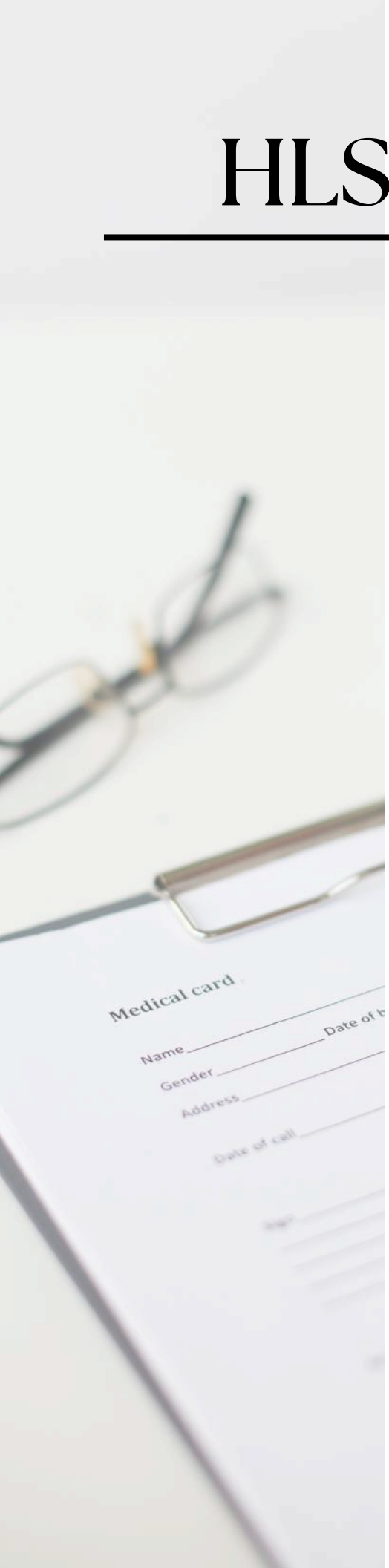
HLS-Biochemistry



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Lecture 1

RBCs Metabolism

HLS-Biochemistry Lecture 1

1. Glucose 6-phosphate dehydrogenase is the key regulatory enzyme in the pentose phosphate pathway, responsible for reducing glutathione. What is wrong about the disease caused by the deficiency of this enzyme?

a. Uncontrolled diabetes mellitus is one of the causes of the hemolytic crises.
b. May be associated with acute renal failure.
c. It is an X-linked disorder but females may show its manifestations.
d. All variants encoding for the enzyme result in clinical consequences.
e. The best way for the proper diagnosis of the disease is by genetic analysis

ANSWER: D

2. Which of the following statements is true regarding the metabolic pathways in RBCs?

a. All variants of glucose 6-phosphate dehydrogenase are accompanied by clinical consequences.
b. The mutation \(721G \rightarrow T \) of pyruvate kinase is a missense mutation.
c. Phosphoglucose isomerase deficiency does not affect reduced glutathione regeneration.
d. Phosphoglycerate kinase deficiency shows 2,3-bisphosphoglycerate accumulation.
e. Triacylglycerols synthesis in RBCs is not affected by triose phosphate isomerase deficiency.

ANSWER: D

3. Hb inside RBCs performs the following functions EXCEPT?

a. Allows RBCs to pass in narrow capillaries.
b. O_2 carriage.
c. CO_2 carriage.
d. Acid-base buffer.
e. Combines with glucose to form glycosylated Hb.

ANSWER: A

4. Which enzymes require zinc (Zn) as a cofactor?

a. Superoxide dismutase (SOD), Carbonic anhydrase, Lactate dehydrogenase
b. Hexokinase, Pyruvate kinase, Phosphofructokinase
c. Catalase, Glutathione peroxidase, Cytochrome oxidase
d. DNA polymerase, RNA polymerase, Helicase
e. Adenylate cyclase, Protein kinase A, Phospholipase C

ANSWER: A

HLS-Biochemistry Lecture 1

5. In the glycolytic pathway, pyruvate is normally released from inside erythrocytes because of?

a. The low activity of glyceraldehyde 3-phosphate dehydrogenase.
b. The high activity of pyruvate kinase.
c. The maintenance of hemoglobin iron in the reduced form.
d. The absence of methemoglobin reductase enzyme.
e. The high concentration of 2,3-bisphosphoglycerate.

