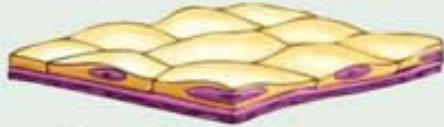


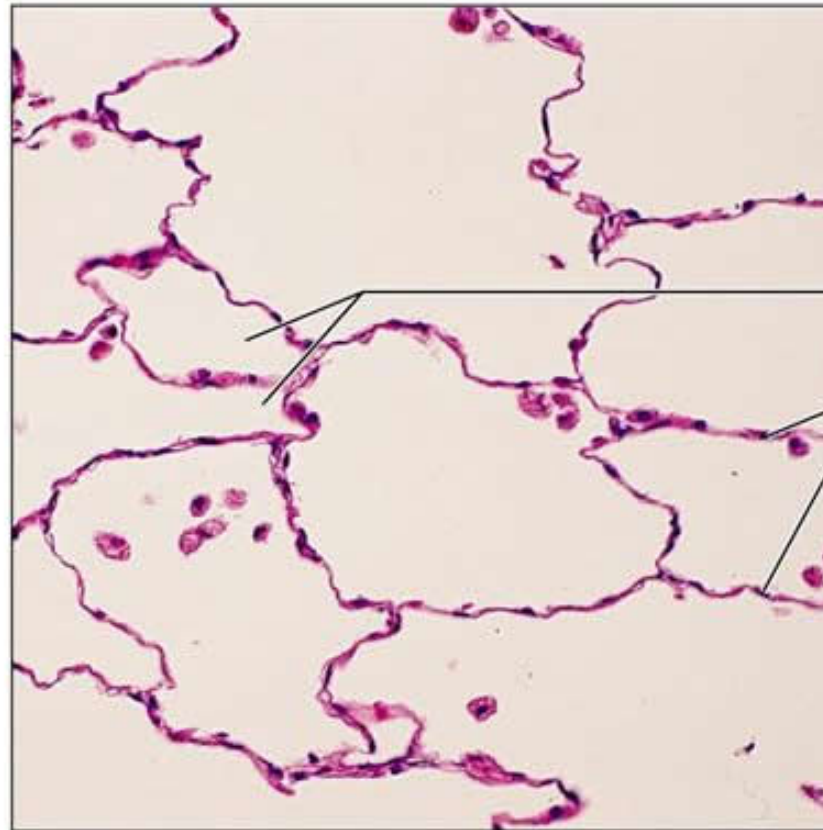
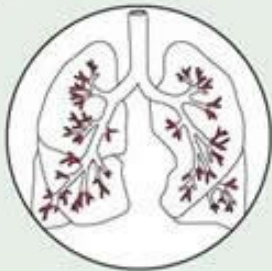
(a) Simple squamous epithelium

Description: Single layer of flattened cells with disc-shaped central nuclei and sparse cytoplasm; the simplest of the epithelia.



Function: Allows passage of materials by diffusion and filtration in sites where protection is not important; secretes lubricating substances in serosae.

Location: Kidney glomeruli; air sacs of lungs; lining of heart, blood vessels, and lymphatic vessels; lining of ventral body cavity (serosae).



Air sacs of lung tissue
Nuclei of squamous epithelial cells

Photomicrograph: Simple squamous epithelium forming part of the alveolar (air sac) walls (400 \times).

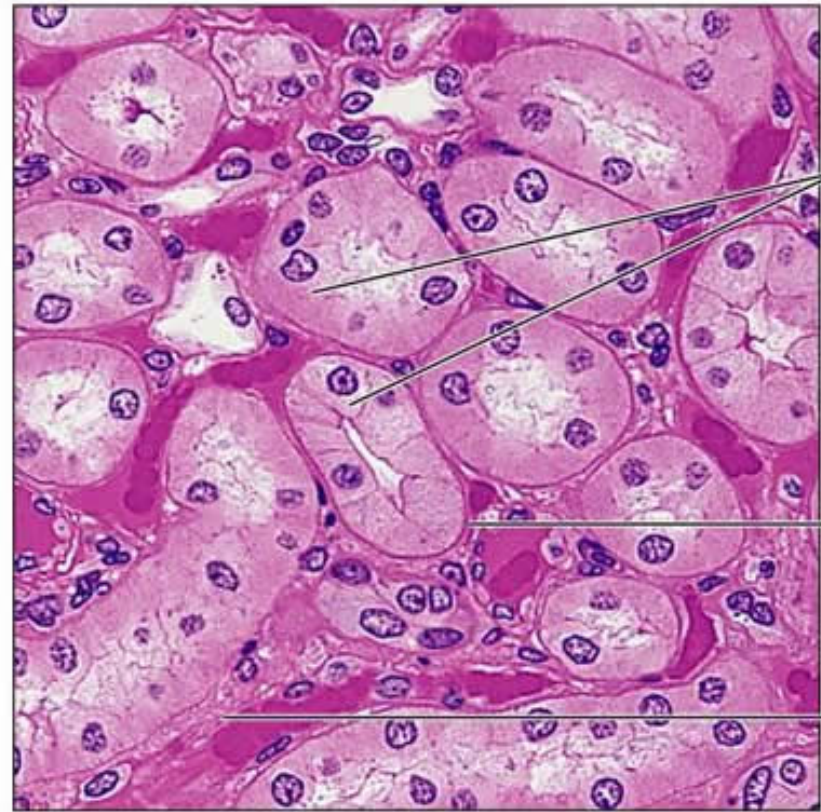
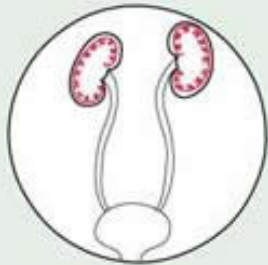
(b) Simple cuboidal epithelium

Description: Single layer of cubelike cells with large, spherical central nuclei.



