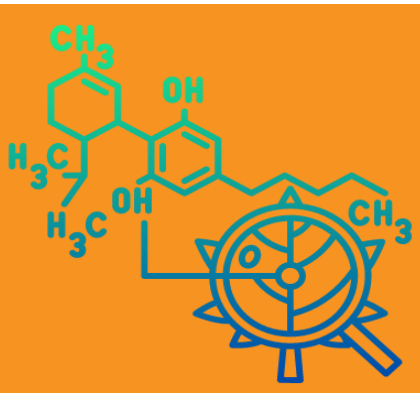
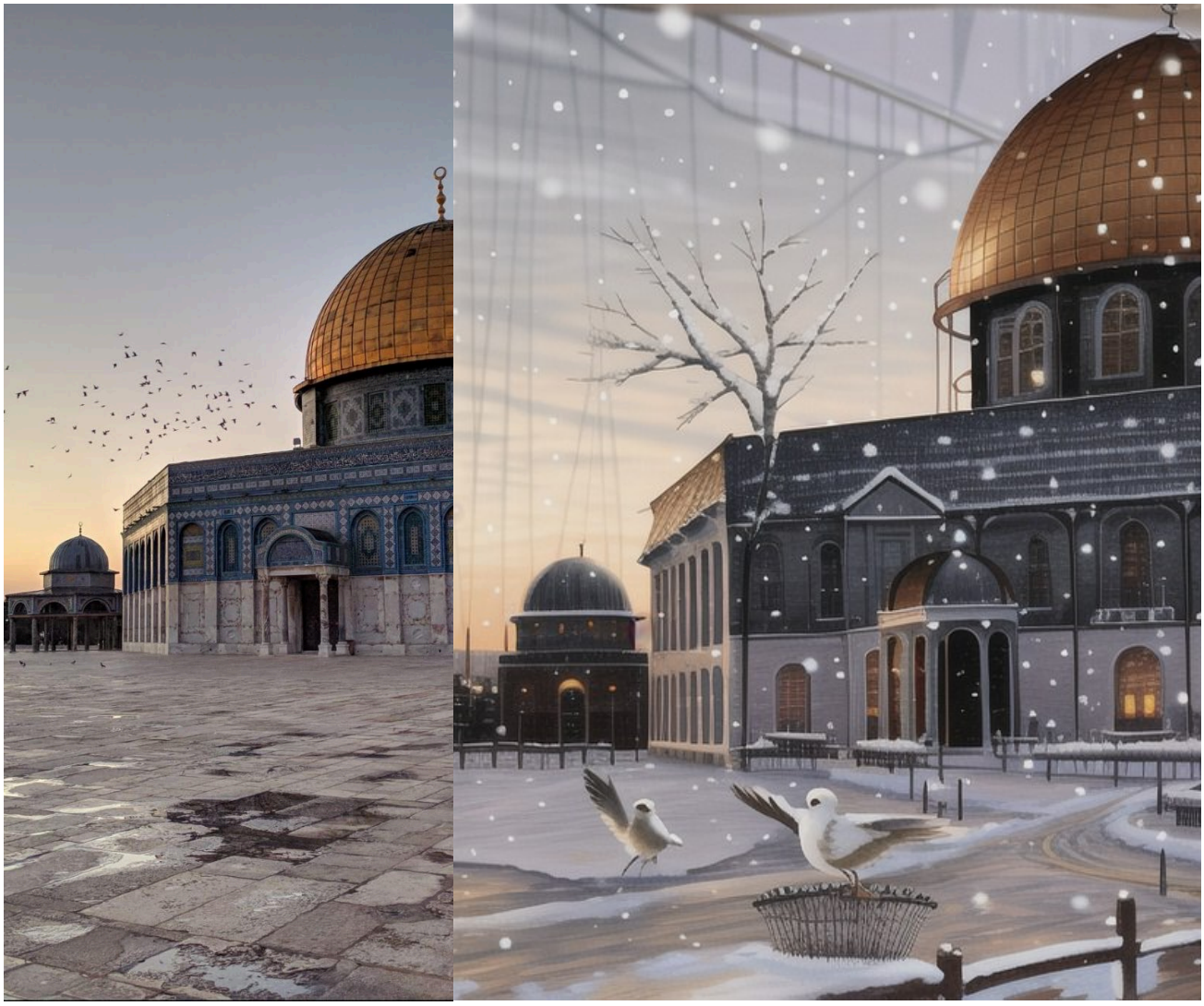


2022
TEST BANK

METABOLISM

WRITTER BY
OK TEAM



TEST BANK

Metabolism, this question could be from past paper or suggested questions

By **OK TEAM**

Omar Khaled Team

OUR COLLAGE BY SMART AI

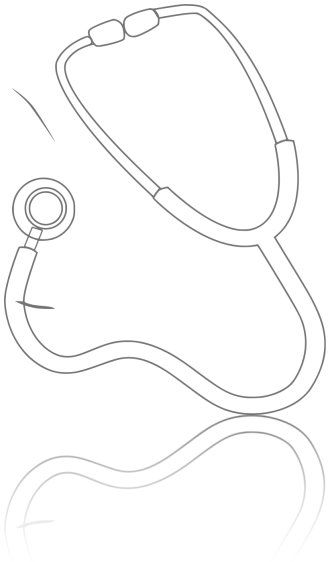
بِسْمِ اللَّهِ الرَّحْمَٰنِ الرَّحِيمِ

I wish to express my profound gratitude and benevolence to the Future doctors who were the inspiring force in making this test bank a reality.

NOTE WHERE YOU SEE WORD COLORED WITH THIS COLOR,COLOR YOU CAN CLICK IT AND IT GET YOU INTO REQUESTED PAGE,DOCTOR SLIDE.

CONTENT

LIPID ABSORPTION & TRANSPORT [DOCTOR SLIDE]



Q1: plasma lipid can be found as:[1]
- A. Lipoprotein[HDL,LDL,VLDL,etc].
- B. Free FA on Albumin.
- C. Steroid hormones.
- D. Sphingolipid.
- E. All of the above.

Q2: Deficiency (or imbalance) of lipid metabolism can cause:[2]
- A. Diabetes.
- B. Obesity.
- C. Atherosclerosis.
- D. None of the above.
- E. All of the above.

Q3:which one is other name for Free FA:[3]
- A. Phospholipid.
- B. Nonesterified FA.
- C. Esterified FA.
- D. TAG.
- E. None of the above.

Q4: When oleic acid, 18:1(9), is desaturated at carbon 6 and then elongated at carbon 18, what is the product?[4]
- A. 19:2(7,9).
- B. 20:2 (n-6).
- C. 20:2(6,9).
- D. 20:2(8,11).
- E. None of the above.

Q5: which one permits partitioning of the aqueous contents of cells and subcelluler structures?[5]
- A. Carbohydrate.
- B. Amino acid.
- C. Glucose.
- D. Nucleic acid.
- E. None of the above.

Q6: can polyunsaturated FA determine as [cis or trans]:[6]
- A. True.
- B. False.
- C. Can't determine [some time yes & other no].

Q7: which of following has/have cluster of sugar in there structure:[7]
- A. Sphingomyelin.
- B. Cerebrosides.
- C. Gangliosides.
- D. Sphingolipid[SL].
- E. C+D

1.E 2.E 3.B 4.C 5.E (LIPID IS THE CORRECT) 6.C 7.E

Q8: glycolipid can be:[8]
- A. Sphingosine+sugar.
- B. Glycerol+sugar.
- C. FFA+sugar.
- D. All of above.
- E. A+B

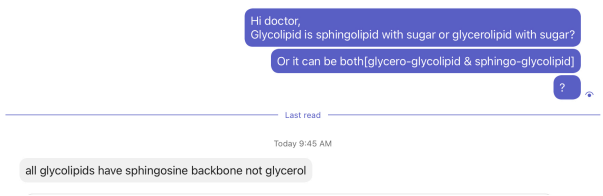
Q9: which of following isn't saturated FA:[9]
- A. Stearic acid.
- B. Palmitic acid.
- C. Myristic acid.
- D. Lauric acid.
- E. None of the above.

Q10: which of following is monounsaturated FA:[10]
- A. Stearic acid.
- B. α-Linolenic acid[OA-n-3].
- C. Oleic acid[OA-n-9].
- D. Arachidonic acid[OA-n-6].
- E. None of the above.

Q11: FA can be converted into(whole fatty acid chain):[11]
- A. Acetic acid.
- B. Fatty acyl-CoA.
- C. Fatty acetyl-CoA.
- D. C+B.
- E. None of the above.

Q12: which of following is the best descrip of lipoprotein:
- A. LDL is good type of lipoprotein.
- B. HDL is bad type of lipoprotein.
- C. Lipoprotein consists of lipid(predominant) & protein.
- D. Its function is esterified FAs' plasma carriers .
- E. All of above.

Q13: which of following couples is wrong:[13]
- A. Chylomicrons—> transport of dietary TAG from intestine into liver [or by lymph into bloodstream].
- B. VLDL—> transport of TAG from liver into body tissue[mainly adipose tissue].
- C. LDL—> has highest cholesterol ester content between lipoprotein & transport CE from liver into peripheral tissues.
- D. HDL—> transport CE from peripheral tissues into liver[cholesterol scavengers].
- E. None of the above.



8.A 9.E 10.C 11.B 12.D 13.E

Q_{14}: which of following is wrong about bile salts:[14]
A. Bile salts are amphipathic.
B. They are cholesterol derivatives[cholic acid].
C. They release from gallbladder.
D. They synthesized inside bile duct.
E. None of the above.

