

URINARY SYSTEM

1. What are the two major functions of the kidney?
2. What two things make up the renal corpuscle? What is it also known as?
3. What four things are found in the cortex of the kidney?
4. What three things are found in the medulla?
5. What is and where is the renal column?
6. What are the capillary networks of the pyramid called?
7. What is the apex of the pyramid? Describe.
8. The minor calyx forms the _____, which forms the _____ and _____.
9. What is the structural and functional unit of the kidney and what does it consist of?
10. What is the Glomerulus?
11. In the glomerulus, what is the site where the arteriole enter and exit?
12. What is the parietal layer of the Bowman's Capsule lined by? Visceral?
13. What is the space between the layers of the Bowman's Capsule called?
14. What is the Glomular Basement Membrane common to?
15. What does the GBM do?
16. What are the three parts of the Juxtaglomerular (JG) apparatus?
17. Where does the Proximal convoluted tubule (PCT) begin in the glomerulus?
18. Give a structural description of the Macula Densa.
19. What is the function of the Macula Densa?
20. Give a structural description of the JG cells.
21. What is the function of the JG cells?
22. What is the function of the Mesangium?
23. What consists of mesangial cells and a matrix? Where is it found?
24. Where are the mesangial cells found?
25. In the tubules, there is _____ and _____ absorption of what three things?
26. What is the major site of reabsorption? What percentage?
27. What are the mesangial cells found outside the corpuscle known as?
28. Give a structural description of the PCT.
29. What type of epithelium lines the PCT?
30. Describe the PCT in comparison to the DCT.
31. What does the thin descending segment of the loop of henle do?
32. What does the thin ascending segment of the loop of henle do?
33. What type of epithelium lines the Loop of Henle?
34. What is the major function of the DCT?
35. The DCT has a _____ lumen with no striation, thus meaning what?



36. Give the structural description of the collecting tubules.
37. What is and when is hypotonic urine excreted?
38. What is frequent urination?
39. What is involved in the countercurrent multiplier system?
40. When ADH is present, the _____ is permeable to _____.
41. What is the countercurrent multiplier system?
42. Give the order of Vascularity of the Kidney.
43. What do the ureters do?
44. What lines the ureter and urinary bladder?
45. What are the layers of the ureter? Describe them if applicable.
46. The lumen of the ureter is _____.
47. What is the function of the urinary bladder?
48. What are the muscularis layers of the urinary bladder?
49. The male urethra is ____ long and lined by _____.
50. The female urethra is (shorter/longer) and lined by _____.

ENDOCRINE

51. Where and what do Endocrine glands secrete?
52. What are the 5 endocrine glands?
53. The _____ region of the pituitary is derived from the diencephalon.
54. The _____ region of the pituitary is derived from the stomodeum.
55. What are the three parts of the adenohypophysis?
56. What are the 2 major types of cells in the adenohypophysis?
57. What are the Acidophils and what do each create?
58. What are the Basophils and what do each create?
59. What do acidophils act on?
60. What do basophils act on?
61. Describe the structure of the pars intermedia.
62. What does the pars intermedia secrete?
63. Describe the pars tuberalis.
64. What contains nonmyelinated axons and _____ granules?
65. What are herring bodies?
66. What are the only cells specific to the neurohypophysis?
67. What is the function of growth hormones?
68. What is the function of lactogenic hormones?
69. How do pituicytes act and what is the structure?