Function: Secretion and absorption.

Location: Kidney tubules; ducts and secretory portions of small glands; ovary surface.



Simple cuboidal epithelial cells

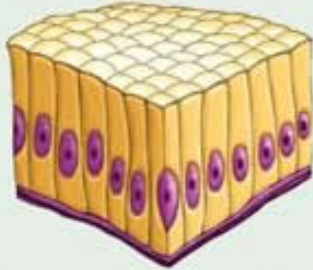
Basement membrane

Connective tissue

Photomicrograph: Simple cuboidal epithelium in kidney tubules (400 \times).

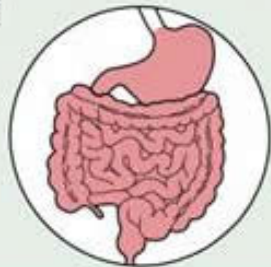
(c) Simple columnar epithelium

Description: Single layer of tall cells with *round to oval* nuclei; some cells bear cilia; layer may contain mucus-secreting unicellular glands (goblet cells).



Function: Absorption; secretion of mucus, enzymes, and other substances; ciliated type propels mucus (or reproductive cells) by ciliary action.

Location: Nonciliated type lines most of the digestive tract (stomach to anal canal), gallbladder, and excretory ducts of some glands; ciliated variety lines small bronchi, uterine tubes, and some regions of the uterus.



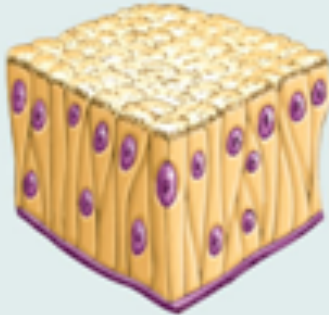
Simple columnar epithelial cell

Basement membrane

Photomicrograph: Simple columnar epithelium of the stomach mucosa (1300 \times).

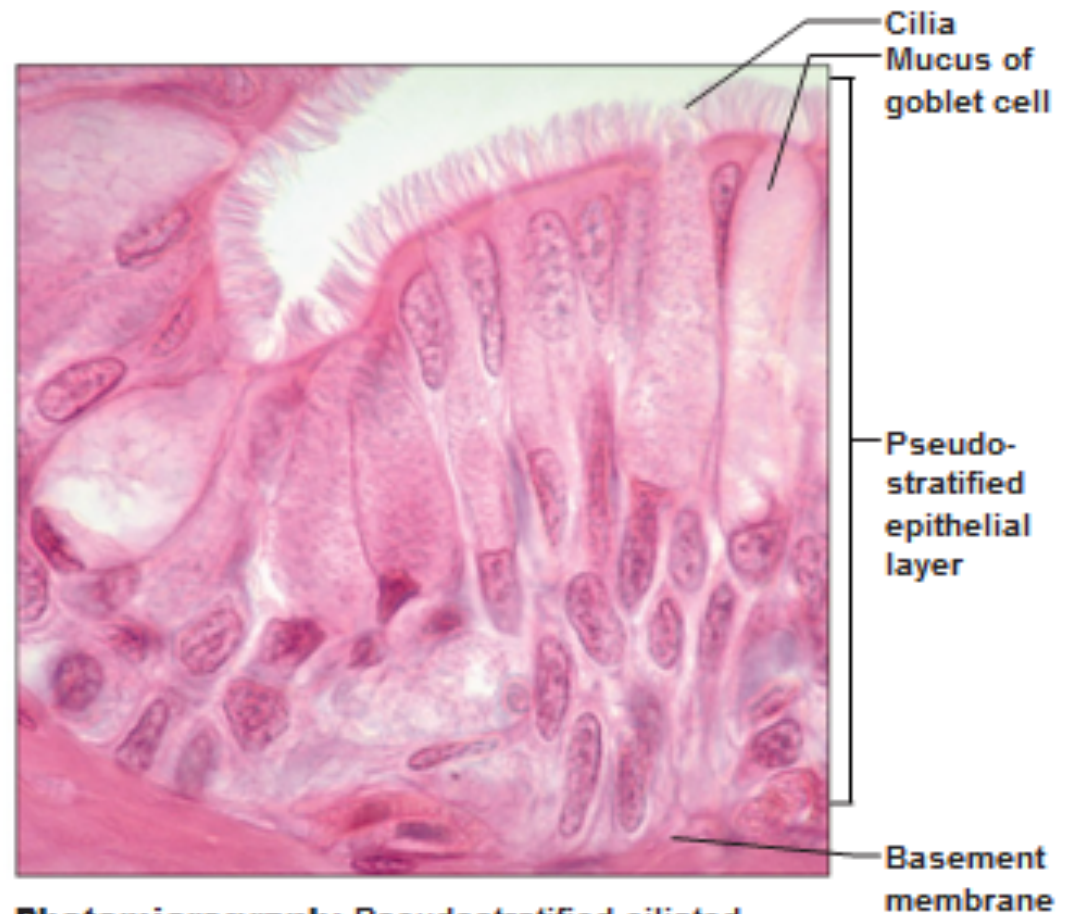
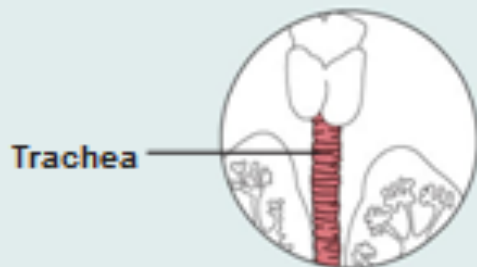
(d) Pseudostratified columnar epithelium

