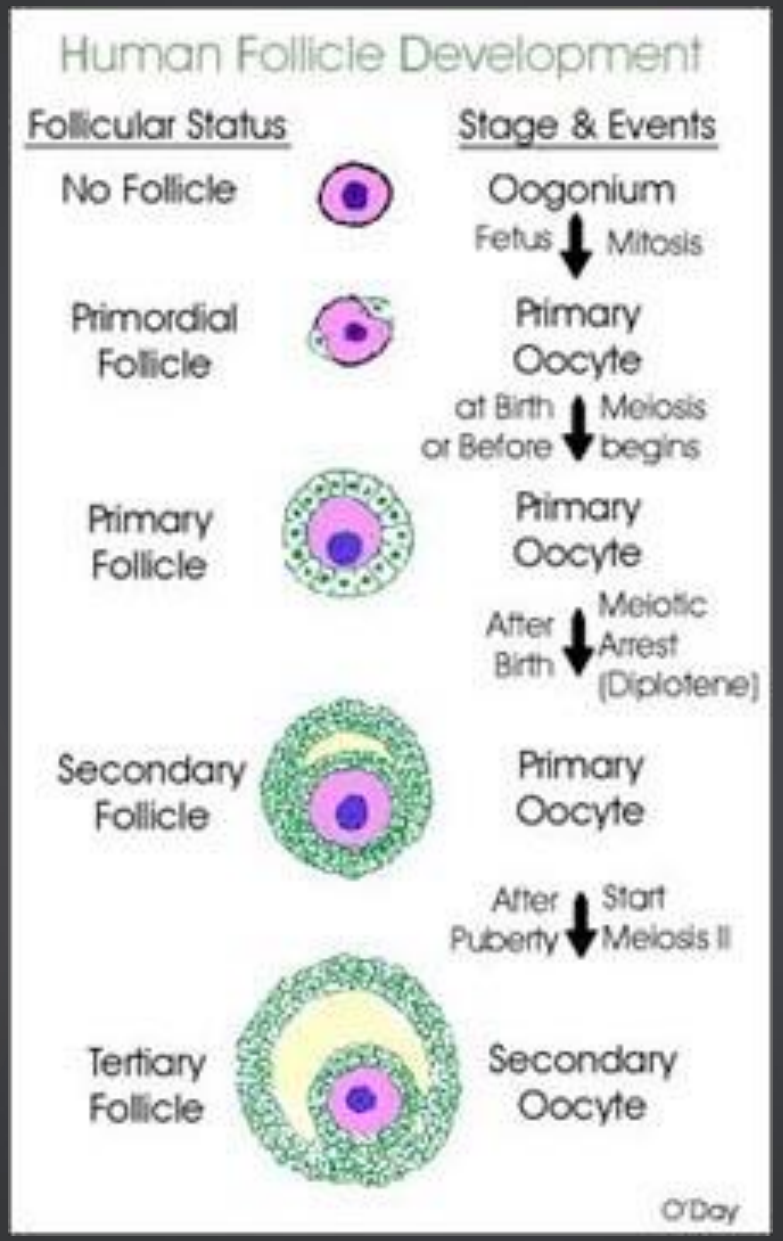



**FIGURE 19.4** ■ Ovary: primordial and primary follicles. Stain: hematoxylin and eosin. 64×


Primary follicle
CORTEX
MEDULLA
Secondary follicle
Tertiary (Graafian) follicle


Human Follicle Development
Follicular Status
Stage & Events
No Follicle
Oogonium
Fetus
Mitosis
Primordial Follicle
Primary Oocyte
at Birth or Before
Meiosis begins
Primary Follicle
Primary Oocyte
After Birth
Meiotic Arrest (Diplotene)
Secondary Follicle
Primary Oocyte
After Puberty
Start Meiosis II
Tertiary Follicle
Secondary Oocyte
O'Day

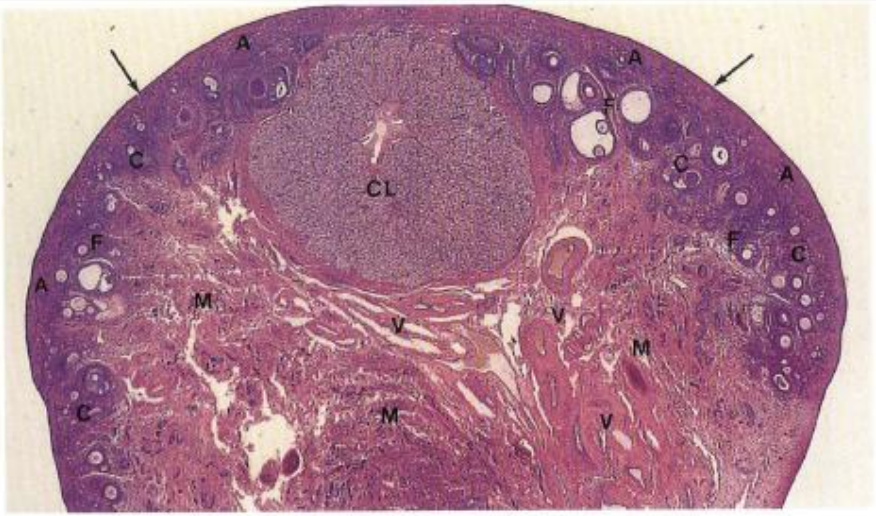
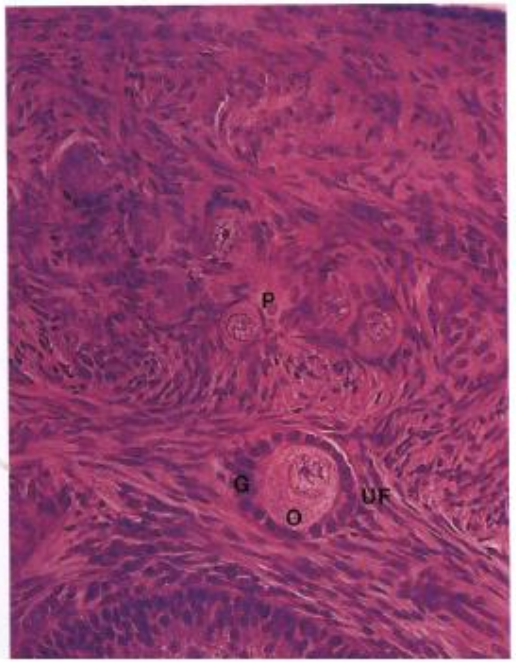



figure 19-1

**FIGURE 19-1**
Photomicrograph of an ovary illustrating the tunica albuginea (A) and the cortex (C) with follicles (F) in various stages of development. The medulla (M) of the ovary is well vascularized (V). Note the corpus luteum (CL) and germinal epithelium (arrows), which is a misnomer. Dog; × 14.



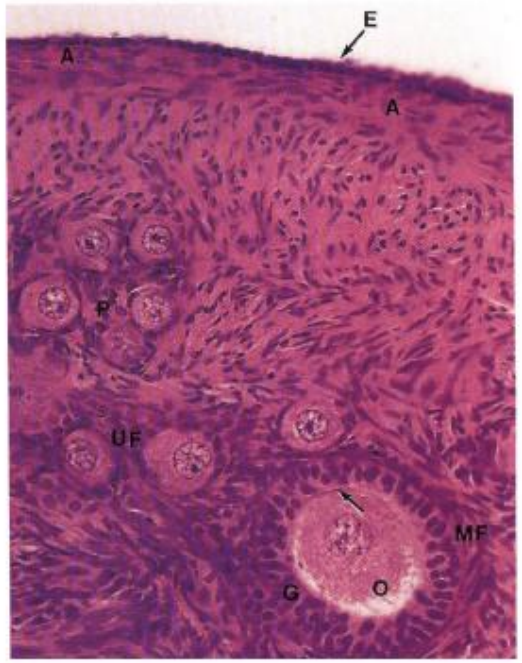




**FIGURE 19-2**
Photomicrograph of primordial (P) and unilaminar primary (UF) follicles. O, oocyte; G, granulosa (follicular) cells. Dog; × 344.

**FIGURE 19-3**
Photomicrograph of primordial (P), unilaminar primary (UF), and multilaminar primary (MF) follicles. Note the zona pellucida (arrow) in the multilaminar primary follicle. O, oocyte; G, granulosa (follicular) cells. × 344.


figure 19-4


figure 19-5

**FIGURE 19-4**
Photomicrograph of a multilaminar primary follicle. Note the mitotic figure (unlabeled arrow) in the granulosa cell layer (G). Note the cuboidal cells of the theca interna (TI). O, oocyte; Z, zona pellucida. Dog; × 560.

**FIGURE 19-5**
Photomicrograph contrasting a unilaminar primary follicle (UF) and a well-developed multilaminar primary follicle (MF). Note the thickness of the granulosa cell layer (G) in the multilaminar primary follicle and the basement membrane (b) separating the granulosa from the developing theca folliculi (TF). O, oocyte; Z, zona pellucida. Dog; × 344.

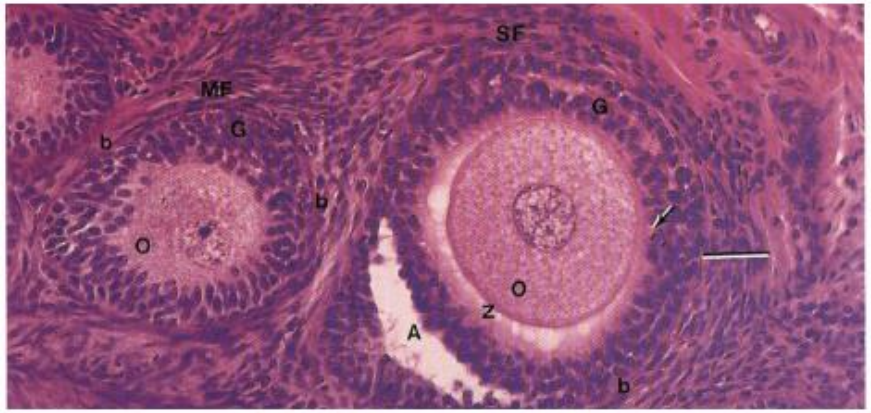



**FIGURE 19-6**
Photomicrograph contrasting a multilaminar primary follicle (MF) and an early secondary follicle (SF). Note in particular the presence of an antrum (A) in the secondary follicle, which distinguishes secondary from primary follicles. Note also the mitotic figure (arrow) and thick theca folliculi (bar) of the secondary follicle. O, oocyte; b, basement membrane; Z, zona pellucida; G, granulosa cell layer. Dog; × 344.

