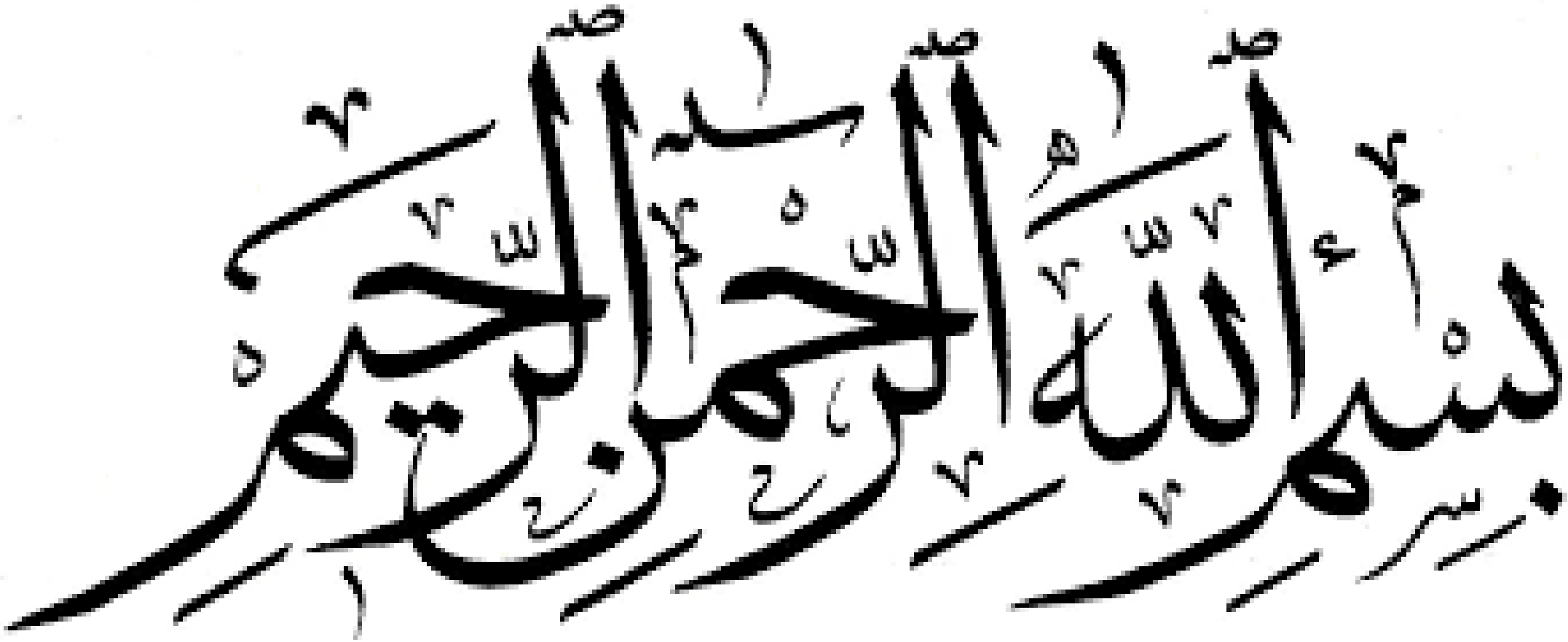
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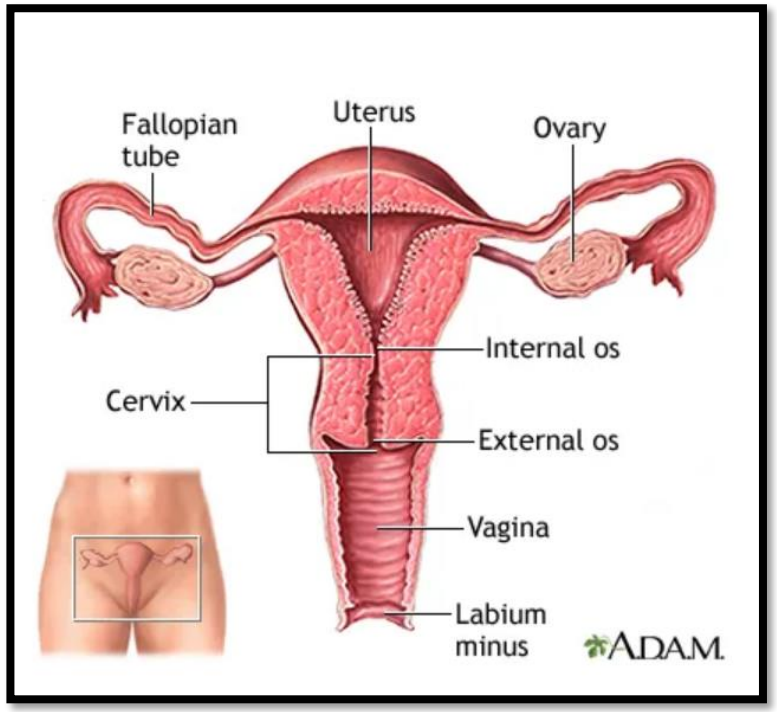
Female genital system



THE FEMALE GENITAL SYSTEM

This system includes:

A-Primary sex organ:

-Ovaries

B-Secondary sex organs:

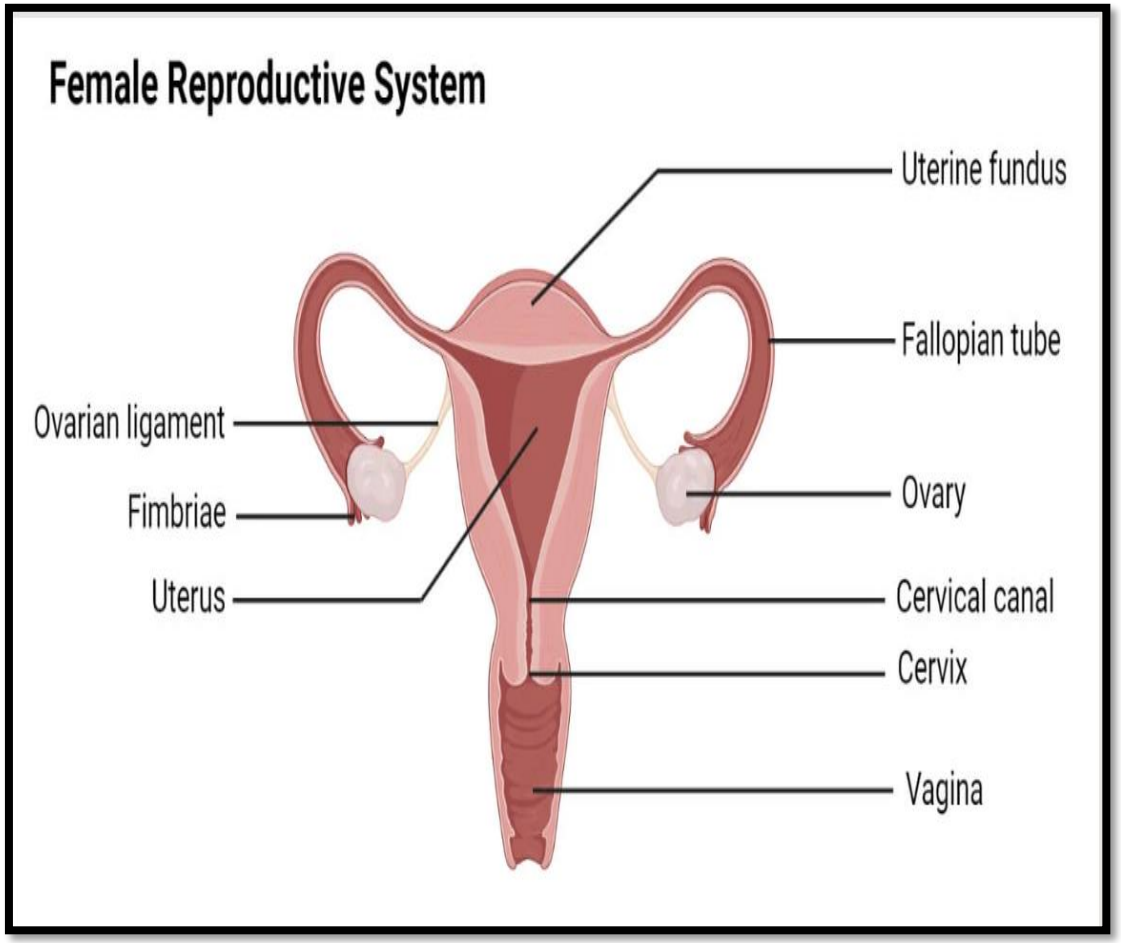
-Fallobian tubes.

