Female Reproductive System

Reproductive Block

At the end of this lecture, the student should be able to describe the microscopic structure of :
By the end of the lecture you should be able to:

- ✓ Describe the histological structure and fate of ovarian follicles.
- ✓ Describe the histological structure of:
  - Ovary.
  - Oviducts (Fallopian tubes).
  - Uterus.
  - Vagina.
  - Placenta.
  - Resting and lactating mammary gland.

جامعة الملك سعود
King Saud University

MED 434 ICINE

HISTOLOGY 434

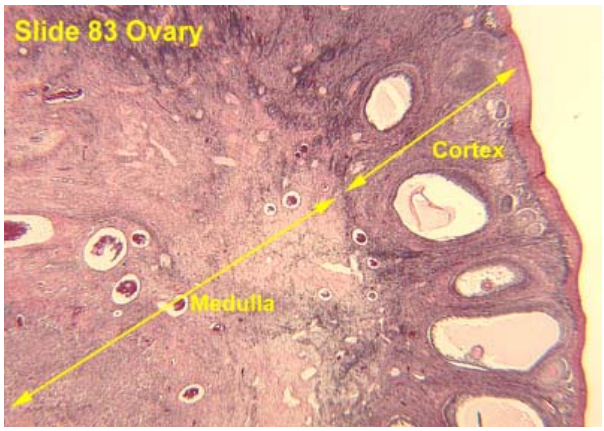
Female Reproductive System

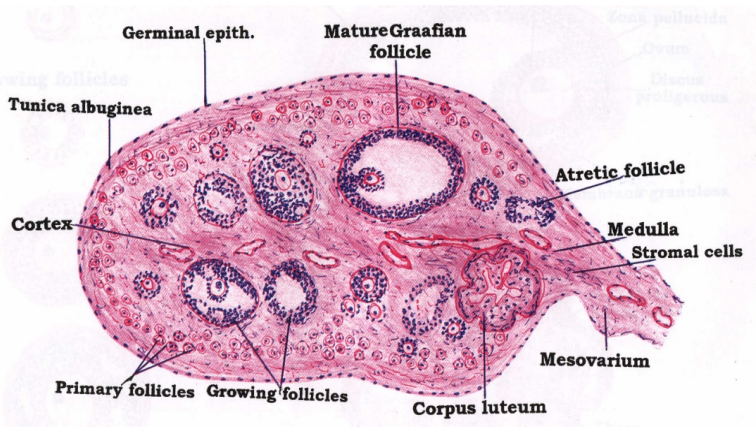
Primary sex organs:
2 ovaries

Secondary sex organs:
2 Fallopian tubes
Uterus.
Vagina
External genitalia
2 mammary glands.

Adult Ovary

1-Germinal epithelium: outer layer of flat cells.
2-Tunica albuginea: dense C.T layer.
3-Outer cortex: ovarian follicles and interstitial cell
4-Inner medulla: highly vascular loose C.T.



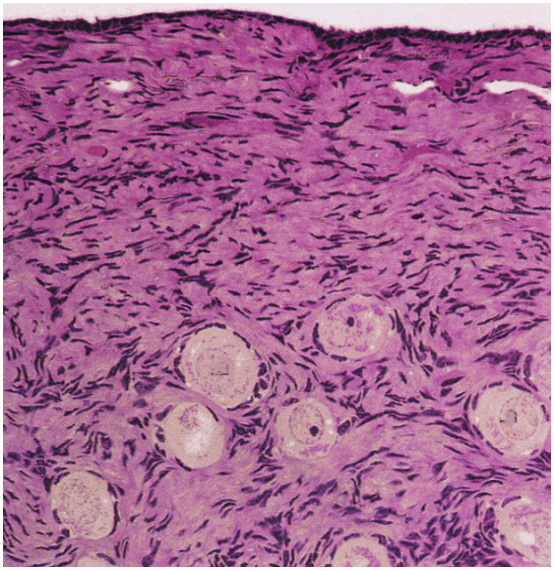


Ovarian Follicles

- Primordial follicles
- Primary follicles
  - Unilaminar
  - Multilaminar
- Secondary (antral) follicles
- Mature Graafian follicles

1. Primordial Follicles

- The ONLY follicles present before puberty.
- The earliest and most numerous stage.
- Located superficially under the tunica albuginea.
- Each is formed of a primary oocyte (25 µm), surrounded by a single layer of flat follicular cells.



