The 4 Basic Tissue Types in the Human Body

By Paul Schwen

Tissues are groups of cells with a common structure (form) and function (job).
There are four main tissues in the body – epithelium, muscle, connective tissue and nervous tissue.

I. Epithelial

Functions (jobs):
1) It protects us from the outside world – skin.
2) Absorbs – stomach and intestinal lining (gut)
3) Filters – the kidney
4) Secretes – forms glands

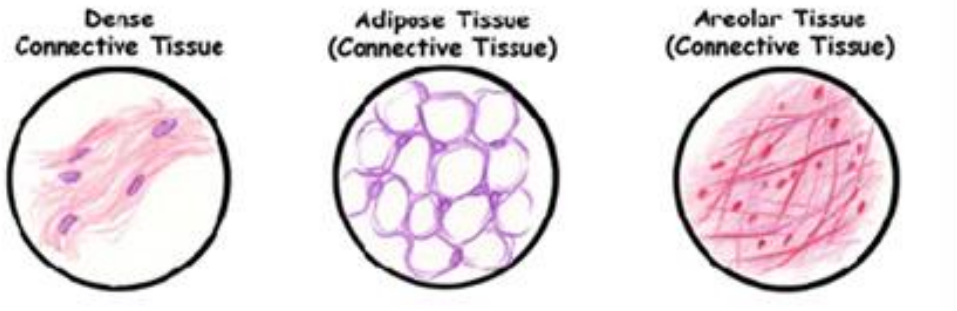
Characteristics:

1) Closely attached to each other forming a protective barrier.
2) Always has one free (apical) surface open to outside the body or inside (cavity) an internal organ.
3) Always had one fixed (basal) section attached to underlying connective tissue.
4) Has no blood vessels but can soak up nutrients from blood vessels in connective tissue underneath.
5) Can have lots of nerves in it (innervated).
6) Very good at regenerating (fixing itself). i.e. sunburn, skinned knee.

Classifications (types):

1) By shape
    a) squamous - flat and scale-like
    b) cuboidal - as tall as they are wide
    c) columnar - tall, column-shaped

2) By cell arrangement
    a) simple epithelium - single layer of cells (usually for absorption and filtration)
    b) stratified epithelium - stacked up call layers (protection from abrasion (rubbing) - mouth, skin.)



II. CONNECTIVE TISSUE

Functions (jobs):
1) Wraps around and cushions and protects organs

2) Stores nutrients
3) Internal support for organs
4) As tendon and ligaments protects joints and attached muscles to bone and each other
5) Runs through organ capsules and in deep layers of skin giving strength

The Three Elements of Connective Tissue:
1) Ground substance – gel around cells and fibers
2) Fibers – provide strength, elasticity and support
3) Cells

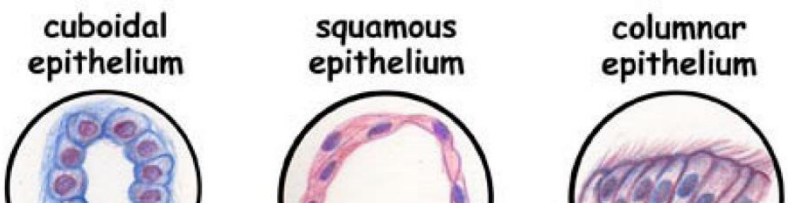
Two Kinds of Connective Tissue:
1) Loose Connective Tissue:
a) Areolar Connective Tissue – cushion around organs, loose arrangement of cells and fibers.
b) Adipose Tissue – storehouse for nutrients, packed with cells and blood vessels
c) Reticular Connective Tissue – internal supporting framework of some organs, delicate network of fibers
and cells

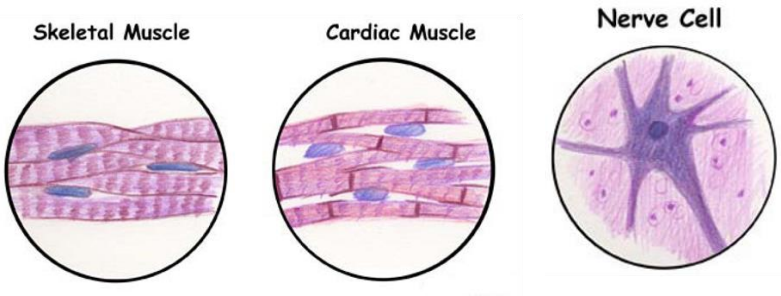
2) Dense Connective Tissue:
a) Dense Regular Connective Tissue – tendons and ligaments, regularly arranged bundles packed with fibers
running same way for strength in one direction.
b) Dense Irregular Connective Tissue – skin, organ capsules, irregularly arranged bundles packed with fibers for strength in all directions.

IIa. SPECIAL CONNECTIVE TISSUES
1) Cartilage
Functions (jobs):
1) provides strength with flexibility while resisting wear, i.e. epiglottis, external ear, larynx
2) cushions and shock absorbs where bones meet, i.e. intervertebral discs, joint capsules

2) Bone
Functions (jobs):
1) provides framework and strength for body
2) allows movement
3) stores calcium
4) contains blood-forming cells

3) Blood
Functions (jobs):
1) transports oxygen, carbon dioxide, and nutrients around the body
2) immune response



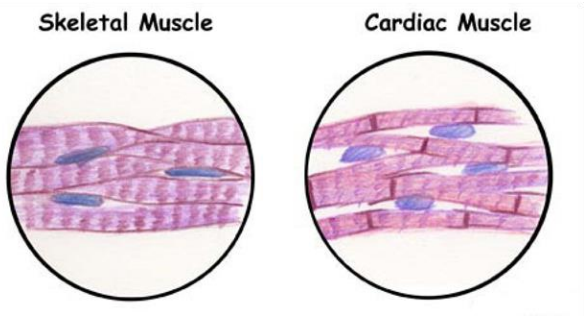


III. NERVOUS TISSUE
Functions (jobs):
1) Conducts impulses to and from body organs via neurons

The 3 Elements of Nervous Tissue
1) Brain
2) Spinal cord
3) Nerves

IV. MUSCLE TISSUE
Functions (jobs):
1) Responsible for body movement
2) Moves blood, food, waste through body's organs
3) Responsible for mechanical digestion

The 3 Types of Muscle Tissue
4) Smooth Muscle – organ walls and blood vessel walls, involuntary, spindle-shaped cells for pushing things
through organs
5) Skeletal Muscle – large body muscles, voluntary, striated muscle packed in bundles and attached to bones for
movement
6) Cardiac Muscle – heart wall, involuntary, striated muscle with intercalated discs connecting cells for synchronized
contractions during heartbeat.


Skeletal Muscle
Cardiac Muscle