-Uterus.

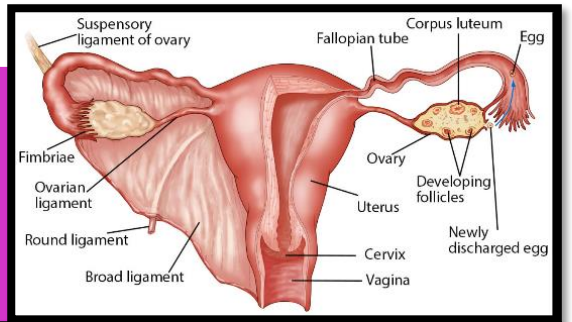
-Vagina.

-External genitalia.

-Mammary glands.



THE FALLOPIAN TUBE



Definition:

It is a highly mobile tube extending between the ovary and uterus.

Length: about 12 cm.

Histological structure:

A- Mucosa:

It is highly folded, branching and anastmosing.

1- Epithelium:

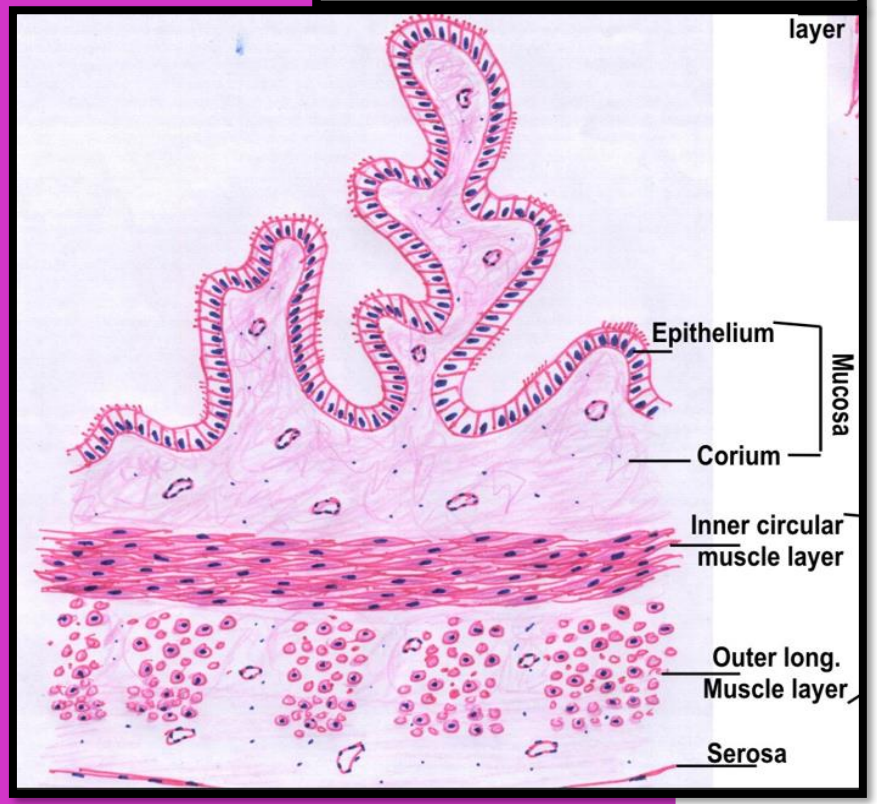
Simple columnar partially secretory and partially ciliated.

The cilia move the ovum toward the uterus.

The secretory cell secretes nutrients to the ovum.

2- Corium:

Loose connective tissue rich in blood vessels.



B- Muscle layer:

It consists of inner circular and outer longitudinal layers of smooth muscle fibres.

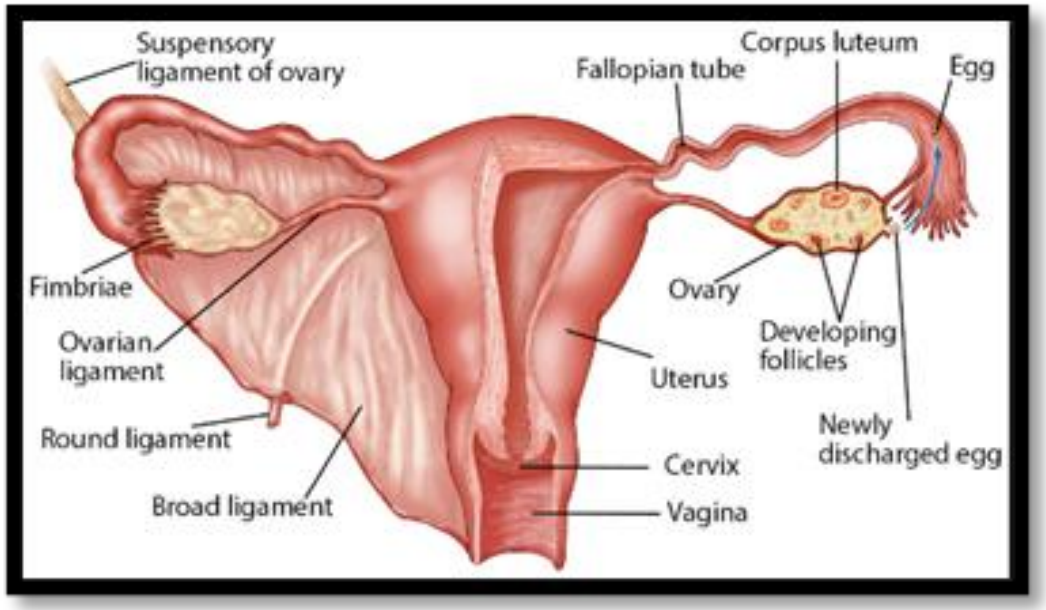
C- Serosa:

a layer of loose C.T. covered with a layer of simple squamous mesothelial cells.