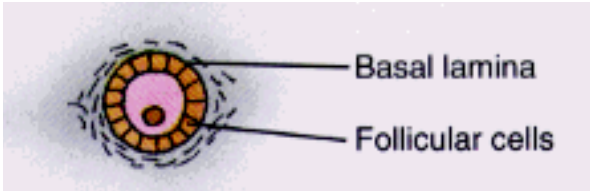
2. Primary Follicles

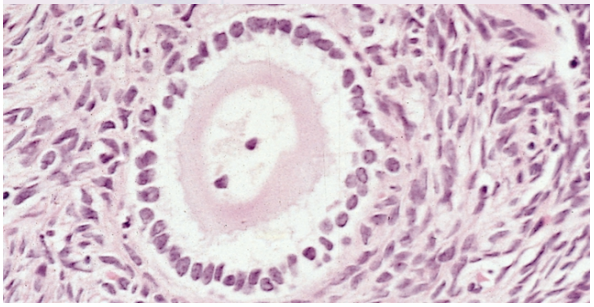
They develop from the primordial follicles, at puberty under the effect of FSH.

Unilaminar

are similar to primordial follicles, but:

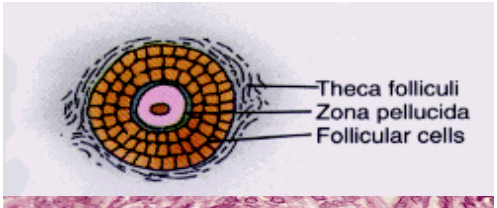
- the primary oocyte is larger (40 µm).
- the follicular cells are cuboidal in shape

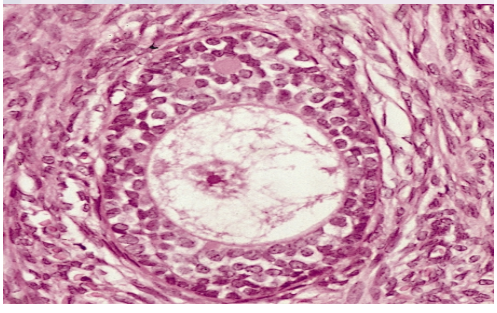




Multilaminar

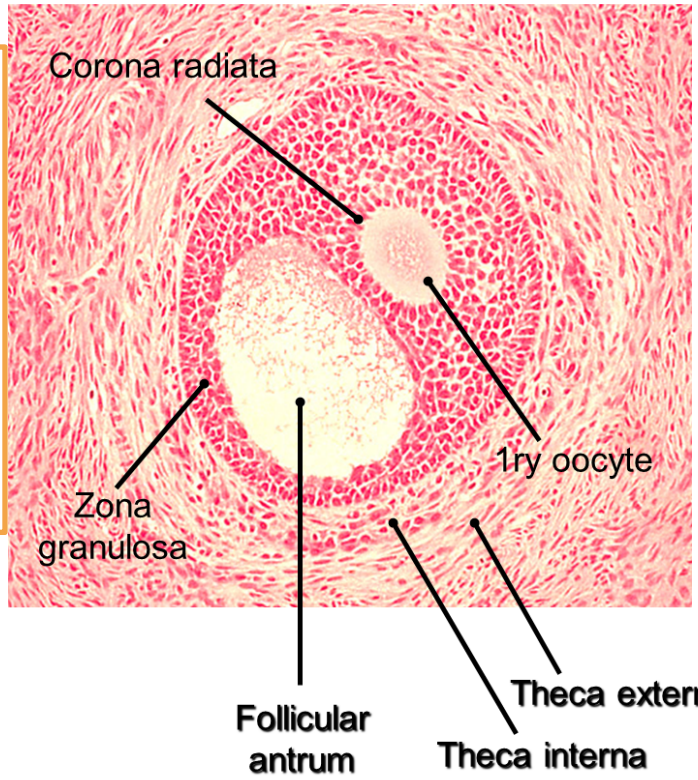
- 1ry oocyte larger
- corona radiata
- granulosa cells
- zona pellucida
- theca folliculi
- follicular fluid (liquor folliculi)





