

# Histology MCQs/Tissues of Mesenchymal Origin (2023/24)

- 1 Easter Egg:** Book The Art of War () written by Sun Tzu () is the oldest known book about military tactics and strategy. Which part of this book can be used for description of function of free (wandering) cells in connective tissue?

Sun Tzu said: Whoever is first in the field and awaits the coming of the enemy, will be fresh for the fight; whoever is second in the field and has to hasten to battle will arrive exhausted.

Sun Tzu said: The art of war is of vital importance to the State. It is a matter of life and death, a road either to safety or to ruin. Hence it is a subject of inquiry which can on no account be neglected.

Sun Tzu said: The control of a large force is the same principle as the control of a few men: it is merely a question of dividing up their numbers.

Sun Tzu said: We come now to the question of encamping the army, and observing signs of the enemy. Pass quickly over mountains, and keep in the neighborhood of valleys.

- 2** Which of following structures does not belong to fibrillary component of extracellular matrix?

- ☐ Collagen fibrils
- ☐ Collagen fibers
- ☐ Elastic fibers
- ☐ Myofibrils

- 3** Which molecular structure is main compound of reticular fibers?

- ☐ Type III collagen
- ☐ Type II collagen
- ☐ Serglycan
- ☐ Glycogen

- 4** How to stain for reticular fibers?

- ☐ Aldehyde fuchsin staining
- ☐ Silver impregnation
- ☐ Sudan red staining
- ☐ Feulgen's method

- 5** Which of following structures is rich on reticular fibers?

- ☐ Skeletal muscle
- ☐ Compact bone
- ☐ Bone marrow
- ☐ Thymus

- 6** Elastic fibers are composed of two main structures. Which ones?

- ☐ Type IV collagen and chondroitin sulfate
- ☐ Type II collagen and aggrecan
- ☐ Elastin and fibrillin
- ☐ Elastin and laminin

- 7** Which stain is appropriate for elastic structures?

- ☐ Methylene blue
- ☐ Alcian blue
- ☐ Sudan red



At the Institute of H&E, we have bad experience that students prefer rather gross (macroscopic) anatomy than microscopic anatomy (histology).

☐ Orcein

**8** Which collagen is main collagen of collagen fibers?

- ☐ Type I collagen
- ☐ Type II collagen
- ☐ Type III collagen
- ☐ Type IV collagen

**9** Which technique is appropriate for analysis of amount of connective tissue proper in the specimen?

- ☐ Any trichromatic method
- ☐ Masson's trichromes
- ☐ Mallory's trichrome
- ☐ AZAN

**10** All but one of following structures are glycosaminoglycans. Which one is not?

- ☐ Chondroitin sulfate
- ☐ Heparan sulfate
- ☐ Hyaluronic acid
- ☐ Fibronectin

**11** Which intracellular structure is responsible for production of sulfated glycosaminoglycans?

- ☐ Smooth endoplasmic reticulum
- ☐ Rough endoplasmic reticulum
- ☐ Golgi apparatus
- ☐ Cell membrane

**12** Only one structure belongs to non-sulfated glycosaminoglycans. Which one?

- ☐ Hyaluronic acid
- ☐ Fibronectin
- ☐ Aggrecan
- ☐ Heparin

**13** Do we have fixed cells of connective tissue derived from the neural crest?

- ☐ Yes, we do, for example melanocytes in meninges
- ☐ Yes, we do, for example adipocytes in mesentery
- ☐ Yes, we do, for example osteocytes in vertebrae
- ☐ No, we do not have these cells

**14** Do we have fibrillary component of extracellular matrix in hyaline cartilage?

- ☐ Yes, we do, it is composed of type II collagen fibrils
- ☐ Yes, we do, it is composed of type IV collagen fibrils
- ☐ Yes, we do, it is composed of type VII collagen fibrils
- ☐ No, we do not have fibrillary component in hyaline cartilage

**15** Which tissue contains cells arranged in an isogenetic groups (isogenetic lineages)?

- ☐ Reticular connective tissue
- ☐ Brown adipose tissue
- ☐ Elastic cartilage
- ☐ Woven bone

**16** Which structure in brown adipocytes produces heat?

- ☐ Smooth endoplasmic reticulum
- ☐ Cytoplasmic enzymes
- ☐ Mitochondria
- ☐ Peroxisomes