Q_{15}: Pancreatitis can lead to a blockage of the pancreatic duct that, inturn, leads to steatorrhea. The steatorrhea is most likely caused by the absence of which one of the following?[15]
A. Trypsin.
B. Colipase.
C. Pepsin.
D. Cholesterol esterase.
E. Amylase.

Q_{16}: which of following cause pancreatic lipase deficiency:[16]
A. Lymphadenopathy.
B. Cyctic fibrosis.
C. Pancreatic cirrhosis[pancreatitis].
D. C+B.
E. None of the above.

Q_{17}: pancreatic lipase can degrade lipid without activation by other enzymes.[17]
A. True.
B. False.

Q_{18}: which of following is proteolytic enzyme used for Colipase & Phospholipase A2 activation:[18]
A. Pancreatic lipase.
B. Gastric lipase.
C. Trypsinogen.
D. Trypsin.
E. None of the above.

Q_{19}: which of the following hormone decrease stomach motility:[19]
A. Gastrin.
B. CCK[cholecystokinin].
C. Secretin.
D. None of the above.
E. More than one is correct.

Q_{20}: we have 23 carbon units FA, we consider it as:[20]
A. Medium chain FA.
B. Short chain FA.
C. Long chain FA.
D. Very long chain FA.
E. We can't determine.

Q_{21}: which of following amino acid cause celiac disease(CD):[21]
A. Aspartic acid.
B. Glycine.
C. Alanine.
D. Glutamine.
E. We didn't take it 😐.

14.D 15.B 16.D 17.B 18.D 19.E 20.C 21.D [GLUTAMINE IN GLIADIN]

Q22: which of following is wrong about Cytidine deaminase:[22]

A. It work on apo-B gene.
B. Convert Cytidine into uridine.
C. Help in synthesizing of chylomicrons.
D. Change original codon into stop codon.
E. Non of the above.

قال صلى الله عليه وسلم: "مَنْ نَفَّسَ عَنْ مُؤْمِنٍ كُرْبَةً مِنْ كُرَبِ الدُّنْيَا، نَفَّسَ اللَّهُ عَنْهُ كُرْبَةً مِنْ كُرَبِ يَوْمِ الْقِيَامَةِ. وَمَنْ يَسَّرَ عَلَى مُعْسِرٍ، يَسَّرَ اللَّهُ عَلَيْهِ فِي الدُّنْيَا وَالْآخِرَةِ. وَمَنْ سَتَرَ مُسْلِمًا سَتَرَهُ اللَّهُ فِي الدُّنْيَا وَالْآخِرَةِ. وَاللَّهُ فِي عَوْنِ الْعَبْدِ مَا كَانَ الْعَبْدُ فِي عَوْنِ أَخِيهِ. وَمَنْ سَلَكَ طَرِيقًا يَلْتَمِسُ فِيهِ عِلْمًا سَهَّلَ اللَّهُ لَهُ بِهِ طَرِيقًا إِلَى الْجَنَّةِ، وَمَا اجْتَمَعَ قَوْمٌ فِي بَيْتٍ مِنْ بُيُوتِ اللَّهِ، يَتْلُونَ كِتَابَ اللَّهِ، وَيَتَدَارَسُونَهُ بَيْنَهُمْ، إِلَّا نَزَلَتْ عَلَيْهِمُ السَّكِينَةُ، وَغَشِيَتْهُمُ الرَّحْمَةُ، وَحَفَّتْهُمُ الْمَلَائِكَةُ وَذَكَرَهُمُ اللَّهُ فِيمَنْ عِنْدَهُ، وَمَنْ بَطَّأَ بِهِ عَمَلُهُ لَمْ يُسْرِعْ بِهِ نَسَبُهُ" رواه مسلم (2699).

22.E

Q_1: The acetyl CoA is produced in the mitochondria and must be transported into the cytosol for the synthesis of fatty acids.
Which of the following is true regarding the transport of Acetyl CoA?[1]

A. Acetyl CoA is diffused from the mitochondrial membrane.
B. Acetyl CoA is transported by its specific transporter protein.
C. Acetyl CoA is converted into pyruvate, enters into the cytosol and acetyl CoA is regenerated.
D. Acetyl CoA is converted into citrate, enters into the cytosol and acetyl CoA is regenerated.
E. All of the above.

Q_2: Which of the following event inactivates acetyl CoA carboxylase?[2]

A. ADP-Ribosylation.
B. Glycosylation.
C. Phosphorylation.
D. Farnesylation.
E. None of the above.

Q_3: Which of the following is not a positive regulator of acetyl CoA carboxylase?[3]

A. Excess calories.
B. Insulin.
C. Citrate.
D. Long-chain fatty acid.
E. None of the above.

Q_4: What is the source of NADPH required for fatty acid synthesis?[4]

A. Pentose phosphate pathway.
B. Malic enzyme.
C. A+B.
D. None of the above.
E. All of the above.

Q_5: The complete beta-oxidation of palmitoyl CoA yield:[5]

A. 8 molecules of Acetyl CoA and 16 NADH
B. 8 molecules of Acetyl CoA and 16 FADH2
C. 8 molecules of Acetyl CoA, 7 NADH, and 7 FADH
D. 8 molecules of Acetyl CoA and 16 NADPH
E. None of the above.

Q_6: A patient has been taking an experimental drug to reduce weight.The drug leads to significant steatorrhea and some night-blindness. A potential target of this drug is which one of the following?

A. LPL activity.
B. Albumin synthesis.
C. Glucagon release.
D. Insulin release.
E. Cholecystokinin release.

1.D 2.C 3.D 4.C 5.E 6.E

Q_7:When does the synthesis of FA occurs?[7]

A. High glucose & high ATP.
B. Low glucose & low ATP.
C. Low NADH & high NAD^+.
D. High ADP & High NADH.
E. None of the above.

Q_8: which of following enzyme cleaves citrate into OAA and acetyl CoA:[8]

A. Isocitrate dehydrogenase.
B. Citrate dehydrogenase.
C. ATP citrate lyase.
D. Citrate decarboxylase.
E. None of the above.

Q_9: which of following enzyme synthesizes malate from OAA with present of NADH:[9]

A. OAA D.H.
B. OAA carboxylase.
C. Malate D.H.
D. Malate transferase.
E. OAA lyase.

Q_{10}: at well-fed state pyruvate converted into OAA by pyruvate D.H:[10]

A. True.
B. False.

Q_{11}: fat can be converted into glucose & vice versus is wrong.[11]

A. False.
B. True.

Q_{12}: Carboxylation of pyruvate can be happened at mitochondrial matrix.[12]

A. True.
B. False.

Q_{13}: which of following FA synthesis reactions is the rate limiting reaction.

A. Malonyl-CoA synthesis.
B. Acetyl-CoA synthesis from citrate.
C. Acetyl-CoA carboxylation.
D. A+C.
E. None of the above.

Q_{14}: which of following is used in malonyl-CoA synthesis.[14]

A. ACC (acetyl-CoA carboxylase) [an allosteric enzyme].
B. ATP.
C. Biotin.
D. Vitamin B_7.
E. CO_2 as HCO_3^-.
F. All of above.

7.A 8.C 9.C 10.B(PYRUVATE CARBOXYLASE IS THE CORRECT) 11.A 12.A 13.D 14.F

Q_{15}: which of following inactivate ACC.[15]

A. Palmitoyl-CoA.
B. Glucagon.
C. Epinephrine.
D. Citrate.
E. Insulin.
F. High level of AMP (allosteric).
G. AMPK (covalent).
H. All of above except D+E.

Q_{16}: which of following inactivate ACC.[16]

A. Palmitoyl-CoA.
B. Glucagon.
C. Epinephrine.
D. Citrate.
E. Insulin.
F. D+E.
G. High level of AMP (allosteric).
H. AMPK (covalent).

Q_{17}: which of following is correct about ChREBP [long-term regulation]:[17]

A. It's a transcription factor.
B. Inactived by phosphorylation.
C. PKA & AMPK inactivates ChREBP.
D. Insulin(high glucose) activates it by dephosphorylation.
E. All of above.

Q_{18}: Metformin can do:[18]

A. Lowering plasma TG.
B. Activation AMPK.
C. Inhibit ACC activity.
D. Lowering Blood glucose concentration.
E. Inhibit ACC & FA synthase expression[decreasing ChREBP and SREBP- 1c].
F. All of the above.
G. None of the above.

Q_{19}: which of following is correct about FAS[Fatty acid synthase]:[19]

A. It's homodimeric enzyme.
B. It has 14 domains & two of them are acyl carrier protein(ACP).
C. Phosphpantetheine(vitamin B_5) mainly is the carrier of acyl units.
D. It has 6 enzymatic activity with acyl carrier domain.
E. All of the above.

Q_{20}: At 4th step in FA synthesis[malonyl attached into acetyl group at ACP domain]is:[20]

A. Condensation reaction.
B. Carboxylation reaction.
C. Hydration reaction.
D. Reduction reaction.
E. None of the above.

15.H 16.F 17.E 18.F 19.E 20.A

Q_{21}: according into FA synthesis which of following is the correct order:[21]

A. Condensation, reduction, reduction, dehydration.
B. Condensation, dehydration, reduction, reduction
C. Condensation, reduction, dehydration, reduction
D. Condensation, reduction, reduction ,dehydration.
E. None of the above.

Q_{22}: there is 5 domain in FAS work at repeated cycle which of following is the correct order of these enzymatic domain:[22]

A. Manolyl/acetyl CoA-ACP transacylase, ketoacyl-ACP synthase, Manolyl/acetyl CoA-ACP transacylase, ketoacyl-ACP synthase, ketoacyl-ACP reductase, hydroxyacyl-ACP dehydratase, enoyl-ACP reductase.
B. Manolyl/acetyl CoA-ACP transacylase, ketoacyl-ACP synthase, Manolyl/acetyl CoA-ACP transacylase, ketoacyl-ACP synthase, hydroxyacyl-ACP dehydratase, ketoacyl-ACP reductase, enoyl-ACP reductase.
C. Manolyl/acetyl CoA-ACP transacylase, ketoacyl-ACP synthase, enoyl-ACP reductase, Manolyl/acetyl CoA-ACP transacylase, ketoacyl-ACP synthase, ketoacyl-ACP reductase, hydroxyacyl-ACP dehydratase.
D. None of the above.
E. We don't know 😐.