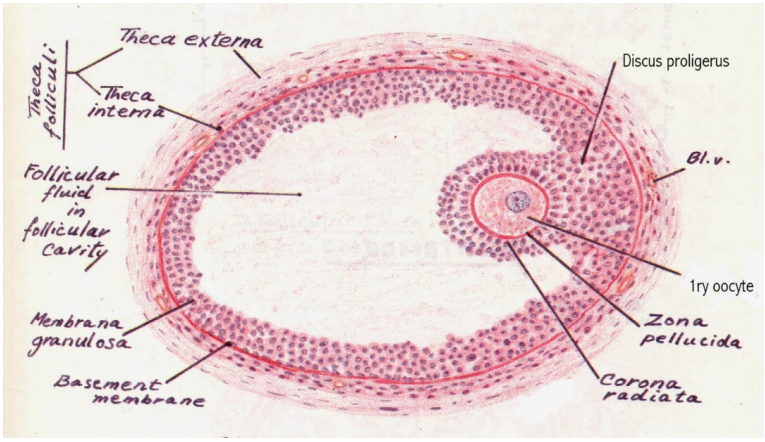
3. Secondary (Antral) Follicles

- Multilaminar primary follicles become secondary follicles when a complete antrum filled with liquor folliculi is formed.
- 1ry oocyte is larger & pushed to one side.
- Theca folliculi differentiates into theca interna and theca externa.



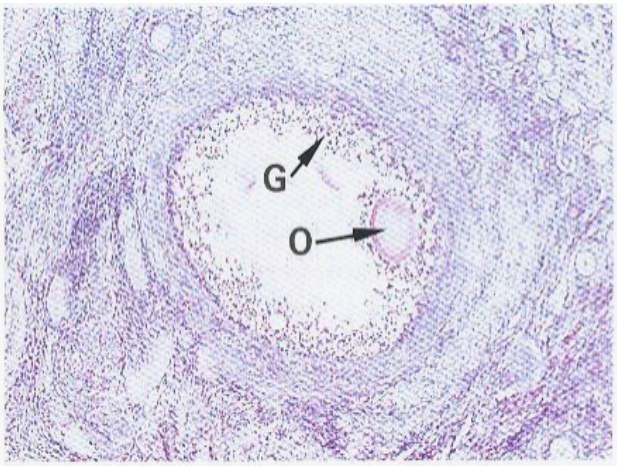
4. Mature (Graafian) Follicle

- large, thin walled
- wide follicular antrum
- large 1ry oocyte
- zona pellucida
- corona radiata
- cumulus oophorus
- zona granulosa
- basement membrane
- theca folliculi: theca interna & theca externa



