

General Histology



Histology definition



is the study of the tissues of the body and how these tissues are arranged to constitute organs. The Greek root *histo* can be translated as either "tissue" or "web," both of which are appropriate because tissues are usually webs of interwoven filaments and fibers, both cellular and non cellular, with membranous linings. Histology involves all aspects of tissue biology

?Why is histology important

It is important because it is one of the tools in the medical toolbox for diagnosis of diseases. A great many diseases reveal themselves at the cellular level: many cancers, bone and connective tissue diseases, vascular diseases, liver diseases, kidney diseases and others can be definitively diagnosed using . histological techniques



General information



Tissue = Cells with similar structure & function organized into groups or layers

:Levels of cellular organization are.

Cells>tissue>organ>system>organism

:Four major types of tissues.

Epithelial (Covers or lines surfaces, found in glands

Connective (Bind & support body parts

Muscle (Movement

Nervous (Detect changes & transmit info

I-Epithelial tissue

characteristics of epithelial tissue

)Covers all body surfaces(inside & outside

Free surface & basement membrane =basal lamina
)which is (connective tissue

)High rate of cell division (healing

) vascularity (rely on diffusion

Many tightly packed cells, usually arranged into layers



Epithelial tissue that occurs on the interior surfaces of the body is known as endothelium

small amount of intercellular substance

The basement membrane provides structural support for the epithelium and also binds it to neighbouring structures

Form glands ,part of sense organs & germinal structures

:-Function

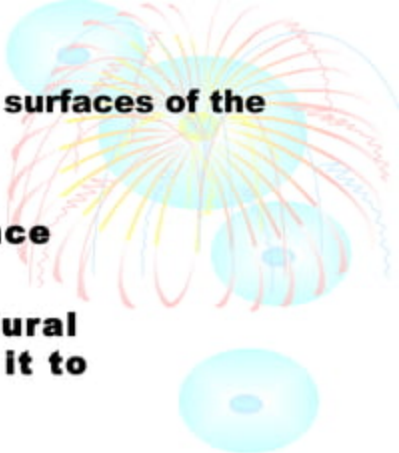
Protection – epidermis of skin

Secretion_ glands

Sensory _neuroepithelium in taste buds

Contraction _ myoepithelium

Reproduction _germinal epithelium

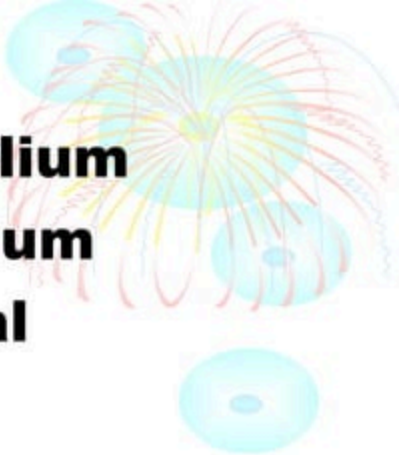


:_Origin

Ectodermic – skin epithelium

Endodermic_ gut epithelium

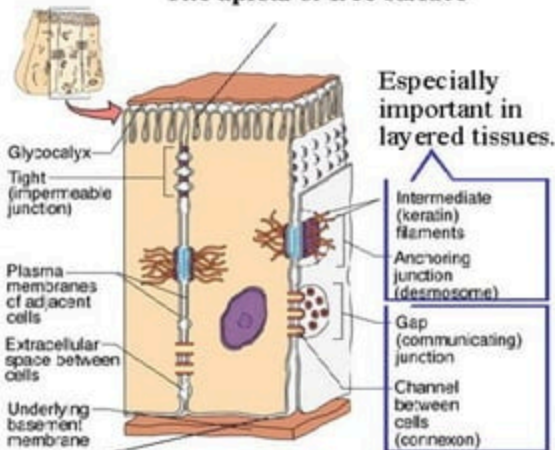
**Mesodermic_ urinogenital
epithelium**



Epithelial Cells

Composed of closely packed cells of mostly uniform type. Cells are anchored by a basement membrane.

The apical or free surface



The basal or attached surface, usually with an underlying connective tissue.

Gap junctions are found in epithelia, smooth and cardiac muscle, nerve, and certain connective tissues.



