

## Review on Animal Tissues

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### Review Article

Received: 10/08/2016

Revised: 24/08/2016

Accepted: 26/08/2016

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**Keywords:** Transmission, Infectious Disease, Zoonosis, Bacterial Infections

#### ABSTRACT

A cell is the Basic component of the body. A group of cells together form a tissue, where as a group of tissues form an organ and a group of organs into an organism. As there are different organisms with different organs, the tissues that form these organs also differ. There are many types of tissues but the below review article describes briefly about the tissues that are present in the animal. It includes structure of the cells that forms the tissues, different types of animal tissues and their functions.

### INTRODUCTION

In latin the word tissue means 'weave'. A group of cells along with intercellular substances combine to form a tissue which performs a specific work in multicellular organism. The study of tissues is known as histology. Four major types of tissues are found in animals <sup>[1,2]</sup>.

- Epithelial tissue
- Connective tissue
- Muscular tissue and
- Nervous tissue

In animals multiple tissues combine to form an organ and body structure. This combination may differ from organ to organ and organism to organism. The origin of the cells that forms the cells will differ in development stage in different classification of organisms or animals.

### ANIMAL TISSUES AND THEIR FUNCTIONS

#### Type of Animal Tissues

In animals the tissues are majorly divided into four different types. These tissues differ in their structure features and functions. These tissues are combined to form a functional organ.

- Epithelial tissue
- Connective tissue
- Muscular tissue and
- Nervous tissue

#### *Epithelial tissue*

Epithelial tissue is mainly found as lining or covering of external or internal body organs. For example epithelial tissue forms an outer layer of the skin and it also forms an inner lining for blood vessels and digestive system <sup>[3-10]</sup>.

The epithelial cells are packed tightly on the basement layer and the intercellular place is freely exposed to air or filled with intercellular fluid. The epithelial cells do not contain blood vessels. Based upon the shape and the

arrangement of cells into one or more layers epithelial tissue is divided into different types. The cells of epithelium exists majorly in three forms,

- squamous (flattened)
- cuboidal
- columnar

If the epithelium is made of single layer of cells t is known as simple epithelium. If the epithelium is made of two or more layer of cells then it is known as stratified epithelium. The combination of number of cell layers and shape of the cells are used to classify the different types of epithelial tissues.

**Simple squamous epithelium:** A single layer of flat cells attached to basal lamella of basement membrane is known as simple squamous epithelium. Simple squamous epithelium is permeable to small molecules and also facilitates the process of diffusion and filtration [11-20]. This type of tissue is found more in the places where diffusion and filtration occurs like blood capillaries, alveoli, glomeruli, and other tissues where rapid diffusion is required. The cells of theses tissues are flat with round or flat nucleus. This type of epithelium is also known as pavement epithelium due to its tile like appearance.

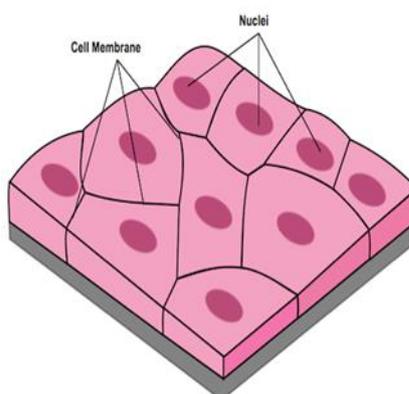


Figure 1. Simple squamous epithelium.

**Simple cuboidal epithelium:** A single layer of cuboidal cells forms a simple cuboidal epithelium. The cells of this epithelium are cubic and contains large spherical nucleus which is centralised. The cells of this epithelium mainly involves in secretion and production activity and located in the regions of the lining of nephrons [21-30], surface of ovaries, parts of the eye, the walls of the renal tubules and thyroid glands. They mainly involve in secretion and absorption.

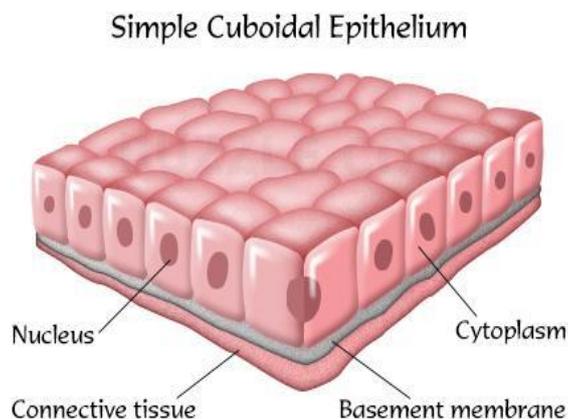


Figure 2. Simple cuboidal epithelium.

**Simple columnar epithelium:** Simple columnar epithelium contains a single layer of cells resting on the basement layer. The cells are greater in height when compared to width. The nuclei of all the cells will be located almost in the

same position of each cell and close to each other [31-40]. Simple columnar epithelium is majorly divided into two different types:

1. Simple secretory columnar epithelium
2. Simple striated columnar epithelium

**Simple secretory columnar epithelium:** Simple secretory columnar epithelium mainly involves in secretion of mucins by merocrine secretory process. In merocrine type of secretory processes the secretory material which was freshly synthesised will be stored in large secretory granules in the apical part of cytoplasm. They will be released into extracellular space through diffusion of secretory vesicles [41-45]. After forming the mucin immediately get hydrated and swells to form mucous on epithelial surface. It is present majorly in two places; they are lining the stomach and lining the cervical canal.

