PRINCIPLES

1. What is etiology?
2. What is pathogenesis?
3. What is morphologic changes?
4. What is the difference between morbidity and mortality?
5. What is cellular adaptation.
6. What are labile cells?
7. What are stable cells?
8. What are permanent cells?
9. What are the factors that dictate whether or not a tissue can adapt?
10. What are the five ways cells can adapt?
11. What is atrophy?
12. What is hypertrophy?
13. When is physiological atrophy seen?
14. When is pathological atrophy, most commonly seen?
15. Goiter and hormone secreting tumors are representative of _____.
16. What is hyperplasia and give two examples of physiological hyperplasia.
17. Give three examples of pathological hyperplasia.
18. What is metaplasia?
19. In metaplasia, granular epithelium is often replaced by _____ epithelium.
20. Give three examples of metaplasia?
21. What occurs in Barrett's esophagus?
22. What is seen in dysplasia?
23. When does dysplasia usually occur?
24. Although dysplasia is the most common, what may also give rise to neoplasia?
25. A neoplasm that has not yet migrated is known as?
26. What are the three categories of cellular accumulation?
27. What are some examples of intra-cellular accumulations?
28. Steatosis is _____, most commonly affects the _____, and is caused by _____.
29. What is a characteristic of hepatic steatosis?
30. What causes cellular swelling and where does the water accumulate?
31. What is hemosiderin and what does it look like?
32. What is a common bruise?
33. What are some causes of systemic hemosiderosis?
34. What is "a pigment of aging"? What is it composed of?
35. What is the cause of lipofuscin deposition?

36. An enzyme deficiency may lead to what glycogen storage diseases?
37. Accumulation of glycogen may be both normal or abnormal. True or false.
38. Where may cholesterol accumulate?
39. What is a disorder of cholesterol accumulation that appears like a skin tag?
40. What are the causes of cell injury? (GI PINCH)
41. During hypoxia, there is a decreased synthesis of _____.
42. What are the universal biochemical themes of cell injury?
43. What are two examples are reversible injury that can become irreversible if persisted?
44. Why may cellular swelling occur?
45. What is steatosis?
46. What is the pathway of reversible injury due to hypoxic/ischemic injury?
47. What are the final irreversible steps of hypoxic/ischemic injury?
48. What is mitochondrial vacuolization?
49. What is a small shrunken in dark nucleus?
50. What is a fragmented nucleus?
51. What is a faded or not visible nucleus?
52. What is it about free radicals that make them so destructive?
53. Free radical induced injury is a _____ in a variety of cell processes?
54. What are some processes that free radical induced injury is involved in?
55. What may free radicals damage?
56. What 4 important substances protects cells from free radicals?
57. What two reactions produce a hydroxyl free radical?
58. O_3 w/ SOD produces _____. Why is this significant?
59. Luckily, normally then $2H_30_2$ w/ catalase bind forming what products?
60. What is calcium deposition in necrotic tissue?
61. What is metastatic calcification?

NECROSIS

62. What is necrosis?
63. What are the two processes that sum to form necrosis?
64. What is it gangrenous necrosis?
65. What disease processes can cause gangrenous necrosis?
66. Mycobacterium tuberculosis is associated with what type of necrosis?
67. Brain necrosis is always _____.
68. What typically causes coagulative necrosis?
69. What classification of necrosis is complete cell destruction in the short-term?

70. What type of necrosis initiates an inflammatory reaction?
71. In acute pancreatitis where fat and calcium are accumulated, what is the classification of necrosis?
72. Myocardial infarct cells become _____, often binding together, as well, more _____ are seen in CT.
73. When do we produce a granuloma?
74. What is apoptosis?
75. Why in apoptosis, is the cell membrane the last to go?
76. What is the morphological pattern of death by apoptosis?
77. What are apoptotic bodies?
78. Apoptosis may play a role in the _____ of _____.
79. What proteins are involved in adaptation to stressful stimuli?
80. Heat shock proteins can be either _____ or _____.
81. Induced heat shock proteins, such as _____, protect against _____.
82. What is a heat shock protein induced during myocardial and cerebral ischemia?
83. Increased heat shock protein expression is correlated with what?
84. What are the mitochondrial chaperones?
85. Ubiquitin facilitates what?