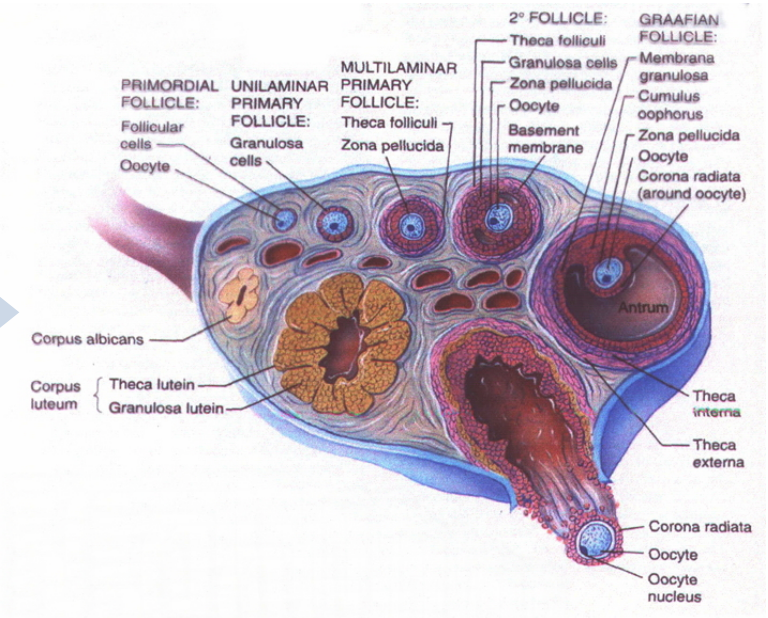
Atretic Follicles

During growth of the ovarian follicles, many of them do not reach maturation and they degenerate, and are finally replaced completely by fibrous tissue and are called atretic follicles or corpora atretica.



Ovulation & Corpus Luteum Formation

Ovulation occurs at day 14 of the cycle, under the effect of LH.
The follicle collapses and forms a corpus luteum.



Corpus Luteum

Zona granulosa becomes

Granulosa lutein cells

Theca interna becomes

Theca lutein cells.

Bleeding may occur

Corpus haemorrhagicum

Fertilization

Corpus luteum of pregnancy

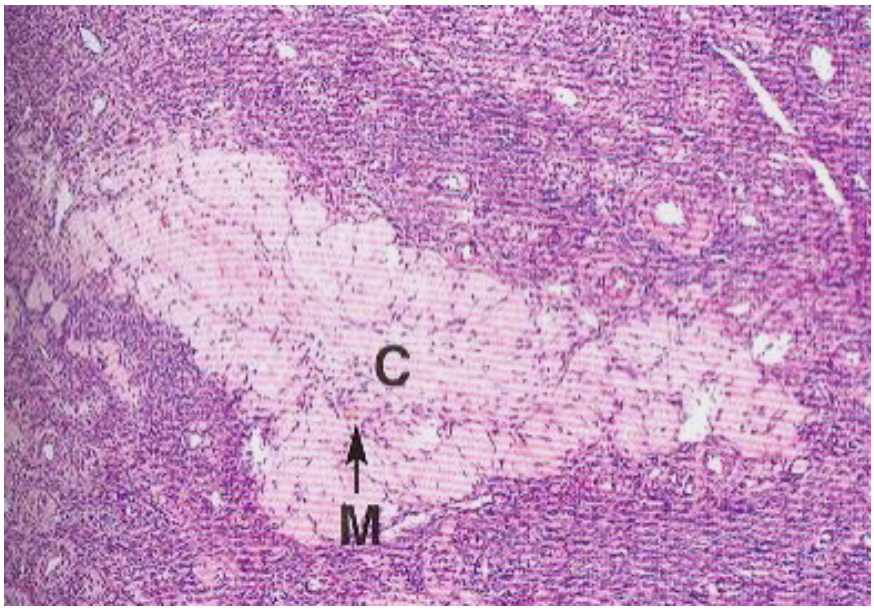
No fertilization

Corpus luteum of menstruation

- ✓ Corpus luteum of **menstruation** lasts about 10 days.
- ✓ Corpus luteum of **pregnancy** persists for six months.
- ✓ Fate of corpus luteum: formation of a white degenerated fibrous body, corpus albicans.
- ✓ Function of corpus luteum:
  - Granulosa lutein cells: secrete progesterone
  - Theca lutein cells: secrete estrogen.

Corpus Albicans

- It is a white degenerated fibrous body formed by involution of corpus luteum (degenerated corpus luteum).
- Secretory cells of corpus luteum degenerate and are phagocytosed by macrophages.

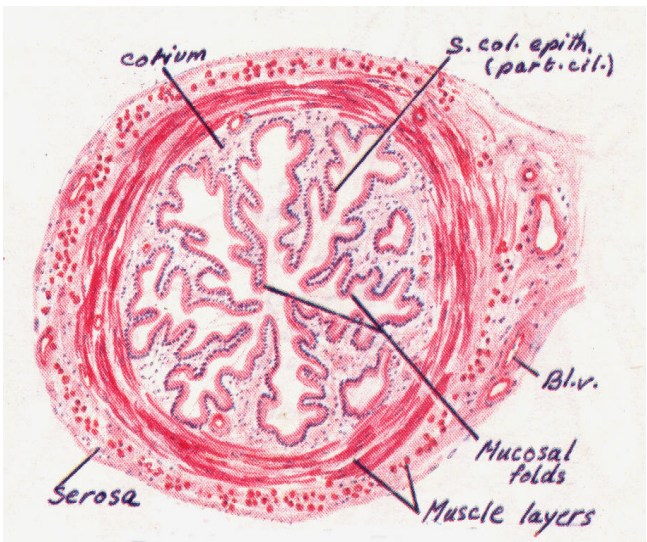


Oviducts (Fallopian Tubes)

From inside to outside :

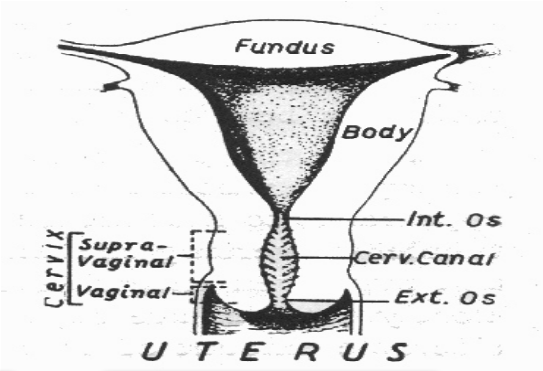
1- Mucosa	2- Musculosa	3- Serosa
❑Highly folded. ❑Epithelium: Simple columnar partially ciliated. ❑ Corium of C.T.	❑ Inner circular. ❑Outer longitudinal.	Because it's cover by peritoneum

1.Ciliated cells	▪ Non-secretory. ▪ Cilia beat toward uterus.
2.Non-ciliated cells	▪ Thinner, also called peg cells. ▪ Secretory cells. ▪ Apices bulge above ciliated cells. ▪ Their apices contain nutritive material to nourish gametes



UTERUS

- Thick-walled muscular organ.
- Inverted pear shape
- Divided into :



Fundus
rounded dome-shaped top of the body.

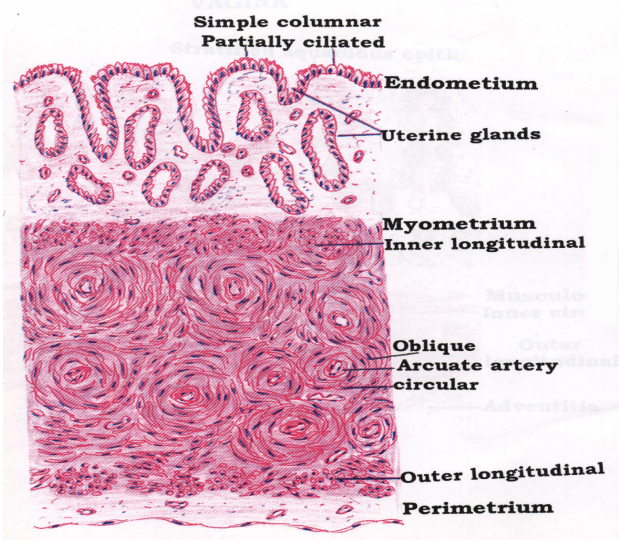
Body
upper 2/3.

