

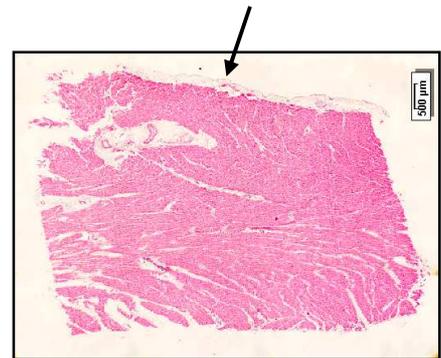
### Histology practical No. 3

- Topics:*
- 1- STRUCTURAL AND FUNCTIONAL CHARACTERISTICS OF COVERING AND LINING EPITHELIA AND THEIR CLASSIFICATION (pre-lab rev.ppt).
  - 2- RECOGNITION OF LINING EPITHELIA IN STAINED HISTOLOGY SLIDES AND PC-MONITORED OR PRINTED IMAGES.
  - 3- REVISION OF THE ULTRASTRUCTURE OF SURFACE SPECIALIZATIONS AND CELL JUNCTIONS OF EPITHELIAL CELLS. (Recommended textbook and Atlas with CD-ROM.)

*Contents:*

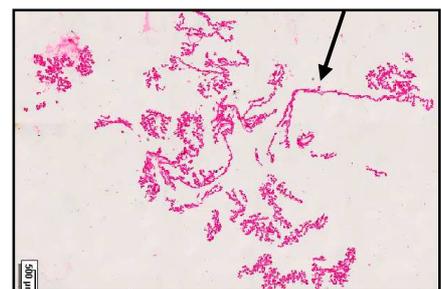
**1. Epicardium (epikard, sl. no. 1A) sect., H&E stain.**

In this section of the heart muscle, observe a thin layer of the simple squamous epithelium that covers the surface of the heart on one side only. This is the visceral layer of the epicardium, forming a membrane supported with some connective tissue and adipose cells.



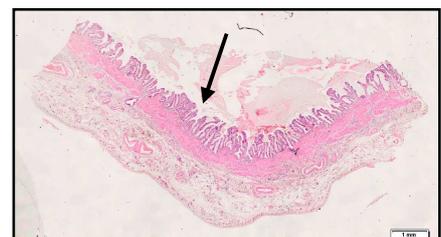
**2. Choroid plexus (plexus choroideus, sl. no. 64) sect., H&E stain.**

Choroid plexus is located in the brain. In this slide, you can see many tiny villous processes of this structure that are covered on both sides with the simple cuboidal epithelium. Note the shape of individual cells, and with the high power lens locate their free surface and the basal membrane.



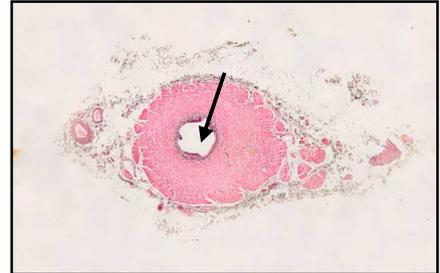
**3. Gallbladder (žlučník, sl.n. 31) l.s., H&E stain.**

In this slide, study the simple columnar epithelium that covers mucosa of the gallbladder. It is found only on one side of this section, where the mucosa is folded into many finger-like projections called villi. Locate and draw some of the tall, prismatic epithelial cells.



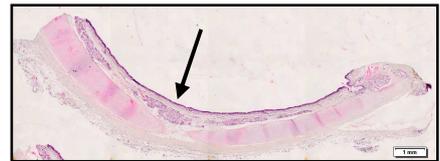
**4. Ductus (vas) deferens (ductus deferens, sl.n. 42) t.s., H&E stain.**

Observe section of this tube-like organ that can be recognized by absence of red blood cells in the lumen, and by its thick muscular wall. The inner surface of its lumen is lined with the pseudostratified columnar epithelium (showing two layers of cell nuclei) having stereocilia on its free surface. Note the cells located close to the basal membrane.



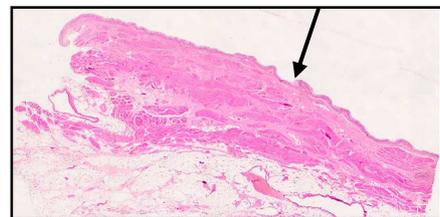
**5. Trachea (trachea, sl.n. 34) t.s., H&E stain.**

In transverse section of the trachea, find the inner surface of this tube and locate the pseudostratified columnar epithelium. It is composed of one layer of columnar cells, all laying on basal membrane, but not all of them reaching the surface. This is why their nuclei appear arranged in several layers. The tallest columnar cells have clearly visible kinocilia on their apical surfaces. Note, that the kinocilia are absent on the surface of pale or empty-looking cells, called goblet cells. What is the function of kinocilia in this location? What is their ultrastructure? Internal layers of the trachea in this slide also contain some other tissues like glands, connective tissue and cartilage, that are not the subject of this practical session.



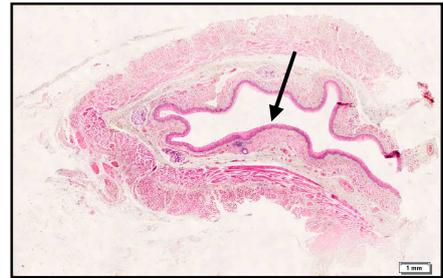
**6. Transitional epithelium, urin. bladder (epitel přechodný, sl. n. 39) l.s., H&E stain.**

The inner surface of the urinary bladder is lined with the transitional epithelium that is thrown into several folds. The epithelial cells look like as if arranged in layers, but all of them do contact the basal membrane with their basal process (pseudostratified arrangement). Note the small basal cells and the most superficial layer of large cuboidal or dome-shaped cells. Some of these large cells may contain two nuclei in one cell. The shape of the superficial cells may vary in stretched or relaxed transitional epithelium. Why?



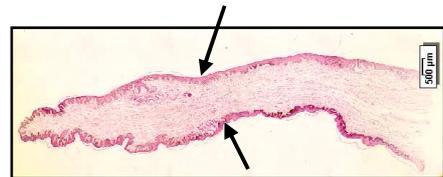
**7. Esophagus (jícen příčně, sl.n. 22) t.s., H&E stain.**

This slide contains one or more sections of the esophagus lined with the stratified squamous non-keratinized epithelium. With the low power objective lens locate the lumen of this organ and study the epithelium. The cells are arranged in several layers, and only the basal cells (columnar) contact the basal membrane. The basal membrane of this epithelium is thrown into many folds. In the next layers, the epithelial cells become polygonal, and in superficial layers, the cells are elongated and reach the surface as squamous-shaped cells. Observe the cells in the most superficial layers. Are they nucleated?



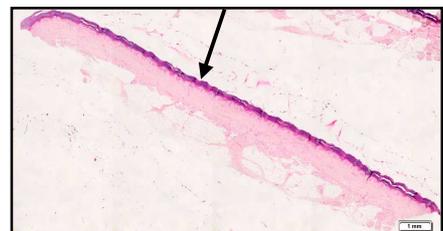
**8. Labium minus, (labium minus, sl.n. 52) t.s., H&E stain.**

Labium minus is a part of the female external genitalia and it is covered with the stratified squamous non-keratinized epithelium similar to the slide n. 22. Observe the cells in all layers. Note the basal cells containing brown pigment. Very thin layer of the most superficial cells may be slightly keratinized (parakeratinized) but you may still identify some flat nuclei in these cells.