70. What is the function of ACTH?
71. What is the function of lipotropin?
72. What is the function of FSH?
73. What is the function of TSH?
74. What is the function of LH and ICSH?
75. The thyroid is a _____ endocrine gland which secretes _____, _____, and _____.
76. The _____ of the thyroid contain _____ which separates it into lobules with _____.
77. T4 and T3 regulate what?
78. What does thyrocalcitonin do?
79. What lines the follicle and what cells sit on the basement membrane?
80. What is seen between the epithelium and basement membrane of the follicle?
81. What is seen in the lumen of the follicles and what is it primarily composed of?
82. Thyroid hormones promote the normal development of what?
83. Thyroid hormones regulate what pumps?
84. What do parafollicular cells produce?
85. What are found on the border of the thyroid?
86. Describe the more numerous parathyroid cell.
87. Describe the less numerous parathyroid cell.
88. What is located on top of the kidney?
89. Parathyroid hormone does what?
90. What percentage of the adrenal gland is the cortex and what does it secrete?
91. What does the medulla of the adrenal gland secrete?
92. What are the three zones of the adrenal cortex and what is the largest?
93. What type of cells are in the glomerulosa and how are they arranged?
94. What does the zona glomerulosa secrete?
95. What does the glomerulosa secretion stimulate?
96. What provides the feedback control of zona glomerulosa?
97. The cells of the Zona fasciculata are _____ arranged in _____.
98. What does the zona fasciculata secrete?
99. Angiotensin II stimulates what two things to occur?
100. What is the major function of glucocorticoids?
101. The cells of the Zona Reticularis are _____ arranged in _____.
102. What are the non-metabolic functions of glucocorticoids?
103. What is secreted by the zona reticularis?
104. Where are chromaffin cells found and how are they arranged?
105. What are Chromaffin cells?



106. What are secreted by the medulla of the thyroid?
107. What is the capsule of the pineal gland made of? Does the pineal gland have lobules?
108. What helps convert norepinephrine into epinephrine?
109. _____ are clumps of cells in the lobule of the pineal gland that secrete _____.
110. The fight or flight response initiated by Cata-mines increases what 4 things?
111. The fight or flight response initiated by Cata-mines dilates what?
112. The fight or flight response initiated by Cata-mines vasoconstricts what?
113. What are the three types of cell found in the pineal lobule?
114. What are the possible human functions of the pineal gland?
115. What is brain sand also known as and describe it.

EYE BALL

116. What are the three eye ball coats or _____?
117. What are the five layers of the cornea? Make sure to describe the type of tissue in the first layer.
118. The sclerocorneal junction is also known as the _____ and _____.
119. What are the four classes of cells found in the Retina?
120. How many layers are there in the retina?
121. Association neurons are _____ and _____ cells.
122. _____ cells are supporting cells.
123. What tissue forms the pigment epithelium and what is the layer's functions?
124. Which is more numerous; rods or cones?
125. Rods are _____ sensitive and are used for _____.
126. Cones are _____ sensitive and are used for _____.
127. What forms the outer limiting membrane and what is the layer's function?
128. What forms the outer nuclear layer?
129. The nuclei of (cones/rods) have a thick cytoplasm.
130. What forms the outer plexiform layer?
131. What are amacrine cells for?
132. What forms the inner nuclear layer?
133. What does the inner plexiform layer show?
134. What forms the ganglion cell layer?
135. Axons of ganglion cells from what layer?
136. The inner limiting membrane is the basal lamina for what?



MALE REPRODUCTIVE SYSTEM

137. What two cells line the tubules of the testis?
138. The seminiferous tubules are lined by _____ and surrounded by _____.
139. Describe the supporting cells of the testis.
140. What exactly do the supporting cells support?
141. What are the functions of the sertoli cells?
142. What are the two types of spermatogonia?
143. What forms the blood testis barrier?
144. What is secreted via the testis exocrine function?
145. What is secreted via the testis endocrine function?
146. Inhibin regulates the secretion of _____ which stimulates _____ to secrete _____.
147. Give the steps between Dark type A to mature sperm.
148. Spermatids become mature via _____.
149. What do myoid cells do?
150. Leydig cells are present in the _____ of the testis.
151. Leydig cells are _____ cells that contain _____ and secrete _____.
152. When are leydig cells active?
153. The epididymis is a _____ tube lined by _____.
154. The epididymis has a smooth lumen with spots. What are the spots?
155. What are the two types of cells in the epididymis?
156. What surrounds the epithelium of the epididymis?
157. What are the functions (5) of the epididymis?
158. The ductus deferens is a _____ tube lined by _____.
159. The mucosa of the ductus deferens is _____.
160. What in the vas deferens has numerous elastic fibers?
161. The vas deferens' muscle layer is _____, with three layers. What are they?
162. Prostate glands are arranged into _____, _____, and _____ layers.
163. The prostate glands are _____, and _____ or collapsed.
164. Where do the prostrate glands open?
165. What are prostrate glands lined by?
166. What are the prostatic concentrations?
167. What do prostate glands secrete?
168. What surrounds the prostrate glands?
169. What does fibrinolysin do?
170. Essentially, the secretions of the prostrate glands do what?
171. What is BPH and where does it occur?



