



“बेटी बचाओ, बेटी पढ़ाओ”

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Faculty Name	-	JV'n Sajal Agarwal (Assistant Professor)
Program	-	I.....Semester / Year
Course Name	-	B.PHARM
Session No. & Name	-	1.1 (Name of the Session)

Academic Day starts with –

- Greeting with saying ‘**Namaste**’ by joining Hands together following by 2-3 Minutes Happy session, Celebrating birthday of any student of respective class and **National Anthem**.

UNIT-I

TOPIC- TISSUE

Defination-

Highly ordered units make up cells. But they do not operate in isolation in multiracial creatures. They collaborate as a tissue, a collection of related cells. A collection of cells with a similar embryological origin that work together to carry out a certain job is referred to as a tissue. Histology is a science that

focuses on the investigation of a tissue. According to their form and function, the body's numerous tissues are divided into four major categories. These include tissue that is epithelial, connective, muscular, and nervous.

Epithelial Tissue-

Epithelial tissues line the body cavities and channels, cover the surface of the body, and create glands. They are broken down into: -

Glandular epithelium

Covering and lining epithelium

Covering and lining epithelium- The epithelium that lines and covers human tissues creates the exterior covering of the skin and the external covering of some internal organs. Along with the nerve tissue, it forms the lining of the body cavity, the interior of the respiratory and gastro intestinal tracts, blood vessels, and ducts, as well as the portions of the sense organs for smell, Human Anatomy and Physiology 29 hearing, vision, and touch. It is a tissue from which sperm and eggs are formed. Based on the arrangement of layers and cell shape, covering and lining epithelium is divided into two categories.

The layers covering and lining the epithelium are arranged as follows:

- a) Simple epithelium: It is designed specifically for filtration and absorption with little wear and strain. It has only one layer.
- b) Stratified epithelium, which has numerous layers and is located in an area that experiences a lot of wear and strain.
- c) Pseudo-stratified, which appears to be multilayered but is only one layer.

The epithelium's lining and covering cells are categorized according to their shape into:

- a) Squamous: flattened and scale-like;

- b) Cuboidal: cube-shaped;
- c) Columnar: tall and cylindrical;
- d) Transitional: combination of cell form present in areas of significant distention or expansion; examples include cuboidal to columnar, cuboidal to polyhydral, and cuboidal to squamous. Therefore, we can divide the covering and lining epithelium into the following groups based on the number of layers and cell shape:

Simple epithelium

- Simple: Squamous epithelium is composed of a single layer of scale-like, flat cells that resemble ceramic tiles. It is very osmosis, diffusion, and filtration suited. As a result, it coats the kidneys' blood channels, lymph vessels, and lung air sacs.
- b) A **straight forward cuboidal** epithelium, a flat polygon covering the surface of the ovary, and lining the anterior surface of the lens, retina, and kidney tubules
- c) Simple-columnar epithelium, which resembles simple-cuboidal epithelium. Various modifications are made depending on the location and function. It lines the gastrointestinal tract, the gall bladder, and several glands' excretory tubes. It performs secretion, absorption, protection, and lubrication activities.
 - a) Layered epithelium It is more resistant to wear and tear and shields underlying tissues from the outside environment.
 - b) Squamous epithelium stratified: The outer cells of this form of epithelium are flat. Based on the presence of keratin, stratified squamous epithelium is categorized into two groups. These stratified squamous non-keratinized and keratinized skin lesions. epithelium. It is common to see non-Keratnized stratified squamous epithelium on damp surfaces that have experienced significant wear and tear. For

instance, the mouth, tongue, and vagina. The surface cell of this kind creates a strong layer of keratin-containing material in keratinized, stratified squamous epithelium. Consider skin. A protein called keratin that is waterproof and resistant to bacterial invasion.

- c) Rare form of epithelium called stratified cuboidal epithelium. It can be present in the pharynx, epiglottis, cavernous urethra of the male urogenital system, and seat gland duct. Secretion is its primary function.
- d) A rare type of columnar epithelium that is stratified. Milk duct of mammary gland and anus layers have stratified columnar epithelium. It performs secretion and defense actions.

Transitional epithelium

The difference is that transitional epithelium's outer layer cells often tend to be big and rounded rather than flat. The property enables stretching of the tissue without breaking it. It is located in the urinary bladder, which is made up of ureters and urethra.

Pseudo stratified epithelium

The major excretory ducts of many glands, the epididymis, sections of the male urethra, and auditory tubes are lined with pseudo stratified epithelium. Protection and secretion are its primary functions.

Glandular Epithelium

Secretion is their primary function. One cell or a collection of highly specialized epithelial cells can make up a gland. Exocrine and endocrine glands can be distinguished by the location of their secretory release.

Exocrine: Those glands that empty their secretion into ducts/tubes that empty at the surface of covering. Their main products are mucous, oil, wax, perspiration and digestive enzyme. Sweat & salivary glands are exocrine glands.

