بسم الله الرحمن الرحيم

# Histology

MID | Lecture #

﴿ وَقُل رَّبِّ أَدْخِلْنِي مُدْخَلَ صِدْقٍ وَأَخْرِجْنِي مُخْرَجَ صِدْقٍ وَاجْعَل لِّي مِن لَّدُنكَ سُلْطَانًا نَّصِيرًا ﴾

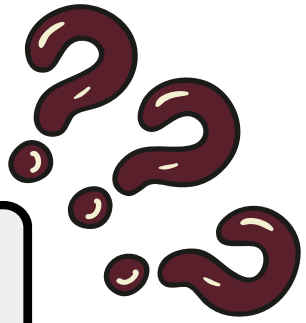
ربنا آتنا من لدنك رحمة وهيئ لنا من أمرنا رشدًا

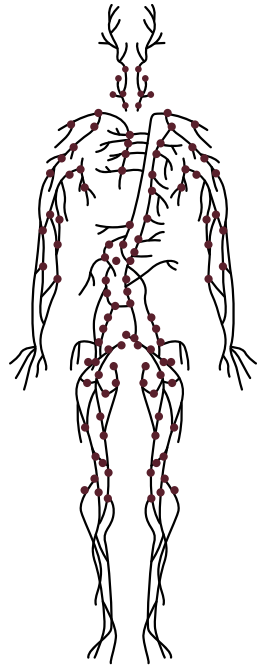
# Past Papers


**Written by:** Zeina Yassin
Hind Suhwail
Dana Hijjeh

**Reviewed by:** Ghena Nusair







# Blood Cells

ربّ اشرح لي صدري، ويسّر لي أمري، واحلل عقدة من لساني يفقه قولي

# Q1: Which one of the following about the HCT is NOT true:

A) The value of HCT is usually 45%

B) The HCT expresses the (%) of red blood cells in a volume of whole blood

C) The values of HCT closely paralleled the values of hemoglobin & red cell count

D) The space occupied by the packed red blood cells is termed the hematocrit

E) The value of HCT does not vary with age & sex of the individual

Ans: E

# Q2: Choose the wrong statement:

A) Unlike platelets, RBCs never stack together

B) Internum of the crystalloid granules contains major basic proteins

Ans: A

# Q3: Erythrocytes, Choose the WRONG statement:

A) Eosinophilia of erythrocytes is due to hemoglobin

B) About one week is needed for the formation of erythrocytes from proerythroblasts

C) Erythrocytes appear electron dense and homogenous under TEM

D) Rouleaux formation is a reversible condition due to surface tension caused by erythrocytes biconcave surface in slow circulation

E) Mature erythrocytes are still capable of producing a little amount of hemoglobin

Ans: E

Q4: Which of the following statements most describe why RBC's are efficient in carrying oxygen:

Contains hemoglobin

2. Have no nucleus
3. Have many mitochondria needed to produce ATP
4. Biconcave shape
5. 4 oxygen molecules are carried by hemoglobin

A) 1, 3, 4
B) 2, 4, 5
C) 1, 2, 4, 5
D) 1, 2, 3, 5
E) 1, 2, 3, 4, 5

Ans: C

Q5: Which biochemical component of the erythrocyte cell surface is primarily responsible for determining blood group (ABO)?

A) Fatty acid

B) Carbohydrate

C) Protein

D) Cholesterol

Ans: B

Q6: What is the approximate life span of circulating erythrocyte?

A) 4 months

B) 120 weeks

C) 20 days

D) 14-28 days

Ans: A

4 months = 120 days ☺

Q7: Eosinophils are cells with bilobed nuclei and many cytoplasmic granules:

A) True

B) False

Ans: A

Q8: Erythrocytes are very small, a cell-like element with no nuclei but many granules:

A) True

B) False

Ans: B

Q9: Erythrocytes consume some of the oxygen they transport for ATP production:

A) True

B) False

Ans: B

## Q10: Which of the following cells express receptors for IgE on their cell surface?

A) Cells with spherical nuclei and scant cytoplasm

B) Biconcave cells with no nuclei

C) Multinucleated cells with irregular S-shaped nuclei and large basophilic cytoplasmic granules

D) Highly phagocytic cells with many basophilic cytoplasmic granules

E) Single nucleated cells with many basophilic cytoplasmic granules

Ans: E

# Q11: Blood formed elements, choose the wrong statement :

A) Erythrocytes lack class 1 MHC molecules

B) Both basophil and mast cell are granulated but basophil nucleus is lobulated while the mast cell nucleus is round

