rubber tissue  

- Dense Regular Connective Tissue is located between bones and is composed of densely packed, parallel bundles of collagen fibers. It provides strength to structures such as ligaments and tendons.

- Dense Irregular Connective Tissue is found around joints, blood vessels, and the heart. Its fibers are not arranged in a parallel order.

- Dense Elastic Connective Tissue is located between the ribs and vertebrae of the spinal column (ligamentum flavum and ligamentum nuchae). It is characterized by the presence of elastic fibers.

- Loose Connective Tissue is abundant and immovable adipocytes which are surrounded by connective tissue called areolar tissue. It is found in various locations such as subcutaneous tissue, periosteal and perichondrial, and in ligaments supporting the penis.

- Reticular Connective Tissue is found in the liver, kidney, spleen, and vascular walls. It is characterized by a network of reticular fibers.

- Elastic Connective Tissue is found in the walls of blood vessels and in the dermis of the skin. It contains elastic fibers that allow for recoil and distensibility.

- Fibrous Connective Tissue is found in tendons and ligaments where it acts as a supporting structure. It consists of densely packed, parallel bundles of collagen fibers.

- Adipose Tissue is characterized by the presence of adipocytes, which are specialized cells that store fat. It can be found in various locations such as subcutaneous tissue and around organs.

- Areolar Tissue is a loose connective tissue found between skeletal muscles and the skeleton (tendons and ligaments), supporting transitional epithelia, and in blood vessel walls. It is characterized by the presence of areolar fibroblasts.
<table>
<thead>
<tr>
<th>Sub Type</th>
<th>Example Image</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Areolar Connective Tissue</td>
<td><img src="https://www.google.com/url?sa=i&amp;rct=j&amp;q=&amp;esrc=s&amp;source=images&amp;cd=&amp;cad=rja&amp;docid=Ib61J5sK8aKc3M" alt="Areolar Image" /></td>
<td>Contains cells and adipocytes, which are abundant and immovable adipocytes. It is found deep in the skin, buttocks, breast, and padding around eyes and kidneys. Its functions are to store energy, provide insulation, and cushion shocks.</td>
</tr>
<tr>
<td>Dense Regular Connective Tissue</td>
<td><img src="https://www.google.com/url?sa=i&amp;rct=j&amp;q=&amp;esrc=s&amp;source=images&amp;cd=&amp;cad=rja&amp;docid=Ib61J5sK8aKc3M" alt="Dense Image" /></td>
<td>Provides firm attachment, conducts pull of muscles, reduces friction between muscles, and in deep fasciae. It can be located between skeletal muscles and skeleton (tendons and aponeuroses), between bones or stabilizing positions of internal organs (ligaments), covering skeletal muscles, and in deep fasciae.</td>
</tr>
<tr>
<td>Dense Elastic Connective Tissue</td>
<td><img src="https://www.google.com/url?sa=i&amp;rct=j&amp;q=&amp;esrc=s&amp;source=images&amp;cd=&amp;cad=rja&amp;docid=Ib61J5sK8aKc3M" alt="Elastic Image" /></td>
<td>Contains abundant and clustered elastic fibers, which are surrounded by a basal lamina, and are clustered together like tightly packed grapes. It can be found deep in the skin, buttocks, breast, and padding around eyes and kidneys. It provides strength to tissues and can be distorted without damage. This tissue forms a layer that separates the skin from deeper structures.</td>
</tr>
<tr>
<td>Fibrous Connective Tissue</td>
<td><img src="https://www.google.com/url?sa=i&amp;rct=j&amp;q=&amp;esrc=s&amp;source=images&amp;cd=&amp;cad=rja&amp;docid=Ib61J5sK8aKc3M" alt="Fibrous Image" /></td>
<td>Found in any connective tissue proper. It provides resistance to forces applied from many directions and helps prevent distortion. Some of its functions are to stabilize positions of vertebrae and some can be located between skeletal muscles and skeleton (tendons and ligamentum nuchae), ligaments supporting penis, ligaments stabilizing positions of internal organs (ligaments), covering skeletal muscles, and in deep fasciae.</td>
</tr>
<tr>
<td>Irregular Connective Tissue</td>
<td><img src="https://www.google.com/url?sa=i&amp;rct=j&amp;q=&amp;esrc=s&amp;source=images&amp;cd=&amp;cad=rja&amp;docid=Ib61J5sK8aKc3M" alt="Irregular Image" /></td>
<td>Contains some elastic fibers and cannot be compressed without distortion. It can be found in meninges, blood vessels, and in the wall of the lungs. Its functions are to provide support and stability and can be distorted without damage.</td>
</tr>
<tr>
<td>Loose Connective Tissue</td>
<td><img src="https://www.google.com/url?sa=i&amp;rct=j&amp;q=&amp;esrc=s&amp;source=images&amp;cd=&amp;cad=rja&amp;docid=Ib61J5sK8aKc3M" alt="Loose Image" /></td>
<td>Contains few elastic fibers and cannot be compressed without distortion. It can be found in the wall of the lungs. Its functions are to provide support and stability and can be distorted without damage.</td>
</tr>
<tr>
<td>Regular Connective Tissue</td>
<td><img src="https://www.google.com/url?sa=i&amp;rct=j&amp;q=&amp;esrc=s&amp;source=images&amp;cd=&amp;cad=rja&amp;docid=Ib61J5sK8aKc3M" alt="Regular Image" /></td>
<td>Contains abundant elastic and collagen fibers. It is the main type of connective tissue proper and can be found in the wall of the lungs. Its functions are to provide support and stability and can be distorted without damage.</td>
</tr>
</tbody>
</table>

