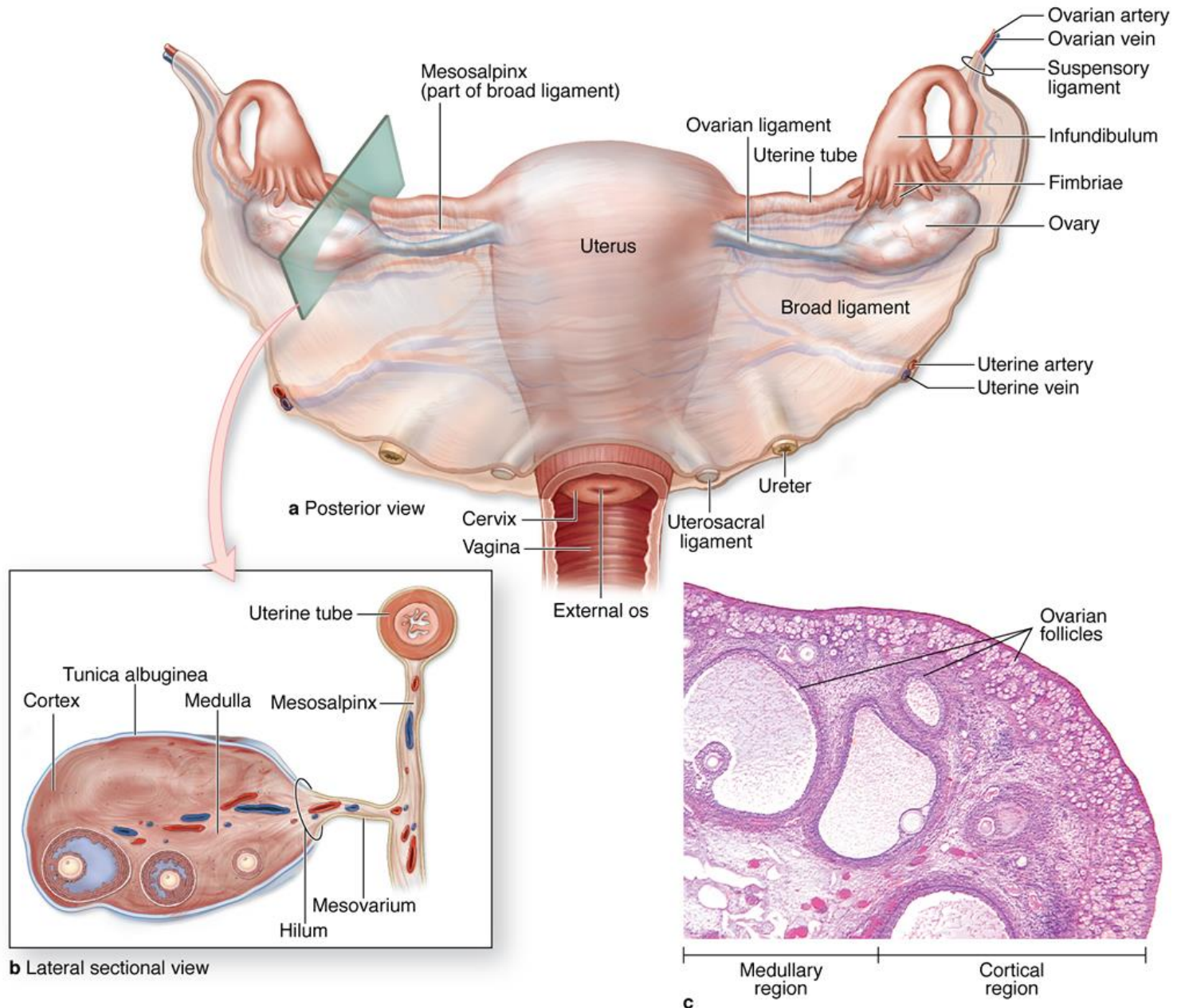


Morphology and histology of the ovary and uterine tube, oogenesis.

János Hanics M.D.

Parts of the female genital tract



Ovary - position

- Lateral wall of the lesser pelvis

- fossa ovarica

- Intraperitoneal organ

- Attached on the broad ligament of the uterus

- Craniocaudal axis

Before puberty: small, smooth

Puberty-menopause:

