



The structural layers of the female reproductive tract

(Please view images towards the end of the document to assist with the learning content)

Name of epithelium	Parts of the female reproductive system	Additional Description	Examples of Immunohistochemistry markers
Stratified squamous epithelium	Vulva This consists of the external genitalia (external structures)	Non-keratinized stratified squamous epithelium: Non-keratinised: The cells have become: ○ Flattened ○ Lose their nuclei ○ They become filled with keratin as they approach the surface. ○ Keratin is a type of protein that strengthens nails, skin and hair. Examples of non-keratinized stratified squamous epithelium: • Hymen • Vestibule It may also be glycogenated (storage compound of sugar). It contains the vaginal and urethral opening. • Minor vestibular gland They are superficial glands that open directly onto surface. It is lined with mucus being secreted in columnar-shaped cells. It merges with the squamous epithelium of the vestibule. • Hart line. It is found inferior (below) between the vulva vestibule and the perineal skin. Keratinized stratified squamous epithelium: • Labia majora – there is additional hair follicles and sweat glands (eccrine, apocrine) and sebaceous glands (oil glands). • Labia minora – no adnexa (adjoining parts)	See individual part.



The structural layers of the female reproductive tract

(Please view images towards the end of the document to assist with the learning content)

		Stroma (connective tissue that forms base of the organ) <i>Shape of the stromal cells:</i> • Spindled • Stellate – star-shaped cells with spiny branches/dendrites • Fusiform – spiny and pyramid shaped • Large multi-lobulated nuclei – Many lobe-shaped nucleus. Urethra • Two-third (2/3) of the lining in the proximal end with urothelium. • One third (1/3) distal third has stratified and pseudostratified columnar and squamous epithelium. Layers of the urothelium: • Superficial – round, dome-shaped umbrella cells. Sometimes they have lots of nucleus (multinucleated) and are flat (squamous) depending on distention. • Intermediate - polymorphous • Basal layer /deep– low columnar/cuboidal cells. This is followed by polyhedral cells.	
--	--	--	--



The structural layers of the female reproductive tract

(Please view images towards the end of the document to assist with the learning content)

Name of epithelium	Parts of the female reproductive system	Additional Description	Examples of Immunohistochemistry markers
Nonkeratinized stratified squamous epithelium	Vagina Ectocervix	<i>Ectocervix</i> The stroma is the connective tissue that forms the basis of the organ. The compartment that underlies the ectocervical stroma is desmin+/smooth muscle actin (SMA)-. The ectocervical stroma expressed Dickkopf-related protein 2 (DKK2) which inhibits Wnt signalling and cellular function at the Squamous-columnar junction. The ectocervical squamous epithelium has several layers: • <i>Basal</i> – early progenitor cells that help with regenerating and repairing tissue. • <i>Parabasal</i> – limited ability to grow (proliferate) • <i>Intermediate</i> – Mature cells, it contains glycogen that is a nutrient and support growth of healthy bacteria Lactobacillus to maintain microbiota (balance of microorganisms). • <i>Superficial</i> (near basement membrane) – non-keratinized flattened cells to exfoliate. It contains glycogen (storage form of glucose/sugar). From Basal to superficial is achieved through growth, becoming more specialised (differentiate) and flattening (squamification).	Ectocervix Basal express Ki67 Cytokeratins: KRT5, KRT14 and KRT17. ectocervix Transcription factor: <i>Tp63</i>, a homologue of the tumour suppressor gene <i>Tp53</i>, regulates the growth and development of squamous epithelium.



The structural layers of the female reproductive tract

(Please view images towards the end of the document to assist with the learning content)

		Vagina • Basal - It is a single layer of columnar cells with high nuclear-to-cytoplasmic (N/C) ratio in a cell. The basal cell layer of the Vagina influences its ability to regenerate, repair and grow. • Parabasal: It has higher N:C ratio than superficial layer. It is above basal layer. • Intermediate: It has more cytoplasm/space where structures/organelles perform chemical reaction. The cytoplasm can have glycogen. • Inner/Superficial Layer – The mucosa aligns the non-keratinized stratified squamous epithelium. It has flat cells that may present pyknotic nuclei. Pyknosis is the irreversible condensation of chromatin during cell death. It contains glycogen (storage form of glucose/sugar) to help provide nutrient and support growth of healthy bacteria, Lactobacillus in the healthy microbiota.	IHC markers for vagina <i>Basal progenitor cells and parabasal cells of the vagina</i> TP63+ KRT17+ KRT5+ KRT14+ <i>The differentiated intermediate layers</i> KRT13 CALML3 (calmodulin-like protein 3) KRT4 IFITM3 (interferon-inducible transmembrane protein 3) <i>Apical cornified terminally differentiated epithelium</i> KRT1 KRT10
--	--	---	--



The structural layers of the female reproductive tract

(Please view images towards the end of the document to assist with the learning content)

		The vaginal wall consists of additional layers: • Superficial – non-keratinized stratified squamous epithelium. • Lamina propria – Loose connective tissue, elastic fibers, blood vessels (vein and lymph). • Stromal cells: spindle, stellate and some multinucleated. • Adventitia ○ Inner dense connective tissue. ○ Outer loose connective tissue. ○ It contains peripheral nerves, blood vessels and lymphatic vessels. • Muscularis (Smooth muscle) ○ Outer layer of the muscularis: longitudinal ○ Inner layer of the muscularis: Circular • Wolffian (mesonephric) duct/Gartner duct ○ It runs deep along the side (lateral) of the vaginal wall. ○ The single small duct is surrounded by small glands clustered together. ○ The cluster is lined by cuboidal-shaped cells. ○ It secretes a type of immune cell called eosinophils in the lumen. ○ Eosinophils help to protect the body by ingesting foreign particles on the lining or covering surfaces. It is also involved in response to allergy.	
--	--	--	--



The structural layers of the female reproductive tract

(Please view images towards the end of the document to assist with the learning content)

Name of epithelium	Parts of the female reproductive system	Additional Description	Examples of Immunohistochemistry markers
Squamocolumnar epithelium	The Squamocolumnar junction (SCJ) It is between the squamous epithelium of the ectocervix and the columnar epithelium of the endocervix.	SCJ is where there is ongoing changes as a result of: • The growth of the wall of the womb. • Increase in the size of the cervix • Changes in the hormones. • Age • Prior infections • Parity (number of pregnancies) ○ At birth and before the first period (pre-menarche), the SCJ is located at or close to the external orifice/opening. ○ During reproductive age, the SCJ is situated at different distances from the external orifice/opening. ○ After the menopause (postmenopause), the new SCJ is not visible and receded into the endocervix. The remodelling process involves the original position of the SCJ evert (goes inside out) along with many columnar-shaped cells from their original position (endocervix) onto the ectocervix. This is called the ectropion.	



The structural layers of the female reproductive tract

(Please view images towards the end of the document to assist with the learning content)

Name of epithelium	Parts of the female reproductive system	Additional Description	Examples of Immunohistochemistry markers
Transformation Zone	The area between the original SCJ and new SCJ	The common site for cervical screening (Papanicolaou stain) because it is the most common area for cervical cancer. The columnar epithelium (ectropion) has been replaced or is being replaced with new metaplastic squamous epithelium. Metaplasia is when there is exposed ectropion reacts to irritation by acidic vaginal environment. This changes from normal to abnormal. Amongst the changes are subcolumnar reserve cells of the endocervix epithelium that grow and proliferate to form a thin layer of immature squamous cells without stratified nor glycogen (immature squamous metaplasia)	
Simple columnar epithelium	Endocervix Uterus: long and tubular glands in proliferative phase but changes to coiled glands in the secretory phase	Endocervix Two cell types • <i>Ciliated cells.</i> ○ They help move the mucus towards the vagina to prevent infection because the Squamocolumnar junction (SCJ) is susceptible to infection and development of cervical neoplasia (non-cancerous/abnormal growth of cells). ○ The ciliated epithelium helps to support the movement of the sperm into the womb/uterus.	Endocervix Cytokeratins including KRT8, KRT7 and KRT18 and renew very slowly for endocervix



The structural layers of the female reproductive tract

(Please view images towards the end of the document to assist with the learning content)

		• <i>Secretory cells</i> ○ They produce cervical mucus that protects the area. ○ The stroma is the connective tissue that forms the base of an organ. ○ The endocervical columnar epithelium contains desmin-/SMA+/CD34+ as a compartment. ○ The stroma also facilitates regeneration/re-growth by the presence of the Wnt signals and its agonists AXIN2 and RSPO1. Uterus There are three layers: endometrium, myometrium and perimetrium. The cells vary throughout the menstrual cycle. It is further subdivided into the following: • <i>The functional layer:</i> ○ It faces the cavity of the uterus (womb). ○ There is surface non-ciliated luminal epithelium and upper part of the long tubular glands. • <i>The Basal layer:</i> ○ The basal and lower part of the glands. • <i>Glandular epithelium:</i> ○ Columnar secretory cells with less ciliated cells in the opening of the glands. During pregnancy, the stroma beneath the surface of the endometrium and between the glands causes changes due to CD10+ factor and vimentin+ mesenchymal cells.	Uterus EpCAM CDH1 KRT7 CD10 Vimentin+ mesenchymal cells
--	--	--	---



The structural layers of the female reproductive tract

(Please view images towards the end of the document to assist with the learning content)

Name of epithelium	Parts of the female reproductive system	Additional Description	Examples of Immunohistochemistry markers
Ciliated simple columnar epithelium	Fallopian tube	There are four sections of the fallopian tube: infundibulum, ampulla, ampulla-isthmus junction and the isthmus. The surface epithelium of the fallopian tube contains: secretory, ciliated and peg cells but vary throughout its structure on the number of the type of cells and the folds. • Ciliated cells ○ This is found in the infundibulum and ampulla because they help to guide the egg cell once it is released from the ovaries towards the ampullary-isthmus junction. ○ The fimbria are the finger-like projections that help move the expelled oocyte further into the junction. ○ The ampullary-isthmus junction is where the binding of the egg and sperm cell are joined together by a process called fertilisation. Inside the lumen, there is ciliated cells that contain acetylated α-tubulin+ protein. The ciliated cells are columnar, oval nucleus with slender cilia in the lumen. The secretory cells are columnar and have apical granules.	Ciliated cells Acetylated α-tubulin – lumen EpCAM Secretory cells PAX8+ EpCAM



The structural layers of the female reproductive tract

(Please view images towards the end of the document to assist with the learning content)

		Peg cells The peg cells are found between ciliated and secretory cells. There is minimal cytoplasm and the nucleus is dark stained. The Peg cells have secreted their products into the lumen. They are a mature subpopulation of epithelial cells.	Peg cells EpCAM CD44 Integrin α6 (ITGA6).
Simple cuboidal epithelium	Outer part of the ovary	Ovarian parenchyma (functional part of the organ) is divided into three: • Tunica Albuginea: ○ Protective hypocellular (fewer cells) layer. ○ It is the most superficial layer and is about 0.3 mm. ○ It has fibrotic (scarring of connective tissue). • Cortex ○ 0.3 mm hypercellular layer (lots of cells) layer. ○ It contains spindle cells that line together (parallel) to the surface. ○ It contains most of the follicles in premenopausal woman. • Medulla ○ Hypocellular area below the cortex. ○ It contains blood vessels. ○ There is also nodular or diffuse proliferation of spindle cells similar to medulla.	KRT7, 8, 18, 19 CDH2 Vimentin CD44 Cortical epithelium: Keratin EMA CA-125 WT1 BerEP4 Desmoplakin



The structural layers of the female reproductive tract

(Please view images towards the end of the document to assist with the learning content)

		• Stroma: ○ Similar to fibroblasts in storiform/pinwheel shape that is surrounded by reticulin ○ Reticulin is a protein made with in early-staged red blood cells (reticulocytes). Stromal cells contain the following types: • Luteinized stromal cells Lutein is the yellow pigment of the corpus luteum. Corpus luteum is a type of glandular cells that is formed following the release of mature egg. • Decidual cells ○ Decidua is a modified form of mucous membranes that lines the wall of the womb during pregnancy and this is shed or broken-down during childbirth. • Smooth muscle • Fat • Neuroendocrine cells ○ A combination of cells that performs activities relates to nerves and hormones. • Endometrial stroma-like cells ○ Cells that resemble stroma cells but are found in the womb/uterus.	Stroma: Vimentin Calretinin Actin / desmin ER beta (oestrogen) (progesterone) PR Inhibin
--	--	--	---



The structural layers of the female reproductive tract

(Please view images towards the end of the document to assist with the learning content)

		Other normal components: • Ovarian Surface epithelium (OSE). ○ It is a modified mesothelium that is flat to cuboidal and is a single layer of cells that is derived from one of the germ layers of the embryo called mesoderm. ○ The OSE is also known as coelomic or germinal epithelium. ○ It helps to release the mature egg and repair. ○ It is similar to Müllerian duct lining epithelium. • Hilar cells. ○ These are found in the hilus. ○ It is situated at a distance from the hilum which is a hollow area where blood vessels, ducts and nerves either enter or leave. ○ Shape of cells: round to polygonal. ○ Hilar cells is commonly seen in foetus (baby) but not in a child (infancy and childhood). It can reappear at puberty/teenage years.	Granulosa / theca cells: WT1 Calretinin Inhibin MART1 CD56 Hilus cells/hilium: MART1 Inhibin Vimentin
--	--	--	---



The structural layers of the female reproductive tract

(Please view images towards the end of the document to assist with the learning content)

		The Hilar cells may contain the following: • Reinke crystalloids ○ They are rod-shaped structures or particles that are found in the cytoplasm called inclusion bodies. ○ Reinke is found in the ovarian stromal cells but mainly the Leydig cells where testosterone (male hormone) is made in the male testes. • Lipochrome ○ It is a natural form of pigment that is soluble in fat. ○ It can be found in many tissues and cells and is sometimes yellow. A further look: • Steroid cells: ○ To further look deep into the structure of the hilar cells, it may look like steroid cells under the electron microscope. • Smooth Endoplasmic Reticulum (SER) ○ This is a structure that does not have ribosomes (make protein) and is involved in the detoxification, metabolism of sugars (carbohydrates), how the calcium ions accumulate (join together) and the production of fats. Mitochondria is how the cell produces energy. ○ The centre of the mitochondria is known as the matrix and is surrounded by the inner mitochondrial membrane that is folded as tubular cristae.	
--	--	--	--



The structural layers of the female reproductive tract

(Please view images towards the end of the document to assist with the learning content)