172. What disease may occur in the main gland?
173. What are the 4 zones of the prostate glands?
174. Seminal vesicles appear as _____ with an upper _____ and a lower _____.
175. Why are the seminal vesicle mucosa thrown into folds?
176. What does the PSCE of the seminal vesicles secrete?
177. Semen is ___% from the seminal vesicle, ___% of prostate gland, and ___% sperm.
178. Fructose is necessary for what?
179. Prostaglandin aids in _____.
180. What does fibrinogen do?
181. Clotting enzymes plus fibrinogen is known as _____.

CELL MEMBRANE STRUCTURE & TRANSPORT

182. The cell membrane is primarily composed of what?
183. What are the other three components of the membrane?
184. What are the five phospholipids?
185. What are the two types of membrane proteins?
186. What are the five ways that molecules may move across the plasma membrane?
187. What proteins may not be removed without disrupting the membrane?
188. Integral membrane proteins can be _____, which means what?
189. Peripheral membrane proteins are associated by _____.
190. What is the best studied peripheral membrane protein?
191. What is diffusion defined as?
192. Diffusion is proportional to what 4 factors?
193. What tends to move via diffusion?
194. What is osmosis defined as?
195. What is osmotic pressure defined as?
196. Osmotic pressure depends on the _____ in solution.
197. What has no net movement?
198. NaCl yields _____ particles. Glucose yields _____ particles.
199. If water moves out of the cell, the cell _____. This is a _____ solution.
200. If water moves into the cell, the cell _____. This is a _____ solution.
201. Facilitated diffusion requires a _____ transporter and a _____ protein.
202. In facilitative diffusion, solutes move from _____.
203. In _____, substances move against the concentration while utilizing _____.
204. What is the best example of primary active transport?
205. What is the best example of a secondary active transport symport? Antiport?



206. _____ influence the rate but not direction of ions without energy expenditure.
207. How were transmembrane alpha helix proteins discovered?
208. How do gap junctions differ from ion channels?

INTERCELLULAR SIGNALING

209. What are the classes of extra-cellular signaling molecules?
210. The endocrine classes act _____ at target cells _____.
211. Hormone secretion is regulated by _____ in response to _____.
212. The momentary rise in _____ causes the fusion of _____ with _____.
213. A hormone can initiate different responses in different cells, thus they are _____.
214. What are the categories of hormones?
215. What are the steroid hormones?
216. Because steroid hormones are derived from _____, they are _____ allowing them to _____.
217. The intercellular _____ receptors of steroids alter what?
218. The action of steroids differ when? How long do they last?
219. How are steroids transported?
220. All _____ are water soluble except _____.
221. Where are peptide/amino receptors located?
222. Binding of peptide/amino activates what? Give two examples.
223. How are paracrine mediators released? Who do they act on?
224. What are three examples of paracrine mediators?
225. What are the types of polypeptide growth factors?
226. What are prostaglandins derived from?
227. What is the action of mitogens?
228. What is the action of trophic factors?
229. What is the action of chemoattractants? Give an example.
230. Histamine is secreted by _____ in response to an _____.
231. What is the mechanism of histamine release?
232. Histamine bonds to H1 receptors where causing what?
233. Histamine bonds to H2 receptors where causing what?
234. Binding to the H1 receptor in the hypothalamus results in what?
235. Nitric oxide is produced by _____ in response to _____.
236. Nitric oxide production is activated by _____ via intercellular _____.
237. What is the enzyme in nitric oxide production? NO catalyzes what reaction?
238. What enzyme produced cGAMP?
239. cGAMP activates _____ which _____, thus nitric oxide leads to _____.