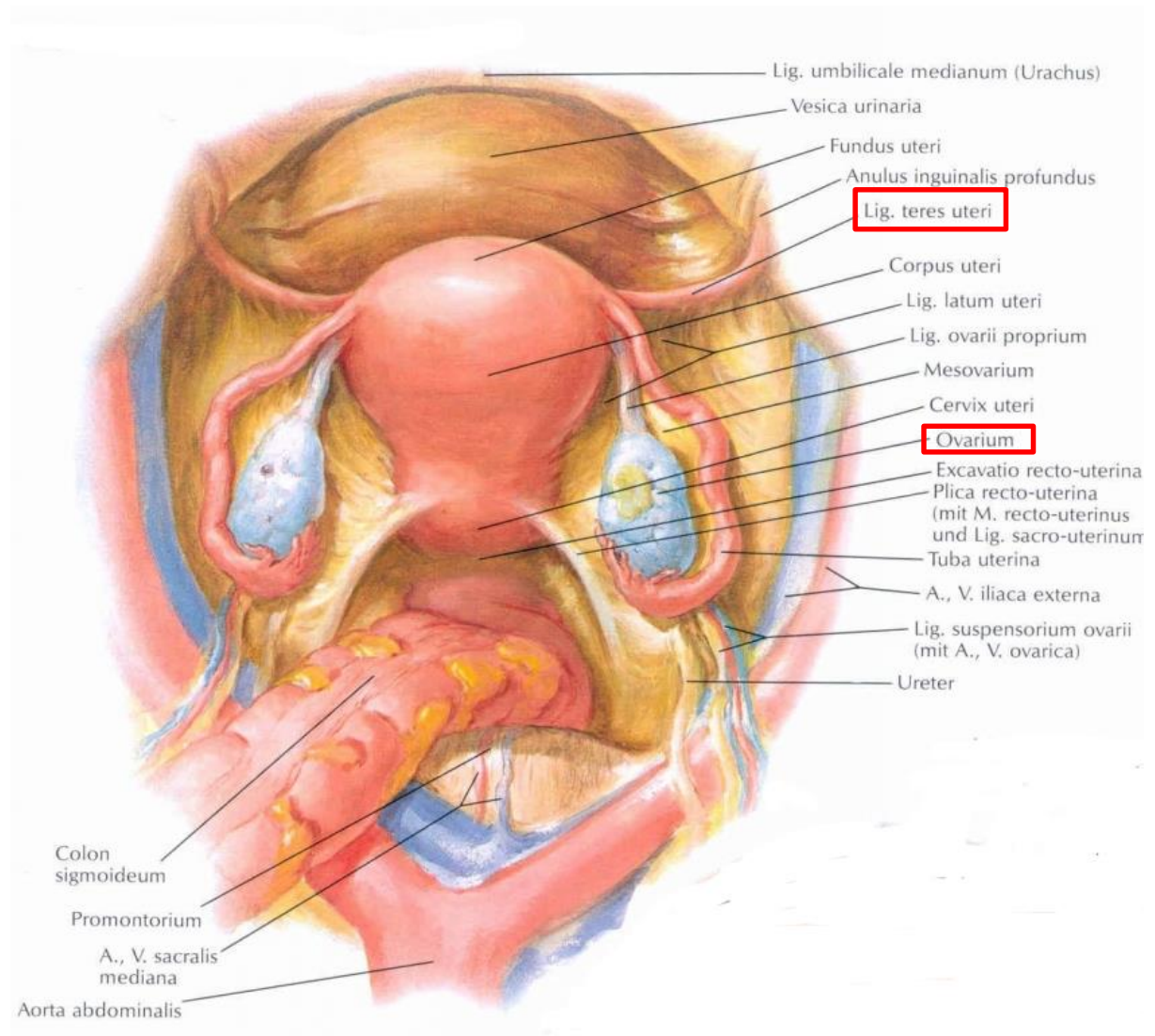
3-4 cm long

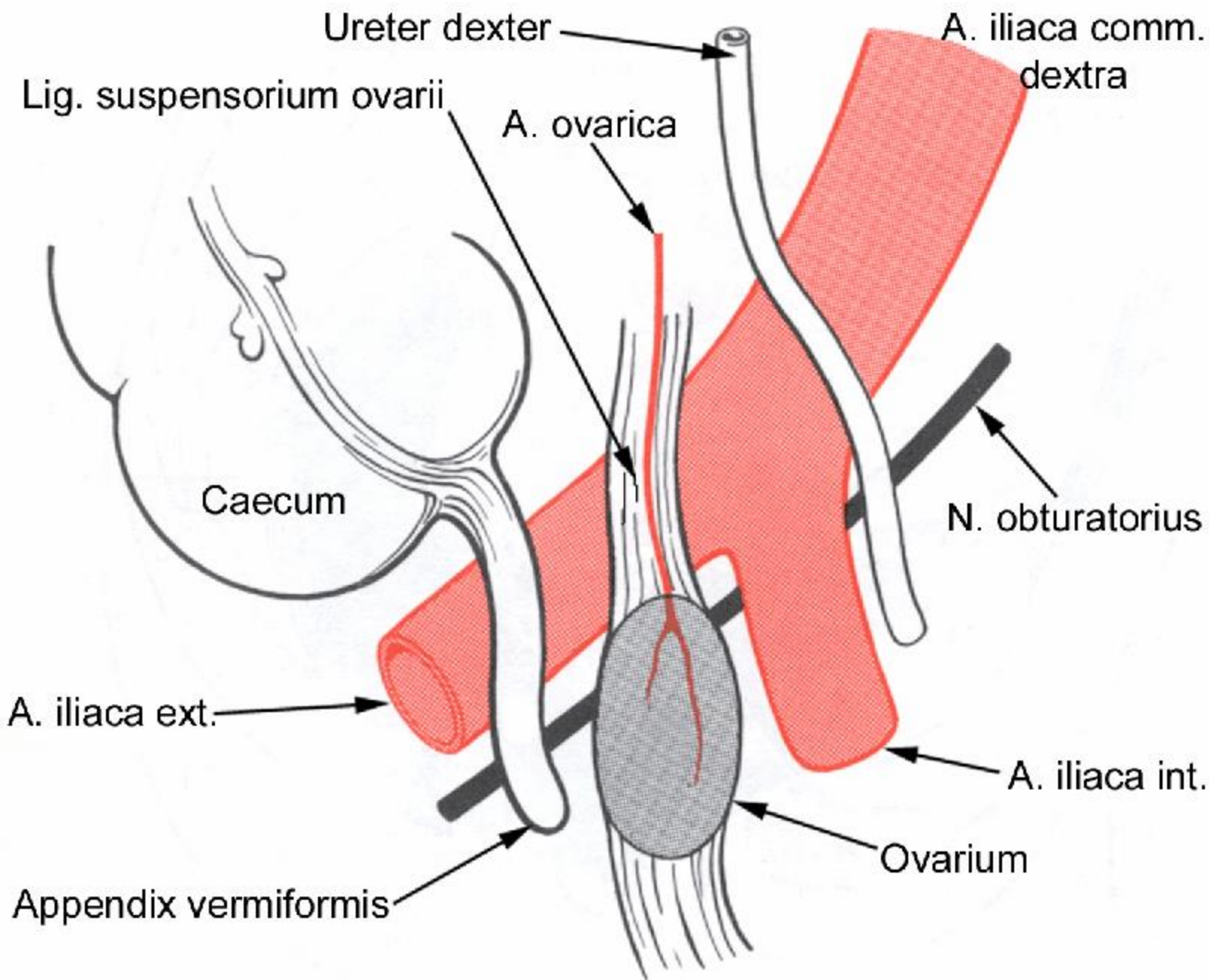
1-1,5 cm thick

7-14 g

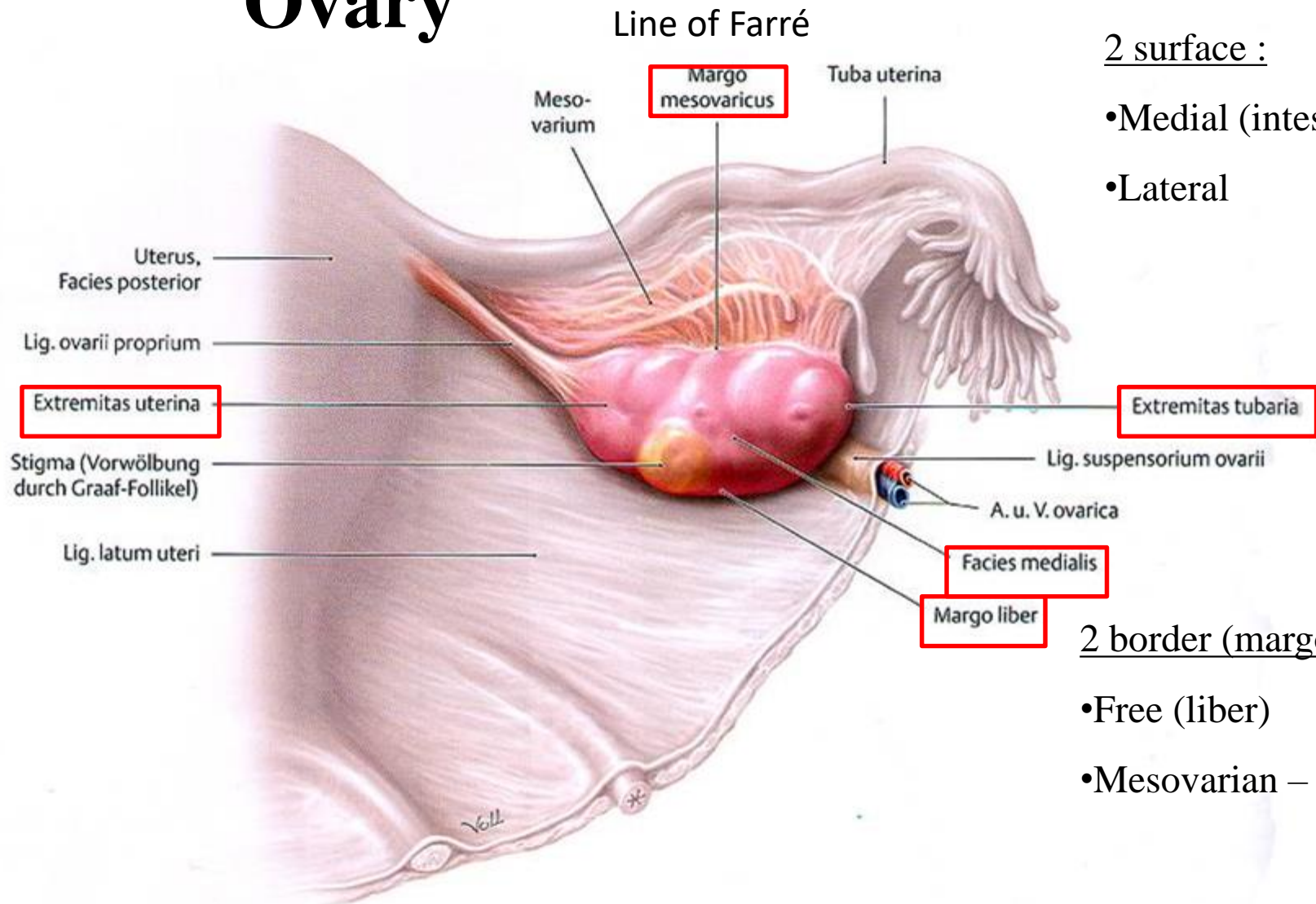
After menopause:

small, rough surface





Ovary



Line of Farré

2 surface :

- Medial (intestinal)
- Lateral

Margo mesovaricus

Tuba uterina

Meso-varium

Uterus, Facies posterior

Lig. ovarii proprium

Extremitas uterina

Stigma (Vorwölbung durch Graaf-Follikel)

Lig. latum uteri

Extremitas tubaria

Lig. suspensorium ovarii

A. u. V. ovarica

Facies medialis

Margo liber