C) Human thrombocytes have, in contrast to erythrocytes, never been individual nucleated cells

D) The internum of eosinophilic granules contains major basic protein

E) Most neutrophils in female peripheral blood normally show barr bodies

Ans: E

Only some (about 3%) of female neutrophils show a Barr body ,not most

Q12: The cell that contains bi-lobed nucleus and large granules that obscureits nucleus

A) monocyte

B) eosinophil

C) Basophil

D) neutrophil

Ans: C

# Q13: Which of the following is wrong about WBCs?

A) Neutrophils are the most prominent cells in blood

B) eosinophils are more phagocytic and bactericidal than neutrophils

C) B cells can act as APCs

Ans: B

Q14: Which of the following cells have granules containing peroxidase and histaminase?

A) neutrophils

B) Basophils

C) eosinophils

Ans: C

# Q15: Which of the following is false :

A) neutrophils phagocytic activity is enhanced by the presence of complement

B) absence of barr body in neutrophils and other body cells indicate true male (XY)

C) Neutrophils are called cells of chronic inflammation

Ans: C

Q16: Which cell type has cytoplasmic granules that contain heparin & histamine ?

A) Eosinophil

B) Basophil

C) Neutrophil

D) Lymphocyte

Ans: B

Q17: Neutrophils are multi-nucleated cell with polymorphic nuclei :

A) True

B) False

Ans: B

Q18: Which of the following cells function in the formation of pus at wound site :

A) Cells with spherical nuclei

B) Cell-like elements with no nuclei

C) Biconcave cells with no nuclei

D) Cells with polymorphic nuclei

Ans: D

Q19: The main different between basophils and mast cells is :

A) The shape of the nucleus

B) The density of their granules

C) The content of their granules

D) The staining reaction of their granules

Ans: A

## Q20: Which one of the following is a correct pair?

A) Basophil / histaminasease

B) Eosinophil / heparin

C) Basophil / basic protein

D) Basophil / histamine

Ans: D

## Q21: Wrong statement :

A) Neutrophils circulate for hours in blood after maturation

B) Neutrophils circulate for days in blood after maturation

Ans: B

## Q22: Wrong statement :

A) Granulocytes have spherical shape in blood & irregular shape in connective tissue

B) Granulocytes have irregular shape in blood & spherical shape inconnective tissue

Ans: B

Q23: Examination of a normal peripheral blood smear reveals a cell more than twice the diameter of an erythrocyte with a C-shaped nucleus and a frosted glassy cytoplasm; Which of the following cell types is being described?

A) Basophil

B) Eosinophil

C) Lymphocyte

D) Neutrophil

E) Monocyte

Ans: E

Q24: A cell with c shaped single non lobulated nucleus :

A) Mast cell

B) Eosinophil

C) Lymphocyte

D) Neutrophil

E) Monocyte

Ans: E

## Q25: Cytotoxic T lymphocytes′ marker:

A) CD45 +

B) CD34 –

C) CD3 +

D) CD19 –

E) CD8 +

Ans: E

# Q26: Which of the following is wrong about HLA class II?

A) it is presented in all nucleated cells

B) it is recognized by T helper

C) it is coupled to peptide product of proteins the cells had ingested

Ans: A

# Q27: Which of the following is the correct statement?

A) Cytotoxic cells recognize MCH 1 and the Ag presented on it

B) cytotoxic T-Cells bind to MHC 2

C) cytotoxic T-Cells express MHC 2 on their surface

Ans: A

## Q28: Which of the following is correct about monocytes?

A) They are phagocytic cells

B) They increase dramatically in parasitic infections

C) They are responsible for allergic reactions

Ans: A

Q29: Which of the following cells can give rise to an APC ?

A) Myeloblast

B) Basophil

C) Monocyte

Ans: C

## Q30: True about monocytes :

A) multinucleated cell

B) frosted glass appearance

C) nucleus is masked by granules

Ans: B

# Q31: Lymphocytes, choose the CORRECT statement?

A) Are produced only in the bone marrow

B) Are the most abundant type of leuckocytes

C) Are produced only in the lymphoid tissues

D) Are granular leucocytes

E) Are produced in the bone marrow & in the lymphoid tissues

Ans: E

# Q32: Which of the following is false?

A) monocytes have C-shaped nucleus

B) 5-lobed-nucleus neutrophils are less mature than 4-lobed ones

C) B and T lymphocytes cannot be distinguished under LM

Ans: B

Remember: Neutrophils will show increasing segmentation as they mature

# Q33: Thrombocytes, choose the WRONG statement :

A) Microtubules and microfilaments are found in the outer marginal bundle

B) Have thick glycocalyx

C) Originate from bone marrow cells with many dynamic cell projections

D) Often form basophilic clumps in histological preparations

E) Formation of germinal centers for B-cell proliferation in each node’s cortex

Ans: E

Platelets are for clotting blood, and germinal centers are spots in lymph nodes where B-cells multiply—they’re completely different functions