Uterus

Anatomy:

- It is pear-shaped with thick wall and flat lumen.
- It is formed of a larger body, and smaller cervix.
- Its upper dome shaped part is called the fundus.



Uterine Wall

- **Endometrium**
- **Myometrium**
- **Perimetrium**

Uterus

Histological structure:

A- Endometrium (mucosa):

It is smooth with no folds.

1- Epithelium:

- **Simple columnar partly ciliated and partly secretory.**
- **Interrupted by the openings of uterine glands.**

2- Corium: (endometrial stroma):

Formed of reticular network which contains:

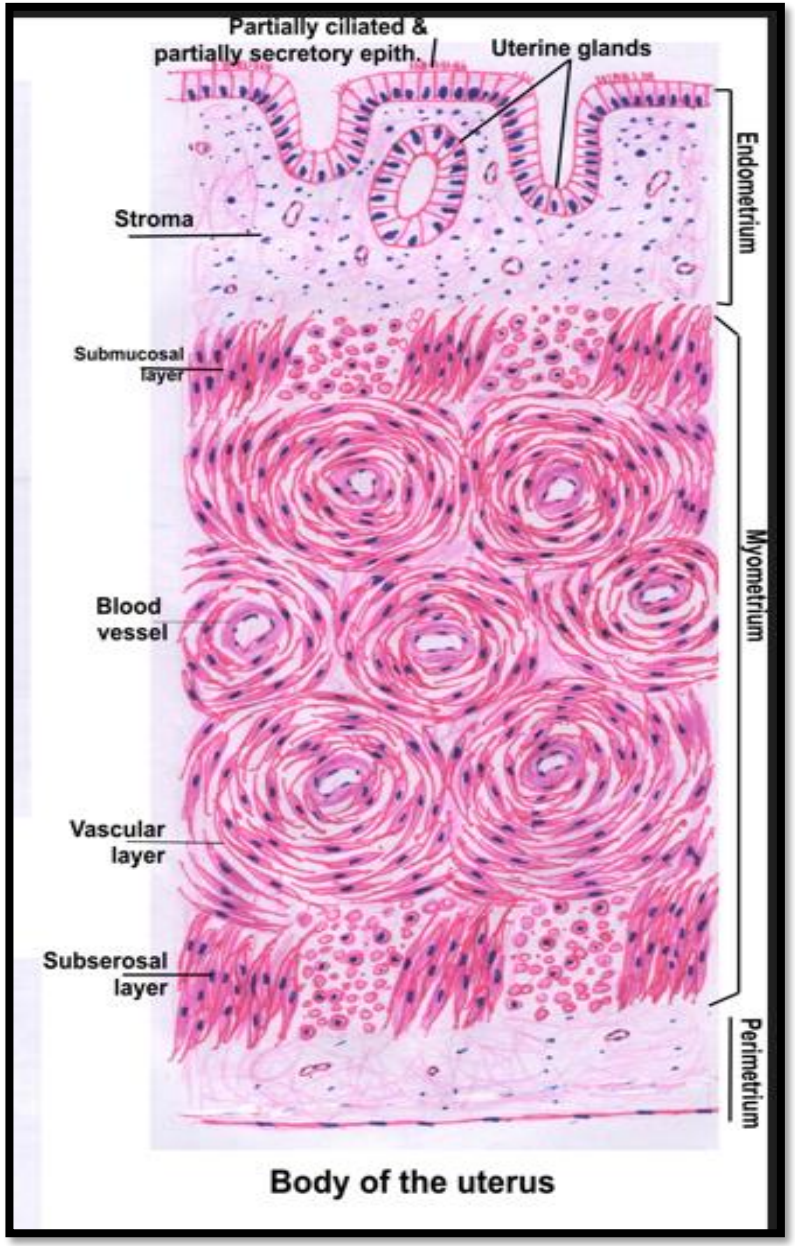
i. **Blood vessels.**

ii. **Decidual cells.**

Function: regulation immune activity and vascular remodeling of uterus

iii. **Leucocytes and phagocytic cells.**

iv. **Uterine glands Lined with columnar secretory cells.**



Body of the uterus

Uterus

B- Myometrium (musculosa):

It is formed of three layers of sm. m. fibres:

1. Submucosal (inner) layer:

Thin layer of oblique and longitudinal fibres.

2. Vascular (middle) layer:

Thick layer of ms fibers arranged in spiral manner around blood vessels to give "8" shape.

3. Supravascular (outer) layer:

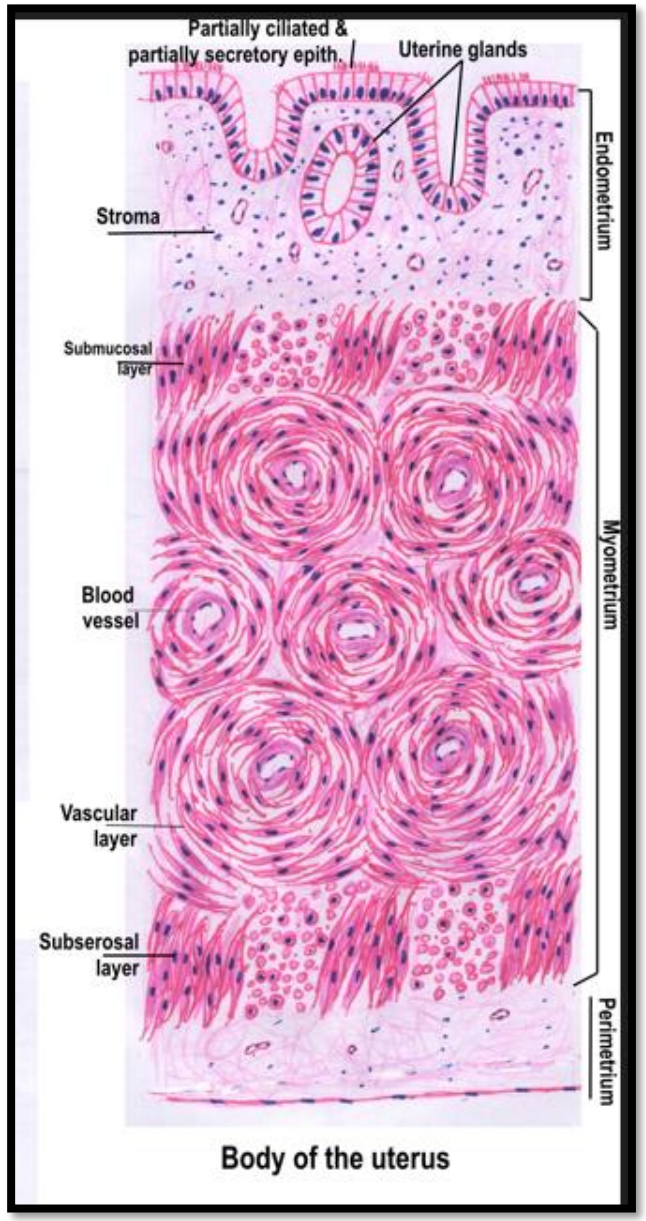
- Thin layer of oblique and longitudinal fibers.

