Department of Anesthesia Techniques
Title of the lecture: human tissue
Dr.Mohammed Zuhair Al-Murib
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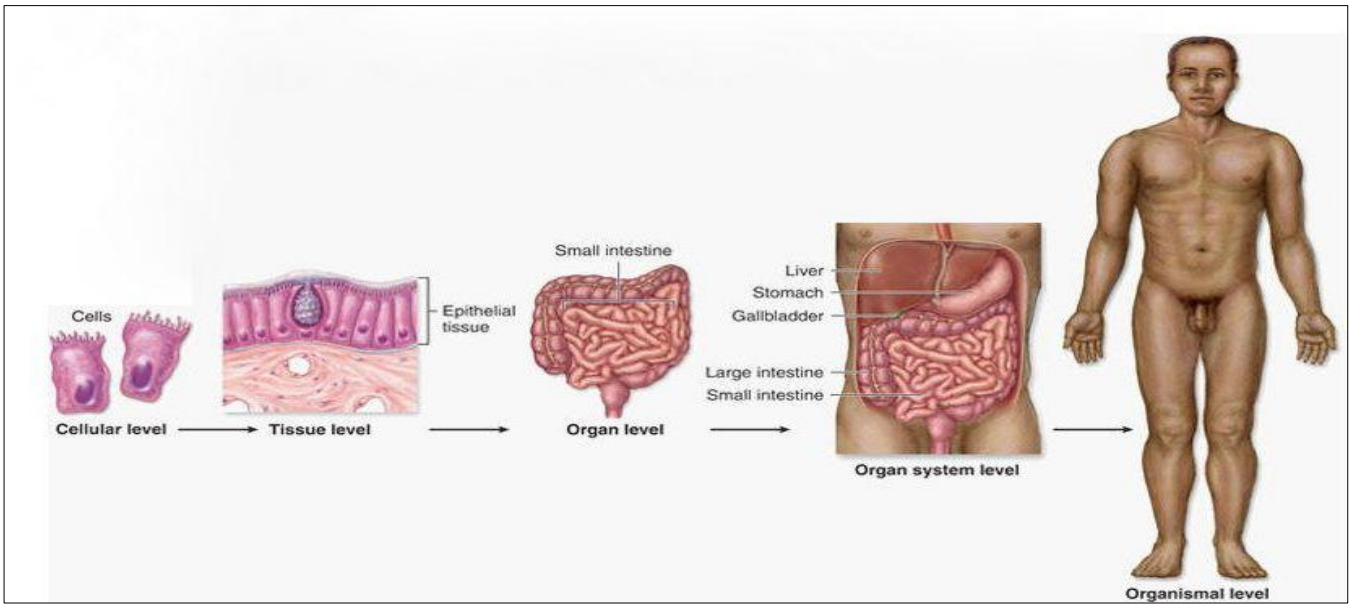
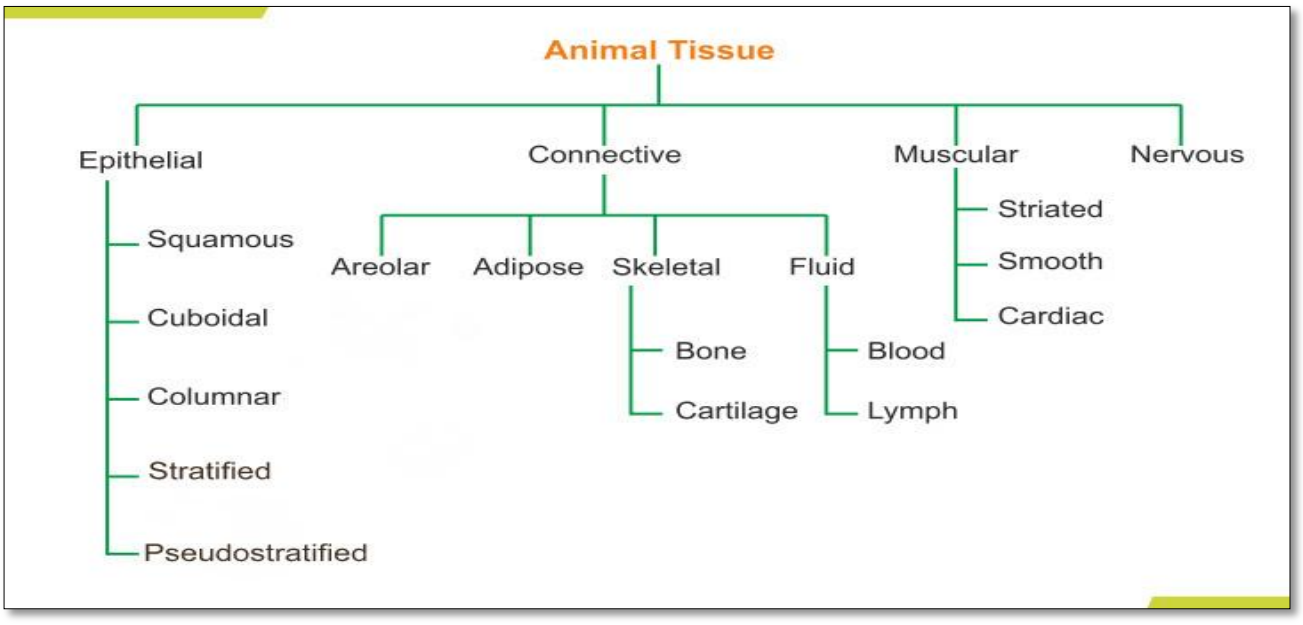
Levels of Organization