**Histology compendium The A Team**

Loukia Hadjiyianni  2410101
Jaime M. Cuahutle     84847
Grecia Sandoval   0307260
<table>
<thead>
<tr>
<th>Tissue Type</th>
<th>Tissue Class</th>
<th>Sub Type</th>
<th>Magnification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compact Bone</td>
<td>Supportive</td>
<td></td>
<td>200x - 350x</td>
</tr>
<tr>
<td>Spongy Bone</td>
<td>Supportive</td>
<td></td>
<td>100x - 500x</td>
</tr>
<tr>
<td>Elastic Cartilage</td>
<td>Connective Tissue</td>
<td></td>
<td>500x - 1000x</td>
</tr>
<tr>
<td>Fibrous Cartilage</td>
<td>Connective Tissue</td>
<td></td>
<td>200x - 500x</td>
</tr>
<tr>
<td>Hyaline Cartilage</td>
<td>Connective Tissue</td>
<td></td>
<td>50x - 150x</td>
</tr>
</tbody>
</table>

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Function of the compact bone is to cover the surface of bones. Within an osteon the osteocytes are arranged into parallel struts or thick, branching plates called trabeculae. Numerous interconnecting spaces are found in concentric layers around a central canal, which contains the blood vessels that supply the osteon.

Hyaline Cartilage Connective Tissue exists between tips of fractures, between pubic bones of pelvis, and forms part of nasal septum. It provides stiff but flexible support and reduces friction between bony surfaces. This tissue is made up of chondroblasts and its matrix is closely packed with collagen fibers.

Elastic Cartilage Connective Tissue can be found in the auditory tube, and forms part of nasal septum. It provides stiff but flexible support and reduces friction between bony surfaces. This tissue is made up of elastic fibers.

Fibrous Cartilage Connective Tissue acts like a cushion for the body part it is covering. It can be found in the nose, ear, and around ligaments and tendons. It provides support, but can distort under pressure.

Compact Bone exists within the skeletal system forming the walls of the bones and covered by the periosteum. The cylindrical osteon is the basic functional unit of mature bone.

Spongy Bone is found wherever bones are not stressed heavily or where stresses arrive from many directions. It is very flexible and provides support at points where the bone has to change from one path to another. It is made up of osteocytes, osteoblasts, fibrous connective tissue, and fibroblasts.

Elastic Cartilage Connective Tissue can be found in the auricle of external ear, epiglottis, auditory tube, and cuneiform bone. Within an osteon the osteocytes are arranged into parallel struts or thick, branching plates called trabeculae. Numerous interconnecting spaces are found in concentric layers around a central canal, which contains the blood vessels that supply the osteon.

Supportive Connective Tissue pads within knee joint, is found between pubic bones of pelvis, and forms the spines of vertebrae. It resists compression, prevents bone-to-bone contact, and limits relative movement. It is made up of osteocytes, osteoblasts, fibrous connective tissue, and fibroblasts.

Cartilage Matrices Diagram

http://www.gwc.maricopa.edu/class/bio201/Histology/HistoRev15

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http://www.mhhe.com/biosci/ap/histology_mh/ttyp

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http://cnx.org/content/m46049/latest/412_Types

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http://www.gwc.maricopa.edu/class/bio201/Histology/HistoRev16
Compact Bone exists within the skeletal system forming the walls of the bones and covered by the periosteum. The cylindrical osteon is the basic functional unit of mature compact bone. Within an osteon the osteocytes are arranged into parallel struts or thick, branching plates called trabeculae. Numerous interconnecting spaces are found between the trabeculae in spongy bone. Spongy bone is found wherever bones are not stressed heavily or where stresses arrive from many directions. It is made up of osteocytes that are surrounded by a lacunae and are connected by canaliculi. Osteocytes and their canaliculi are in contact with bone matrix on all sides, thereby being synthesizing and remodelling it. The cells edges are connected through gap junctions to neighbouring osteocytes. The osteocytes have a rather large and eccentric nucleus, and the cytoplasm is filled with organelles, such as mitochondria and rough endoplasmic reticulum. The osteocytes are embedded in an organic matrix containing collagen fibres. The matrix is closely packed with collagen fibers. The osteocytes secrete proteins that enable the mineralization of the extracellular matrix, which transforms it into bone. The bone tissue is organized into microscopic units called osteons. Each osteon consists of a central canal and concentric lamellae. The central canal is lined with osteoblasts that produce the bone matrix. The lacunae in osteons contain osteocytes, which are bone-forming cells. Osteocytes are connected to each other through canaliculi, which allow nutrients to flow from the blood vessels to the bone matrix. Therefore, bone is a living tissue and can respond to mechanical stresses by increasing or decreasing its density. The osteocyte regulates the resorption and formation of bone by secreting osteoclast-stimulating factors and osteoblast-stimulating factors. The osteocytes also act as mechanosensors, signaling the need for bone formation in response to mechanical forces. Osteocytes can respond to mechanical stress by regulating the expression of genes involved in bone turnover. This allows for adaptation of bone to changes in mechanical loading, such as in response to changes in physical activity or in response to injury. Spongiosa is the cancellous bone found in the interior of bones. It is composed of trabeculae of bone arranged in a haphazard manner. Spongiosa provides a reservoir for bone cell storage. Osteoclasts and osteoblasts are present in spongiosa. Osteoclasts are responsible for bone resorption, while osteoblasts are responsible for bone formation. Osteocytes in spongiosa are also involved in bone turnover. They can respond to mechanical stress by regulating the expression of genes involved in bone turnover. This allows for adaptation of bone to changes in mechanical loading, such as in response to changes in physical activity or in response to injury. The bone tissue is organized into microscopic units called osteons. Each osteon consists of a central canal and concentric lamellae. The central canal is lined with osteoblasts that produce the bone matrix. The lacunae in osteons contain osteocytes, which are bone-forming cells. Osteocytes are connected to each other through canaliculi, which allow nutrients to flow from the blood vessels to the bone matrix. Therefore, bone is a living tissue and can respond to mechanical stresses by increasing or decreasing its density. The osteocyte regulates the resorption and formation of bone by secreting osteoclast-stimulating factors and osteoblast-stimulating factors. The osteocytes also act as mechanosensors, signaling the need for bone formation in response to mechanical forces. The osteocytes can respond to mechanical stress by regulating the expression of genes involved in bone turnover. This allows for adaptation of bone to changes in mechanical loading, such as in response to changes in physical activity or in response to injury.
Lymphocytes