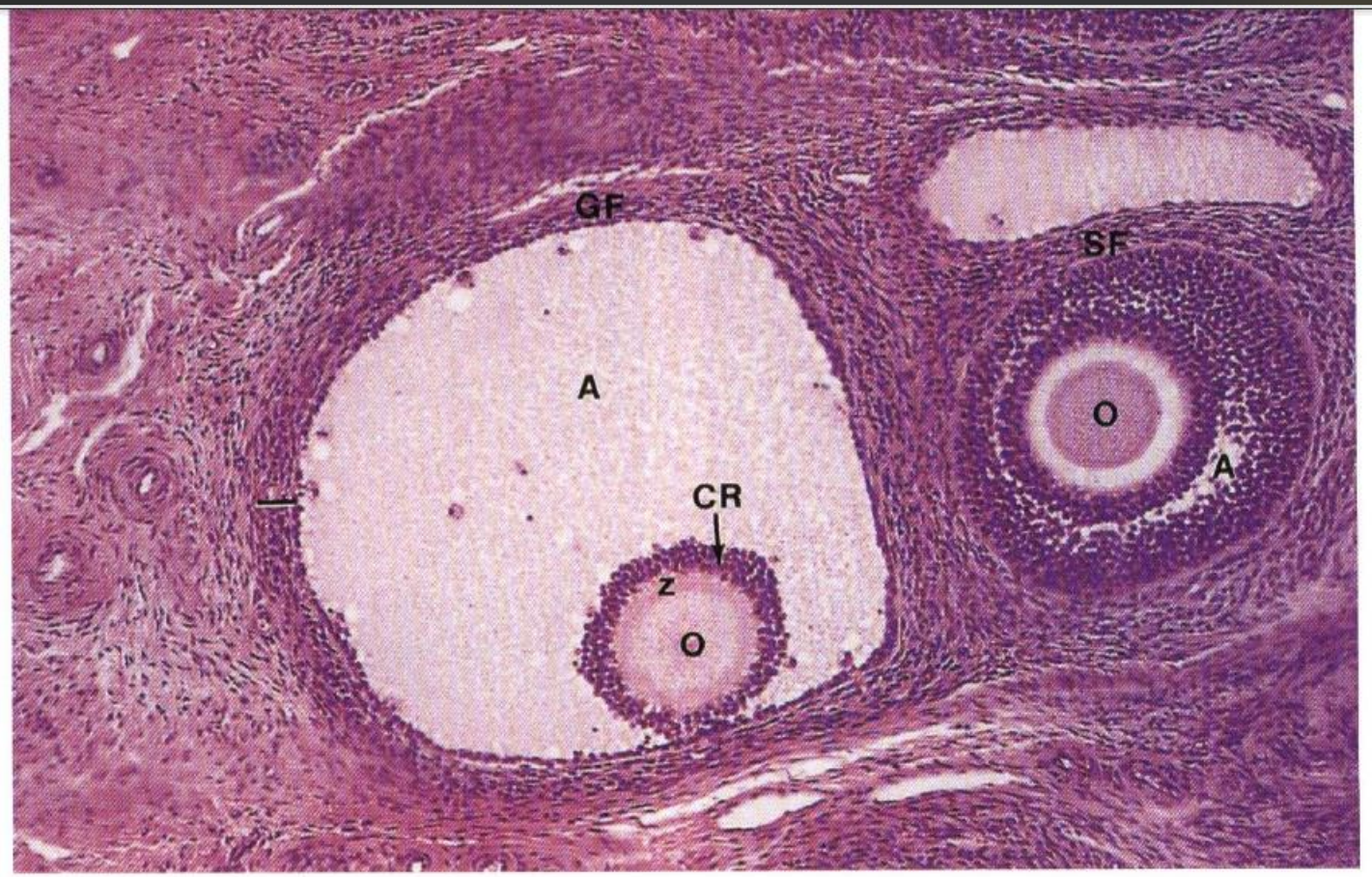
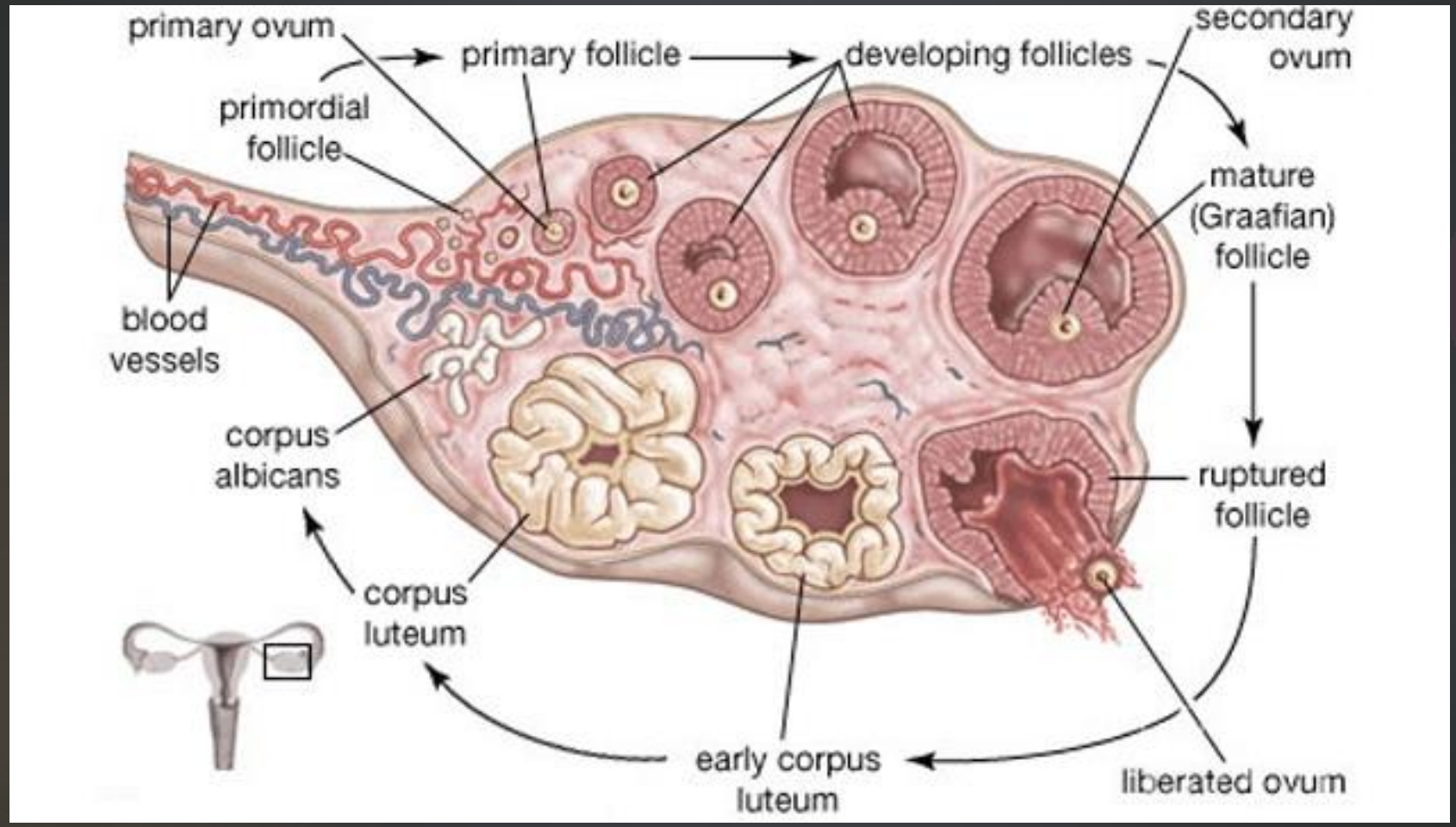



*figure 19-7*

**FIGURE 19-7**
Photomicrograph contrasting a Graafian (GF) and a secondary (SF) follicle. Note the corona radiata (CR), the single layer of granulosa cells that are in immediate contact with the zona pellucida (z) and remain with the ovum after ovulation. O, oocyte; bar, theca folliculi; A, antrum. Dog; × 140.

# Ovulation


primary ovum
primary follicle
developing follicles
secondary ovum
primordial follicle
mature (Graafian) follicle
blood vessels
corpus albicans
ruptured follicle
corpus luteum
early corpus luteum
liberated ovum