During pregnancy the smooth muscle fibres increase in size and number.

After delivery, the uterus is reduced in size to be involuted after 72 hours.

C- Perimetrium (serosa):

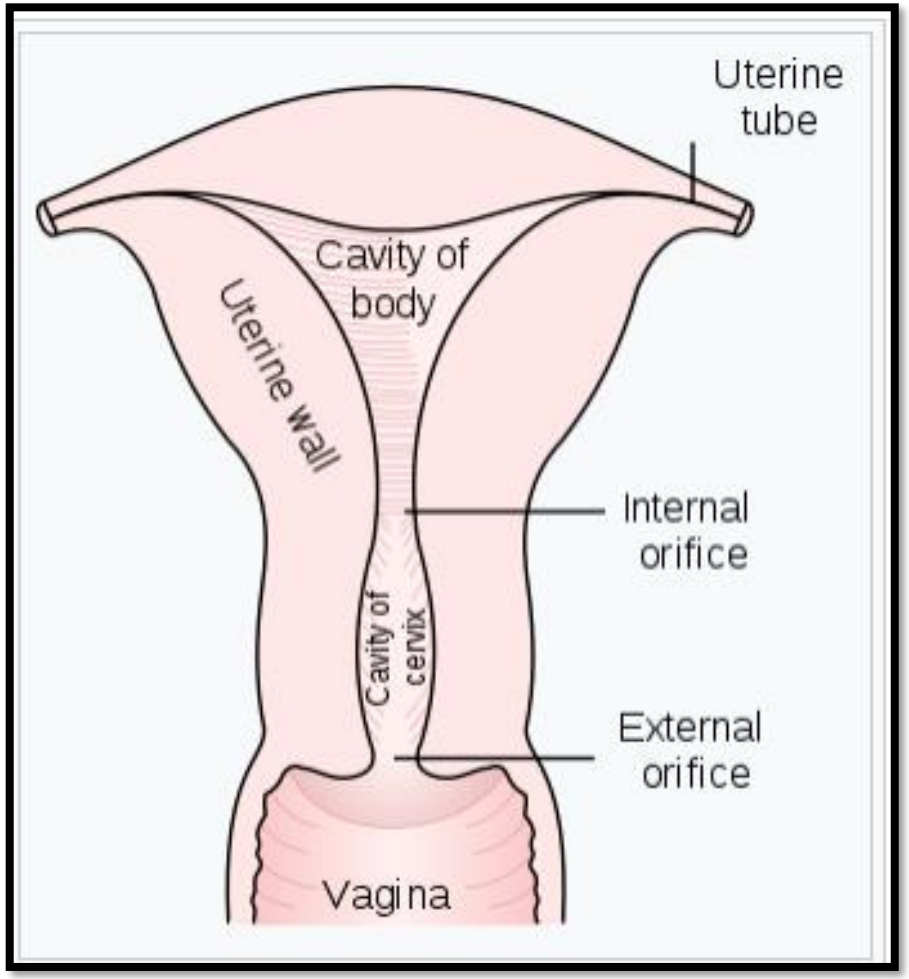
- Loose C.T containing blood vessels.
- Covered with simple squamous mesothelial layer.



Body of the uterus

The Uterine Cervix

- It is the lower segment of the uterus.
- Its lumen (the cervical canal) is narrow.
- It has a vaginal and supravaginal parts.



The Uterine Cervix

A-Mucosa:

It shows two longitudinal folds (anterior & posterior) and many transverse rugae.

1- Epithelium:

Simple columnar secretory at the internal os.

Stratified squamous at the external os.

2- Corium:

C.T containing branched tubulo-alveolar mucous secreting glands.

B-The substance of the cervix:

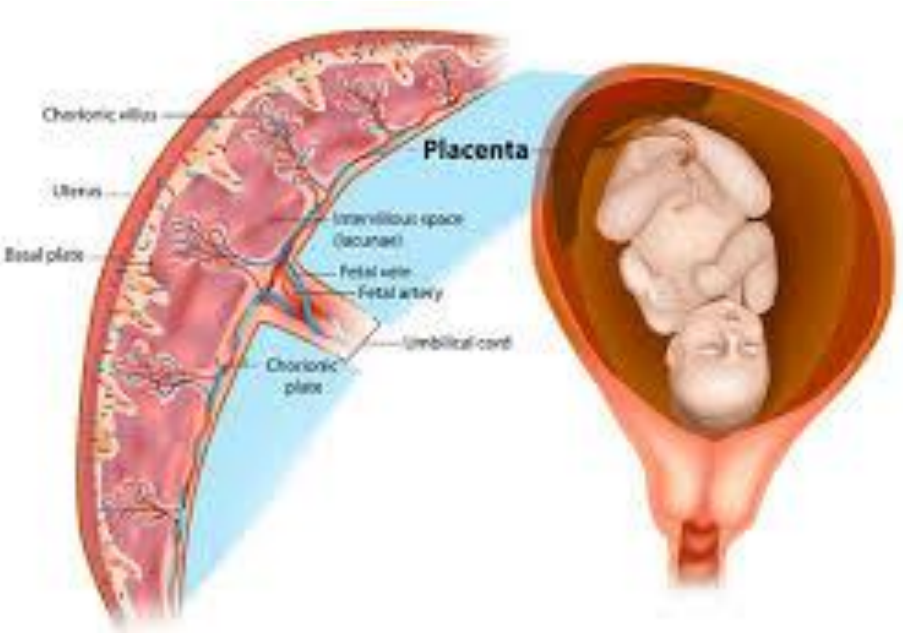
- Dense fibrous tissue.
- Few muscle fibers (15%).
- Rare elastic fibers.

During labour, the cervix becomes lax due to secretion of relaxin hormone by the ovary which leads to increase in the intercellular fluid and softening of the tissue of the cervix.

THE PLACENTA

It is a disc-shaped structure which is formed of:

Foetal part → **Maternal part**



A- Foetal part:

The trophoblasts, which cover the chorion, proliferate to form finger-like processes called ***chorionic villi***.

THE PLACENTA

Each chorionic villus consists of:

1- A central core:

Mesenchymal tissue containing foetal blood.

2- Epithelial covering (2 layers of trophoblast):

Cyto-trophoblast :

It is the inner pale layer.

Cubical cells with clear boundaries.