Cell basic unit of structure and function in living things, Tissue group of cells working together, Organ group of tissues working together, Organ system group of organs working together and Organism most complex group of organ systems working together



Animal Tissues

There are four types of tissues found in animals: **epithelial tissue**, **connective tissue**, **muscle tissue**, **and nervous tissue**.



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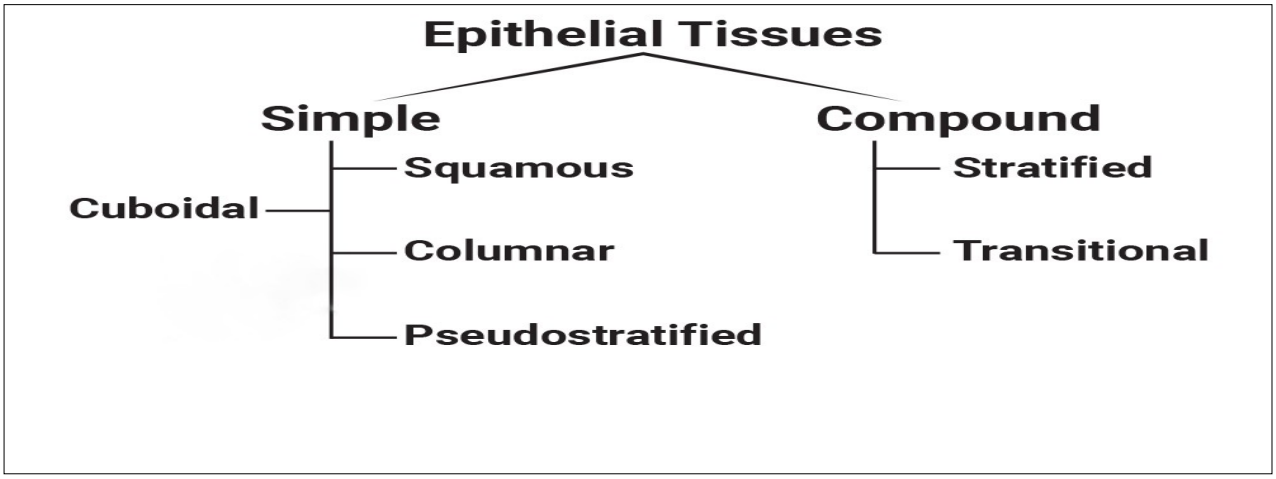
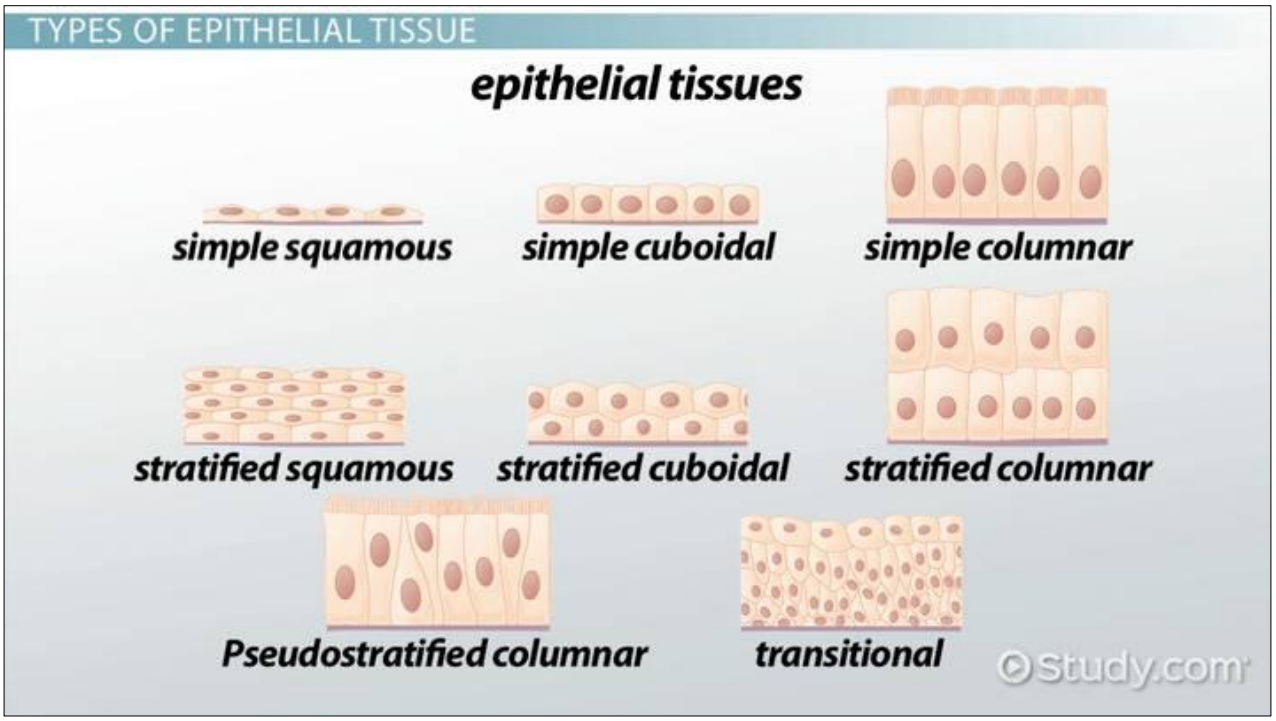
❖ EPITHELIAL TISSUES