Classification of epithelium according to structure & function

I_ covering epithelium

II_ glandular epithelium



Covering epithelium



:-According to no of layers

Simple epithelium= one layer

Stratified // > one layer

:-According to shape of cells

**Squamous... like scales ,polyhedral,oval
central nucleus**

**Cuboidal ... like cube,spherical central
nucleus**

Columnar ...oval basal nucleus

Simple epithelium

**simple squamous epithelium around blood vessels,- 1
covering heart, lining body cavities**

Function: diffusion

simple cubical epithelium collecting tubules of kidney-2

Function ion exchange

simple columnar epithelium intestine- 3

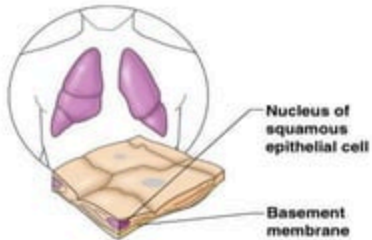
Function absorption

simple ciliated columnar epithelium oviduct- 4

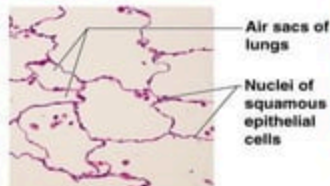
pseudostratified columnar vasdefrense-5

pseudostratified ciliated columnar trachea-6

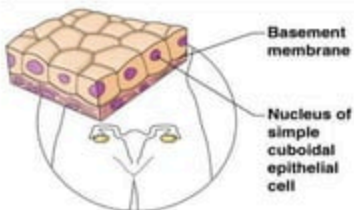




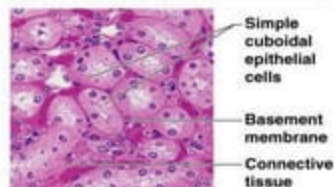
(a) Diagram: Simple squamous



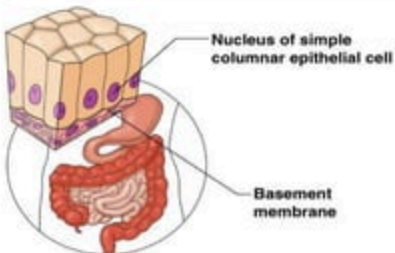
Photomicrograph: Simple squamous epithelium forming part of the alveolar (air sac) walls (100x).



(b) Diagram: Simple cuboidal



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



(c) Diagram: Simple columnar



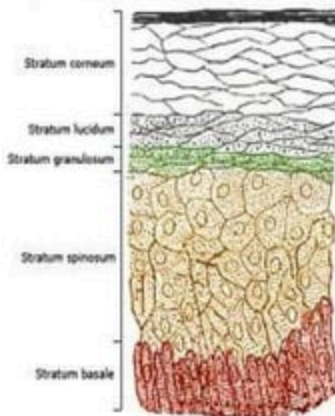
Photomicrograph: Simple columnar epithelium of the stomach lining (900x).



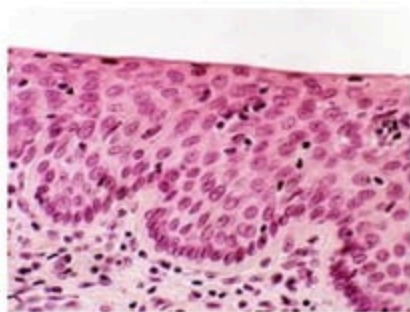
Stratified epithelium

**Stratified squamous epithelium-1
keratinized, on-keratinized) ex-epidermis of
skin**

Keratinized

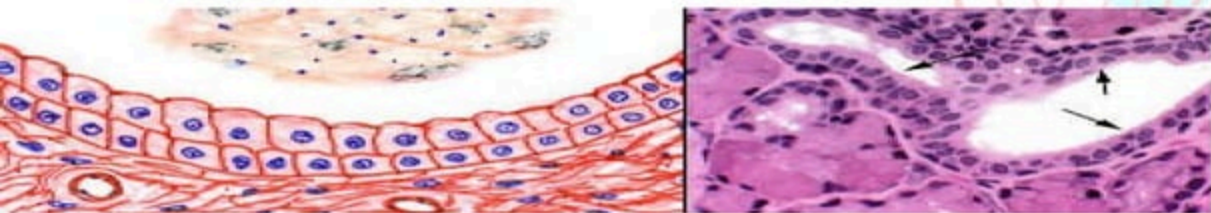


non-keratinized



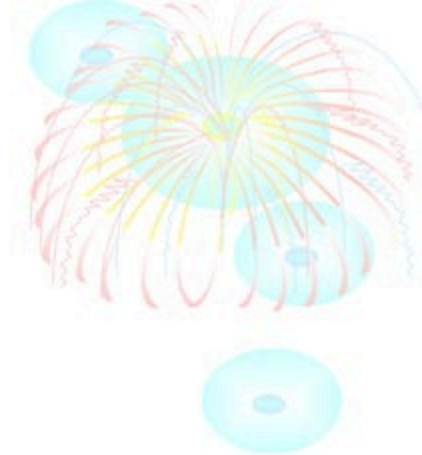
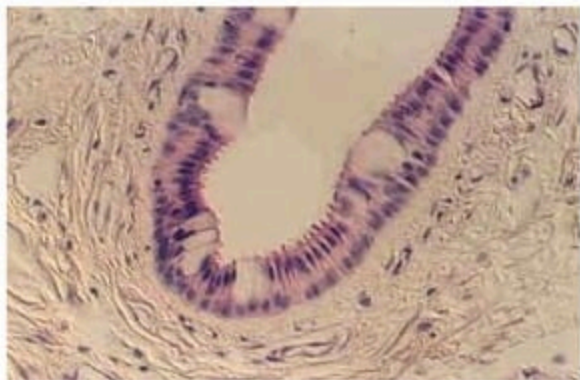
stratified cuboidal epithelium-2

Ex-duct of sweat gland



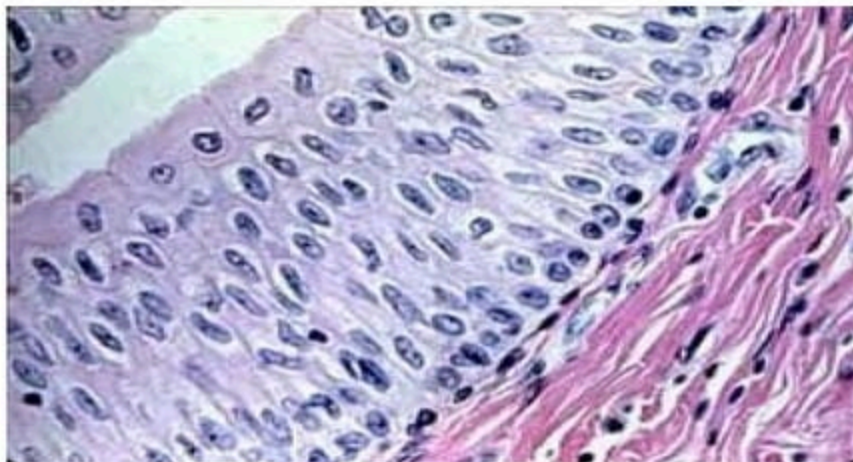
stratified columnar-3 epithelium

Ex- epiglottis



Transitional epithelium

Ex-lining of urinary bladder

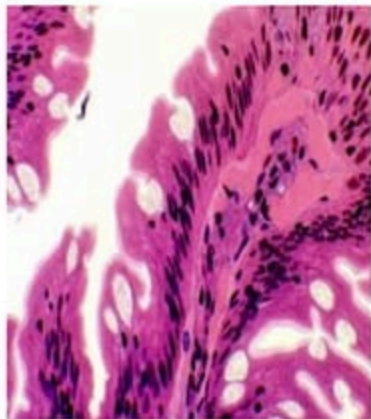


Glandular epithelium

acc to no of cells

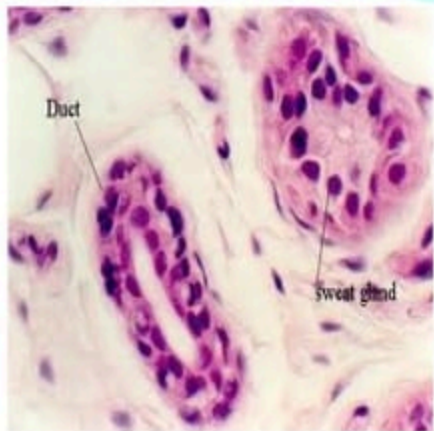
Unicellular

Ex- goblet cell



multicellular

ex-sweat gland



Acc to presence or absence of duct

Endocrine- thyroid gland

Exocrine- sweat gland

Mixed- pancreas



Acc to method of secretion

Merocrine -secretory cells remain intact, discharge by exocytosis- ex-pancrease

Apocrine-apical part of glandular cell detaches with secretion- ex-mammary gland

Holocrine-glandular cell burst-ex-sebaceous gland



Classification of glands acc to shape of secretory portion

-)tubular (intestinal glands-1
-)alveolar (poisonous gland in skin of toad-2
-)Tubulo-alveolar (salivary gland & pancreas

Classification of glands Acc to duct system

A) Simple :-😊(

Simple tubular gland (ex) intestinal gland

Simple coiled tubular (ex) sweat gland

Simple branched tubular (ex) sebaceous gland of human skin

Simple alveolar (ex) mucous & poisonous gland in skin of toad

:_B) compound(

compound tubular (ex) kidney

Compound alveolar (ex) mammary gland

Compound Tubulo-alveolar (ex) pancreas



Special types of epithelium

neuroepithelium (ex) taste buds- 1

germinal epithelium (ex) testis& ovary-2

myoepithelium (ex) lining of glands-3

Polarity of epithelium

Cilia for movement

microvilli

Next Connective tissue