# Q34: One of the following about blood cells is incorrect:

A) Eosinophils have a particular phagocytic affinity for antigen- antibody complex

B) Erythrocytes lack MHC-I

C) Agranulocytes have a single lobulated nucleus

Ans: C

# Q35: One of the following is correct about platelets:

A) Granulomere contains cytoskeleton and membranous channel

B) Alpha granules contain lysosomes

C) Lack glycocalyx

D) Megakarycyte cells produce them from outside bone marrow

E) Pale peripheral zone is called hyalomere

Ans: E

## Q36: Which of the following is true about basophils :

A) They are single lobulated cells

B) They have the highest phagocytic activity among granulocytes

C) They have receptors for IgE

D) They are highly motile

E) We commonly see basophils in blood films

Ans: C

## Q37: Cells whose granules contain major basic proteins :

A) Polymorphs

B) Cells with bi-lobed nucleus and acidophilic granules in cytoplasm

C) Small Cells with scant cytoplasm

D) Small fragments of cells

E) Biconcave anucleated discs

Ans: B

Q38: Small cells with small highly heterochromatic nucleus and minimal cytoplasm :

A) Neutrophils

B) Basophils

C) Eosinophils

D) Inactive lymphocytes

Ans: D

Q39: Which of the following may act as an antigen presenting cell :

A) Natural killer cells

B) Basophils

C) Eosinophils

D) B lymphocytes

Ans: D

Q40: Which of the following has a granulomere and hyalomere :

A) RBCs

B) small cell- like element has many granules

C) binuclear cell with acidophilus granules

D) granulated polymorphic cells

Ans: B

## Q41: Which of the following is false about WBC :

A) eosinophils act in parasitic infection

B) basophils releases eosinophilic chemotactic agent

C) monocytes – powerful phagocytic ability

D) neutrophils are the most common leukocytes

Ans: C

# Q42: The wrong statement :

Macrophages secretes IL-2 that stimulates T-cells

# Q43: AIDS progression :

CD4+ count decreases and viral load increases

Q44: Cell with the same size of erythrocyte and blue cytoplasm with large nucleus?

Lymphocyte

# Hematopoiesis

Q1: which statement is wrong about granulopoisis ?

a) It takes around 2 weeks

b) Precursors have lobulated nucleus

c) Some of the Precursors have intended nucleus

d) All choices are true

Ans: B

# Q2. Reticulocytes, choose the CORRECT statement:

A)Their percentage in peripheral blood is not changed in hemorrhage.

B) Contain remnants of DNA.

C) Contain acidophilic reticulum of polyribosomes.

D) Have the same size as mature erythrocytes.

E) They are stained with Brilliant cresyl blue.

Ans: E

# Q3. Which of the following is wrong about reticulocytes?

A) Contain DNA not RNA

B) increases in hemolytic anemia

C) can synthesize heme

Ans: A

Reticulocytes can still synthesize hemoglobin and heme until they fully mature.

# Q4. What can be found inside the red bone marrow?

A) Hematopoietic stem cells along with numerous fat tissue

B) Hematopoietic stem cells + sinusoidal capillaries + reticular tissue

C) Hematopoietic stem cells + fenestrated capillaries + reticular tissue

Ans: B

Q5. Hematopoiesis starts in liver, moves to yolk sac and then to the bone marrow .

A) True

B) False

Ans: B

# Q6. Choose the correct statement regarding the changes occurring during Erythropoiesis

A) Specific granules appear in cytoplasm

B) Nucleus disappears

C) Cytoplasm changes to basophilic

D) Cells maintain their capacity for mitosis

E) Size of cells increases

Ans: B

# Q7. Choose the wrong statement about erythropoiesis:

A) Lowest erythropoiesis occurs in the pelvis and vertebrae.

B) In adults, erythropoiesis mainly occurs in flat bones such as the sternum, ribs, and pelvis.

C) In the fetus, erythropoiesis initially occurs in the yolk sac, then the liver and spleen.

