Lab 6 - Observation of Tissue Slides

(Epithelial, Muscular, Connective and Nervous Tissues)

What is the tissue?

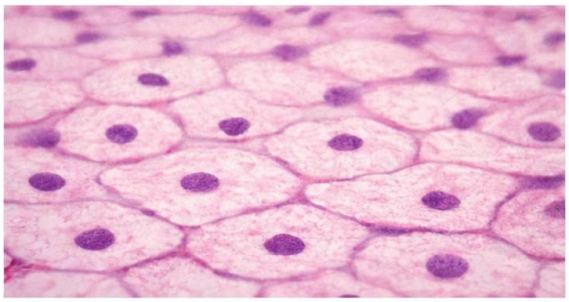
Tissue is a group of similar cells, together with their products, that perform a specific function in the body. Tissues are formed by cells that share a common origin, structure and function. In multicellular organisms, tissues work together to form organs and organ systems, ensuring proper physiological activities.

1 .Epithelial Tissue

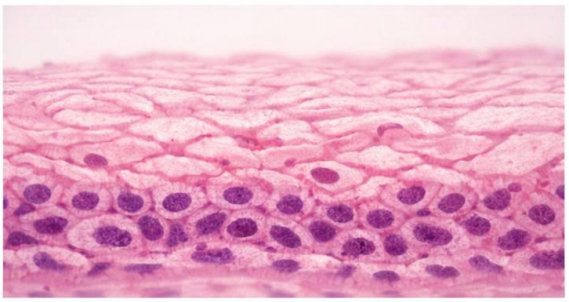
Epithelial tissue covers body surfaces, lines internal cavities, and forms glands. It acts as a protective barrier and is involved in absorption, secretion, filtration, and diffusion. Epithelial cells are tightly packed with minimal intercellular space and rest on a basement membrane. This tissue is avascular but usually well innervated and shows a high rate of cell regeneration.

❖ Common types include:

1. Simple squamous epithelium (diffusion and filtration)
2. Simple cuboidal epithelium (secretion and absorption)
3. Simple columnar epithelium (absorption and secretion)
4. Stratified squamous epithelium (protection).

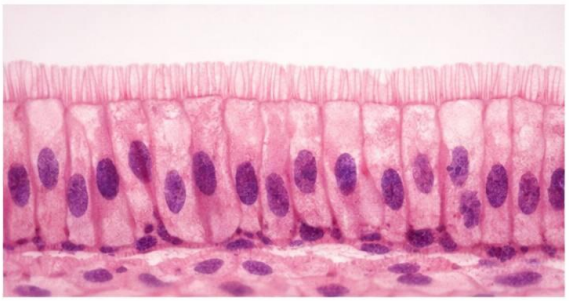


Simple Squamous Epithelium



Stratified Squamous Epithelium

Simple Cuboidal Epithelium



Simple Columnar Epithelium

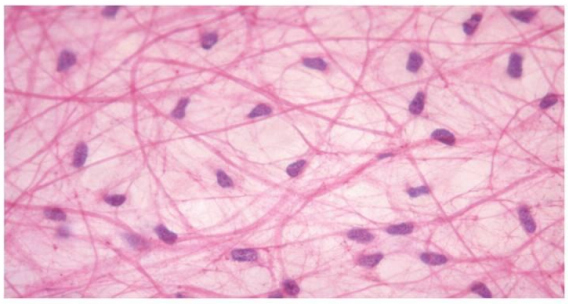
a. **Simple squamous epithelium** is made of one thin layer of flat cells and helps in diffusion.
b. **Stratified squamous epithelium** has many layers of cells and protects the body from damage.
c. **Simple cuboidal epithelium** consists of one layer of cube-shaped cells and is involved in secretion and absorption.
d. **Simple columnar epithelium** is formed of tall cells and helps in absorption and secretion.