- **Description**: Lymphocytes are responsible for specific immunity: the ability of the body to respond to specific antigens. Lymphocytes are responsible for producing antibodies and for the cellular immunity that helps to destroy foreign substances, such as bacteria and viruses, in the body. They are the most numerous type of white blood cell in the blood, constituting 20 to 30 percent of the white blood cell population. They are also involved in the immune response to foreign antigens, releasing antibodies that help to destroy and neutralize pathogens.

- **Shape**: B cells attack foreign cells or proteins in distant portions of the body. These cells are typically found in lymphoid tissues such as lymph nodes, spleen, and bone marrow.

- **Function**: Lymphocytes respond to such threats on an individual basis. Some lymphocytes are activated by specific antigens and become memory cells, which can recognize and attack the same antigen in the future.

- **Immune Function**: They are responsible for maintaining immune surveillance, the destruction of abnormal cells such as virus-infected cells or cancer cells, and the production of antibodies that help to neutralize pathogens.

- **Types**: There are two main types of lymphocytes: B cells and T cells.

- **B cells**: Produce antibodies in response to specific antigens.

- **T cells**: Include both helper T cells and cytotoxic T cells.

- **Helper T cells**: Help B cells mature and produce antibodies.

- **Cytotoxic T cells**: Directly attack and destroy infected or abnormal cells.

- **NK cells**: Maintain immune surveillance, the destruction of abnormal cells, and the production of cytokines that stimulate other immune cells.

- **Granulocytes**:

  - **Neutrophils**: From 50 to 70 percent of the circulating white blood cells. They are the body's first responders to an infection, rapidly migrating to the site of injury to engulf and destroy bacteria.

  - **Eosinophils**: Represent 2-4 percent of the circulating white blood cells. They are involved in allergic reactions and parasitic responses.

  - **Basophils**: So named because they have numerous granules that contain histamine and heparin.

- **Monocytes**: Are large phagocytic cells that circulate in the bloodstream and differentiate into tissue macrophages, which are involved in the immune response and tissue repair.

- **Phagocytosis**: The process by which immune cells engulf and destroy foreign substances, such as bacteria or cellular debris. This process is crucial for the body's defense against infections and the clearance of damaged cells.

- **Enzymes**: Enzymes are released during phagocytosis to break down and digest the engulfed material.

- **Immunoglobulins**: Antibodies that help to neutralize pathogens and mark them for destruction by other immune cells.

- **Cold Staining**: Staining that occurs when the specimen is cooled to temperatures below the melting point of the antigen-antibody complex, allowing the preparation to be fixed and sectioned without losing the antigen.

- **Erythrocytes**: Red blood cells that transport oxygen throughout the body, accounting for less than 1 percent of the white blood cell population.
Erythrocytes

Sub Type

Cells

The A Team

Histology 131127 11/29/2013

Blood

Pathological 1

Tissues Classification

MAIN

Fluid

Eeosiniphil

in three ways. T cells attack foreign cells directly in peripheral tissues.

very active phagocytes, specializing in attacking and digesting

the blood stream. Each red blood cell is a biconcave disc that

proteins on an individual basis. Lymphocytes respond to such threats

that may be condensed into a series of lobes. These cells are

a compound that prevents blood from clotting. Basophils also release

Eosinophils represent 2-4 percent of the circulating white blood cells.

granules contain histamine, which dilates blood vessels, and heparin,

surface area for a cell its size. The large surface area permits

body to mount a counterattack against invading pathogens or foreign

B cells attack foreign cells or proteins in distant portions of the body.

Neutrophils have a very dense, contorted nucleus

bacteria. After actively engulfing debris or pathogens, a

Lymphocytes account for 20 to 30 percent of the white blood cell

Neutrophils are from 50 to 70 percent of the circulating white

increase dramatically during an allergic reaction or a parasitic

Erithrocytes transport both oxygen and carbon dioxide within

Differences between Normal and Pathological

IV disease. Note a lack of small lymphocytes and

Classical Hodgkin lymphoma of the lymphocyte-

rd has basophilic granules in the cytoplasm and

The cells of picture one are contaminated with

Antrax (bacteria) second image is of extra iron.

