METABOLISM

بسم الله الرحمن الرحيم

FINAL

Past Papers

﴿ وَإِن تَتَوَلَّوْا يَسْتَبْدِلْ قَوْمًا غَيْرَكُمْ ثُمَّ لَا يَكُونُوا أَمْثَالَكُم ﴾

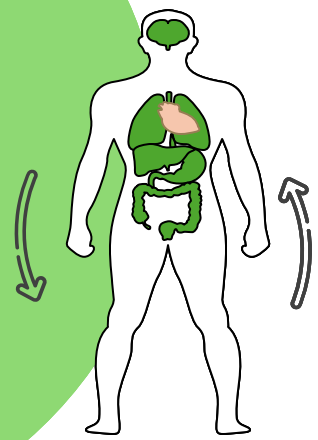
اللهم استعملنا ولا تستبدلنا

Written by:

- **Dema Aljaabari**
- **Hala Alka’abneh**
- **Layan Al-Amir**

Reviewed by:

- **Salwa Alawi**



Metabolism of Lipids: Absorption and Transport

Question 1

The fatty acid that has NO double bonds :

a) Palmitic acid
b) Myristic acid
c) Lauric acid
d) All of the above

Ans: d

Question 2

Which one of the following protein activates lipoprotein lipase

a) Apolipoprotein A-|
b) Apolipoprotein B-48
c) Apolipoprotein C-||
d) Cholesteryl ester transfer protein

Ans: c

Question 3

Glycerol after TAG hydrolysis?

a) is used in the liver and muscle for glycolysis
b) used to resynthesize fat in the liver
c) is used in the liver for gluconeogenesis
d) is metabolized in the kidney and excreted in the urine

Ans: c

Question 4

something true about lipoproteins

a) chylomicron has the lowest apolipoprotein percentage
b) chylomicron has the lowest TAG
c) HDL has the lowest apolipoprotein percentage

Ans: a

Question 5

Fastest lipoprotein to reach anode:

a) HDL
b) LDL
c) VLDL
d) IDL.

Why does HDL move the fastest?

HDL (High-Density Lipoprotein):

- It has the **highest protein content (about 50%)** and the lowest lipid content compared to other lipoproteins.
- This gives it the **highest charge-to-mass ratio**, allowing it to move the fastest towards the anode

Ans: a

Question 6

Apo-B100 is found only by itself in:

a) LDL
b) HDL
c) IDL
d) Chylomicrons

Ans: a

Question 7

The excess dietary carbohydrates are converted to TAGs and transported to cells by:

a) VLDL
b) HDL
c) IDL
d) Chylomicrons

Ans: a

Question 8

Lisophosphatidyl choline is produced from lecithin by the action of:

a) phospholipase D
b) phospholipase c
c) phospholipase A2
d) phospholipase B
e) ysophospholipase

lecithin (phosphatidylcholine) → lysolecithi (Lisophosphatidyl choline)
Phospholipid → lysophipholipid

Ans: c

Question 9

Glycerol is produced in the adipose tissue by hydrolysis of triacylglycerol. What happens to glycerol then?

a) It is phosphorylated in the adipose tissue to glycerol phosphate.
b) It is converted in the liver to 3 phosphoglycerate
c) It is converted in the muscle to phosphoenol pyruvate
d) It is converted in the muscle to glyceraldehyde 3-phosphate.
e) It is converted in the liver to dihydroxyacetone phosphate.

Ans: e

Question 10

Lecithin

a) A glycolipid
b) Also known as sphingomyelin
c) Present in the core of lipoprotein particles
d) Phosphatidyl choline
e) The precursor of inositol trisphosphate

Ans: d

Question 11

Which of the following statements regarding lipoproteins is correct:

a) LDL receptor binds Apo A1 in LDL which results in endocytosis
b) Chylomicrons have the lowest percentage of apolipoproteins
c) LDL is the source of Apo Cll needed for chylomicrons metabolism
d) Apo lipoprotein B48 is found in the newly synthesized HDL
e) The only apolipoprotein in LDL is ApoA1

Ans: b

Question 12

Glycerol is produced from hydrolysis of triacylglycerol in adipose tissue, later it is phosphorylated in :

a) The liver to be used as gluconeogenesis substrate
b) The liver by glycerol kinase and converted to acetoacetate
c) The adipose tissue by glycerol kinase and used for triacylglycerol synthesis when insulinis high.
d) The liver then enters glycolysis pathway
e) The liver followed by oxidation to 3 phosphoglycerate

Ans: a

Question 13

Which lipoprotein is synthesized in the liver and gets activated by the addition of apoC-ll?

a) LDL
b) VLDL
c) HDL
d) Chylomicron

Ans: b

Question 14

Which lipoprotein has the lowest density?

a) Low-density lipoprotein (LDL)
b) Very low-density lipoprotein (VLDL)
c) Chylomicron
d) High-density lipoprotein (HDL)