2 .Connective Tissue

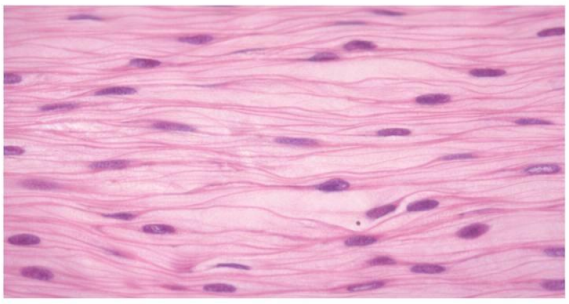
Connective tissue supports, binds and protects other tissues and organs. It consists of cells embedded in an extracellular matrix composed of fibers and ground substance. Unlike epithelial tissue, connective tissue is usually well vascularized.

❖ Major types include:

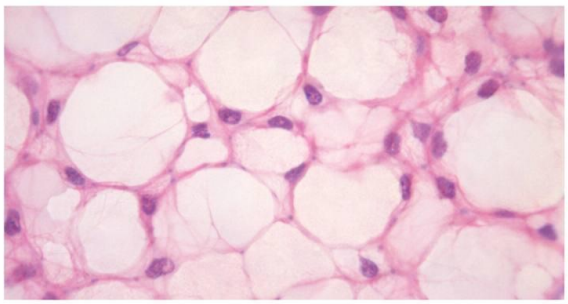
1. Loose connective tissue (areolar, adipose)
2. Dense connective tissue (tendons, ligaments)
3. Supporting connective tissue (cartilage, bone)
4. Fluid connective tissue (blood).



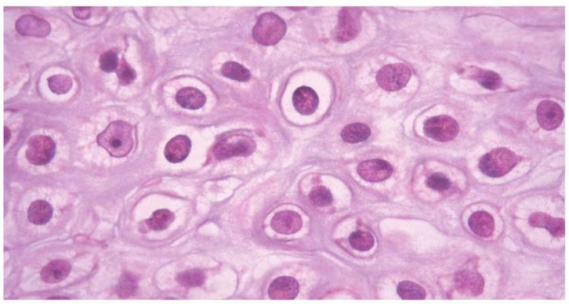
Loose (Areolar) Connective Tissue



Dense Regular Connective Tissue



Adipose Tissue



Cartilage Tissue

a. **Loose** (areolar) connective tissue has loosely arranged fibers and cells and supports surrounding tissues.
b. **Dense** regular connective tissue contains tightly packed collagen fibers and provides strong attachment and support.
c. **Adipose** tissue is made of fat cells and is used for energy storage, insulation, and protection.
d. **Cartilage** tissue consists of cells (chondrocytes) embedded in a firm matrix and provides flexible support.

3-Musculer tissue

Muscular tissue is specialized for contraction and movement. Muscle cells are elongated and contain contractile proteins (actin and myosin). This tissue is responsible for body movement, posture, and propulsion of substances within organs.

❖ Types of muscular tissue:

1. Skeletal muscle (voluntary, striated)
2. Cardiac muscle (involuntary, striated, branched fibers)
3. Smooth muscle (involuntary, non-striated)

