

Marie Curie Training Courses

Summer School 2007 – Avian Q5

Slide Q5: Tissue from a turkey (electron microscopy)

Tissue : Trachea, tracheal epithelium

Description of the ultrastructural findings: The electron micrograph displays the full thickness of a columnar pseudostratified epithelium composed of three ultrastructurally distinct cell types. In the centre of the picture, three similar adjacent columnar epithelial cells are present (with only two of their nuclei present on the picture). These cells possess apical cilia, basal bodies, apical desmosomes and numerous mitochondria, which are concentrated subjacent to the basal bodies (ciliated cells). These cells contain oval basally-located euchromatic nuclei, with a central nucleolus. They possess moderate amount of endoplasmic reticulum. These epithelial cells have lost most of their cilia.

On the bottom right of the picture are found two smaller cells, with a more electron-dense cytoplasm and a higher nucleoplasmic ratio. These cells do not reach the apical surface of the epithelium (basal cells). They contain oval nuclei, with peripheral heterochromatin and a voluminous centrally located nucleolus. Moderate amount of endoplasmic reticulum, some mitochondria and sparse electron-dense mucous granules are scattered in their cytoplasm.

At the extreme right and left of the picture, there are columnar non-ciliated cells, with apical short microvilli and apically concentrated small to medium-sized mucous granules (goblet cells). Their electron-dense cytoplasm contain numerous mitochondria, uniformly distributed among large amounts of rough endoplasmic reticulum.

Restricted to the area of ciliated cells, there are numerous bacilli interposed among the cilia, that are electron dense with a lucent core. Clumps of amorphous, electron-dense material are found among bacteria and cilia of colonised cells. The bacteria are two-fold larger in diameter than the cilia. Adjacent non-ciliated cells are not colonised.

Morphological diagnosis

Trachea, tracheal epithelium: tracheitis, with cilia shortening and loss, and cilia-associated bacilli colonisation

Probable etiology

Bordetella avium

Key words and marks :

Tissue	1
Design	2
Description :	
Pseudostratified epithelium	1
Columnar epithelial cells	1
Apical desmosomes	1
Apical cilia	1
Numerous mitochondria	1
Basally-located euchromatic nuclei	1
Loss of ciliature	1
Basal cells	1
Goblet cells	1
Mucous granules	1
Bacilli interposed among the cilia	2
Absence of colonisation of non-ciliated cells	1
Morphological diagnosis	3
Etiology	1