

Practice Quiz Answers : Dr. Balliett : "You haven't been eating your flaxseed oil have you?"

GLYCOGENESIS, GLYCOGENOLYSIS, GLUCONEOGENESIS

1. Brain & RBCs
2. Glycogen, Liver
3. Glut-2 transporter, no
4. High carbohydrate
5. Glycogen stores
6. Glycolysis and triglyceride synthesis
7. Glycogen synthase, insulin
8. Glut-4 transporter, yes
9. Glycogen phosphorylase, glycogen synthase, uptake of glucose by muscle and adipose tissue
10. Glucagon
11. Alpha 1→4 linkages, Debranching enzymes
12. Hypoglycemia, Pancreatic α -cells, rapid activation
13. Hypoglycemia & stress, Adrenal medulla, rapid activation
14. Stress, Adrenal cortex, chronic activation
15. Hyperglycemia, Pancreatic β -cells, inactivation
16. Epinephrine
17. \uparrow levels of cAMP (via epinephrine) and Ca-calmodulin complex (influx Ca via nerve impulse)
18. PFK-1
19. Glycogen phosphorylase A
20. When hepatic glycogen is depleted
21. 4 ATP supplied by beta-oxidation of fats
22. Muscle protein
23. Lactic acid (muscle & rbc cori cycle), glycerol (triglycerides of adipose)
24. Pyruvate carboxylase, PEPCK, glycerol kinase, phosphoglycerate kinase
25. Pyruvate carboxylase (PC), PEPcarboxykinase (PEPCK), FBPase, G6Pase
26. Malate and citrate
27. Pyruvate carboxylase : CO_2 , ATP, biotin, manganese
28. PEP to Pyruvate
29. GTP, CO_2
30. Liver, allows glucose to leave the cells and increase blood glucose
31. Glycerol kinase (needs ATP)
32. PFK-2 and Fructose 2-6 Biphosphatase (F 2,6 BP)
33. Fat metabolism, \downarrow PDH (\downarrow krebs), and \uparrow PC (\uparrow gluconeogenesis)
34. Bypasses PFK-1, increases pyruvate, increases fat production



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LIPID OXIDATIVE METABOLISM

35. Oxidative, beta-oxidation
36. Hormone sensitive lipase, glucagon/epinephrine/thyroxin
37. Acetyl CoA, FADH₂, NADH, H
38. Ketone bodies, exported
39. Kreb's Cycle, ATP
40. 6 to 8 bound to albumin
41. Fatty acid thiokinase, ATP
42. Outer mitochondrial membrane, CPT-1 (Carnitine palmitoyl transferase-1)
43. Fatty acid acyl CoA synthase
44. Long chain fatty acids to be transferred to carnitine & imported into the mitochondrial matrix
45. Trimethyl-lysine : Lysine & SaME (B6)
46. CPT-1, CPT-2
47. Acyl CoA DH (FAD), Enoyl CoA Hydratase (H₂O), Hydroxyacyl CoA DH (NAD), Thiolase (CoA)
48. 16C, 18C, 20C
49. Liver uses fatty acids for energy for gluconeogenesis producing excess acetyl CoA
50. Excess acetyl CoA is converted into _____. Give 3 examples.
51. HMG CoA synthase, Lyase
52. Succinyl-CoA and CoA
53. 50%, starvation
54. During fasting/starvation
55. Under Stress
56. Under Chronic stress (it also increases insulin resistance)

FATTY ACID SYNTHESIS

57. Liver, Kidney, Mammary Gland, Adipose tissue
58. Cytosol, Malate Shuttle
59. Malate-citrate antiporter
60. Pentose Phosphate Pathway & NADP dependent malate DH
61. Citrate → OAA + Acetyl CoA
62. It has 3 carbons (only odd numbered FA)
63. Acetyl CoA + CO₂
64. Biotin & ATP
65. Citrate (polymer), and insulin (phosphatase)
66. High carbohydrate & low fat diet



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67. Reduce FAs, Increase cholesterol
68. Palmitoyl CoA (polymer), Glucagon & Epinephrine (cAMP kinase)
69. 7, dimer, Acyl Carrier protein
70. 8, 7, 7 CO₂
71. 7 ATP
72. 14, Water & 7 ADP
73. High levels of free fatty acids
74. 14,16,18,20 carbons : Essential Fatty acids : Palmitate (16C)
75. Smooth Endoplasmic Reticulum, Multi-enzyme complex FA elongase, Malonyl CoA, NADPH
76. 2,4, or 6
77. Acetyl CoA
78. Reverse Beta-oxidation with a NADH dependence
79. 22-24 carbons, brain for synthesis of sphingolipids for myelination
80. Stearoyl CoA
81. Delta 9 bond, Linoleic & Linolenic (18:2 & 18:3)
82. Arachidonic, EPA, DHA : Delta 6 desaturase and elongase
83. Triacylglycerol
84. Glycerol Kinase
85. Wide variety of food, eating in large groups, availability of energy dense foods
86. DHAP
87. Leptin, hypothalamus
88. ↑ Corticotrophin releasing hormone, ↓ neuropeptide Y

MAKE SURE YOU CAN DRAW GLYCOGENESIS, GLYCOLYSIS, GLYCOGENOLYSIS, BETA OXIDATION OVERVIEW REACTION PAGE 6