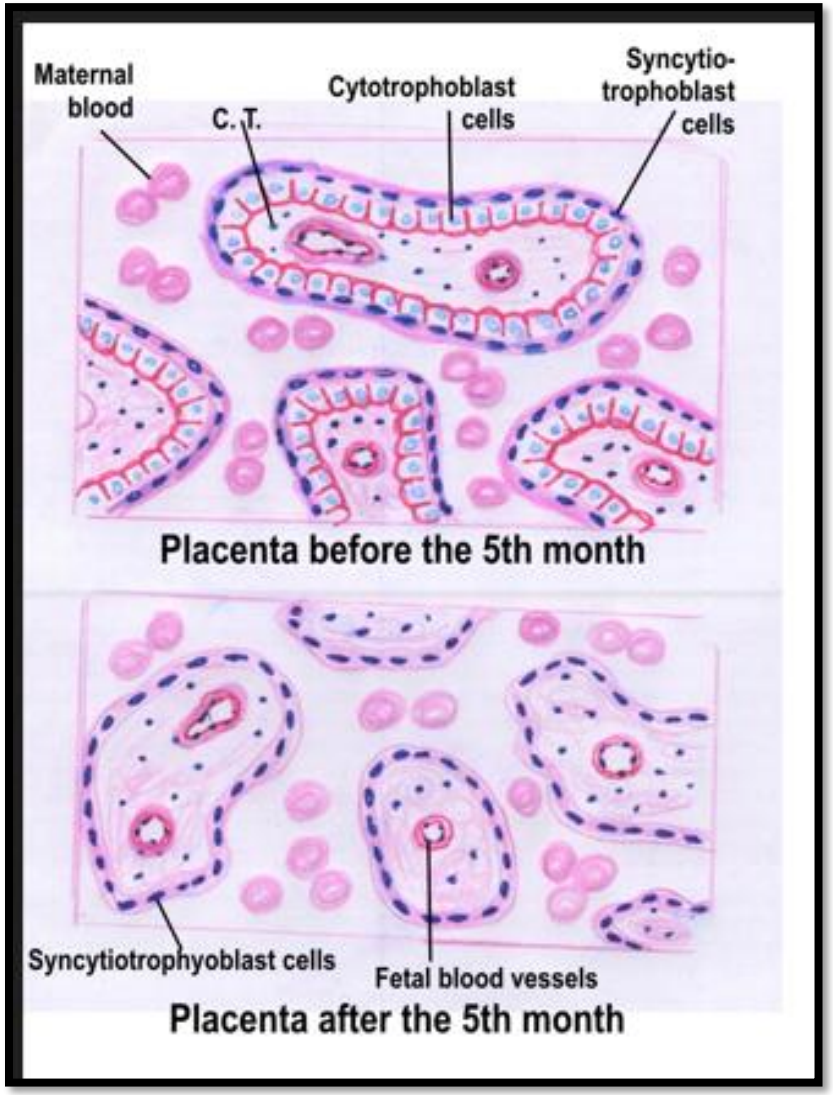
Syncytio-trophoblast:

It is the outer dark layer.

Have indistinct boundaries.

Show microvilli covered with fibrinoid coat.

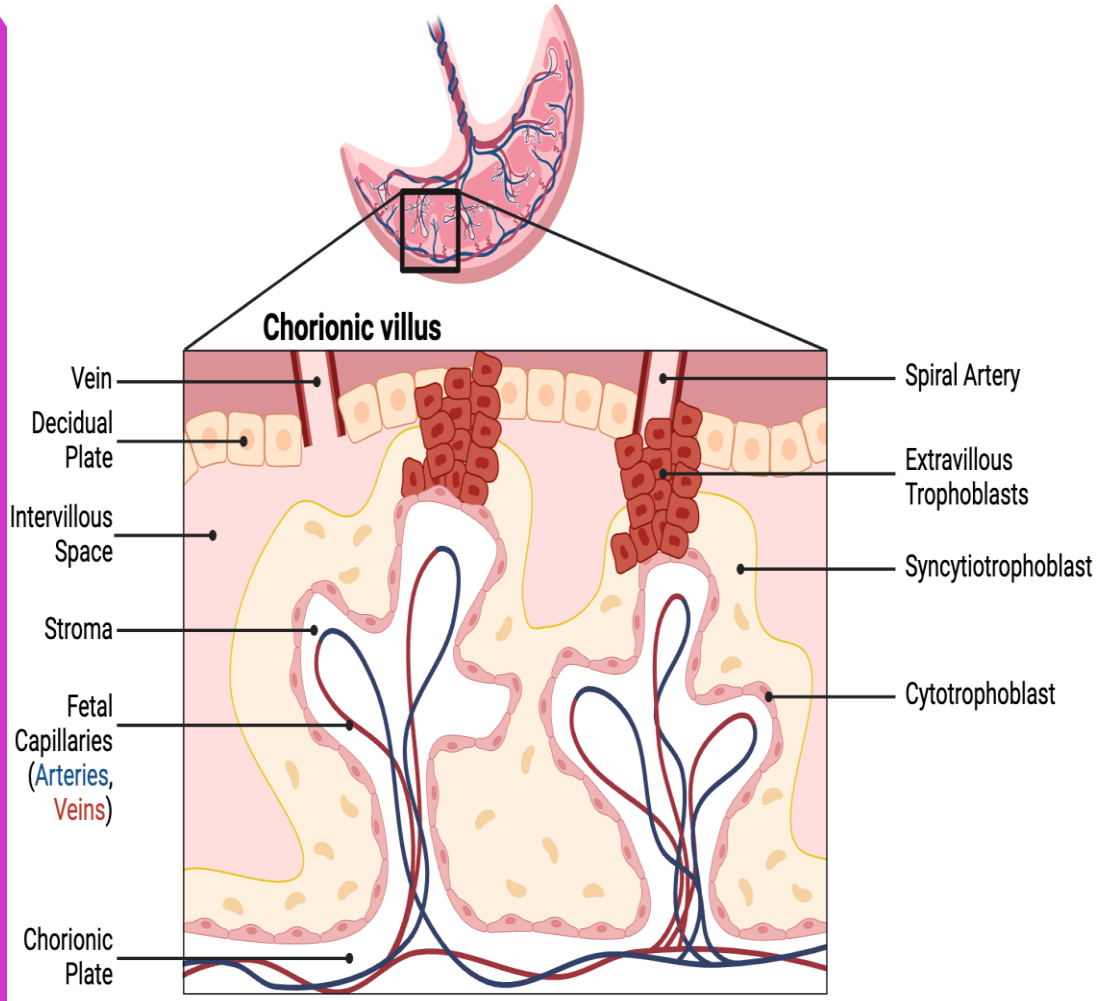
After the fourth month of pregnancy, the cyto-trophoblast disappears.