Line body Surfaces and cavities, as well as form glands. The Cells of the tissue are closely connected to each other via cellular junctions and because epithelium is found on the edges of organs, it has two distinct surfaces. The Apical surface is exposed to the body cavity or exterior, while the basal surface is adjacent to the underlying tissue.

The functions of epithelial tissue are protection, transportation, secretion and absorption.





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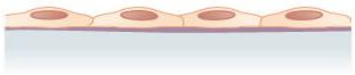
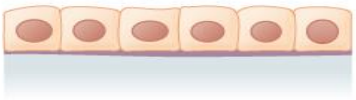
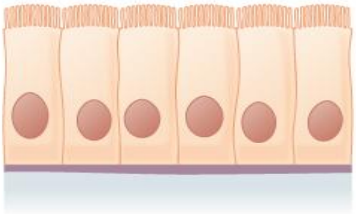
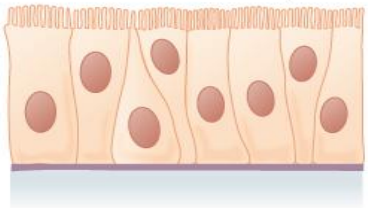
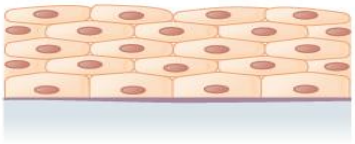
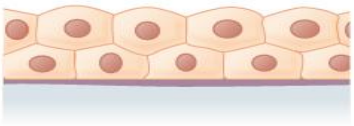
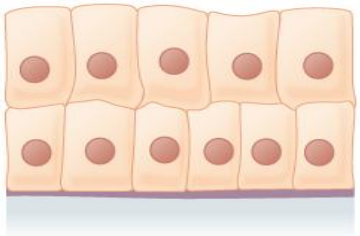
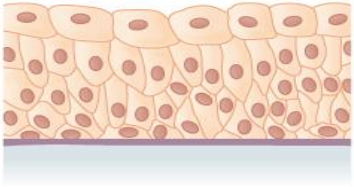
Cells	Location	Function
Simple squamous epithelium 	Air sacs of lungs and the lining of the heart, blood vessels, and lymphatic vessels	Allows materials to pass through by diffusion and filtration, and secretes lubricating substance
Simple cuboidal epithelium 	In ducts and secretory portions of small glands and in kidney tubules	Secretes and absorbs
Simple columnar epithelium 	Ciliated tissues are in bronchi, uterine tubes, and uterus; smooth (nonciliated tissues) are in the digestive tract, bladder	Absorbs; it also secretes mucous and enzymes
Pseudostratified columnar epithelium 	Ciliated tissue lines the trachea and much of the upper respiratory tract	Secretes mucus; ciliated tissue moves mucus
Stratified squamous epithelium 	Lines the esophagus, mouth, and vagina	Protects against abrasion
Stratified cuboidal epithelium 	Sweat glands, salivary glands, and the mammary glands	Protective tissue
Stratified columnar epithelium 	The male urethra and the ducts of some glands	Secretes and protects
Transitional epithelium 	Lines the bladder, uretha, and the ureters	Allows the urinary organs to expand and stretch