Q_{23}: which of following molecule/s has/have four carbon units:[23]

A. Malonyl-CoA.
B. Acytel-CoA.
C. Butyryl-ACP.
D. A+C
E. None of the above.

Q_{24}: which of following domain releases palmitate from FAS:[24]

A. ACP Transacylase.
B. ACP synthase.
C. ACP lyase.
D. Thioesterase.
E. Thiolyase.

Q_{25}: which of the following is correct [about net palmitate synthesis]:[25]

A. We need 7 malonyl CoA & 1 acetyl CoA(totally 8 acetyl CoA).
B. We need 14 NADPH +7 H^+ & 7 ATP.
C. Net 0 CO_2.
D. We release 6 H_2O & 8 CoA.
E. All of above correct.
F. None of the above.

Q_{26}: which of the following is correct about source of FA synthesis molecules:[26]

A. OAA synthesized by PC which can only found inside mitochondria.
B. NADH, that used for dehydrogenation, come from glycolytic pathway.
C. NADPH come from PPP & NADP reduction by maltic enzyme.
D. Acetyl CoA come from pyruvate D.H .
E. All of the above.

21.C 22.A (SEE NOTE PAGE D) 23.C 24.D 25.E(NET IS SAME AS OVERALL STOICHIOMETRY) 26. E

Q_{27}:which of following wrong about palmitate post elongation:[27]

A. It can occur inside SER & we need malonyl CoA as carbon donor.
B. It can occur inside RER & we need NADH as electron donor.
C. It can occur inside SER & we only use NADPH as electron donor.
D. It can occur inside SER & we don't need ACP or multifunctional enzyme.
E. All of the above wrong except B.

Q_{28}: which of following organ/organelle can synthesize VLCFA:[28]

A. Liver.
B. Brain.
C. Mitochondria.
D. Peroxisome.
E. Smooth muscle.

Q_{29}:which of following wrong about palmitate post elongation:[29]

A. It can occur inside mitochondria & we need NADH and NADPH as electron donor.
B. It can occur inside mitochondria & we need acetyl CoA as carbon donor.
C. It can occur inside mitochondria & we only use NADPH as electron donor.
D. It can occur inside mitochondria & we don't need ACP or multifunctional enzyme.
E. All of the above correct except A.

Q_{30}: according to FA desaturation there is wrong description:[30]

A. We have only $\Delta^{9,6,5\ \&\ 4}$ desaturases.
B. We can't desaturate FA chain carbon from 10 to ω-carbon.
C. These desaturation reactions take place inside SER.
D. We need NADH & NADPH electron donor for desaturation.
E. We need molecular oxygen & Cyt b5, with its flavin adenine dinucleotide (FAD)-linked reductase, as electron acceptors.

Q_{31}: which of following has 2 mechanisms for Glycerol-3-phosphate synthesis:[31]

A. Adipocyte.
B. Hepatocyte.
C. Endothelial cell.
D. Pancreatic cell.
E. All of above.

Q_{32}: adipose tissue has Glycerol kinase & Glycerol-3-phosphate D.H .[32]

A. False.
B. True.

Q_{33}: which of following FA form can be used at TAG synthesis:[33]

A. Fatty acyl-ACP.
B. Fatty acyl-AMP.
C. Acylodenylate.
D. Fatty acyl-CoA.
E. More than one is correct.

27.B 28.B 29.A 30.D 31.B 32.A 33.D

Q_{34}: according to acyltansferase's substrates at TAG synthesis, which of following are not considered as these substrates:[34]

A. Glycerol-3-phosphate.
B. Lysophophatidic acid.
C. DAG.
D. Phoshatidic acid.
E. All of above.

Q_{35}: where TAG is synthesized via MAG pathway.[35]

A. Enterocyte.
B. Hepatocyte.
C. Adipocyte.
D. Intestinal mucosal cell.
E. A+D.

"فَلْيَنظُرِ الْإِنسَانُ إِلَى طَعَامِهِ{٢٤} أَنَّا صَبَبْنَا الْمَاءَ صَبًّا{٢٥}ثُمَّ شَقَقْنَا الْأَرْضَ شَقًّا{٢٦}فَأَنبَتْنَا فِيهَا حَبًّا{٢٧}وَعِنَبًا وَقَضْبًا{٢٨}وَزَيْتُونًا وَنَخْلًا {٢٩} وَحَدَائِقَ غُلْبًا{٣٠}وَفَاكِهَةً وَأَبًّا{٣١}مَّتَاعًا لَّكُمْ وَلِأَنْعَامِكُمْ{٣٢}" [سورة عبس، ٢٤-٣٢]

34.D 35.E

Q_1: it prevent FA from degradation by HSL inside adipose tissue:[1]

A. Prolipin.
B. Lipoprotein.
C. ATGL.
D. MGL.
E. perilipin.

Q_2: Glucagon increase preilipin synthesis:[2]

A. True.
B. False.

Q_3: which of following is wrong:[3]

A. Insulin decrease expression of lipolysis enzymes.
B. Insulin decrease expression of lipogenesis protein.
C. Insulin can effect HSL, ATGL & MGL synthesis.
D. Insulin increase glucose uptake by $GLUT_4$.
E. Insulin decrease PKA phosphorylation pathways.

Q_4: which of following is wrong about glycernogenisis:[4]

A. We can synthesize glycerol from gluconeogenisis.
B. Mitochondria is included in glycernogenisis [not only cytosol].
C. OAA kinase is one of enzyme that used to change pyruvate into glycerol.
D. The end product of glycernogenisis is G3P.
E. All of the above is correct.

Q_5: One of following reaction is irreversible at glycolysis. However it can reverse at glycernogenisis:[5]

A. PEP into pyruvate.
B. Glucose-1-Phosphate into UDP-Glucose.
C. Citrate into isocitrate.
D. F-6P into F-1,6P.
E. GAP into 1,3-BPG.

Q_6: at Fatty acyl transport from cytosol into mitochondrial matrix, one of the following is wrong:[6]

A. It must attach CoA enzyme.
B. Carnitine palmitoyl-transferase I is inner mitochondrial membrane protein.
C. Carnitine palmitoyl-transferase I is outer mitochondrial membrane protein.
D. Fatty acyl-CoA into Fatty acyl-carnitine[by Carnitine palmitoyl-transferase I], then into Fatty acyl- CoA[by Carnitine palmitoyl-transferase II].
E. IMM has translocase.

Q_7: which of following is correct about Carnitine:[7]

A. Abundant in meat.
B. Can be synthesized from amino acid[lysine & methionine].
C. Synthesis can occur inside muscles.
D. Acetyl CoA carboxylase 2 can inhibit CPT I by increasing malonyl-CoA.
E. All of the above.

1.E 2.B 3.B 4.C 5.A 6.B 7.E

Q_8: inside muscle which of following is wrong:[8]
A. ACC 1 synthesize malonyl-CoA.
B. ACC 2 regulate β-oxidation.
C. ACC 1 regulate FA synthesis.
D. ACC 2 expression is higher than ACC 1.
E. All of the above correct.

Q_9: which of following need Carnitine to enter mitochondria:[9]
A. SCFAs.
B. MCFAs.
C. LCFAs.
D. TAG.
E. G3P.

Q_{10}: according β-oxidation the correct reaction order is:[10]
A. Reduction, dehydration, reduction, cleavage.
B. Oxidation, dehydration, reduction, cleavage.
C. Dehydration, oxidation, dehydration, cleavage.
D. Oxidation, hydration, oxidation, cleavage.
E. None of the above.

Q_{11}: according β-oxidation of stearic acid, which of following is correct:
A. Number of cycles= 8.
B. Sum of FAD & NAD^+ that used = 14.
C. Total of acetyl-CoA released= 8.
D. Low acetyl-CoA/CoA ratio inhibit thiolase[lead for β-oxidation inhibition].
E. At hydration step we add H_2O to rid of double bond between C_β & C_γ.

Q_{12}: Long chain fatty acids are oxidized step-wise in ….. carbon units starting from the …. end.
A. 2, aliphatic.
B. 2, carboxyl.
C. 3, carboxyl.
D. 2, gamma.
E. None of the above.

Q_{13}: The acyl-CoA formed in the …. ,Then it is transported to the …. for oxidation.
A. mitochondrial matrix, cytosol.
B. mitochondrial matrix, inner-membrane.
C. cytosol, mitochondrial matrix.
D. endoplasmic reticulum, cytosol.
E. A+B.

Q_{14}: Each cycle of β-oxidation produces :
A. 1 FAD, 1 NADH, and 1 acetyl-CoA.
B. 1 FADH2, 1 NADH, and 1 acetyl-CoA.
C. 1 FADH2, 1 NAD+, and 1 acetyl-CoA.
D. 1 FAD, 1 NAD+, and 2 CO2 molecules.
E. None of the above.

