Epithelial Tissues

Directions:
Insert and install your Interactions: Foundations CD.
a. Click the "Contents" button.
b. Open the Tissue Level of Organization file.
c. Click on Anatomy Overviews.
d. Work through Epithelial Tissues.

Complete the following worksheet and add it to your notes.

1. Interactions Foundations CD/Contents/Tissue Level/Anatomy Overviews/Epithelial Tissues

   1. Where are epithelial tissues found? It covers the external surface of the body; it covers the internal and external organs. It forms secretory components of glands and lines the body cavities.

   2. Describe these three basic shapes of epithelial cells:
      
      * **squamous** The cell is very flat with a flattened centrally located nucleus.
      * **cuboidal** - the cell is cube shaped with a round centrally located nucleus
      * **columnar** - the cell is rectangle shape with an oval centrally located nucleus

   3. What is the apical surface of epithelial tissue? What is the function of microvilli and cilia located on this surface?

      Apical surface is exposed to the outside environment, the body cavity or the inner surface of hollow organs. Microvilli are finger like extensions of the cytoplasm and increase surface absorption. Cilia are hair like extensions of the apical surface. Designed to move substances across the surface.

   4. Describe the positional relationship between the epithelial surface cells, basal surface, basement membrane, and connective tissue.

      Epithelial surface cell is the free surface or surface exposed; the basal surface is the bottom of the cell with underlying tissues below and basement membrane is the membrane between epithelial and underlying connective tissue

   5. Describe each of the following epithelial tissue arrangements:

      * **simple**: contain single layer of cells. Each cell contacts the basement membrane
stratified: contains multiple layers of cells. Only the deepest layer of cells are the basal surface touches the basement membranes.

pseudostratified: is really simple epithelium because every cell reaches the basement membrane. It looks like stratified epithelium because the nuclei of the cells appears to be scattered.

Transitional: contains multi layers of cells that vary in shape. The basal cells may either be cubodial or columnar. The apical cells may be either squamous if the tissue is stretched or cuboidal if the tissue is relaxed.

6. Observe and describe each of the following tissues. Name example(s) of where each can be found and describe the function of each. You should be able to identify each epithelial type by sight. Study their appearance and characteristics. Correlate their physical structure with their function.

simple squamous epithelium: Specialized in diffusion, osmosis, filtration & secretion. Can be found in the kidneys, pericardium and lines inner lining of the heart.

stratified squamous epithelium: is named for the presence or absence of a protective layer called keratin. Can be found in the oral cavity, vagina, ureter, and epidermis.

7. Keratin is a water proofing protein. What are the functions of keratinized and nonkeratinized stratified squamous epithelium.

Non-keratin tissues provide protection for organs and passageways. Keratinized tissues provide both waterproofing and protection for the skin.

Where are each found? Keratinizes are found in the epidermis while non keratinized tissue is found in the oral cavity, vagina, ureter

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simple cuboidal epithelium kidney tubules and thyroid gland and in areas where there is absorption and secretion

stratified cuboidal epithelium - Gives protection, absorption, of sweat

Other exocrine glands. Can be found in portions of male urethra and developing ovarian particles.
Simple columnar epithelium - The non-ciliated form provides secretion, absorption, and barriers for protection. The ciliated form is used for movement of secretion (respiratory track) and the ovum (female reproduction track).

Non-ciliated cells can be found in the stomach, small intestine, large intestine, gallbladder, rectum, anal canal ducts and glands. Ciliated cells can be found in the female reproductive system, uterine tube, uterus, respiratory air passage and canal of spinal column.

Stratified columnar epithelium – provides protection and secretions.
Can be found in large ducts, glands, urethra, anal mucous membrane and part of conjunctiva.

Pseudostratified columnar epithelium – is ciliated and non ciliated. The non ciliated is used for secretion and absorption - the ciliated is used to move and excrete mucus across surface.

8. What is the function of goblet cells? Release of mucous

9) What is the function of cilia (when present)?
To sweep mucus across the apical surface.

Transitional epithelium Provides destinations for organs that change volume. It can be binucleate, meaning more than one nuclei. It can be found in the urinary bladder, ureter, and the upper portion and the urethra.

Glandular Epithelium
Return to the opening Epithelial Tissue window on your CD.
Click Glandular Epithelium.

10. Identify functional differences between exocrine and endocrine glandular epithelia. How are they structurally different from one another?

Endocrine glands secrete hormones that regulate many activities and maintain homeostasis. Hormones secrete directly into the blood stream. Exocrine secrete mucus, sweat, oils milk saliva, and digestive enzymes into ducts that empty and release the product into the skin's surface.
Epithelial Membranes

Once again, return to the first Epithelial Tissue window. Click on Epithelial Membranes.

11. Define/describe epithelial membrane structure.

It covers the internal and external structure and is composed of epithelium, an underlying connective tissue called lamina propria, and a basement membrane that separates them.

12. Describe structure, function, and location of each epithelial membrane type:

   Serous

   *is a fluid that allows organs to glide easily over one another or against the walls of cavities.*

   Cutaneous  -  *protects the body from foreign matter, regulates body temperature and provides the sensory input of touch, pressure or pain.*

   Mucous prevents the cavity from drying out. Traps particles in the respiratory track and lubricates food in the digestive track. It also provides a barrier to microbes and other pathogens from penetrating into the organ.