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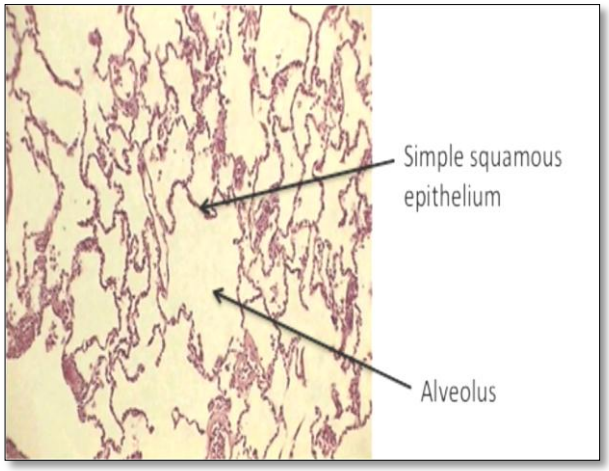
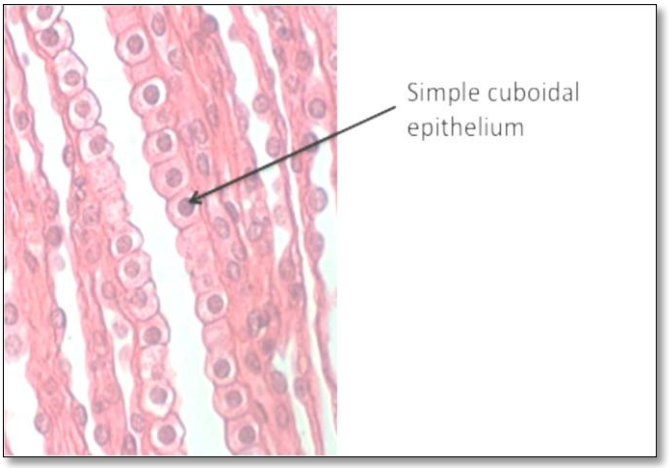
✓ ***Simple Squamous Epithelium***

Ex\ Kidney slide



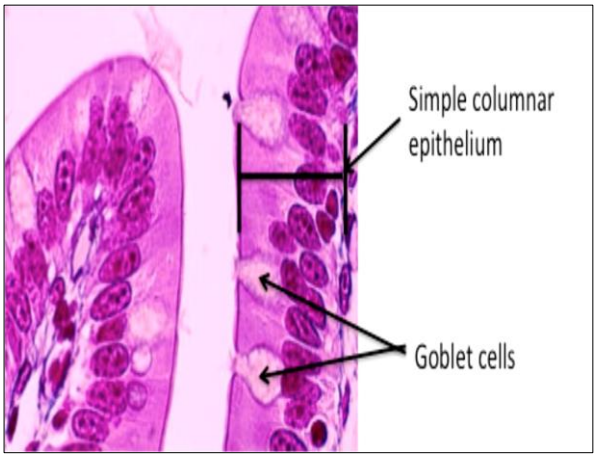
Simple cuboidal epithelium

Ex\ Lung slide:



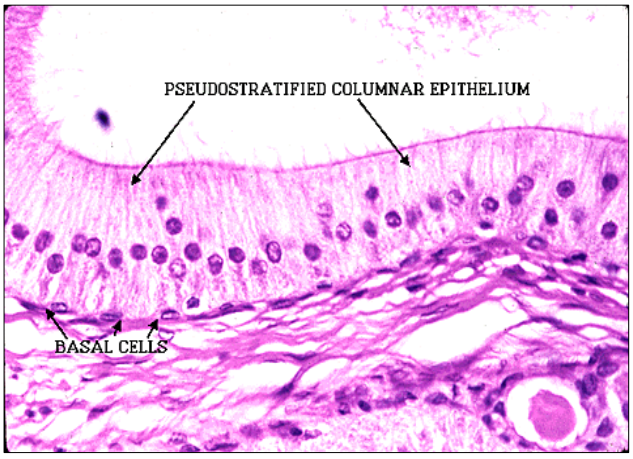
✓ **Simple columnar epithelium**

- Ex\ Duodenum\ Small intestine



Pseudostratified epithelium

. Ex\ Trachea



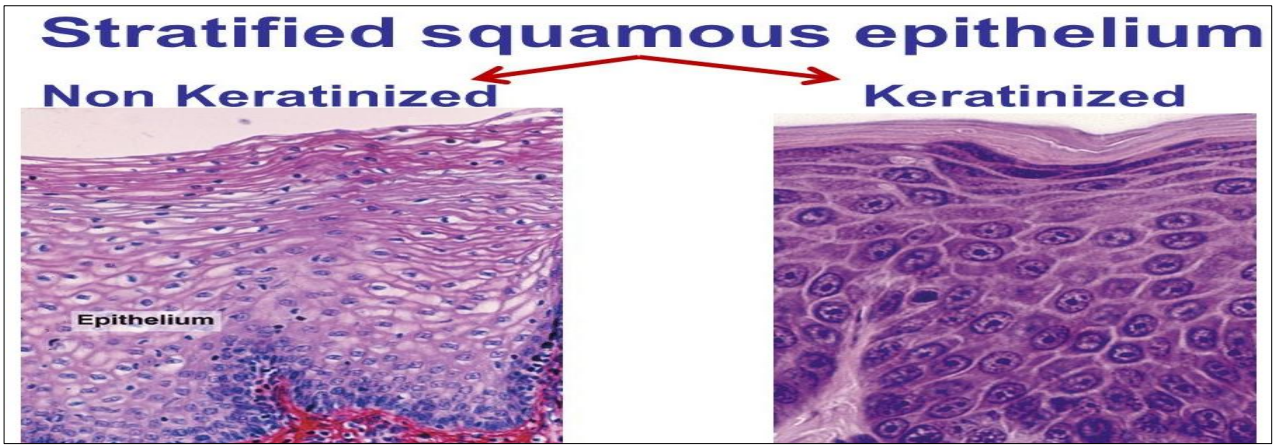
Stratified Epithelium

Stratified epithelium consists of several layers of cells of various shapes

stratified squamous epithelium

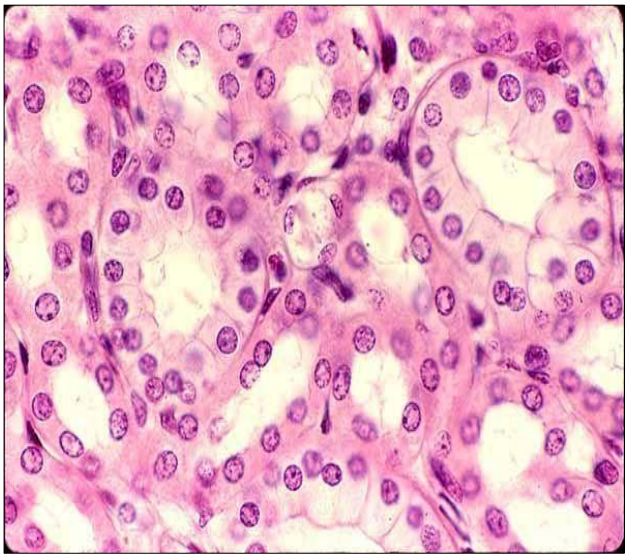
Ex of Keratinized stratified squamous epithelium \ Palmar Human Skin