Cervix
lower 1/3

Endometrium (mucosa)

Myometrium (musculosa)

Perimetrium (serosa)



Endometrium

Epithelium

- Simple columnar partially ciliated

Corium

- Endometrial glands: simple tubular.
- Stromal cells.
- Blood vessels.
- Leucocytes.
- Reticular fibers

Endometrium (Blood supply):

❑Two types of arteries derived from vessels in the myometrium:

Coiled arteries	Straight arteries
❑ Extend into the functional zone. ❑ cyclic changes.	❑ Terminate in basal zone. ❑ No cyclic changes

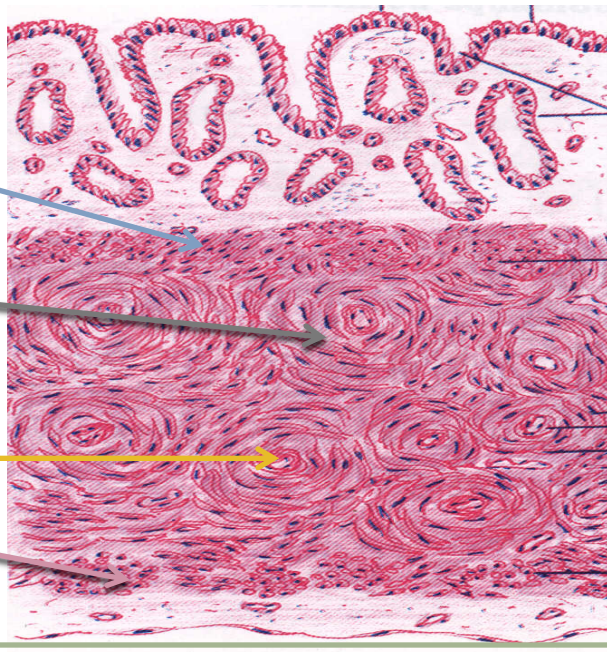
Myometrium:

❑3 ill-defined smooth muscle layers:

✓ Stratum submucosum: longitudinal

✓ Stratum vasculare: circular smooth muscle fibres in figure of 8 arrangement around large blood vessels.

✓ Stratum supravasculare longitudinal.

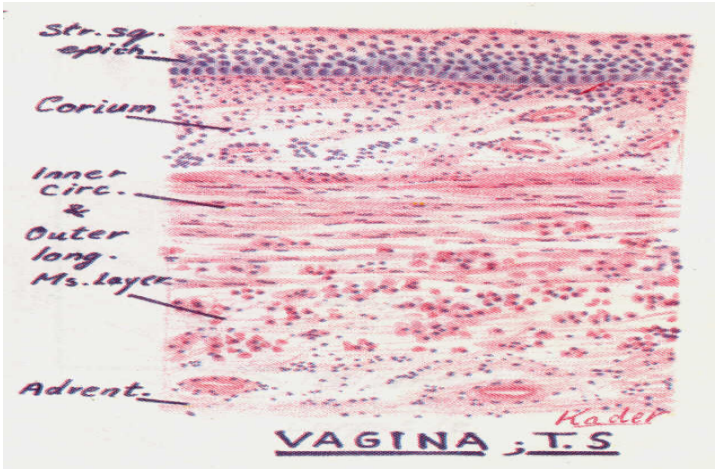


Uterine Cervix :