		Hilar cell Hyperplasia • Overgrowth of normal hilar cells. • This is associated with the administration of the Human chorionic gonadotropin (hCG). • hCG is a female hormone that function in pregnancy and childbirth. • In pathological conditions, hyperplasia is linked with choriocarcinoma, which is the rare cancer of the placenta that arises from the outermembrane that surround the foetus (chorion). • Placenta is an organ produced during pregnancy and is involved in the exchange of nutrients between the mother and foetus. Rete ovarii: This is a complex network of tubules found within the ovary, more specifically in the hilum of the ovary and surrounded by spindle cell stroma. It arises during the development of the embryo. It is surrounded with cuboid or column shaped lining. Rete ovarii consists of the following types. • Intraovarian rete (IOR) • Connecting rete (CR) • Extraovarian rete (EOR). It is involved during sexual reproduction and division (meiosis) and the growth and differentiation of granulosa cells (outer structures of the egg). The granulosa cells secrete the oestrogen and inhibin which influences the egg activity.	Rete ovarii: CAM5.2 EMA Vimentin PR CD56
--	--	---	--



The structural layers of the female reproductive tract

(Please view images towards the end of the document to assist with the learning content)

		Walthard cell nests: This may appear as a cyst, nodules or solid structure with possible structures: ○ A benign cluster of epithelial cells ○ Coffee bean shaped nuclei ○ Eosinophilic luminal material ○ Variable mucin (protein that makes mucus) in the serosal membrane. It can be found in the following: ○ Urothelium: Lining of the urethra ○ Mesovarium: This is the double layer of peritoneum/mesentery of the ovaries. ○ Mesosalpinx: This is the fold of the peritoneum that surrounds the fallopian tube/uterine tube/oviduct especially near the upper end of the broad ligament that surrounds the ovaries. ○ Ovarian hilus ○ Fimbriae The nests is especially found in the tubal, paratubal and paraovarian serosa that can form abnormal cells (transitional cell metaplasia). There has been research where there is association between Walthard cell nests, Brenner tumours or mucinous tumours of the ovary and rare outside the ovarian parenchyma.	
--	--	---	--



The structural layers of the female reproductive tract

(Please view images towards the end of the document to assist with the learning content)

		Sometimes it can be mistaken for pelvic tuberculosis that is diagnosed on the presence of: • Granulomas • Disseminated tumour where there is abdominal pain, mass, ascites, or high levels of tumour markers in the serum/blood. • Ascites is the accumulation of fluid in the peritoneal cavity/belly. • Ovarian stem cells: ○ Ovary is an example of an organ that contains stem cells. ○ Stem cells are undifferentiated cells that has the ability to renew and produce all specialised cells (body/somatic cells and sex/germ cell). ○ Examples of body stem cells relevant to female reproductive tract and are part of the structure of the egg: granulosa, theca, stroma and epithelial cells. • Cortical granuloma: ○ This can be observed incidental in the ovaries in women who are late middle aged and post menopause. ○ They contain a cluster of epithelioid histiocytes. • Histiocyte is a type of fixed macrophage that does not move in a connective tissue. • It is surrounded by mobile lymphocytes (a type of white blood cells).	
--	--	--	--



The structural layers of the female reproductive tract

(Please view images towards the end of the document to assist with the learning content)

		Granuloma can illustrate difference between left and right side and may be previously linked to the following: • Endometriosis is growth in areas outside the endometrium (lining of the uterus). • Luteinized stroma cells • Ectopic Decidua Decidua is when there is shedding of the uterus wall during childbirth. There are three types: ○ Decidua capsularis (thin layer covers the embryo) ○ Decidua basalis (embryo is attached) ○ Decidua parietalis (not in contact with the embryo). ○ Ectopic is when it is produced outside of the normal area.	
--	--	--	--

References

Atwi, D., Ghofrani, M., and Hassell, L. (2023) *General Anatomy & histology*. Available at:

<https://www.pathologyoutlines.com/topic/ovarynontumornormalhistology.html> (Accessed: 6th September 2026)

Chumduri, C. and Turco, M.Y. (2021). Organoids of the female reproductive tract. *Journal of Molecular Medicine*, 99(4), pp.531–553. doi:10.1007/s00109-020-02028-0.

Rosner, J., Samardzic, T. and Sarao, M. (2024) *Physiology, Female reproduction*. Available at:

<https://www.ncbi.nlm.nih.gov/books/NBK537132/> (Accessed: 14th August 2026)

Southern Illinois University (2022) *Fallopian Tube*. Available at: <https://histology.siu.edu/erg/RE017b.htm> (Accessed: 7th September 2026)



The structural layers of the female reproductive tract

(Please view images towards the end of the document to assist with the learning content)

Southern Illinois University (2022) *Ovarian Cortex*. Available at: <https://histology.siu.edu/erg/RE005b.htm> (Accessed: 7th September 2026)

Srivastava, P. and Lanjewar, S. (2025) *Anatomy & histology - vulva, vagina & female urethra*. Available at: <https://www.pathologyoutlines.com/topic/vulvaanatomy.html> (Accessed: 6th September 2026)

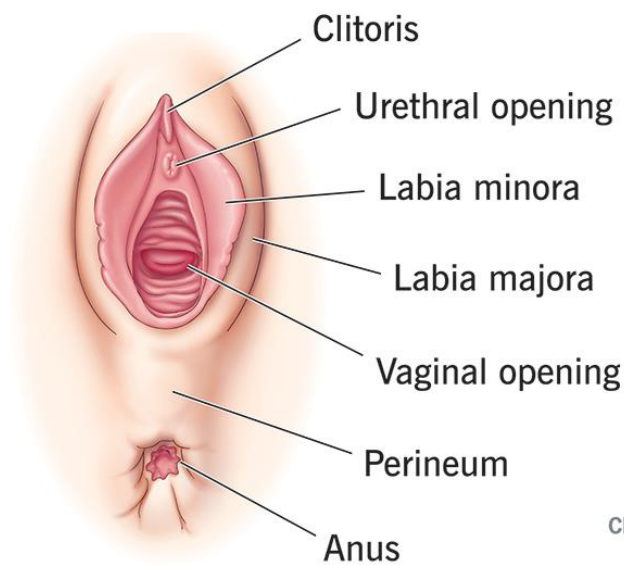
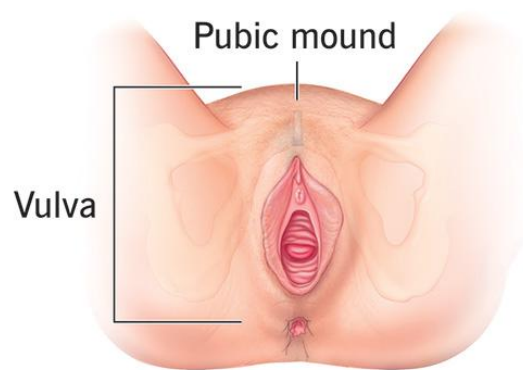
Vassilakos, P., Gfmer/Negulescu, R. and Pinto Catarino, R. (n.d) *Anatomy Of The Cervix, Squamocolumnar Junction, Metaplastic Change And Transformation Zone*. Available at: <https://www.gfmer.ch/ccdc/pdf/module1.pdf> (Accessed: 6th September 2026)

Zarei, S. (2025) *Walthard cell nests* Available at: <https://www.pathologyoutlines.com/topic/fallopianubeswalthard.html> (Accessed: 8th September 2026)

The structural layers of the female reproductive tract
(Please view images towards the end of the document to assist with the learning content)

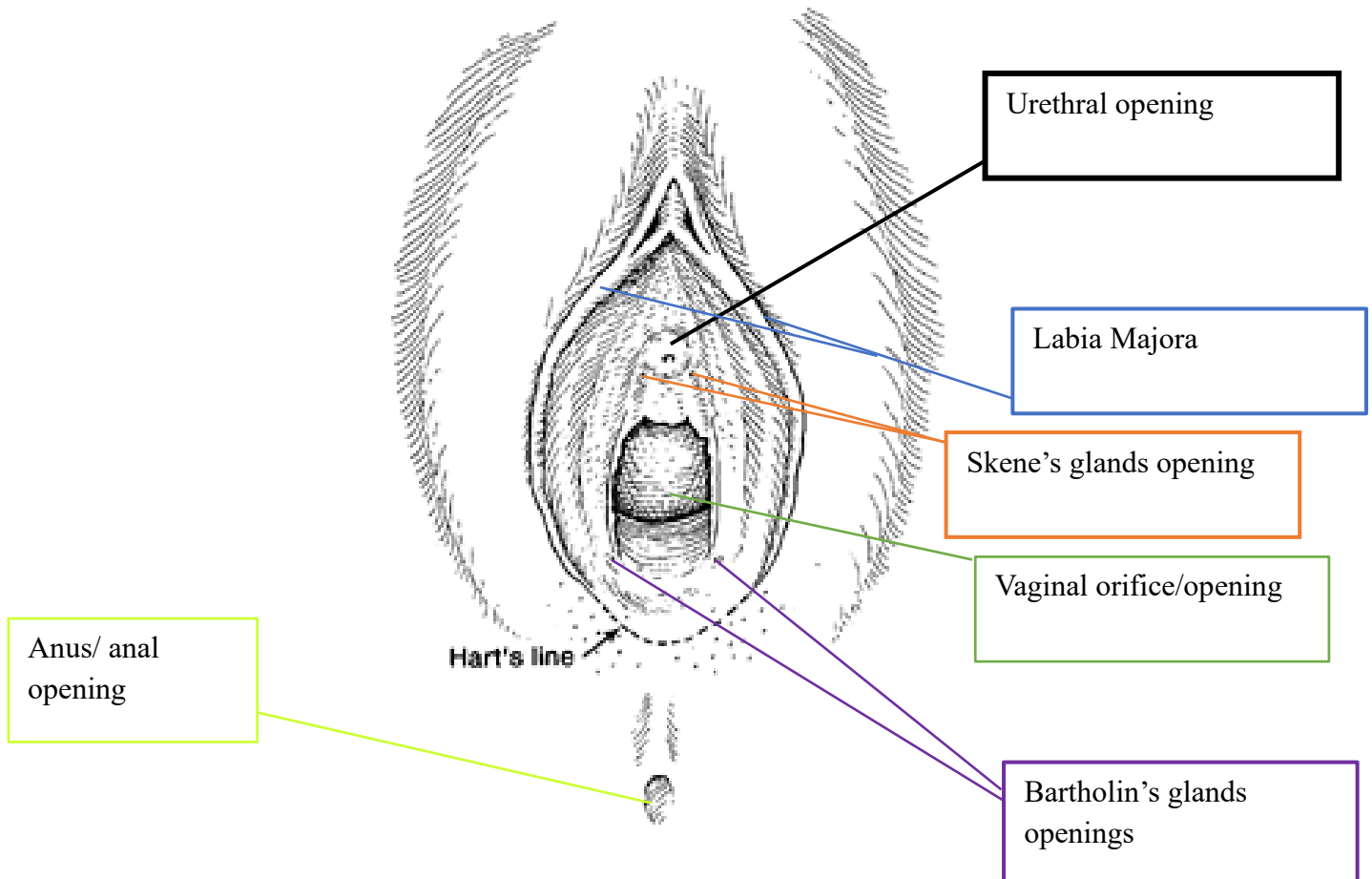
The Vulva (External Genitalia)

Vulva



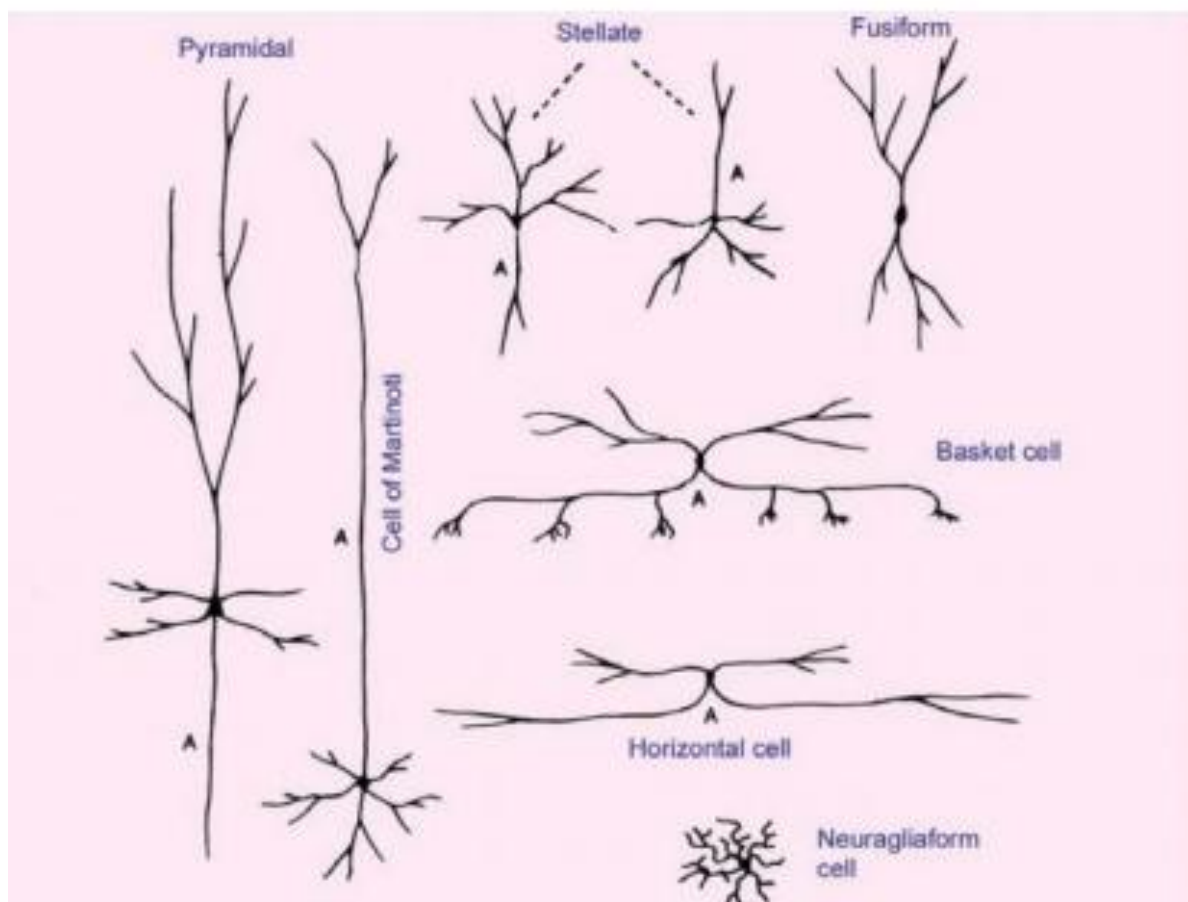
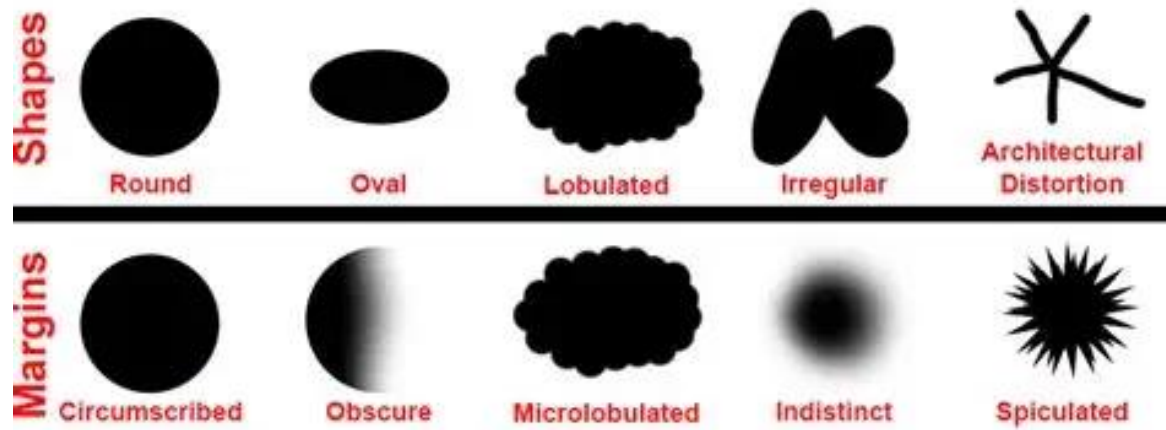
The structural layers of the female reproductive tract
(Please view images towards the end of the document to assist with the learning content)