Description: Single layer of cells of differing heights, some not reaching the free surface; nuclei seen at different levels; may contain mucus-secreting goblet cells and bear cilia.



Function: Secretion, particularly of mucus; propulsion of mucus by ciliary action.

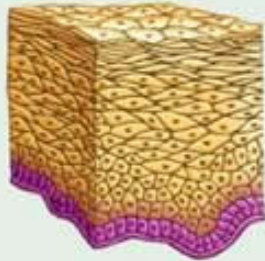
Location: Nonciliated type in male's sperm-carrying ducts and ducts of large glands; ciliated variety lines the trachea, most of the upper respiratory tract.



Photomicrograph: Pseudostratified ciliated columnar epithelium lining the human trachea (780 \times).

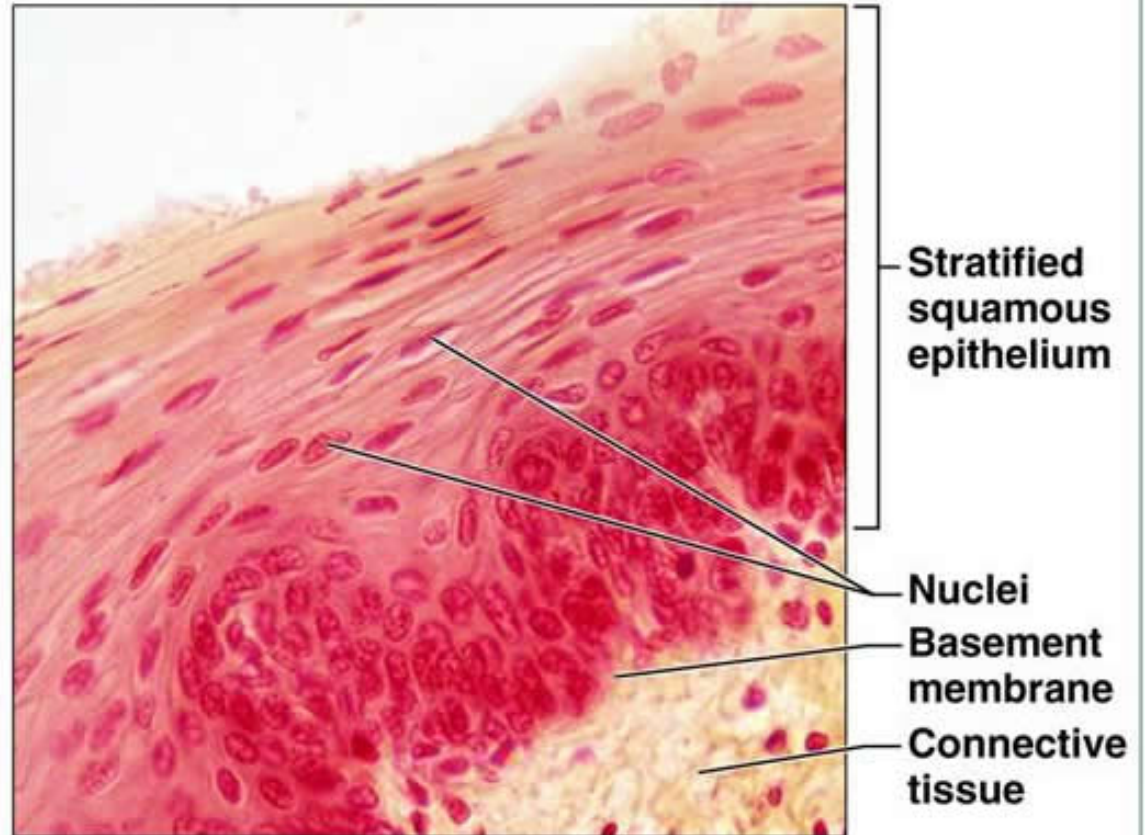
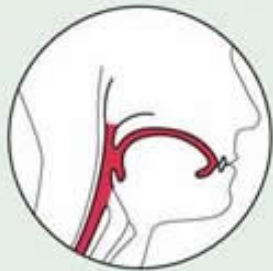
(e) Stratified squamous epithelium

Description: Thick membrane composed of several cell layers; basal cells are cuboidal or columnar and metabolically active; surface cells are flattened (squamous); in the keratinized type, the surface cells are full of keratin and dead; basal cells are active in mitosis and produce the cells of the more superficial layers.



Function: Protects underlying tissues in areas subjected to abrasion.

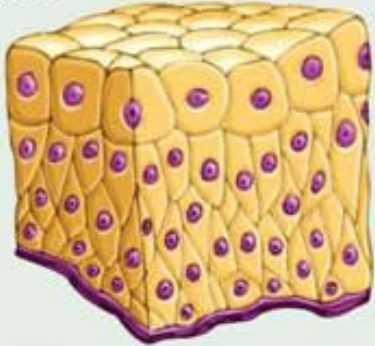
Location: Nonkeratinized type forms the moist linings of the esophagus, mouth, and vagina; keratinized variety forms the epidermis of the skin, a dry membrane.



Photomicrograph: Stratified squamous epithelium lining the esophagus (425 \times).

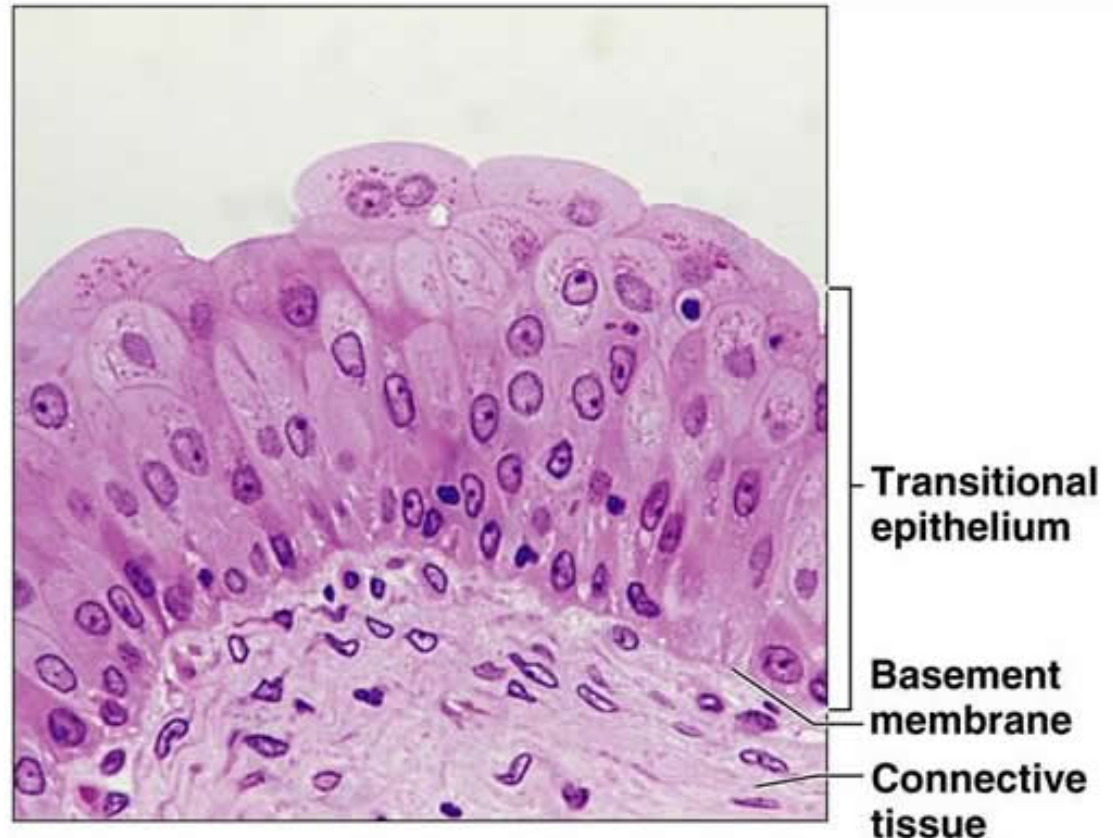
(f) Transitional epithelium

Description: Resembles both stratified squamous and stratified cuboidal; basal cells cuboidal or columnar; surface cells dome shaped or squamouslike, depending on degree of organ stretch.



Function: Stretches readily and permits distension of urinary organ by contained urine.

Location: Lines the ureters, bladder, and part of the urethra.

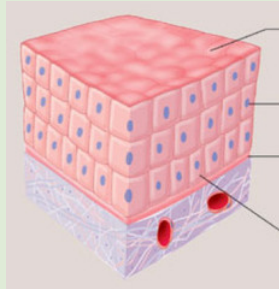


Photomicrograph: Transitional epithelium lining the bladder, relaxed state (500 \times); note the bulbous, or rounded, appearance of the cells at the surface; these cells flatten and become elongated when the bladder is filled with urine.