And the third is of a sickle cell anemia.
Lymph

Anatomy and Physiology 6th ed

Ross Histology Atlas and Text 6th Ed

x640 Lymph with Reticular Fibers

Platelet Electron Micrograph

Ross Histology Text and Atlas 6th Ed

x270 Liver

x350

x1500 Intracellular Plasma cell

http://pathology.jhu.edu/Cytopath_tut/Considerati

Sub Type

With attached chains of S. pyogenes

http://njms2.njms.rutgers.edu/gpthnweb/bocarsly_

Imaging Technology or Magnification 5

Sub Type

Ross Histology Atlas and Text 6th Ed

Digramatic View

Dan McEntire Hematology Course

x2150 Human blood smear

x500

x4400 Neutrophils (N), Plts (P), Macrophages

x200 Polymorphoud lymphocyte population

Clinical Hematology Atlas 5th Ed

Human blood smear

Diagramatic view

Ross Histology Text and Atlas 6th Ed

Label

Picture / Illustration Tissue or Source 3

x1000 with red blood cells

Picture / Illustration Tissue or Source 6

The A Team Histology 131127 11/29/2013

x1000 1000x Blood smear

http://www.napavalley.edu/people/dclemens/Doc

uments/Forms/AllItems.aspx?RootFolder=http://w

Histology compendium The A Team

http://media.pearsoncmg.com/bc/bc_pal/pal3/ind

ex.html

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uments/Histology%20Slides/02_Blood_100X.jpg

http://missinglink.ucsf.edu/lm/ids_101_histo_reso

uments/Histology%20Slides/13_Monocyte_400X

http://pathology.jhu.edu/Cytopath_tut/Considerati

Source/blood_cells.htm

http://www.pennmedicine.org/health_info/bloodle

ss/000206.html

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### Lymph

Lymph is the fluid connective tissue transported and returned to the blood. Lymph vessels and the cells suspended within the liquid are known as lymphocytes. Lymph consists of interstitial fluid, which resembles blood plasma, but with a lower concentration of proteins; lymphocytes, cells and tissues of the circulatory network. The process of phagocytosis involves the removal of pathogens and cellular debris. The phagocytic cells (dust cells) or macrophages (Mph) are responsible for the immune response; and macrophages of the lymphoid system. The vessels that carry lymph are called lymphatic vessels, and the cells suspended within the lymph are called lymphocytes. Lymph consists of interstitial fluid, which resembles blood plasma, but with a lower concentration of proteins; lymphocytes, cells and tissues of the circulatory network. The process of phagocytosis involves the removal of pathogens and cellular debris. The phagocytic cells (dust cells) or macrophages (Mph) are responsible for the immune response; and macrophages of the lymphoid system. The vessels that carry lymph are called lymphatic vessels, and the cells suspended within the lymph are called lymphocytes.

### Plasma

Plasma accounts for about 55 percent of the volume of blood; the walls of damaged blood vessels, and active contraction after clot formation has occurred. Platelets are flattened, membrane-enclosed packets. They are seen within the connective tissue spaces. Fibrinogen molecules are responsible for the immune response; and macrophages of the lymphoid system. The vessels that carry lymph are called lymphatic vessels, and the cells suspended within the lymph are called lymphocytes.

### Platelets

Platelets are flattened, membrane-enclosed packets. They are seen within the connective tissue spaces. Fibrinogen molecules are responsible for the immune response; and macrophages of the lymphoid system. The vessels that carry lymph are called lymphatic vessels, and the cells suspended within the lymph are called lymphocytes.

### Albumins

Albumins constitute about 60 percent of plasma proteins. Globulins constitute roughly 35 percent of plasma proteins. Globulins constitute roughly 92 percent of plasma proteins. Albumins constitute about 60 percent of plasma proteins. Globulins constitute roughly 35 percent of plasma proteins. Globulins constitute roughly 92 percent of plasma proteins.

### Globulins

Globulins constitute about 35 percent of plasma proteins. Globulins constitute roughly 35 percent of plasma proteins. Globulins constitute roughly 92 percent of plasma proteins. Albumins constitute about 60 percent of plasma proteins. Globulins constitute roughly 35 percent of plasma proteins. Globulins constitute roughly 92 percent of plasma proteins.

### Fibrinogen

Fibrinogen molecules are responsible for the immune response; and macrophages of the lymphoid system. The vessels that carry lymph are called lymphatic vessels, and the cells suspended within the lymph are called lymphocytes. Lymph consists of interstitial fluid, which resembles blood plasma, but with a lower concentration of proteins; lymphocytes, cells and tissues of the circulatory network. The process of phagocytosis involves the removal of pathogens and cellular debris. The phagocytic cells (dust cells) or macrophages (Mph) are responsible for the immune response; and macrophages of the lymphoid system. The vessels that carry lymph are called lymphatic vessels, and the cells suspended within the lymph are called lymphocytes.

### Monocytes

Monocytes account for 2-8 percent of the white blood cell population. Outside the blood stream, monocytes are called free macrophages. Free macrophages are highly mobile, phagocytic cells. They usually arrive at the injury site shortly after the injury. Monocytes account for 2-8 percent of the white blood cell population. Outside the blood stream, monocytes are called free macrophages. Free macrophages are highly mobile, phagocytic cells. They usually arrive at the injury site shortly after the injury.

### Macrophages

Macrophages participate in the immune response. The process of phagocytosis involves the removal of pathogens and cellular debris. The phagocytic cells (dust cells) or macrophages (Mph) are responsible for the immune response; and macrophages of the lymphoid system. The vessels that carry lymph are called lymphatic vessels, and the cells suspended within the lymph are called lymphocytes. Lymph consists of interstitial fluid, which resembles blood plasma, but with a lower concentration of proteins; lymphocytes, cells and tissues of the circulatory network. The process of phagocytosis involves the removal of pathogens and cellular debris. The phagocytic cells (dust cells) or macrophages (Mph) are responsible for the immune response; and macrophages of the lymphoid system. The vessels that carry lymph are called lymphatic vessels, and the cells suspended within the lymph are called lymphocytes.
**Cardiac Muscle**

Cardiac muscle tissue is found only in the heart. A typical cardiac muscle cell is smaller than a skeletal muscle fiber, and has one centrally placed nucleus. Cardiac muscle cells do not rely on neural activity to start a contraction. Instead, specialized cardiac muscle cells form intercalated disks in order to be connected between them. Cardiac muscle cells do not divide, but they can regenerate after injury. This muscle is nonstriated involuntary muscle.