ANSWER: C

6. The deficiency of pyruvate kinase is one of the causes of RBC hemolysis, but some of its manifestations can be hidden due to?

a. Increased production of 2,3-bisphosphoglycerate.
b. Decreased production of 1,3-diphosphoglycerate.
c. Increased activity of Na^+/K^+ ATPase.
d. Increased activity of glucose 6-phosphate dehydrogenase.
e. Increased ATP production

ANSWER: A

7. In pyruvate kinase (PK) deficiency with chronic hemolytic anemia, which statement is **incorrect?**

a. Occurs in compound heterozygotes only.
b. They affect conserved residues in structurally and functionally important domains of PK.
c. Have a variety of clinical pictures.
d. Usually missense mutation.
e. Increased 2,3-BPG levels ease the anemia by lowering the oxygen-affinity of hemoglobin.

ANSWER: A

8. Identify the mismatched group of enzymes and their associated cofactors/metals in oxidative stress in RBCs.

a. Superoxide dismutase - zinc
b. Catalase - iron
c. Glutathione reductase - NADPH
d. Glutathione peroxidase - selenium
e. Superoxide dismutase - magnesium

ANSWER: E

HLS-Biochemistry Lecture 1

9. Which statement is **false** about 2,3-bisphosphoglycerate (2,3-BPG)?

a. Increased at high altitude.
b. Eases the anemia of pyruvate kinase (PK) deficiency.
c. Higher concentration than ATP in RBCs.
d. Negative allosteric regulator.
e. Increased in PK-1 deficiency.

ANSWER: E

10. ATP generated in RBCs is utilized in reactions catalyzed by?

a. Phosphoglucose isomerase
b. PFK-1, Hexokinases
c. Fructose-bisphosphate aldolase

ANSWER: B

11. Zinc is a cofactor for?

a. Carbonic anhydrase
b. Lactate dehydrogenase
c. Glycogen synthase

ANSWER: A

12. In the glycolytic pathway, which enzyme deficiencies affect the 2,3-bisphosphoglycerate (2,3-BPG) level?

a. Hexokinase and pyruvate kinase
b. Phosphoglycerate kinase and diphosphoglycerate mutase
c. Aldolase and triose phosphate isomerase
d. Lactate dehydrogenase and enolase
e. Phosphofructokinase-1 and glucose-6-phosphate dehydrogenase

ANSWER: B

13. Which enzymes are involved in the nucleotide salvage pathway?

a. AMP deaminase (AMPDA), Hypoxanthine-guanine phosphoribosyltransferase (HGPRT), Adenine phosphoribosyltransferase (ADPRT)
b. Ribonucleotide reductase, Thymidylate synthase, Dihydrofolate reductase
c. DNA polymerase, RNA polymerase, Helicase
d. Adenylate kinase, Creatine kinase, Lactate dehydrogenase
e. Carbamoyl phosphate synthetase, Aspartate transcarbamylase, Dihydroorotase

ANSWER: A

HLS-Biochemistry

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Lecture 2

Hemoglobin synthesis

HLS-Biochemistry Lecture 2

1. The asymmetric substitution of the tetrapyrrole ring of heme starts with the activity of the following enzyme?

a. ALA synthase.
b. PBG synthase.
c. Uroporphyrinogen synthase III.
d. Coproporphyrinogen oxidase.
e. Coproporphyrinogen decarboxylase.

ANSWER: C

2. Which of the following enzymes in the heme synthetic pathway requires a cosynthase molecule for the asymmetric substitution of the heme tetrapyrrole ring?

a. ALA synthase.
b. Uroporphyrinogen synthase III.
c. PBG deaminase.
d. Protoporphyrinogen oxidase.
e. Uroporphyrinogen decarboxylase.

ANSWER: B

3. Different proteins are involved in iron metabolism, among them hepcidin, which is **not characterized by?**

a. It is upregulated by increased iron levels to downregulate ferroportin.
b. It is downregulated by decreased iron levels to upregulate ferroportin.
c. Its high expression rate negatively regulates bacterial growth.
d. Its low expression rate positively regulates bacterial growth.
e. It directly affects iron exportation from tissues to blood.

ANSWER: E

4. In the heme synthetic pathway, one of the following sets of enzymes is responsible for starting and finalizing the asymmetrical substitutions of the four pyrrole rings of the heme molecule. Select one:

a. Coproporphyrinogen oxidase and protoporphyrinogen oxidase.
b. Porphobilinogen deaminase and uroporphyrinogen decarboxylase.
c. Porphobilinogen synthase and protoporphyrinogen oxidase.
d. ALA synthase and hydroxymethylbilane synthase.
e. Uroporphyrinogen synthase III and coproporphyrinogen oxidase.