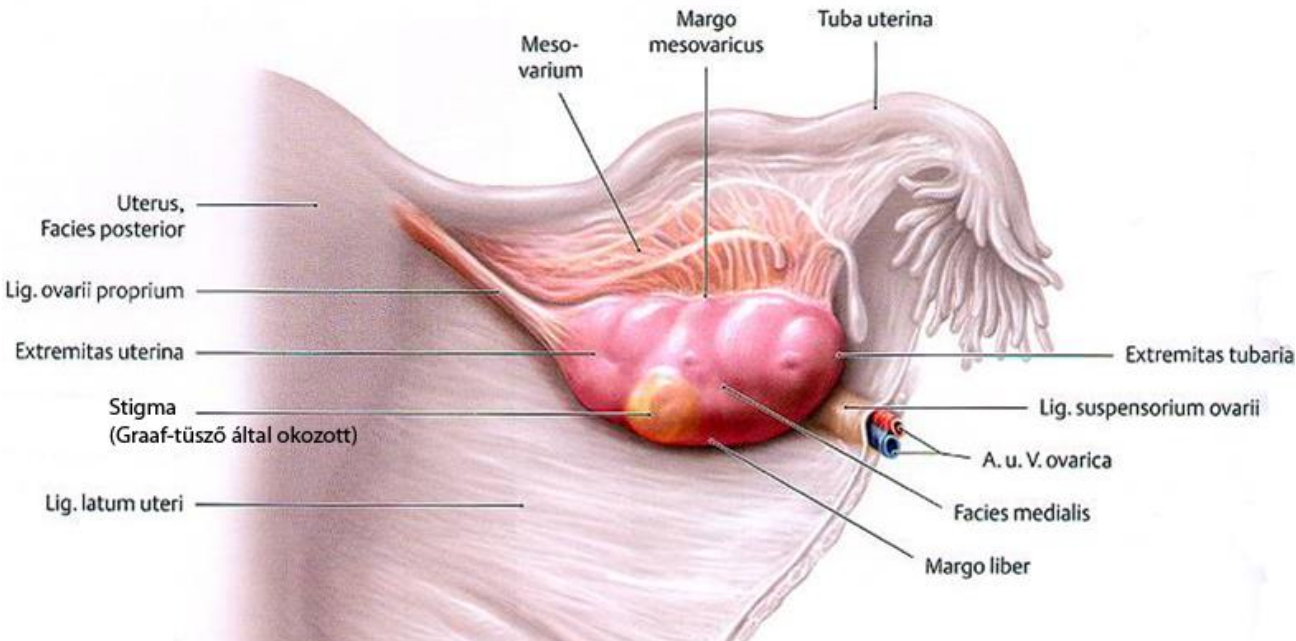
2 border (margo):

- Free (liber)
- Mesovarian – Line of Farré

2 pole:

- Extremitas uterina
- Extremitas tubaria

Ovary - ligaments



Suspensory ligament:

From the lateral wall of the lesser pelvis to the extremitas tubaria

Within:

Ovarian a.

Ovarian v.

Lymph vessels

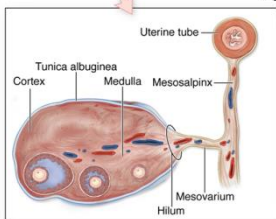
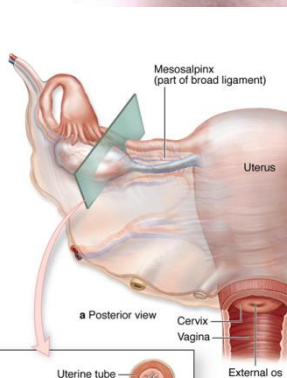
Nerves

Proper ligament: Extremitas uterina → tubar angle

Smooth muscle

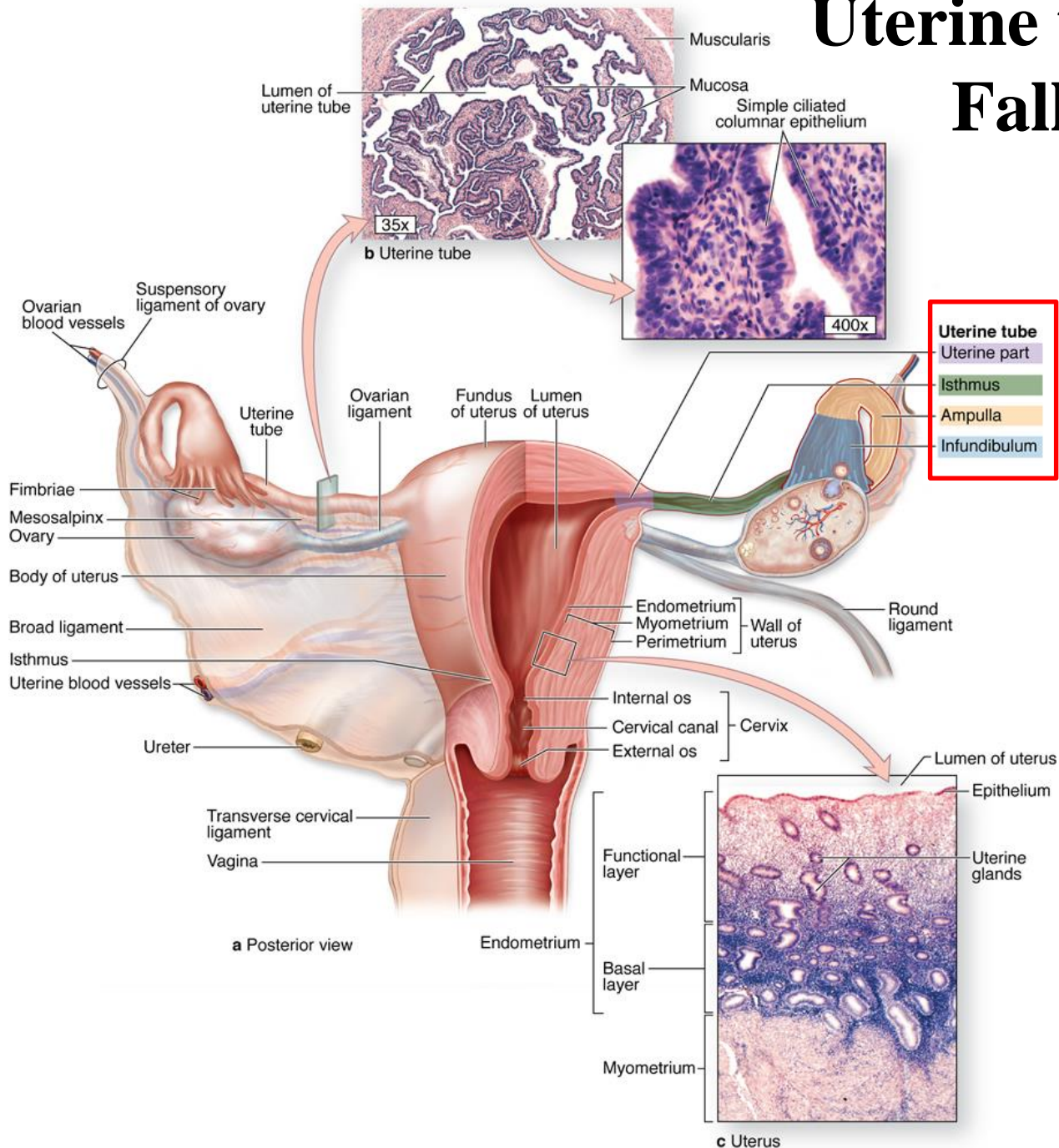
Ovarian branch of the uterine a.