Ans: c

Question 15

NADPH is used in the following processes, except:

a) Glycolysis
b) glutathione reactions
c) Fatty acid synthesis
d) Cholesterol synthesis

Ans : a

Question 16

In celiac disease the affected enzyme is :

a) Lactase
b) Transglutaminase
c) Lipase
d) Protease

Ans: b

Question 17

What is the function of cholecystokinin (CCK)?

a) Deactivates pancreatic enzymes
b) increases GIT motion
c) Deactivates lingual enzymes
d) Induces gallbladder to release bile acids
e) Proteolytically activates digestive enzymes

Ans: d

Important information:

All fat-soluble vitamins are carried in chylomicrons

Question 18

What is important for lipoprotein lipase function?

a) Apo B-100
b) Apo c
c) Apo D
d) Apo A-|

Ans : b

Question 19

true or false: Bile salts inhibit cholesterol esterase?

a) True
b) False

Ans: a

Degradation of Fatty Acids

Question 1:

True about hormone sensitive lipases:

a. Inhibited by phosphorylation

b. Activated by phosphatases

c. Phosphodiesterase inhibitors maintain the active form

d. They are released by the pancreas

Ans:C

Question 2:

Regarding the product in the following figure, which of the following will be used in the next reaction?

a. CoA

b. H2O

c. FAD

d. NAD+

Ans:B

Question 3:

Which of the following is used in the oxidation of very long fatty acid and not in long or short chain fatty acids?

a. NAD+

b. FAD

c. H_2O

d. O_2

Ans:D

Question 4:.

A coenzyme derived from Vitamin B12 is needed for?

a. Synthesis of D-Methylmalonyl CoA

b. Formation of Guanidinoacetate

c. Decarboxylation of Uroporphyrinogen III

d. Proprionyl CoA metabolism

Ans:D

Question 5:

What inhibits carnitine shuttle?

a. Malonyl coA

b. Acyl CoA

c. Acetyl CoA

d. Acetoacetate

Ans:A

Question 6:

Glycerol after TAG hydrolysis?

a. is used in the liver and muscle for glycolysis

b. used to resynthesize fat in the liver

c. is used in the liver for gluconeogenesis

d. is metabolized in the kidney and excreted in the urine

Ans:C

Question 7:

Which of the following is used in the step that introduces double bond in the fatty acid during B-oxidation?

a. NAD+

b. NADP

c. H_2O

d. FAD

Ans:D

Question 8:

Second substrate for thiolase :

a. ATP

b. H_2O

c. O_2

d. Coenzyme A

Ans:D

Question 9:

Right about the conversion from hydroxy acyl coA to ketoacyl coA:

A- Requires NAD+.

B-The enzyme that involved is enoyl-coA hydratase

C- It’s an hydration process

Ans:A

Question 10:

methymalnoyl CoA to succinyl CoA requires:

a- racemase

b- biotin

c-vit B12

d- TPP

Ans:C

Question 11:

What inhibits carnitine shuttle?

a. Malonyl coA

b. Acyl CoA

c. Acetyl CoA

d. Acetoacetate

Ans:A

Question 12:

Glycerol after TAG hydrolysis:

a. is used in the liver and muscle for glycolysis

b. used to resynthesize fat in the liver

c. is used in the liver for gluconeogenesis

d. is metabolized in the kidney and excreted in the urine

Ans:C

Question 13:

Enhance of long chain fatty acyl CoA across IMM is inhibited by :

a.Methyl malonyl CoA

b.Propionyl CoA

c.Malonyl CoA

d.Succinyl CoA

e.Acetyl CoA

Ans:C

Question 13:

The reaction that convert Malonyl CoA to Acetyl CoA:

a.requires energy

b.is the rate limiting step in cholesterol biosynthesis

c.is inhibited by citrate

d.requires vitamin B12

e.is activated by phosphorylation

Ans:A

Question 16:

The enzyme that introduces a double bond in fatty acid in ß oxidation requires:

a. FAD.

b. ATP.

c. NADH.

d. NAD +.

e. 02.

Ans:A

Question 17:

A coenzyme produced from vitamin B12 is required in:

a. In production of phosphatidyl choline from phosphatidyl ethanolamine.

b. Carboxylation of propionyl COA to methylmalonyl COA.

c. The metabolism of propionyl COA produced from fatty acids with odd number of carbon atoms.

d. In using ketone bodies as a source of energy in the muscle.

e. In production of succinyl COA from succinate in the muscle.

Ans:C

Question 18:

Why are MCFA less efficient (produce less ATP) than LCFA?

Answer: They have less carbons

Question 19:

Propionyl coA is converted to which of the following when oxidizing oddnumbered fatty acid?

Answer: Succinyl CoA

Question 20:

In peroxisomal beta oxidation of VLCFA, FAD is regenerated via ?

Answer: Peroxisomal membrane oxidase enzyme

Question 21:

How many ATP molecules result from the oxidation of (18) carbon fatty acid?