The Hart Line

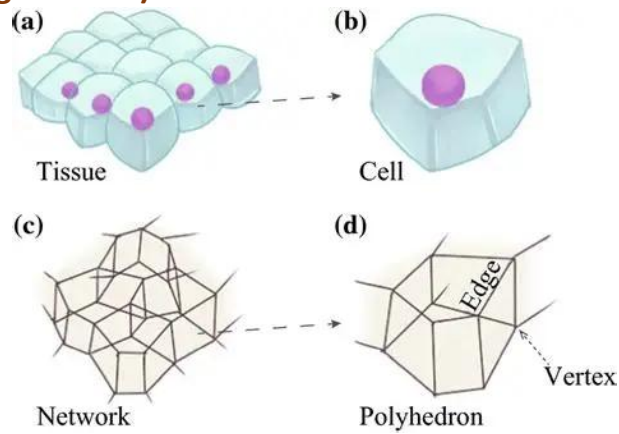


The structural layers of the female reproductive tract
(Please view images towards the end of the document to assist with the learning content)

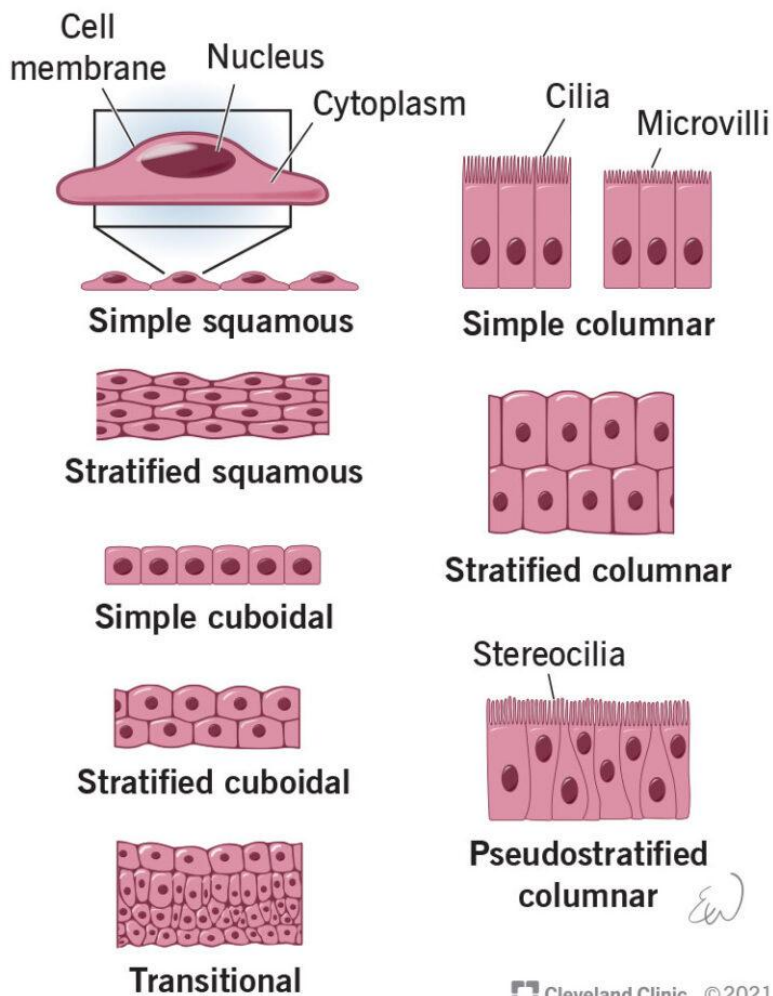
Examples of morphology/shapes of cells



The structural layers of the female reproductive tract
(Please view images towards the end of the document to assist with the learning content)



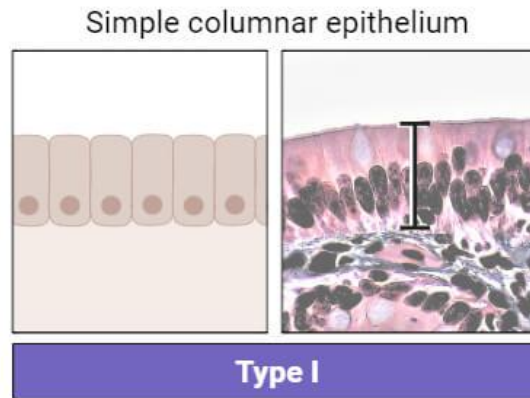
Epithelium



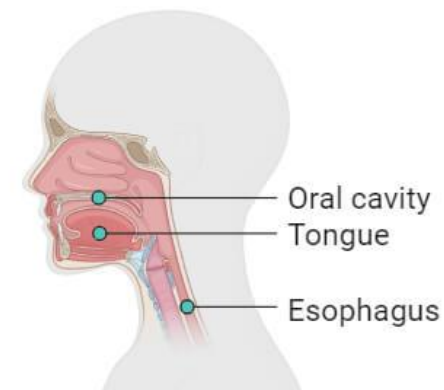
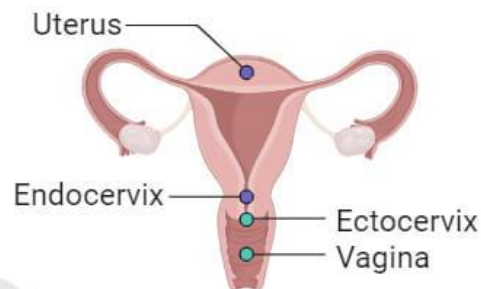
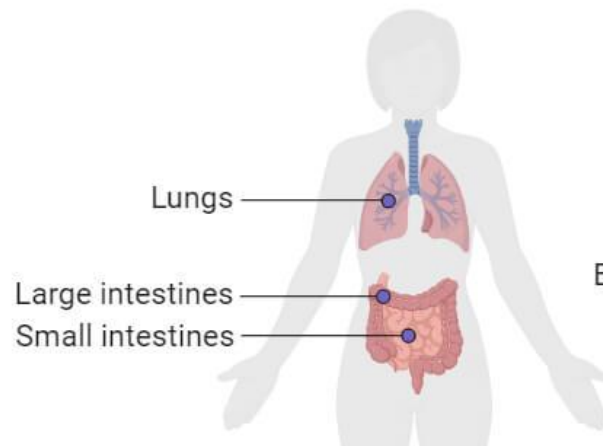
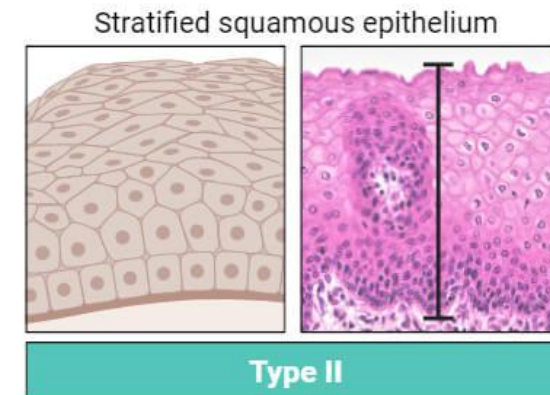


The structural layers of the female reproductive tract

(Please view images towards the end of the document to assist with the learning content)



Mucosal Tissues of the Human Body



The structural layers of the female reproductive tract

(Please view images towards the end of the document to assist with the learning content)

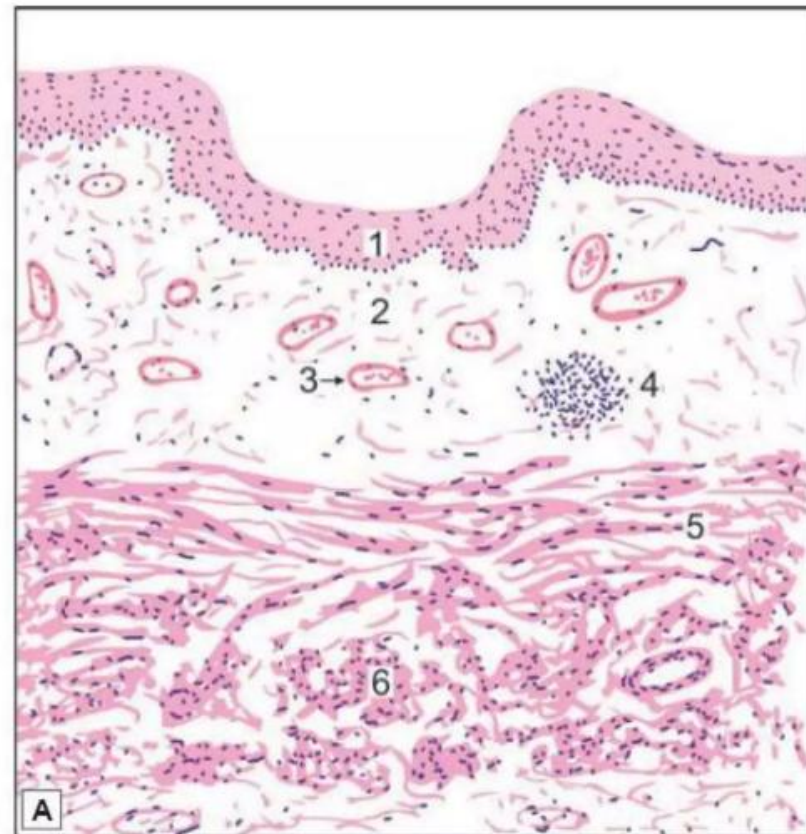
Vaginal mucosal membrane

Mucous Membrane

- The mucous membrane shows numerous longitudinal folds, and is firmly fixed to the underlying muscle layer.
- It is lined by stratified squamous epithelium (nonkeratinised).
- The epithelium rests on dense connective tissue (lamina propria) that is highly vascular.
- The tissue is rich in elastic fibres.
- No glands are seen in the mucosa.
- The vaginal surface being kept moist by secretions of glands in the cervix of the uterus.

Key

1. Lining of stratified squamous epithelium
2. Lamina propria
3. Blood vessel
4. Lymphoid follicle
5. Muscle coat (longitudinal)
6. Muscle coat (circular)

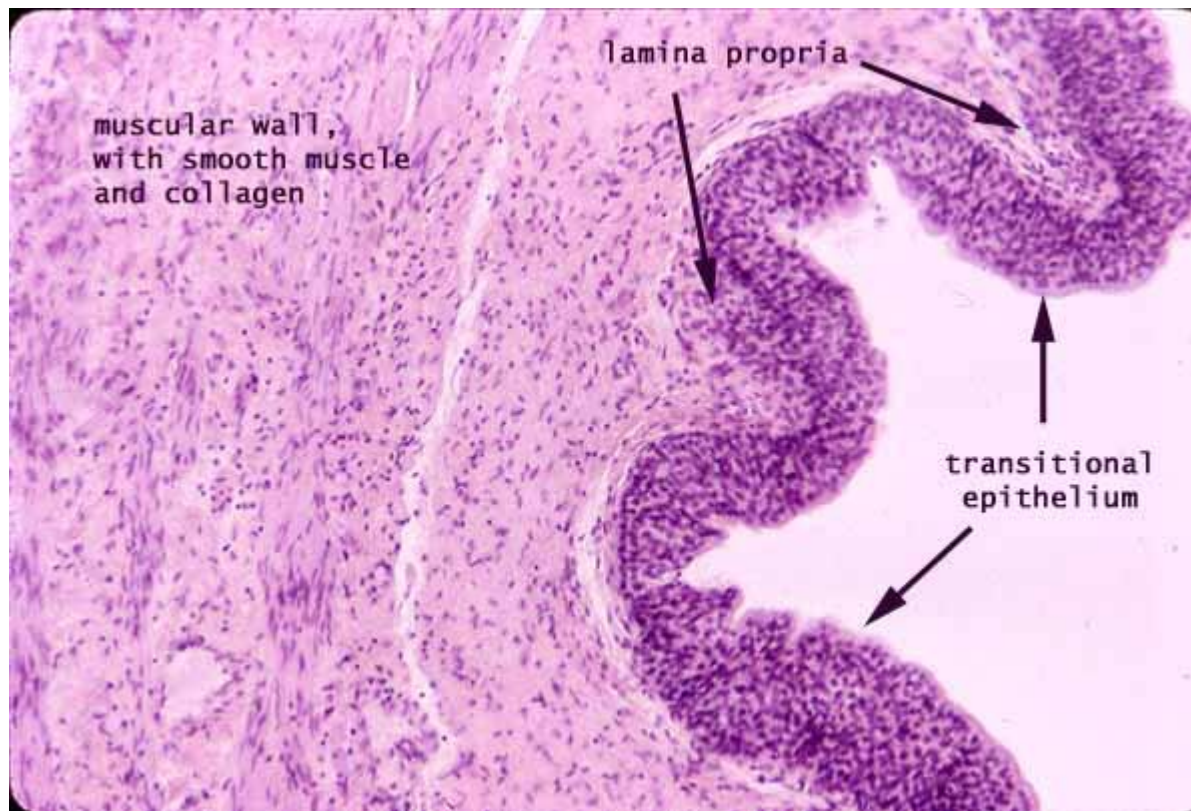




The structural layers of the female reproductive tract

(Please view images towards the end of the document to assist with the learning content)

