

Difference Between Ciliated Epithelial Cell and Squamous Epithelial Cell

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Key Difference - Ciliated Epithelial Cell vs Squamous Epithelial Cell

The surface of a body is covered by a special type of tissue layer known as the epithelial tissue. The tissue layer is composed of tightly packed epithelium cells of different types with a minimum of one layer of cells. It covers both internal and external body surfaces. The endothelium is the type of epithelial tissue that covers the internal body surfaces. Since the epithelial cells are tightly packed within the tissue, intercellular air spaces are either absent or present in very fewer quantities. All epithelial cells get separated from the underlining tissue by the presence of a special connective tissue known as basement membrane. The main function of the basement membrane is to provide structural support to the epithelium cells and assist in binding it to neighboring cell structures. Epithelial tissue is of two main types; simple epithelium (epithelial tissue with a single cell layer) and stratified epithelium (epithelial cells with two or more cell layers). There are 03 distinct principal morphologies which the epithelial cells are associated with. They are Squamous epithelium (cells which are wider than the height), Cuboidal epithelium (cells with same height and width) and Columnar epithelium (cells are taller than their width). Squamous epithelial and ciliated epithelial cells are two types of epithelial cells. Squamous epithelial cells contain flat scale-like cells in its most superficial layer, and the cells are packed tightly together with less inter cellular air spaces. The **key difference** between Ciliated Epithelial Cell and Squamous Epithelial Cell is, **Ciliated epithelial cells are specialized epithelial cells due to the presence of cilia and extensions of apical plasma membrane whereas Squamous epithelial cells are composed of cells which are wider than the height and are situated as a single cell layer.**

What is Ciliated Epithelial Cell?

Ciliated epithelial cells consist of long root hair structures called cilia. The cilia are narrow and hair like organelles which are microscopic. It is composed of microtubules. The epithelial cells may be columnar or cuboidal cells. Some ciliated epithelial cells consist of mucus-secreting goblet cells.

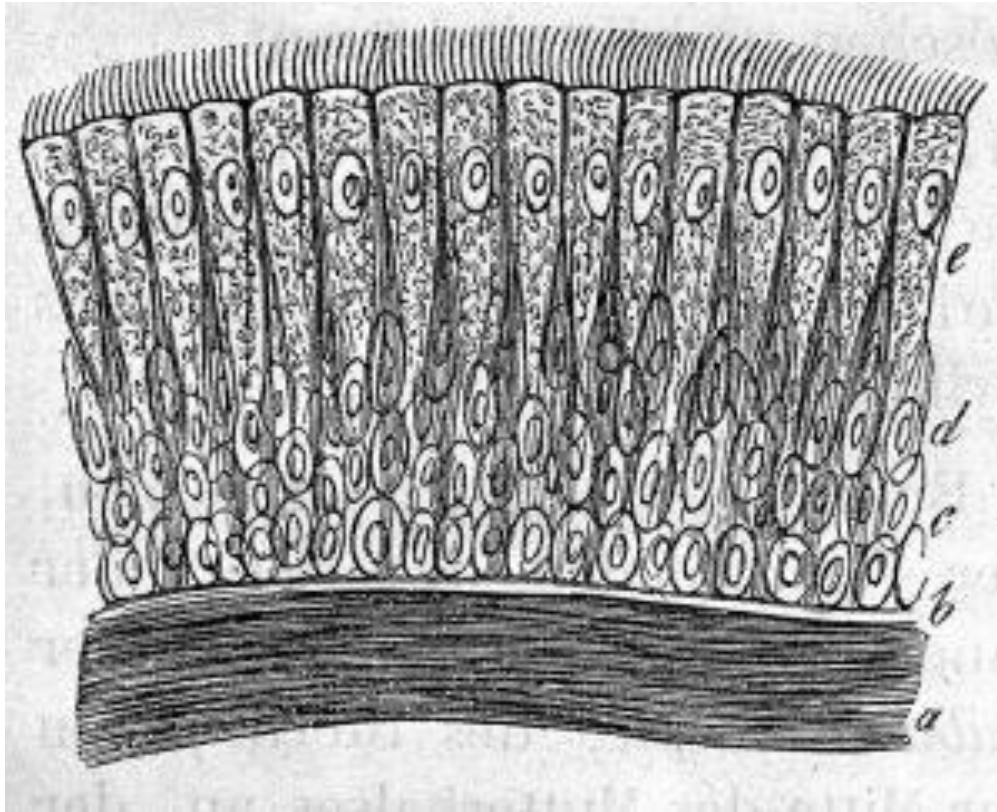


Figure 01: Ciliated Epithelial cell

The function of the cilia is to move the mucous which is secreted by the goblet cells through the throat. It is present in the lining of the nasal cavity, trachea, bronchi, and bronchioles. Afterwards, the mucous is swallowed. This action happens in a rhythmical manner. To make this process efficient and to fuel up the process, numerous mitochondria are present in these ciliated cells. Ciliated epithelial tissue assists in the circulation of fluids in the ventricles of the brain. This regular movement of fluids maintain the healthy functioning of the brain and assist in conducting signals efficiently.

What is Squamous Epithelial Cell?