Mesovarium: posterior part of the broad ligament (lig. latum uteri)



b Lateral sectional view

Uterine tube (oviduct) – Fallopian tube



10-15 cm long, 2-5 mm thick tube
 Intraperitoneal, with a duplication - mesosalpinx

2 orifice:

- Uterine orifice
- Abdominal orifice, with fimbriae

Parts:

1 Infundibulum:

- Lies on the ovary, fimbriae surround the matured follicle

2 Ampulla: 7-8 cm

- Place of fertilisation
- Rich in folds

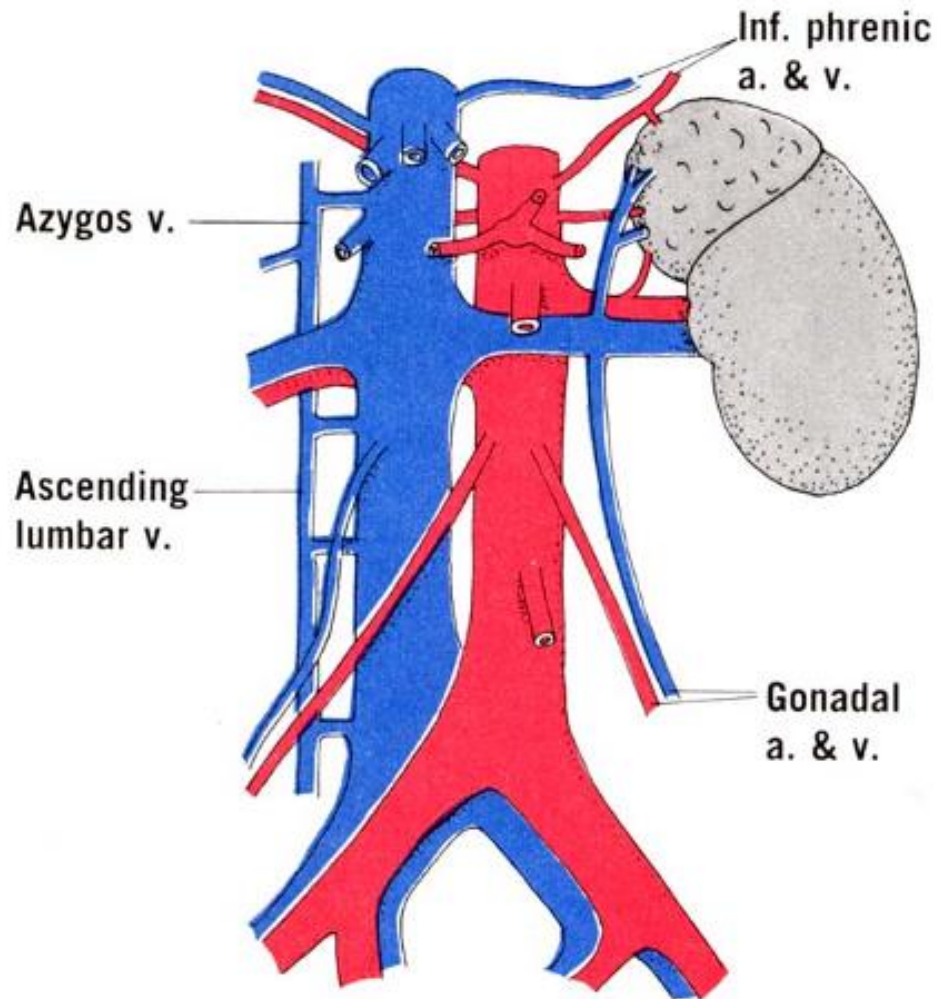
3 Isthmus: 3-4 cm

- Few fold

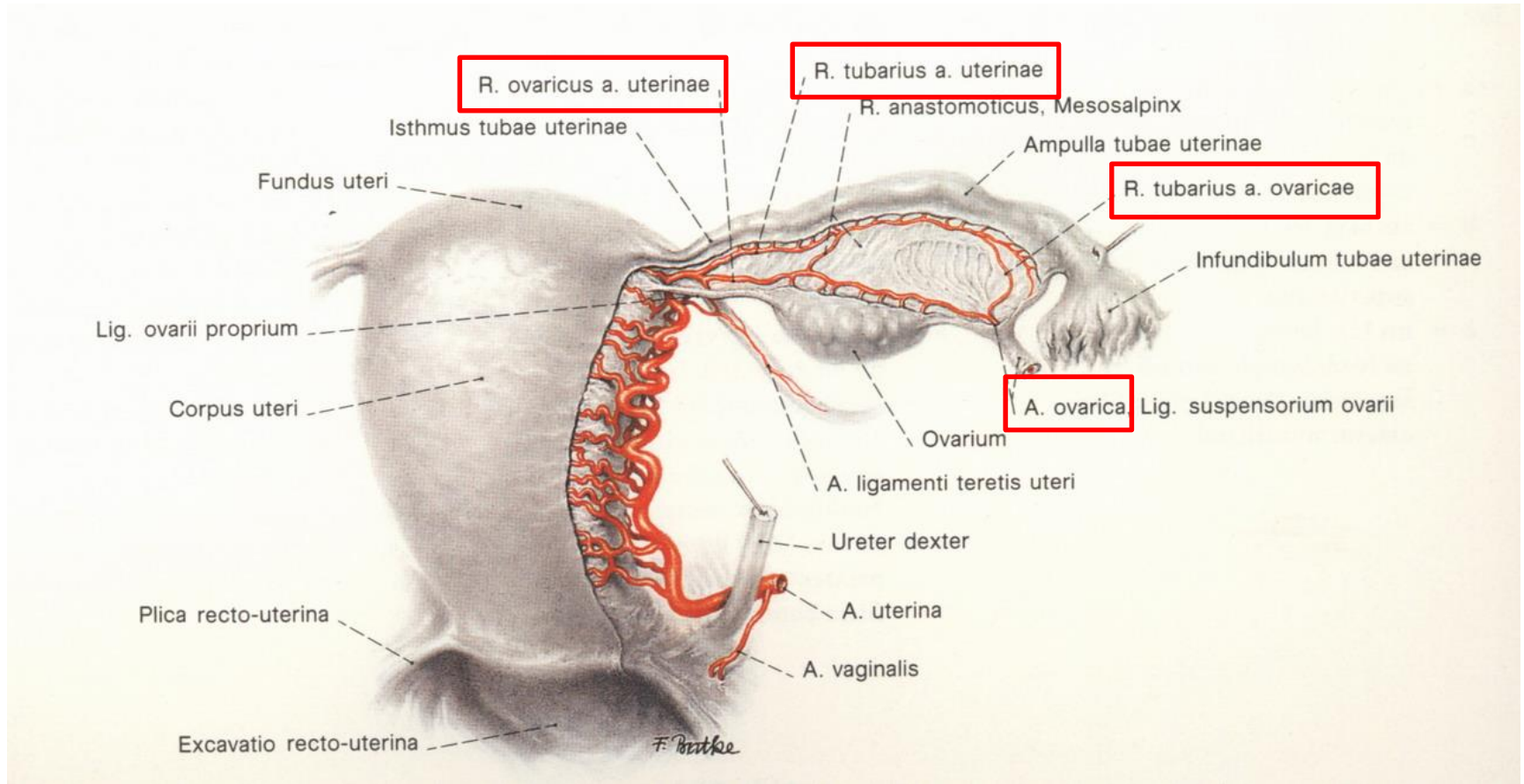
4 Uterine part (intramural):

- The narrowest part

Gonadal vessels



Arteries



Ovarian a.: Suspensory lig.

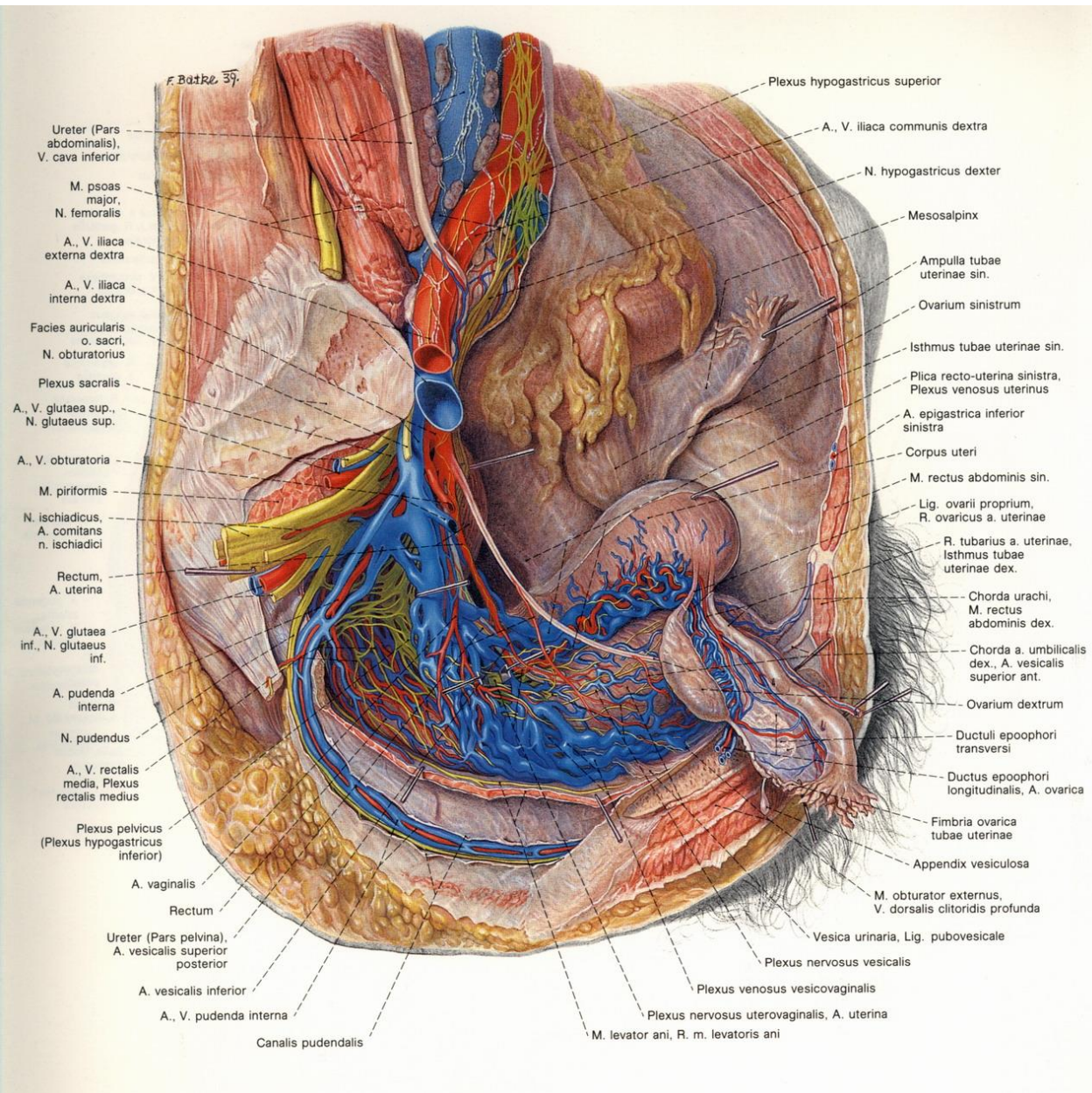
Ovarian branch of the uterine a.: proper lig.

} Anastomosis along the mesovaric margin

Tubarian branch of the ovarian a.
Tubarian branch of the uterine a.

} Anastomosis within the mesosalpinx

Vessels and nerves



Veins:

Right ovarian v. → IVC

Left ovarian v. → Left renal v.

Uterine plexus

Uterovaginal plexus

Lymph vessels:

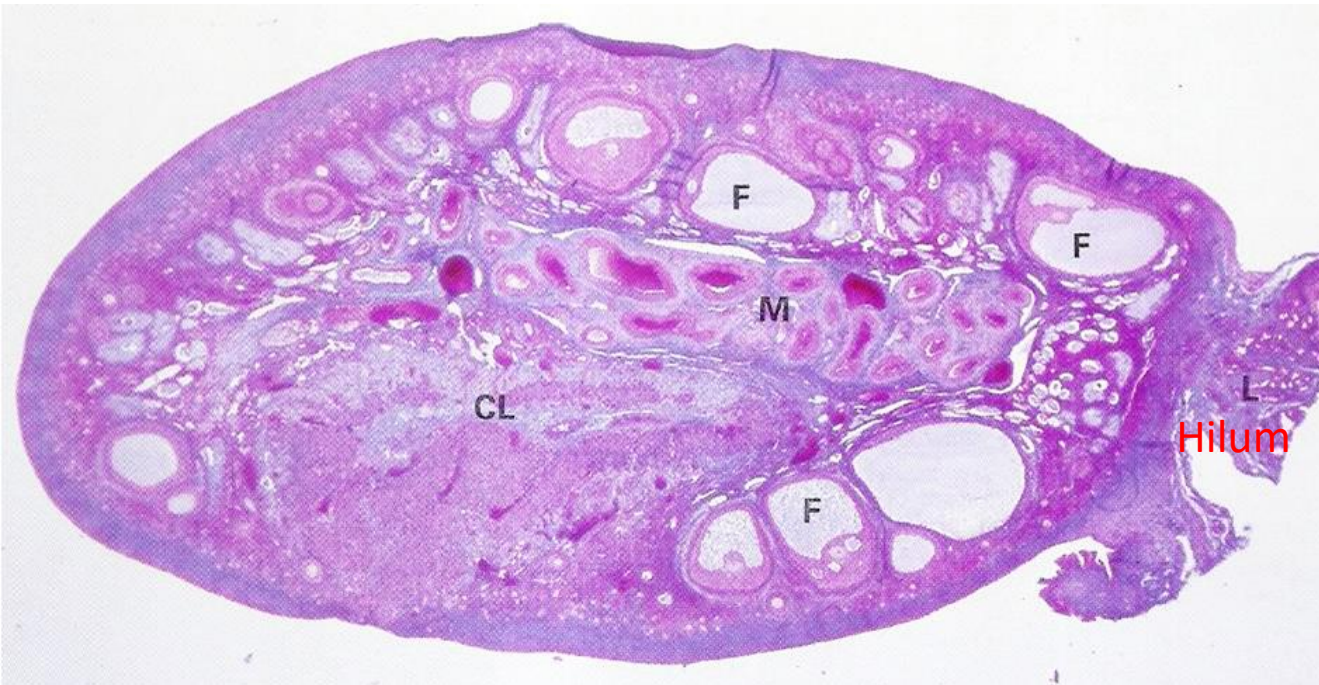
Lumbal, paraaortic lymph nodes

→ Lumbal trunk

Nerves:

Ovarian plexus (aortic, renal, uterovaginal plexuses)

Ovary - histology



Cortex: development of follicles
Medulla (M)

Outer surface: „germinal epithelium” (simple cuboidal epithelium)



Along the mesovarian border (Farré) changes to peritoneum (simple squamous epithelium)

Stroma = cell rich (spino-cellular) connective tissue

Cortex: 1-3 mm

- „germinal epithelium”
- Tunica albuginea: fibrous connective tissue
- Follicles in different stages, corpus luteum and albicans

Medulla:

- No follicles
- Hilum – continuation of medulla
- Rich in vessels

Hilum - interstitial cells

Oogenesis

Place: Ovary, follicles

Asymmetric division: Oocyte-polocyte

2 STOP in the meiosis:

1. Prophase 1, diploten: ———

could take 40 year!

2. In Metaphase 2: ———

the second meiotic division ending only with the fertilization

without fertilization the oocyte died on the second metaphase

5 month fetus	5-7 milliö oogonia
Time of birth	1 million primary oocyte
At the time of puberty	400.000
Matured	400-500
At the time of menopause	no

The 99.9 % (!) of the oocytes degenerates with apoptosis in different developmental stages during the female reproduction period.

**Proliferation phase
(mitoses)**

Growth phase

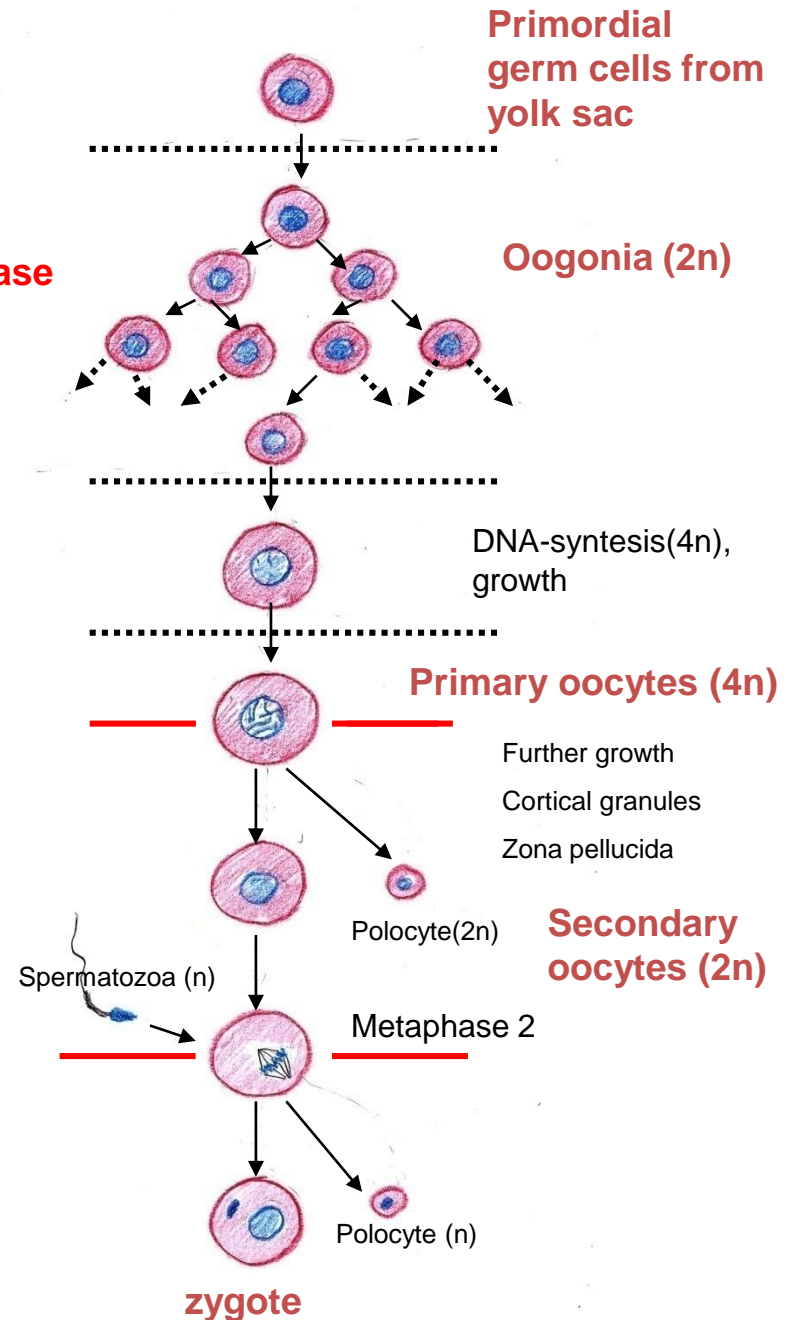
Time of birth

Meiosis 1

Mature phase

Meiosis 2

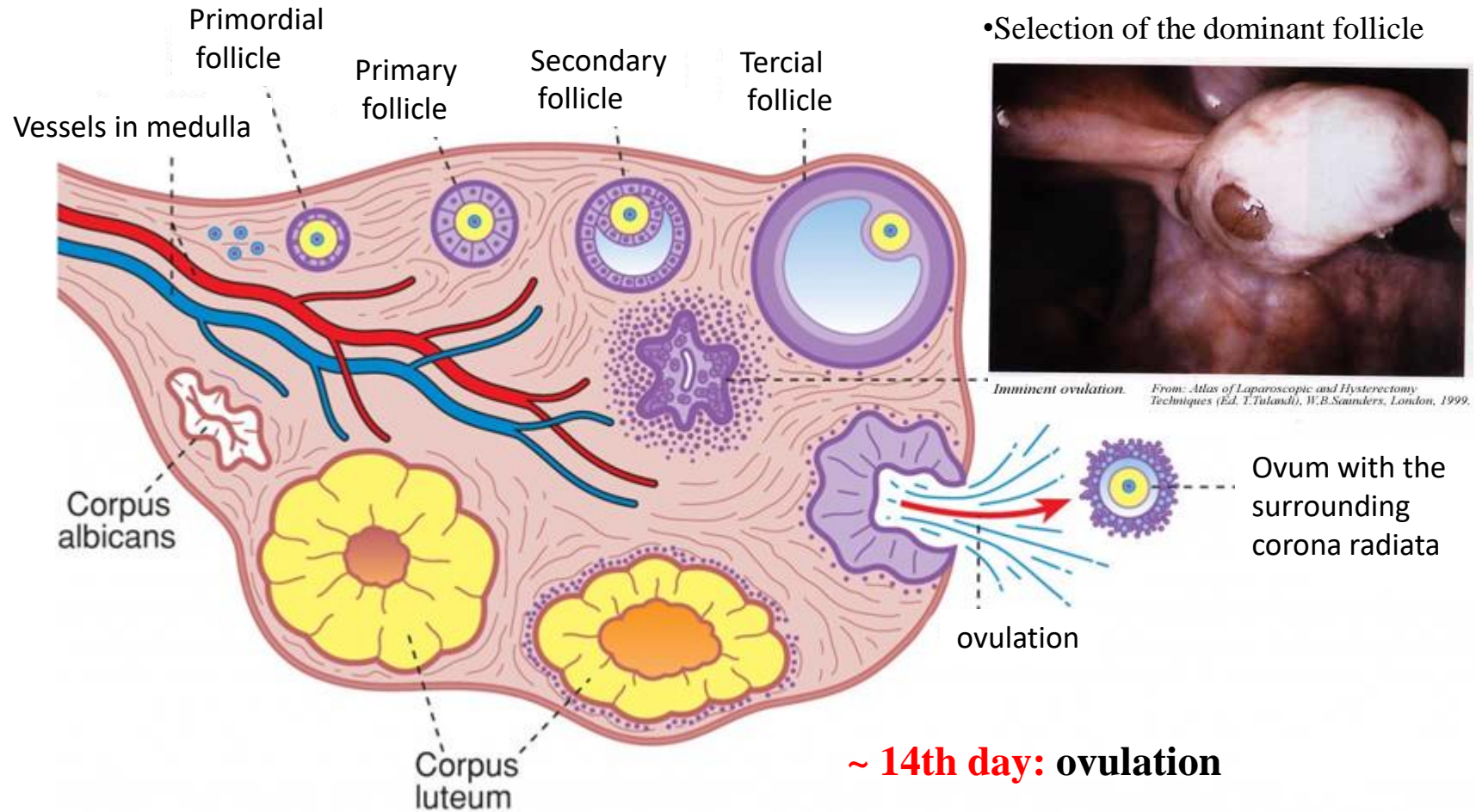
Fertilization



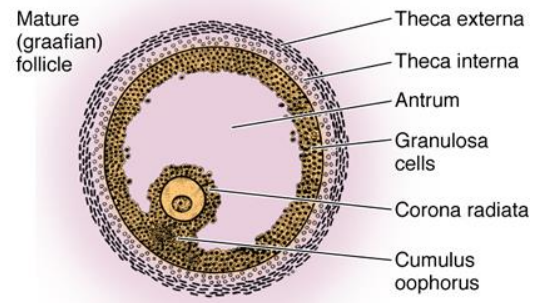
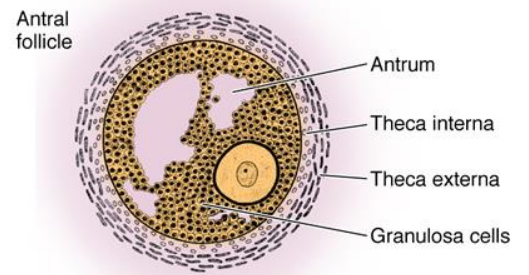
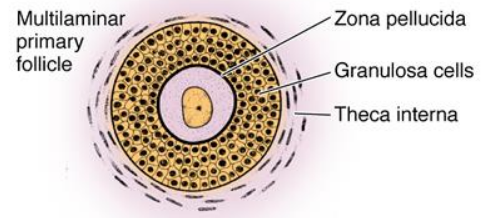
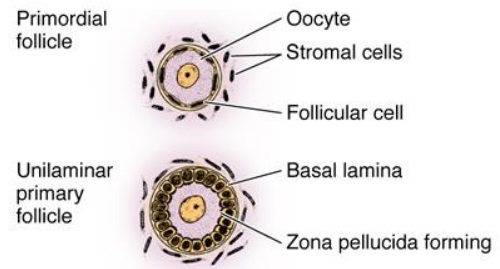
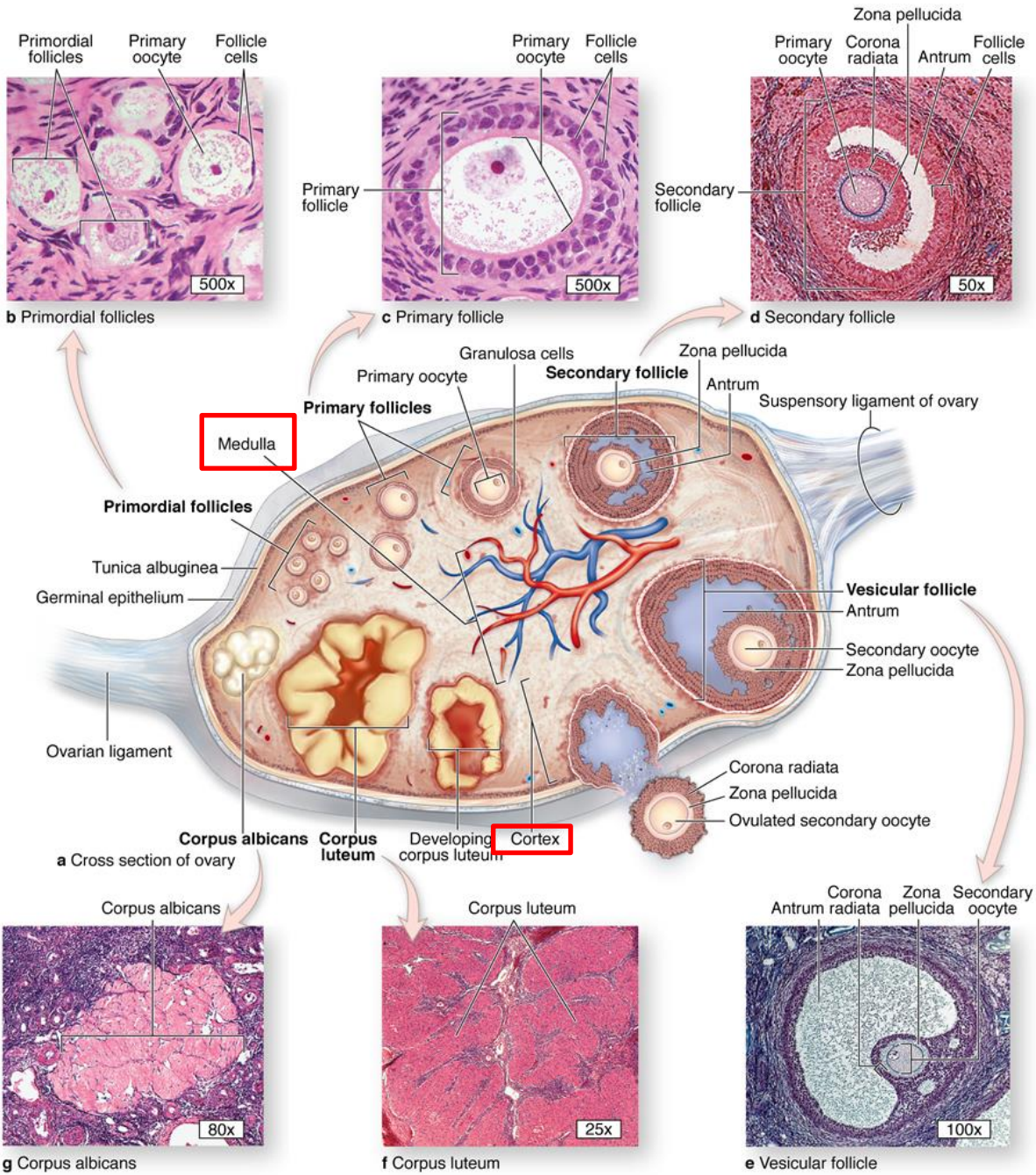
Ovarian cycle

Follicular phase: 1-14. days

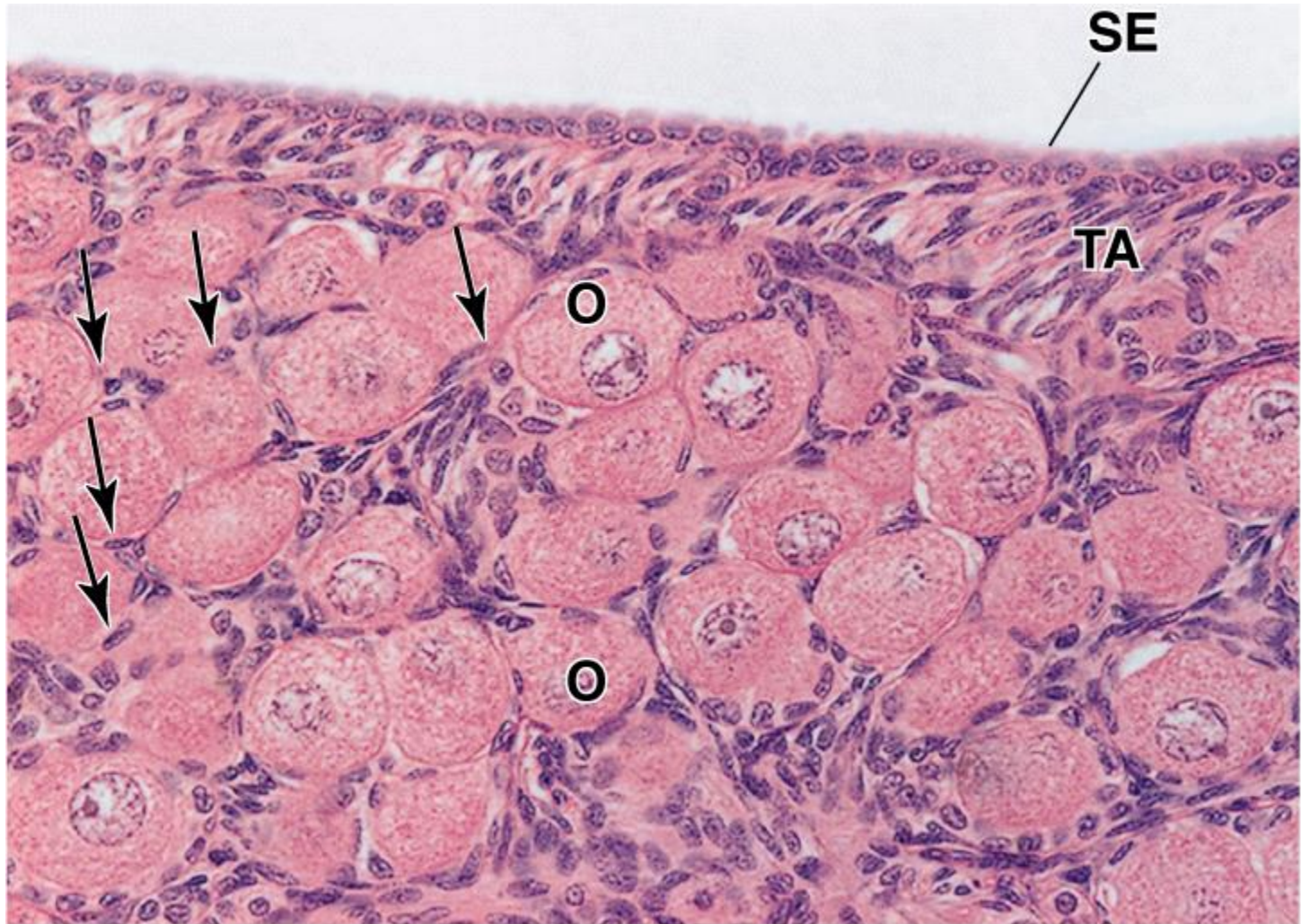
- Activation of some follicles
- Selection of the dominant follicle