# Corpus luteum

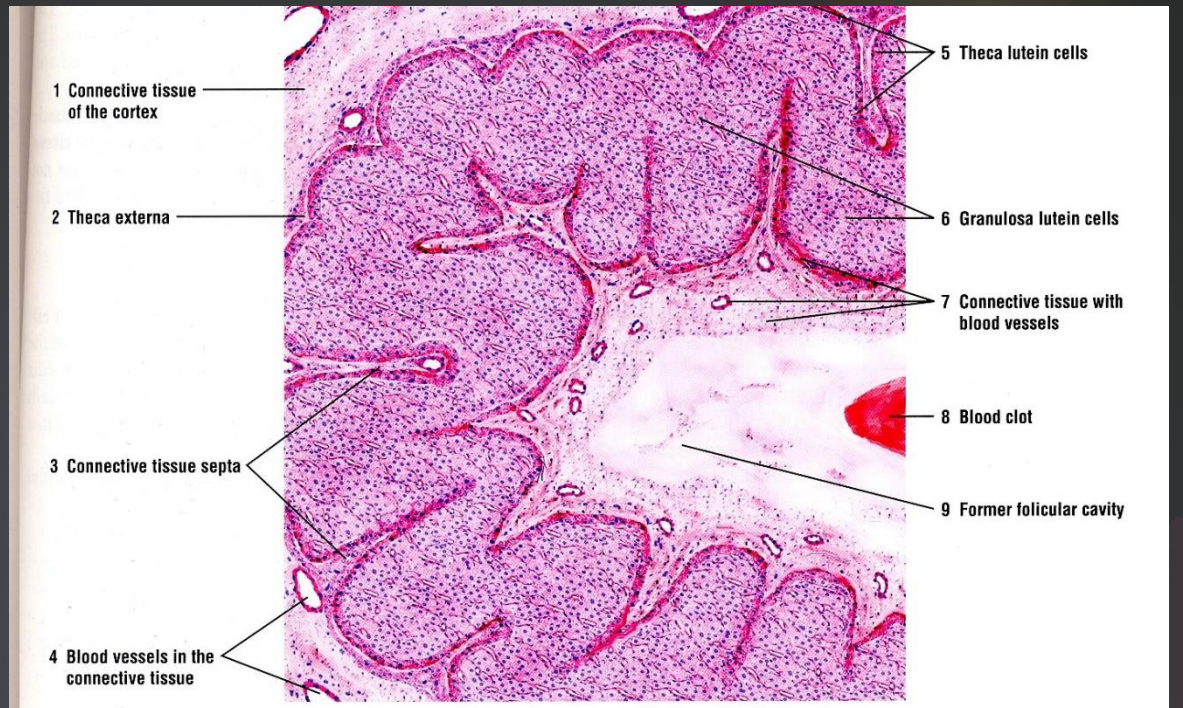



**FIGURE 19.6** ■ Corpus luteum (panoramic view). Stain: hematoxylin and eosin. Low magnification.

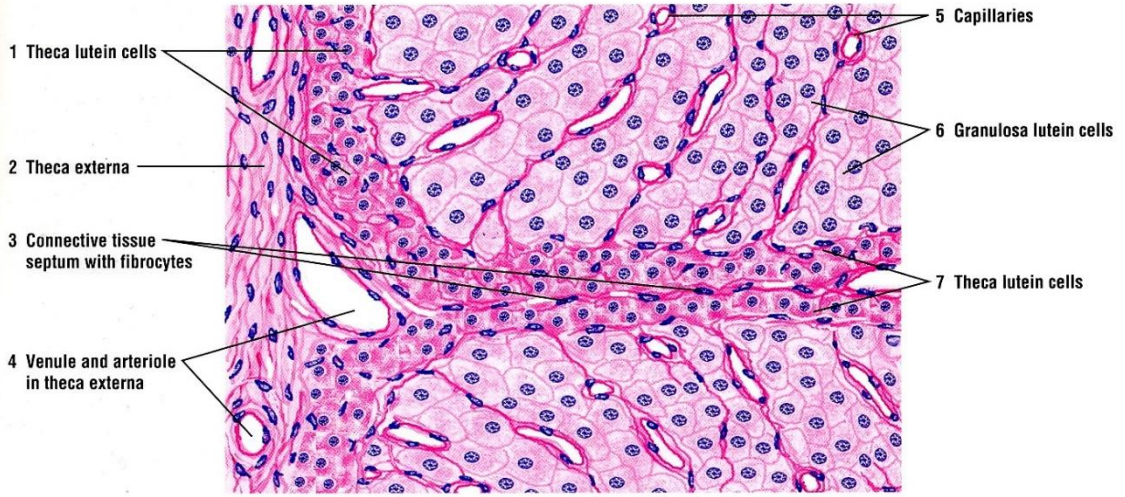
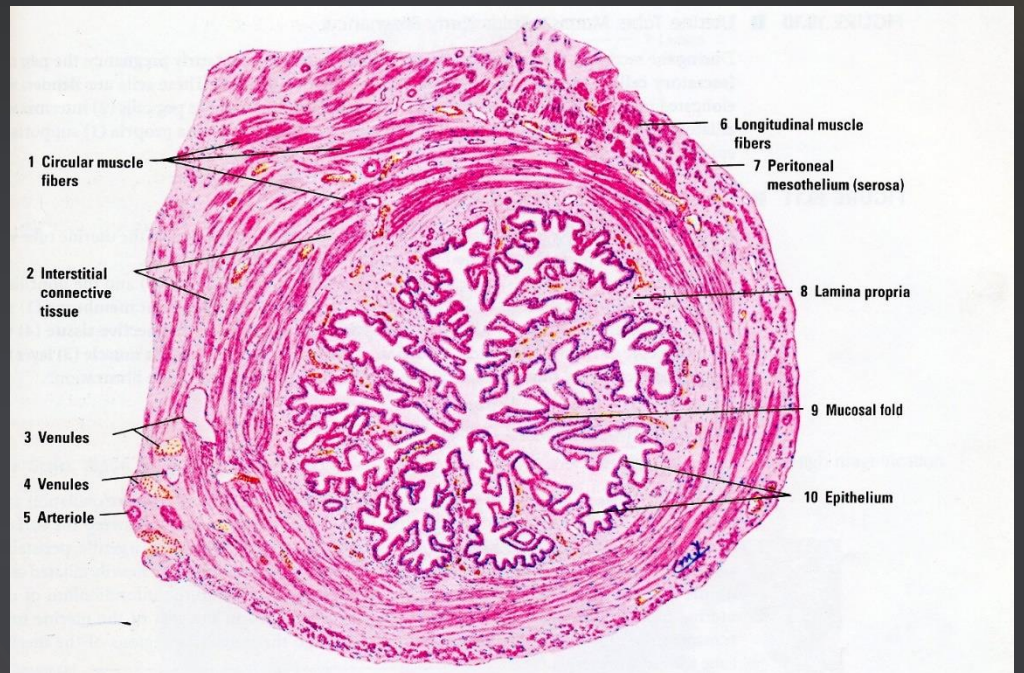
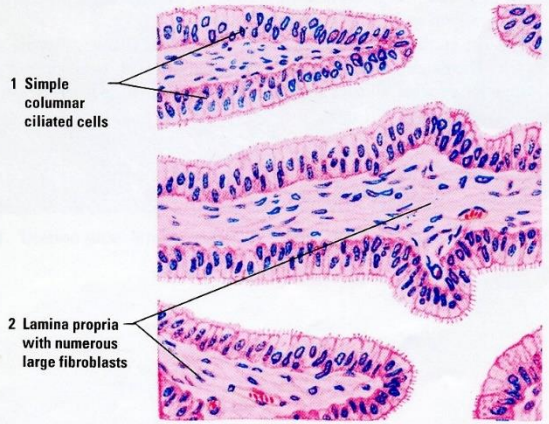



**FIGURE 19.7** ■ Corpus luteum: theca lutein cells and granulosa lutein cells. Stain: hematoxylin and eosin. High magnification.

# Uterine Tubes




URE 19.8 ■ Uterine tube: ampulla (panoramic view, transverse section). Stain: hematoxylin and eosin. Low magnifi-on.




GURE 19.9 ■ Uterine tube: mucosal folds (early proliferative phase). Stain: hematoxylin and eosin. High magnification.