Layers of the Urethra

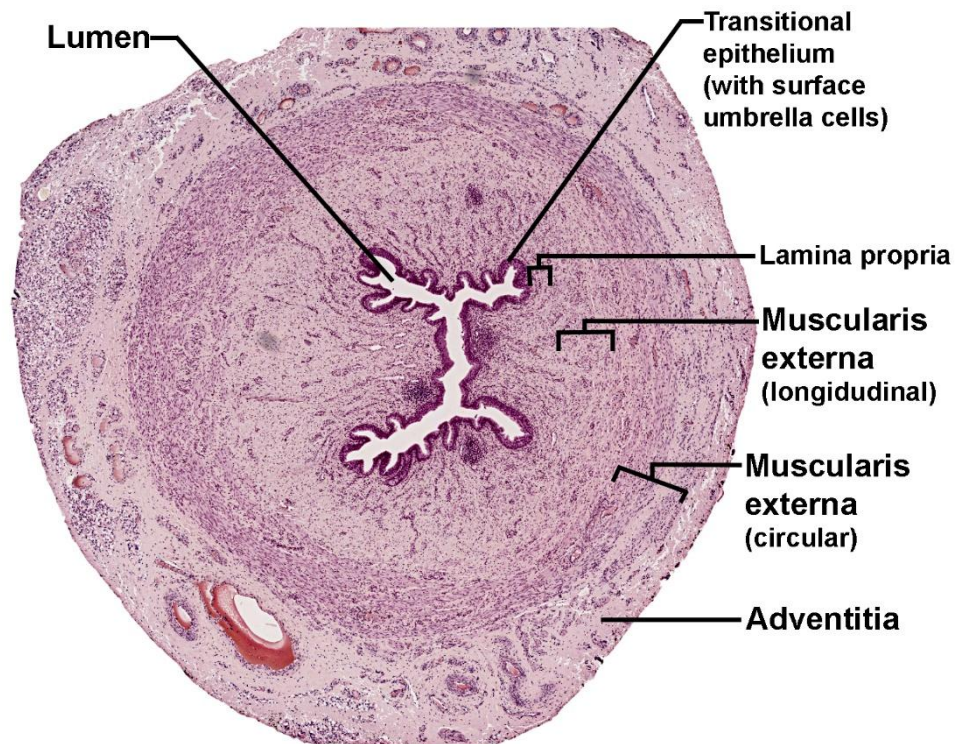


A microscopic presentation with high magnification that illustrates the transitional epithelium (outermost layer) followed by the lamina propria and muscularis



The structural layers of the female reproductive tract

(Please view images towards the end of the document to assist with the learning content)



A cross-section of the urethra where it illustrates the different layers:

Superficial/transitional epithelium.

Lamina propria

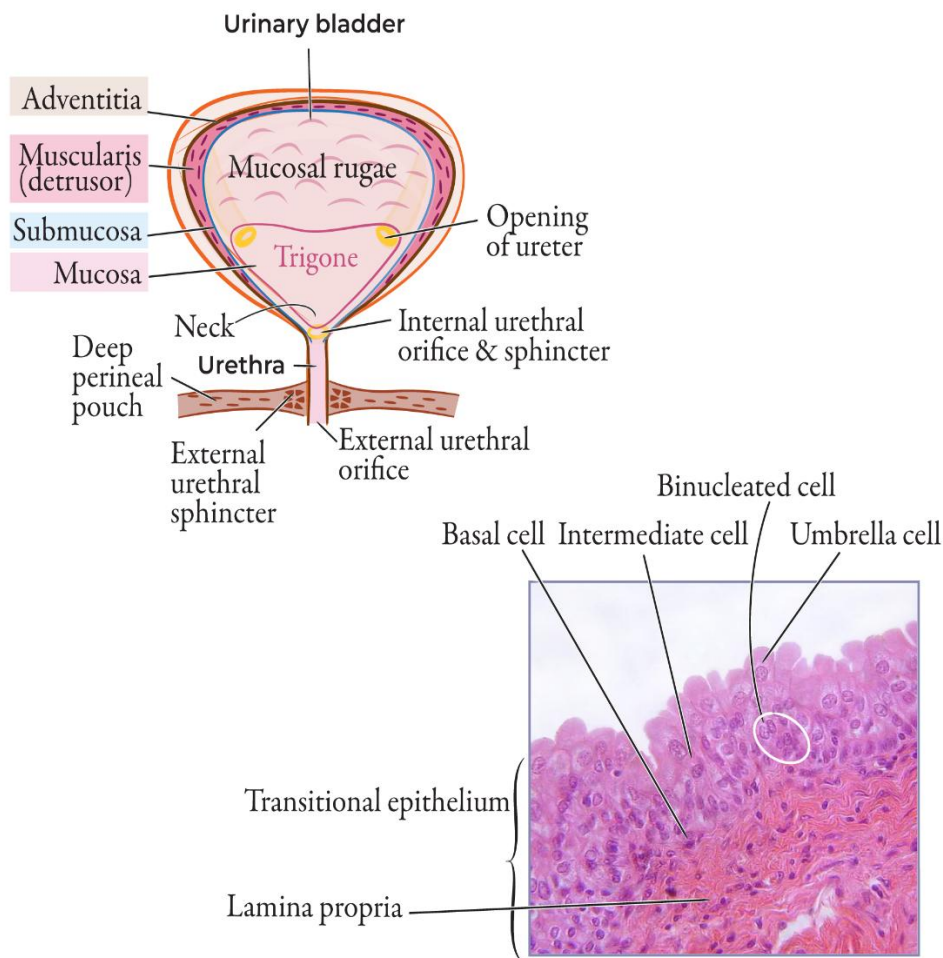
Muscularis

Adventitia

The structural layers of the female reproductive tract

(Please view images towards the end of the document to assist with the learning content)

Urinary Bladder & Urethra

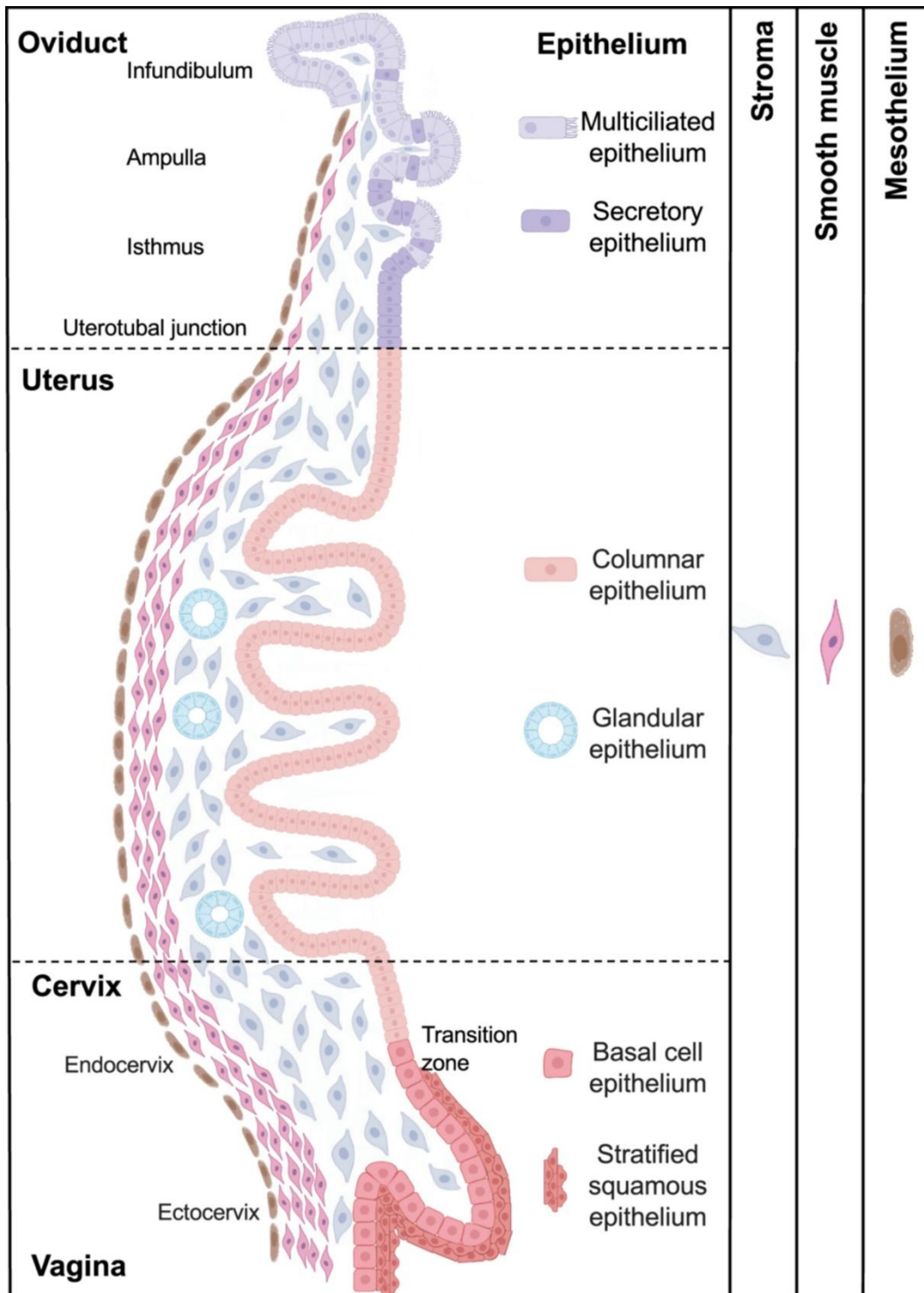


An anterior presentation of the urinary bladder and urea illustration and a small section of the tissue. The bladder has several layers: Mucosa, Submucosa, Muscularis (detrusor muscle) and adventitia. At the neck of the bladder, there is a little door called a sphincter and also opening into the urethra (internal urethral orifice/opening). The release of the urine from the bladder and into the urethra. The structure of the basal, intermediate and muscularis helps during contraction and relaxation with the mucus that lubricates the area.

The structural layers of the female reproductive tract

(Please view images towards the end of the document to assist with the learning content)

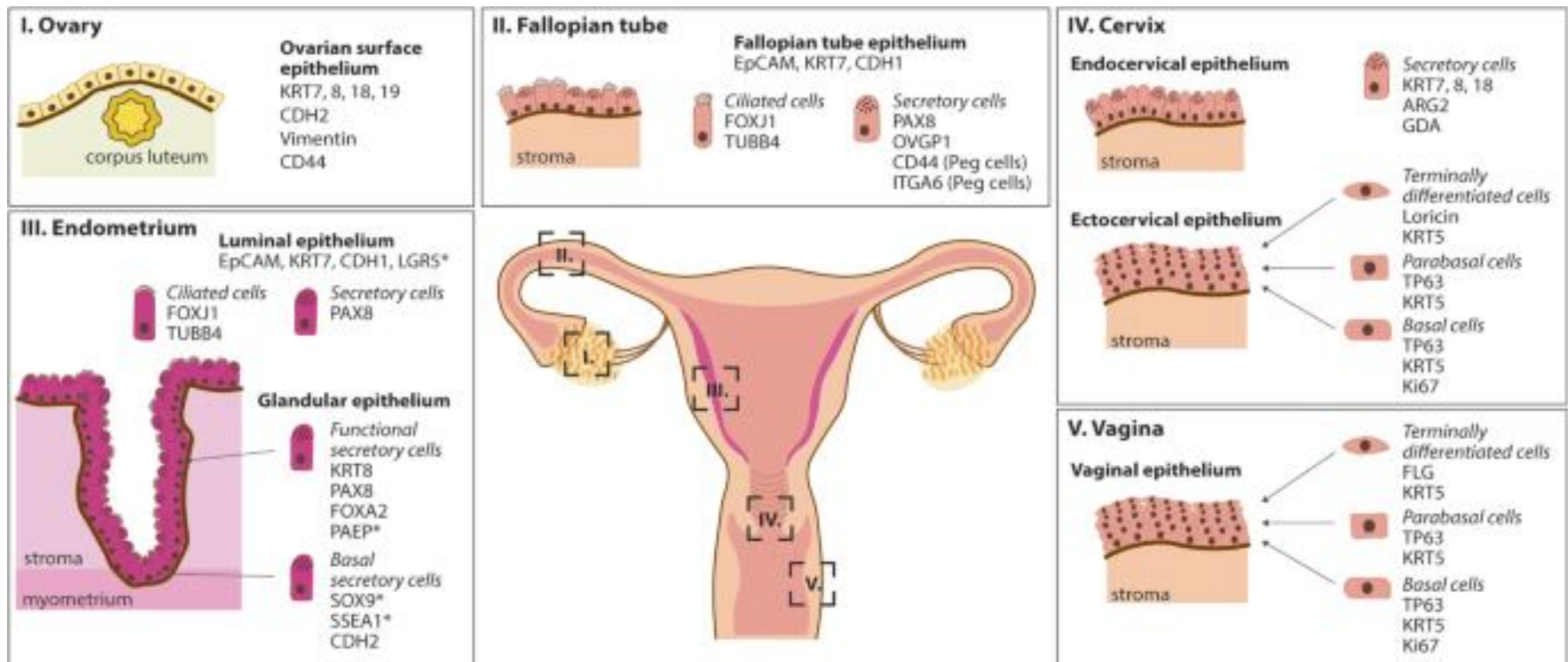
The Epithelial Layers Of Some Of The Internal Genitalia (Oviduct, Uterus And Cervix)



The structural layers of the female reproductive tract

(Please view images towards the end of the document to assist with the learning content)