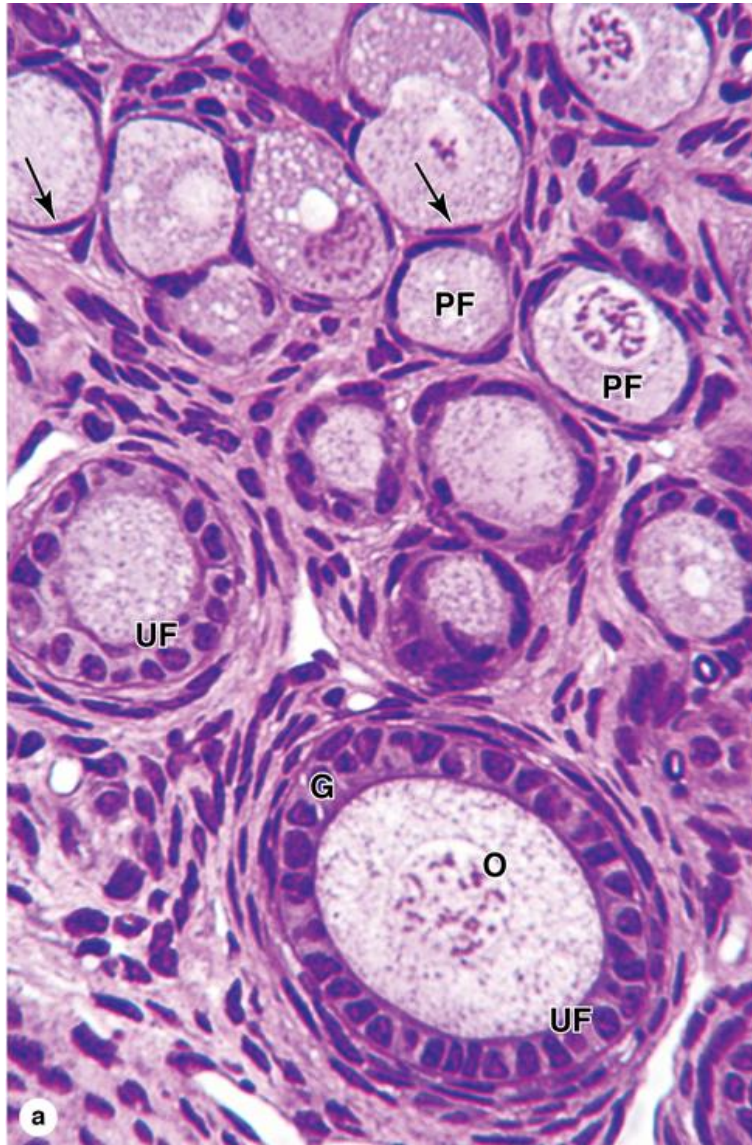
Luteal phase: 15-28. days

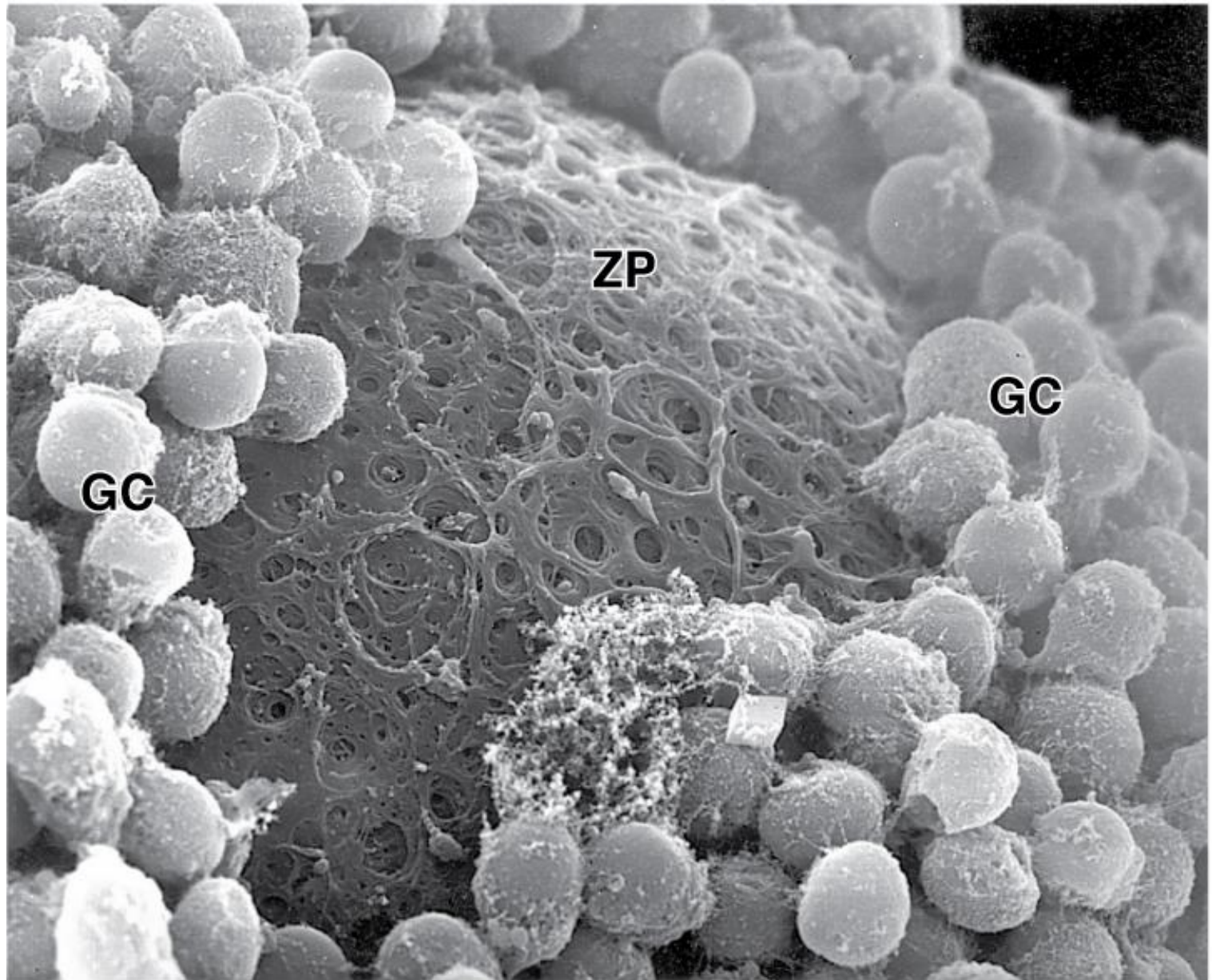


Primordial follicles

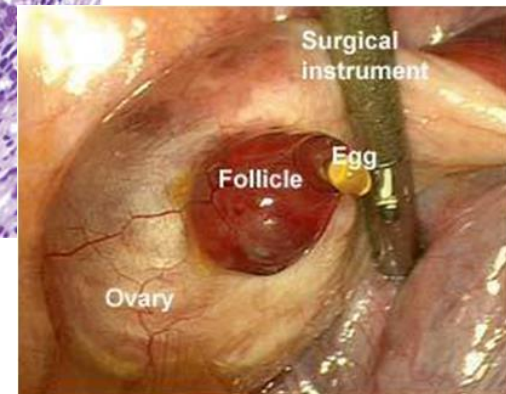
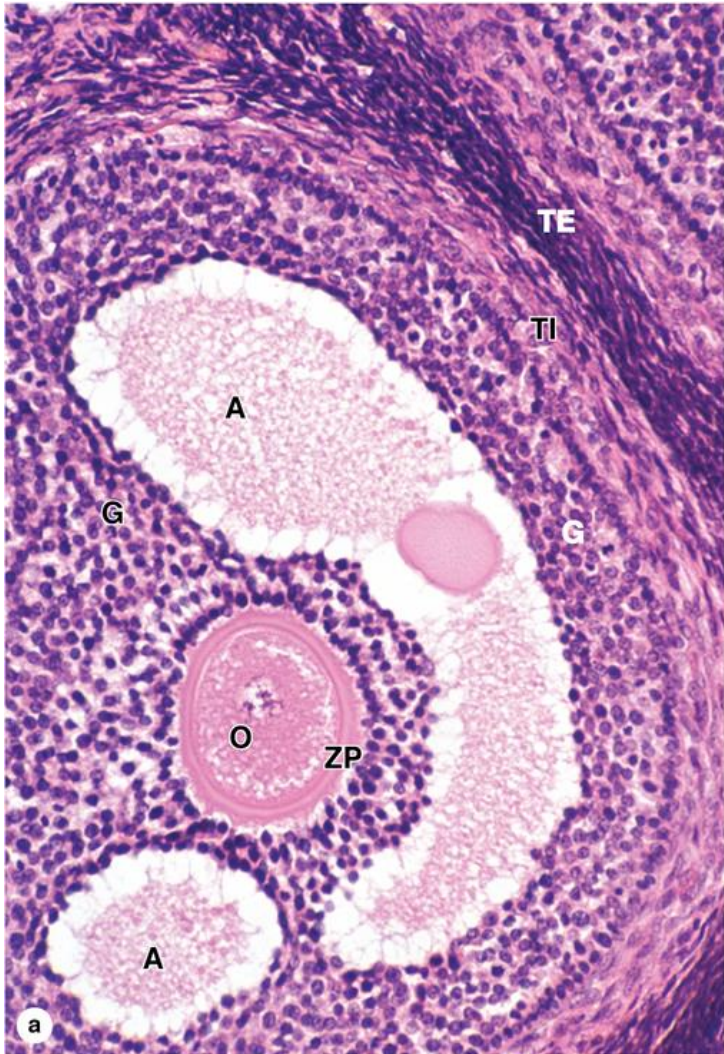


Primary follicles





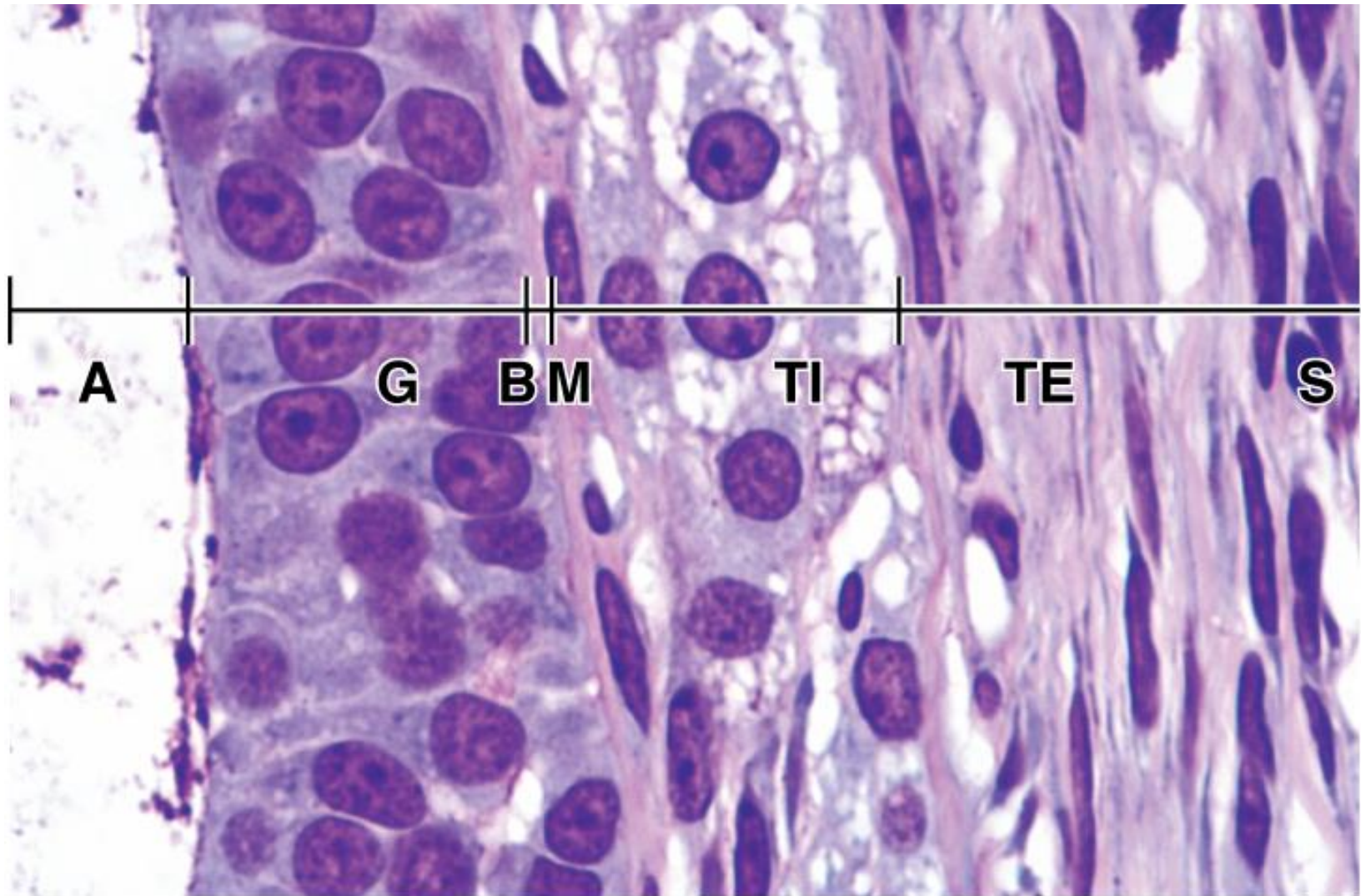
(a) Secondary and (b) matured (tertiary, preovulatory or Graafian) follicles



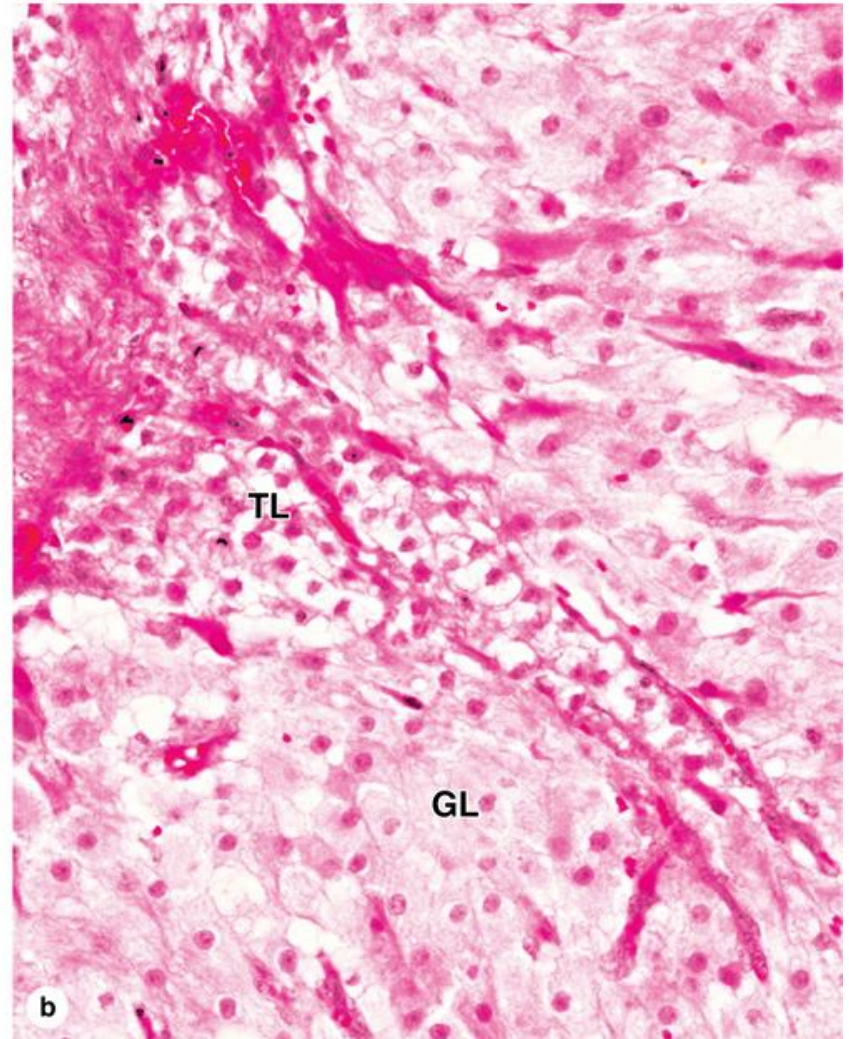
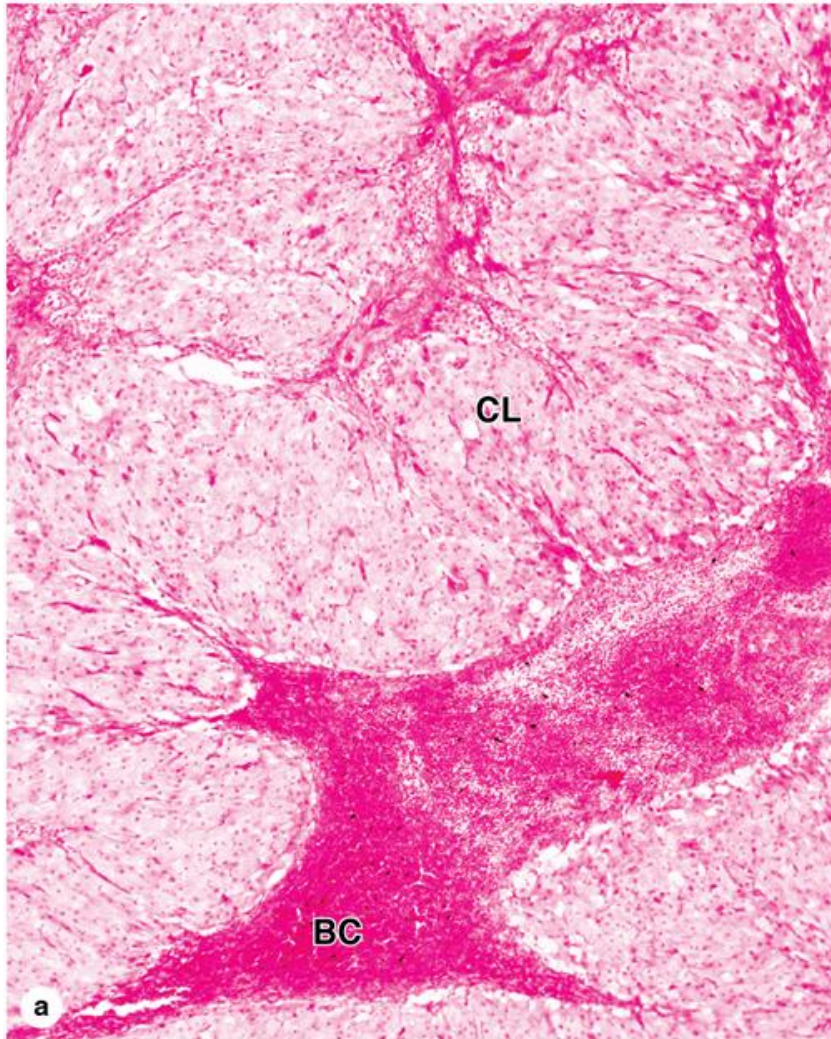
• 3-4 cm, oocyte: ~150 μm