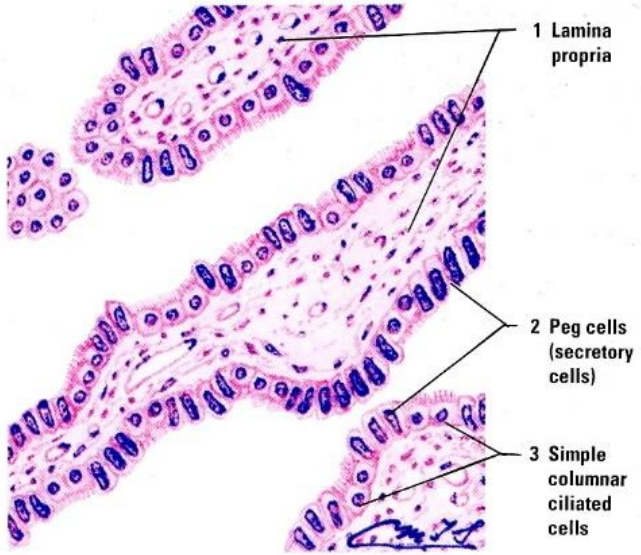



**FIGURE 19.10** ■ Uterine tube: mucosal folds (early pregnancy). Stain: hematoxylin and eosin. High magnification.

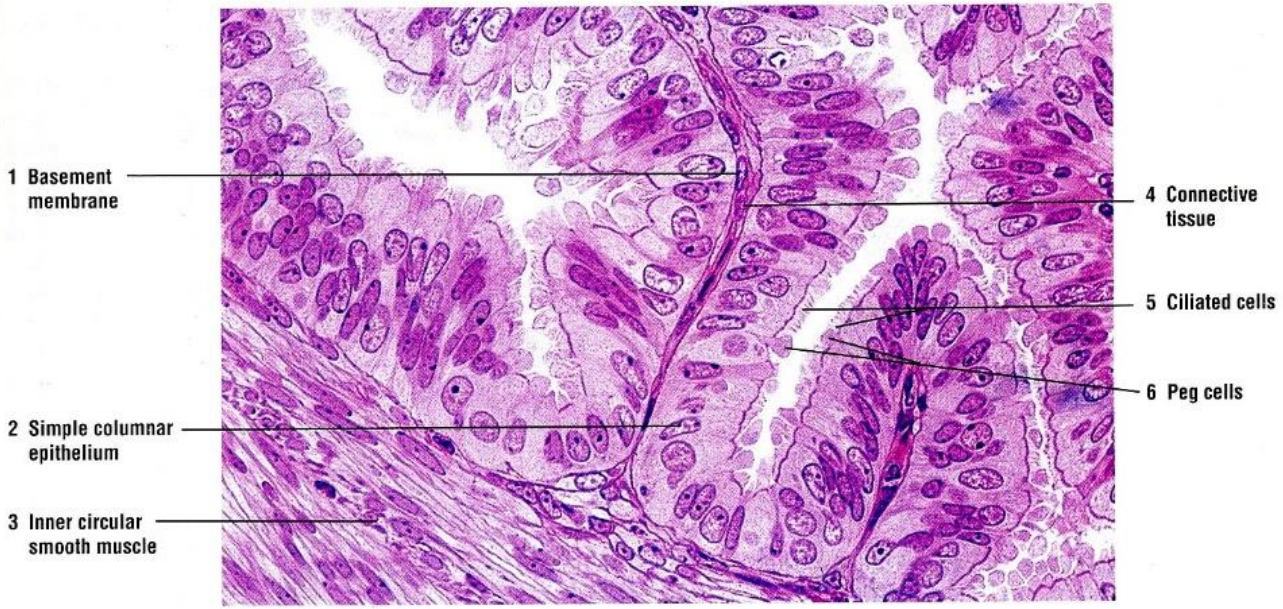
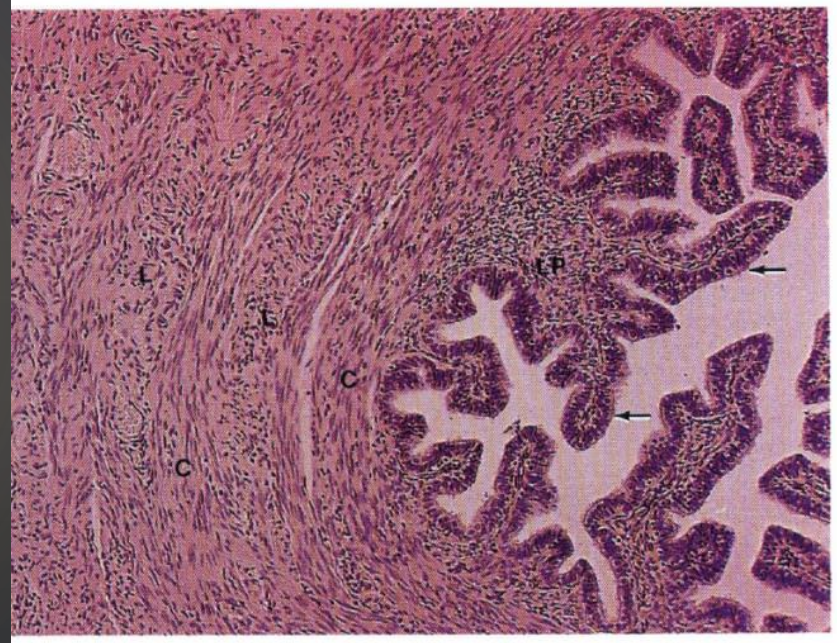


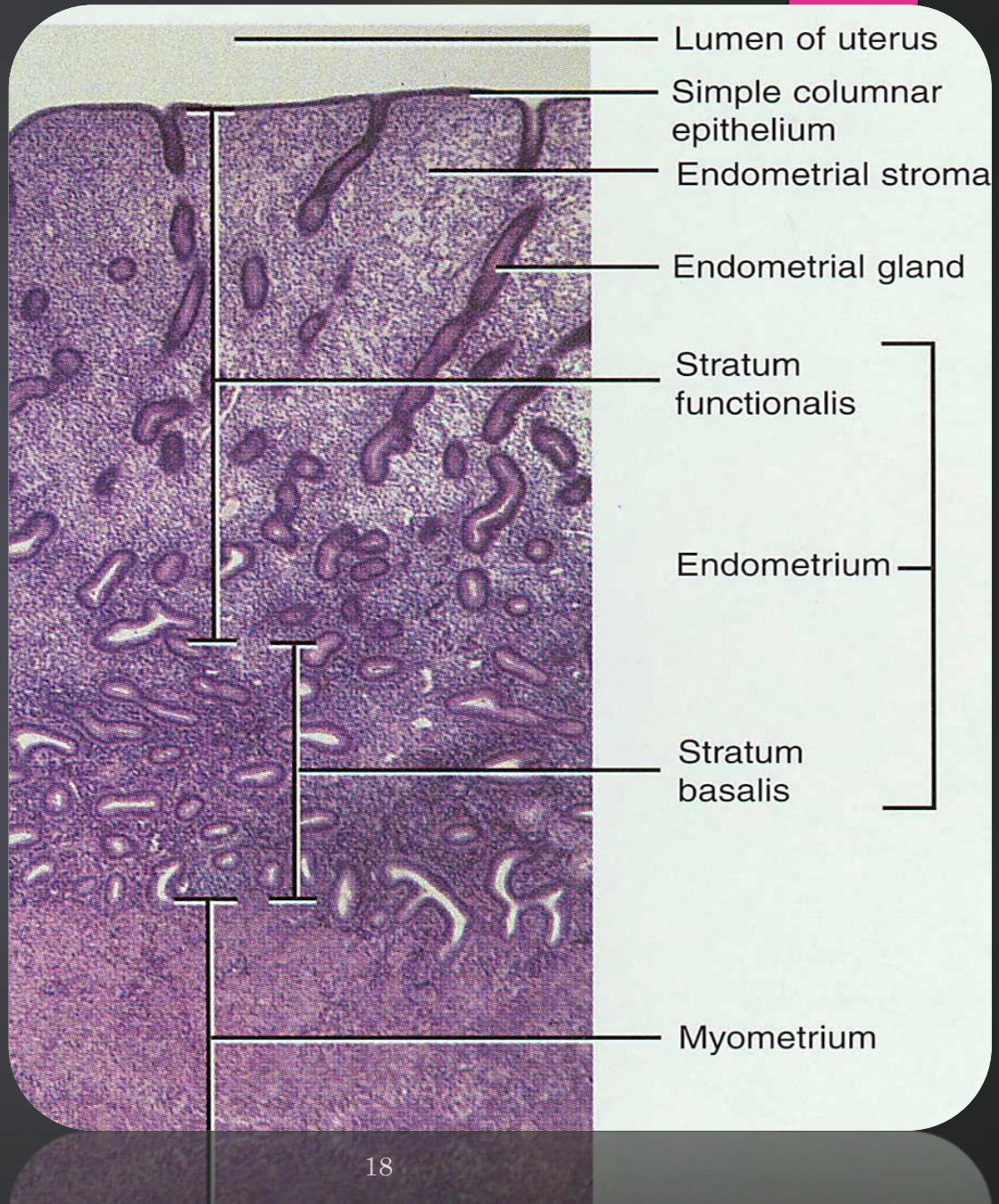

**FIGURE 19.11** ■ Uterine tube: lining epithelium. Stain: hematoxylin and eosin (plastic section). 130×


I
A
BL


L
L
C
C
LP

# Uterus

- Endometrium
  - Simple columnar epithelium
  - Stroma of connective tissue and endometrial glands
    - Stratum functionalis: Shed during menstruation
    - Stratum basalis: Replaces stratum functionalis each month
- Myometrium
  - 3 layers of smooth muscle
- Perimetrium
  - Visceral peritoneum



## Proliferative phase:

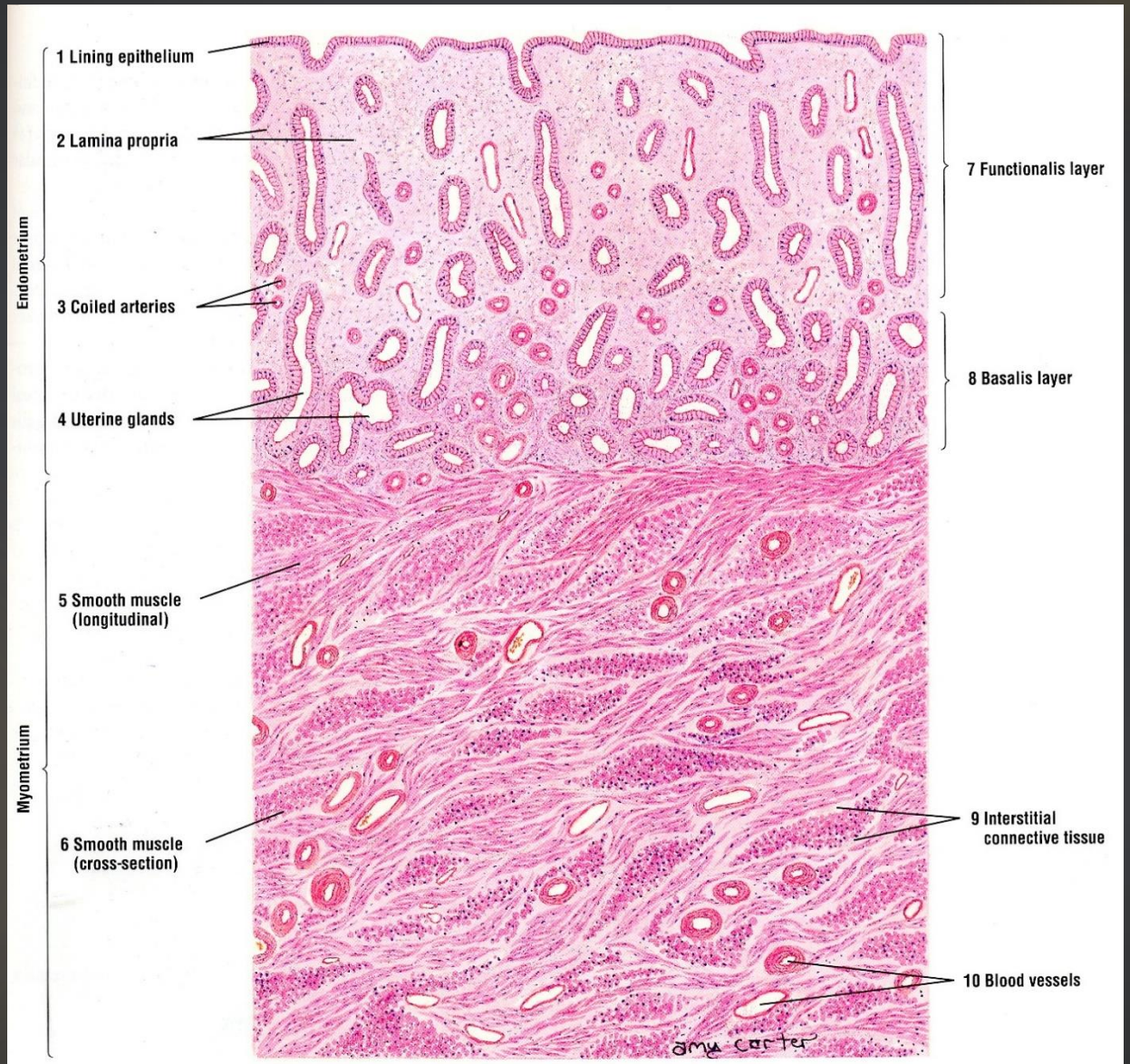



FIGURE 19.12 ■ Uterus: proliferative (follicular) phase. Stain: hematoxylin and eosin. Low magnification.