FEMALE REPRODUCTIVE SYSTEM

240. The mammary gland is a modified _____ gland.
241. What are the three ducts of the mammary gland?
242. The smallest branches of the duct system is what type of epithelium? Lactiferous duct?
243. The alveoli of the mammary gland is lined by what type of epithelium?
244. If the secretory units are seen in the form of a duct system what is its state?
245. When is inter & intralobar CT evident?
246. Production of milk involves what two secretions?
247. What are five hormones necessary for production and release of milk?
248. What is the function of milk?
249. What contracts the myoepithelium cells?
250. What two hormones from the corpus luteum and placenta influence of what two things?
251. Describe the mucosa of the vagina.
252. How is the vagina lubricated?
253. What does the deep dense region of the vagina lamina propria contain?
254. What are seen in the lamina propria of the vagina?
255. The does not change during menstruation and what does that structure lack?
256. What type of epithelium line the oviduct? What type of cells and what do they do?
257. What are the two parts of the cervix? What type of epithelium lines each?
258. What occurs during mid cycle to the cervix ? For what purpose?
259. What are the three layers of the uterine wall?
260. What forms the perimetrium?
261. The myometrium is _____ with _____ layers of _____ muscle.
262. What are the three stratum of the myometrium?
263. Which layer undergoes cyclic changes and what is it lined by?
264. The endometrium consists of two layers, describe the stratum basale.
265. The endometrium consists of two layers, describe the stratum functionale.
266. What are the four stages of the ovulatory cycle in order?
267. During which stages is a decrease of progesterone and estrogen seen?
268. What occurs in the endometrium during the proliferative stage?
269. What regulates the proliferative stage? Secretory/luteal?
270. The proliferative stage corresponds to what period of follicle maturation?
271. The luteal stage is associated with the formation and growth of the _____.
272. What occurs in the endometrium during the luteal stage?
273. What happens to the endometrium during the premenstrual phase?



274. What kind of epithelium covers the surface of the ovary?
275. What two components make up the ovary?
276. The tunica _____ intervenes between the _____ and the _____.
277. What two things does the cortex contain? What four things does the medulla contain?
278. Each ovarian follicle contains a single _____.
279. Oocytes are derived from _____.
280. Only a few oocytes mature to become ova. What happens to all the others?
281. What are the 4 follicle types?
282. Describe a primordial follicle.
283. What phase of meiosis is a primordial oocyte arrested in?
284. In the primary oocyte _____ cells proliferate and become _____ cells.
285. To qualify as a primary oocyte, there must be how many layers of cuboidal cells?
286. Where can the zona pellucida be found?
287. What process does the oocyte undergo in the primary follicle?
288. What is the distinguishing characteristic of secondary follicles?
289. In the secondary follicle several layers of _____ cells are called _____ cells and form the _____.
290. What appears among the granulosa cells? What do they do?
291. What does the antrum folliculi contain?
292. What do the granulosa cells form? And what does the formed structure do?
293. The cells that surround the oocyte form the _____.
294. What becomes of the corona radiata when the oocyte is liberated from the ovary?
295. What forms the theca folliculi?
296. What are the two layers of the theca folliculi? Explain.
297. Describe the theca interna.
298. Describe the theca externa.
299. What is the final stage of ovarian follicles?
300. Graafian follicles occupy the full extent of _____.
301. The granulosa layer of a mature follicle is _____.
302. The antrum folliculi INCREASES/DECREASES in size.
303. What happens to the cumulus cells of a mature follicle?
304. The theca interna cells exhibit the features of _____.
305. In Graafian follicles a _____ oocyte becomes a _____ oocyte.
306. How long is the primary oocyte arrested from further development?
307. The secondary oocyte is arrested until _____ occurs at _____ of the _____ meiotic division.



308. Define ovulation.
309. The oocyte is taken up by the _____ and is viable for _____.
310. What happens to the oocyte if fertilization does not occur?
311. How many ovum are liberated per cycle?
312. How long does the corpus luteum of pregnancy last? The corpus luteum of menstruation?
313. What prevents the degeneration of the CL of pregnancy?
314. Both CLs contain large centrally placed _____ and small peripherally placed _____. They secrete _____ and _____.
315. What is a corpus albicans? How does it appear?
316. Do the scars last forever?
317. What is an atretic follicle?