8.E 9.C 10.D [NOTE F] 11.A [NOTE G] 12.B 13.C

Q_{15}: which of following pathway can't Acetyl CoA follow:[15]

A. Lipogenesis.
B. Ketogenesis.
C. Gluconeogenesis.
D. Krebs cycle.
E. β-oxidation.

Q_{16}: according FA synthesis & degradation, one of following is wrong;[16]

A. High insulin/glucagon ratio favored FA synthesis.
B. Synthesis take place in cytosol & degradation inside mitochondria.
C. End product: synthesis is palmitate & degradation is Acetyl CoA.
D. Reaction+Coenzymes: synthesis[reduction+NADPH] & degradation [oxidation+FAD,NAD^+].
E. Inhibitor: synthesis(malonyl CoA) & degradation(Palmitoyl CoA).

Q_{17}: which of the following isn't an isozymes of fatty acyl CoA dehydrogenase:[17]

A. VSCAD.
B. SCAD.
C. MCAD.
D. LCAD.
E. VLCAD.

Q_{18}: which of following is wrong about VLFA degradation:[18]

A. It can oxidize by peroxisomes and get inside peroxisomes by ABC Class D Transporter.
B. It can oxidize inside mitochondrial matrix and get inside by Carnitine shuttle system.
C. Oxidation inside mitochondria need last electron acceptor(molecular oxygen).
D. Oxidation inside peroxisomes need electron transfer flavoprotein(ETF).
E. Peroxisomes can use this VLFA degradation in convert O_2 into H_2O_2 then removed by catalase.
F. C+D.

Q_{19}: best describe of zellweger syndrome is:[19]

A. X-linked adrenoleukodystrophy.
B. Cause accumulation of VLCFs.
C. Can effect ROS removing by catalase.
D. Body synthesize dysfunctional transporter for VLFAs[ABC Class D Transporter].
E. All of the above.

Q_{20}: which of following is wrong about phytanic acid:[20]

A. It is produced from chlorophyl.
B. It can be oxidized inside mitochondria by alpha-oxidation.
C. Fully degradation gives us formyl-CoA, propionyl-CoA, acetyl-GoA, and 2 methyl-propionyl-CoA from the methyl-end.
D. PhyH(phytanoyl CoA hydroxylase) Deficiency cause Refsum disease.
E. None of the above.

15.E 16.E 17.A 18.F 19.E [NOTE H] 20.B

Q_{21}: which of following happen at SER and generate dicarboxylic acid:[21]

A. ω-Oxidation.
B. α-oxidation.
C. β-oxidation.
D. δ-oxidation.
E. None of the above.

Q_{22}: which of following is correct:[22]

A. Fats release more energy than carbohydrates.
B. Carbohydrates can be found as short & long-term storage.
C. Fat need more oxygen than carbohydrates to degrade.
D. Fat degradation needs more CoA than carbohydrate.
E. All of above.

عن حذيفة بن اليمان رضي الله عنه قال :سمعت رسول الله ﷺ يقول :"تُعْرَضُ الفِتَنُ عَلَى القُلُوبِ كَالحَصِيرِ عُودًا عُودًا ، فَأَيُّ قَلْبٍ أُشْرِبَهَا نُكِتَ فِيهِ نُكْتَةٌ سَوْدَاءُ ، وَأَيُّ قَلْبٍ أَنْكَرَهَا نُكِتَ فِيهِ نُكْتَةٌ بَيْضَاءُ ، حَتَّى تَصِيرَ عَلَى قَلْبَيْنِ : عَلَى أَبْيَضَ مِثْلِ الصَّفَا ، فَلَا تَضُرُّهُ فِتْنَةٌ مَا دَامَتِ السَّمَاوَاتُ وَالأَرْضُ ، وَالآخَرُ أَسْوَدُ مُرْبَادًّا كَالكُوزِ مُجَخِّيًا لَا يَعْرِفُ مَعْرُوفًا وَلَا يُنْكِرُ مُنْكَرًا إِلَّا مَا أُشْرِبَ مِنْ هَوَاهُ" [رواه مسلم].

21.A 22.E

Q_1: A 4-month-old child is being evaluated for fasting hypoglycemia.Laboratory tests at admission reveal low levels of ketone bodies, free carnitine, and acylcarnitines in the blood. Free fatty acid levels in the blood were elevated. Deficiency of which of the following would best explain these findings?[1]

A. Adipose triglyceride lipase.
B. Carnitine transporter.
C. Carnitine palmitoyltransferase I.
D. Long-chain fatty acid dehydrogenase.
E. None of the above.

Q_2: according ketone bodies, which can consider correct answer:

A. It's derived from Acetyl-CoA.
B. It used as intermediate transport for Acetyl-CoA from liver into peripheral tissue.
C. Brain depend on ketone body as main energy source at severe starvation.
D. RBC don't use ketone bodies.
E. All of above.

Q_3: according ketone bodies, which can consider correct answer:

A. It transport by blood without carrier.
B. It's slow metabolism pathway.
C. It can't spare glucose at tissue[not CNS].
D. At starvation or prolonged fasting, it's low concentration.
E. None of the above.

Q_4: person fasts for long time & imagine world wide starvation, one of following is wrong:

A. Body mainly depends on Fat as source of energy.
B. Pyruvate dehydrogenase is inhibited.
C. Pyruvate carboxylase is stimulated.
D. Insulin released into blood stream.
E. All of above.

Q_5: which of following is wrong:

A. At ketone body synthesis, after first condensation we add malonyl CoA for each elongation.
B. HMG CoA is an intermediate in cholesterol synthesis.
C. HMG-lyase produce acetocetate & acetyl CoA from HMG CoA.
D. Hydroxy-methylglutaryl CoA synthase catalyze the rate limiting step at ketone body synthesis.
E. None of the above.

Q_6: which of following is correct:

A. Thiophorase expressed at muscle but not at liver.
B. Hydroxybutyrate D.H use NADH to convert 3-hydroxybutyrate into acetoacetate.
C. TCA cycle include as a part of ketone body degradation[CoA donor].
D. Thiolase found at both, liver & muscle, and it can catalyze reversible reaction.
E. More than one.

1.B 2.E 3.A 4.D 5.A 6.E [NOTE I]

Q_7: which of following can cause ketoacidosis except:[7]

A. Diabetic.
B. Prolonged fasting.
C. Alcoholism[alcohol drinker].
D. Succinyl CoA thiolase deficiency.
E. All of above except D.

Q_8: ketoacidosis can cause:

A. Dehydration.
B. Acidemia.
C. Fruity odor of breath.
D. Kidney failure.
E. There is one of the above wrong.

Q_9: insulin increase Keto acid synthesis:

A. True.
B. False.

عن جندب بن عبدالله رضي الله عنه قال : قال رسول الله ﷺ :
"إِنَّ رَجُلًا مِمَّنْ كَانَ قَبْلَكُمْ خَرَجَتْ بِهِ قَرْحَةٌ ، فَلَمَّا آذَتْهُ انْتَزَعَ سَهْمًا مِنْ كِنَانَتِهِ فَنَكَأَهَا ، فَلَمْ يَرْقَأِ الدَّمُ حَتَّى مَاتَ، قَالَ رَبُّكُمْ : قَدْ حَرَّمْتُ عَلَيْهِ الجَنَّةَ" [رواه مسلم].

7.D 8.E 9.B

METABOLISM OF GLYCEROPHOSPHOLIPIDS [SLIDE]

Q_1: molecule from TAG synthesis can be precursor of glycerophospholipid:[1]

A. Glycerol-3-phosphate[G3P].
B. Lysophosphatidic acid.
C. Phosphatidic acid.
D. Diglyceride.
E. Triglyceride.

Q_2: we can consider one as correct answer:

A. SER is the site of glycerophospholipid synthesis.
B. We can activate head group[choline, ethanolamine] for glycerophospholipid synthesis by adding CDP.
C. We can activate Diacylglycerol for glycerophospholipid synthesis by adding CDP.
D. Inositol 4,5-bisphosphate[head group] has hexagon cyclic structure with two phosphates.
E. All of the above.

Q_3: which of following is wrong:

A. Choline can't be synthesize inside body.
B. Choline can be recycled by glycerophospholipid degradation.
C. Ethanolamine can be synthesized inside the liver.
D. More than one.

Q_4: which of following enzymes consider as choline/ethanolamine activator for phoshatidylethanolamine & phosphatidylcholine synthesis.

A. Esterase.
B. CTP hydrolyase.
C. Phosphotase.
D. Kinase.
E. Lyase.

Q_5: which of following can be metabolized into PC:

A. Phosphatidylethanolamine[PE].
B. Phosphatidylserine[PS].
C. CDP-Choline.
D. UDP-choline.
E. All of above except D.

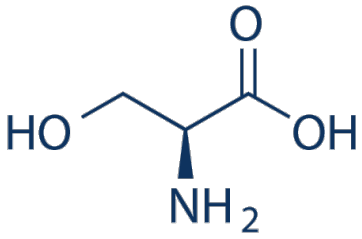
Q_6: which of following couples is wrong:

A. CTP-phosphocholine cytidylyltransferase[CT] —> replace phosphate group into CDP.
B. CDP-choline:diacylgycerol choline phosphotransferase[CPT] —> replace OH group from diacylglycerol by phosphocholine.
C. At CDP-Ehanolamine into PE step, CDP which added to ethanolamine released as CMP.
D. PS into PE is decarboxylation reaction.
E. Non of the above.

1.C 2.E 3.A 4.D 5.E 6.E

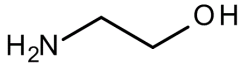
Q7: Which of following is a correct pathway:[7]
A. Phosphoserine, CDP-Serine, phosphatidylserine, phosphatidylcholine.
B. CDP-serine, PS, PE, PC.
C. Diacylglycerol, CDP-Diacylglycerol, PS,PE.
D. PC, PE, phosphatidic acid, PS.
E. All of above correct.

Q8: this structure is:
A. Choline.
B. Ethanolamine.
C. Serine.
D. Inositol.
E. Glycerol.