## Secretory phase:

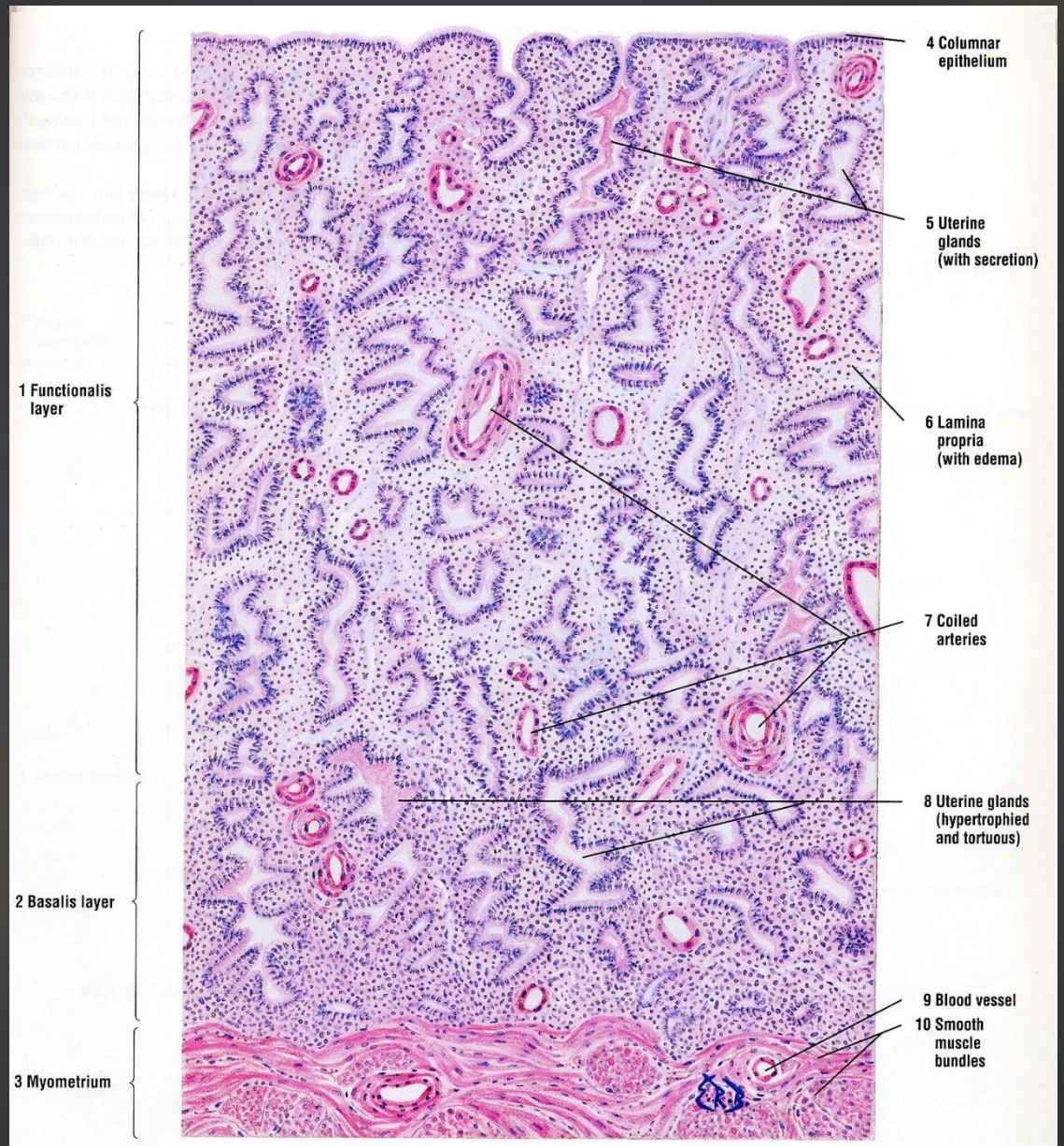



FIGURE 19.13 ■ Uterus: secretory (luteal) phase. Stain: hematoxylin and eosin. Low magnification.