A) 148

B) 184

C) 146

D) 180

Ans:C

Question 22:

Which disease pair from the following is correct:

A) MCAD - severe hypoglycemia & hypoketonemia

B) Fabry - β hexosaminidase A

C) Gaucher - α galactosidase

D) Niemann-Pick - β glucosidase

Ans:A

Question 23:

What is transport by Carnitine shuttle?

A) Long chain fatty acyl CoA

B) Medium chain fatty acids

C) Short chain fatty acid

Ans:A

Question 24:

What do we use in beta oxidation?

Answer: NAD+

Question 25:

Loss of electrons due to FADH2 production occur during the oxidation of:

A. Odd numbered FA

B. Monosaturated FA

C. Polyunsaturated FA

D. Very Long chain FA E. Esterified fatty acids

Ans:D

Question 26:

B12 deficiency leads to accumulation of:

A. Odd numbered FA

B. Branched chain FA

C. Polyunsaturated FA D. Even numbered FA

E. None of the above

Ans:A

Question 27:

Not true regards to MCFA:

Answer: should be avoided in case of CPTII deficiency

Synthesis of Fatty Acids

Question 1:

To synthesize a 6 carbon fatty acid :

a. 1 malonyl CoA ,4 NADPH ,2 acetyl CoA

b. 1 malonyl CoA ,2 NADPH ,2 acetyl CoA

c. 2 malonyl CoA ,3 NADPH ,1 acetyl CoA

d. 2 malonyl CoA ,4 NADPH ,1 acetyl CoA

Ans:D

Question 2:

Which of the following enzymes catalyzes the production of NADPH used in the synthesis of fatty acids?

a. Aconitase

b. Cytosolic malate dehydrogenase

c. Citrate synthase

d. Pyruvate dehydrogenase

Ans:B

Question 3:

At the condensation step (malonyl CoA & acetyl CoA) in the fatty acid synthesis the following result is:

A- release of CO_2

B-require CO_2

C-Forming NADPH

D-produce hexoacyl-ACP

Ans:A

Question 4:

The step required to activate\start TAG synthesis?

A- activation of fatty acids by addition of CoA.

B-forming DHAP

Ans:A

Question 5:

True about TAG synthesis:

A-DHAP is reduced to glycerol phosphate in adipose tissue

B-Glycerol kinase play important role

C-It’s not a hormone sensitive process

D-Phosphatidate is not on the pathway of TAG synthesis

Ans:A

Question 6:

True about acetyl coA carboxylation:

a- don’t require ATP

b- exergonic

c- require ATP

d- B+C

Ans: C

Question 7:

TAG is produced in adipose tissue, which is true ?

a- needs NADPH

b- needs glycerol kinase

c- needs active glycolysis

d- b+c

Ans:C

Question 8:

butyric acid is formed by synthase by which of the following :

a- oxidation of long fatty acid

b- condensation of malonyl and acetyl

Ans:B

Question 9:

Pantothenic acid is found in the structure of?

a. NADP

b. FMN

c. ACP

d. NAD+

Ans:C

Question 10:

One of the following is required for synthesis of CoA:

a) Biotin

b) Riboflavin

c) Thiamine

d) Pantothenic acid

e) Niacin

Ans:D

Question 11:

Pantothenic acid is a vitamin of B group . It is required for the synthesis of :

a.FMN

b.NADH

c.Coenzyme A

d.NADPH

e.FAD

Ans:C

Question 12:

Which of the following produces NADPH :

a.Malic enzyme

b.cytosolic pyruvate dehydrogenase

c.mitochondrial isocitrate dehydrogenase

d.glutathione peroxidase

e.lactate dehydrogenase

Ans:A

Question 13 :

Fatty acid elongation in the mitochondria: Source of carbon?

Ans:Acetyl CoA

Question 14:

What we need for TAG synthesis?

A) Glycerol-1phosphate by Glycerol kinase in adipocyte

B) Fatty acids by acetyltransferase

Ans:B

Question 15:

What we need to make a fatty acid of 14 carbon?

Answer: 6 malonyl COA, 1 acetyl COA and 12 NADPH

Question 16:

condensation of malonyl CoA by 3-ketoacyl ACP, driven by?

Answer: 3-Ketoacyl–ACP synthase

Question 17:

Condensation reaction results in:

Answer: decarboxylation of malonyl CoA

Question 18:

-Further elongation of FA can occur in?

A.Cytosol

B.Mitochondria

C.Peroxisome

D.Mitochondria + ER

E.Mitochondria + ER + peroxisome

Ans:D

Metabolism of Glycerophospholipids

Question 1:

Produces diacyl glycerol and inositol 3 phosphate from PIP2

a- phospholipase b

b- phospholipase d

c- phospholipase a

d- phospholipase c

Ans:d

Question 2:

Phosphatidyl serine is produced from phosphatidylethanolamine by:

a- carboxylation

b- decarboxylation

c- methylation

d- polar head exchange

e- more than one of the above

Ans:d

Question 3:

Phosphatidylcholine is formed from?