Ex of non Keratinized stratified squamous epithelium \ vagina



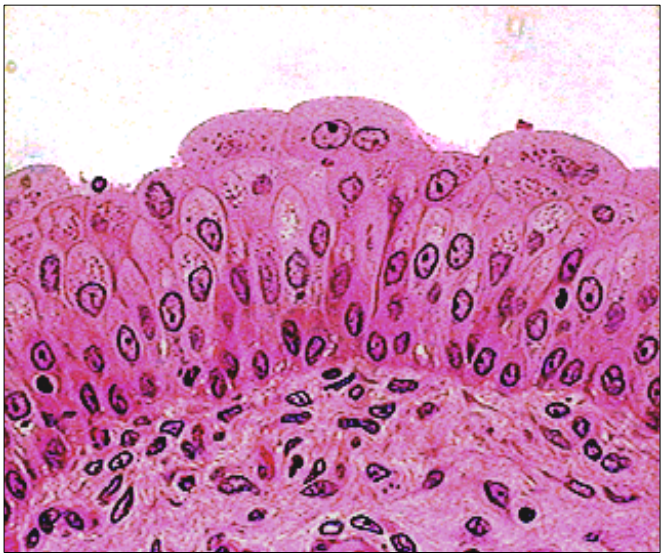
Stratified Cuboidal Epithelium

Ex\ Ducts of salivary and sweat glands



Stratified columnar epithelium

Ex\ Male urethra

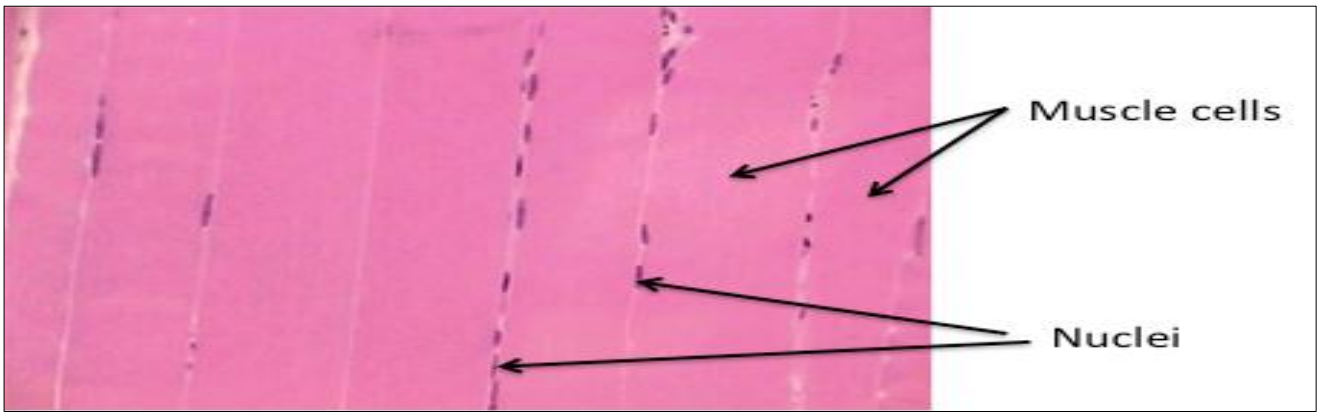


❖ Muscle Tissue

Muscle tissue is specialized for contraction. The cells are elongated, and are also known as muscle fibers. They contain the contractile proteins actin and myosin, which interact to shorten and elongate the cells. There are three different types of muscle tissue: **skeletal**, **cardiac** and **smooth**.