ANSWER: E

HLS-Biochemistry Lecture 2

5. Which one of the following sets of enzymes in the heme synthetic pathway can be inhibited by lead?

a. ALA synthase and ALA dehydratase.
b. PBG synthase and PBG deaminase.
c. Uroporphyrinogen synthase III and ALA synthase.
d. Uroporphyrinogen decarboxylase and coproporphyrinogen oxidase.
e. Ferrochelatase and ALA dehydratase.

ANSWER: E

6. Among the following sets of proteins, one set is playing a role in cellular membranes transported iron?

a. Hepcidin, and matriptese2.
b. Ceruloplamin and heme carrier protein.
c. DMT and transferrin.
d. Duodenal cytochrome B and iron regulatory proteins.
e. Ferritin and ferroportin.

ANSWER: B

7. Choose the **wrong statement about hepcidin :**

a. Is upregulated in response to iron to induce degradation of ferroportin.
b. Is upregulated in response to iron to induce more synthesis of ferroportin.
c. Is synthesized by the liver.

ANSWER: B

8. Which enzyme in heme synthesis converts two of the propionyl side chains into vinyl groups?

a. Uroporphyrinogen 3 synthase
b. Uroporphyrinogen decarboxylase
c. Coproporphyrinogen oxidase
d. Protoporphyrinogen oxidase
e. Ferrochelatase

ANSWER: C

HLS-Biochemistry Lecture 2

9. The last two enzymes that prepare the tetrapyrrole ring for iron addition in heme synthesis are?

a. ALA synthase and ALA dehydratase
b. Uroporphyrinogen III synthase and uroporphyrinogen decarboxylase
c. Coproporphyrinogen oxidase and protoporphyrinogen oxidase
d. Ferrochelatase and protoporphyrinogen oxidase
e. PBG deaminase and coproporphyrinogen decarboxylase

ANSWER: C

10. What is true about the enzyme that converts propionyl side chains into vinyl groups in heme synthesis?

It is a mitochondrial enzyme.

11. Which of the following represents the correct sequence of proteins involved in intestinal iron absorption and transport?

a. DcytB → DMT1 → Apo-ferritin → Ferroportin → Ceruloplasmin
b. Ferroportin → DMT1 → Ceruloplasmin → Apo-ferritin → DcytB
c. DMT1 → Ceruloplasmin → Ferroportin → DcytB → Apo-ferritin
d. Apo-ferritin → DcytB → Ferroportin → DMT1 → Ceruloplasmin
e. Ceruloplasmin → Apo-ferritin → DMT1 → DcytB → Ferroportin

ANSWER: A

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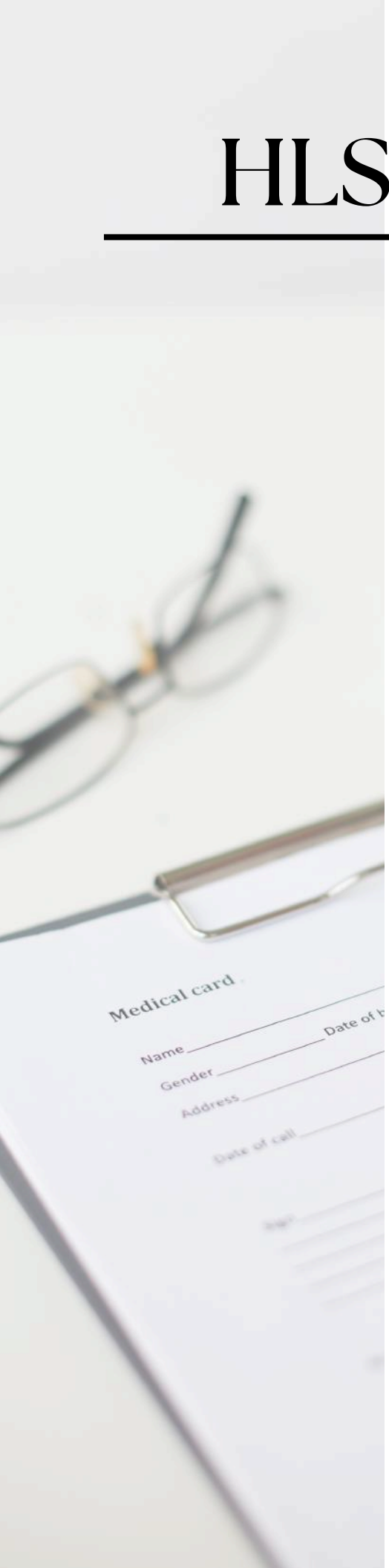