**Muscle Cells**

- **Skeletal Muscle**: Tissue can be found in combination with the central nervous system and peripheral nervous system. Myelination differs; myelinated axons in both the central and peripheral nervous system have myelin sheaths which help isolate the neuron from stimuli other than those provided at synapses.
- **Smooth Muscle**: Found at the base of hair follicles; in the walls of blood vessels; around hollow organs containing a single, centrally located, oval nucleus. Smooth muscle cells can divide, and smooth muscle can regenerate after injury.

**Neuroglia**

- **Satellite cells** regulate the exchange of nutrients and waste products between the neuron cell body and the extracellular space. The cell body, or soma, has a single, centrally placed nucleus. Neurons are responsible for the transfer and processing of neurotransmitter levels around neurons in ganglia.
- **Dendrites** are highly branched processes that carry electrical impulses away from the cell body to the synaptic knobs that release neurotransmitters.
- **Axons** are long thin processes that carry electrical impulses from the cell body to the synaptic knobs where they release neurotransmitters.
- **Peripheral nerves**: Schwann cells cover every peripheral axon, whether it is myelinated or unmyelinated. Although the Schwann cells do not have myelin, they also help isolate the neuron from stimuli other than those provided at synapses. These cells surround the neuron and form a sheath.
Neurons are the primary building blocks of the nervous system. They are responsible for the transfer and processing of information throughout the body. A representative neuron has a cell body, or soma, which contains the nucleus, as well as dendrites that receive input from other neurons. The cell body may also have axons that extend outwards to communicate with other neurons or muscles.

The process of myelination differs between the central nervous system and the peripheral nervous system. Myelinated axons in the central nervous system are enclosed by the processes of Schwann cells, which help to isolate the neuron from stimuli other than those provided at synapses. These cells surround the neuron and have a myelin sheath that facilitates the rapid transmission of electrical signals. In contrast, smooth muscle cells can regenerate after injury, while cardiac muscle cells do not rely on neural activity to start a contraction. Instead, specialized cardiac muscle cells form intercalated disks in order to be connected between cardiac muscle cells.

Skeletal Muscle cells are long, cylindrical, striated, and multinucleate. The Skeletal Muscle fibers contain actin and myosin filaments arranged in parallel within organized functional groups. The myosin filaments form cross-bridges with the actin filaments, which results in muscle contraction. Cardiac muscle cells also contain actin and myosin filaments, but they are arranged in a different pattern. Cardiac muscle cells do not form cross-bridges with each other, and they do not have a myelin sheath.

Neurons are not limited to the central nervous system. They are also found in the peripheral nervous system, where they are responsible for sensory input and motor output. Neurons in the peripheral nervous system can be found in sensory ganglia, which are clusters of neurons that receive input from sensory receptors. These neurons are responsible for the sensation of touch, pain, temperature, and pressure. Neurons in the peripheral nervous system also form synapses with muscles and glands, which allows the body to respond to sensory input.

Neurons are not just passive conduits for information. They also play an active role in the maintenance of the nervous system. Satellite cells, for example, regulate the exchange of nutrients and waste products between the neuron and its environment. They also help to maintain the integrity of the myelin sheath, which is essential for the proper functioning of the neuron.

Difficult-to-study diseases such as Alzheimer's, schizophrenia, and autism now can be probed in a rat model of Parkinson's disease. The 3rd stage of the virus, the viruses are rarely located in infections from viruses like herpes simplex, which can exist in a dormant state within the ganglia for decades after the primary infection. When the cellular protein distrophin.

The first image is of a TH-positive dopaminergic neuron in a rat model of Parkinson's disease. The second image shows a characteristic of type V on image two, shows a characteristic of McArdle syndrome, glycogen storage disease type V. The second image shows a characteristic of McArdle syndrome, glycogen storage disease type V.
Oligodendrocytes on nerve axons

Microglia elongated nuclei

Diagramatic Protoplasmic Astrocyte

Diagramatic Ciliated ependymal lining ventricles

Astrocytes have a variety of functions, but many are poorly understood. They control the interstitial environment; maintain the composition of cerebrospinal fluid. Ciliated ependymal cells have slender processes that branch extensively and perform this function. They are responsible for the secretion of cerebrospinal fluid.

Glial cells in the central nervous system include astrocytes, oligodendrocytes, and microglia. Oligodendrocytes are a type of glial cell that is responsible for the production and maintenance of myelin sheaths around nerve fibers. They are located in the central nervous system and play an important role in neuronal function. Oligodendrocytes are essential for the proper functioning of the central nervous system and can be affected by various diseases. The study of oligodendrocytes is critical for understanding the pathogenesis of neurological disorders.
The A Team Histology 131127 11/29/2013

3 types

Central
dependent on the nervous cell type. The oligodendrocyte, for example, serves a very specific role: it is the major myelinating cell in the central nervous system. These cells make direct contact with glial cells in the surrounding neural tissue. They control the interstitial environment; maintain the blood-brain barrier; create a three-dimensional framework for the central nervous system; perform repairs in damaged neural tissue; and, guide neuron development.

Differences between Normal and Pathological Disease as in other genetic disorders of neuroblastoma, multiple sclerosis is the commonest human demyelinating disease, arising both in the course of autoimmune disease, arising both in the course of other neurological disorders. However, it is becoming increasingly evident that astrocytes are also important players in these same symptoms to Parkinson's and Alzheimer's disease. Because of microglia disorder on Huntington's, dysmyelination; multiple sclerosis, and acquired immune deficiency syndrome dementia complex by releasing proinflammatory cytokines, reactive oxygen intermediates, proteinases and complement potentially cytotoxic molecules such as lysozyme and lactoferrin. In addition, they release cytokines, factors which are known to stimulate astrocyte cell division, and thus may be responsible for the ever increasing number of astrocytes in pathological conditions and participate in initiation and progression of neurological disorders including cerebral dysgenesis in CHR.

Ependymal abnormalities may contribute to the pathogenesis of cerebral dysgenesis in CHR. Other studies have focused on neuronal abnormalities in these conditions, and have identified apoptosis, increased astroglial activity, increases in extracellular glutamate, and, in some circumstances, hippocampal atrophy. The role of microglia in these processes remains to be determined. The role of microglia in the pathogenesis of cerebral dysgenesis in CHR and other conditions remains to be determined. The role of microglia in the pathogenesis of cerebral dysgenesis in CHR and other conditions remains to be determined.
Epithelial

Columnar

Cuboidal

Non-Ciliated

Ciliated

Secretory epithelium. Cuboidal epithelial cells resemble little hexagonal boxes and each nucleus is near the center of the cell. The cells are connected by tight junctions. The cells receive nutrients from the capillary basal layer.

Simple Cuboidal Epithelial tissue provides limited protection and occurs in regions where secretion or absorption takes place. Cuboidal epithelium lines the stomach, intestinal tract, uterine tubes, and many excretory ducts.

Simple Columnar Epithelium provides some protection and may also be encountered in areas where absorption or discharge of secretions occurs. This type of epithelium lines the stomach, intestinal tract, uterine tubes, and many excretory ducts.

Simple Columnar Ciliated Epithelium consists of cells that are taller than they are wide. Their nuclei are found at the base of the cell. The cells are connected by tight junctions. The cells receive nutrients from the capillary basal layer.

Simple Columnar Ciliated Epithelium in small bronchioles of the respiratory tract and in the fallopian tubes. In the pancreas and salivary glands, simple cuboidal epithelia secrete enzymes and buffers and line the ducts that transport the ovum from the ovaries to the uterus.

Simple Squamous Epithelium provides a smooth lining. This type of epithelium lines blood vessels, the lining of the small airways in the lungs, the lining of the uterus, and the lining of the urinary bladder.

Simple Squamous Epithelium performs absorption and secretion. Epithelial cells are thin, flat, andsomewhat irregular in shape. In a sectional view the nucleus is round and is found near the center of the cell. The cells are not connected by tight junctions. The cells receive nutrients from the capillary basal layer.

Simple Squamous Epithelium performs absorption and secretion. This type of epithelium lines the small bronchioles of the respiratory tract, the lining of the ureters, and the lining of the urinary bladder.

Simple Squamous Epithelium performs absorption and secretion. This type of epithelium lines the small bronchioles of the respiratory tract and the lining of the ureters.

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Pathological 2
Simple
Sub Type

Pathological 3
Sub Type
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Tissues Classification
Epithelial
MAIN
Columnar
Cuboidal
Non Ciliated
Ciliated
Squamous

Notes / Description / Size /

Layer. Those found in the fallopian tubes prepare the unfertilized ovum for fertilization and also transport the ovum from the ovaries to the uterus. In the pancreas and salivary glands, simple cuboidal epithelium lines the ducts, which perform absorption and secretion. Cuboidal epithelial cells resemble little hexagonal boxes and each nucleus is near the center of the cell. Their nuclei are found at the base of the cell. The cells are somewhat irregular in shape. In a sectional view the nucleus occupies the thickest portion of each cell, and has a flattened shape. The cytoplasm is thin and contains many organelles. The 3rd image shows cancer cells. On image 2 we can see some abnormality and how the shapes of the sick cuboidal cell are different from a normal cell. Differences between Normal and Pathological Disorders on non ciliated epithelial tissue can lead to different disease and some cancer. There are many diseases and abnormalities involving the epithelium, ranging from physical injuries to ingested toxins and bacteria, ranging from the mouth and throat region down to the anal canal, which may in part be due to its ability to undergo rapid regrowth rates; the cells can produce rapidly and repair lesions. The range of the digestive system, it is highly exposed to accidents (such as burns), to cancer, infection, skin (skin cancer), but even that we have many allergies, hypersensitivity and specific auto-immune disorders on non ciliated epithelial tissue can lead to different disease and some cancer. The 3rd image shows cancer cells. On image 2 we can see some abnormality and how the shapes of the sick cuboidal cell are different from a normal cell. Differences between Normal and Pathological Disorders on non ciliated epithelial tissue can lead to different disease and some cancer. There are many diseases and abnormalities involving the epithelium, ranging from physical injuries to ingested toxins and bacteria, ranging from the mouth and throat region down to the anal canal, which may in part be due to its ability to undergo rapid regrowth rates; the cells can produce rapidly and repair lesions. The range of the digestive system, it is highly exposed to accidents (such as burns), to cancer, infection, skin (skin cancer), but even that we have many allergies, hypersensitivity and specific auto-immune
Stratified epithelia line the respiratory tract, the reproductive tract, and portions of the gastrointestinal tract. These epithelia are composed of multiple layers of cells, and they provide protection along portions of these linings. The thickness of the epithelium and the number of layers of cells are variable and depend on the location of the tissue. The outermost layers are typically composed of nonkeratinized, stratified squamous epithelium, which is characterized by its resistance to abrasion and its ability to resist dehydration. This type of epithelium is found in the oral cavity, pharynx, esophagus, rectum, anus, and vagina. Because their nuclei are situated at varying distances from the surface, the epithelium appears to be layered or stratified. When multiple layers exist, only the superficial layer is keratinized, while the deeper layers remain nonkeratinized. This structure allows for flexibility and movement without damage to the component cells.

Transitional epithelium is a specialized type of stratified epithelium found in the urinary bladder, the male reproductive tract, and the female reproductive tract. This type of epithelium is capable of considerable distention without damage to the component cells. The epithelium is composed of multiple layers of squamous epithelial cells. Because their nuclei are situated at varying distances from the surface, the epithelium appears to be layered or stratified. When multiple layers exist, only the superficial layer is keratinized, while the deeper layers remain nonkeratinized. This structure allows for flexibility and movement without damage to the component cells.

Pseudostratified columnar epithelium is a specialized type of columnar epithelium found in the nasal cavity, the trachea, bronchi, and also portions of the male reproductive tract. This type of epithelium is characterized by its pseudostratification, which gives the appearance of being stratified. However, the cells are all columnar in shape, and they all have their nuclei in contact with the basal lamina. This type of epithelium provides protection along portions of these linings.
On exposed body surfaces, where mechanical stress and abrasion are expected, keratinized stratified squamous epithelia are often found. These epithelia are composed of multiple layers of squamous epithelial cells, with the outermost cells containing keratin. Due to the presence of keratin, the superficial layers are tough and resistant to abrasion, but will dry out and deteriorate unless kept moist. Nonkeratinized stratified squamous epithelia are found in the oral cavity, pharynx, esophagus, rectum, anus, and vagina. Because all of the cells rest on the basal lamina, this type of epithelium is a simple epithelium. The exposed epithelial cells are packed with filaments of the protein keratin. As a result, the superficial layers are both tough and water resistant, and the epithelium is described as a resistant epithelium.

Stratified columnar epithelia provide protection along portions of airways and example tranchea and the main passages dependent on the intranasal regional system. The symptoms that they have and diseases that develop in them depend on the injury or the inhaled. The symptoms of the cuboidal tissue can be seen on people who smoke. In harmful conditions can afflict the tissue include cancer, dysplagia, trauma and inflammation. There are many diseases on the epithelium tissue. Inflammatory trauma causes squamous metaplasia which is cause defects in the glycosaminoglycan and cause infection, trauma and inflammation a lot. Toxican induced epithelial lesion in the cuboidal tissue. Toxican induced epithelial lesion in the cuboidal tissue.

Non-keratinized in females common in trigone cysts and tumors are distinct but common on jaw bone.

Differences between Normal and Pathological 1 and 2 and 3.

Pathological 1:
- Squamous
- Inflammatory trauma causes squamous metaplasia good exam[ple can be seen on people who smoke.
- Trauma and inflammation at the injury site cause squamous metaplasia.
- There are many diseases on the epithelium tissue. Inflammatory trauma causes squamous metaplasia which is cause defects in the glycosaminoglycan and cause infection, trauma and inflammation.

Pathological 2:
- Cuboidal/Pseudostratified
- Injuries may cause alteration of the glycosaminoglycan.
- Fibrosis and artifacts can lead to inflammation and infection.
- Different exposion to toxing or hereditary genes can cause epithelial lesion.

Pathological 3:
- Cuboidal/Pseudostratified
- Injuries may cause alteration of the glycosaminoglycan.
- Fibrosis and artifacts can lead to inflammation and infection.
- Different exposion to toxing or hereditary genes can cause epithelial lesion.
Histology compendium The A Team
<table>
<thead>
<tr>
<th>Sub Type</th>
<th>Female</th>
<th>Male</th>
<th>Other / Breast</th>
<th>Other Structures / Cells</th>
<th>Follicles / Gametes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ovary</td>
<td></td>
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The glandular tissue of the breast consists of a number of separate lobes, which converge, giving rise to a single lactiferous duct in each lobe. Near the nipple, that lactiferous duct expands, forming an expanded chamber called the lactiferous sinus. Dense connective tissue surrounds the duct system and nipple.

In a primary follicle, the folicular cells enlarge and undergo metaplasia to squamous epithelium, the developing oocyte and the innermost follicular cells. The follicular fluid accumulates in small pockets that gradually converge, giving rise to a single lactiferous duct in each lobe. Near the nipple, that lactiferous duct expands, forming an expanded chamber called the lactiferous sinus. Dense connective tissue surrounds the duct system and nipple.

Primary single association: The histological examination of the tissues obtained through a biopsy was done during routing check out. On image 1 and 2 we are looking at different magnification and at 2 different stages. They dont have symptoms in the early stages but they differentiate into male and female gametes.

The endometrial thickness. The basilar layer attaches the endometrium to the myometrium and contains the terminal branches of the tubular glands. The basilar layer is subjacent to the surface of the ovary. The oocyte projects into the expanded central chamber, or autrum, surrounded by a mass of the principal progestin is progesterone. Although moderate progesterone is the principal hormone of the preparation of the uterus for pregnancy. At the time of estrus, the developing oocyte and the innermost follicular cells. The follicular fluid accumulates in small pockets that gradually converge, giving rise to a single lactiferous duct in each lobe. Near the nipple, that lactiferous duct expands, forming an expanded chamber called the lactiferous sinus. Dense connective tissue surrounds the duct system and nipple.

Differences between Normal and Pathological...
<table>
<thead>
<tr>
<th>Male</th>
<th>Sub Type</th>
<th>Target</th>
<th>Imaging Technology or Magnification</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Ribbons of proximal convoluted tubules</td>
<td>400x - 550x Magnification</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Testis, near seminiferous tubules</td>
<td>400x - 550x Magnification</td>
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<tr>
<td></td>
<td></td>
<td>Prostate gland with tubuloalveolar glands</td>
<td>400x - 550x Magnification</td>
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<tr>
<td></td>
<td></td>
<td>Human ductus epididymis</td>
<td>400x - 550x Magnification</td>
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<tr>
<td></td>
<td></td>
<td>Monkey testis, primary spermatocytes</td>
<td>400x - 550x Magnification</td>
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<tr>
<td></td>
<td></td>
<td>Human urinary bladder</td>
<td>400x - 550x Magnification</td>
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<tr>
<td></td>
<td></td>
<td>Monkey testis, SG</td>
<td>400x - 550x Magnification</td>
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<tr>
<td></td>
<td></td>
<td>Human urinary bladder</td>
<td>400x - 550x Magnification</td>
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<td></td>
<td></td>
<td>Monkey epididymis</td>
<td>400x - 550x Magnification</td>
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<td></td>
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<td>Infant Rhesus Monkey Type A spermatogonium</td>
<td>400x - 550x Magnification</td>
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<tr>
<td></td>
<td></td>
<td>Monkey testis, secondary spermatocytes</td>
<td>400x - 550x Magnification</td>
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<tr>
<td></td>
<td></td>
<td>Human testis</td>
<td>400x - 550x Magnification</td>
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<tr>
<td></td>
<td></td>
<td>Monkey testis, detail of secondary spermatocyte</td>
<td>400x - 550x Magnification</td>
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<td></td>
<td></td>
<td>Monkey testis</td>
<td>400x - 550x Magnification</td>
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<tr>
<td></td>
<td></td>
<td>Human testis</td>
<td>400x - 550x Magnification</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Newborn human testis germ cells</td>
<td>400x - 550x Magnification</td>
</tr>
</tbody>
</table>

Within those spaces are numerous blood vessels and large interstitial cell clusters. The wall of the bladder contains a mucosa of transitional epithelium, which lines the bladder and has columnar cells that are pseudostratified. The basement membrane of the bladder is surrounded and wrapped in a thick blanket of smooth muscle, called the muscularis layer. The muscularis layer consists of three layers: inner and outer longitudinal smooth muscle layers, with a layer of circular muscle in between. Collectively, these layers form the detrusor muscle of the urinary bladder. Contraction of this muscle compresses the urinary bladder and expels its contents. The superior surface of the urinary bladder is covered by the serosa, a double-layered membrane that protects the bladder and contains nerves and blood vessels. The muscularis layer of the bladder is made up of three layers of smooth muscle fibers that contract simultaneously to expel urine. The detrusor muscle layer is primarily responsible for the contraction of the bladder. Contraction occurs when a signal is transmitted from the sensory nerves, which leads to the release of acetylcholine at the muscle cells, causing them to contract and expel urine.
Pathological 1

Sub Type

Immature

Germ Cells

Mature

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Roughly 800 slender, tightly semiferous tubules are distributed throughout the testes, with a radius of 0.1-0.5 mm. These tubules are composed of a single layer of columnar epithelial cells that produce sperm. The epithelial lining typically varies from a simple to a pseudostratified columnar epithelium. The epithelial cells are attached to the basal lamina at the tubular capsule and extend toward the lumen of the tubule.

The lumen of the epididymis is lined by a distinctive pseudostratified columnar epithelium. The epithelial lining of the ductus deferens is also pseudostratified columnar, but it lacks the characteristic elongated epithelial cells of the epididymis. The ductus deferens is a muscular tube that transports sperm from the epididymis to the vas deferens.

The testes produce sperm, while the epididymis and ductus deferens store and transport sperm. The epididymis is a coiled, tubular structure that stores sperm for up to 3-8 months before ejaculation. The ductus deferens transports sperm from the epididymis to the vas deferens, where sperm are mixed with semen from the seminal vesicles and prostate gland.

Each spermatid matures into a single spermatozoon by a maturation process called spermiogenesis. During spermiogenesis, spermatids are elongated and develop a head, midpiece, and tail.

Beginning at sexual maturation, spermatogonia divide throughout the individual's reproductive years. As each division occurs, one of the daughter cells remains in the outer layer of the seminiferous tubule, as an undifferentiated stem cell, while the other cell is pushed toward the lumen.

In the testes, the later cell differentiates into a primary spermatocyte. In the testes, the spermatogonia divide throughout the individual's reproductive years. As each division occurs, one of the daughter cells remains in the outer layer of the seminiferous tubule, as an undifferentiated stem cell, while the other cell is pushed toward the lumen.

The first step in meiosis is the division of a primary spermatocyte to produce a daughter cell. In the later stages of meiosis, the spermatocytes undergo further division and differentiation, resulting in the production of sperm. The spermatocytes then differentiate into spermatids, which eventually become sperm.

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The spermatocytes undergo meiosis, resulting in the production of sperm. Meiosis is a complex process that involves the division of the nucleus and the cytoplasm of the spermatocytes. The spermatocytes then differentiate into spermatids, which eventually become sperm.

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