

II. Tissues

This is basic background to the rest of anatomy and physiology.

Definition:

- a group of cells with a common structure and function.

Four main tissue types:

1. Epithelial [Fig. 20.4, p. 416]

- cover surfaces (example: skin)
 - this surface may be very complicated. For example:
 - lining the inside of the gut
 - lining the ducts inside the pancreas.
- secrete stuff.

Examples are sweat, oils (on the skin), or digestive enzymes (in the gut /and or pancreas).

On one side this tissue is free, on the other it is attached to a basement membrane which connects it to underlying tissues.

Epithelial tissues are classified based on:

- shape: cuboidal, columnar or squamous.
- # of layers: simple, pseudostratified [Fig., not in book], stratified.

2. Connective [Fig. 20.5, p. 417].

- consist of cells surrounded by non-living matrix.
- six basic types:
 - loose connective tissue - loose collagen fibers. Holds tissues and organs in place.
 - adipose- stores fat (energy & insulation)
 - blood - transports substances (oxygen, nutrients, etc.)

- fibrous (dense?) connective tissue - tendons & ligaments
- cartilage - covers joints, supports nose, ears, etc.
- bone - rigid, provides for support of body & movement.

- in each case, the cell is alive and is responsible for extruding the non-living surrounding matrix.

3. Muscle (= contractile) [Fig. 20.6, p. 418]

- These tissues contract and allow us to work.

- Three types:

- skeletal (= voluntary = striated). These are the ones you have voluntary control over.

- are highly organized and have a “striated” appearance.
- individual cells can be quite long, and multinucleate.

- smooth (= involuntary). You have no conscious control over these. They include the muscles lining the gut, arteries, bladder, etc. They are slower, but can contract over greater distances and for longer periods of time.

- cardiac. Highly organized like striated. Involuntary. Characterized by intercalated disks. Can have branched cells.

- these allow for rapid dissemination of the electrical signal.

4. Nervous tissue [Fig. 28.2, p. 565].

- send impulses around the body. Information needs to come in (senses), be processed (what do you do with it), and then some response needs to be made (usually muscular).

- are composed of dendrites (bring signal in), a nerve cell body, and axons (take signal out).

Higher organizations:

tissues are organized into organs [Fig. 20.8, p. 419].

- organs include several tissues that perform specific functions:

- heart - pumps blood around body
- lungs - exchange oxygen and carbon dioxide
- kidneys - secrete metabolic wastes
- etc.

- organs are made up of the different tissue types.

Even higher, we have organ systems made up of organs [**Fig. similar to 20.10, p. 420** (20.10 just seems a bit too silly to use)]:

digestive system: mouth, esophagus, liver, stomach, etc.

circulatory system: heart, blood vessels, etc.

We'll spend the first part of the semester going through these different organ systems.