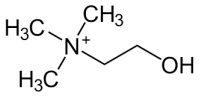


Q9: which of following enzymes need thiamine as Co-enzyme:
A. PE hydrolyase.
B. PS decarboxylase.
C. PC esterase.
D. PS phosphatase.
E. PE D.H .

Q10: which of following reaction can convert this



into



A. Acetylation.
B. Carboxylation.
C. Dehydration.
D. Methylation.
E. None of the above.

Q11: when we convert PE into PC, the reaction catalyzed by ….. & ….. is the donor of methyl group.
A. Phosphatidylethanolamine methyltransferase, S-adenosyl methionine.
B. Phosphatidylcholine methyltransferase, S-AM.
C. Ethanolamine-choline transferase, S-adenosylmethionine.
D. Phosphatidlethanolamine methyltransferase, acetyl CoA.
E. None of the above is correct.

Q12: choose the correct answer:
A. Phosphatidylinositol is synthesized by Diacylglycerol activation pathway.
B. PI can carry 18 carbon saturated FA at carbon no.1 .
C. PI can carry 20 carbon polyunsaturated FA at carbon no.4 .
D. PIP2 is cleaved into DAG & IP3 by phospholipase C.
E. All of the above.

Q13: PKC is allosterically activated by DAG & IP3.
A. False.
B. True.

7.C 8.C 9.B 10.D 11.A 12.E [NOTE J] 13.B

Q_{14}: PI can anchor protein by producing GPI:[14]
- A. True.
- B. False.

Q_{15}: At cardiolipin & phosphatidylglycerol synthesis:
- A. We start from DAG & add CDP for activation.
- B. We start from lysophosphatidic acid & add CTP for activation.
- C. We start from phosphatidic acid & add CDP for activation.
- D. We start from TAG & add CTP for activation.
- E. We start from phosphatidic acid & add CTP for activation.

Q_{16}: crdiolipin is synthesized by adding CDP-DAG into phosphatidylglycerol & we use CLS[cardiolopin synthase].
- A. True.
- B. False.

Q_{17}: which of following is 2 phosphatidic acid linked by glycerol.
- A. Phosphatidylglycerol.
- B. Phosphatidylcholine.
- C. Phosphatidylethanolamine.
- D. Triglyceride.
- E. Cardiolipin.

Q_{18}: which of following isn't ether glycerophospholipid:
- A. Plasmalogen.
- B. Phosphatidalethanolamine.
- C. Platelet-activating factor.
- D. Prothrombotic.
- E. Phosphatidylethanolamine.

Q_{19}: phosphatidalcholine is abundant in myocardial cells.
- A. True.
- B. False.

Q_{20}: which of following is correct about surfactants:
- A. Consist of lipids[major] & proteins[minor].
- B. Lining the alveoli.
- C. Secreted by type II pneimocytes.
- D. Dipalmitoylphosphatidylcholine[DPPC] is the major lipid at it.
- E. All of the above.

Q_{21}: which of following is correct about surfactants:
- A. It decrease alveoli's surface tension.
- B. Help at reinflation of alveoli.
- C. Prevent atelectasis.
- D. Its Deficiency can cause respiratory distress syndrome[RDS].
- E. All of the above.

14.A 15.E 16.A 17.E 18.E [NOTE K] 19.A 20.E 21.E

Q22: which of following is wrong about phospholipids degradation:[22]

A. Phospholipase A_1 cleavage at carbon no.1 of glycerol.
B. Phospholipase A_2 is activated by trypsinogen.
C. Phospholipase A_2 release arachidonic from its store molecule [phosphatidylinositol].
D. Phospholipase C cleavage PIP2 into IP3 & DAG.
E. None of the above.

Q23: which of following is correct about phospholipase A_2:

A. It's present at pancreatic juice, bee & snake venom.
B. It is zymogen[proenzyme] & actives by trypsin.
C. It can act at phosphatidylinositol release molecule that is precursor of eicosanoide.
D. It is inhibited by glucocorticoid[ex. Cortisol].
E. All of above.

﴿يَا أَيُّهَا الَّذِينَ آمَنُوا إِذَا نُودِيَ لِلصَّلَاةِ مِن يَوْمِ الْجُمُعَةِ فَاسْعَوْا إِلَى ذِكْرِ اللهِ وَذَرُوا الْبَيْعَ ذَلِكُمْ خَيْرٌ لَّكُمْ إِن كُنتُمْ تَعْلَمُونَ﴾

عن أبي الجعد الضمري رضي الله عنه ،أن رسول الله ﷺ قال :"مَنْ تَرَكَ ثَلَاثَ جُمَعٍ تَهَاوُنًا بِهَا طَبَعَ اللهُ عَلَى قَلْبِهِ"[رواه أبو داود]

فلا تجعل دراستك سببا لإضاعتك لفرائض الله

20.B 21.E 22.E

METABOLISM OF SPHINGOLIPIDS [SLIDE]

Q_1: Phospholipid is derived into sphingolipid & glycerol phospholipid:
- A. True.
- B. False.

Q_2: ….. is type of sphingolipid:
- A. Sphingomyelin.
- B. Sphingophospholipid.
- C. Sphingoglycolipid.
- D. Sphingogrignard.
- E. All of above except D.

Q_3: which of following couple is correct:
- A. Cerebroside—> sphingosine + glucose or galactose.
- B. Globoside—> sphingosine + two sugar[lactose].
- C. Gangelioside—> sphingosine + three or more sugar molecules + sialic acid [oligosaccharide].
- D. Sulfatides—> sphingosine + sugar + sulfate group.
- E. Ceramide—> sphingosine + hydrogen.
- F. All of the above.

Q_4: sphingosine is three carbon with its branch, C_1 has oxygen atom where head group will be attached, C_2 has nitrogen atom which attached fatty acid chain, C_3 is attached with unsaturated FA and hydroxyl group.
- A. True except C_3.
- B. Wrong except C_2.
- C. C_1 is only true.
- D. C_2+C_1 is wrong.
- E. There is no wrong.

Q_5: at sphinganine synthesis, we need:
- A. Pyridoxal phosphate[PLP].
- B. NADPH.
- C. Palmitoyl CoA.
- D. Serine.
- E. All of above.

Q_6: according Sphingomyelin synthesis pathway, which of following can't release as byproduct:
- A. CO_2.
- B. $NADP^+$.
- C. CMP.
- D. DAG.
- E. None of above.

1.A 2.E 3.E 4.E 5.E 6.C 7.

Q_7: what is wrong about the difference between shinganine & ceramide:
A. C_1 at Sphingomyelin attached LFAC ,while at ceramide attached hydrogen atom.
B. C_2 at ceramide attached nitrogen with fatty acyl group , while at sphinganine attached amide.
C. C_3 at sphinganine attached 15 carbon unit saturated FA, while ceramide attached 15: Δ^1 unsaturated FA.
D. None of the above.

Q_8: Sphingomyelin is:
A. Ceramide + phosphatidylcholine.
B. Ceramide + phosphorylcholine.
C. Sphinganine + LFAC + phosphorylcholine.
D. Sphingosine + LFAC + phosphorylcholine.
E. B+D

Q_9: which of following is correct about NPD[niemann-pick disease]:
A. It caused by shingomyelinase deficiency.
B. Enlarged liver & spleen is symptom of it.
C. NPD-A can lead into neurodegeneration.
D. NBD-B can't be fatal in early childhood.
E. All of above.

Q_{10}: which of following can be glycosylated:
A. RNA.
B. Protein.
C. Lipid.
D. All of above.
E. More than one but not all.

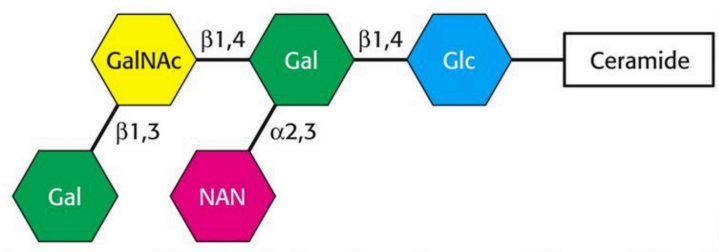
Q_{11}: glycosphingolipid has:
A. N-glycosidic bond.
B. O-glycosidic bond.
C. C-glycosidic bond.
D. H-glycosidic bond.
E. More than one.

Q_{12}: which of glycogenesis intermediate can be included at glycoshingolipid synthesis:
A. Glucose.
B. Glucose-1-phosphate.
C. Glucose-6-phosphate.
D. UDP-glucose.
E. None of the above.

Q_{13}: which of following enzyme or molecules can be used at galactocerebroside-3-sulfate synthesis.
A. UDP-Galactose.
B. Ceramide.
C. Glycosyltransferase.
D. PAPS[3'-phosphoadedenosine-5'-phosphosulfate] & sulfotransferase.
E. All of above.

7.A 8.E 9.E 10.D 11.B 12.D 13.E

Q14: at picture, which of following can include at its degradation:



A. β-Galactosidase.
B. β-hexoaminidase.
C. Neuraminidase.
D. β-glucosidase.
E. Degraded inside phagolysosomes.
F. All of the above.

Q15: one of following diseases is correct according if man having one allele mutation can cause the deficiency:

A. Tay-Sachs disease.
B. Gaucher disease.
C. Niemann-pick disease.
D. Fabry disease.
E. None of the above.

عن عبدالله بن مسعود رضي الله عنه قال : قال رسول الله ﷺ :
"إِنَّهَا سَتَكُونُ بَعْدِي أَثَرَةٌ وَأُمُورٌ تُنْكِرُونَهَا"
قالوا : يا رسولَ الله ، كَيفَ تأمُرُ مَن أدرَكَ مِنَّا ذَلِكَ؟ ، قال :
"تُؤَدُّونَ الحَقَّ الَّذِي عَلَيْكُمْ ، وَتَسْأَلُونَ اللهَ الَّذِي لَكُمْ"[رواه مسلم].