D) Erythropoietin is primarily produced by the kidney in response to hypoxia.

E) Reticulocytes are released from bone marrow into circulation and mature into erythrocytes within a day.

Ans: A

Q8. The precursor cells of granulocytes are destroyed by radiotherapy.Toreestablish the granulocytic lineage, which of the following cells should be transplanted?

A) Promyelocytes.

B) Metamyelocytes.

C) Promonocytes.

D) Band cells.

E) Myelocytes.

Ans: A

# Q9. Regarding granulopoiesis, choose the WRONG statement

A) Azurophilic granules first appear at the promyelocyte stage.

B) Secondary granules first appear at the myelocyte stage.

C) Metamyelocytes have kidney shaped nuclei and cannot divide.

D) Both types of granules in granulopoietic cells are synthesized by the free ribosomes.

E) Band cells are almost mature granulocytes but without segmented nuclei

Ans: D

# Q10. Which of the following is wrong about neutrophils?

A) it has its own specific granules

B) it lives for several hours only and stores glycogen

C) it has polymorphic nucleus throughout its life

D) measuring neutrophils from blood represents all neutrophils in our body

Ans: D

Blood measure circulating pool

# Q11. We recognize myelocytes from:

A) specific granules

B) Primary granules

C) size

Ans: A

## Q12. Choose the correct statement.

A) The first morphologically distinguishable stage of development of redblood cells is basophilic erythroblast.

B) The first morphologically distinguishable stage of development ofgranulocytes is promyelocyte.

C) The type of tissue serves as a supportive structure for hematopoiesis in the bone marrow is a jelly- like connective tissue.

D) Myeloid progenitor cell can be a precurser for all leukocytes except lymphocytes.

Ans: D

# Q13. Which of the following statements about granulopoiesis is WRONG?

A) Azurophilic (primary) granules appear first in promyelocytes.

B) Specific (secondary) granules appear first in myelocytes.

C) Metamyelocytes have kidney-shaped nuclei and cannot divide.

D) Precursors have lobulated nuclei.

E) Band cells are almost mature granulocytes but lack fully segmented nuclei.

Ans: D

# Q14. Which of the following statements about granulopoiesis is WRONG?

A) Neutrophils circulate in blood for several days after maturation.

B) Promyelocytes are the first stage to contain azurophilic (primary) granules.

C) Myelocytes are the first stage to contain secondary (specific) granules.

D) Metamyelocytes have kidney-shaped nuclei and are no longer capable of cell division.

E) Band cells are nearly mature granulocytes with a U- or band-shaped nucleus.

Ans: A

# Q15. The correct order for hematopoiesis in fetus:

A) Thymus-bone marrow-liver

B) bone marrow - yolk sac -liver

C) yolk sac - spleen,liver - bone marrow

D) liver ,spleen - yolk sac - bone marrow

Ans: C

Q16. The correct order for Polymorphonuclear neutrophils (PMN) maturation is:

A) promyelocyte>myelocyte>metamyelocyte> band cell ›segmented cell ›myeloblast

B) myelocyte> metamyelocyte> promylocytes› band cell ›segmented cell ›myeloblast

C) myelocyte>metamyelocyte> band cell› promylocytes›segmented cell ›myeloblast

D) myeloblast>promyelocyte>myelocyte>metamyelocyte > band cell ›segmented cell

Ans: D

Q17. One of the precursors in granulopoiesis is the largest and begins synthesizing of Azurophilic:

A) myeloblast

B) myelocyte

C) metamyelocyte

D) Promyelocyte

Ans: D

Q18. One of the following stains is used to detect reticulocytes:

A) Hematoxylin

B) Brilliant cresyl blue

C) Eosin

D) Black ink

Ans: B

# Q19. The correct order of erythropoiesis:

A) Proerythroblast-Basophilic erythroblast-Normoblast-Polychromatophilic erythroblast-Reticulocyte-Erythrocyte

B) Proerythroblast-Basophilic erythroblast-Orthochromatophilic erythroblast-Polychromatophilic erythroblast-Reticulocyte-Erythrocyte

C) Basophilic erythroblast-Orthochromatophilic erythroblast-Proerythroblast -Polychromatophilic erythroblast-Reticulocyte-Erythrocyte

D) Proerythroblast-Basophilic erythroblast-Polychromatophilic erythroblast-Normoblast-Reticulocyte-Erythrocyte

E) Basophilic erythroblast-Orthochromatophilic erythroblast-Proerythroblast-Polychromatophilic erythroblast-Reticulocyte-Erythrocyte