A- phosphatidylethanolamine+ 3 SAM.

B- CDP-DAG + cholin

C- CMP+ phosphocholin

Ans:A

Question 4:

The common intermediate for triacylglycerol and phospholipids synthesis is:

A-phosphatidic acid.

B-cholic acid

C-lysophosphotidic acid

D-archadionic acid

Ans:a

Question 5:

Lysophosphatidyl choline is produced from lecithin by the action of

a) phospholipase D

b) phospholipase C

c) phospholipase A2

d) phospholipase B

e) ysophospholipase

Ans: c

Question 6:

Phosphatidylserine is produced from phosphatidylethanolamine by:

a) A carboxylation reaction.

b) A decarboxylation reaction.

c) A reaction that requires the transfer of a one-carbon group from folic acid.

d) An exchange of the polar head group.

e) An isomerization reaction.

Ans:d

Question 7:

(Lecithin + H_2O → Diacylglycerol + X). What is the enzyme and what is substance X in this reaction?

- a) Phospholipase A1 and Phosphorylcholine, respectively.
- b) Phospholipase A1 and Phosphorylethanolamine, respectively.
- c) Phospholipase A2 and Phosphorylcholine, respectively.
- d) Phospholipase A2 and Inositoltrisphosphate, respectively.
- e) Phospholipase C and Phosphorylcholine, respectively.

Ans: e

Question 8:

Lecithin is:

a. A glycolipid.

b. Also known as sphingomyelin.

c. Present in the core of lipoprotein particles.

d. Phosphatidyl choline.

e. The precursor of inositol trisphosphate.

Ans:d

Question 9:

The generation of phosphatidylcholine from phosphatidylserine is:

a. Directly catalyzed by phosphatidyltransferase

b. Mediated by phosphatidylethanolamine as an intermediate

c. A one-step reaction requiring S-adenosylmethionine (SAM)

d. Accomplished through the salvage pathway of sphingomyelin

e. Independent of any intermediate molecule

Ans:b (indirectly!)

Question 10:

Glucocorticoids play a crucial role in fetal lung development by:

a. Suppressing genes involved in surfactant synthesis to prevent premature lung function

b. Inducing the expression of phospholipase A2, which is directly responsible for surfactant production

c. Enhancing the activity of enzymes like choline acetyltransferase for surfactant assembly

d. Inducing the expression of genes involved in surfactant synthesis, including surfactant protein genes

e. Promoting collagen synthesis to improve lung compliance indirectly

Ans:d

Question 11:

One of the following enzymes plays a role in producing second messengers:

A) Phospholipase A2

B) Phospholipase D

C) Phospholipase A1

D) Phospholipase C

Ans:D

Question 12:

Which of the following processes is responsible for the production of phosphatidylethanolamine?

A) Decarboxylation of phosphatidylserine
B) Methylation of phosphatidylserine
C) Phosphorylation of phosphatidylcholine
D) Hydrolysis of phosphatidylinositol

Ans:a

Question 13:

Which of the following pathways is involved in the synthesis of cardiolipins?

A) Activation of both DAGs by CDP

B) Activation of a DAG by CDP and another by phosphate

C) Activation of both DAGs by ATP

D) Activation of one DAG by CDP and one by CMP

Ans: B

Question 14:

Which of the following phospholipids is an intermediate in the synthesis of triacylglycerol (TAG)?

A) Phosphatidylethanolamine

B) Phosphatidic acid

C) Phosphatidylserine

D) Cardiolipin

Ans:b

Question 15:

Which of the following molecules is responsible for converting phosphatidylcholine (PC) to phosphatidylethanolamine (PE) in lipid metabolism?

A) SAM (S-adenosylmethionine)

B) NADPH

C) ATP

D) Coenzyme A

Ans:a

Question 16:

Which of the following molecules is involved in the activation of choline for the synthesis of phosphatidylcholine?

A) UMP
B) UDP
C) ATP
D) NADPH

Ans: b

Question 17:

Other than emulsification of lipids, what function do bile salts have?

