

Specialization of apical Cell Surface

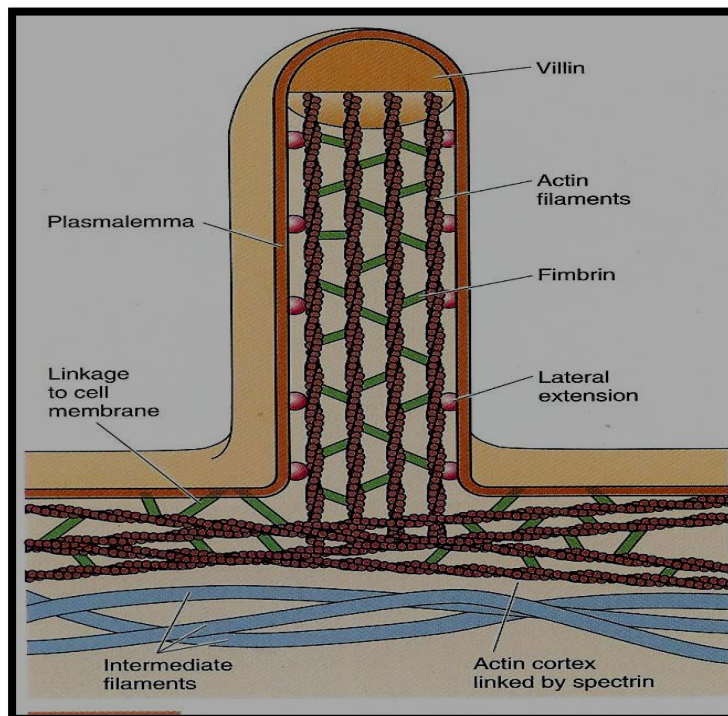
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Lec.7

The surface of the most cells has extensions, they are used in cell movement, phagocytosis, absorption, and most of these extensions are based on actin filaments.

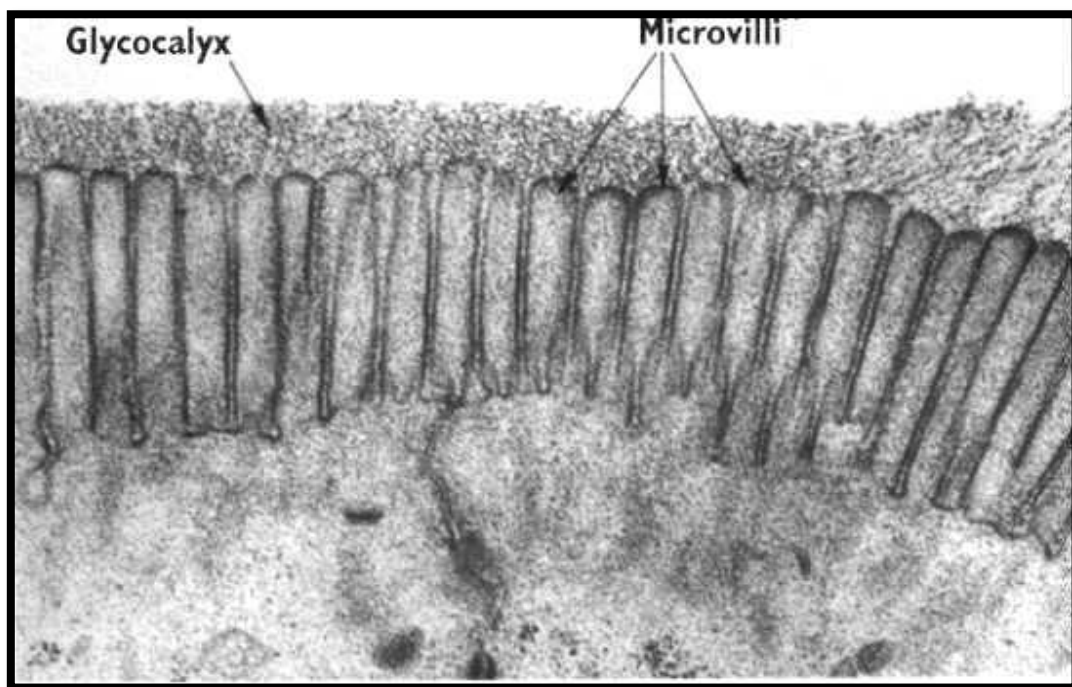
Microvilli

Finger-like prolongations 1 μ in length 0,1 μ diameter (can be seen with L.M). It contains a bundle of straight parallel filaments (20-30 actin filaments). Actin filaments extend 0,5 μ down into the apical cytoplasm. A bundle of actin, (Actin binding proteins) cross link actin filaments: Fimbrin, and Villin, filaments are cross linked into closely packed parallel arrays.