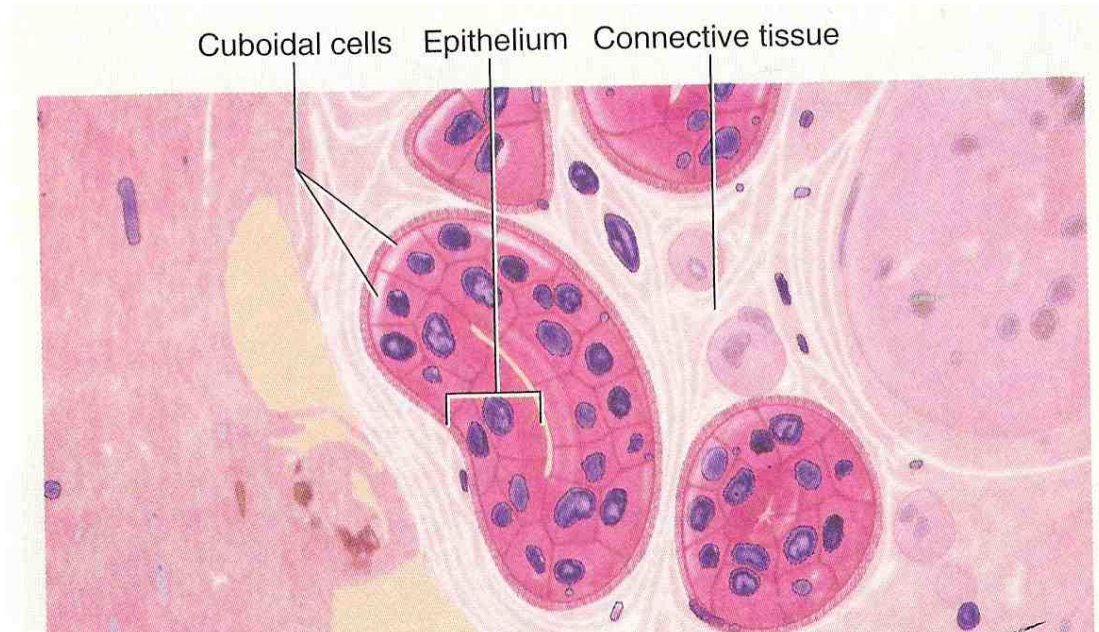
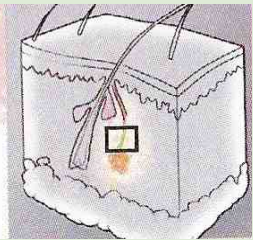
g) Stratified Cuboidal Epithelium

Description: Stratified cuboidal epithelium is arranged in two or more layers of cuboidal cells.

Function: protection



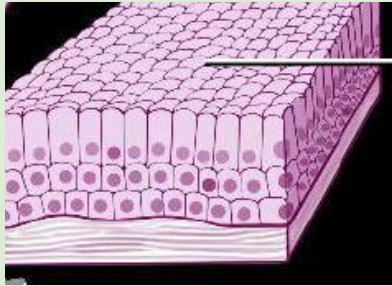
Location: ducts of mammary glands, sweat glands, and salivary glands



Photomicrograph: Stratified cuboidal epithelium of gland in the skin (400x)