## Secretory phase:

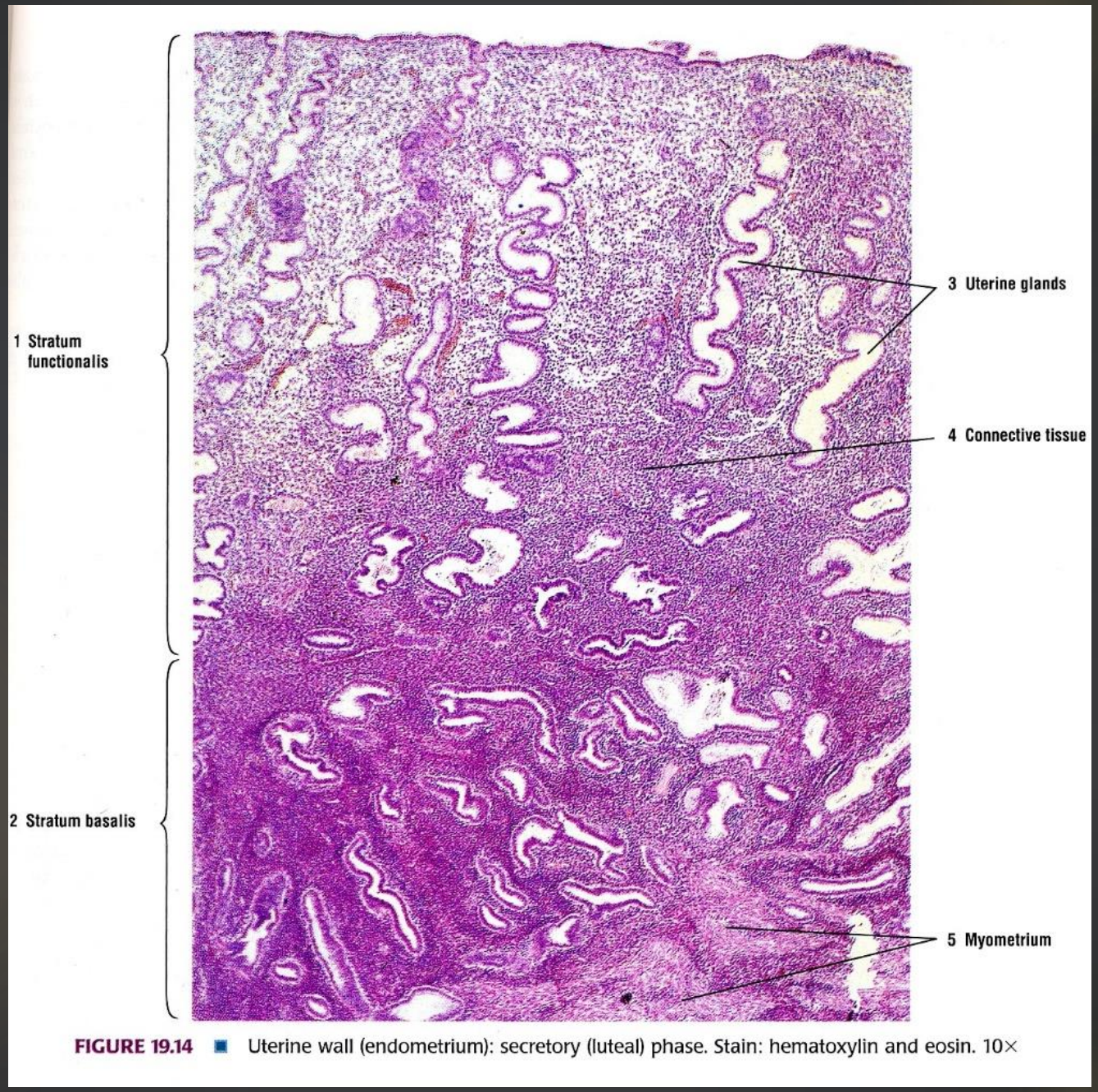



**FIGURE 19.14** ■ Uterine wall (endometrium): secretory (luteal) phase. Stain: hematoxylin and eosin. 10×

## Menstrual phase:

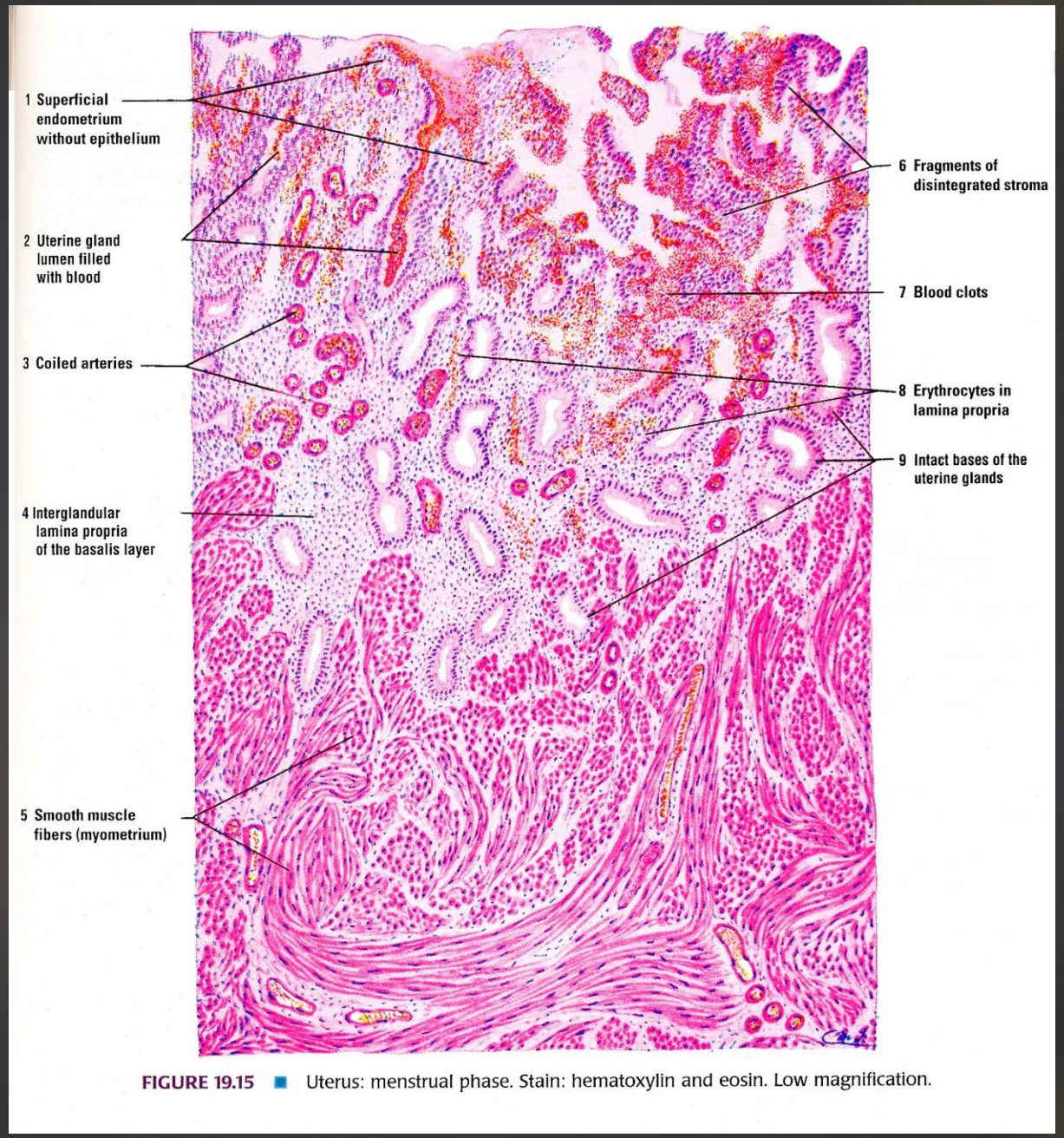
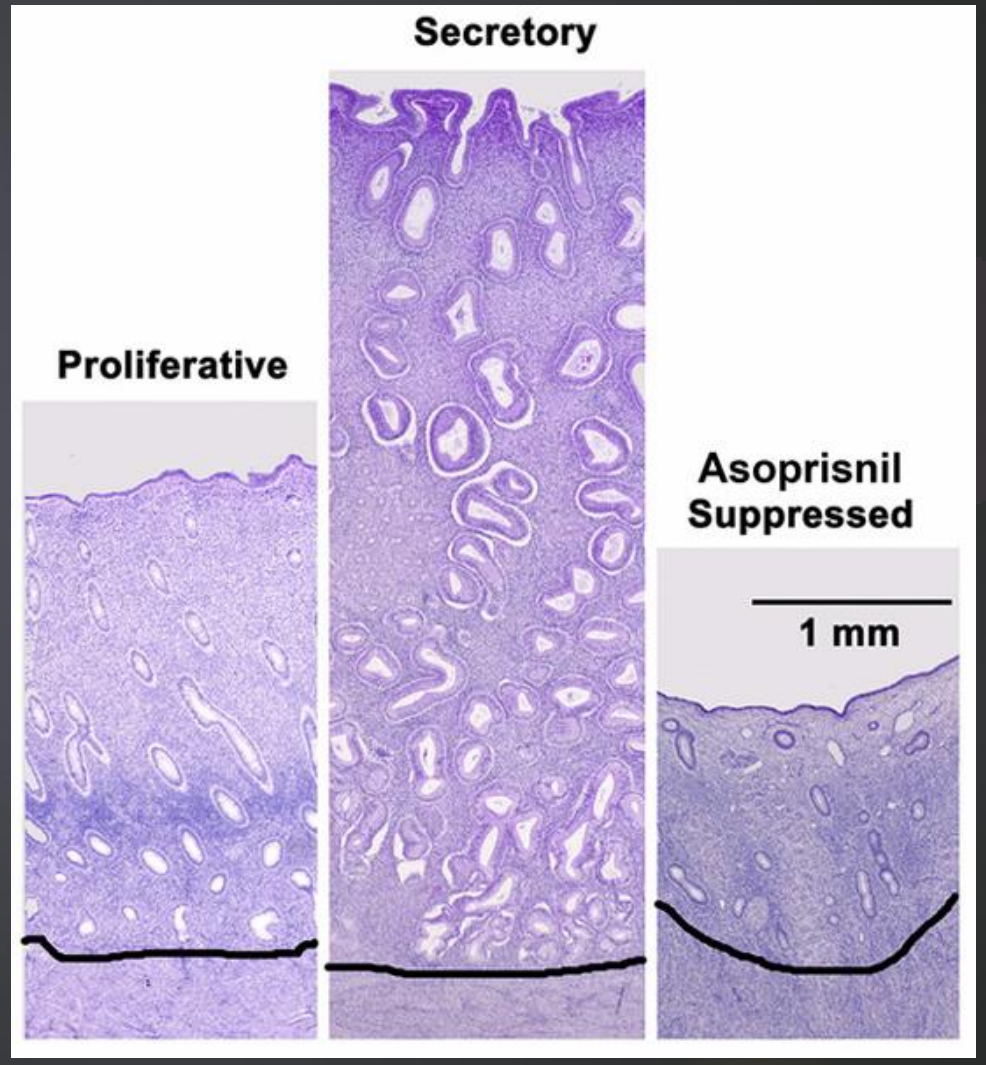



FIGURE 19.15 ■ Uterus: menstrual phase. Stain: hematoxylin and eosin. Low magnification.

- **Proliferative phase**: glands and blood vessels scattered throughout the functional zone with little or no branching.
- New glands form and endometrium thickens.
- **Secretory phase**: glands are enlarged and have branches. Preparing the endometrium for implantation
- If no implantation then endometrium breaks down and menstruation begins.



# Cervix

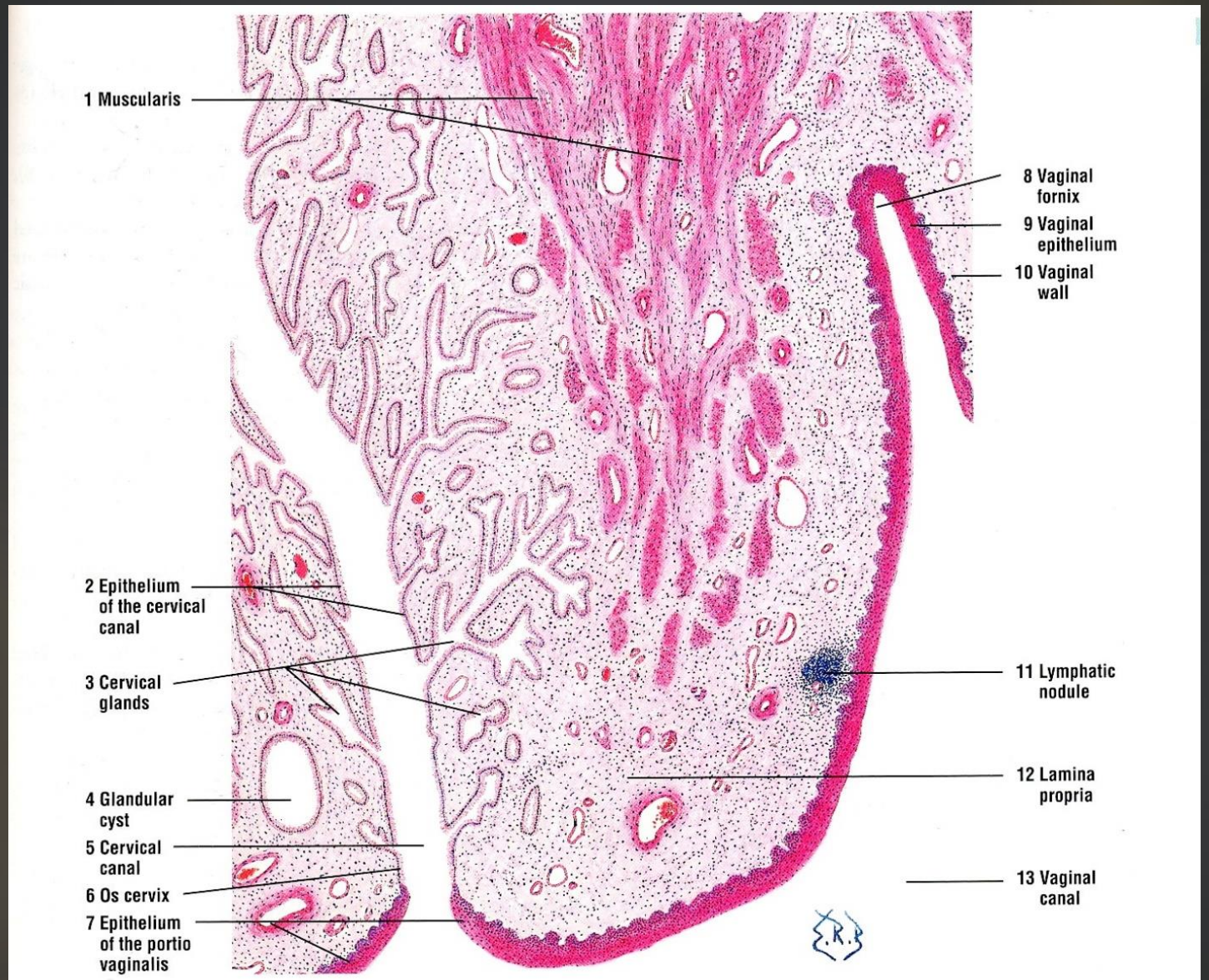
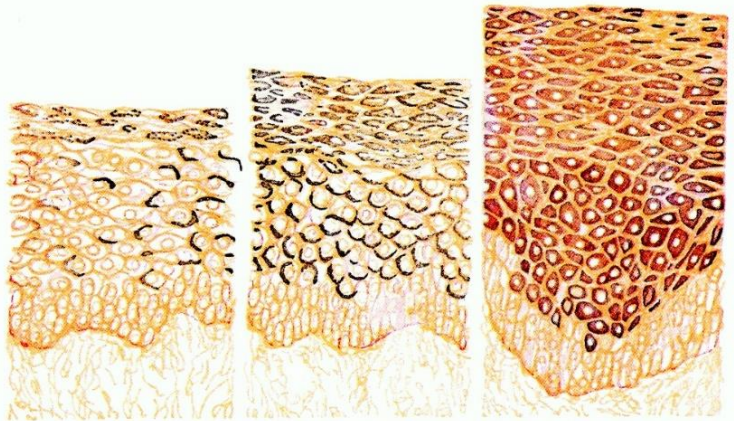



**FIGURE 19.16** ■ Cervix, cervical canal, and vaginal fornix (longitudinal section). Stain: hematoxylin and eosin. Low magnification.