INFLAMMATION

86. What is inflammation?
87. Repair involves replacement of injured tissue via _____, _____, & _____.
88. Who are the players of inflammation?
89. What are the major causes of inflammation?
90. What are the two patterns of inflammation?
91. What leukocytes are seen in the acute inflammatory response?
92. What is histologically seen in the chronic inflammatory response?
93. Neutrophils are also known as PMN's, what does that stand for?
94. What are the cardinal signs of inflammation?
95. What is an edema?
96. What is an effusion?
97. What is a transudate?
98. What is an exudate?
99. What is a serous exudate?
100. What does serosanguinous refer to?
101. What is a fibrinous exudate?
102. What is a purulent exudate?
103. What is supperative inflammation?

104. What are the three major components of the inflammatory response?
105. Why does transient vasoconstriction occur immediately after injury?
106. What does vasodilation and increased vascular wall permeability do to the blood within the lumen?
107. What is and explain the first cellular event of inflammation?
108. The second cellular event is adhesion/pavementation, what are the roles of the involved proteins?
109. What are the leukocytes adhesion deficiency disorders?
110. What are leukocyte adhesion deficiencies characterized by?
111. What is the third cellular event?
112. Recognition and binding of white blood cells occurs via opsonization, what is it?
113. How may leukocytes kill an antigen?

CHEMICAL MEDIATORS

114. What are chemical mediators?
115. Where do chemical mediators originate and how long do they live for?
116. Chemical mediators sometimes may have _____ on the host.
117. What are the two chemical mediator control mechanisms of inflammation?
118. What are the three plasma mediator systems?
119. What is the most important and potent chemical mediator in the kinin family?
120. What are the three general inflammatory effects?
121. Bradykinin is activated by the _____ via _____ and is rapidly degraded.
122. While in blood Hagmann factor is inactive. When is it active?
123. Name six proteins of the complement system.
124. In the alternative pathway of the complement system, what do C-proteins seek out?
125. Antigen antibody binding is associated with which C- protein in the classic pathway?
126. Which complement proteins are vasodilators and increase vascular permeability?
127. Which complement protein is an opsonin?
128. What complement protein causes chemotaxis and activates amino acid metabolism?
129. What complement proteins yield the membrane attack complex?
130. What is the coagulation system?
131. What are the functions of thrombin?
132. Fibrin split products increase _____.
133. What activates plasminogen into plasmin?
134. What is fibrin used for?
135. What is the function of plasmin?
136. What pathway produces prostaglandins and thromboxane?
137. What pathway produces leukotrienes and asthma symptoms?

138. _____ block the cyclooxygenase pathway?
139. What are the cell-derived vasoactive (vasodialator) amines?
140. Prostaglandins ____ vascular permeability and _____vascular dilation.
141. Name four cell-derived arachodonic acid metabolites.
142. PGI_2 causes _____ release.
143. PGE_2 allows for _____.
144. TXA_2 has a _____effect, thus is _____ and stimulates _____.
145. The leukotrienes, LTC/D/E_4, stimulate _____, enhance _____, and are responsible for _____.
146. What does the leukotriene LTB_4 do?
147. What may be used to inhibit arachidonic acid metabolism?
148. Who produces inflammatory cytokines? What stimulates their secretion?
149. Name the inflammatory cytokines?
150. Cytokines induce the synthesis of what?
151. Cytokines, ____ & ____, induce what type of reactions?
152. Cytokines are chemotactic thus induce aggregation of what type of white blood cell?
153. What are the systemic acute phase reactions?
154. What is nitric oxide also known as?
155. What are the actions of the short lived gas, nitric oxide?
156. What are the two forms of nitric oxide?
157. Where is the very potent cell-derived mediator, platelet activating factor, derived from?
158. What synthesizes platelet activating factor?
159. What is the function of platelet activating factor?
160. Interferons (INFs) inhibit _____.
161. What specific interleukin activates gross differentiation and antibody production?