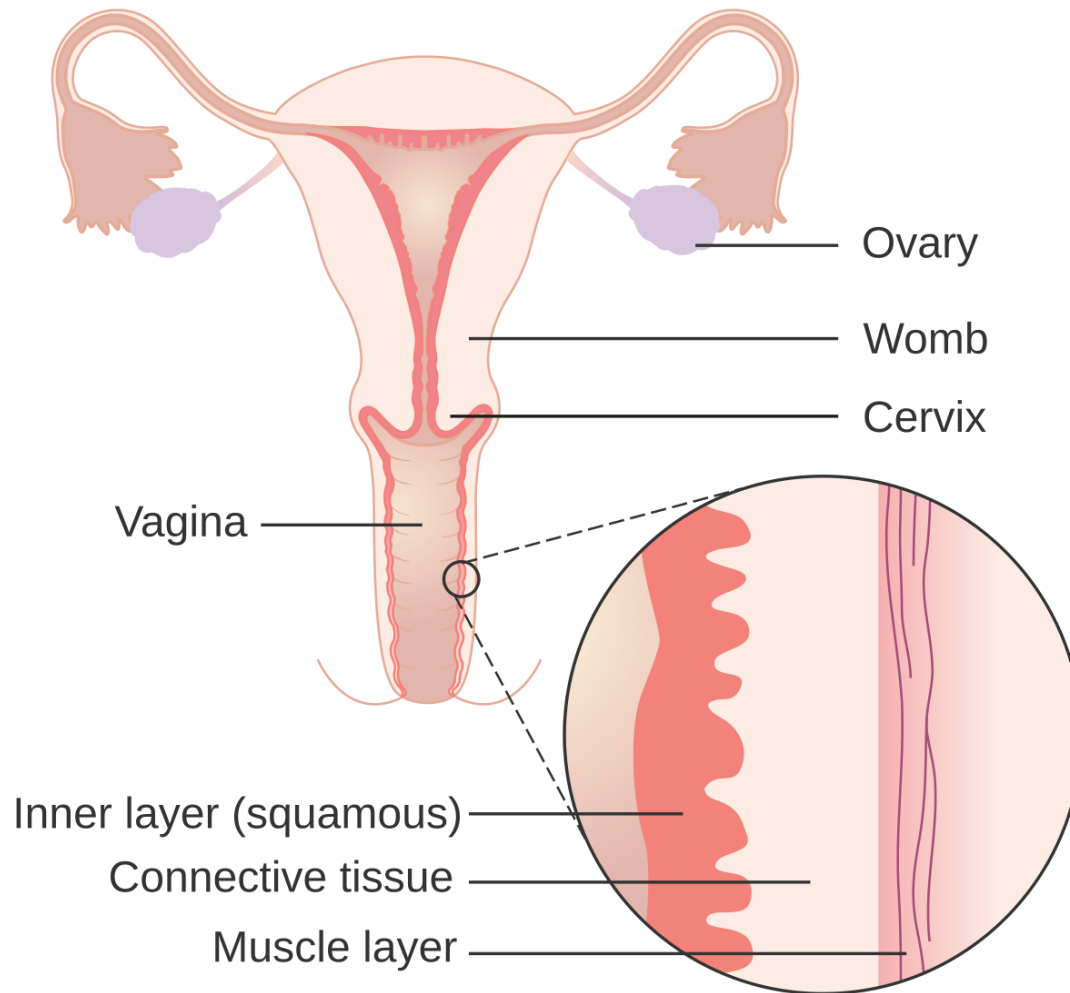
The immunohistochemistry markers (proteins) that can help to detect structures and target proteins in tissues under the microscope





The structural layers of the female reproductive tract

(Please view images towards the end of the document to assist with the learning content)

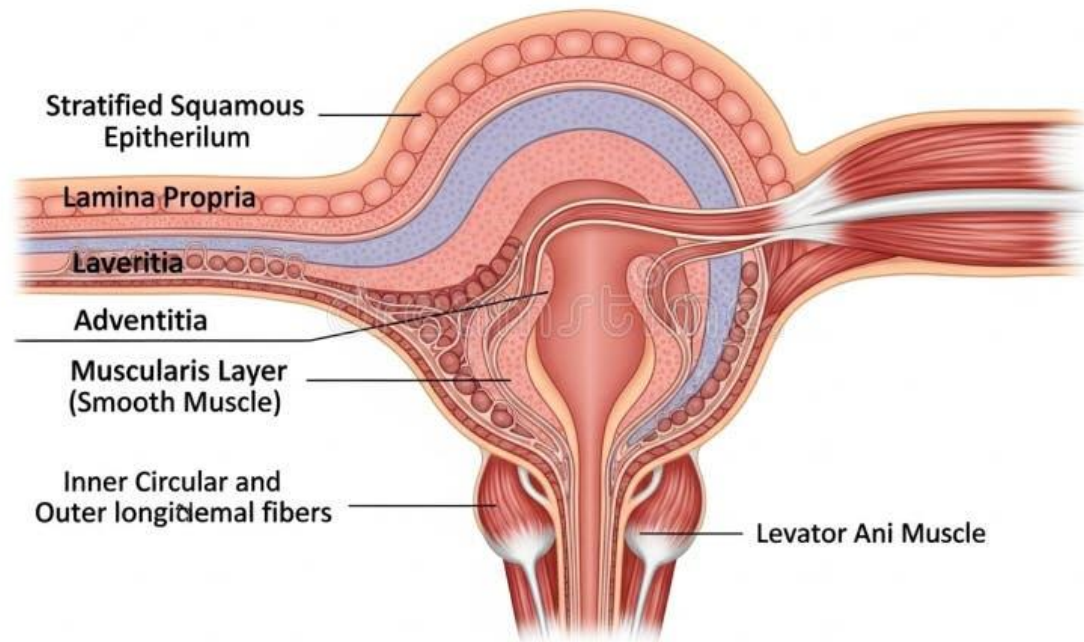


An illustration of the internal genitalia and a close section of the layers of the vagina.

The structural layers of the female reproductive tract

(Please view images towards the end of the document to assist with the learning content)

Vaginal Wall



A closer presentation of the different layers of the vaginal wall. There are three types of muscles presented:

Inner circular

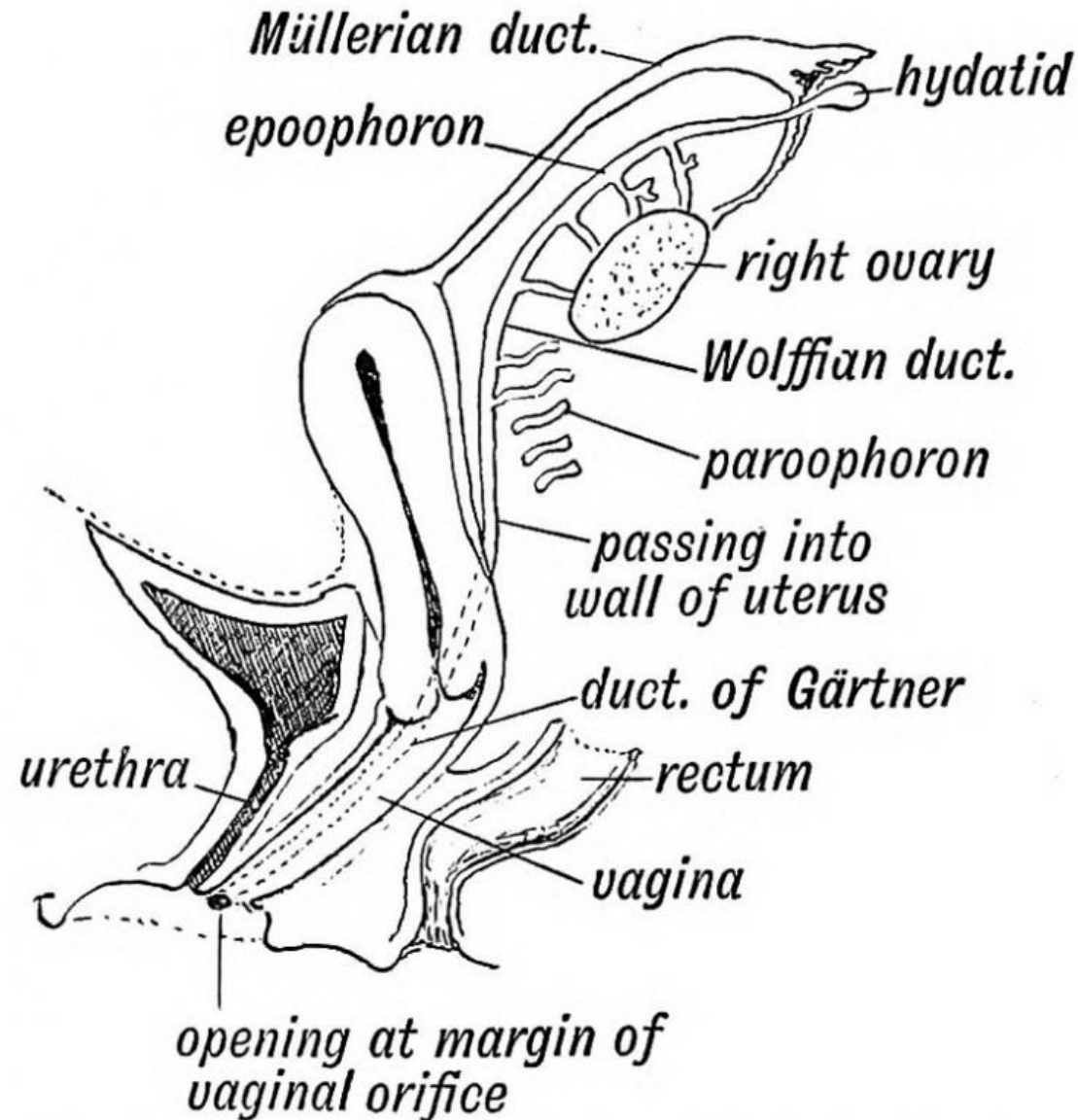
Outer longitudinal

Levator Ani Muscle



The structural layers of the female reproductive tract

(Please view images towards the end of the document to assist with the learning content)



The Wolffian duct = male

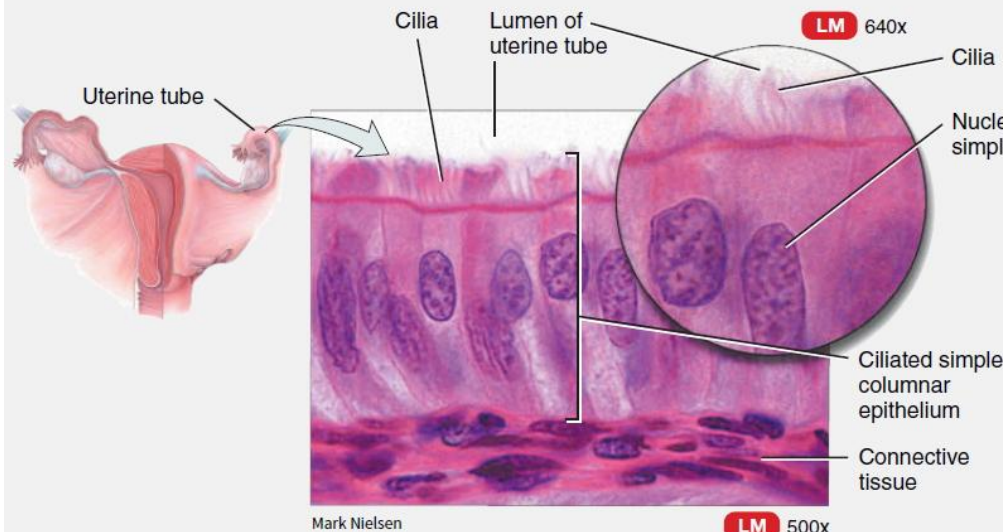
The Mullerian duct = female

The Mullerian duct is what the embryo develops into a female reproductive system.

The structural layers of the female reproductive tract

(Please view images towards the end of the document to assist with the learning content)

Fallopian Tube Ciliated Epithelium

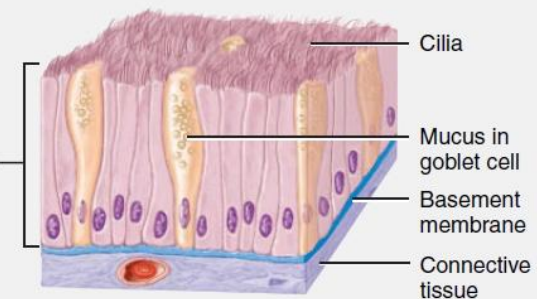


Sectional view of ciliated simple columnar epithelium of uterine tube



SEM 6000x

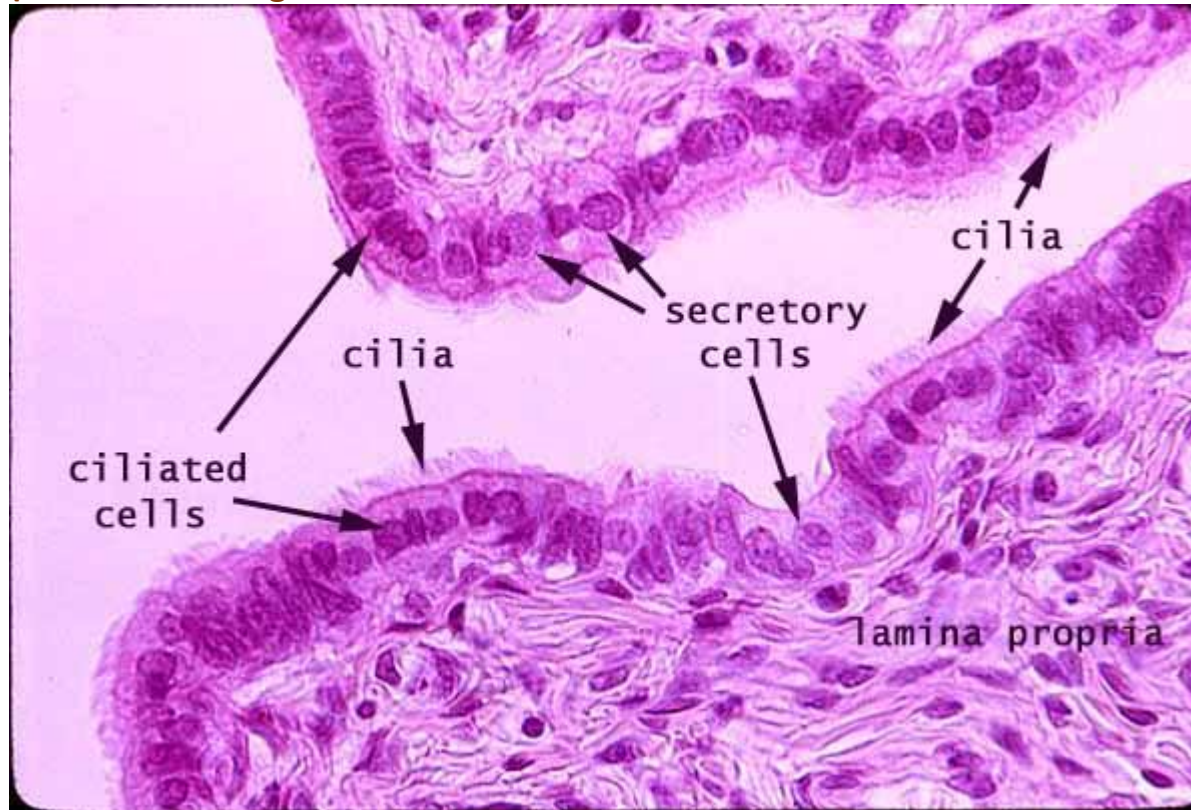
Ciliated simple columnar epithelium of uterine tube



Ciliated simple columnar epithelium

The structural layers of the female reproductive tract

(Please view images towards the end of the document to assist with the learning content)



The lining of the Fallopian Tube

The lining consists of simple column shaped cells.