14.F 15.D

METABOLISM OF EICOSANOIDS [SLIDE]

Q_1: which of following considered as eicosanoids:
A. Prostaglandins[PGs].
B. Prostacyclin[PGI].
C. Thrombaxcines[TXs].
D. Leukotrienes[LTs].
E. Lipoxins[LXs]
F. All of above.

Q_2: which of following can't be eicosanoid feature:
A. They can't be stored.
B. They have short $t_{1/2}$.
C. They are rapidly metabolized into inactive structure.
D. They are hormones.
E. More than one.

Q_3: Which of following has cyclopentane at its structure:
A. PGE_2.
B. PGI_2.
C. TXA_2.
D. LTA_4.
E. There is two correct.

Q_4: Which of following has 4 double bond between carbon atom at its structure:
A. PGE_2.
B. PGI_2.
C. LX.
D. LTA_4.
E. There is two correct.

Q_5: $18{:}2^{\Delta 9,12}$ is desaturated at carbon no.5&8 then elongated[after carbon 8],it can be:
A. Linoleic acid.
B. $20{:}4^{\Delta 5,8,11,14}$.
C. Arachidonic acid.
D. ω-6 FA.
E. More than one.

Q_6: which of following order for PGH_2 synthesis is correct:
A. Desaturation, elongation, oxidative cyclization.
B. Desaturation, elongation, COX, peroxidase.
C. Linoleic acid, arachidonic acid, PGI_2, PGH_2.
D. More than one.

Q_7: which of following is correct according PGH_2 synthesis:
A. PGH_2 synthase is ER membrane-bound protein.
B. PGH_2 synthase has 2 catalytic activities.
C. PGH_2 synthase can do oxidative cyclization by COX & O_2 as reactant.
D. PGH_2 synthase need reduced glutathione for its peroxidase.
E. All of above is correct.

1.F 2.D 3.E[A+B] 4.E[C+D] 5.E 6.D 7.E

Q_8: which of following is wrong about COX of PGH_2 synthase:
- A. COX_1 is constitutively synthesized.
- B. COX_2 is inducible.
- C. COX_1 can be found at gastric & renal tissue.
- D. COX_2 can cause pain,redness & swelling of inflammatory reaction.
- E. None of above.

Q_9: which of following COX inhibitors is correct:
- A. Celecoxib inhibit COX_1.
- B. Aspirin inhibit both COX_1 & COX_2.
- C. Aspirin increase incidence of MI.
- D. There are inhibitors that inhibit COX_1 but not COX_2.
- E. Celecoxib stop PG synthesis.

Q_{10}: which of following is wrong:
- A. TXA_2 cause vasoconstriction.
- B. PGI_2 cause vasodilation.
- C. We get injury and our vessel damaged, then at the next few minutes PGI_2 level increased lead to increase platelets aggregation, then after a few hours TXA_2 level increased so platelet aggregation inhibited.
- D. TXA_2 synthesized by COX_1 & released from platelets.
- E. PGI_2 synthesized by COX_2 & released from endothelial cells.

Q_{11}: which of following is wrong:
- A. 15-LOX found at epithelial cell.
- B. 5-LOX found at leukocyte.
- C. 12-LOX found at platelets.
- D. COX_2 can change arachidonic acid into 15R hydroxyeicosatetraeonic[15-HEHE] by aspirin-mediated acetylation of COX structure.
- E. None of above.

Q_{12}: according lipoxin synthesis, LTA_4 is an intermediate of[between bracket is the enzyme that modifies arachidonic acid]:
- A. Classic pathway[first modification by 5-LOX].
- B. Endo/epithelial pathway[first modification by acylated COX_2].
- C. Monocytes pathway[first modification by 15-LOX].
- D. More than one.
- E. None of the above.

Q_{13}: which of following is anti inflammatory lipid:
- A. Resolvins[Rv].
- B. Protectins[PD].
- C. Maresins[MaR].
- D. All of above.

عن أبي هريرة رضي الله عنه ،قيل : يا رسولَ الله ، مَن أكرَمُ الناسِ؟ ، قال :"أَتْقَاهُمْ"[رواه البخاري].
قال تعالى:"إِنَّ أَكْرَمَكُمْ عِندَ ٱللَّهِ أَتْقَىٰكُمْ ۚ إِنَّ ٱللَّهَ عَلِيمٌ خَبِيرٌ"[سورة الحجرات، الآية ١٣]

8.E 9.B 10.C 11.E 12.A

METABOLISM OF CHOLESTEROL [SLIDE]

Q_1: which of following is correct:
A. Cholesterol can absorbed by enterocytes & clustered at chulomicron remanant.
B. Cholesterol can return into liver from extrahepatic tissue by HDL.
C. Cholesterol can de novo synthesis in liver.
D. Cholesterol can be secreted from liver inside VLDL and/or as bile acids and/or it can be free.
E. All of above.

Q_2: cholesterol consists of:
A. Four fused hydrocarbon ring[steroid nucleus]=17 carbon.
B. Two methyl group.
C. Ring A has 3'-hydroxyl group where it can be esterified by FA.
D. Ring B has double bond.
E. All of the above.

Q_3: at intestine, cholesterol absorbed by…… which found at surface of….. :
A. Niemann-pick C1-like 1 protein[NPC1L1], enterocytes.
B. ABCG5/G8, enterocytes.
C. NPC1L1, nephrocyte .
D. ABCG5/G8, hepatocyte.
E. More than one is correct.

Q_4: plant sterols[phytosterols] can:
A. Reduce dietary cholesterol absorption.
B. Reduce plasma cholesterol levels.
C. Poorly absorbed by humans.
D. Be actively transported into intestinal lumen.
E. All of above.

Q_5: which of following wrong about cholesterol synthesis:
A. Cholesterol's carbons come from acetyl CoA.
B. Where we need reduction we use NADH.
C. We generate the need energy for endergonic reactions from thioester bond breaking of acetyl CoA.
D. We generate the need energy for endergonic reactions from ATP.
E. It need enzymes that found in cytosol, SER-membrane & peroxisome.
F. None of the above.

Q_6: HMG-CoA synthase has two isoenzymes one works at mitochondria & the other works at cytosol.
A. True.
B. False.

Q_7: cholesterol synthesis from HMG-CoA need cytosol reductase & ketone body synthesis need mitochondrial lyase.
A. False.
B. True.

1.E 2.E 3.A 4.E 5.B 6.A 7.B

Q_8: HMG-CoA reduction:

A. Need 1 molecule of NADPH.
B. HMG-CoA reductase found at SER-Membrane[integral protein].
C. HMG-CoA reductase catalytic site projected into cytosol.
D. It produce Mevalonatyl-CoA.
E. B+C.

Q_9: according cholesterol synthesis which of following is reversible reaction:

A. Isopentenyl pyrophosphat[IPP] into Dimethylallyl pyrophosphate.
B. Mevalonate into 5-pyrophosphomevalonate.
C. Dimethylallyl pyrophosphate into geranyl pyrophosphate.
D. Acetyl CoA into acetoacetyl CoA.
E. More than one.

Q_{10}: which of following is the correct order of carbon unit at cholesterol synthesis intermediate.

A. 2,4,6,6,6,5,5,10,15,30,30,27.
B. 2,4,6,5,10,16,15,30,27.
C. 2,4,8,8,7,7,14,34,34,31.
D. 3,5,6,6,5,5,10,20,30,30,27.
E. I didn't look at cholesterol synthesis pictures 😐.

Q_{11}: we need to keep cholesterol synthesis intermediate phosphorylated to keep it soluble at cytosol, there for squalene need sterol carrier.

A. True.
B. False.

Q_{12}: the net cholesterol synthesis reactant:

A. 18acetyl CoA+8NADPH+8H^++5H_2O+18ATP.
B. 16acetyl CoA+6NADPH+6H^++6H_2O+16ATP.
C. 18acetyl CoA+8NADH+8H^++5H_2O+18ADP.
D. 16acetyl CoA+6NADH+6H^++6H_2O+16ADP.
E. Non of above.

Q_{13}: Which of following reaction doesn't release PPi:

A. Dimethylallyl pyrophosphate into geranyl pyrophosphate.
B. Geranyl pyrophosphate into farnesyl pyrophosphate[FPP].
C. farnesyl pyrophosphate[FPP] into squalene.
D. Isopentenyl pyrophosphat[IPP] into Dimethylallyl pyrophosphate.
E. None of above.

Q_{14}: which of following is wrong according cholesterol synthesis regulation.

A. We inhibit HMG-CoA reductase expression by inhibit SREBP-2 transportation from ER into Golgi apparatus.
B. We have enzyme that can degrade HMG-CoA reductase so we'll inhibit mevalonate synthesis.
C. Phosphorylation of HMG-CoA reductase inhibit cholesterol synthesis.
D. Insulin can dephosphorylate HMG-CoA reductase so induce cholesterol synthesis.
E. INSIG induce cholesterol synthesis.

8.E 9.E[A+D] 10.A 11.A 12.A 13.D 14.E

Q15: cholesterol can be eliminated from body as:
- A. Bile salt.
- B. Free cholesterol at bile juice.
- C. Release inside VLDL from liver.
- D. All of above.
- E. More than one is correct but not all.

Q16: bile acid is 24 carbon unit that & at the duodenum bile acid:bile salt is 1:1.
- A. True.
- B. False.

Q17: which of following cholesterol modifications include at bile acid synthesis:
- A. Hydroxyl groups are added.
- B. B ring double bond is reduced.
- C. Side Chain get shorten by three carbon & Carboxylation happens at this chain.
- D. Its enzyme is only found in liver & there will be farther modification by adding glycine or taurine by 3:1 ratio[3 bile acid has glycine: 1 bile acid has taurine].
- E. All of above.