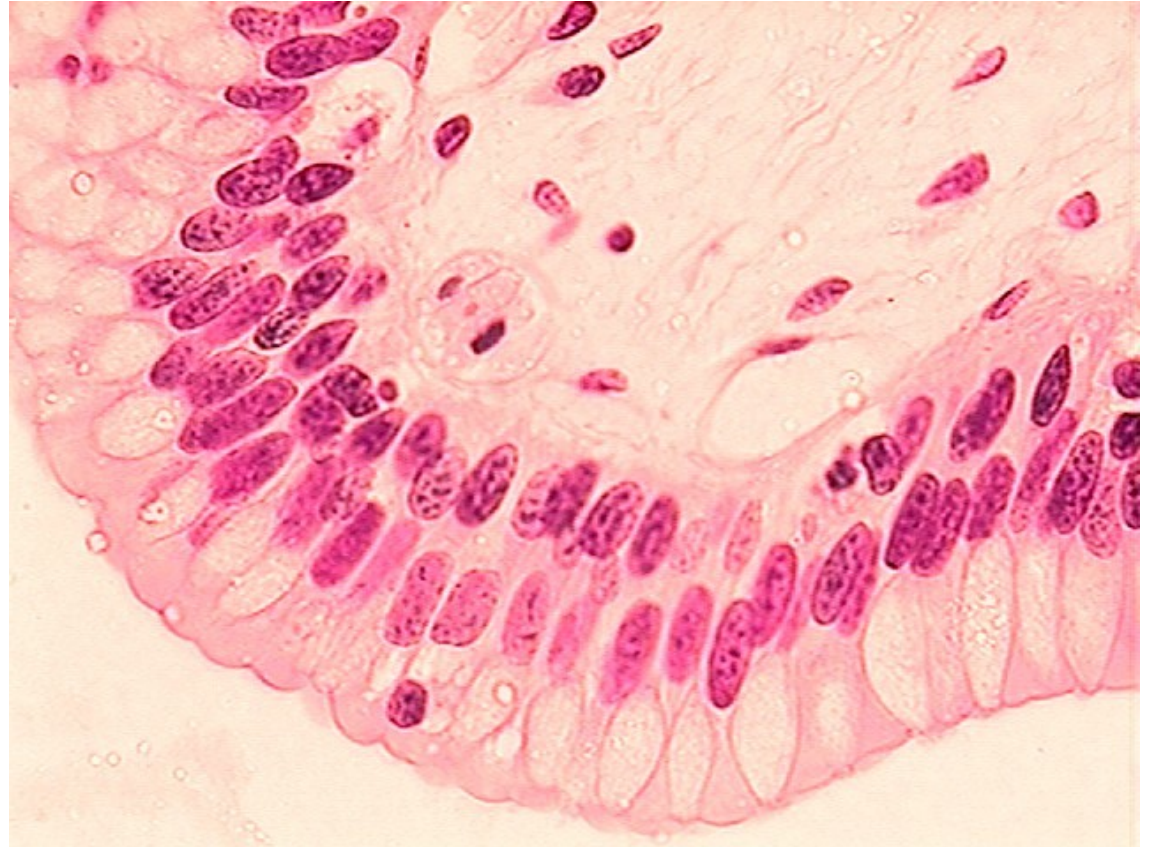
h) Stratified Columnar Epithelium

Description: Stratified columnar epithelium is arranged in two or more layers of columnar cells. It is very rare.



Function: secretion & protection

Location: ocular conjunctiva of the eye, anus, pharynx, uterus, urethra, vas deferens, salivary glands.

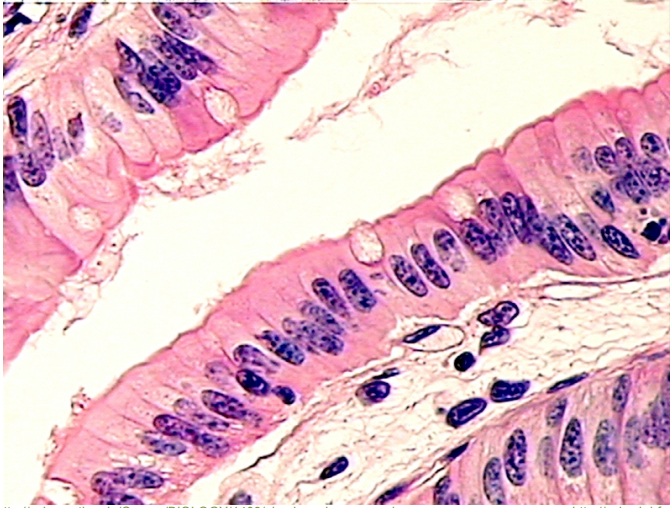


Photomicrograph: Stratified columnar epithelium of a salivary gland (425x)

http://www.jeremyswan.com/anatomy/203/lab_03_tissues/stratified_columnar-1000.jpg

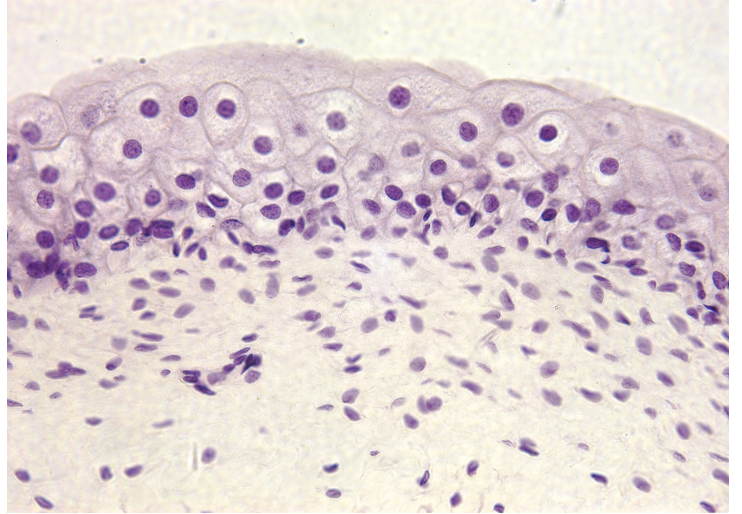
Lab 4a, Part B: Color Images

A.



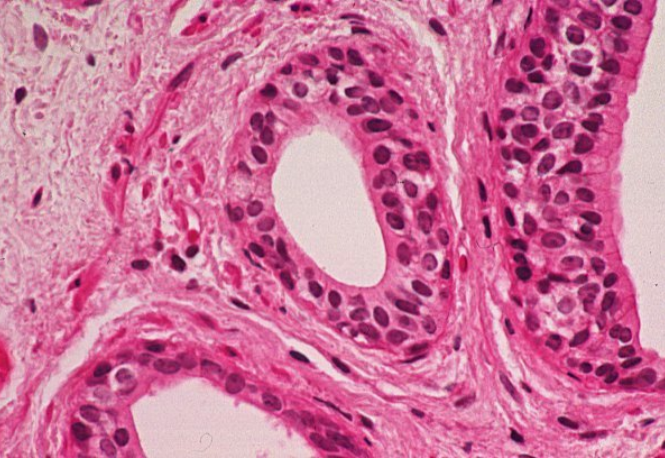
http://science.tjc.edu/Course/BIOLOGY/1409/simple_columnar_ep.jpg

B.