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Lecture 3+4

Heme degradation

HLS-Biochemistry Lecture 3+4

1. Which of the following causes intrahepatic jaundice?

A) Drug-induced hepatitis
B) Common bile duct stone
C) Pancreatic carcinoma
D) Choledochal cyst
E) Gallstones

ANSWER: A

2. Which statement about heme degradation is INCORRECT?

A) Heme oxygenase utilizes NADPH
B) Oxygen is a reactant in the first step
C) First step breaks methylene bridges between rings I & II
D) First step breaks methylene bridges between rings I & IV
E) Cytochrome P450 converts biliverdin to bilirubin

ANSWER: D+E

3. Children with which condition are most likely to die from kernicterus if untreated?

A) Gilbert syndrome
B) Crigler-Najjar syndrome, type II
C) Crigler-Najjar syndrome, type I
D) Dubin-Johnson syndrome
E) Rotor syndrome

ANSWER: C

4. During heme degradation to bilirubin, which metabolic pathway provides essential agent required for this conversion?

A) Pentose phosphate pathway
B) Glycolysis
C) Urea cycle
D) Citric acid cycle

ANSWER: A

5. Intravascular hemolysis causes the liver to produce protective proteins against free hemoglobin. This can be detected by measuring:

a. Plasma heme level
b. Plasma hemoglobin level
c. Plasma liver enzymes
d. Plasma albumin

ANSWER: B

HLS-Biochemistry Lecture 3+4

6. An 18-year-old presents with mild jaundice (icterus), normal CBC, normal LDH, negative hepatitis tests, and elevated bilirubin. After one week, bilirubin levels decreased spontaneously without treatment. What is the most likely cause?

Transient bile obstruction by gallstones

7. Which of the following statements about bilirubin metabolism is incorrect?

a. Urobilinogen may be produced in the liver.
b. Unconjugated bilirubin produces urobilinogen.

ANSWER: B

8. Intravascular degradation of heme yields unconjugated bilirubin, which is transported to the liver bound to albumin. Which of the following is true about this process?

a. It is the only site that produces unconjugated bilirubin.
b. Albumin is a specific carrier for unconjugated bilirubin.
c. Albumin always has high-affinity binding sites for unconjugated bilirubin.
d. Haptoglobin and hemopexin can participate in carrying unconjugated bilirubin.

ANSWER: all are incorrect

9. Which one of the following is true regarding jaundice due to acute viral hepatitis?

a. Alpha-fetoprotein is increased.
b. AST and ALT are normal.
c. Serum albumin is decreased.
d. Conjugated bilirubin is not excreted in urine.
e. Serum conjugated bilirubin is increased.

ANSWER: E

10. When erythrocytes are hemolyzed intravascularly, some heme molecules are oxidized. The rate of expression of which protein is increased to scavenge iron?

a. Haptoglobin
b. Transferrin
c. Ferritin
d. Hemopexin
e. Methemalbumin

ANSWER: E

HLS-Biochemistry Lecture 3+4

11. The genetic defects in the membrane of erythrocytes are among the causes of hemolytic anemia. All of the following investigations for RBCs hemolysis are correct EXCEPT?

a. CBC reveals high reticulocytes count.
b. Liver enzymes are normal.
c. Blood lactate dehydrogenase (LDH) level is normal.
d. Hemoglobinuria is detected.
e. Urobilinogen and stercobilinogen are normal.

ANSWER: C

12. A 48-year-old man came to the liver clinic in a hospital. After examination, he was clinically diagnosed with jaundice due to hepatocellular failure. All of the following investigations for such a case are correct EXCEPT?

a. No increase in reticulocytes %.
b. Both types of bilirubin are elevated.
c. All liver enzymes are elevated.
d. Urine urobilinogen is reduced.
e. Vitamin K cannot prolonged PT

ANSWER: D

13. Intravascular hemolysis of erythrocytes is associated initially with increased the rate of expression of the gene encoding for this protein?

a. Transferrin.
b. Hemosiderin.
c. Ferritin.
d. Haptoglobin.
e. Methemoglobin.