Q18: which of following is not a secondary bile acid.
- A. Deoxycholic acid.
- B. Lithocholic acid.
- C. Cholic acid.
- D. Chenodeoxycholic acid.
- E. More than one.

Q19: which of following is correct about cholelithiasis:
- A. Accumulation of cholesterol[high level of cholesterol and low level of bile acid].
- B. There will be insoluble gallbladder stones.
- C. Best treatment is cholecystectomy[surgical removal of gallbladder].
- D. After cholecystectomy we must follow deities that consist low cholesterol[less meat dishes].
- E. All of above.

"اللَّهُ لاَ إِلَـهَ إِلاَّ هُوَ الْحَيُّ الْقَيُّومُ لاَ تَأْخُذُهُ سِنَةٌ وَلاَ نَوْمٌ لَّهُ مَا فِي السَّمَاوَاتِ وَمَا فِي الأَرْضِ مَن ذَا الَّذِي يَشْفَعُ عِنْدَهُ إِلاَّ بِإِذْنِهِ يَعْلَمُ مَا بَيْنَ أَيْدِيهِمْ وَمَا خَلْفَهُمْ وَلاَ يُحِيطُونَ بِشَيْءٍ مِّنْ عِلْمِهِ إِلاَّ بِمَا شَاء وَسِعَ كُرْسِيُّهُ السَّمَاوَاتِ وَالأَرْضَ وَلاَ يَؤُودُهُ حِفْظُهُمَا وَهُوَ الْعَلِيُّ الْعَظِيمُ"

[آية الكرسي، سورة البقرة، الآية٢٥٥]

15.E 16.A 17.E 18.E[C+D] 19.E

PLASMA LIPOPROTEINS [SLIDE]

Q_1: which of following isn't a component of amphipathic shell of lipoprotein:
A. Apolipoprotein.
B. Phospholipid.
C. Non-esterified cholesterol.
D. TAG.
E. There no wrong answer.

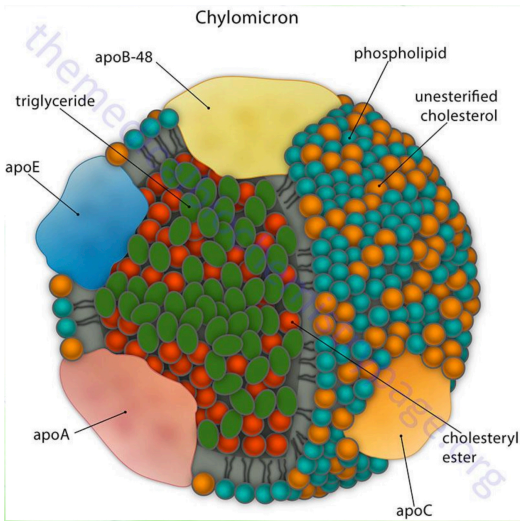
Q_2: which of following is correct about microsomal triglyceride transfer protein[MTP]:
A. Found in both hepatocyte & enterocyte.
B. At liver, it assembles apo-100 with lipid[TAG,CE,phospholipid], produces VLDL.
C. At intestine, it assembles app-48 with lipid, produces chylomicron.
D. It found at ER.
E. All of the above.

Q_3: chylomicrons are inactive[nascent] until HDL translates apo-C II & apo-E to it:
A. True.
B. False.

Q_4: apo-C II receptor stimulates chylomicron degradation, and induce chylomicron remnants endocytosis by liver:
A. True.
B. False.

Q_5: which of following is the another name of chylomicron remnant:
A. HDL.
B. Apo- B100 lipoprotein[A-B100LP].
C. IDL.
D. VLDL.
E. VHDL

Q_6: which of following is correct about type-1-hyperlipproteinaemia:
A. It caused by phospholipase deficiency & apo-C II deficiency.
B. It can cause chylomicronemia.
C. It can cause hypertriglyceridemia.
D. all of the above.



Q_7: mutation in apo-E gene can cause type III hyperlipoprotenemia ,therefore chylomicron remnant accumulate at blood.
A. True.
B. False.

Q_8:betalipoproteinemia:
A. Is caused by defective MTP.
B. Leads to VLDL & Chylomicron synthesis deficiency.
C. TAGs accumulate at liver & intestine.
D. Can cause defective at fat solubility of vitamins.
E. All of above.

1.D 2.E 3.A 4.B 5.C 6.D 7.A 8.E

Q_9: highest concentration of LPL is in:
A. Adipose tissue.
B. Cardiac muscle.
C. Skeletal muscle.
D. All of above have same concentration.

Q_{10}:deficiency of ….. can deficit liver endocytosis of IDL & chylomicron remnant:
A. Apo-E1.
B. Apo-E2.
C. Apo-E3.
D. Apo-E4.
E. None of the above.

Q_{11}: which of following increase risk of early AD[Alzheimer disease]:
A. Apo-E1.
B. Apo-E2.
C. Apo-E3.
D. Apo-E4.
E. None of the above.

Q_{12}: …… can be LDL-receptor associated disease:
A. Type IIa hyperlipidemia.
B. Inherited hypercholesterolemia[FH].
C. Atherosclerosis.
D. Non-inherited hypercholesterolemia.
E. All of above.

Q_{13}: which of follow can deal with high cholesterol level inside cells:
A. Inhibit HMG-CoA reductase.
B. Inhibit of LDL receptors expression.
C. Esterification of cholesterol by acyl CoA:cholesterol acyltransferase[ACAT].
D. all of above.

Q_{14}: which of following is the precursor of atherosclerotic plaque.
A. Foam cells.
B. Macrophages.
C. PMN.
D. HDL-cholesterol.
E. More than one.

Q_{15}: which of following is structural lipoprotein that only found at HDL.
A. Apo-A1.
B. Apo-E3.
C. Apo-C2.
D. Apo-B24.
E. None of above.

9.B 10.B 11.D 12.E 13.D 14.E[A+B] 15.A

Q_{16}: which of following transport free cholesterol into nascent dicoidal HDL:

A. ABCA2.
B. ABCA1.
C. NPC1L1.
D. Endocytosis.
E. All of the above.

Q_{17}: VLDL gives TAG to HDL by cholesterol ester transfer protein[CETP]:

A. True.
B. False.

Q_{18}: cholesterol from HDL_2 is uptaked by liver by:

A. ABCA1.
B. SR-B1.
C. NPC1L1.
D. LCAT.
E. None of the above.

قال تعالى: "وَإِلَهُكُمْ إِلَهٌ وَاحِدٌ لَّا إِلَهَ إِلَّا هُوَ الرَّحْمَنُ الرَّحِيمُ"[سورة البقرة، الآية ١٦٣]
«لَا إِلَهَ إِلَّا اللهُ وَحْدَهُ لَا شَرِيكَ لَهُ ، لَهُ المُلْكُ ، وَلَهُ الحَمْدُ ، يُحْيِي وَيُمِيتُ ، بِيَدِهِ الخَيْرُ ، وَهُوَ عَلَى كُلِّ شَيْءٍ قَدِيرٌ»

16.B 17.A 18.B

Q_1: 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)

Q_2: Which one of the following protein activates lipoprotein lipase?

a. Apolipoprotein A-I
b. Apolipoprotein B-48
c. Apolipoprotein C-II
d. Cholesteryl ester transfer protein

Q_3: Aspirin inhibits the production of?

a. prostaglandins
b. thromboxanes
c. Leukotrienes.
d. A+B
e. A+C

Q_4: Second substrate for thiolase :

a. ATP
b. H2O
c. O2
d. Coenzyme A

Q_5: 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

Q_6: To synthesize a 6 carbon fatty acid we need:

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

Q_7: 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

1.D 2.C 3.D 4.D[THIOLASE AT MUSCLE] 5.D 6.D 7.C

Q_8: A 4-month-old child is being evaluated for fasting hypoglycemia. Laboratory tests at admission reveal low levels of ketone bodies, free carnitine, and acylcarnitines in the blood. Free fatty acid levels in the blood were elevated. Deficiency of which of the following would best explain these findings?

A. Adipose triglyceride lipase
B. Carnitine transporter
C. Carnitine palmitoyltransferase I
D. Long-chain fatty acid dehydrogenase

Q_9: 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

Q_{10}: Needed to synthesize sphingomyelin from ceramide?

a. Phosphocholine
b. UDP-choline
c. Phosphatidylinositol
d. lecithin[PC]

Q_{11}: Tay sach's disease leads to the accumulation of:

e. Gangliosides
f. Lecithin
g. Sphingomyelin
h. Cerebrosides

Q_{12}: 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

Q_{13}: 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

Q_{14}: What inhibits carnitine shuttle?

a. Malonyl coA
b. Acyl CoA
c. Acetyl CoA
d. Acetoacetate

Q_{15}: Familiar hypercholesterolemia involves a deficiency in:

a. HMG-CoA reductase
b. Uptake of HDL by the liver
c. Synthesis of cholesterol
d. LDL endocytosis

8.B 9.A 10.D 11.A 12.C 13.A 14.A 15.D

Q_{16}: 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. H2O
d. FAD

Q_{17}: 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
D. A+C

Q_{18}: produces diacyl glycerol and inositol 3 phosphate from PIP2:

A. phospholipase b
B. phospholipase d
C. phospholipase a
D. phospholipase c

Q_{19}: phosphatidyl serine is produced from phosphatidylethanolamine by:

A. carboxylation
B. decarboxylation
C. methylation
D. polar head exchange
E. more than one of the above

Q_{20}: 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

Q_{21}: in the final step of ketone body synthesis the products are acetoacetate and ?