• stigma

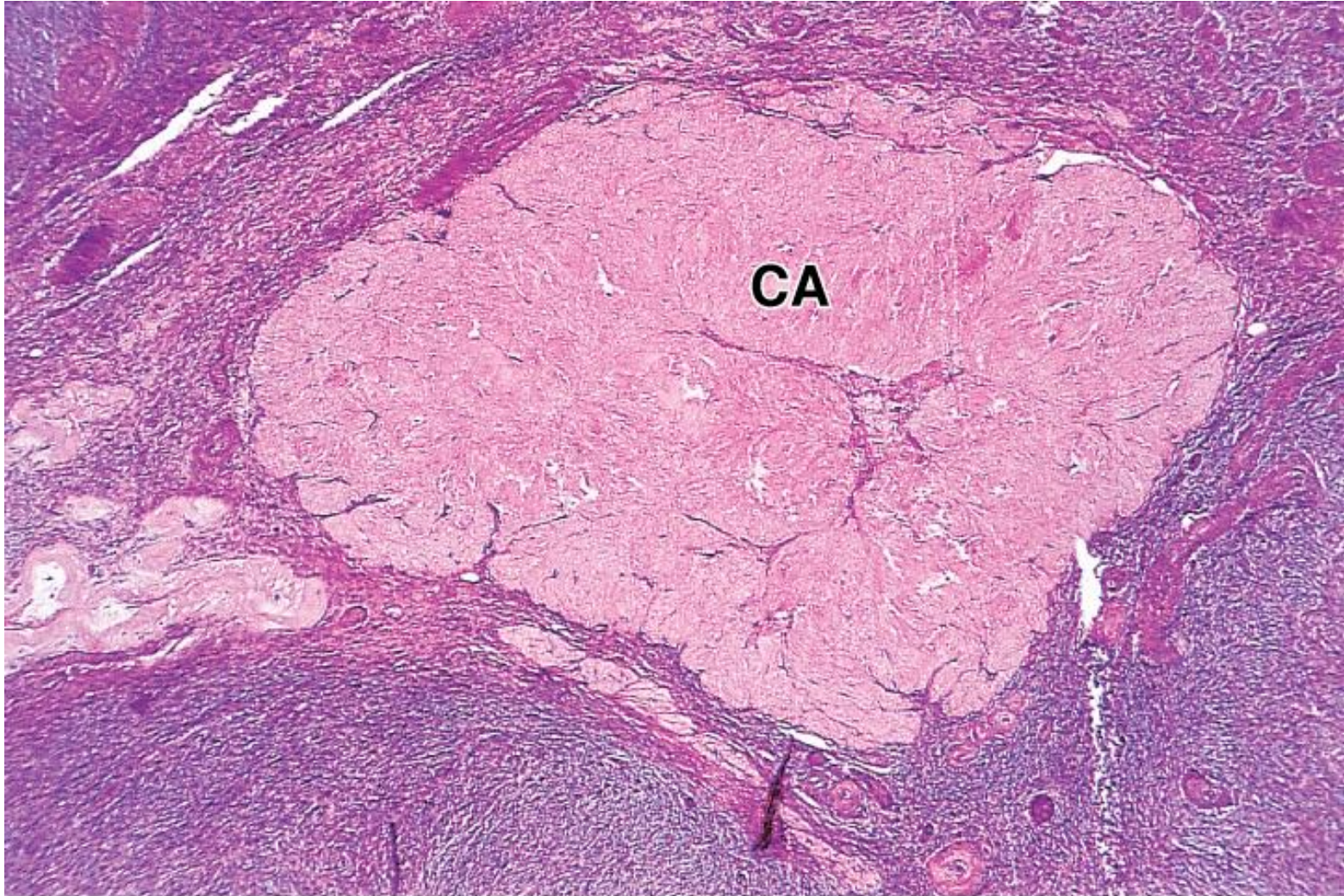
Wall of antral follicle



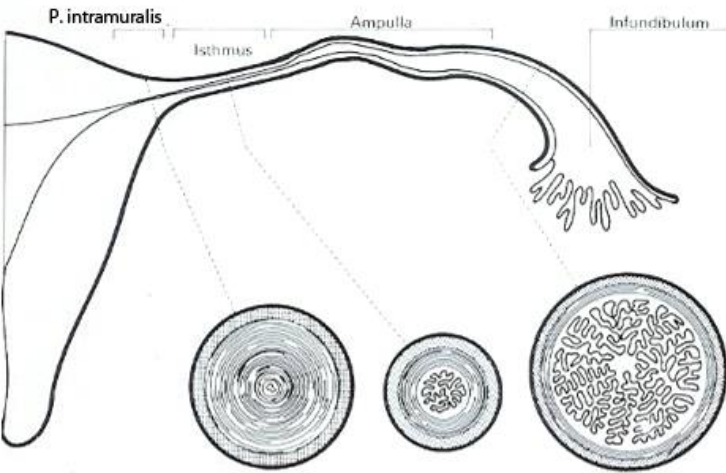
Corpus luteum



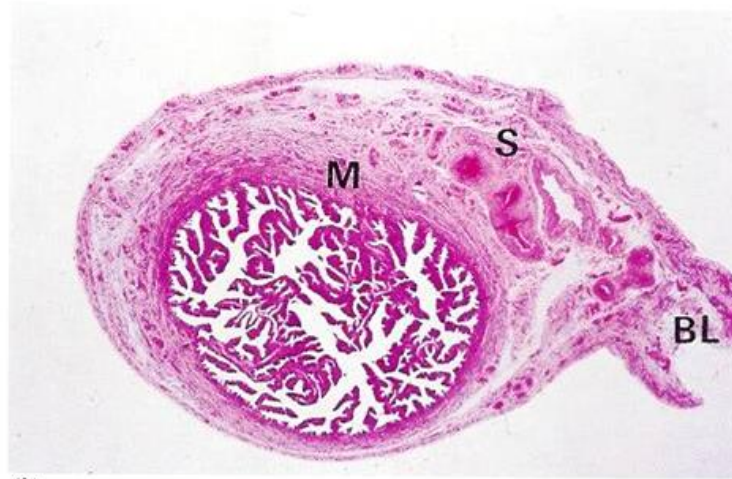
Corpus albicans



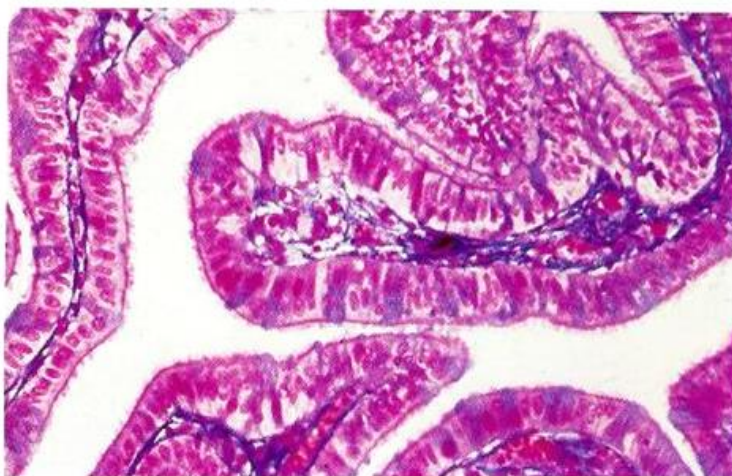
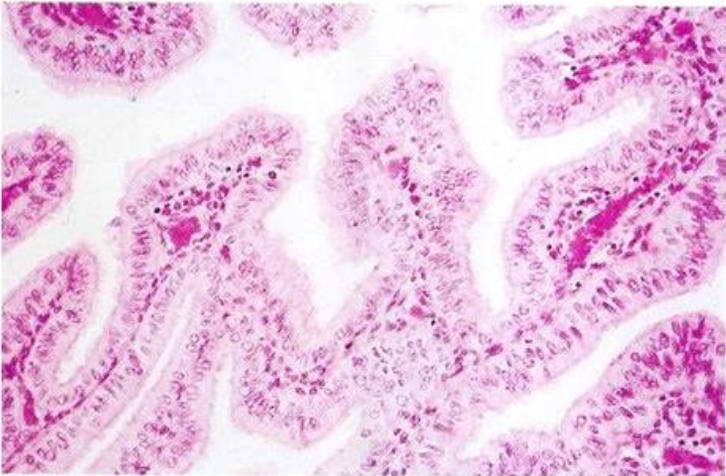
Uterine tube - histology



(a)



(b)

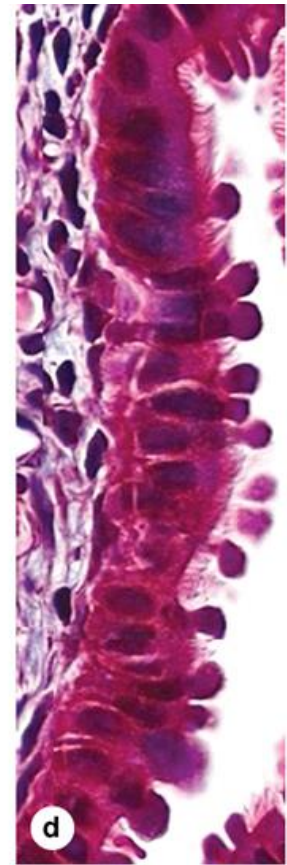
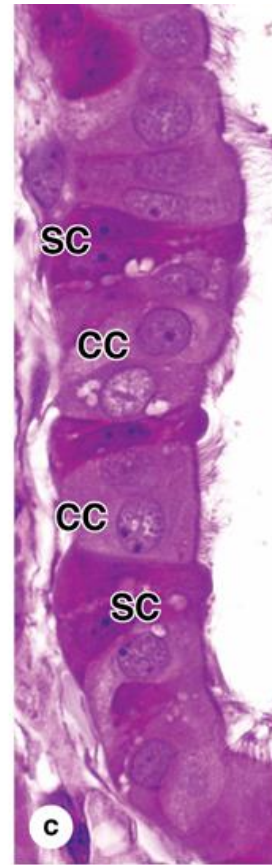
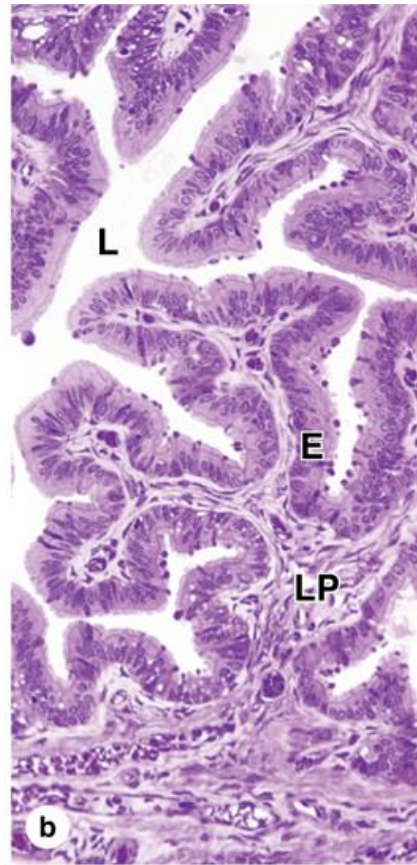
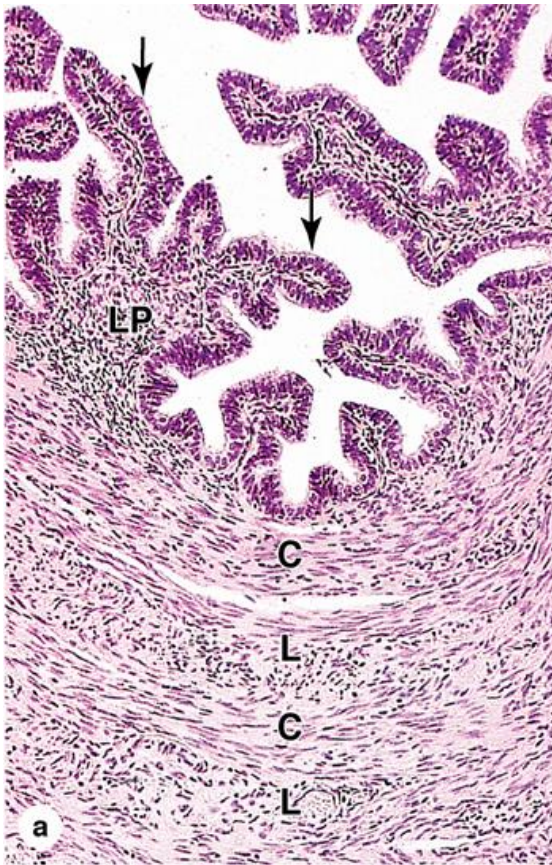