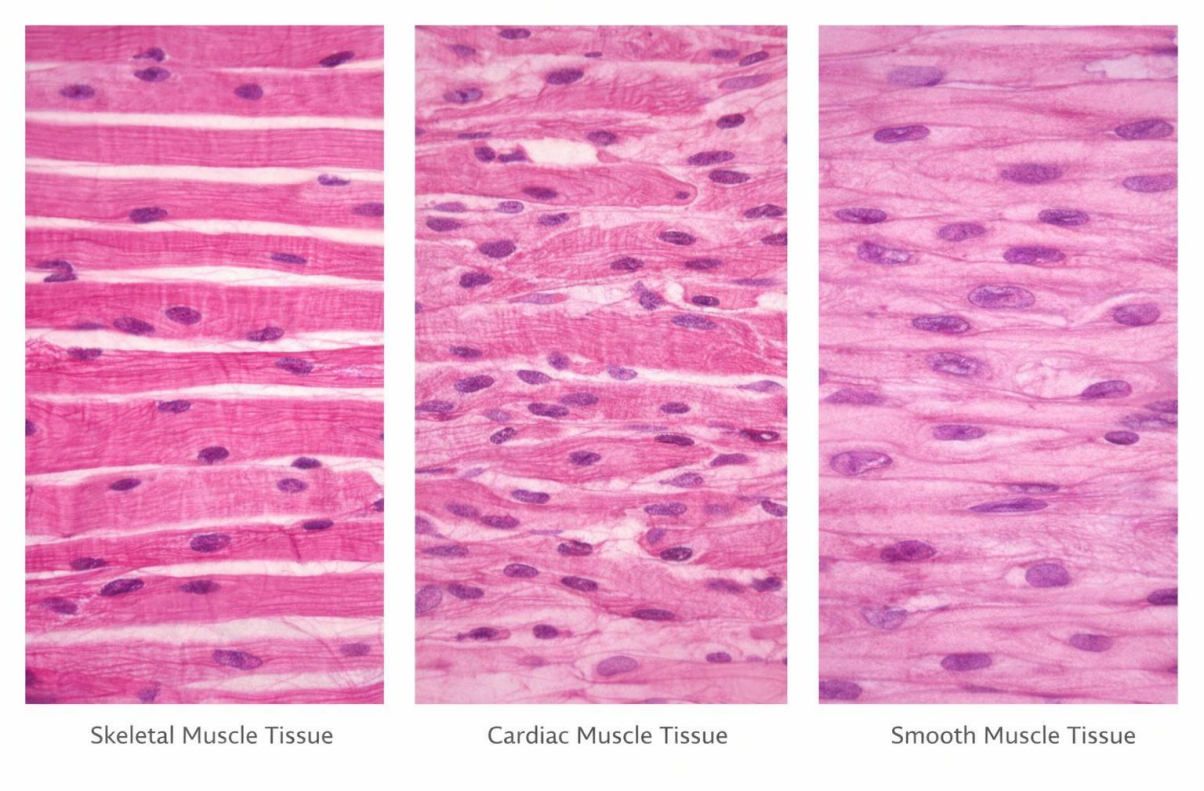


Figure. 3

a) Skeletal muscle tissue consists of long, striated fibers and is responsible for voluntary movement.
b) Cardiac muscle tissue has branched, striated cells and forms the wall of the heart.
c) Smooth muscle tissue is made of non-striated cells and controls involuntary movements of internal organs.

4 .Nervous Tissue

Nervous tissue is specialized for **communication** and **control**. It is found in the brain, spinal cord and peripheral nerves. The tissue consists of neurons and supporting cells called **neuroglia**.

Neurons transmit electrical impulses, while neuroglial cells provide support, protection and nourishment.

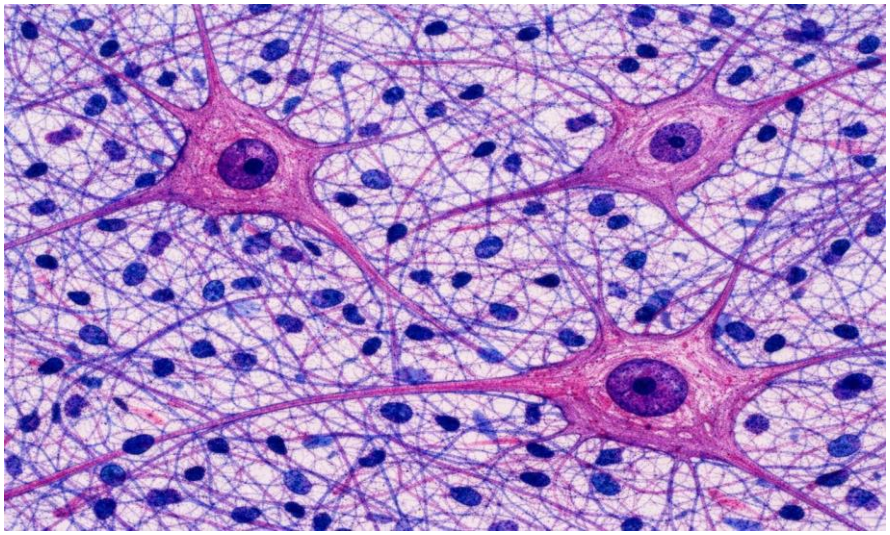


Figure 4: Light micrograph of nervous tissue showing neurons with prominent cell bodies, nuclei, and extending nerve fibers.