ANSWER: D

HLS-Biochemistry

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Lecture 5

Porphyrias

HLS-Biochemistry Lecture 5

1. Which statement is FALSE about porphyria cutanea tarda (PCT)?

a. Caused by deficiency of the last cytosolic enzyme (uroporphyrinogen decarboxylase)
b. Iron intake precipitates the disease
c. Estrogen precipitates the disease
d. Erythrocytic isocoproporphyrin characterizes the disease
e. Motor neuropathy and photocutaneous sensitivity

ANSWER: E

2. Porphyria related to erythropoietic?

a. Acute intermittent porphyria and Porphyria cutanea tarda
b. Variegate porphyria and Hereditary coproporphyria
c. Congenital erythropoietic porphyria and Erythropoietic coproporphyria
d. ALA dehydratase deficiency porphyria and Hepatoerythropoietic porphyria

ANSWER: C

3. Porphyria cutanea tarda (PCT) is characterized by all of the following EXCEPT?

a. Overdoses of iron are among the risk factors.
b. It is due to the deficiency of a cytosolic enzyme.
c. An inhibitor of an enzyme can be given to relieve its symptoms and signs.
d. Besides variegate porphyria, both are having neurocutaneous manifestations.
e. Can be diagnosed by investigating the presence of a modified intermediate in the stool.

ANSWER: D

4. An 8-year-old girl with abdominal pain and motor neuropathy was diagnosed with congenital erythropoietic porphyria (CEP). Which catabolite can be detected in her urine?

a. ALA (Aminolevulinic acid).
b. Uroporphyrinogen I.
c. PEG .
d. Protoporphyrin.
e. Coproporphyrin I

ANSWER: B

HLS-Biochemistry Lecture 5

5. A 4-year-old boy came to the hospital suffering from a burning sensation in the exposed areas of the skin to sunlight. His blood analysis reveals the presence of porphyrin in the erythrocytes. Which one of the following genes is suspected to have a mutation responsible for this disease?

a. Coproporphyrinogen oxidase.
b. Uroporphyrinogen decarboxylase.
c. Ferrochelatase.
d. ALA synthase.
e. Uroporphyrinogen synthase III.

ANSWER: C

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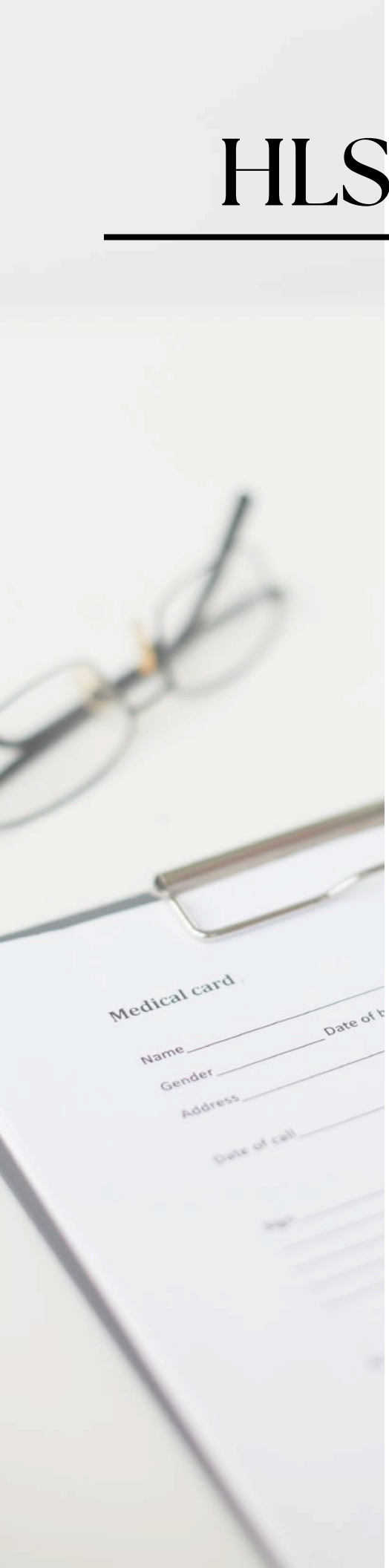

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Lecture 6

Hemoglobinopathies

HLS-Biochemistry Lecture 6

1. Genetic insufficiency in __ results in hydrops fetalis?

A. 4 deletions of Alpha genes
B. 2 deletions of Beta genes
C. 1 deletion of Alpha gene + 1 Beta gene mutation
D. 3 deletions of Beta genes

ANSWER: A

2. What is the genetic composition of HbD trait and Cooley's anemia ?

A. HbA/D, β+1 β+1
B. HbA, β0 β0

ANSWER: A

3. Which of the following is not associated with sickle cell disease?

A. Deoxygenated hemoglobin S polymerization
B. Chronic hemolytic anemia
C. Oxygenated hemoglobin S solubility
D. Increased risk of malaria infection

ANSWER: D

4. A woman has heterozygous sickle cell anemia , heterozygous hemoglobin C disease , and alpha thalassemia minor. What is her most likely genetic composition?