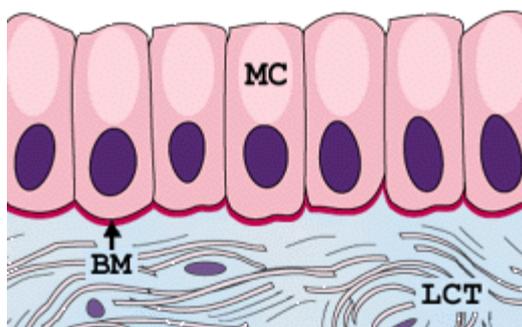


Figure 3. Simple secretory columnar epithelium.

**Simple striated columnar epithelium:** It is very rare form of epithelium and contains undetectable basement membrane on which the single layer of epithelial cells of column shape are laid [46-50]. It majorly performs the function of protection and secretion.

It is majorly found in conjunctiva, Uterus, anus, pharynx etc., They also involves in the absorption procedures. It is also present as lining of the gall bladder and intestine.

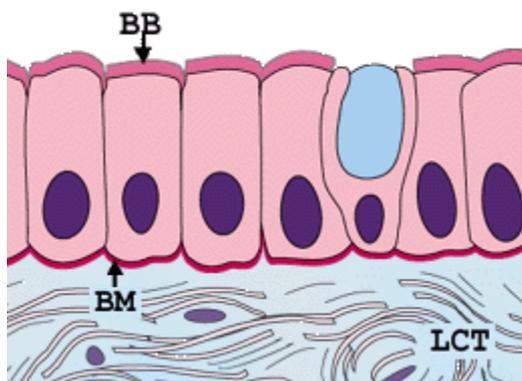


Figure 4. Simple striated columnar epithelium.

### Connective tissue

It is a type of tissue which is present in almost all the parts of body. It majorly involves in anchoring, supporting and connecting the various tissues of the body. Connective tissue is majorly divided into two different types they are: Connective Tissue proper [51-55], Specialized Connective tissue

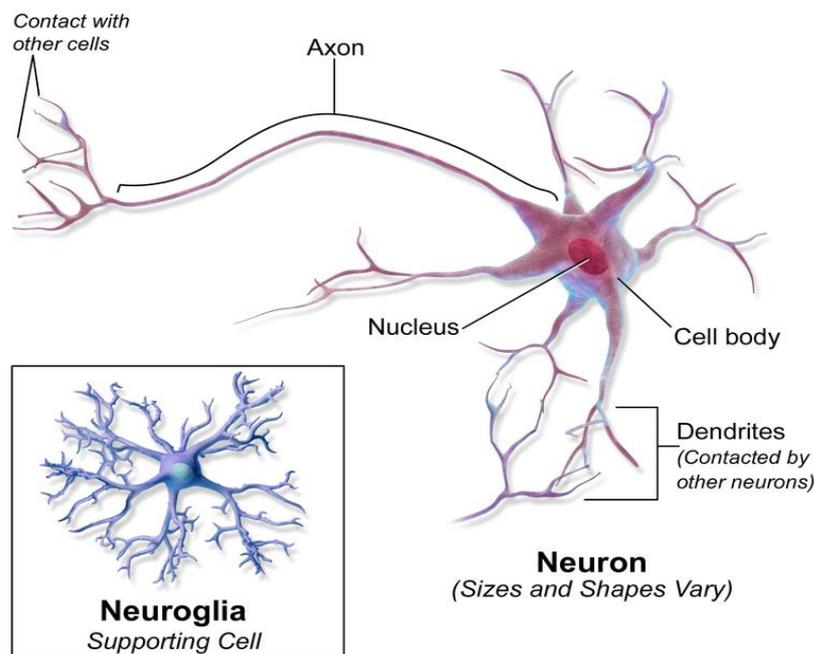
**Connective tissue proper:** It is a binding tissue and is also known as loose connective tissue which contain a homogenous and soft matrix. It contains adipose tissue, dense regular tissue and areolar tissue. Areolar tissue performs various functions it fills the gap between the organs and attaches the skin with the different under laying tissues. Adipose tissues serves as a storage site of lipids and forms as insulating layer to regulate the temperature

of the body [56-60]. Dense regular tissue majorly contain the collagen fibres and also known as collagenous connective tissue and creates the fibres for tissues.

**Specialized connective tissue:** Specialized connective tissue majorly contains bones, blood and cartilage. Bones and cartilage together forms the skeletal system of the body and blood serves as a transporting system for the tissues.

**Nervous tissue**

The nervous tissue is majorly made up of nerve cells which are also known as neurons. Neurons majorly contains dendrites, axone and nucleus [61-63]. Central nervous system and peripheral system is majorly made up of nervous tissue. Nerve cells will receive the impulses and carries them. They play major role in controlling and regulating the body functions and activities.



**Neural Tissue**

Figure 5. Nervous tissue.

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