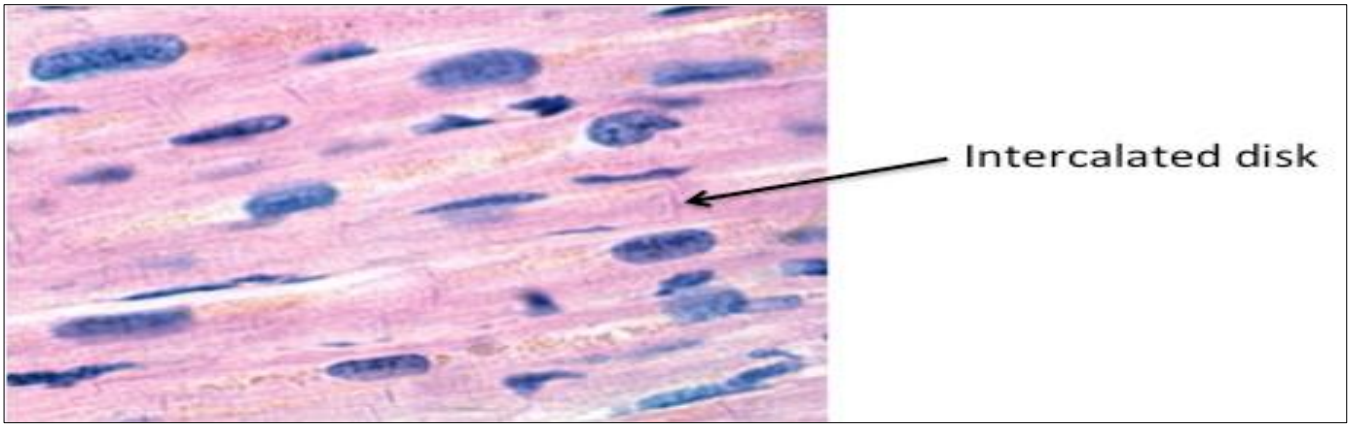
✓ **Skeletal muscles**

Skeletal muscles are attached to bones, and contraction of these muscles generates body movements (limb movement, jaw movement, breathing, etc.). The skeletal muscle fibers are long and cylindrical, with multiple peripherally located nuclei. The cells have **striations**, alternating light and dark bands that result from the ordered arrangement of actin and myosin within the cell.



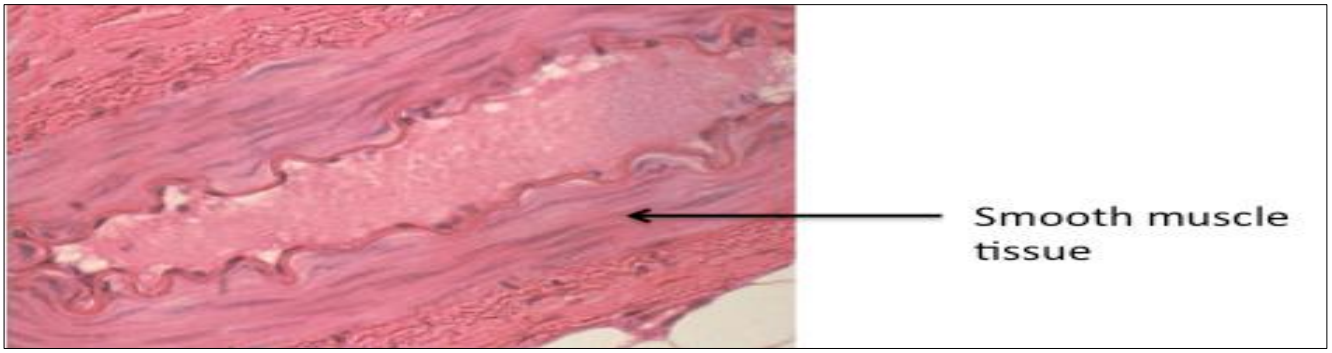
✓ **Cardiac muscle**

Cardiac muscle is present in the heart. Cells are striated, but the striations are much less obvious than in skeletal muscle tissue. The cells are shorter than skeletal muscle fibers, have a single nucleus and are often branched. Individual cells are connected via gap junctions and desmosomes. These cellular connections are visible under the microscope as dark bands called **intercalated disks**. These cellular Communication junctions are necessary for the coordinated beating of the heart.



✓ Smooth muscle

muscle composite slide & artery/vein/nerve slide: Smooth muscle tissue is found in the walls of hollow organs, such as the gastrointestinal tract, blood vessels, and the urinary bladder. Contractions of these muscles propel fluid or materials through the organs (i.e. food through the GI tract, Blood through blood vessels, urine pushed out of bladder), smooth muscle cells are not striated (hence the name "smooth" muscle); they have a single nucleus, and have tapered ends.



❖ Nervous Tissue

Nervous tissue is specialized for communication and composes the brain, spinal cord, and peripheral nerves. The tissue consists of two major cell types: neurons and glial cells. Neurons communicate with each other via electrical and chemical signals. They have nucleated cell bodies and two types of elongated cellular processes: dendrites –which Receive signals, and axons – which send signals. Glial cells are the support cells of nervous tissue. This slide show large neurons with their elongated cellular processes and the smaller, more numerous glial cells.