THE PLACENTA

B- Maternal part:

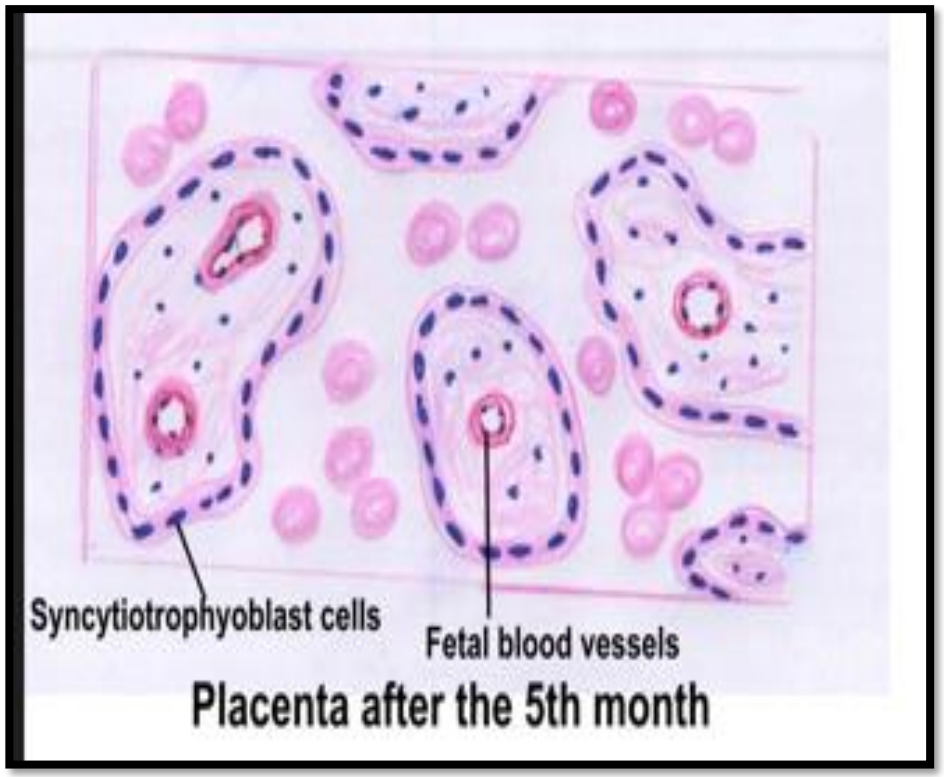
- This is the decidua basalis which is the part of the endometrium surrounding the villi.
- Its stroma cells show marked decidual reaction.
- The villi extend from the chorion to erode the endometrial stroma. They branch and anastomose freely causing rupture of the congested vessels thus, they become separated by inter-villous spaces containing maternal blood.



THE PLACENTAL Barrier

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

➢ Endothelium of foetal capillaries
➢ Basement membrane of foetal capillaries.
➢ Mesenchymal connective tissue.
➢ Thick basement membrane.
➢ The syncytio-trophoblast.



Placenta after the 5th month

Functions of placenta

- The **placental barrier** provides the fetus with nourishment and oxygen from the maternal blood.
- Secretion of placental **hormones**:
    1. Chorionic gonadotrophin.
    2. Somatomammotrophin (growth and prolactin).
    3. Chorionic thyrotrophin (TSH).
- The **fibrinoid coat** acts as immune barrier which prevent contact between the fetus and maternal lymphocytes thus prevent rejection of the fetus.

THE VAGINA

A- Mucosa:

It shows transverse ridges or rugae.

Epithelium:

Stratified squamous non-keratinized.

Rich in glycogen giving nutrition to sperms.

When glycogen is fermented, it forms lactic acid which prevents the harmful bacteria to penetrate the vagina.

Corium:

It is dense C.T. rich in elastic fibers.

It contains blood vessels and lymphocytes.

Has no glands.

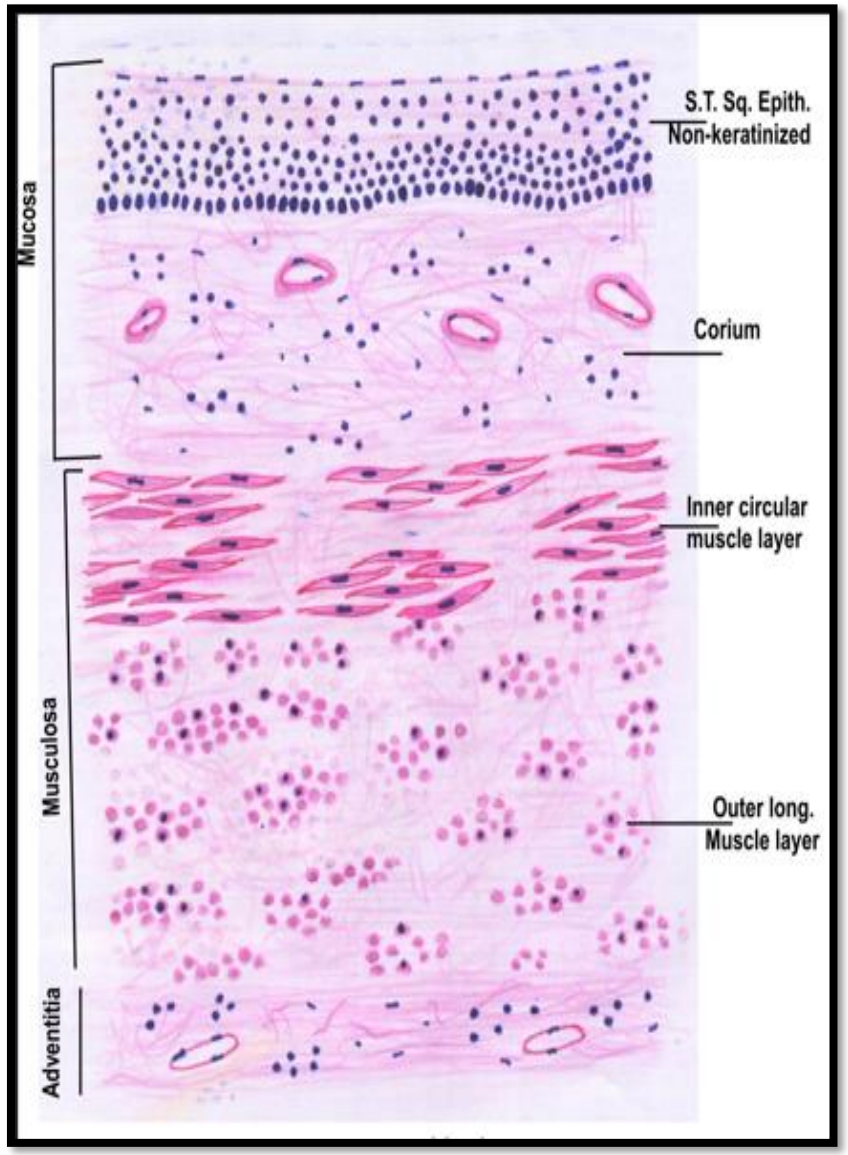
B- Musculosa:

Thin inner circular smooth muscle fibers.

Thick outer longitudinal smooth muscle fibers.

C- Adventitia:

It is dense fibrous C.T. rich in blood vessels, nerves and lymphatics.



Vaginal Smear

It is smear taken from vagina, cervix and endometrium.
It can detect the following:

- **Ovulation time:**

The epithelium tends to be keratinized.
The cells are acidophilic with dark nuclei.

