

## CARBOHYDRATES

1. Where do most carbohydrates come from?
2. Carbohydrates are synthesized from \_\_\_\_ and \_\_\_\_\_, thus containing \_:\_:\_ in what ratio?
3. How are monosaccharides subdivided?
4. What are the three disaccharides?
5. What has 3 to 10 monosaccharides?
6. What is a polysaccharide and give five examples.
7. Pyranose has how many rings? Give three examples.
8. Furanose has how many rings? Give two examples.
9. Glucose is \_\_\_% pyranose.
10. Because the ring structure can open, rotation can occur at the \_\_\_\_\_, this is termed \_\_\_\_\_.
11. Dextrose is a mixture of what?
12. What is the first carbon termed? What if the OH is down? OH up?
13. What is an epimere?
14. What is it called if the epimere is at C2? C4?
15. Although not the same molecule, Fructose has the same molecular formula as what?
16. Fructose is a \_\_\_\_\_.
17. Glucose is an \_\_\_\_\_.
18. What are the three disaccharides?
19. What is the bond of sucrose?
20. What is the bond of lactose?
21. What is the bond of maltose?
22. What has a bottle-brush appearance?
23. Starch is a polymer of \_\_\_\_\_ termed \_\_\_\_\_.
24. Where are starches found?
25. What are the two main types of starch?
26. What is animal starch?
27. Describe amylose.
28. Describe amlopectin.
29. Where is glycogen stored, and what happens to it when there is enough of it?
30. Glycogens have both branching and non-branching, and more branching than what?
31. What is the bond of Cellulose and where is cellulose found?
32. Cellulose is a form of \_\_\_\_\_ that can be fermented by bacteria in the GI tract.
33. What is a polymer of fructose and what is it also known as?
34. What are long unbranched polysaccharides containing repeating modified \_\_\_\_\_ units?



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35. What are the two things disaccharide units contain?
36. What are two amino sugars?
37. What are two uronic acids?
38. What are the 6 GAG's?
39. What presents a chiral carbon?
40. What is the only isomer to occur naturally in mammals?
41. How is the number of a stereoisomer calculated?
42. What monosaccharide's have 3 carbons? Hint 3GlyD.
43. What monosaccharide's have 4 carbons? Hint 4E.
44. What monosaccharide's have 5 carbons? Hint 5RedRibs.
45. What monosaccharide's have 6 carbons? Hint 6 GoodGirlsMetFools.
46. What monosaccharide's have 9 carbons? Hint 9N.

## LIPIDS & LIPOPROTEINS

47. What transports lipids in plasma?
48. What are the four classes of lipoproteins? Which is the largest?
49. \_\_\_\_\_ is the structural protein of lipoproteins.
50. What is the enzyme cofactor of LCAT?
51. B-lipoproteins serve as what?
52. Chylomicrons transport what into the circulation?
53. Where are Chylomicrons found?
54. Chylomicrons \_\_\_\_\_ from blood.
55. The liver \_\_\_\_\_ metabolize native chylomicrons.
56. Where and what do VLDL's transport?
57. The fatty acids being carried by the VLDL's are liberated by \_\_\_\_\_ located in the \_\_\_\_\_.
58. What happens to a VLDL when all the triglycerides exit?
59. VLDL's and \_\_\_\_\_ both have \_\_\_\_\_ receptors. Convenient!
60. LDL's carry \_\_\_\_\_.
61. Lipoproteins aside, who has B100 E receptors?
62. LDL's are associated with what?
63. Where are LDL's primarily degraded and their percentage of degradation?
64. What produces and secrete HDLs?
65. What are HDL proteins involved in?
66. Quickly summate the reverse cholesterol transport.



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67. LCAT converts \_\_\_\_\_ into \_\_\_\_\_, which can move into what?
68. What is the LCAT activator and HDL liver receptor ligand?
69. What four things are related to elevated HDL levels?
70. What increases hepatic lipase's action? Decreases?
71. Bile is made from \_\_\_\_\_ in the liver.
72. The liver converts fatty acids into ketone bodies, thus it is \_\_\_\_\_.
73. What do the active enzymes of the liver do in lipid transport and metabolism?
74. What is the main storage site of triglycerols?
75. How does adipose tissue effect the liver and muscle?
76. Aside of increased VLDL and chylomicrons, what factors increase triacylglycerols in adipose?
77. What results if triacylglycerols accumulate in the liver?
78. A fed state and a \_\_\_\_\_ diet can lead to \_\_\_\_\_.
79. With a \_\_\_\_\_ deficiency, the resulting fatty liver cannot do what?
80. What deficiencies lead to a fatty liver?
81. What two excesses can lead to a fatty liver?
82. From what does G3P originate?
83. From what FFA originate?
84. In lipolysis, Hormone sensitive lipase is stimulated by what four things?