A) Activating phospholipase A

B) Inhibiting lipase activity

C) Stimulating triglyceride synthesis

D) Inactivating pancreatic amylase

Ans:a

Metabolism of Sphingolipids

Question 1:

Needed to synthesize sphingomyelin from ceramide?

a. Phosphocholine

b. UDP-choline

c. Phosphatidylinositol

d. lecithin

Ans:d

Question 2:

Second substrate for thiolase

a. ATP

b. H_2O

c. O_2

d. Coenzyme A

Ans:d

Question 3:

Tay sach’s disease leads to the accumulation of:

a. Gangliosides

b. Lecithin

c. Sphingomyelin

d. Cerebrosides

Ans:A

Question 4:

Amide group in ceramide comes from:

a- serine

b- phosphatidyl choline c-sphingomylein

d- glutamine

e- glutamate

Ans:a

Question 5:

What is used to catalyze the degradation of sphingomyelin into ceramide and phosphocholine?

a. Phospholipase C

b. Phospholipase A

c. Phospholipase B

d. Phospholipase D

Ans: a

Question 6:

What are the reactant A and the product B in the following reaction

Ceramide + A --> sphingomyelin + B+

a) **UDP-choline** and **UMP**

b) **CDP-choline** and **CMP**

c) **Acyl CoA** and **COA**

d) **UDP choline** and **UDP**

e) **Phosphatidyl choline** and **diacylglycerol**

Ans:e

Question 7:

Conversion of ceramide to sphingomyelin requires:

a) Lecithin

b) NADPH and O_2

c) Diacylglycerol

d) CDP choline

e) S-adenosyl methionine

Ans: a

Question 8:

The reaction of lactosyl and ceramide produces:

a. Ganglioside

b. Globoside

c. Cerebroside

d. Sulfatide

e. Phosphatidylcholine

Ans:b

Question 9:

A defect in neuraminidase enzyme leads to the accumulation of:

a. Cerebroside

b. Sulfatide

c. Ganglioside

d. Globoside

e. Phosphatidylserine

Ans:c

Question 10:

The synthesis of sphingomyelin involves the transfer of a head group from which of the following sources?

a. CDP-choline via the Kennedy pathway, catalyzed by sphingomyelin synthase

b. Ceramide phosphorylcholine, formed from ceramide and S-adenosylmethionine

c. Phosphatidylcholine, with diacylglycerol (DAG) as a byproduct

d. Sphingosine-1-phosphate after hydrolysis of the phosphate group

e. Phosphatidylserine, through sequential methylation reactions

Ans:c

Question 11:

Which disease pair from the following is correct:

A) MCAD - severe hypoglycemia & hypoketonemia

B) Fabry - β hexosaminidase A

C) Gaucher - α galactosidase

D) Niemann-Pick - β glucosidase

Ans:A

Question 12:

sphingosine can result from:

A) Palmitoyl COA + serine

B) Palmitoyl COA + alanine

C) Serine +alanine

D) Palmitoyl COA + threonine

Ans:A

Question 13:

Niemann-Pick disease occurs due to the accumulation of which of the following substances?

A) Galactocerebroside

B) Cholesterol

C) Glycogen

D) Sphingomyelin

Ans:d

Question 14:

Which of the following statements is **NOT** true about sphingolipidoses?

A) They are high in Jewish populations

B) They exhibit extensive phenotypic variability

C) They involve the accumulation of sphingomyelin

D) They are caused by defects in lysosomal enzymes

Ans:c

Question 15:

A deficiency of the ceramidase enzyme leads to the accumulation of which of the following substances?

A) Sphingomyelin

B) Cholesterol

C) Ceramide

D) Galactocerebroside

Ans:c

Ketogenesis

Question1:

Relative or absolute lack of insulin in humans would result in which one of the following reactions in the liver?

a. Decreased activity of hormone-sensitive lipase

b. Decreased gluconeogenesis from lactate

c. Decreased glycogenolysis

d. Increased formation of 3-hydroxybutyrate

Ans: d

Question 2:

One of the following increases ketone bodies synthesis:

a. High free fatty acids concentration in the blood

b. Low blood levels of Glucagon

c. Inhibition of beta oxidation

d. Inhibitions of hormone sensitive lipases

Ans:A

Question 3:

True about using acetoacetate as a source of energy:

a. Utilizes succinly CoA

b. Occurs in the cytosol

c. Occurs when oxaloacetate is depleted

d. Occurs in the liver and in red blood cells

Ans: C

Question 4:

in the final step of ketone body synthesis the products are

acetoacetate and ?

a- DHAP

b- acetone

c- 3-hydroxybutyrate

d- acetyl CoA

Ans:D

Question 5:

What happens in both type 1 and type 2 diabetes?

a. Ketoacidosis

b. Hyperglycemia

c. High HDL/LDL ratio

d. Hypo-triacylglycerolemia

Ans: b

Question 6:

Which of the following statements about glucagon is correct?

a. High levels of blood glucose increase the release of glucagon from the α cells of the pancreas

b. Glucagon levels decrease following ingestion of a protein-rich meal

c. Glucagon increases the intracellular levels of cAMP in liver cells, causing an increase in glycogenolysis

d. Glucagon is the only hormone important in combating hypoglycaemia

e. Glucagon depresses the formation of ketone bodies by the liver

Ans:c

Question 7:

The use of 3-hydroxybutyrate as a source of energy:

a) Occurs in the brain during prolonged fasting

b) Starts with cleaving it into two acetate molecules

c) Can occur in the absence of oxaloacetate

d) Is observed in the liver during prolonged fasting

e) Starts by conversion to acetoacetate in an isomerization reaction

Ans: a

Question 8:

Which of the following serves as a common intermediate in the synthesis of both cholesterol and ketone bodies?

a. Acetoacetate

b. Mevalonate

c. Squalene

d. HMG CoA

e. Acetyl CoA

Ans:d

Question 9:

The rate limiting step of ketogenesis:

A) HMG CoA synthase

B) Thiolase

C) HMG CoA lyase

D) 3-Hydroxy butyrate dehydrogenase

Ans:a

Question 10:

Using acetoacetate as a source of energy…

a. utilizes succinyl COA to produce acetoacetyl COA.

b. starts with cleaving it into two acetate molecules.

c. can occur in the absence of oxaloacetate.

d. is observed in the liver during prolonged fasting.

e. requires COA and acetoacetate COA synthase.

Ans:

Question 11:

The most often finding in untreated patients with type 1 and type 2 diabetes is:

a. Ketoacidosis

b. Low levels of insulin synthesis and secretion

c. Insulin molecules with an abnormal primary sequence

d. Hyperglycemia

e. Overactivated glycolysis

Ans:d

Question 12:

During the fasting state, which of the following processes would be initiated?

A) Glycogenesis
B) Gluconeogenesis
C) Ketogenesis
D) Lipogenesis

Ans:c

Question 13:

Which of the following enzymes is responsible for the inability of the liver to use ketone bodies?

A) Thiolase

B) Thiophorase

C) Acetyl-CoA carboxylase

D) HMG-CoA reductase

Ans: b

Question 14:

What is the normal ratio of 3HB to AcAc in the blood?

A) 1:1

B) 2:1

C) 3:1

D) 1:2

Ans:a

Question 15:

In type 1 diabetes, ketosis occurs due to which of the following reasons?

A) Increased glycolysis and glucose oxidation
B) Decreased beta oxidation of fatty acids
C) Increased beta oxidation of fatty acids into 3HB and ACAC
D) Increased amino acid metabolism

Ans:c

Cholesterol Metabolism

Question 1:

Statin drugs act on:

a- inhibits reabsorption

b- HMG CoA reductase

c- bind to bile acid

Ans:b

Question 2:

Albumin binds all of the following except

a. Free fatty acids

b. Steroid hormones

c. Conjugated billirubin

d. Ca+2

Ans: c

Question 3:

Familiar hypercholestrolemia involves a deficiency in:

a. HMG-CoA reductase

b. Uptake of HDL by the liver

c. Synthesis of cholesterol

d. LDL endocytosis

Ans:

Question 4:

Atorvastatin is a drug from the statin family; it lowers the plasma cholesterol level by inhibiting the step that produces:

a) squlaene epoxide.

b) isopentenyl pyrophosphate

c) squalene

d) HMG COA

e) Mevalonate

Ans:e

Question 5:

Familial hypercholesterolemia results from

a) overproduction of VLDL

b) decrease in the rate of cholestrol degradation

c) decrease in the rate of conversion of cholesterol to bile acids

d) defect or absence of LDL receptor

e) defect or deficiency of the enzyme that inhibits the enzyme that catalyzes the rate lim cholesterol synthesis

Ans:d

Question 6:

Arrange the following intermediates in cholesterol synthesis in the proper order:

1. HMG COA
2. Squalene
3. geranyl pyrophosphate
4. isopentyl pyrophosphate

Options:

a) 1 > 2 > 3 > 4

b) 2 > 3 > 4 > 1

c) 1 > 3 > 2 > 4

d) 1 > 4 > 3 > 2

Ans:d

Question 7:

What is the type of the reaction that produces mevalonate in the cholesterol synthesis pathway?

a) Dehydration reaction

b) Oxidation-reduction reaction

c) Isomerization reaction

d) Decarboxylation reaction

e) Carboxylation reaction

Ans: b

Question 8:

Sitosterolemia is a condition primarily related to:

a. Cholesterol absorption in the liver

b. Cholesterol efflux in the intestines

c. Bile acid synthesis in the liver

d. Triglyceride breakdown in adipose tissue

e. Lipoprotein formation in the bloodstream

Ans:b

Question 9:

Which of the following enzymes is inhibited by cholesterol?

A) HMG-CoA reductase
B) Phospholipase A2
C) Acetyl-CoA carboxylase
D) Fatty acid synthase

Ans:a

Question 10:

Which of the following is the first ring structure in the cholesterol synthetic pathway?

A) Squalene

B) Lanosterol

C) Cholestanol

D) Geranylgeranyl pyrophosphate

Ans:b

Question 11:

During the synthesis of cholesterol, hydrophobic intermediates are handled by:

A. A carrier

B. A protein

C. Hydrophobic cluster

D. None of the above

Ans: A+B

Question 12:

How much ATP is needed to make squalene.