There are two main types:

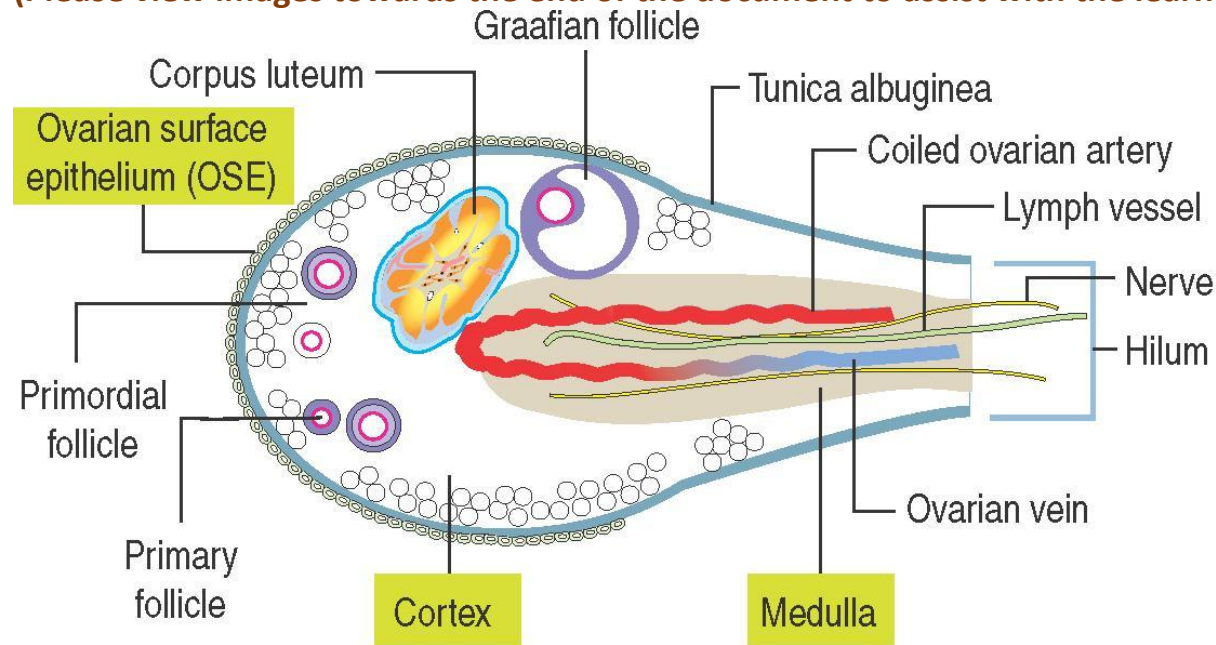
Ciliated – These are hair-like projections where along the fimbriae. It aims to push the egg towards the ampulla-isthmus junction to be fertilised before going down the womb.

Secretory – They produce the mucus to lubricate and soften the area.

There is a layer of lamina propria which is a layer of membrane that aims to support the simple columnar epithelium (Southern Illinois University, 2022)

The structural layers of the female reproductive tract

(Please view images towards the end of the document to assist with the learning content)

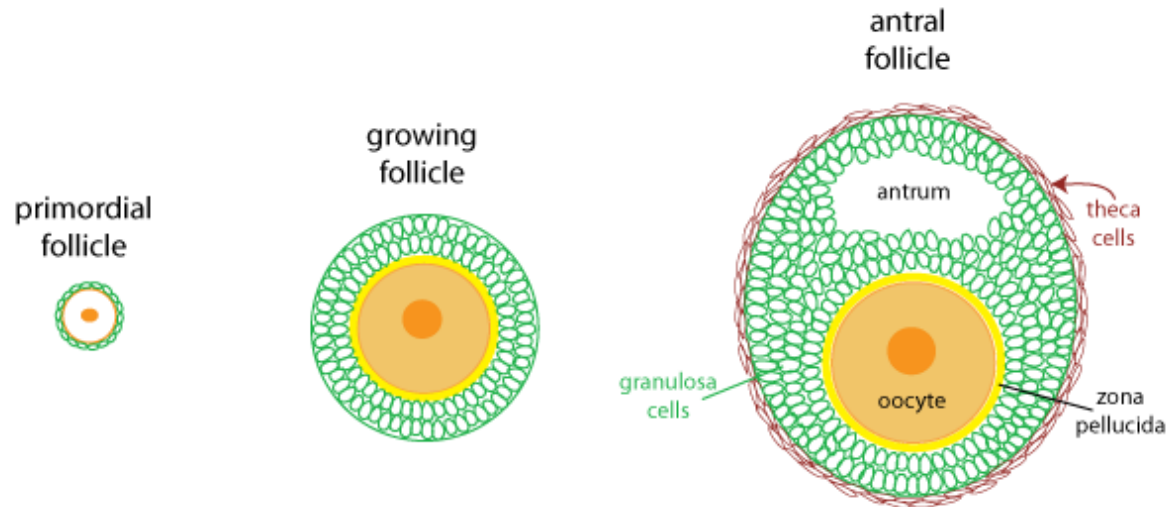


The structure of the ovary

The ovary is covered by the **ovarian surface epithelium** (simple cuboidal-to-squamous epithelium) and consists of an outer **cortex** and a central **medulla**. The medulla contains connective tissue supporting large blood vessels (a **coiled and tortuous ovarian artery** and **vein**), lymph vessels and nerves. The cortex displays clusters of **primordial follicles**. The **tunica albuginea**, a thin layer of connective tissue, is observed at the periphery of the cortex.

The structural layers of the female reproductive tract

(Please view images towards the end of the document to assist with the learning content)



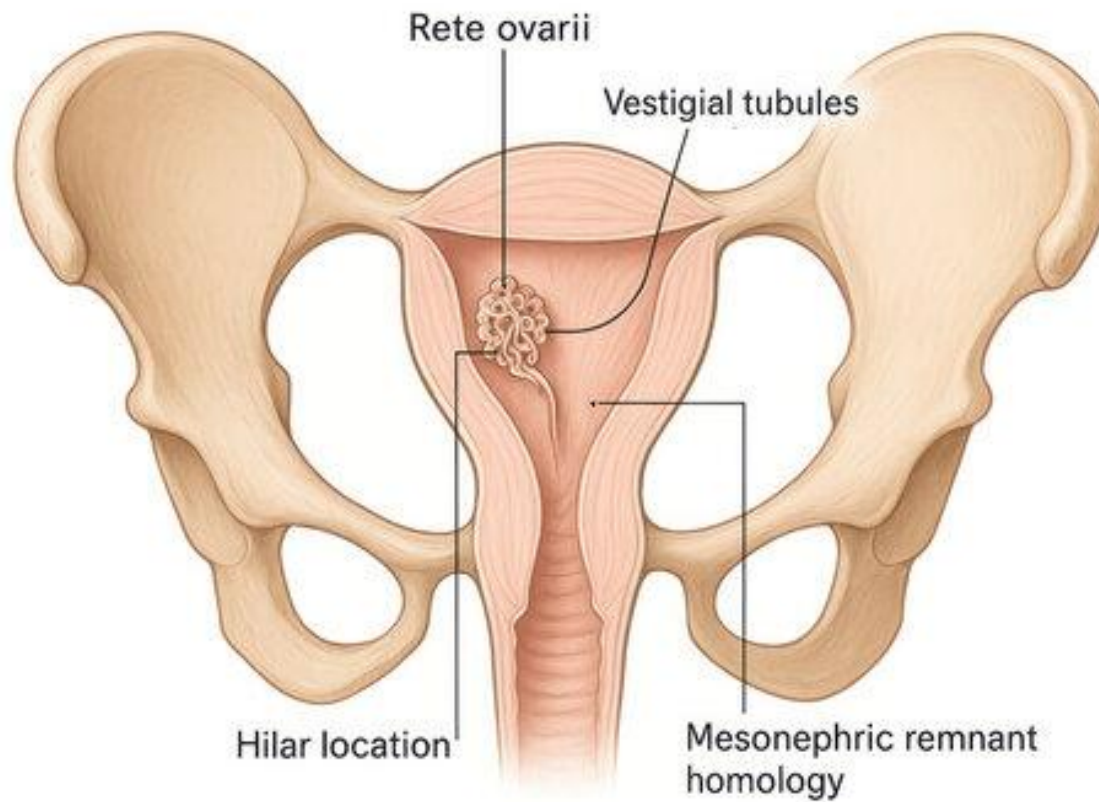
The structure of the early stages of a growing follicle. The granulosa and theca cells are what surrounds the ovarian follicle.



The structural layers of the female reproductive tract

(Please view images towards the end of the document to assist with the learning content)

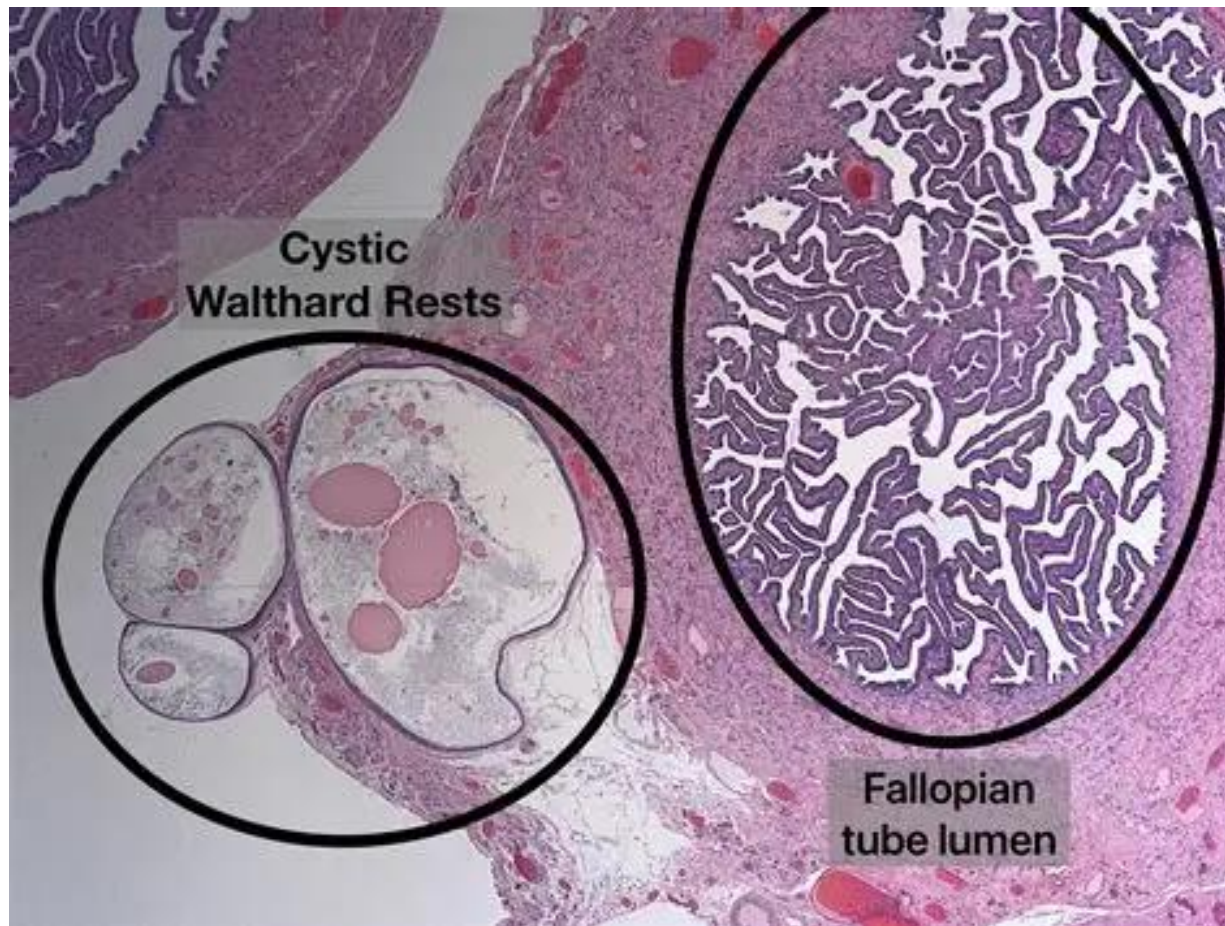
The rete ovarii





The structural layers of the female reproductive tract

(Please view images towards the end of the document to assist with the learning content)