A. HbS/C, αα/α-
B. HbS/A, α-/--
C. HbS/C, --/αα
D. HbA/C, --/αα

ANSWER: C

5. Beta thalassemia is associated with?

A. Decreased HbA, increased HbF
B. Increased HbA, decreased HbF
C. Normal HbA, decreased HbF
D. Decreased HbA, normal HbF

ANSWER: A

HLS-Biochemistry Lecture 6

6. What is the genotype of a patient with HbC trait, HbD trait, Cooley's anemia, and α-thalassemia minor?

A. HbC β+3 /HbD β0, -α/-α
B. HbC β+3 /HbA, --/αα
C. HbA/HbD β0, -α/--
D. HbC β+3 /HbD β0 , αα/αα

ANSWER: A

7. What is Hemoglobin S (HbS)?

A. An abnormal hemoglobin where valine replaces glutamic acid at position 6 of the β-globin chain, causing sickle cell anemia.
B. An abnormal hemoglobin where lysine replaces glutamic acid at position 6 of the β-globin chain, causing mild hemolytic anemia.
C. A normal hemoglobin variant with increased oxygen affinity, seen in thalassemia.
D. An unstable hemoglobin due to deletions in the α-globin chain, leading to Heinz bodies.

ANSWER: A

8. Why does severe beta-thalassemia often not become clinically apparent until a child is several months old?

A. Overexpression of γ-globin compensates for the missing β-chains early in life.
B. Elevated hemoglobin A2 compensates for the missing β-globin genes.
C. The α-globin genes don't turn on until several months after birth.
D. The γ-to-β-globin switch is not complete until several months after birth.
E. The oxygen needs of a newborn are minimal.

ANSWER: D

9. The mutations in [β] and [α] globin genes are variable causing different types of hemoglobinopathies, among them one is due to a mutation leading to unstable mRNA?

a. Unstable hemoglobin disorder.
b. Hemoglobin M variant.
c. Hereditary persistence of Hb F.
d. Hemoglobin Lepore.
e. Hemoglobin Constant Spring.

ANSWER: E

HLS-Biochemistry

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Lecture 7

Molecular basis of some blood coagulation disorders

HLS-Biochemistry Lecture 7

1. Which of the following is incorrect about disseminated intravascular coagulation (DIC)?

A. Arises from obstetric complications
B. Involves release of cytokines
C. Increases tissue factor expression
D. Increases thrombomodulin expression
E. Causes multi-organ involvement

ANSWER: D

2. Which of the following is incorrect regarding Von Willebrand disease (vWD)?**

A. Most common types (1 and 2) are autosomal dominant (Type 3 is recessive).
B. Patients have compound defects in platelet function and coagulation mostly platelet defects produces clinical findings.
C. The major source of vWF is the liver.
D. vWF is stored in Weibel-Palade bodies (endothelial cytoplasmic granules).

ANSWER: C

3. Prothrombin time (PT) is prolonged in all of the following except?

A. Factor XII inhibition
B. Factor VII inhibition
C. Liver disease
D. Vitamin K deficiency
E. Factor X deficiency

ANSWER: A

4. Regarding hemophilia A and B, all of the following are correct except:

A. Prolonged aPTT not corrected by mixing patient's plasma with normal plasma
B. Both are X-linked recessive disorders.
C. Hemophilia A is the most common hereditary cause of serious bleeding.
D. Both present with identical clinical symptoms
E. Normal PT

ANSWER: A

HLS-Biochemistry Lecture 7

5. Hemophilia is characterized by all of the following EXCEPT:

A. Prolonged prothrombin time (PT)
B. Prolonged clotting time
C. Decreased clotting factors VIII, IX, or XI
D. Prolonged activated partial thromboplastin time (aPTT)
E. Hemarthrosis (joint bleeding)