- **Estrogen deficiency:** the epithelium shows atrophy.
- **Efficiency of estrogen therapy:**

The epithelium is thick and keratinized.

- **Early diagnosis of cancer.**

THE MAMMARY GLANDS

Type:

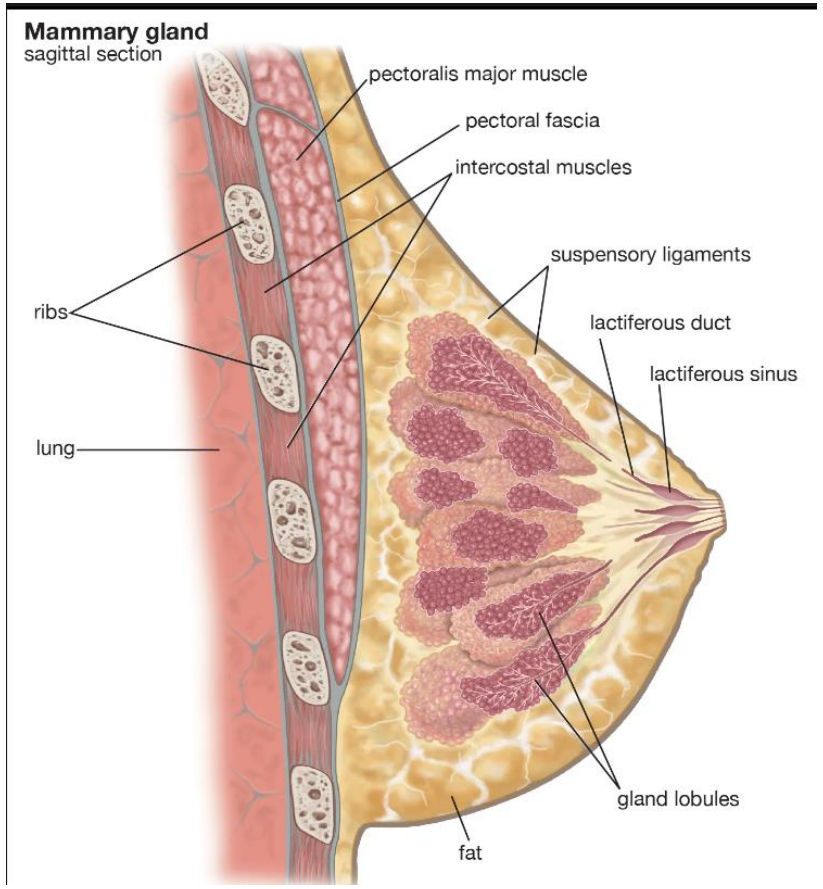
These are a pair of compound alveolar glands.

Structure:

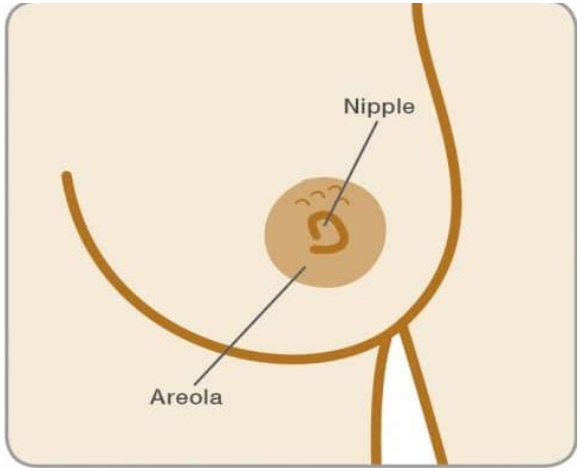
I- The Resting Mammary gland

2-The Mammary gland at pregnancy.

3-The Lactating mammary gland.



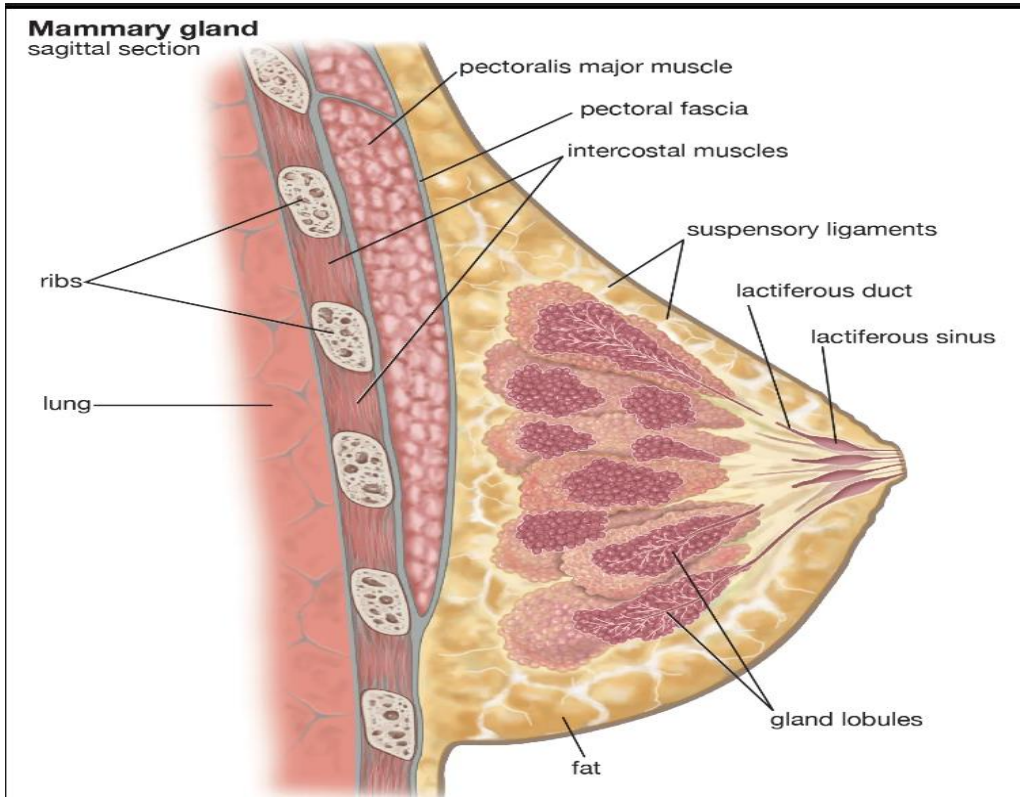
I- The Resting Mammary Gland



A- Covering skin:

The gland is covered with thin skin which shows:

- ***The areola:***
- A central pink area of skin.
- It becomes permanently pigmented during pregnancy.
- Glands of Montgomery are modified sweat glands under the areola.
- ***The nipple:***
- An elevation in the center of the areola.
- It consists of dense connective tissue and smooth muscle fibers.
- It contains a number of lactiferous ducts.



I- The Resting Mammary Gland

B- Stroma:

Inter-lobar septa:

- Thick fibrous C.T called “suspensory ligaments of cooper”.
- They divide the gland into 15-20 lobes.

Inter-lobular septa:

Divide the lobes into lobules.

Adipose connective tissue:

In both inter-lobular and inter-lobar septa.