Microvilli enclosed in an extension of the plasma membrane and usually surround with a thick complex carbohydrates (glycoprotein) called **Glycocalyx**. Glycocalyx have inhibits cell adhesion (blood vessels) and defense/protection (cornea), damage to the glycocalyx loss of protective tear film (Figure 1-59).

Microvilli contain enzymes i.e. sucrase, maltase, lactase , lipase and amino peptidase. They are involved in the terminal digestion of proteins, carbohydrates and lipids.



Glycocalyx

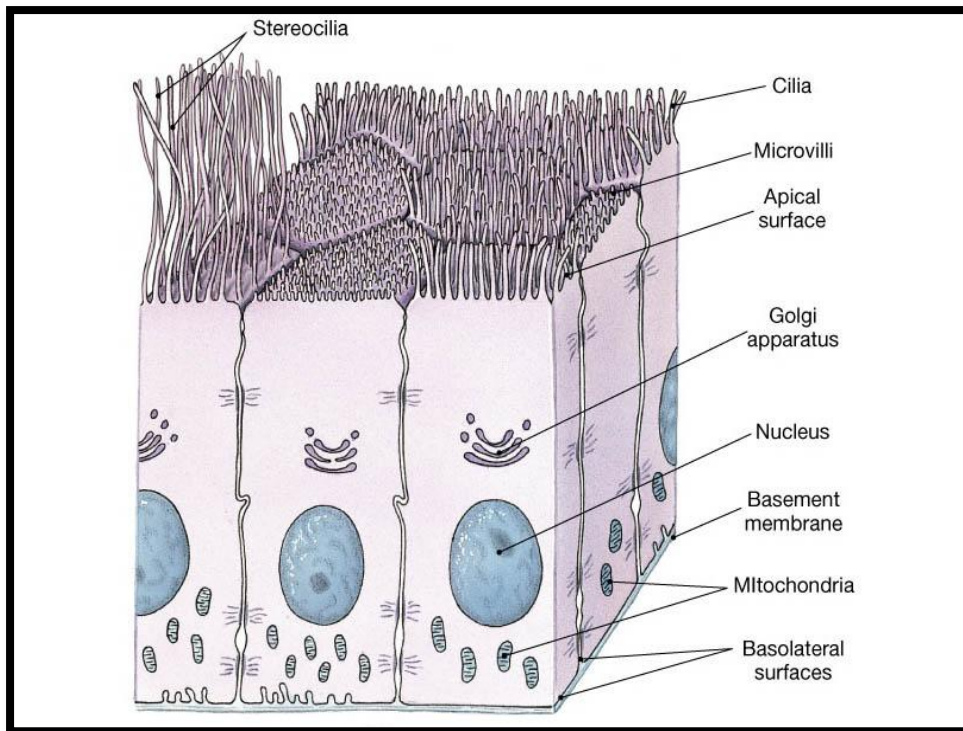
Is a glycoprotein and glycolipid covering that surrounds the cell membranes of some bacteria, epithelia and other cells. The **glycocalyx** also known as the pericellular matrix.

Most animal epithelial cells have a fuzz-like coat on the external surface of their plasma membranes. This coating consists of several carbohydrate moieties of membrane glycolipids and glycoproteins, which serve as backbone molecules for support. Generally, the carbohydrate portion of the glycolipids found on the surface of plasma membranes helps these molecules contribute to cell-cell recognition, communication, and intercellular adhesion.

Stereocilia

Long and irregular microvilli 8μ , have no internal structure, Microfilaments are poorly developed, No motility and no basal body.

Stereocilia found at the apices of cells lining the ductus epididymidis and ductus deferens of the male genital tract (Figure 1-60). Stereocilia also occur on **cochlear and vestibular hair cells** of the internal ear. The main function is increase the cell surface for absorption.



Caveolae

Caveole are small (50 nm), flask-shape invaginations of the plasma membrane enriched in cholesterol, diverse signaling molecules, and membrane transporters.

They are especially abundant in endothelial cells, where they mediate transcellular shuttling of serum proteins and nutrients from the bloodstream into tissues, also found in the sarcolemma of the smooth muscle cells collecting the calcium molecules.