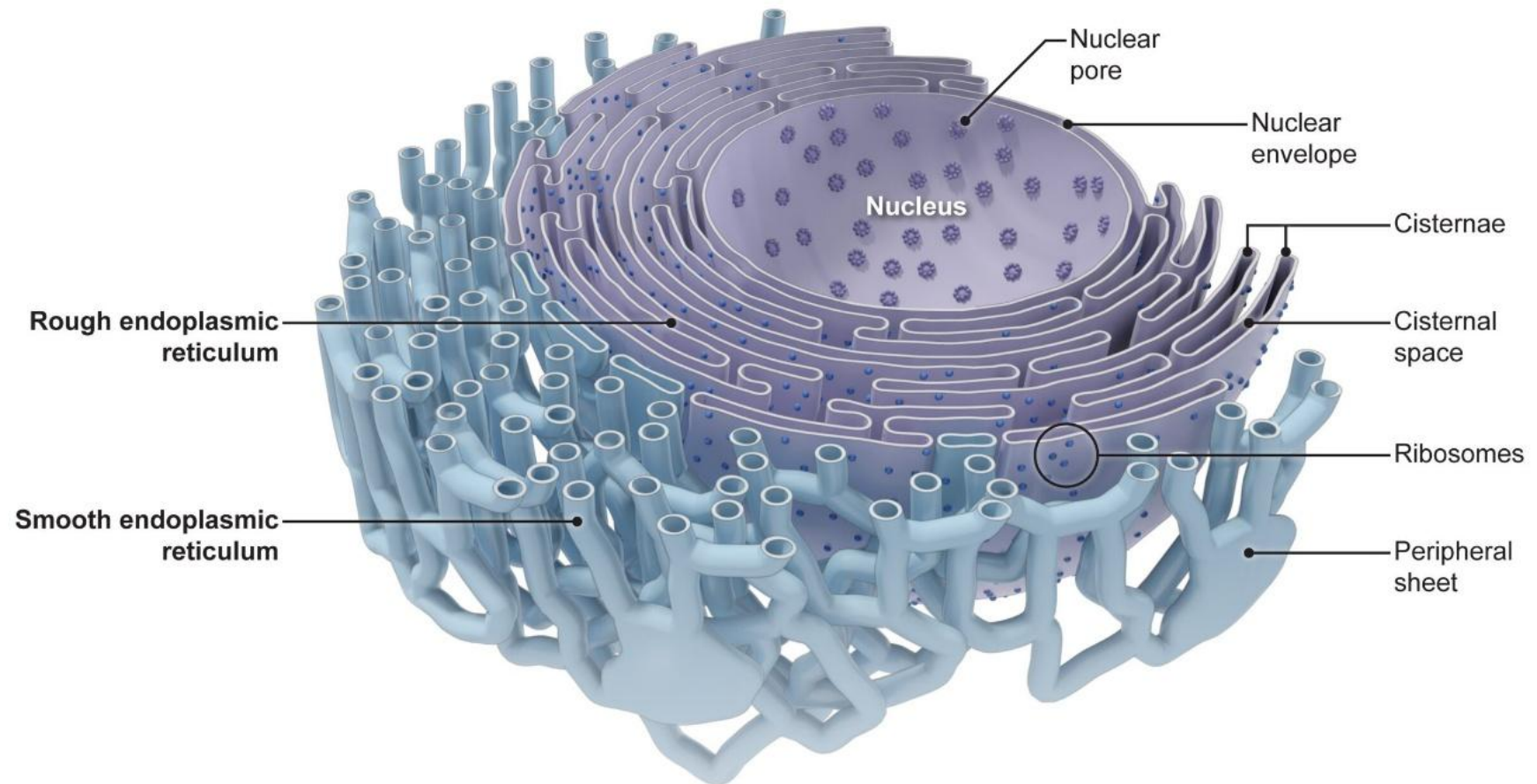
A microscopic presentation of Walthard Rests is a benign cluster of cells that is commonly found in the ovaries. They appear to have eosinophilic luminal material and cluster of cells. There is also bean shaped nuclei.



The structural layers of the female reproductive tract

(Please view images towards the end of the document to assist with the learning content)

Some of the organelles found in the cytoplasm of a cell.

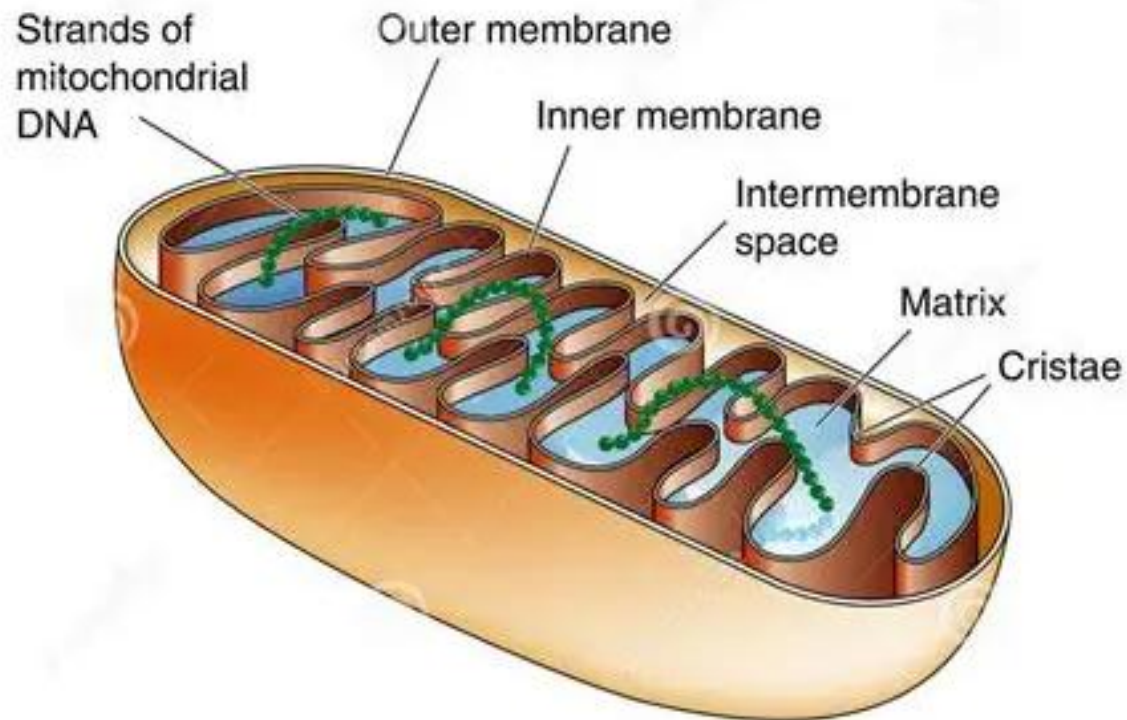




The structural layers of the female reproductive tract

(Please view images towards the end of the document to assist with the learning content)

The structure of a mitochondria



Download from
Dreamstime.com

This watermark-free image is for personal use only.



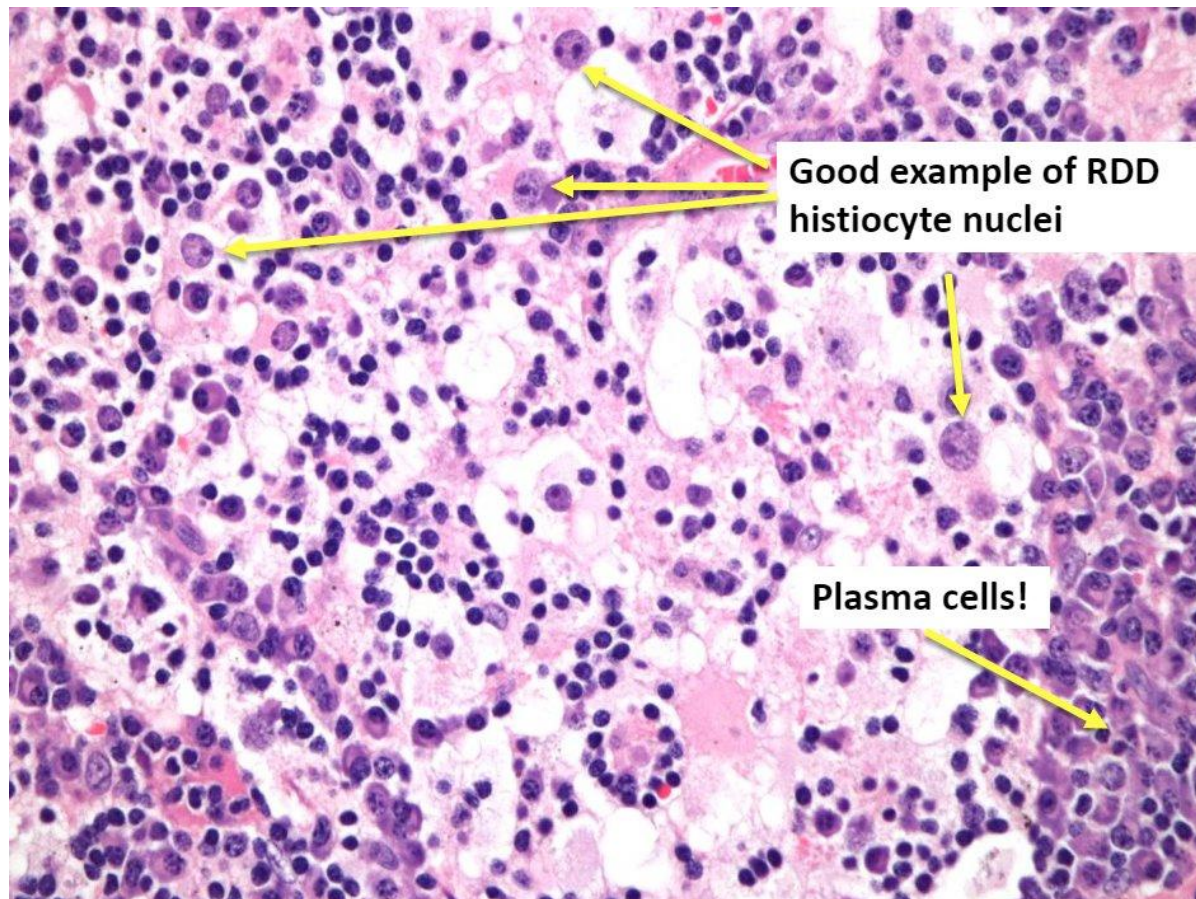
14219389

Leggeri | Dreamstime.com



The structural layers of the female reproductive tract

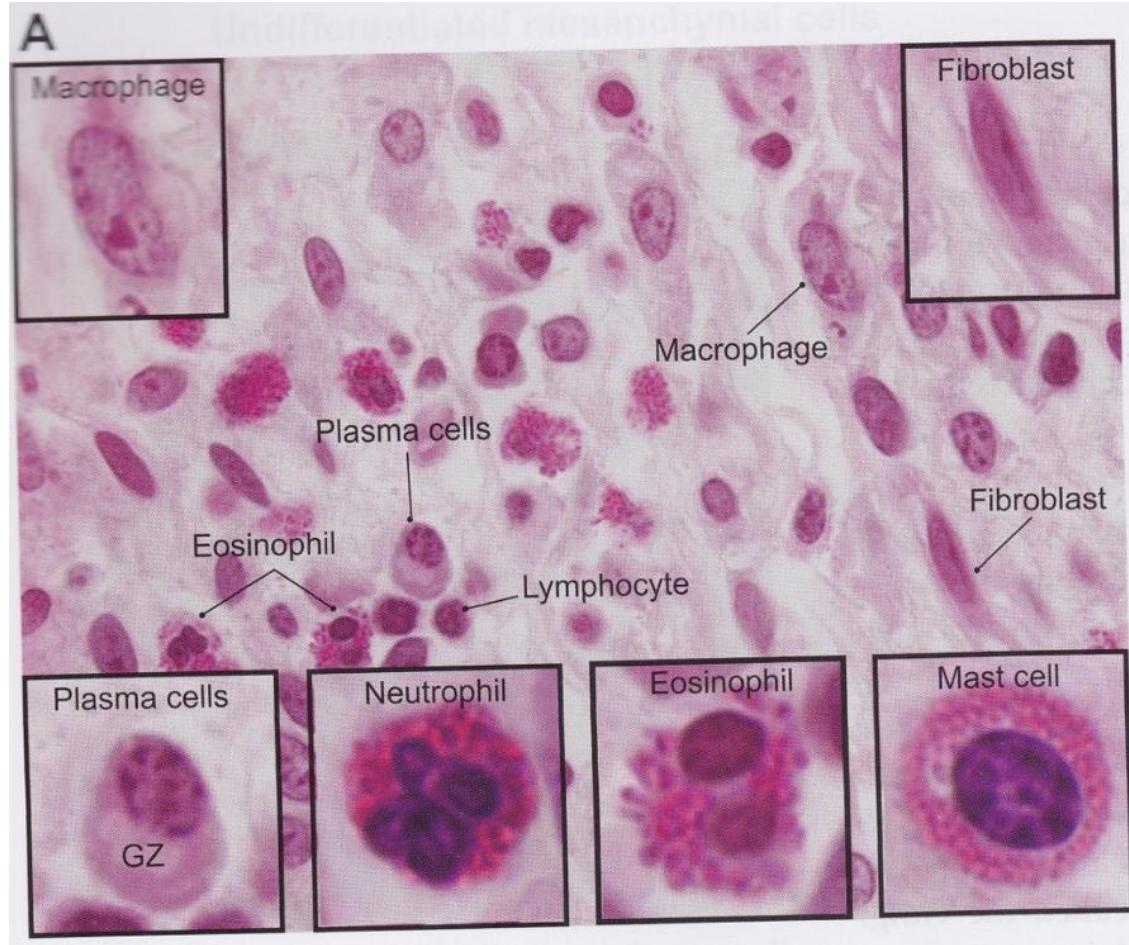
(Please view images towards the end of the document to assist with the learning content)



Histiocyte that have been microscopically stained. The nuclei appear dark blue.

The structural layers of the female reproductive tract

(Please view images towards the end of the document to assist with the learning content)



Types of immune cells and fibroblasts.

There are a different types of white blood cells:

Lymphocytes: B cells and T cells.

Granulocytes: Neutrophils, Eosinophils and Basophils.

Plasma cells make proteins called antibodies that boost immune response.

Fibroblast – It is found in connective tissue and precursor for elastic, collagen and reticular fibres.

Macrophages – They engulf any pathogens and break it down via perforin and granzymes.

Mast cells – They are type of immune cells that is contains chemicals, for instance, histamine, heparin and serotonin. They release these chemicals from its granules during inflammation.