ANSWER: A

6. What is the most common inherited coagulation/bleeding disorder**?

A. Hemophilia A
B. Von Willebrand disease
C. Hemophilia B
D. Factor V Leiden
E. Thrombocytopenia

ANSWER: B

7. Hemophilia A is caused by a deficiency of which clotting factor?

A. Factor V
B. Factor VII
C. Factor VIII
D. Factor IX
E. Factor X

ANSWER: C

8. Which condition leads to a deficiency in Factor IX that can be corrected by intravenous vitamin K?

A. Classic hemophilia
B. Hepatitis B
C. Bile duct obstruction
D. Genetic deficiency in Antithrombin III
E. Hemophilia C

ANSWER: C

9. In Hemophilia A, the X-linked recessive clotting disorder caused by Factor VIII deficiency, the most common mutations in the gene encoding for factor VIII causing the disorder are :

A. Nonsense mutations
B. Deletion mutations
C. Point mutations
D. Frameshift mutations
E. Missense mutations

ANSWER: E

HLS-Biochemistry Lecture 7

9. A 12-year-old male patient has suffered from a long history of bleeding for hours or days after the injury as well as recurrent painful haemarthroses. Which of the following are the correct laboratory test findings that consistent with this case?

a. Prolonged PT, PTT and BT.
b. Prolonged PTT and PT with normal BT.
c. Specific assay for factor IX or factor VIII above than 100 U/dl.
d. Prolonged BT, normal PT and PTT and platelet less than 100.000/mm3.
e. Prolonged PTT and normal PT and BT.

ANSWER: E

11. Which of the following would best explain a prolonged bleeding time test?

a. Hemophilia A
b. Hemophilia B
c. Thrombocytopenia
d. Coumarin use
e. Hemophilia C

ANSWER: C

12. Disseminated intravascular coagulation is a blood coagulation disorder that results in sudden widespread of fibrin thrombi in the microcirculation affecting the vital organs. Choose the wrong one?

a. It is secondary to other illnesses.
b. Associated with the release of thrombolastic substances from the involved organs.
c. Endotoxins and cytokines are apparent.
d. Protein C is inhibited.
e. Thrombomodulin expression is not suppressed on the endothelium.

ANSWER: E

13. Von Willebrand disease is one of the commonest blood coagulation disorders, it could be due to genetic or acquired causes. What is correct about the disease?

a. All mutations causing vWF disease are affecting quantitively the gene product
b. The mutations affecting vWF gene are associated with reduction of VIIa factor
c. There are some subtypes of one of the types of vWF disease.
d. The mutations affecting the gene encoding for vWF are not variable.
e. Medications are not inducing vWF disease

ANSWER: C

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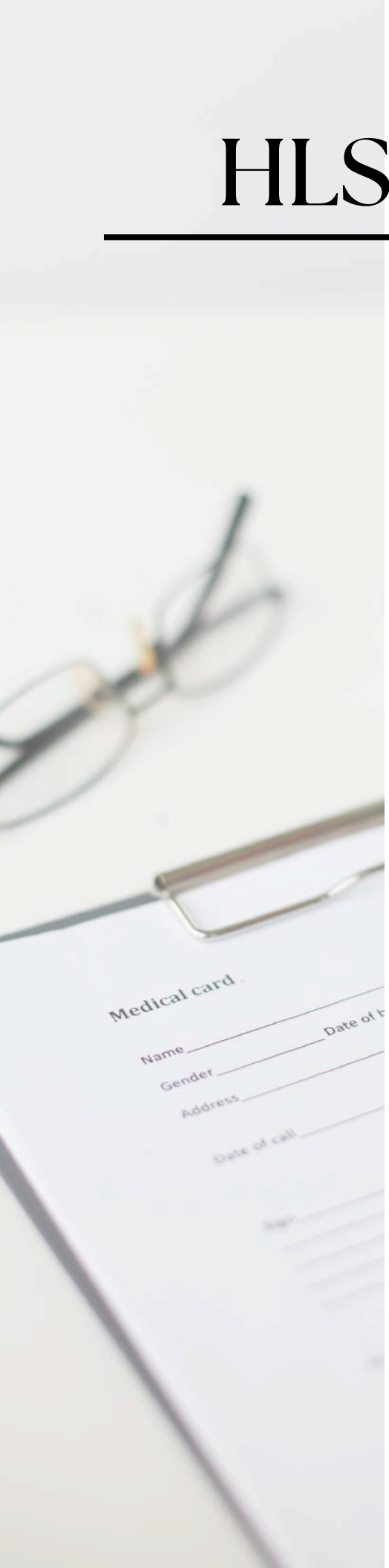