T. mucosa: long folds, simple cuboidal epithelium (kinocilia – beat toward the uterus), secretory cells, peg cells.

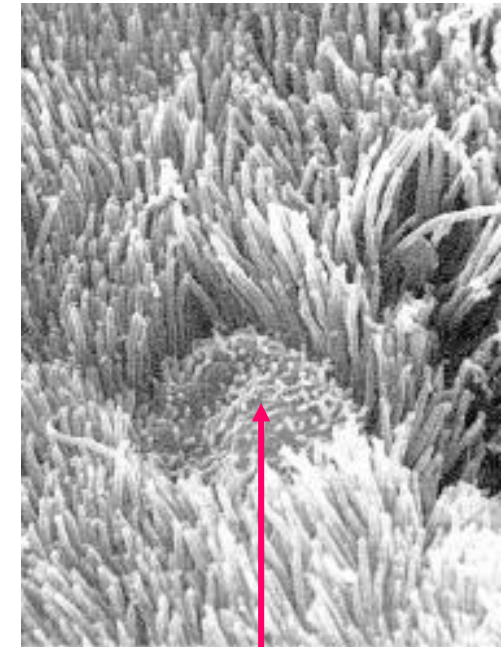
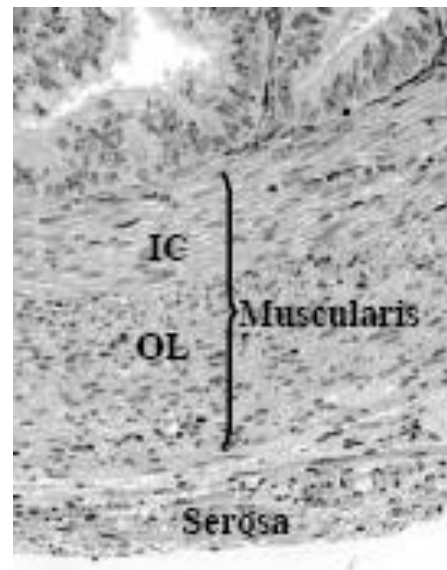
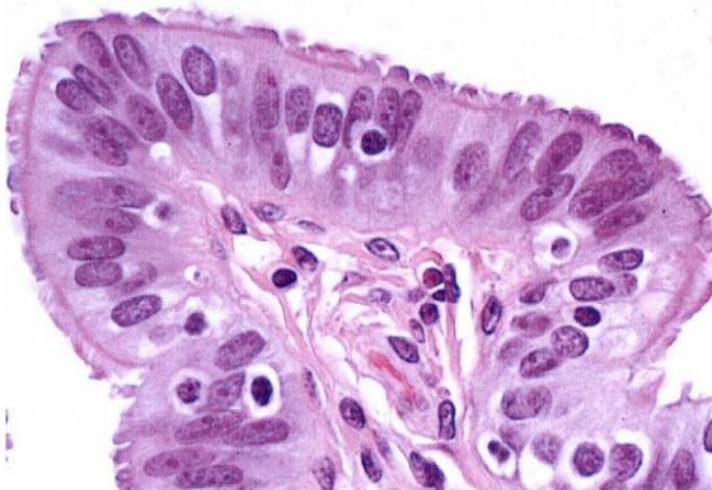
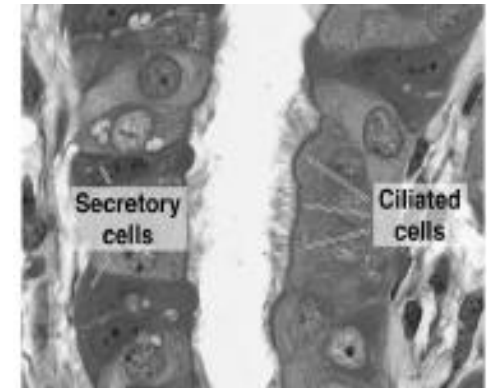
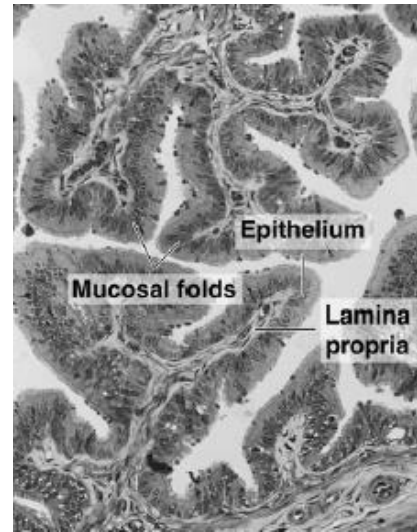
T. muscularis: own (inner circular, outer longitudinal), perivascular, subperitoneal.

T. serosa, subserosa: rich in vessels.

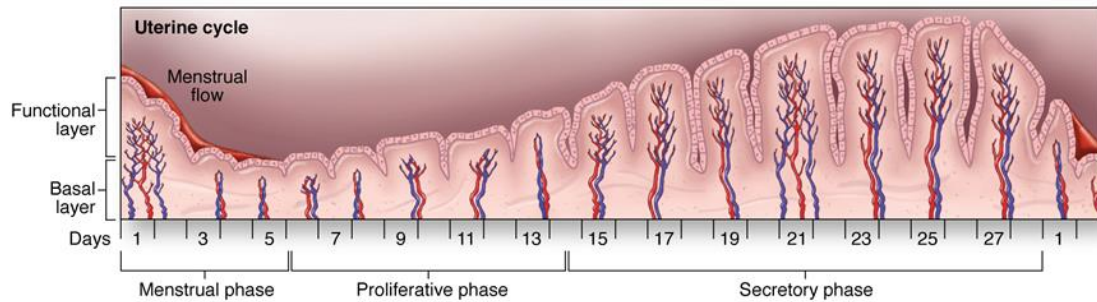
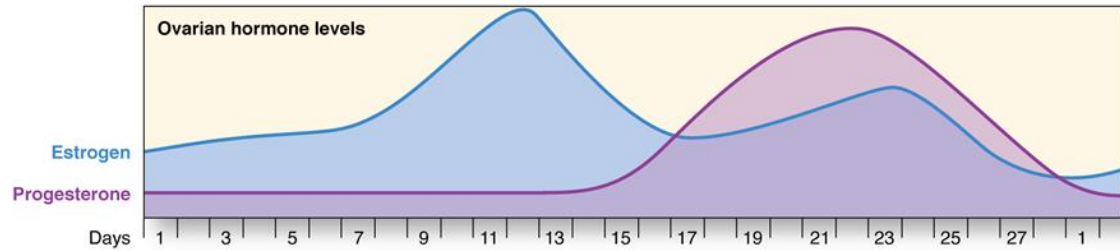
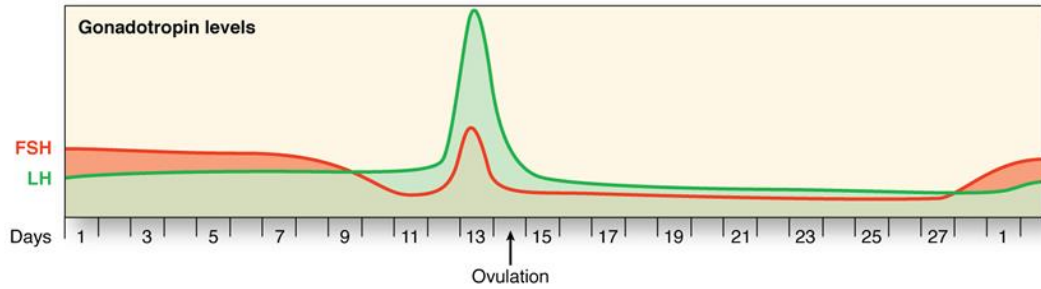
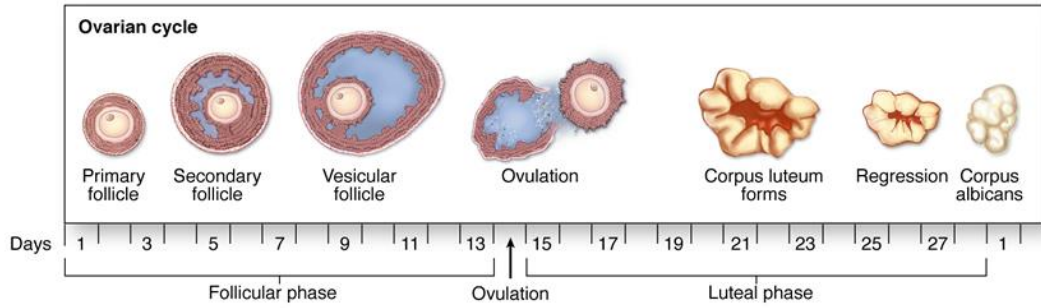
Uterine tube - histology



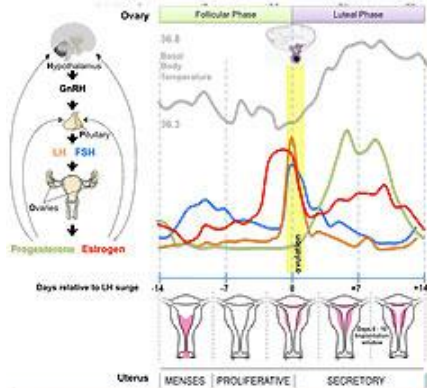
Uterine tube - histology



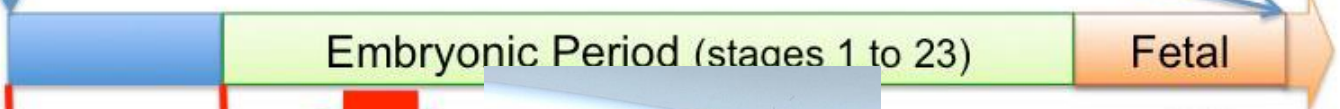
PEG cell



Human Development Timeline



Menstrual cycle

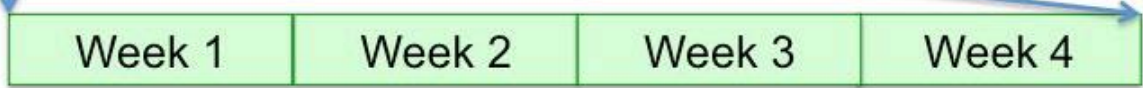


Last Menstrual Period

Fertilization Positive



Fertilization



Events

- zygote
- morula
- blastocyst
- implantation
- blastocyst hatching
- bilaminar
- trilaminar
- gastrulation
- folding
- somitogenesis
- cardiogenesis
- neurogenesis
- placodes