# Vagina


**FIGURE 19.17** ■ Vagina (longitudinal section). Stain: hematoxylin and eosin. Low magnification.



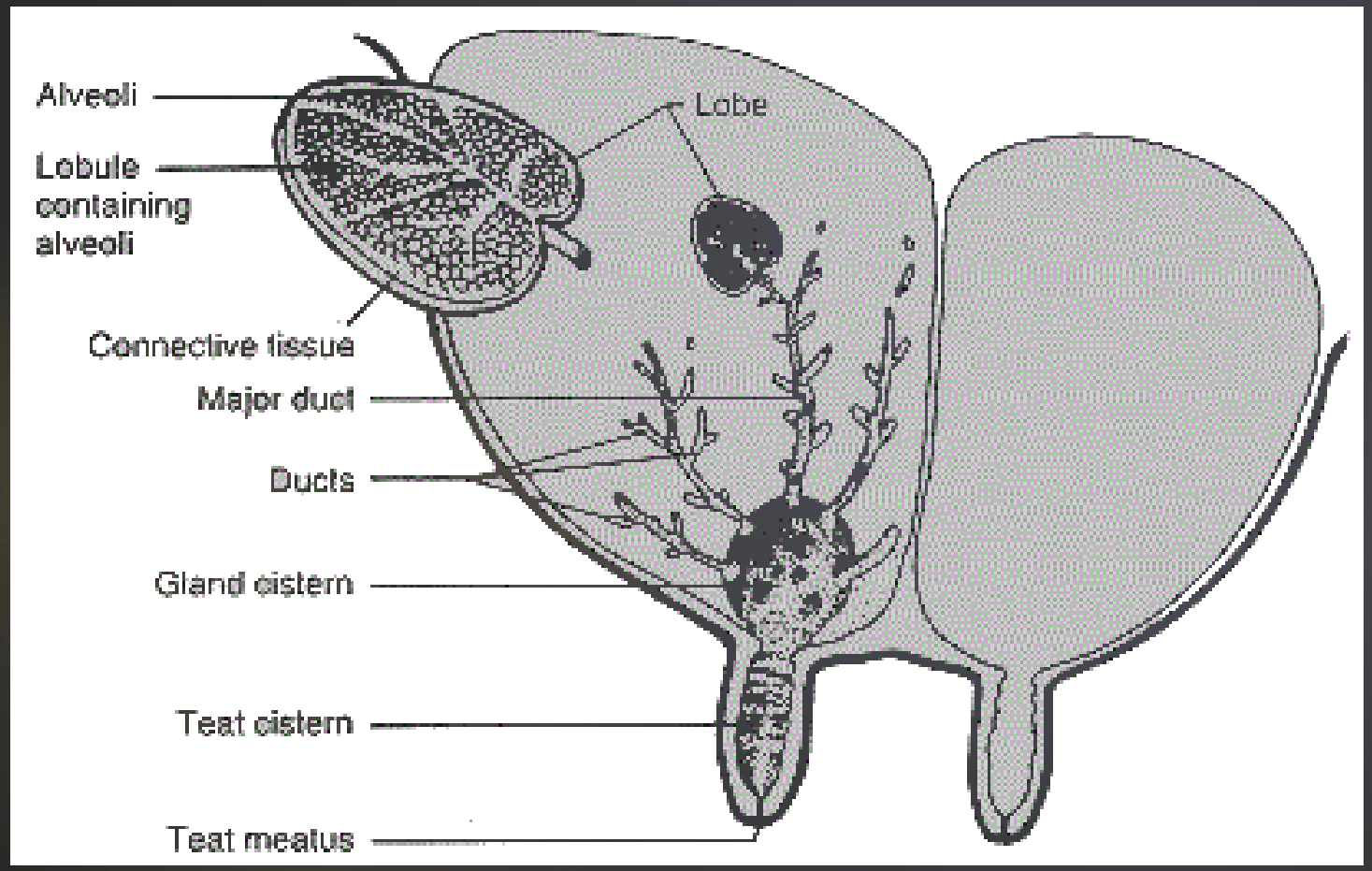
a. Interfollicular phase b. Follicular phase c. Follicular phase

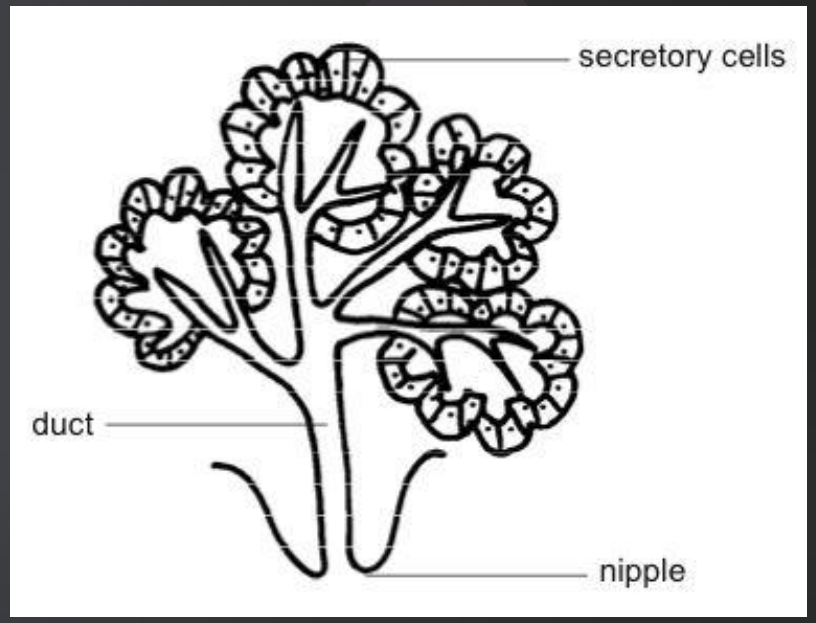
**FIGURE 19.18** ■ Glycogen in human vaginal epithelium. Stain: Mancini's iodine technique. Medium magnification.


*figure 19-23*

**FIGURE 19-23**
Photomicrograph illustrating the stratified squamous epithelium (E), lamina propria (L), lamina muscularis (M), and fibroelastic connective tissue of the vagina. Note the lymphocytic infiltration (arrows) in the lamina propria. × 56.

# Mammary Glands



# Mammary Glands

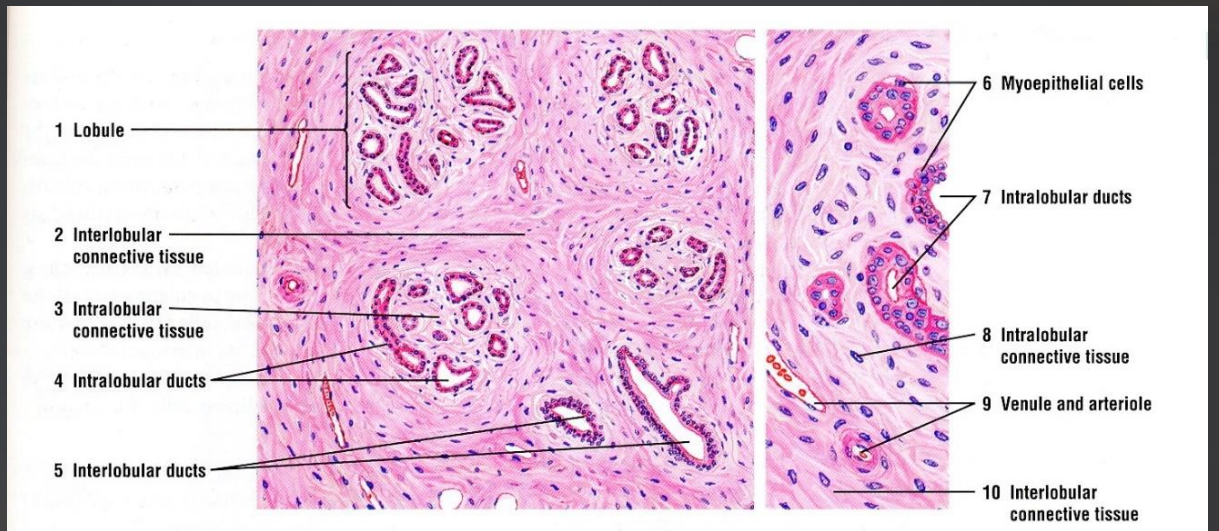



**FIGURE 19.24** ■ Inactive mammary gland. Stain: hematoxylin and eosin. Left side: medium magnification; right side: high magnification.