## LIPID CLASSIFICATION

85. What fatty acids are solid at body temperature?
86. How may carbons and double bonds do unsaturated fatty acids have?
87. How are fatty acids most commonly stored as?
88. In what state are unsaturated fats at at 0°C.
89. What are the two kinds of simple fats?
90. What are simple fats?
91. An ester glycerol plus 3 fatty acids yields a \_\_\_\_\_.
92. What are the three neutral lipids?
93. Complex fats are amphipatic, what does that mean?
94. Where are complex found?
95. What do amphipathic lipids form?
96. How are amphipathic lipids oriented?
97. What complex fat is the main lipid constituent of cell membranes?
98. What do phosphoglycerols contain?
99. What is the most abundant phospholipid?



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100. A fatty acid plus sphingosine yields what?
101. What is a major phospholipid in myelin sheaths?
102. What is needed to produce acetylcholine and surfactant?
103. What contributes to surface cell carbohydrates?
104. What are the three components of sphingomyelin?
105. What are the four groups of glycolipids?
106. Glycolipids contain \_\_\_\_\_ and one or more \_\_\_\_\_.
107. What is the chemical name of myelin?
108. What are the lipid storage diseases?
109. What are the three main groups of complex fats?
110. Natural fats contain an \_\_\_\_\_ number of carbons, and may be \_\_\_\_ or \_\_\_\_\_.
111. What configuration are all unsaturated natural fatty acids?
112. Trans-fatty acids \_\_\_\_\_ LDL cholesterol and \_\_\_\_\_ HDL cholesterol.
113. What may Trans-fatty acids exacerbate?
114. In what general source are Trans fatty acids found and give a few examples.
115. Anolic is for \_\_\_\_\_, as enolic is for \_\_\_\_\_.
116. What are the five clinically important saturated fatty acids? Number of carbons for each?
117. How are omega's classified?
118. Why are omega 3 fatty acids so special?
119. What are the unsaturated fatty acid enzymes in respect to omega's?
120. Often when we lack essential fatty acids what phospholipid membrane irregularities occur?
121. Where is DHA found in the body?
122. Abnormal EFA metabolism is seen in what diseases?
123. What are the three types of Eicosanoids?
124. What are the three prostanoids?
125. Who makes each prostanoid?
126. Localized pain and smooth muscle contraction are regulated by what?
127. What is the function of prostacyclins?
128. What is the function of thromboxanes?
129. Who do prostaglandins talk to?
130. What is the SRS of anaphylaxis?
131. What are the functions of lipoxin?
132. Leukotrienes attract and activate \_\_\_\_\_, and can result in a \_\_\_\_\_.
133. What produces leukotrienes?
134. What are the two pathways to Eicosanoid synthesis?



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135. Who is the precursor to all the others in the cyclooxygenase pathway?
136. What are the possible final products of the cyclooxygenase pathway?
137. What makes up the Prostaglandin H Synthase?
138. What is the default product of the cyclooxygenase pathway?
139. What is PGHS-2?
140. What structures make COX1?
141. What structures make COX2?
142. What does prostaglandin E cause?
143. How can you inhibit COX1 and what may the inhibition lead to?
144. How can you inhibit COX2 and what may the inhibition lead to?
145. Aspirin \_\_\_\_\_ inhibits \_\_\_\_\_.
146. What does ibuprofen \_\_\_\_\_ inhibit and compete with?
147. What do corticosteroids block?
148. Where does the lipoxygenase pathway occur and what does it produce?
149. What inhibits the release of arachidonate?
150. What foods are rich in Arachidonate?
151. What is lipid peroxidation?
152. What can disorders can peroxidation cause?
153. What can peroxidation do to foods?
154. What are the three stages of free radical production?
155. What are the three types of free radical oxidation?
156. What is the most important Lipid anti-oxidant?
157. What is the most important water soluble anti-oxidant?
158. What are the food additives anti-oxidants?
159. In ethanol metabolism, \_\_\_\_\_ → \_\_\_\_\_ → \_\_\_\_\_.
160. What does ethanol and acetate reduce?
161. What makes a person throw up?
162. What is 60% less active in women than men? What does it do?
163. What coenzyme is needed to break down ethanol?
164. What alcohol related genetic defect may some Asian and Native Americans have?

STUDY THE DIGESTION TABLE IN THE PACKET



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FILL IN THE TABLE BELOW

NAME	# CARBON	# DOUBLE BONDS	OMEGA	FOOD SOURCE
Polmitoleic				
Oliec				
Linoleic				
Linolenic				
Arachindonic				
Eicosapentaenoic				
Docosahexenoic				

