

(Frequently Asked Questions)

Q.What is squamous metaplasia?

Under certain pathological conditions the ciliated pseudostratified epithelium of the bronchi may change to stratified squamous epithelium—a change described as squamous metaplasia.

A similar transformation can be induced experimentally, the greater evaporative loss of moisture that accompanies the increased ventilation through the remaining nasal passage causes its pseudostratified ciliated columnar epithelium to transform into stratified squamous epithelium.

Q.What do you mean by transitional epithelium?

a)Description:

i.Multilayered or stratified.

ii.Shape of surface cells changes round, dome shaped (umbrella cells) when unstretched and flat when stretched.

iii.Relaxed basal cells: Cuboidal or slightly columnar.

iv.With layer above basal cells-made up irregularly pear shaped elongated cells.

Q.What are the major types of specialization found in epithelia?

There are specializations of the plasmalemma on the lateral surfaces of the cells that serve to maintain close cell to cell contact. The free surfaces of the superficial cells may also be modified in various ways to increase the efficiency of the epithelium in carrying out the functions of absorption or transport.

Specialization for cell attachment and communication:

Adjacent epithelial cells cohere so tightly that a relatively strong mechanical force must be applied to separate them. There is a thin layer of an interstitial substance (intercellular substance) between cells that acted as an adhesive.

[Q. What is terminal bar?

On the boundary between adjacent columnar epithelial cells, immediately subjacent to their free surface, dark dots or dense bars could be seen with the light microscope. These are called *terminal bars*.]

(a)Zonula occludens or tight junctions:

Electron microscope reveals a junctional complex often consisting of 3 distinct components, Zona occludens, zonula adherens and macula adherens or desmosome.

On the lateral cell boundaries immediately below the free surface of the epithelium, one finds the zonula occludens, a region of specialization where the membranes of adjoining cells converge and the outer leaflets of their unit membrane appear to fuse.

i)Cell-cell junction where plasma membrane of adjacent cells fuse together and prevent passage of most dissolved molecules from one side of membrane sheet to the other. e.g.; in epithelial cells.

ii)At fusion point the external half-membrane of one cell may form a continuous leaflet with the external half membrane of the adjacent.

iii)It occur at the same circumferential level of the cell, so that they give rise to belts of fusion point with adjacent cells.

iv)The belt obliterates the intercellular space and prevent the flow of materials between the cell-surfaces.

v)Junctions provided with two interdigitating rows of membrane particles ,one row contributed by each cell.

vi)These rows are called sealing strands , which act in much the same manner as the two halves of a zipper.

Zonula occludens also has a mechanical role in maintaining the structural integrity of the epithelium. The cells are more firmly attached in this region of membrane fusion than anywhere else on their surface.

(b)The zonula adherens:

On the epithelial cells boundaries just below the zonula occludens the membrane divert distance of 150 to 200 Å. The opposing unit membrane are on modified but are reinforced on their cytoplasmic surface by a moderately dense mass of fine filamentous material that form a continuous band around the cell parallel to the zonula occludens.

(c)Macula adherens or desmosome: