

Epithelium

Functions: Covering, lining, absorption, secretion. Covers body surfaces, lines cavities, constitutes glands; for protection, absorption, secretion.

General Features: Basal lamina, avascular, regeneration, polarity, junctional complex..

Classification: Simple, stratified, pseudostratified; squamous, cuboidal, columnar.

Specific Types:

Simple	Pseudostratified:
Squamous: Thin barrier, facilitates exchange (e.g., lung alveoli).	Appears stratified; secretion, cilia-mediated transport (e.g., respiratory tract).

Simple Cuboidal: Absorption and secretion (e.g., exocrine glands).	Stratified Squamous: Protection, prevents water loss (e.g., skin, esophagus).
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Simple Columnar: Absorption, secretion, lubrication (e.g., intestine).	Transitional: Distensible property, changes shape (e.g., bladder).
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Simple Epithelia: Single layer; types include squamous, cuboidal, columnar. Stratified Epithelia: Multiple layers; types include squamous (keratinized, non-keratinized), cuboidal, columnar, transitional. Special Structures: Microvilli, cilia, stereocilia for absorption, secretion, sensory functions.

Connective Tissue

Functions: Connects tissues, metabolic support, highly vascular. **Components:** Extracellular matrix (ground substance and fibers), connective tissue cells. **Fibers:** Collagen (tensile strength), elastic (elasticity), reticular (support). **Cells:** Fibroblasts (extracellular matrix synthesis), adipocytes (fat storage), macrophages (immune response), mast cells (inflammation mediators).

Connective Tissue

Functions: Connects, supports, binds, or separates other tissues or organs. **Components:** Extracellular Matrix (ECM): Ground substance and fibers (collagen, elastic, reticular). **Cells:** Fibroblasts (principal cells), adipocytes, macrophages, mast cells, various blood cells. **Types:** Loose Connective Tissue: More cells, less fibers; supports organs, vessels, nerves. Dense Connective Tissue: More fibers, less cells; types include regular (tendons, ligaments) and irregular (dermis). Specialized Connective Tissue: Cartilage, bone, blood.

Muscle Tissue

Characteristics: Contractility, movement, shape and size change of organs. **Types:** Skeletal Muscle: Striated, voluntary control. Cardiac Muscle: Striated, involuntary control, intercalated discs. Smooth Muscle: Non-striated, involuntary control, lines hollow organs.

Learning objectives

ANT.2: Understand the microscopic anatomy and functional correlates of epithelia.

ANT.2.1. Describe the general microscopic characteristic of epithelia.

ANT.2.2. Classify the types of epithelia based on their microscopic features, sites, and functions.

MCB.16.1. Determine the type of cell-cell and/or cell-matrix interaction important for the normal function of a tissue.

ANT.2.3. Describe the microscopic anatomy of glands, their modes of secretion, and functions.

ANT.3: Understand the microscopic anatomy and functions of connective tissues and muscles.

ANT.3.1. Differentiate the histologic features of the types of connective tissue.

ANT.3.2. Distinguish connective tissue cells and their functions.

ANT.3.3. Differentiate the microscopic anatomy of smooth, skeletal and cardiac muscle types.

Textbook readings:

- Pawlina W. & Ross M. H. (2024). *Histology: A Text and Atlas with Correlated Cell and Molecular Biology* (9th ed.). Philadelphia, PA: Wolters Kluwer / Lippincott Williams and Wilkins. • <http://auamed.idm.oclc.org/login?url=https://premiumbasicsciences.lwwhealthlibrary.com/book.aspx?bookid=3290>

- Agur, A. M. R., Dalley, A. F., & Moore, K. L. (2024). *Moore's Essential Clinical Anatomy* (7th ed.). Philadelphia: Wolters Kluwer. <http://auamed.idm.oclc.org/login?url=https://premiumbasicsciences.lwwhealthlibrary.com/book.aspx?bookid=3243>