A. DHAP
B. acetone
C. 3-hydroxybutyrate
D. acetyl CoA

Q_{22}: something true about lipoproteins:

A. chylomicron has the lowest apolipoprotein percentage
B. chylomicron has the lowest TAG
C. HDL has the lowest apolipoprotein percentage

Q_{23}: Fastest lipoprotein to reach anode:

A. HDL
B. LDL
C. VLDL
D. IDL

16.D 17.A 18.D 19.A 20.B 21.D 22.A 23.A

Q_{24}: The step required to activate\start TAG synthesis?
Answer : activation of fatty acids by addition of CoA

Q_{25}: TAG is produced in adipose tissue, which is true ?
A. needs NADPH
B. needs glycerol kinase
C. needs active glycolysis
D. b+c

Q_{26}: in HDL cholesterol is esterified from :-
A. acetyl CoA
B. phosphatidyl choline/lecithin
C. phosphartidylethanolamine

Q_{27}: Apo-B100 is found only by itself in:
A. LDL
B. HDL
C. IDL
D. chylomicrons

Q_{28}: 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

Q_{29}: The fatty acid that has NO double bonds :
A. Butyric acid.
B. Palmitic acid.
C. Capric acid.
D. All the above.

Q_{30}: amide group in ceramide comes from:
A. serine
B. phosphatidyl choline
C. sphingomylein
D. glutamine
E. glutamate

Q_{31}: The excess dietary carbohydrates are converted to TAGs and transported to cells by?
A. VLDL
B. HDL
C. Chylomicrons
D. IDL

Q_{32}: Phosphatidylcholine is formed from?
A. phosphatidylethanolamine+ 3 SAM.
B. CDP-DAG + cholin
C. CMP+ phosphocholin

25.C 26.B 27.A 28.A 29.D 30.A 31.A 32.A

Q_{33}: Albumin binds all of the following except:
a. Free fatty acids
b. Steroid hormones
c. Conjugated billirubin
d. d. Ca+2

Q_{34}: 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 .

Q_{35}: One of the following is required for synthesis of CoA:
A. Biotin
B. Riboflavin
C. Thiamine
D. Pantothenic acid
E. Niacin

Q_{36}: The common intermediate for triacylglycerol and phospholipids synthesis is:
A. phosphatidic acid.
B. cholic acid
C. lysophosphotidic acid
D. archadionic acid

Q_{37}: What happens in both type 1 and type 2 diabetes?
a. Ketoacidosis
b. Hyperglycemia
c. High HDL/LDL ratio
d. Hypo-triacylglycerolemia

Q_{38}: Lisophosphatidyl choline is produced from lecithin by the action of:
A. phospholipase D
B. phospholipase C
C. phospholipase A2
D. phospholipase B
E. ysophospholipase

Q_{39}: 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

33.C 34.D 35.D 36.A 37.MAYBE A 38.C 39.B

Q40: Which of the following can be used to lose weight?
- a. Inhibition of pancreatic lipases
- b. Activation of pyruvate dehydrogenase
- c. Inhibition of HMG-CoA reductase
- d. Increasing absorption of fat

Q41: The rate limiting step in prostaglandins synthesis is catalyzed by:
- A. peroxidase
- B. oxygenase
- C. phospholipase A2
- D. cyclooxygenase
- E. PGG synthase

Q42: During the last hours of a 48hour fast, which of the following is used as a source of energy?
- a. Amino acids
- b. Glycogen
- c. Lactate
- d. Nucleotides

Q43: What is used to catalyze degradation of sphingomyline into ceramide and phosphocholine?
- a. Phospholipase C
- b. Phospholipase A
- c. Phospholipase B
- d. Phospholipase D

Q44: 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

قال تعالى:"وَقَالُواْ لَن يَدۡخُلَ ٱلۡجَنَّةَ إِلَّا مَن كَانَ هُودًا أَوۡ نَصَٰرَىٰۗ تِلۡكَ أَمَانِيُّهُمۡۗ قُلۡ هَاتُواْ بُرۡهَٰنَكُمۡ إِن كُنتُمۡ صَٰدِقِينَ (111) بَلَىٰۤ مَنۡ أَسۡلَمَ وَجۡهَهُۥ لِلَّهِ وَهُوَ مُحۡسِنٞ فَلَهُۥٓ أَجۡرُهُۥ عِندَ رَبِّهِۦ وَلَا خَوۡفٌ عَلَيۡهِمۡ وَلَا هُمۡ يَحۡزَنُونَ (112) وَقَالَتِ ٱلۡيَهُودُ لَيۡسَتِ ٱلنَّصَٰرَىٰ عَلَىٰ شَيۡءٖ وَقَالَتِ ٱلنَّصَٰرَىٰ لَيۡسَتِ ٱلۡيَهُودُ عَلَىٰ شَيۡءٖ وَهُمۡ يَتۡلُونَ ٱلۡكِتَٰبَۗ كَذَٰلِكَ قَالَ ٱلَّذِينَ لَا يَعۡلَمُونَ مِثۡلَ قَوۡلِهِمۡۚ فَٱللَّهُ يَحۡكُمُ بَيۡنَهُمۡ يَوۡمَ ٱلۡقِيَٰمَةِ فِيمَا كَانُواْ فِيهِ يَخۡتَلِفُونَ (113) وَمَنۡ أَظۡلَمُ مِمَّن مَّنَعَ مَسَٰجِدَ ٱللَّهِ أَن يُذۡكَرَ فِيهَا ٱسۡمُهُۥ وَسَعَىٰ فِي خَرَابِهَآۚ أُوْلَٰٓئِكَ مَا كَانَ لَهُمۡ أَن يَدۡخُلُوهَآ إِلَّا خَآئِفِينَۚ لَهُمۡ فِي ٱلدُّنۡيَا خِزۡيٞ وَلَهُمۡ فِي ٱلۡأٓخِرَةِ عَذَابٌ عَظِيمٞ (114) وَلِلَّهِ ٱلۡمَشۡرِقُ وَٱلۡمَغۡرِبُۚ فَأَيۡنَمَا تُوَلُّواْ فَثَمَّ وَجۡهُ ٱللَّهِۚ إِنَّ ٱللَّهَ وَٰسِعٌ عَلِيمٞ (115) وَقَالُواْ ٱتَّخَذَ ٱللَّهُ وَلَدٗاۗ سُبۡحَٰنَهُۥۖ بَل لَّهُۥ مَا فِي ٱلسَّمَٰوَٰتِ وَٱلۡأَرۡضِۖ كُلّٞ لَّهُۥ قَٰنِتُونَ (116) بَدِيعُ ٱلسَّمَٰوَٰتِ وَٱلۡأَرۡضِۖ وَإِذَا قَضَىٰٓ أَمۡرٗا فَإِنَّمَا يَقُولُ لَهُۥ كُن فَيَكُونُ (117)"
[سورة البقرة، الآيات من١١١ إلى ١١٧]

40.A+C 41.C 42.A 43.A 44.E

NOTE:

1. Lipid:

A. glucose-6-phosphate dehydrogenase —} glutathione.

B. Lipid enzyme found in liver but not in adipose tissue—} glecyrol kinase.

C. biotin is vitamin B_7 [not B_7 derivatives] (the same compound but different name).

D. you mustn't save whole enzymatic domain name, you must know

1. transacylase change the Fatty Acyl carrier from CoA into ACP.
2. ACP synthase change the Fatty Acyl carrier from ACP into cystine residues & at step four it work as condensation.
3. ketoacyl reductase need NADPH[electron source] to reduce keto group into alcohol.
4. Dehydratase remove H_2O and make double bond so the product is alkene.
5. Enoyl reductase need NADPH to get rid of double bond and get alkane product.
6. You must know order of reaction. RETURN INTO Q22

E. If we use malonyl CoA at overall palmitate synthesis equation then we have released of 7 CO_2.

F. β-oxidation reaction[oxidation, hydration, oxidation] is opposite for FA synthesis [reduction, dehydration, reduction]. RETURN INTO Q10

G. At β-oxidation:

1. Number of acetyl CoA= number of cycles+1.
2. Number of FAD=NAD^+ =number of cycles. RETURN INTO Q11

H. When we gedrade VLFAs inside peroxisomes, we use Acyl-CoA oxidase[ACOX] rather than Acyl-CoA dehydrogenase[ACAD(inside mitochondria)]. RETURN INTO Q19

I. Be carful for the ratio which is the numerator[البسط],keto synthesis stimulates by low NAD^+/NADH[high NADH/NAD^+] & keto degradation stimulates by high NAD^+/NADH[low NADH/NAD^+]. RETURN INTO Q6

J. Where PIP2 get this abbreviation:

P: phosphatidyl[DAG with 3-phosphate].

I: inisitol.

P2: 4,5-bisphosphate[inositol ring phosphate]. RETURN INTO Q12

K. Ether glycerophospholipid:

1. Plasmalogen is phosphatidalethanolamine but the name is different.
2. Be carful there is a not y to be Plasmalogen.
3. Peothrombotic is Platelet-activating factor. RETURN INTO Q18

في الختام نرجو الله أن قد وفقنا في هذا ، راجين الثواب والأجر في الدنيا والآخرة، والحمد لله على أن وفقنا لهذا التخصص وهذه العلوم.

قال تعالى:"وَإِذْ تَأَذَّنَ رَبُّكُمْ لَئِن شَكَرْتُمْ لَأَزِيدَنَّكُمْ ۖ وَلَئِن كَفَرْتُمْ إِنَّ عَذَابِي لَشَدِيدٌ"[سورة ابراهيم، الآية ٧]

وصلى الله و سلم و بارك على نبينا محمد وعلى آله و صحبه أجمعين