Loose connective tissue:-

It contains fibroblasts, lymphocytes, plasma cells and macrophages.

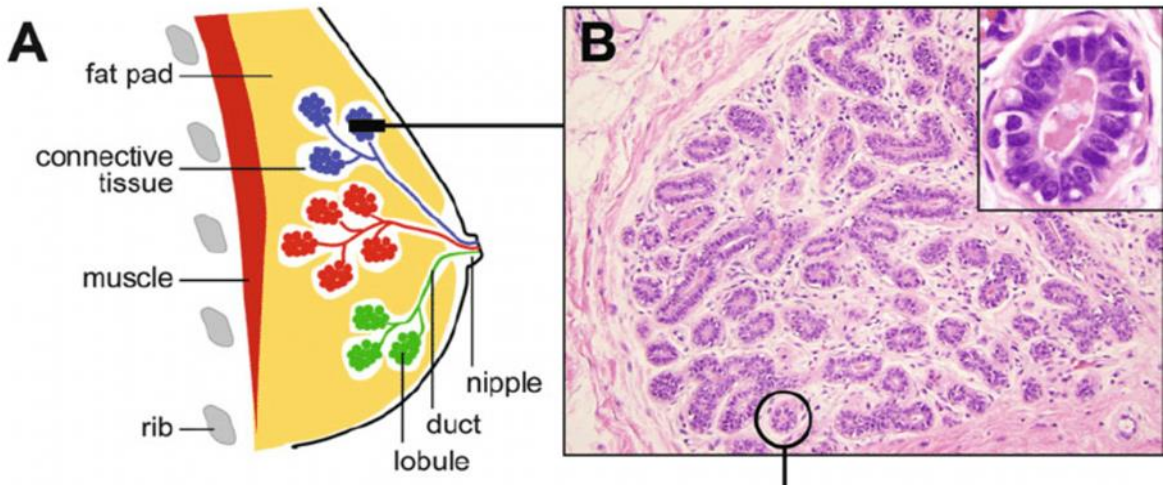
I- The Resting Mammary Gland

C- Parenchyma:

The resting mammary gland consists of duct system only with no secretory units.

Intra-lobular ducts:

- Found inside the lobule.
- Lined with two layers of cubical cells.



a. Lactiferous ducts:

- They result from union of intra-lobular ducts.
- They become dilated to form **lactiferous sinus** just before their opening on the summit of the nipple.
- Their proximal parts are lined with stratified columnar epithelium.
- The lactiferous sinuses and terminal parts are lined with stratified squamous epithelium.

II-The Mammary Gland at Pregnancy

A- Covering skin: (as before).

B- Stroma:

as before.

The intra-lobular C.T. is reduced in amount.

C- Parenchyma:

Duct system:

As before.

Proliferates with new branches.

Alveoli:

- They begin to appear at the 6th month.
- They are lined with columnar epithelium.
- They are surrounded by myoepithelial cells.
- In later months, special secretion “colostrum” appears in the alveoli which are rich in protein.

Hormones causing enlargement of breast at pregnancy:

Ovarian hormonal: estrogen and progesterone.

Placental hormones: (somatomammotrophin and progesterone).

Anterior pituitary: (growth hormone and prolactin).

Suprarenal: (glucocorticoids).

III- Lactating Mammary Gland

Type:

It is a compound alveolar gland.

It is apocrine as the apical part of the cells is lost during secretion.

Structure:

A- Covering skin: (as before).

B- Stroma:

The intra-lobular C.T is reduced.

The septa are thin

The lobules are packed with alveoli & ducts.

C- Parenchyma:

Duct system: (as before).

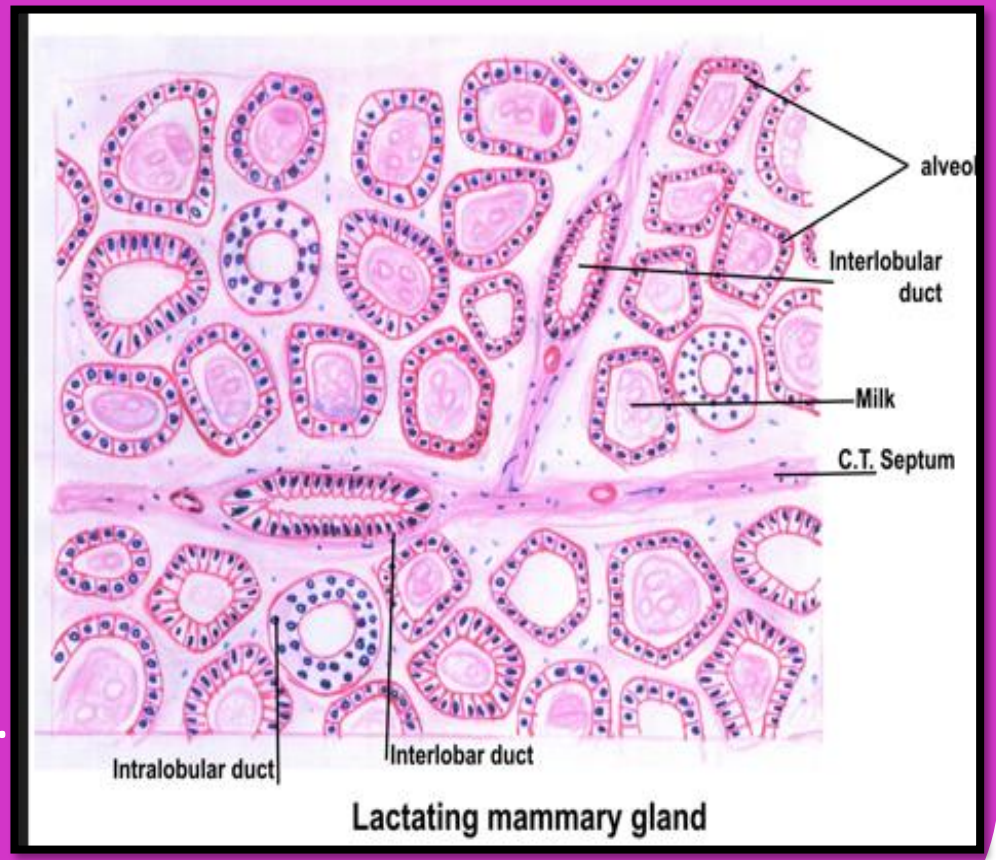
The alveoli:

Some are lined with columnar & others by cubical cells.

They are surrounded by myoepithelial cells.

Some are distended with milk & others are empty.

Milk secretion appears vacuolated due to dissolved fat droplets.



Lactating mammary gland

Hormones involved in lactation:

- Prolactin secreted by mammotrophs, stimulates the alveolar cells to form milk.
- Oxytocin → contraction of myoepithelial cells → squeezes the alveoli → ejects milk (ejection reflex).

References

- Junqueira LC, Carneiro J: Junqueira's Basic Histology. Text and Atlas, fourteenth edition, Copyright © 2016 by McGraw-Hill Education.
- Student medical histology book, Mansoura university.