A) 6

B) 5

C) 27

D) 30

E) 18

Ans: E

Metabolism of Eicosanoids

Question 1:

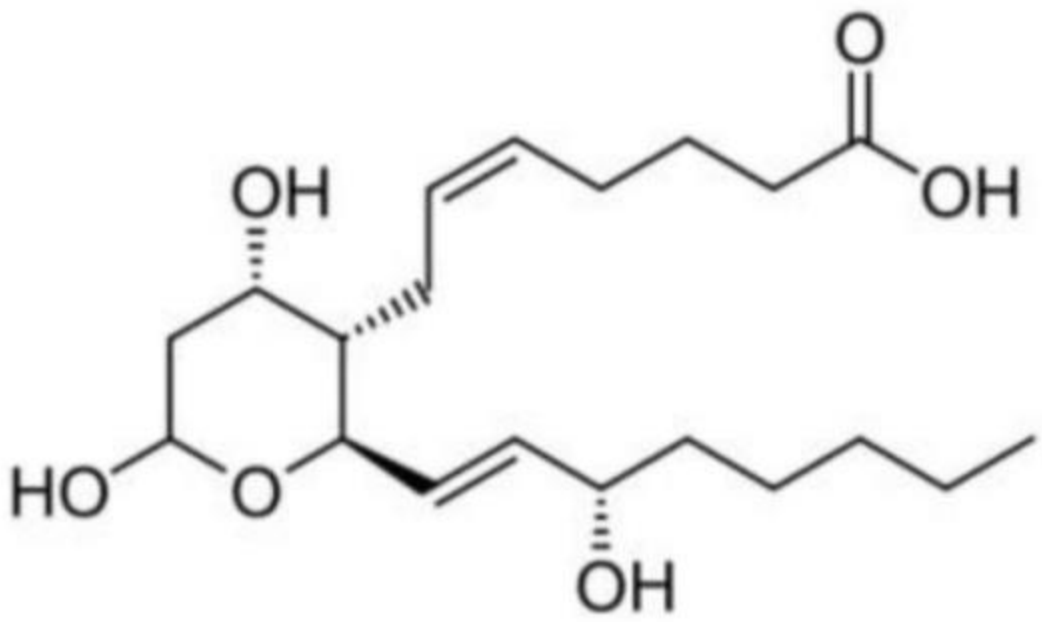
The following figure represents the structure of?

a. Prostaglandin I3

b. Prostaglandin G2

c. Thromboxane B2

d. Leukotriene B4



Ans:c

Question 2:

Aspirin inhibits the production of?

a. prostaglandins

b. thromboxanes

c. Leukotrienes

d. A+B

e. A + C

Ans:b

Question 3:

The rate-limiting step in prostaglandin synthesis is catalyzed by

a) peroxidase

b) oxygenase

c) phospholipase A2

d) cyclooxygenase

e) PGG synthase

Ans:c

Question 4:

TXA2:

a) Has 2 double bonds.

b) Is a stable, long-lived molecule.

c) Acts as a potent vasodilator.

d) Reduces platelet aggregation.

Ans:a

Question 5:

Aspirin is taken daily in low dose to decrease blood clotting; it acts by inhibiting:

A. Phosphodiesterase

B. HMG CoA reductase

C. Cyclooxygenase

D. Phospholipase A2

E. Protein kinase A

Ans:c

Question 6:

Which of the following statements about COX-1 and COX-2 is true?

a) COX-1 is inducible, while COX-2 is constitutive.

b) COX-1 is found in most places.

c) COX-1 is inhibited by aspirin, but COX-2 is not.

d) COX-2 is primarily responsible for the production of protective prostaglandins in the stomach.

Ans:b

Question 7:

Synthesis of which of the following is not affected by glutathione?

A) Prostaglandins

B) Prostacyclins

C) Thromboxane

D) Leukotriens

E) Lipoxins

Ans:e

Question 8:

Arachidonic acid is not the precursor of:

A) Lipoxins.

B) Leukotriens.

C) Thromboxane.

D) Prostacyclins.

E) None of the above.

Ans:e

Question 9:

When aspirin acetylates COX2, it will produce?

A) Prostaglandins.

B) Prostacyclins.

C) Thromboxanes.

D) Lipoxins.

Ans:d
this question is probably not included !