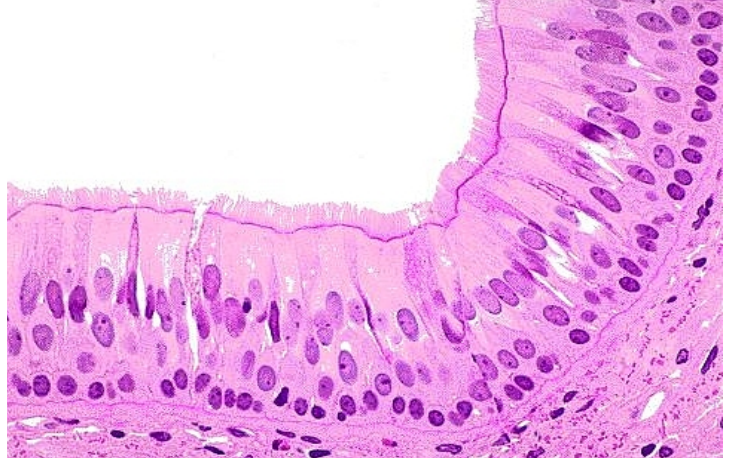
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C.



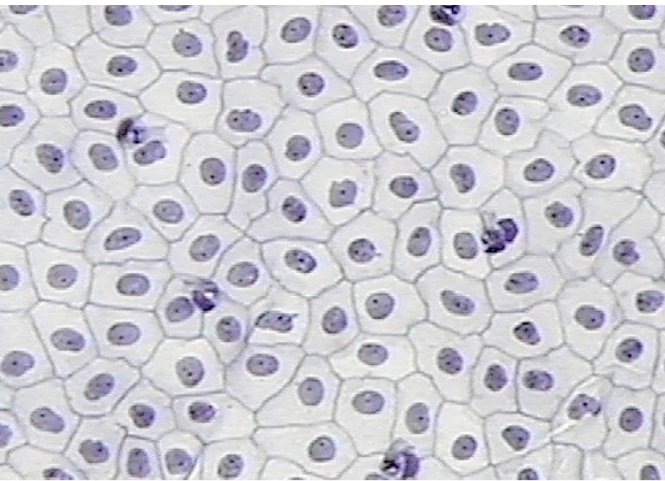
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D.



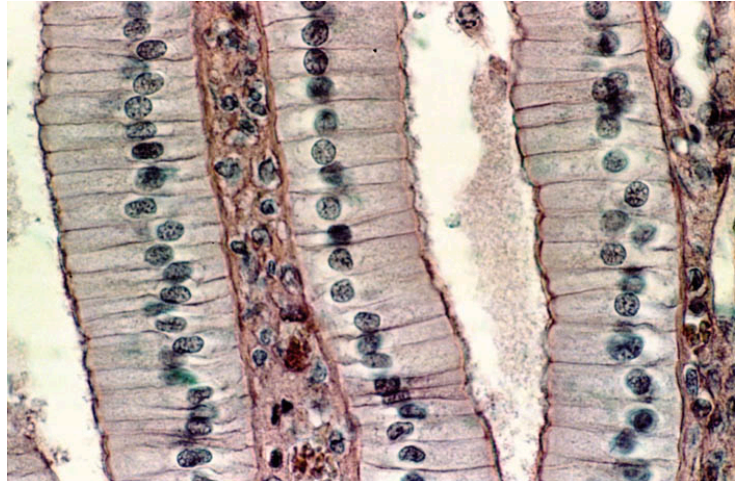
<http://stevegallik.org/sites/histologyolm.stevegallik.org/images/PseudoCilia4.jpg>

E.



<http://science.tjc.edu/Course/BIOLOGY/1409/squamouslow.jpg>

F.



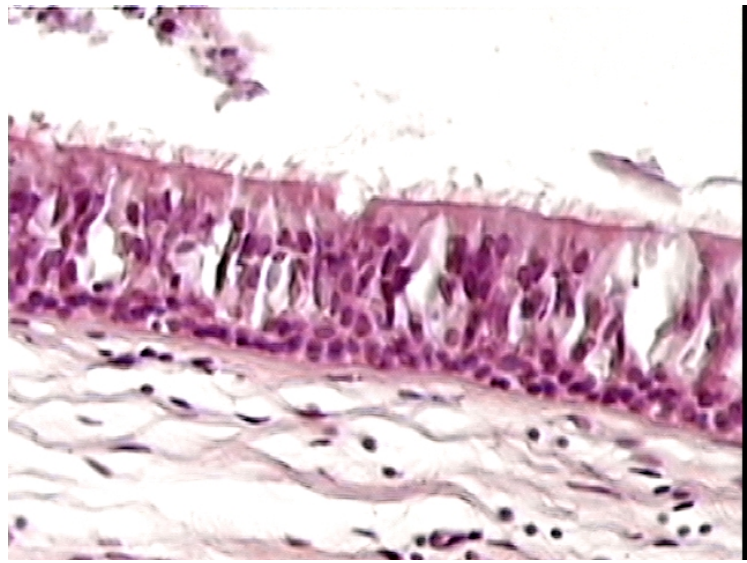
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G.



