

*Done by: Musab Hussein*

# *Cartilage+Bone Tissues*

*which of the given options is true about articular cartilage*

*a) None of the mentioned.*

*b) Is devoid of periosteum.*

*c) All of the mentioned.*

*d) Exhibits a high regenerative capacity.*

*e) Is a fibrocartilage.*

*Answer: B (+)*



*Elastic cartilage is present in:*

*a) External ear.*

*b) External acoustic meatus.*

*c) Costal cartilages.*

*d) There is more than one correct answer.*

*e) Epiglottis.*

*Answer: D >> ear + epiglottis*

*Regarding fibers in cartilage, choose the INCORRECT statement:*

*a) All of the mentioned.*

*b) None of the mentioned.*

*c) Collagen fibers stain well with H&E stain.*

*d) Collagen type I is abundant in fibrocartilage.*

*e) Collagen type II is abundant in hyaline cartilage.*

*Answer: B*

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*b) None of the mentioned.*

*c) Collagen fibers stain well with H&E stain.*

*d) Collagen type I is abundant in fibrocartilage.*

*e) Collagen type II is abundant in hyaline cartilage.*

*Answer:E*



*How does articular cartilage differ from most other hyaline cartilage?*

- a. It undergoes mainly appositional growth.*
- b. It contains isogenous groups of chondrocytes.*
- c. It lacks a perichondrium.*
- d. Its matrix contains aggrecan.*
- e. It is derived from embryonic mesenchyme.*

*Answer:C*

*We can find hyaline cartilage in all of the following except?*

*A)nose*

*B)costal cartilage*

*C)ear*

*D)larynx*

*Answer:C*



*Cartilage have a low metabolic activity why?*

*A)tough and compressible*

*B)Avascular*

*C)because is contains collagen*

*D)Rich in ECM*

*Answer:B*

*What is the most abundant proteoglycan in hyaline cartilage?*

*a) Aggecan*

*b) chondronectin*

*c) glycoproteins*

*D) proteoglycan*

*Answer: A*

*What is common condition causes Osteoarthritis ?*

*A)lifestyle*

*B)aging*

*C)over use the joint*

*D)genes*

*Answer:B*



*Which step occurs first in chondrogenesis?*

*a. Appositional growth*

*b. Conversion of chondroblasts to chondrocytes*

*c. Formation of mesenchymal condensations*

*d. Interstitial growth*

*e. Secretion of collagen-rich and proteoglycan-rich matrix*

*Answer:c*

*An osteon is*

*a. A cylinder of bone tissue surrounding a central canal*

*b. A porous bone composed of trabeculated bone tissue*

*c. Involved in the formation of outer circumferential lamellae*

*d. The basic structural unit of spongy bone*

*e. Composed of woven bone*

*Answer: a*

*2. Hydroxyapatite crystals are made mainly from the combination of ?*

*a) Collagen type 1 fibers and carbon molecules*

*b) Calcium, phosphate and collagen type 1 fibers*

*c) Calcium and phosphate*

*d) Chondroitin sulfate and inorganic salts*

*e) Glycoproteins and vitamin D*

*Answer :c*



*Osteocytes maintain contact with the blood vessels of the central canal through:*

- a) Concentric lamellae*
- b) Interstitial lamellae*
- c) Canaliculi*
- d) Perforating fibers*
- e) Periosteum*

*Answer:C*

*All of the following statements about bone cells are correct EXCEPT:*

*a) Osteoblasts produce type I collagen*

*b) Osteocytes are often grouped in nests inside lacunae as a result of earlier mitoses*

*c) Osteoblasts are mononucleate cells*

*d) Osteoclasts form the ruffled border that opposes the surface of the bone tissue*

*e) Some osteoblasts turn into osteocytes while the new bone is being formed*

*Answer:b*

*Which of the following cells is located in Howship's lacuna?*

- a) Chondroblast*
- b) Osteogenic cell*
- c) Osteoblast*
- d) Osteocyte*
- e) Osteoclast*

*Answer: E*



*Formation and growth of long bones, choose the WRONG statement:*

- a) Hyaline cartilage remains on the articular surfaces and persists through adult life*
- b) The first site of ossification in long bones occurs in the middle of diaphyseal*
- c) Growth in diameter is due to osteoblastic activity in periosteum and osteoclastic activity in endosteum*
- d) Bone collar facilitates the diffusion of oxygen and nutrients to the underlying cartilage*
- e) The cartilage between the primary and secondary ossification centers is called the epiphyseal plate*

*Answer:D*

*Regarding Endosteum, choose the WRONG statement:*

- a) Covers trabeculae of spongy bone*
- b) Is composed of a single layer of cells*
- c) Is attached to bone trabeculae by Sharpey's fibers*
- d) Is involved in bone growth in width*
- e) Lines the internal cavity of the bone*

*Answer:C*

*The CT framework used for the formation of bones by intramembranous ossification*

*a. cartilage*

*b. collagen fibers*

*c. calcified cartilage matrix*

*d. a and c can be correct*

*Answer :B*



*Which of the following events occurs firstly during Endochondral bone formation?*

- a. Appearance of primary bone at the epiphyseal ends.*
- b. Invasion by a vascular bud into the forming large cavity.*
- c. Formation of a bony collar around the diaphysis.*
- d. Calcification of the cartilage matrix.*

*Answer: C*

*.All the followings can be found in the ossification zone EXCEPT:*

- a) Chondrocyte within lacunae*
- b) Osteocyte within lacunae*
- c) Primary bone*
- d) Calcified matrix of the cartilage*
- e) Osteoblasts*

*Answer:A*

*Several layers of cells reside within epiphyseal plates of developing long bones. Which statement best describes the ossification zone?*

*a) Cells enlarging and causing the cartilaginous matrix to become calcified*

*b) Resting cells*

*c) Cells undergoing mitosis and forming long columns of*

*isogenous groups*

*d) None of the mentioned*

*e) Osteoblasts adhering to the remnants of calcified cartilage*

*matrix and producing woven bone*

*Answer:e*



*Which of the following are found in compact bone and cancellous bone?*

*a) Lacunae*

*b) Circumferential lamellae c) Haversian canals*

*d) Trabeculae*

*e) Volkmann's canals*

*Answer:A*

*All of the followings apply to both endochondral ossification and intramembranous ossification EXCEPT:*

- a) They start prenatally*
- b) The type of collagen synthesized*
- c) The bone matrix is formed by osteoblasts*
- d) The formation of bone collar*
- e) The first bone produced is immature bone*

*Answer:D*

*Woven bone, choose the WRONG statement:*

- a) Its collagen fibers are not organized into lamellae*
- b) It has a lower mineral content compared to secondary bone*
- c) It is the first bone tissue to appear in embryonic development*
- d) It is not degraded by osteoclasts*
- e) It is formed during repair of fracture sites*

*Answer:D*



*Intramembranous ossification, choose the WRONG statement:*

- a. Involves several points of ossification*
- b. Fontanelles are areas of the newborn's skull in which the cartilage is not yet ossified*
- c. Takes place in mesenchymal condensations*
- d. Forms the flat bones of the skull*
- e. Contributes to the growth of short bones and thickening of long bones.*

*Answer:B*

*Which of the following joints are classified as symphyses?*

*a) Saddle joints*

*b) Interosseous membranes c) Sutures*

*d) Intervertebral discs*

*e) Growth plates*

*Answer: D*

*34. Perichondrium is a?*

*a) Loose connective which contains fibroblasts, chondrogenic cells, and other elements.*

*b) Reticular connective which contains fibroblasts, chondrogenic cells, and other elements. c) Dense connective which contains fibroblasts, chondrocytes, and other elements.*

*d) Loose connective which contains chondrocytes, chondrogenic cells, and other elements.*

*e) Dense connective which contains fibroblasts, chondrogenic cells, and other elements.*

*Answer:e*



*Formation and growth of long bones, choose the WRONG statement:*

- a) Hyaline cartilage remains on the articular surfaces and persists through adult life*
- b) The first site of ossification in long bones occurs in the middle of diaphysis*
- c) Growth in diameter is due to osteoblastic activity in periosteum and osteoclastic activity in endosteum*
- d) Bone collar facilitates the diffusion of oxygen and nutrients to the underlying cartilage*
- e) The cartilage between the primary and secondary ossification centers is called the epiphyseal plate*

*Answer:D*

*. In epiphyseal plate growth, what happens when the zone of ossification overtakes the zone of resting cartilage?*

*a) All of the mentioned*

*b) The hyaline cartilage of the plate is replaced by bone*

*c) Longitudinal growth of the bone terminates (at least at one end)*

*d) The epiphyseal plate becomes the epiphyseal line*

*e) The diaphysis and epiphysis portions of the bone fuse together to form a single adult bone*

*Answer:A*

*Muscle tissue*



*White fibers, choose the CORRECT statement:*

- a) Are smaller in diameter compared to red fibers*
- b) Their oxidative capacity is high*
- c) Can be differentiated from red fibers using H & E*
- d) Their glycolytic capacity is high*
- e) Their ATPase activity is low*

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*Which characteristic is unique to skeletal muscle cells compared to cardiac and smooth muscle cells?*

- a) Often branched*
- b) Multinucleated*
- c) Contain centrally located nuclei*
- d) Striated*
- e) Lack T-tubules*

*Answer: B*

*Characteristics of smooth muscle fibers are:*

*a) Spindle shaped, branched, unstriated, uninucleate and involuntary*

*b) Spindle shaped, unbranched, unstriated, multinucleate and involuntary*

*c) Spindle shaped, unbranched, unstriated, uninucleate and involuntary*

*d) Cylindrical, unbranched, unstriated, uninucleate and involuntary*

*e) Spindle shaped, branched, striated, uninucleate and involuntary*

*Answer: c*



*The triad in skeletal muscle, choose the WRONG statement:*

- a) Is visible by light microscopy*
- b) Is found at the site of A-I band junction*
- c) Includes two terminal cisternae of sarcoplasmic reticulum*
- d) Includes part of T tubule*
- e) Is involved in the process of initiating muscle contraction*

*Answer: a*

*In the I band of a sarcomere of voluntary muscle:*

*a) The Z line is found*

*b) There are only thick myofilaments*

*c) The M line is found*

*d) There are overlapping thin and thick myofilaments*

*e) There are no myofilaments*

*Answer:A*

*Sarcoplasmic reticulum, choose the WRONG statement:*

- a) Acts as a storage site for calcium ions*
- b) Is well developed in smooth muscle cells*
- c) Is associated with T-tubules in striated muscle cells*
- d) Is more extensive in skeletal muscle cells compared to cardiac*
- e) Is visible by electron microscopy*

*Answer:B*



*Diads are usually seen in:*

- a) Smooth muscles by electron microscope*
- b) Cardiac muscles by electron microscope*
- c) Cardiac muscles by light microscope*
- d) Skeletal muscles by light microscope*
- e) Skeletal muscles by electron microscope*

*Answer: B*

*In what way are cardiac muscles and skeletal muscles similar?*

*a) Both have myogenic activity*

*b) Both have tubular myofibrils*

*c) Both are controlled by somatic nervous system d)*

*Both are highly branched*

*e) Both are connected by gap junctions*

*Answer: B*

*Intercalated discs , choose the correct statement:*

*A)are characteristics of striated muscle cells*

*B )containing only two types of junctions*

*C)It can be easily visualized when observing a longitudinal section of cardiac muscle cells*

*D)producing cross striations of striated muscle*

*E)are found at every Z line*

*Answer:C*



*Thin filaments of human skeletal muscle, choose the CORRECT statement:*

*a) Are attached to Z line by titin*

*b) In a relaxed muscle, they completely overlap the myosin thick filaments*

*c) Are anisotropic*

*d) In a relaxed muscle, they present in the H zone of a sarcomere*

*e) Are pulled by the thick filaments toward the center of the*

*sarcomere during contraction*

*Answer:E*

*Muscle tissue, choose the WRONG statement:*

*a) Endomysium is a loose type of connective tissue*

*b) Muscle spindles are also called intrafusal muscle fibers*

*c) All muscle fibers of a motor unit are of the same type (red or white)*

*d) The area between two Z lines is known as a myofibril*

*e) Intracytoplasmatic dense bodies of smooth muscle cells*

*functionally correspond to the Z-lines of the other muscle types*

*Answer:D*

*Which of the following is present in all three types of muscle cells?*

*a) Myofilaments*

*b) Myofibrils*

*c) Troponin*

*d) Intracytoplasmic dense bodies*

*e) Caveolae*

*Answer:A*



*Cells of smooth muscles, choose the CORRECT statement:*

- a) Their sarcolemma contains caveolae*
- b) Have distinct sarcomeres*
- c) Lack gap junctions*
- d) Have no myofilaments*
- e) Lack intermediate filaments*

*Answer:A*

*Sarcoplasmic network, choose the correct phrase:*

*A) is associated with T tubules in all muscle types*

*B) is more extensive in cardiac muscle cells compared to skeletal*

*C) is rudimentary in smooth muscle cells*

*D) forms diads in skeletal muscle cells*

*E) None of the above*

*Answer: C*

*Which of the following is incorrect regarding the functions of muscles:*

*A) To produce a movement, muscle should at least cross two joints*

*B) Contraction of muscles, results in locomotion only*

*C) When we feel cold we shiver due to contraction of muscles*

*D) All of the above are incorrect except C*

*Answer:D*



*All of the following are correct according to skeletal muscle EXCEPT:*

- A) Their cells have obvious striations*
- B) They represent almost half of body weight*
- C) Their contraction is voluntary*
- D) It can be found in viscera*
- E) All of the above are correct*

*Answer : D*

*What type of muscle is mainly composed of spindle shaped cells?*

*A) Skeletal muscle*

*B) Cardiac muscle*

*C) Smooth muscle*

*D) Both "a" and "b"*

*Answer: C*

*The correct answer according to Intercalated junctional disks in cardiac muscle is:*

- A) fascia adherens forms belt like structure around the cardiac cell*
- B) Desmosomes are associated with actin filaments*
- C) Fascia adherens are associated with intermediate filaments*
- D) It contains 3 types of junctions*

*Answer:D*



*All of the following are correct regarding HYPERTROPHY except:*

*A) It is caused by increasing in number of myofibrils only*

*B) It is caused by increasing in size of myofibers*

*C) It is caused by increasing in size and number of myofibrils*

*D) All of the above are correct*

*Answer: A*

*The correct arrangement of muscle fibers resistance to fatigue is :*

*A) Red > White > Intermediate FIBERS*

*B) White > Intermediate > Red FIBERS*

*C) Red > Intermediate > White FIBERS*

*D) Intermediate > White > Red FIBERS*

*E) none of the above*

*Answer: C*

*All of the following are correct regarding to myosin filaments, except:*

- A) It has 2 heads and one tail*
- B) It has 2 binding sites in each head*
- C) It is anisotropic*
- D) All of the above are correct*
- E) none of the above is true*

*Answer: D*



*Which of the following is the lightest staining area in the sarcomere:*

*A) H band*

*B) A band*

*C) I band*

*D) A and C are correct*

*Answer: C*

*The sarcomere is composed of:*

*A) One A band, One I band, One T tubules*

*B) One A band, Two I band, Two T tubules*

*C) One A band, Two halves of I bands, Two T tubules*

*D) One A band, Two halves of I bands, We cannot determine the number of T tubules Because we don't know the type of muscle*

*Answer : D*

*Concerning Cardiac and Skeletal muscle, which statement is most accurate?*

*A) Cardiac Myofibril nuclei are eccentrically located whereas skeletal myofibers nuclei are centrally placed.*

*B) Skeletal muscle fibers exhibit more branching than cardiac muscle fibers*

*C) The striations of cardiac muscle cells are more distinct than that of skeletal muscles*

*D) Cardiac muscle contains structures known as intercalated discs while skeletal muscle does Not*

*Answer:D*



*66-year-old man who lives alone has a severe myocardial infarction and dies during the night. The medical examiner's office is called the following morning and describes the man's body as being in rigor mortis. This state of rigor mortis is due to which one of the following?*

- a. Inhibition of  $\text{Ca}^{2+}$  leakage from the extracellular fluid and sarcoplasmic reticulum*
- b. Enhanced retrieval of  $\text{Ca}^{2+}$  by the sarcoplasmic reticulum*
- c. Failure to disengage tropomyosin and troponin from the myosin active sites*
- d. Absence of ATP preventing detachment of the myosin heads from actin*
- e. Increased lactic acid production*

*Answer:D*

*A 5-year-old boy sustains a small tear in his gastrocnemius muscle when he is involved in a bicycle accident. Regeneration of the muscle will occur through which of the following mechanisms?*

- a. Dedifferentiation of muscle cells into myoblasts*
- b. Differentiation of muscle satellite cells*
- c. Fusion of damaged myofibers to form new myotubes*
- d. Hyperplasia of existing muscle fibers*
- e. Differentiation of fibroblasts to form myoblasts*

*Answer: B*

*Nerve tissue*



*Which the of the following cell types lines the central canal of the spinal cord and the ventricular system of the brain?*

- a) Microglia*
- b) Oligodendrocytes*
- c) Ependymal cells*
- d) Astrocytes*
- e) Schwann cells*

*Answer:C*

*Ganglia of nervous system, choose the CORRECT statement:*

*a) Cells of autonomic ganglia are pseudounipolar neurons*

*b) Autonomic ganglia are masses of neuronal cell bodies of postganglionic neurons*

*c) Cells of sensory ganglia are multipolar neurons*

*d) Sensory ganglia contain synapse*

*e) Autonomic ganglia do not contain synapse*

*Answer:B*

*Schwann cells are characterized by the followings*

*EXCEPT:*

- a) Each Schwann cell myelinates only one internodal segment of one axon*
- b) They are interrupted by nodes of Ranvier*
- c) They play a role in regeneration of axons in peripheral nervous system*
- d) They are similar in function to astrocytes of central nervous system*
- e) They support both myelinated and unmyelinated axons in the peripheral nervous system*

*Answer:D*



*Neuroglial cells, choose the WRONG statement:*

- a) Are smaller in size compared to neurons*
- b) Are not able to transmit nervous impulses*
- c) Are able to undergo mitosis*
- d) Are found in both peripheral and central nervous systems*
- e) Are less numerous compared to neurons*

*Answer:E*

*Which of the following is the correct layering of the connective sheaths of a peripheral nerve from the superficial to deep?*

- a) Endoneurium, perineurium, epineurium*
- b) Perineurium, epineurium, endoneurium*
- c) Epineurium, endoneurium, perineurium*
- d) Epineurium, perineurium, endoneurium*
- e) Epineurium, endoneurium, perineurium*

*Answer:D*

*The neuron conducting an impulse from the stomach wall to the central nervous system would be classified as a:*

- a) Somatovisceral*
- b) Visceral afferent*
- c) Visceral efferent*
- d) Somatic afferent*
- e) Somatic efferent*

*Answer: B*



*Nervous tissue, choose the CORRECT statement*

- a) Each neuron has as a rule one primary dendrite, and never more than one primary dendrite*
- b) Microtubule and neurofilaments are found in soma, dendrite, and axon*
- c) Nissl bodies provide the main cytoskeletal tracks for axonal transport*
- d) Bundle of axons within central nervous system is called nerve*
- e) Bipolar neurons do not have axons*

*Answer: B*

*The axon hillock is found at:*

*a) Schwann cells*

*b) The dendrites*

*c) The end of the axon*

*d) The origin of the axon*

*Answer:D*

*Small cells closely associated with neurons in peripheral ganglia are:*

- a) Schwann cells*
- b) Satellite cells*
- c) Microglia*
- d) Ependymal cells*
- e) Oligodendrocyte*

*Answer: B*



*Regarding Axons, choose the WRONG statement:*

- a) Are mostly myelinated*
- b) Conduct impulses away from perikaryon*
- c) Are longer than dendrites*
- d) Their cytoplasm is similar in composition to the cytoplasm of cell bodies*

*Answer:D*

*Choose the WRONG match:*

*a) Epineurium: dense connective tissue*

*b) Motor neurons: multipolar*

*c) Anaxonic neuron: lack true axon*

*d) Neurons: no centrioles*

*e) Anterograde axonal transport: movement toward soma*

*Answer: E*

*regarding dendrites, choose the correct :*

*a) are usually the myelinated*

*b) Are tapering processes*

*C)are usually longer than the axons*

*D)Conduct the impulses away from the perikaryon*

*E)are less numerous than axon*

*Answer:B*



*Nissl bodies consist of ?*

*a) Clusters of synaptic vesicles*

*b) Golgi bodies*

*C) Rough endoplasmic reticulum and ribosomes*

*D) Lysosomes and lipofuscin granules*

*E) Microtubules and microfilaments*

*Answer: C*

*Nervous tissue, choose the CORRECT statement :*

*A) Motor and sensory innervations of viscera are mediated by somatic nervous system*

*B) The ventral ramus of a spinal nerve is typically motor while the dorsal ramus is sensory*

*c) Bundle of axons within peripheral nervous system is called tract*

*D) Schwann cells support both myelinated and unmyelinated axons in the peripheral nervous system*

*E) Basophilic granular structures within the axon are called Nissl bodies*

*Answer : D*

*Which of the following neuroglial cells participate in the formation of blood brain barrier:*

*A)Microglia*

*B)Satellite cells*

*C)Oligodendrocytes*

*D)Astrocytes*

*E )schwann cells*

*Answer: D*



*Motor neurons are classified as:*

*A)Unipolar OR pseudounipolar*

*B)Bipolar*

*C)Multipolar*

*D)Pseudounipolar*

*E)Unipolar After birth*

*Answer:B*

*The myelin forming cells in central nervous system are:*

- A) Schwann cells*
- b) Oligodendrocytes*
- C) Microglia*
- D) Astrocytes*
- E) Satellite cells*

*Answer: B*

*typical peripheral mixed nerve includes all of the following EXCEPT:*

*A) Connective tissue of epineurium, perineurium and endoneurium*

*B) Sensory axons*

*C) Interneurons*

*D) Schwann cells*

*E) Motor axons*

*Answer: C*



*Structures extending the length of the axon which provide the substrate for axoplasmic transport are the :*

- a) Nissl bodies*
- b) Synaptic vesicles*
- c) Schwann cells*
- d) Nodes of Ranvier*
- e) Microtubules*

*Answer: E*

*The outermost layer of dense irregular connective tissue surrounding a peripheral nerve is called :*

*A)Endoneurium*

*B)Fasciotele*

*C) Epineurium*

*D)Septum*

*E)Perineurium*

*Answer: C*

*What term applies to collections of neuronal cell bodies (somata) in the central nervous system?*

- a. Ganglia*
- b. Neuroglia*
- c. Nodes*
- d. White matter*
- e. Nuclei*

*Answer: E*



*Which of the following events occurs immediately after an action potential reaches a synapse at an axon terminal?*

*a. Vesicle fusion with the presynaptic terminal membrane*

*b. Calcium ion influx at the presynaptic terminal*

*c. Neurotransmitter binding to receptors on the postsynaptic membrane*

*d. Neurotransmitter release into the synaptic cleft*

*e. Binding of the neurotransmitter at the presynaptic terminal>>> Answer : B*

*Best of luck*