Lipid Metabolism

- *Which of the following statements regarding prostaglandin E2 is correct*
- *A. it is a dicarboxylic acid*
- *B. its structure contains five membered ring*
- *C. it is the parent compound of other prostaglandins*
- *D. it has a net zero charge at pH 7*
- *E. it contains an amino group*
- *Answer: B*

- *Which of the following statements regarding introduction of double bond at carbon 9 of palmitic acid is correct*
- *A. O2 and NADH are needed*
- *B. is accompanied by reduction of FAD*
- *C. produces omega-6 fatty acid*
- *D. is catalyzed by acyl CoA dehydrogenase*
- *E. produces oleic acid*
- *Answer: A*

- *Synthesis of palmitic acid from acety-Co requires*
- *A. bicarbonate for conversion of acetyl CoA to malonyl COA*
- *B. 8 molecules of water*
- *C. 16 molecules of NADPH*
- *D. 7 NADH and 7 FADH2*
- *E. 8 ATP*
- *Answer: A*

- *Arrange the following intermediates of cholesterol synthesis pathway in the correct order: I. Mevalonate, 2. Lanosterol, 3. HMG CoA, 4. Squalene*
- *A. 1 > 3 > 4 > 2*
- *B. 3 > 1 > 4 > 2*
- *C. 3 > 4 > 2 > 1*
- *D. 1 > 2 > 3 > 4*
- *E. 1 > 3 > 2 > 4*
- *Answer: B*

- *Which of the following statements regarding the production of acetoacetate from acety- CoA is correct?*
- *A. three moles of Coenzyme A are produced per one mole of acetoacetate*
- *B. occurs when oxaloacetate level is high in the cell*
- *C. acetone is an intermediate*
- *D. the process occurs in the mitochondria of liver cells*
- *E. is active in the presence of high insulin/ glucagon ratio*
- *Answer: D*

- *The reaction catalyzed by ceramidase produces*
- *A. sphingosine*
- *B. sphingomyelin*
- *C. phosphocholine*
- *D. ganglioside*
- *E. cerebroside*
- *Answer: A*

- *Inositol trisphosphate is produced from Phosphatidyl inositol bisphosphate in a reaction catalyzed by…*
- *A. Phospholipase A2*
- *B. Phospholipase C*
- *C. Lipoprotein lipase*
- *D. Inositol bisphosphate kinase*
- *E. Acetyicholine esterase*
- *Answer: B*

- *When lipoproteins are separated by electrophoresis, the fastest class in moving towards the anode is*
- *A. Chylomicrons*
- *B. IDL*
- *C. HDL*
- *D. VIDI*
- *E. LDL*
- *Answer: C*

- *Enoyl Co isomerase*
- *A. is required in the oxidation of fatty acids with odd number of carbons*
- *B. catalyzes an irreversible reaction*
- *C. is required for oxidation of unsaturated fatty acids*
- *D. is a cytosolic enzyme*
- *E. catalyzes a rate limiting step in oxidation of fatty acid*
- *Answer: C*

- *Statin is a drug used for losing weight, it inhibits the step that produces which of the following products*
- *A. HMG CoA*
- *B. Mevalonate*
- *C. Acetyl CoA*
- *D. Propionyl CoA*
- *Answer: B*

- *Which of the following is used in the oxidation of very long fatty acid and not in long or short chain fatty acids*
- *A. NAD+*
- *B. FAD*
- *C. H2O*
- *D. O2*
- *Answer: D*

- *Synthesis of TAG in adipose tissue requires*
- *A. Active glycerol kinase X*
- *B. Isomerization of DHAP*
- *C. Phosphorylated hormone sensitive lipase*
- *D. Active gluconeogenesis*
- *E. Insulin*
- *Answer: E (Old questions)*

- *Lactating mammary glands produce short chain fatty acids. » Production of fatty acid with 4 carbons by fatty acid synthase requires (...) acetyl COA, (...) malonyl COA and (...) NADPH*
- *A. 2, 1 and I*
- *B. 1, 2 and 4*
- *C. 0, 2 and 4*
- *D. 1, 1 and 2*
- *E. 2, 0 and 2*
- *Answer: D*

- *Succinyl CoA is produced from the end product of oxidation of*
- *A. ethanol*
- *B. polyunsaturated fatty acids*
- *C. very long chain fatty acids*
- *D. monounsaturated fatty acids*
- *E. fatty acids with odd number of carbon atoms*
- *Answer: E*

- *The reaction that produces cholesterol ester from free cholesterol in the plasma occurs in..*
- *A. Chylomicrons*
- *B. HDL*
- *C. VLDL*
- *D. LDL particles*
- *E. Chylomicron remnants*
- *Answer: B*

- *(X -› Oleic acid). What is the substrate X in this reaction that is catalyzed by 9 Desaturase*
- *A. palmitoleic acid*
- *B. linoleic acid*
- *C. linolenic acid*
- *D. palmitic acid*
- *E. stearic acid*
- *Answer: E*

- When oleic acid, 18:1(9), is desaturated at carbon 6 and then elongated, what is the product?
- A. 19:2(7,9)
- B. 20:2 (n-6)
- C. 20:2(6,9)
- D. 20:2(8,11)
- Answer : D

For any feedback, scan the code or click on it.

Corrections from previous versions:

Versions	Slide # and Place of Error	Before Correction	After Correction
V0 → V1			
V1 → V2			

Additional Resources:

رسالة من الفريق العلمي:

لا اله إلا أنت سبحانك إني كنت من الظالمين

سبحان الله وبحمده، سبحان الله العظيم