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COURSE CODE: ANA 204

MATRIC NUMBER: 18/mhs06/037

ASSIGNMENT:Explain the histological basic of upper respiratory system conducting portion of the respiratory system) attacked by corona virus.

The respiratory tract is the pathway through which much needed oxygen enters the body. It begins at the nostrils of the nose, continuing into the [nasal cavity](/en/library/anatomy/nasal-cavity). From here, it passes through the [pharynx](/en/library/anatomy/the-pharynx), [larynx](/en/library/anatomy/larynx), [trachea](/en/library/anatomy/the-trachea), [bronchi](/en/library/anatomy/bronchi), bronchioles and ends in the [alveoli](/en/library/anatomy/alveoli). The airway as a whole can be divided into two segments: a **conducting segment** (from the nostrils to the terminal bronchiole) and a **respiratory segment** (from the respiratory bronchioles to the alveoli).

Along the respiratory pathway, the epithelial lining changes to accommodate different functions. This article reviews changes in the epithelia and supporting cells of the upper respiratory tract (from the nasal cavity to the pharynx).

## **NASAL CAVITY**

The nose, as the primary mode of entry of air into the airway, has both respiratory and olfactory functions. In its respiratory capacity, it modifies the air so that gaseous exchange will occur more efficiently in the [lungs](/en/library/anatomy/the-vascular-system-and-innervation-of-the-lungs), while in its olfactory capacity, it detects various odors and transmits those impulses to the [brain](/en/library/anatomy/cerebral-cortex) for interpretation.

#### **CELL TYPES**

There are several cell types found in the epithelium that make [olfaction](/en/library/anatomy/the-olfactory-pathway) possible. Air is first directed towards the olfactory epithelium by the **turbinates** (bones in the conchae that support the mucosa).

In the lamina propria, **Bowman’s glands** (also called olfactory glands) produce serous secretions that dissolve odiferous particles so that they can interact with the **olfactory cilia**. The olfactory cilia are short hair-like projections that extend into the mucous lining to detect and transmit odors through the olfactory nerve cells.

**Olfactory nerve cells** are bipolar neurons span the thickness of the epithelium. The impulses from the olfactory cilia are transmitted by nerve fibers from the olfactory cells that travel through the cribriform plate of the ethmoid bone. The afferent fibers then enter the cranial cavity and synapse with mitral cells in the **olfactory bulb** (CN I).

**Sustentacular** (supportive) **cells** distributed throughout the epithelium are interspersed with olfactory nerve cells and **basal cells**proximal to the cribriform plate of the ethmoid bone. The cell shapes are hard to distinguish; so the position and shape of the nuclei are used to distinguish the cell types.

* The nuclei of the basal cells are spherical and proximal to the cribriform plate of the ethmoid bone.
* The nuclei of sustentacular cells are more elongated and distal to the cribriform plate of the ethmoid bone.
* The nuclei of the olfactory nerve cells are seen between those of the basal and sustentacular cells.

The mucosa of the para[nasal sinuses](/en/library/anatomy/the-paranasal-sinuses) is also respiratory epithelium. The only difference is that the epithelium is thinner and has fewer goblet cells and serous and mucous glands. The paranasal sinuses are typically devoid of lymphoid tissue.

**PHARYNX AND EPIGLOTTIS**

The epithelia of the pharyngeal portion of the conducting zone changes with respect to each pharyngeal segment. In the nasopharynx, the epithelium is continuous with that of the nasal cavity. The ciliae here continues to wharf foreign particles through the pharynx to be swallowed.

In the oropharynx and laryngopharynx, the epithelium transitions to **non-keratinized stratified squamous epithelium**. This durable epithelium is better suited to accommodate friction associated with [swallowing food](/en/library/anatomy/stages-of-swallowing). Additionally, lymphatic aggregates (distributed throughout the mucosa) act as a first contact point for the immune system to sort through particles entering the body (see [Waldeyer’s Ring](/en/library/anatomy/waldeyers-ring)).