Squamous epithelial cells consist of flat scale-like structures at its most superficial layer. They can be of two types according to the layers of cells present within the epithelial tissue. If the squamous epithelial tissue consists of a single layer of cells, it is known as simple squamous epithelium, and if the cell layer is of two or more, it is known as stratified squamous epithelium. Within the squamous epithelial tissue, the cells are tightly packed with less number of inter cellular air spaces. This provides an ideal smooth environment for the fluids to move over the cells with low friction. The nucleus of the squamous epithelial cell is horizontally flattened with an oval shape. It is mainly located at places where passive diffusion takes place. The cell lining of alveolar in the lung is composed of squamous epithelium. Specialized squamous epithelium is found in cavity lining of blood vessels, pericardial cavities, pleural and peritoneal cavities and other major cavity linings of the body. Presence of squamous epithelial cells in urinalysis confirms the development of urine infection in the body.

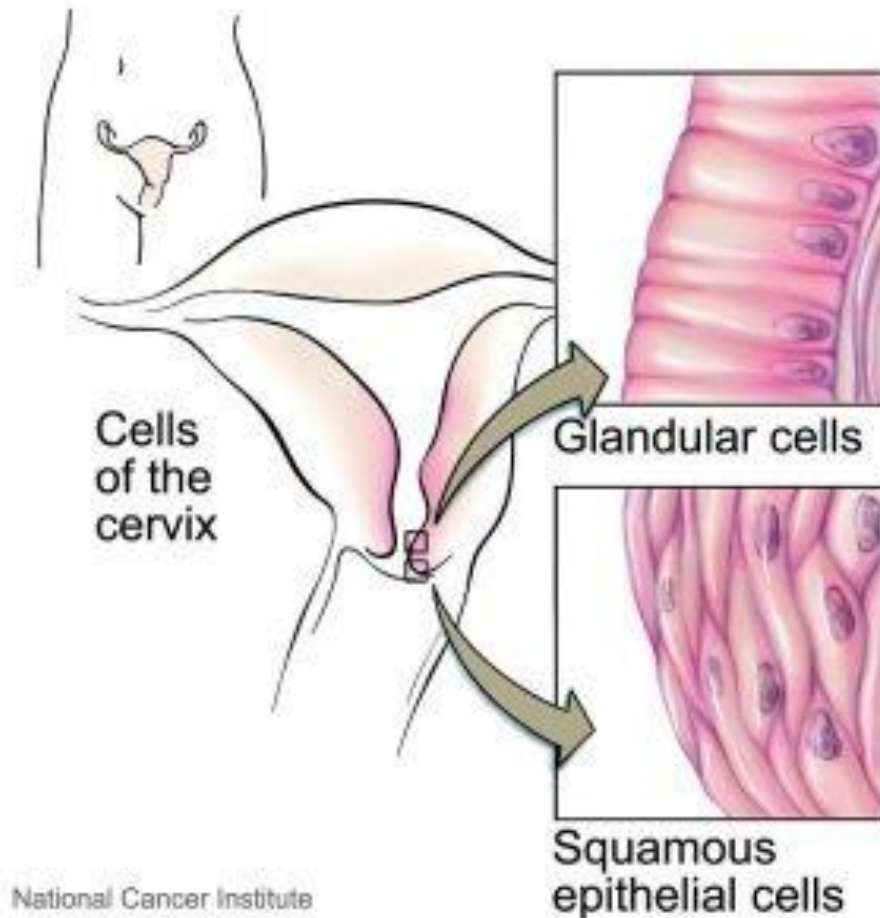


Figure 02: Squamous Epithelial Cell

What is the Similarity Between Ciliated Epithelial Cell and Squamous Epithelial Cell?

- Both types of epithelia act as cell linings in different regions of the body.

What is the Difference Between Ciliated Epithelial Cell and Squamous Epithelial Cell?

Ciliated Epithelial Cells vs Squamous Epithelial Cells	
Ciliated epithelium is a region of epithelium consisting of columnar or cuboidal cells with hairlike appendages.	Squamous epithelial cells are the thin and flat cells found in layers or sheets covering surfaces such as skin and the linings of blood vessels and esophagus.
Location	
Present in the capillary walls, glomeruli, pericardial lining, lining of the pleura, peritoneal cavity lining	Present in the lining of respiratory tract from the nasal cavity to bronchiolar level.

Summary - Ciliated Epithelial Cell vs Squamous Epithelial Cell

Epithelial tissue is present in the cell lining of different locations of the body. They differ according to the number of cell layers and different structures attached to them. Ciliated epithelial cells are characterized by the presence of cilia, apical plasma membrane projections. They are mainly found in the lining of the respiratory tract. Squamous epithelia are found in the lining of different cavities of the body including capillary walls, glomeruli, pericardial lining, the lining of the pleura, and peritoneal cavity lining.

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Image Courtesy:

1. "[Ciliated epithelium from the human windpipe. Wellcome M0011238](#)" By [Welcome Images \(CC BY 4.0\)](#) via [Commons Wikimedia](#)
2. "Cells of the cervix" By Don Bliss (Illustrator) - the National Cancer Institute, an agency part of the National Institutes of Health, with the ID 4349. (Public Domain) via [Commons Wikimedia](#)

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