**17** Which of following techniques is staining for lipids (triacylglycerols)?

- ☐ Heidenhein's hematoxylin
- ☐ Feulgen's reaction

- ☐ Sudan black
- ☐ Congo red

**18** Which of following tissues is avascular?

- ☐ Loose connective tissue
- ☐ Hyaline cartilage
- ☐ Compact bone
- ☐ Tendon

**19** Which type of tissue is main tissue of ligaments?

- ☐ Dense irregular connective tissue
- ☐ Dense regular connective tissue
- ☐ Reticular connective tissue
- ☐ Fibrocartilage

**20** Shape of which organ is supported by elastic cartilage?

- ☐ Outer ear
- ☐ Trachea
- ☐ Aorta
- ☐ Nose

**21** Where takes place fibrocartilage?

- ☐ False ribs (costae spuria)
- ☐ Intraarticular discs
- ☐ Articular cartilage
- ☐ Nasal septum

**22** Which type of collagen is main collagen of tendons?

- ☐ Type I collagen
- ☐ Type II collagen
- ☐ Type III collagen
- ☐ Type IV collagen

**23** Do we have fibrillary component of extracellular matrix in bones?

- ☐ Yes, we do. It is composed of type I collagen fibrils
- ☐ Yes, we do. It is composed of type I collagen fibers
- ☐ Yes, we do. It is composed of fibrillin fibrils
- ☐ No, we do not have it

**24** How is called precursor cell of osteoclast?

- ☐ Satellite cell
- ☐ Veiled cell
- ☐ Macrophage
- ☐ Monocyte

**25** Do adult people have chondroclasts (cells resorbing cartilage)?

- ☐ Yes, we do have these cells in all cartilages with exception of articular cartilages
- ☐ Yes, we do have these cells, but in healing fractures only
- ☐ Yes, we do have these cells, but in the ribs only
- ☐ No, we do not have these cells

**26** Which structure composed of hyaline cartilage lacks perichondrium?

- ☐ Hyaline cartilage has perichondrium in all cases
- ☐ Cartilage covering inner surface of joints
- ☐ Cartilage on the tip of xyphoid process
- ☐ Cartilage in the wall of trachea

**27** Can we apply immunohistochemical staining on the slide obtained using cutting & grinding technique?

- ☐ Yes, we can. But we can not expect positive result, because organic structures were burned
- ☐ Yes, we can. But we can not use primary antibodies of mice origin
- ☐ Yes, we can. But we can not use DAPI system for visualization
- ☐ Yes, we can. But we can not use fluorescent dyes as label

**28** Which skeletal muscle contains the longest muscle fibers?

- ☐ Extensor hallucis longus muscle
- ☐ Quadriceps femoris muscle
- ☐ Biceps brachii muscle
- ☐ Sartorius muscle

**29** What is main function of tropomyosin in a skeletal muscle?

- ☐ It enhances interaction of actin and troponin
- ☐ It prevents interaction of actin and myosin
- ☐ It acts as a receptor for calcium
- ☐ It binds troponin to myosin

**30** What is immediate signal for contraction of myofibrils?

- ☐ Sharp increase of potassium level in sarcoplasm
- ☐ Sharp increase of calcium level in sarcoplasm
- ☐ Sharp drop of potassium level in sarcoplasm
- ☐ Sharp drop of calcium level in sarcoplasm

**31** Is a muscle fiber of skeletal muscle a cell?

- ☐ No, it is not bounded by a cell membrane
- ☐ No, it is called syncytium
- ☐ No, it is called coenocyt
- ☐ Yes, it is

**32** What is main mediator on a neuromuscular junction of skeletal muscle?

- ☐ Acetylcholine
- ☐ Epinephrin
- ☐ Dopamine
- ☐ GABA

**33** Why have smooth muscle cells no striation?

- ☐ Actin and myosin are arranged in a three-dimensional network
- ☐ They lack both actin and myosin
- ☐ They lack myosin only
- ☐ They lack actin only

**34** Which cell adhesion does not take place in the intercalated disc?

- ☐ Zonula occludens
- ☐ Fascia adhaerens
- ☐ Gap junction
- ☐ Desmosome

**35** Which protein acts as a ruler for length of actin filaments in sarcomeres?

- ☐ Myomesin
- ☐ Nebulin
- ☐ Actinin
- ☐ Tinin

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