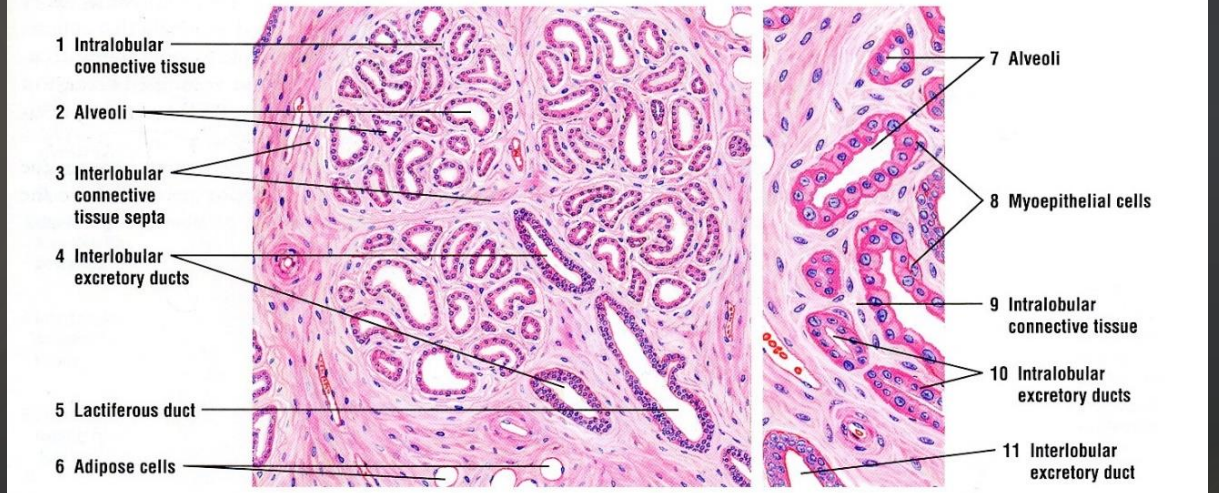



**FIGURE 19.25** ■ Mammary gland during proliferation and early pregnancy. Stain: hematoxylin and eosin. Left side: medium magnification; right side: high magnification.

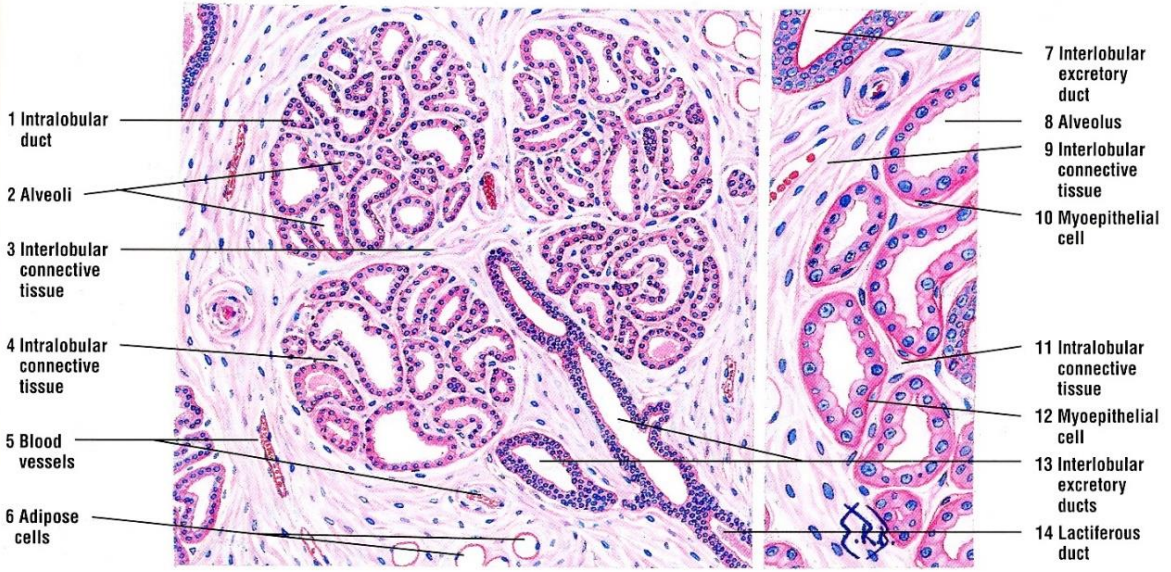



**FIGURE 19.26** ■ Mammary gland during late pregnancy. Stain: hematoxylin and eosin. Left side: low magnification; right side: high magnification.

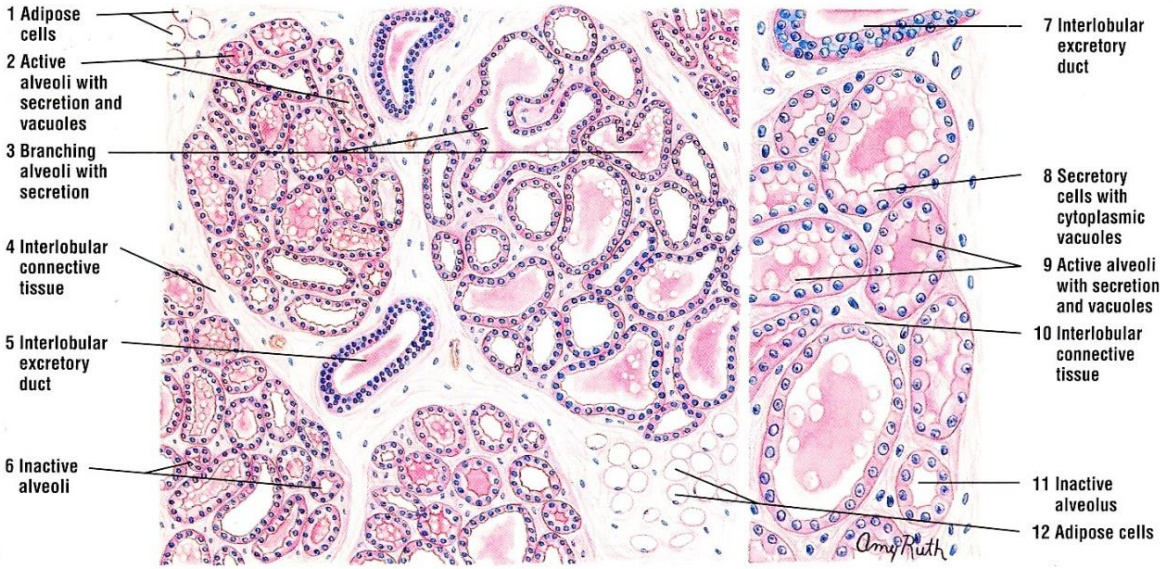



**FIGURE 19.27** ■ Mammary gland during lactation. Stain: hematoxylin and eosin. Left side: low magnification; right side: high magnification.

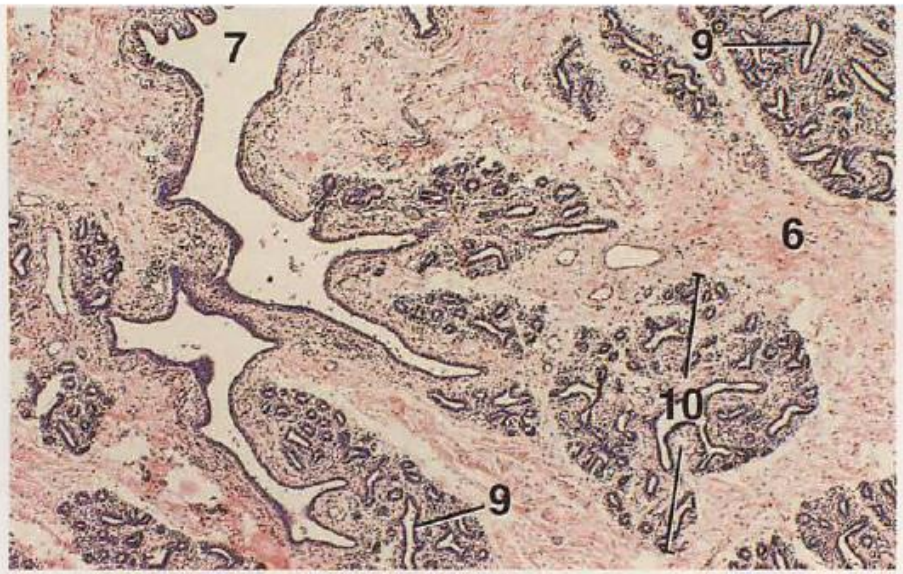



Figure 12.48 ×25

**Figure 12.48. Mammary Gland, Inactive, Cow.** Abundant interlobular connective tissue and components of the duct system are evident in an inactive gland. Interlobular ducts branch into the lobules as intralobular ducts.

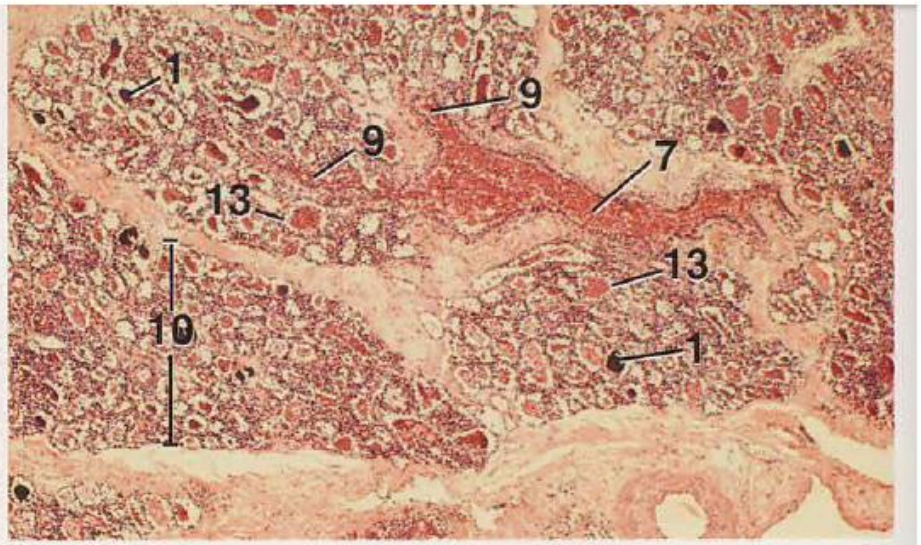



Figure 12.50 ×25

**Figure 12.50. Mammary Gland, Active, Cow.** In the active gland, secretory parenchyma is well developed and connective tissue is reduced. Compare with Figure 12.48. The lumens of the secretory glands and ducts are filled with secretion *(deep pink)*.

| KEY | |
|---|---|
| 1. Corpora amylacea | 8. Intralobular connective tissue |
| 2. Epidermis | 9. Intralobular duct |
| 3. Gland | 10. Lobule |
| 4. Glandular epithelium | 11. Lymphatic vessel |
| 5. Hair follicle | 12. Sebaceous gland |
| 6. Interlobular connective tissue | 13. Secretory unit |
| 7. Interlobular duct | 14. Sweat gland |

# Good JOB!