Endocrine: They ultimately secrete their products into the blood system. The secretions of endocrine glands are always hormones. Hormones are chemicals that regulate various physiological activities. Pituitary, thyroid & adrenal glands are endocrine.

Connective tissue-

Mesenchyme and mucous connective tissue are found in embryonic connective tissue. The tissue from which every other connective tissue eventually develops is called mesenchyme. It is found in the embryo along the growing bone beneath the skin. The fetus is the main host of mucous (Wharton's Jelly) connective tissue, which is present in the fetus' umbilical cord where it maintains the chord.

Adult connective tissue-

It is differentiated from mesenchyme and does not change after birth. Adult connective tissue composes connective tissue proper, cartilage, osseous (bone) & vascular (blood) tissue

Connective tissue proper- connective tissue proper has a more or less fluid intercellular matrix and fibroblast. The various forms of connective tissue proper are:

- Loose (areolar) connective tissue, which are widely distributed and consists collagenic, elastic & reticular fibers and several cells embedded in semi fluid

intercellular substances. It supports tissues, organ blood vessels & nerves. It also forms subcutaneous layer/superficial fascia/hypodermis.

- Adipose tissue: It is the subcutaneous layer below the skin, specialized for fat storage. Found where there is loose connective tissue. It is common around the kidney, at the base and on the surface of the heart, in the marrow of long bone, as a padding around joints and behind the eye ball. It is poor conductor of heat, so it decrease heat loss from the body
 - Dense (Collagenous) connective tissue: Fibers are closely packed than in loose connective tissue. Exists in areas where tensions are exerted in various directions. In areas where fibers are interwoven with out regular orientation the forces exerted are in many directions. This occurs in most fascia like deeper region of dermis, periosteum of bone and membrane capsules. In other areas dense connective tissue adapted tension in one direction and fibers have parallel arrangement. Examples are tendons and ligaments. Dense connective tissues provide support & protection and connect muscle to bone.
 - Elastic connective tissue: Posses freely branching elastic fibers. They stretch and snap back in to original shape. They are components of wall of arteries, trachea, bronchial tubes & lungs. It also forms vocal cord. Elastic connective tissue allows stretching, and provides support & suspension.
 - Reticular connective tissue: Lattice of fine, interwoven threads that branch freely, forming connecting and supporting framework. It helps to form a delicate supporting stroma for many organs including liver, spleen and lymph nodes. It also helps to bind together the fibers (cells) of smooth muscle tissue.
- a) Cartilage : There are no blood vessels or nerves in cartilage, in contrast to other connective tissue. It is made up of a tight network of elastic and collagenous fibers that are solidly entrenched in chondriotin sulfate. The collagenous fibers are responsible for the strength. Chondrocytes are the

name for the cartilage's developed cells. A dense connective tissue called perichondrium, which is organized erratically around the surface of a cartilage, surrounds it. Hyaline, fibro, and elastic cartilage are the three types of cartilage.

- b) The most common type of hyaline cartilage, gristle is blue-white in color and strong. Found as articular cartilage at joints over long bones and as costal cartilage (at ventral end of ribs). Additionally, it creates the larynx, bronchi, trachea, and bronchial tubes. It creates the embryonic skeleton, supports breathing, promotes joint freedom, and helps the rib cage move during breathing.
- c) Fibro cartilage: they are found at the symphysis pubis, in the intervertebral discs and knee. It provides support and protection.
- d) Elastic cartilage: Chondrocytes are arranged in a network of elastic fibers that resembles a thread in elastic cartilage. Elastic cartilage gives some organs like the epiglottis, larynx, external ear, and Eustachian tube strength and elasticity while still maintaining their shape.
- e) Osseous tissue (Bone) : The matured bone cell osteocytes, embedded in the intercellular substance consisting mineral salts (calcium phosphate and calcium carbonate) with collagenous fibers. The osseous tissue together with cartilage and joints it comprises the skeletal system.

Muscle tissue-

Muscle tissue consists of highly specialized cells, which provides motion, maintenance of posture and heat production. Classification of muscles is made by structure and function. Muscle tissues are grouped in to skeletal, cardiac and smooth muscle tissue.

- **Skeletal muscle tissue** are attached to bones, it is voluntary, cylindrical, multinucleated & striated -

Cardiac muscle tissue: It forms the wall of the heart; it is involuntary, uni-nucleated and striated.

Smooth muscle tissue: located in the wall of hollow internal structure like Blood vessels, stomach, intestine, and urinary bladder. It is involuntary and non-striated.

Nervous Tissue-

In nervous tissue, there are primarily two types of cells. The neuroglia and neurons are seen here. Neurons are nerve cells that are responsive to different stimuli. It changes external inputs into nerve impulses. The fundamental unit of the neurological system is the neuron. There are 3 fundamental parts to it. The cell body, axons, and dendrites are these. Cells called neuroglia maintain, feed, and shield neurons. They are significant in terms of medicine since they have the capacity to multiply and generate malignant growths.

- University Library Reference-
- Human Anatomy And Physiology by Ross and Willson.
- Academic Day ends with-
National song 'Vande Mataram'