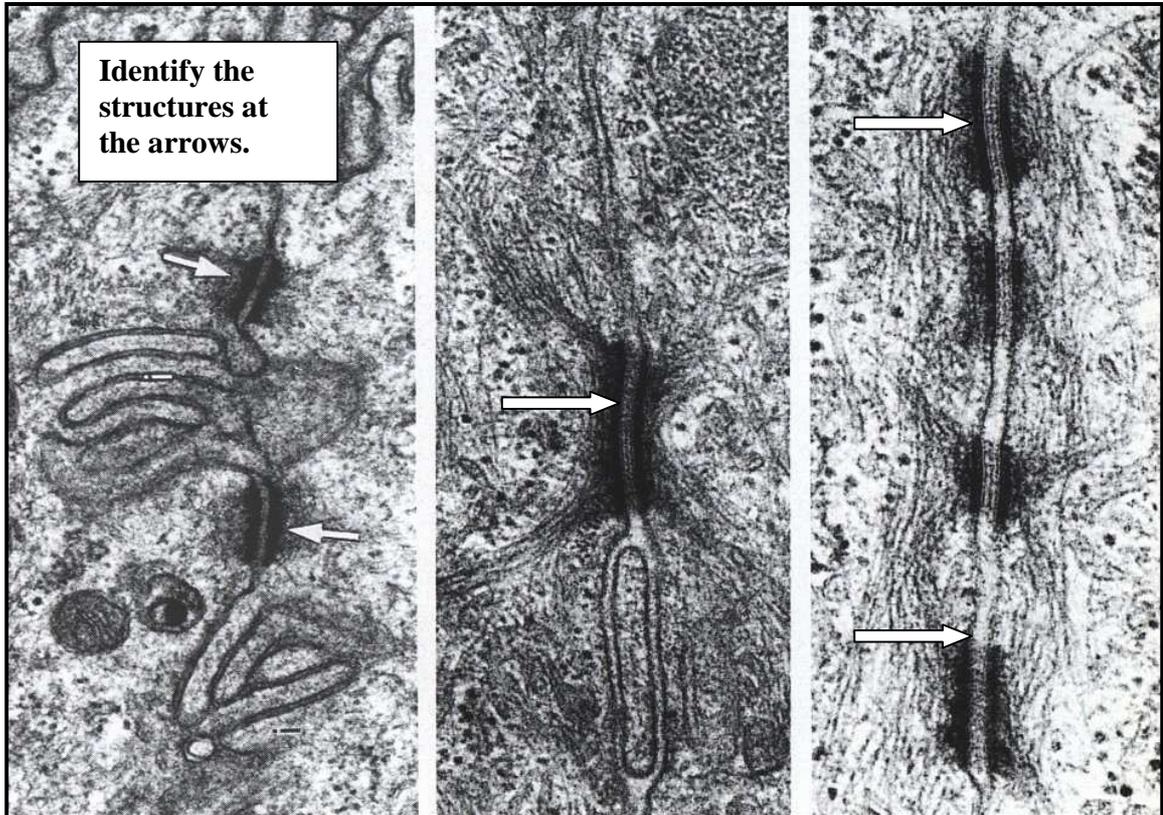


**9. Thick skin from palm (kůže z dlaně, sl.n. 55) sect., H&E stain.**

The skin of the palm region is very thick, covered with the stratified squamous keratinized epithelium. Look at the densely-stained surface of the section and study the layers of the epithelium, starting from the basal membrane (irregularly folded) with basal cells, and continuing to see the cells in the middle layers as they change their shape and contents. Note the cells with granular cytoplasm at the border line between the non-keratinized and keratinized parts of the epithelium. The keratinized layer is very thick and contains remnants of epithelial cells without visible nuclei. The pale spaces that split this layer in many places are fixation artifacts. What is the function of this layer? What kind of ultrastructures hold the cells together in the middle layers of this epithelium?



10.



11. **In your selfstudy, revise the ultrastructure of surface specializations and cell junctions of epithelial cells.** (Use the recommended textbook and atlas with CD-ROM)

Websites:

<http://www.histology-world.com/contents/contents.htm#epithelium>

[http://visualhistology.net/Visual\\_Histology\\_Atlas/VHA\\_Chpt2\\_Epithelia.html](http://visualhistology.net/Visual_Histology_Atlas/VHA_Chpt2_Epithelia.html)

<http://www.lab.anhb.uwa.edu.au/mb140/>

<http://www.anatomyatlases.org/MicroscopicAnatomy/MicroscopicAnatomy.shtml>

<http://www.okc.cc.ok.us/deanderson/dennis-tutorial/histology.html>

<http://casweb.cas.ou.edu/pbell/Histology/Outline/epithelium.html>