CELLULAR PARTICIPANTS OF INFLAMMATION

162. What polymorphonuclear leukocyte is the most common leukocyte in our bodies?
163. What do Neutrophils release? What is their origin?
164. Neutrophils circulate for 10 hours. How long do they live at the site of injury?
165. 2 to 5% of leukocytes are _____, which have granules containing _____.
166. When are eosinophils commonly found?
167. 1% of leukocytes are basophils. What do they release and what are they involved in?
168. A basophil of the lung is known as a _____.
169. When are the actively motile leukocytes, macrophages, most commonly found?
170. What are the various names for macrophages once they leave the blood?
171. What do macrophages release?

172. What occurs to macrophages when they are activated?
173. What cells are the primary player in chronic inflammation?
174. What protein from the thymus identify cells as "self"?
175. 70% of lymphocytes are t-lymphocytes which are responsible for _____ immunity.
176. Explain the T- lymphocyte subset, CD4.
177. Explain the T- lymphocyte subset, CD8.
178. What lymphocytes subset is impacted in AIDS.
179. B- lymphocytes are responsible for _____ immunity.
180. What are the two antigen stimulated B-cells?
181. Cytokines stimulate plasma cells to synthesize what five classes of anti-bodies?
182. Specifically, what is a plasma cell?
183. What is natural immunity.
184. Give an example of natural immunity.
185. What is acquired immunity?
186. Where are IgA antibodies found?
187. IgG are found in _____, and are the most important antibodies for _____ & _____.
188. Why are IgGs the only antibodies that can cross the placenta and confer immunity to the fetus?
189. What are the largest anti-bodies and where are they found?
190. What antibodies are found in body cavities and may be involved in allergic chemical reactions?
191. During infection, what antibody is produced first?
192. Where are IgE's found and who typically has high levels of these?

HYPERSENSITIVITY REACTIONS

193. What are the types of hypersensitivity?
194. What antibody mediates type 1 hyper sensitivity and what does it bind to?
195. What is released in a type 1 hyper sensitivity?
196. The released chemical in a type 1 hypersensitivity results in _____.
197. Give some examples of an immediate hypersensitivity?
198. What is the pathway to a type 1 hypersensitivity reaction?
199. In a type 2 hypersensitivity reaction, what do the IgG & IgE antibodies bind to?
200. In a type II, antibody binds to the antigen and then attracts _____ and _____.
201. Type II hypersensitivity sometimes results in a _____ disorder.
202. Give two examples of a type 2 reaction that does not lead to death.
203. What is involved in Goodpasture's syndrome?
204. What is type 1 diabetes mellitus?
205. What is Hashimoto Polo thyroiditis?

206. What is Graves' disease?
207. What is myasthenia gravis?
208. In a Type III, IgG & IgM binds to circulating antigen and form _____ which can become _____.
209. _____ is implicated in normal clearance of immune complexes.
210. Immune complexes that deposit in tissues can cause disorders, give four examples.
211. Deposited complexes induce _____, thus activate the _____ and attract _____.
212. About how long does it usually take to initiate a type 3 response?
213. Type 4 hypersensitivity is cell mediated, what does this mean?
214. Foreign antigens elicit _____ release by the _____ cells.
215. The released cytokines cause _____ & _____ activation _____ after exposure to the antigen.
216. What are CD4+ T cells sometimes known as? When do they appear in a delayed type reaction?
217. Give some examples of a type four hypersensitivity?

CHRONIC INFLAMMATION

218. When can chronic inflammation arise without in acute inflammatory response?
219. What is a granulomatous inflammation?
220. What types of cells are commonly seen in a granulomatous inflammation?
221. What is a granuloma?
222. What type of macrophage is seen in a TB case?
223. What system is involved in fibrinous inflammation?
224. What are the four components of repair by connective tissue?
225. What is angiogenesis?
226. What type of collagen is deposited initially? What is it remodeled with?
227. _____ is the hallmark tissue of early healing by fibrosis?
228. What is granulation tissue composed of?
229. What are the functions of granulation tissue?
230. What are the sequences of events in healing by primary union/intention?
231. Healing by secondary union/intention requires more _____.
232. Healing by secondary union/intention results in more _____, _____, _____, and _____.
233. What cell allows for wound contraction to occur?
234. What are the local factors which influence wound healing?
235. What are the systemic factors which influence wound healing?
236. What is excessive granulation tissue?
237. What is a hypertrophic scar with excessive collagen deposition?
238. What is it called when mechanical stress pulls a wound apart?
239. What is an excessive wound contraction and what does it look like?