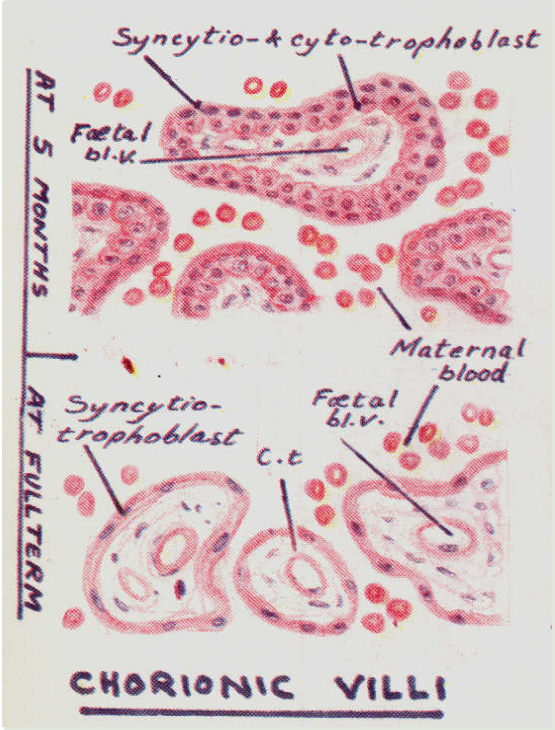
Mucosa	Substance of the cervix
❑Epithelium: Simple columnar in the cervical canal but it changes to stratified squamous epith. (non-keratinized) at the external os. ❑**Corium:** CT containing tubulo-alveolar glands	Dense fibrous tissue with few smooth muscle fibers

VAGINA

Mucosa	Musculosa	Adventitia
shows transverse folds and is made of: 1 - Epithelium: ✓ stratified squamous epithelium non-keratinized ✓ rich in glycogen *glycogen to feed the bacteria there (normal flora) and prevent any infection* 2 - Corium: ✓ Dense C.T. ✓ very rich in blood vessels, elastic fibres and leucocytes	✓ Formed of interlacing inner circular and outer longitudinal layers of smooth muscle fibres.	✓ Formed of loose C.T.



PLACENTA

Maternal part (decidua basalis)	Foetal part (chorionic villi)
	✓ Finger-like projections separated by intervillous spaces containing maternal blood. ✓ Each chorionic villus consists of: ❑ Mesenchymal CT core containing fetal blood vessels. ❑ Epithelial covering (trophoblast), made of 2 layers: 1 - Outer syncytiotrophoblast: deeply stained with NO cell boundaries. 2 - Inner cytotrophoblast: disappears late in pregnancy

Placental Barrier: Protect the fetus

It is the barrier between the maternal and foetal blood. It consists of:

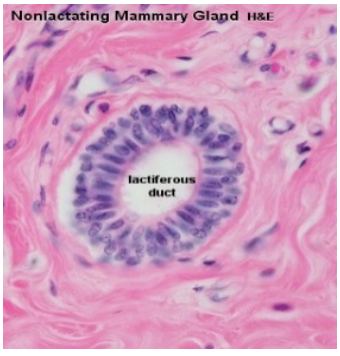
1. The trophoblast covering the villus.
2. The basement membrane of the trophoblast.
3. The C.T. core of the villus.
4. The basement membrane of foetal capillaries.
5. The endothelium of foetal capillaries.

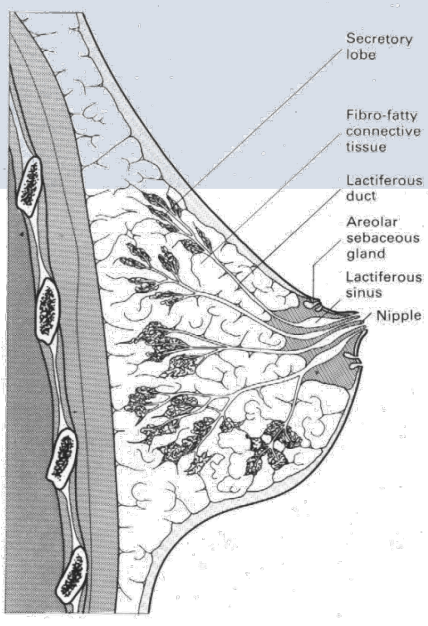
MAMMARY GLAND

❑ At puberty they enlarge by accumulation of fat, but contain only a duct system.