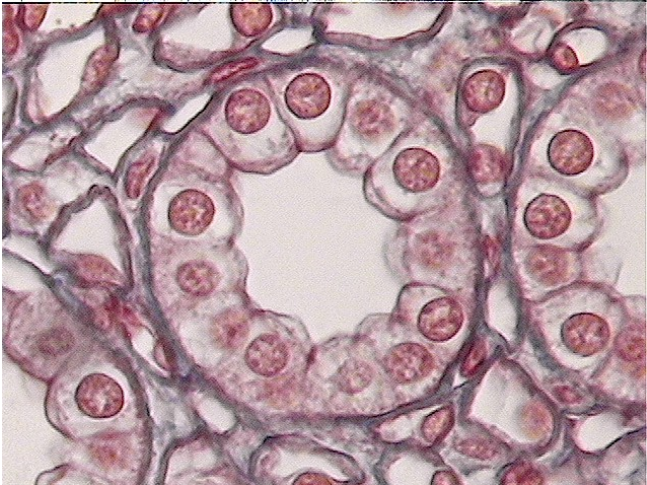
http://bio.rutgers.edu/~gb102/lab_6/epithelium/cuboidal_high_kc.jpg

H.



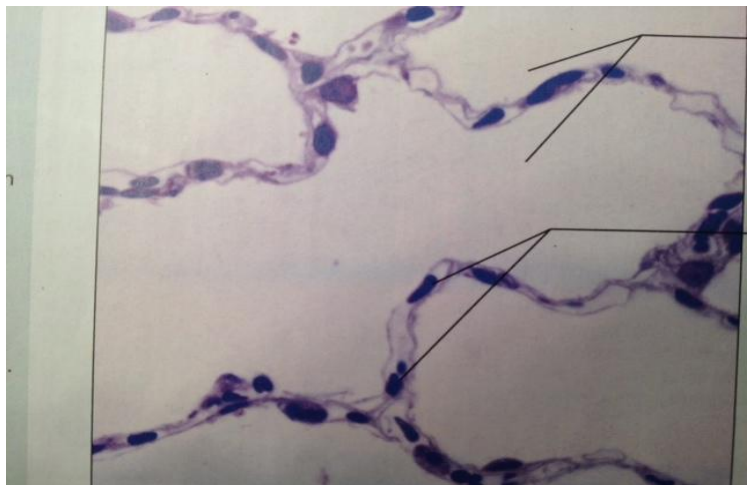
<http://science.tjc.edu/Course/BIOLOGY/1409/ciliatedpseudostrat.jpg>

I.



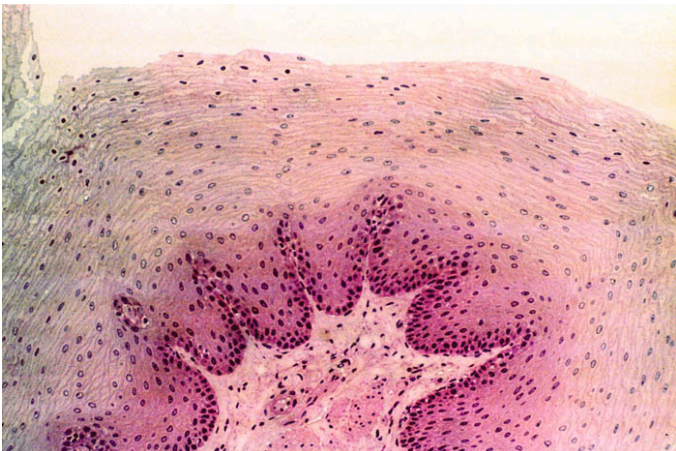
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J.



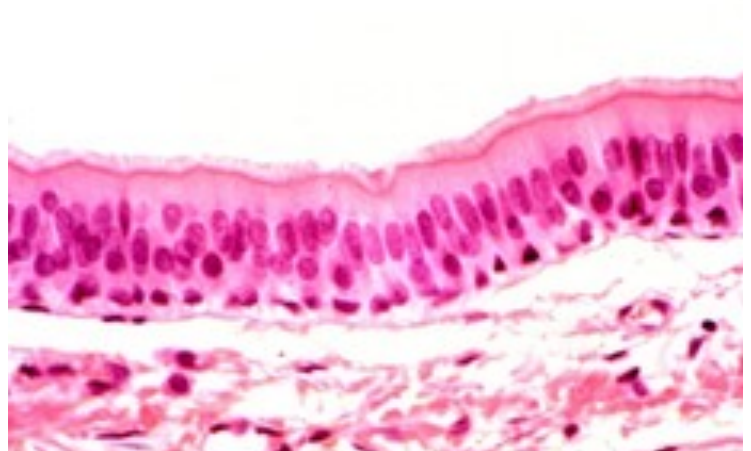
http://classconnection.s3.amazonaws.com/112/flashcards/844112/jpg/simple_squamous_epithelium1336529145515.jpg

K.



http://www.stegen.k12.mo.us/tchrges/sghs/ksulkowski/images/13_Stratified_Squamous_Epithelial_Tissuetemp_000.jpg

L.



http://o.quizlet.com/i/_F3HzOtZs1wgdlybe41sXQ_m.jpg