Ans: D

# Lymphatic System

Q1: Which of the following characteristics is the least value to distinguish between spleen and lymph nodes:

A) Blood sinusoids

B) Fibroblasts in capsule and trabaecule

C) Small dark round nucleus cells

D) Subcapsular sinus

Ans: B

Q2: which of the following isn't made of reticular framework:

A) bone marrow

B) Thymus

C) Spleen

D) lymph node

Ans: B

Q3: Which of the following characteristics is the least value to distinguish between spleen and lymph nodes:

A) Blood sinusoids

B) Lymphatic follicles

C) Small dark round nucleus cells

D) Subcapsular sinus

Ans: B

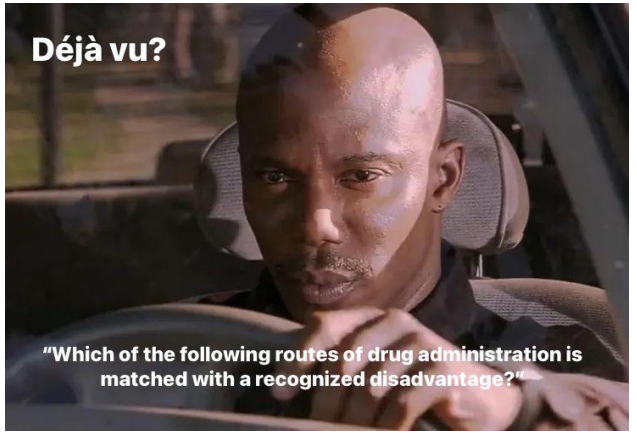
Q4: Which of the following characteristics is the least value to distinguish between spleen and lymph nodes:

A) High endothelial venules

B) Afferent lymphatic vessels at capsule

C) Lymphatic sinuses

D) Stromal reticular tissue




Ans: D

Q5: Which of the following features is characteristic of lymph nodes:

A) Cortex

B) Afferent vessels

C) Medulla

D) Sinuses

E) Lobes

Ans: B

Q6: Which of the following characteristics is the least value to distinguish the spleen from **thymus**:

A) Activated B cells

B) Fibroblasts in capsule and trabeculae

C) Endothelial cells with tight junctions and thick basement membranes

D) Reticular epithelial cells

Ans: B

# Q7: Where can you find T lymphocytes in spleen:

A) Primary follicles

B) Splenic cords (Billroth's cords)

C) Splenic sinusoids

D) Periarteriolar lymphatic sheaths (PALS)

E) Germinal centers (Malpighian corpuscles)

Ans: D

# Q8: Wrong about the lymphatic system:

A) Primary follicles form only when stimulated by an antigen

B) Primary lymphatic organs are the sites for production, maturation & selection

C) Secondary lymphatic organs are the sites for encountering pathogens

D) Macrophages attack the pathogen & present it to secondary lymphatic organs

Ans: A

# Q9: One of the following is mismatched:

A) Follicular dendritic cell – medulla

B) Antigen presenting cells –cortex and medulla

C) T lymphocytes –inner cortex

D) B lymphocytes –outer cortex

E) Plasma cells –medullary cords

Ans: A

Q10: What of the following is mainly found in the primary follicles?

A) Unstimulated B lymphocytes

B) Activated B lymphocytes

C) T lymphocytes

D) Plasma cells

Ans: A

# Q11: Which of the following is wrong regarding spleen?

A) PALS are tightly packed T cells arranged in cylindrical sheaths around central arterioles
B) Splenic cords consist of all cells between the sinusoids in the red pulp

C) Marginal zone sinuses are directly located between the white and red pulp

D) Central arterioles will branch into short straight penicillar arterioles as they leave white pulp
E) Stave cells are connected by special intracellular junctions

Ans: E

# Q12: Which of the following is false regarding thymic epithelial cells?

A) They are part of the blood-thymic barrier

B) They produce hormones for maturation and differentiation of T cells

C) They have MHC I and MHC II

D) They can present tissue specific antigens

E) They are connected by their processes by tight junctions

Ans: E

Check the following statements and answer the question after it:

1) IgA will be transported to the lumen to get rid of antigen
2) Dendritic cells will capture antigens and present processed antigen to T helper cells
3) Antigens would bind M cells and undergo transcytosis into intraepithelial pocket
4) B lymphocytes are activated by T helper cells to produce IgA

Q13: **Which of the following is the correct order of M cells function in immunity?**

Ans: 3, 2, 4, 1

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