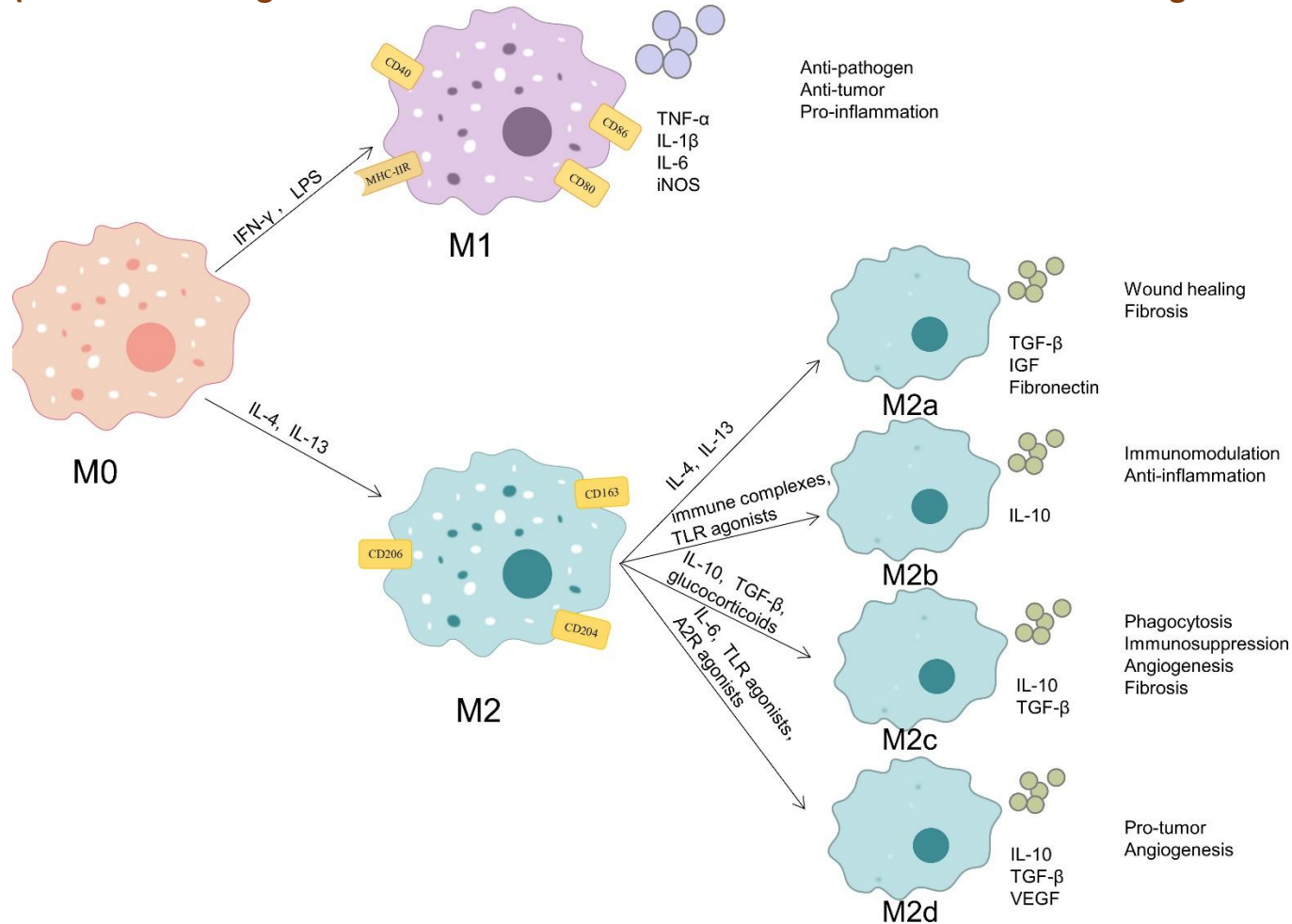
The granulocytes can be distinguished based on the colour and shape of its nuclei, granules when stained with Romanosky

Neutrophil – one-lobed nucleus, blue-purple granules.

Eosinophil – two-lobed nucleus, red-orange granules

The structural layers of the female reproductive tract

(Please view images towards the end of the document to assist with the learning content)



The function of macrophages

There are two main types and requires proteins like interleukins, chemokines, tumour necrosis factor, interferons and other factors to induce response

M1 – This is involved in removing pathogens, tumour cells and elicit inflammation.

M2 – it facilitated wound healing, angiogenesis, fibrosis/scarring of tissue, prevent inflammation, engulf pathogens (phagocytosis).

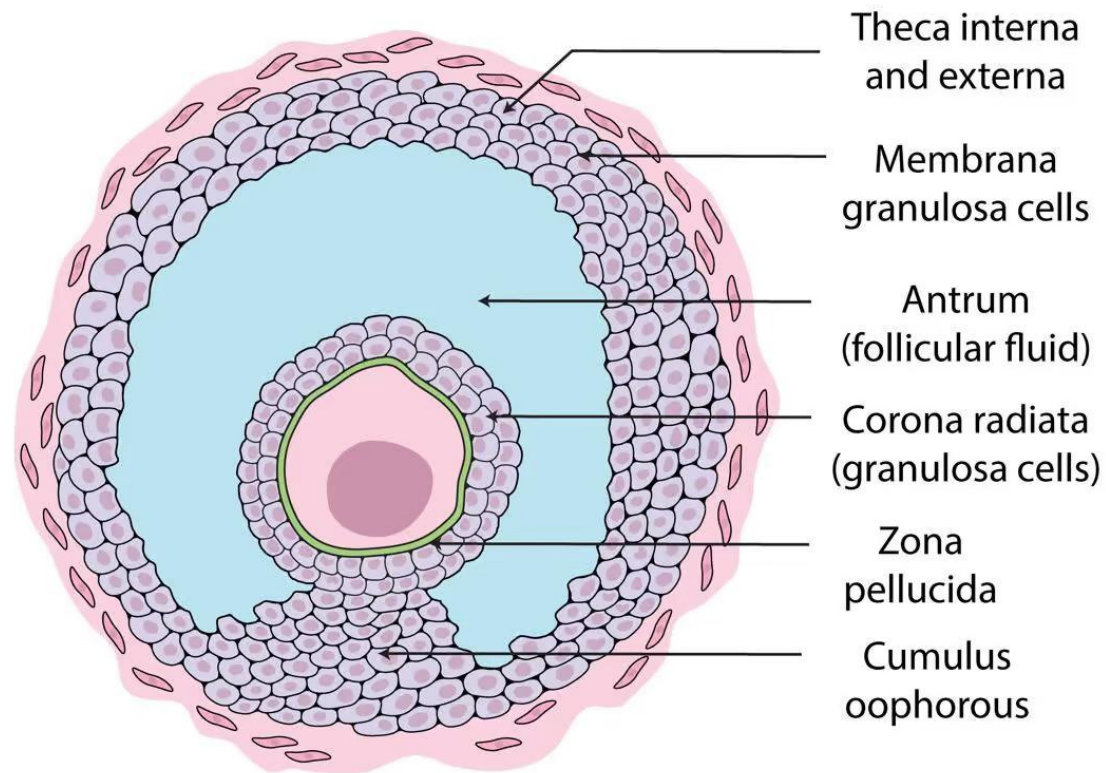
On the other hand, it can also induce tumour growth via angiogenesis and suppress immune system.



The structural layers of the female reproductive tract

(Please view images towards the end of the document to assist with the learning content)

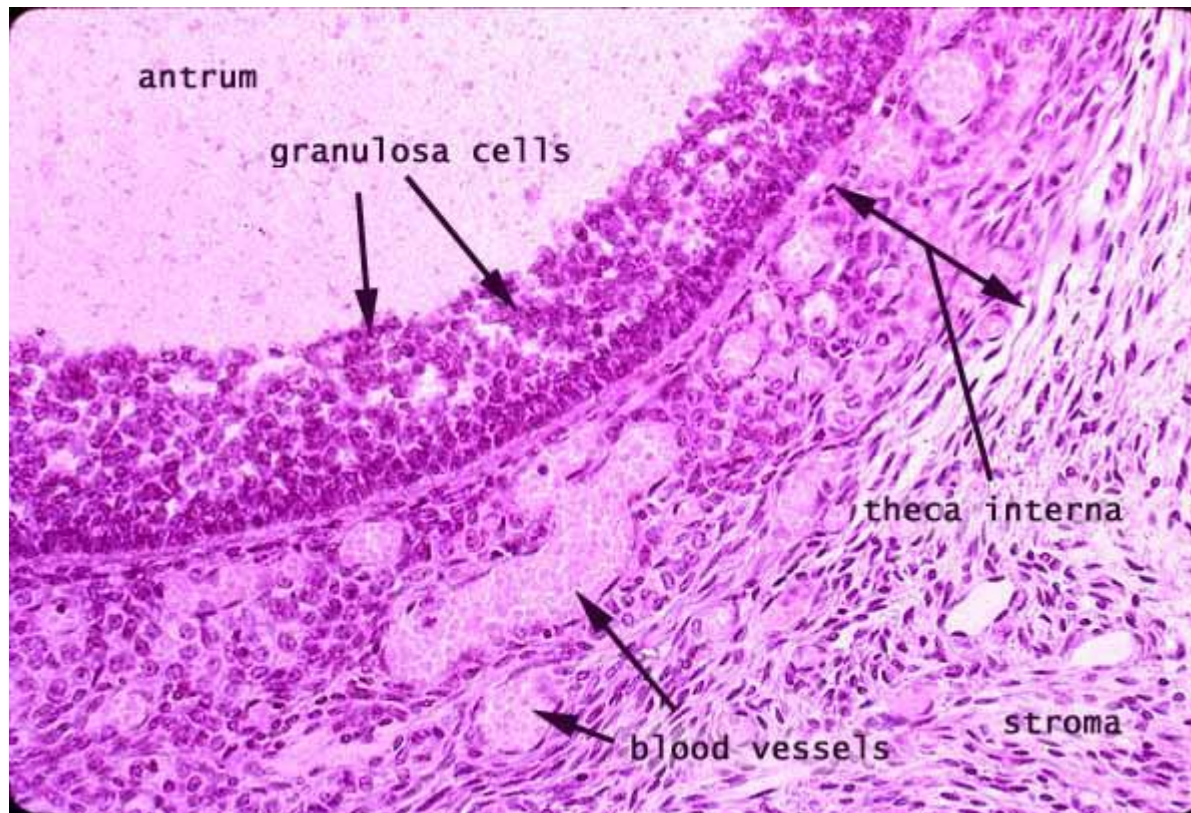
The structure of an egg cell





The structural layers of the female reproductive tract

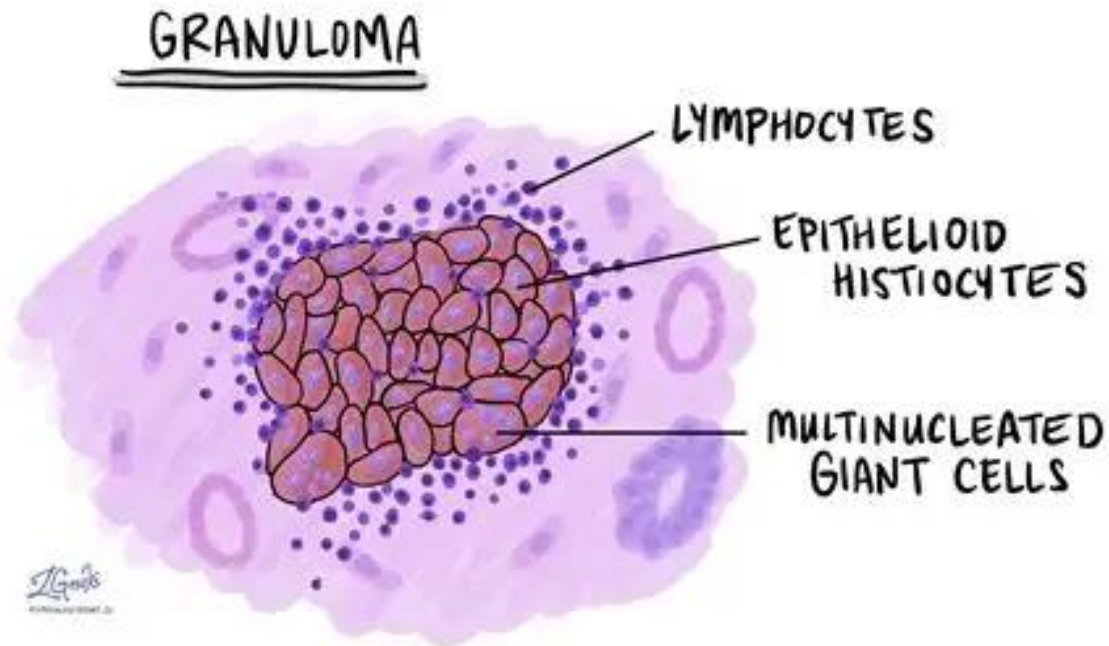
(Please view images towards the end of the document to assist with the learning content)



A microscopic /section of the egg cell where it presents the granulosa and theca cells, blood vessels and stroma cells.

The structural layers of the female reproductive tract

(Please view images towards the end of the document to assist with the learning content)



A illustration of epithelioid histiocytes, multinucleated giant cells and lymphocytes are common characteristics of granuloma. The lymphocytes mediate immune response to infection.

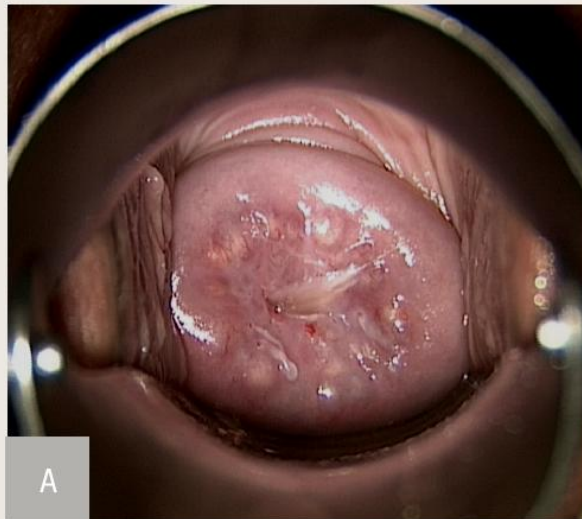


The structural layers of the female reproductive tract

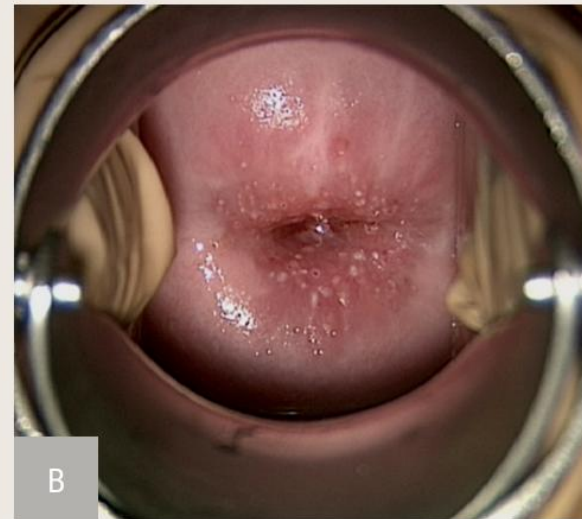
(Please view images towards the end of the document to assist with the learning content)

Nabothian cysts and fine glandular orifices in the transformation zone of the cervix

Nabothian cysts and fine glandular orifices are normal findings in a transformation zone. They appear when metaplasia fails to progress into the glandular crypts.



Nabothian cysts (a): the metaplastic process fails to enter the crypts covering them only at the surface. The mucus of endocervical crypts accumulates creating a typical cyst aspect.



The fine glandular orifices (b): the metaplastic process fails to descend or cover the crypts of the columnar epithelium. Therefore the orifices of the crypts remain visible.