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Lecture 8

Plasma proteins

HLS-Biochemistry Lecture 8

1. Which proteins have anti-protease activity?

A) α1-antitrypsin and α2-macroglobulin
B) Albumin and transferrin
C) Ceruloplasmin and haptoglobin
D) CRP and β2-microglobulin

ANSWER: A

2. Which set of plasma proteins is formed of carbohydrate and protein moieties ?

A) Albumin & transferrin
B) Transferrin & haptoglobin
C) Haptoglobin & transthyretin
D) Haptoglobin & ceruloplasmin
E) Alpha-1 antitrypsin & ceruloplasmin

ANSWER: D

3. Which set of plasma proteins is a marker of multiple myeloma?

A) Haptoglobin & ceruloplasmin
B) Alpha-2 macroglobulin & Bence Jones proteins
C) Beta-2 microglobulin & paraproteins
D) Bence Jones proteins & haptoglobin
E) Cryoglobulin & transferrin

ANSWER: C

4. Which of the following is one of the largest plasma proteins?

A) Albumin
B) α2-Macroglobulin
C) Transferrin
D) Haptoglobin
E) Ceruloplasmin

ANSWER: B

5. What markers are used to diagnose testicular cancer and rheumatoid arthritis, respectively?

A) α-Fetoprotein and cryoglobulins
B) β2-Microglobulin and rheumatoid factor
C) C-reactive protein and ceruloplasmin
D) Haptoglobin and α1-antitrypsin

ANSWER: A

HLS-Biochemistry Lecture 8

6. Which markers are used to diagnose multiple myeloma and hepatoma, respectively?

A) Cryoglobulins & α-Fetoprotein
B) β2-Microglobulin & C-reactive protein
C) Bence Jones proteins & Ceruloplasmin
D) Paraproteins & Alkaline phosphatase

ANSWER: A

7. Which of the following diseases/disorders is commonly associated with polyclonal gammopathy?

A) Rheumatoid arthritis
B) Multiple myeloma
C) Smoldering myeloma
D) Monoclonal gammopathy of undetermined significance (MGUS)
E) Waldenström macroglobulinemia

ANSWER: A

8. Which main plasma protein primarily affects the osmotic pressure of plasma?

A) Gamma globulins
Your paragraph text
B) Albumin
C) Prothrombin
D) Fibrinogen
E) Alpha globulins

ANSWER: B

9. Protein electrophoresis shows a dense Alpha-2 globulin band. Which plasma proteins, when increased, cause this pattern?

A) Transcortin and haptoglobin
B) Ceruloplasmin and Alpha-2 macroglobulin
C) α-Fetoprotein and thyroid-binding protein
D) Polyclonal antibodies and transcortin
E) C-reactive protein and β-lipoprotein

ANSWER: B

10. The defensive function of plasma proteins is primarily due to which component?

A) Albumin
B) Globulins
C) Fibrinogen
D) Prothrombin
E) Both Albumin & Fibrinogen

ANSWER: B

11. Which plasma proteins can be used as biomarkers for the diagnosis of multiple myeloma?

A) β2-Microglobulin, paraprotein, and α-fetoprotein
B) α2-Macroglobulin, Bence Jones proteins, and β2-microglobulin
C) Bence Jones proteins, cryoglobulins, and paraprotein
D) β2-Microglobulin, α-fetoprotein, and α2-macroglobulin
E) α1-Antitrypsin, paraprotein, and C-reactive protein

ANSWER: C

12. Protein electrophoresis shows a dense Beta (β) globulin band. Which plasma proteins, when increased, cause this pattern?

A) Transcortin, haptoglobin, and ceruloplasmin
B) Transcortin, paraprotein, and alpha transcortin
C) α-Fetoprotein, transcortin, and thyroid-binding protein
D) Thyroid-binding protein, polyclonal antibodies, and α-fetoprotein
E) C-reactive protein, transferrin, and β-lipoprotein

ANSWER: E

13. What is the major component of the Alpha-2 (α2) protein fraction in plasma?

A) α1-Antitrypsin
B) Ceruloplasmin
C) Haptoglobin
D) α2-Macroglobulin
E) Transferrin

ANSWER: D

تم بحمد الله