❑Secretory units appear only during pregnancy and are functioning only during lactation.

Resting Mammary Gland	Lactating Mammary Gland:
✓ It is divided into lobes and lobules. ✓ The interlobular C.T. is dense and contains numerous fat cells. ✓The intralobular C.T. is loose and contains no fat cells. ✓ Within the lobules, there are widely separated ducts lined by simple cuboidal epithelium. ✓Ducts collect to form lactiferous ducts lined by stratified columnar epithelium and open at the top of the nipple.	✓ Interlobular and intralobular C.T. become reduced. ✓ Lobules are made of ducts and alveoli. ✓ Alveoli are distended with milk and lined by cuboidal or flat cells surrounded by myoepithelial cells. ✓ Milk appears acidophilic with vacuoles of dissolved fat.





MCQs

1- Which of the following will disappear in pregnancy

A- Outer syncytiotrophoblast.

B- Inner cytotrophoblast.

C- trophoblast.

2- which of the followings corisum's contain tubuloalveolar gland :

A- vagina.

B- body of uterus.

C- Uterine Cervix

3- Corpus luteum of menstruation last for :

A – 7 months

B – 6 months

C- 10 days.

Answers:

1- B

2- C

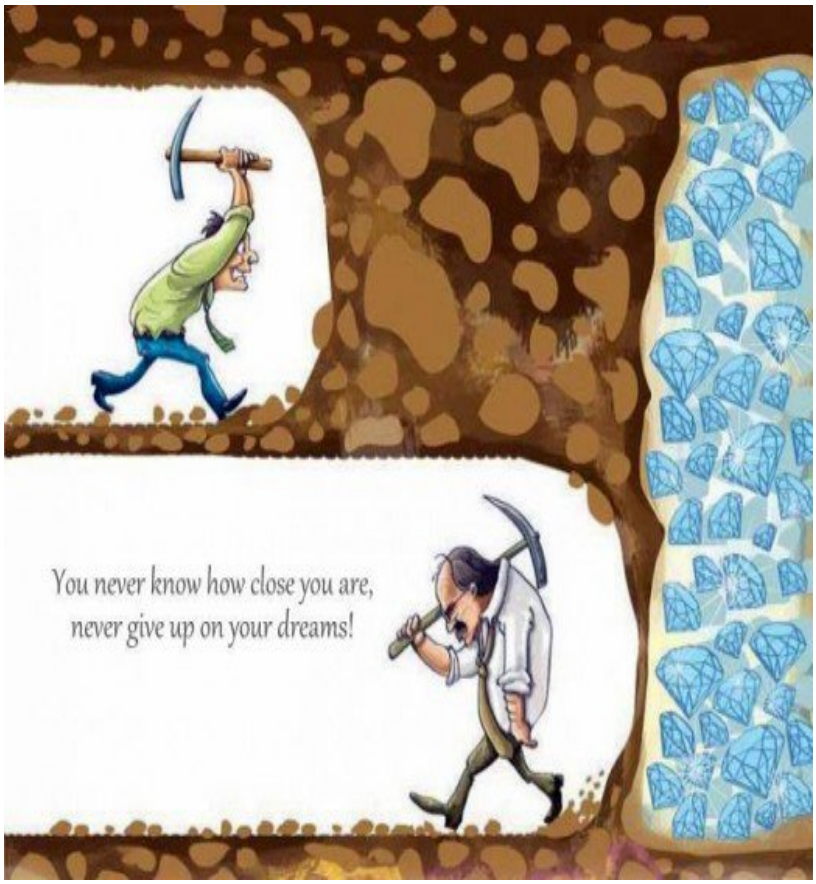
3- C

Motivation Corner

Done By:

Lina Aljurf

Nada Alamri



Thank you for checking our work

For any correction, suggestion or any useful information do not hesitate to contact us: **Histology434@gmail.com**