TISSUES

4 major types of tissues

- Epithelial
- Connective
- Muscle
- Nervous

Epithelial

- Covers all body surfaces inside and out
- Main glandular tissue
- Attached to underlying connective tissue by basement membrane
- No vascular tissue – blood supply
- Cells reproduce rapidly – rapid healing
- Cells tightly packed together
- Functions – protection, secretion, absorption, excretion, sensory perception

Epithelial cont….

Shapes

- Stratified
  - several layers
- Simple
  - one layer

- Squamous
  - Large flat – nucleus in middle
- Columnar
  - Rectangle – nucleus near bottom
- Cuboidal
  - Square shape – nucleus in middle

Simple Squamous

- single layer
- Flattened cells – squamous
- Diffusion and filtration
- Found in air sacs of lungs and walls of capillaries

Simple Cuboidal

- Single layer
- Cube-shaped cells
- Secretion and absorption
- Found in lining of kidney tubules, ducts of glands, and covering surface of ovaries

Simple Columnar

- Single layer
- Elongated cells
- Protection, secretion and absorption
- Lining of digestive tract and uterus
- Contains goblet cells – secrete mucus
- Microvilli – increase surface area

Stratified Squamous

- Multi-layered
- Squamous cells
- Protection
- Lines body cavities like the mouth and outer layer of skin

Pseudostratified (Ciliated) columnar

- Single layer but appears to be more layers
- Nuclei are scattered
- Ciliated
- Secretion
- Line air passages like the trachea and reproductive system

Transitional Epithelium

- Thick layer
- Cuboidal cells
- Stretchable tissue
- Lining of urinary bladder

Epithelial

- Repairs/reproduces quickly in the following locations
  - Skin
  - Mouth
  - Intestinal lining

Epithelial Glandular Tissue

Exocrine

- Have a duct
- Sweat glands
- Mucus glands

- Pancreas acts as both exocrine and endocrine

Endocrine

- Secrete hormones to blood
- No duct
- Thyroid
- Pituitary

Connective Tissue

- Most abundant tissue in the body
- Binds structures together
- Provides support, protection, framework, fills space, stores fat, produces blood cells, fights infection, and helps repair tissue
- Good blood supply

3 common types of cells in connective tissue

- Mast Cells
  - Prevents blood clots
- Macrophages
  - phagocytic
- Fibroblasts
  - Most abundant, produce fibers

Main types of fibers in connective tissue

- Collagenous Fibers
  - Thick, made of protein, long parallel bundles
  - Strong, flexible but not elastic
    - White fibers – ligaments and tendons
- Elastic Fibers
  - Microfibrils in protein elastin
    - Yellow fibers
    - Very elastic – respiratory and vocal cords

4 connective tissue types

- Soft
  - Areolar
  - Adipose
- Fibrous
  - Collagen
  - Elastin
- Hard
  - Bone
  - cartilage
- Liquid
  - Blood
  - Lymph

Soft Connective Tissue

- Areolar
  - Found in mucous membranes
  - Under skin
  - Around vessels/organs
  - Connects skin to muscle
  - Contains WBC
- Adipose
  - Found in subcutaneous body areas (FAT)
  - Stores lipids as a reserve energy source
  - Provide heat insulation
  - cushions

Fibrous Connective Tissue

- Slow to repair itself due to poor blood supply
- Functions
  - Provide protection via strenght
- Found
  - Outer walls of arteries
  - Alveoli
  - Tendons/ligaments
  - Dermis

Hard Connective Tissue

Cartilage

- Found in trachea, joint surfaces, between joints, ears, tip of nose
- Functions: shock absorbtion, reduces friction, reinforcement of some organs
- Slow to heal because no capillaries

Bone

- Contains: nerves, blood vessels, bone forming cells, bone marrow
- Heals quicker because of abundant blood supply

Liquid Connective Tissue

- Blood
- Lymph

Muscle Tissue

- Skeletal
  - Striated
  - voluntary
- Cardiac
  - Striated
  - involuntary
- Smooth
  - Non-striated
  - Involuntary

Muscle tissue repair

- Difficult if at all possible
- Mostly replaced with scar tissue

Nervous Tissue

- Neurons
  - Transmit electrical impulses
- Nerves
  - Bundles of nerve cells
- Neuroglia
  - Do not transmit electrical impulses
  - Produce myelin
  - Destroy harmful substances in the brain

Neurons

- Nerve cell body
- Axon
- Dendrite

- Myelin – white matter – high function areas
- Unmyelinated – gray matter – basic areas

Nervous Tissue Repair

- Central Nervous System
  - Injured tissue can't be repaired
- Peripheral Nervous System
  - Injured tissue may repair

Membranes

- Functions
  - Cover line surfaces
  - Separate organs/parts of organ from one another
  - Anchor organs
  - Produce secretions

Types of membranes

Epithelial

- Serous
  - 3 P's
- Mucus
  - tracts
- Cutaneous
  - skin

Connective

- Synovial
- Meninges
- Fascia
- Fibrous Pericardium
- Periosteum

Tissue repair

- Fibrosis
  - Occurs if damaged area is too large
  - Fibrocytes fill the gaps
  - Scar
  - More sensitive and less flexible
  - Clean cuts heal better than ragged tears