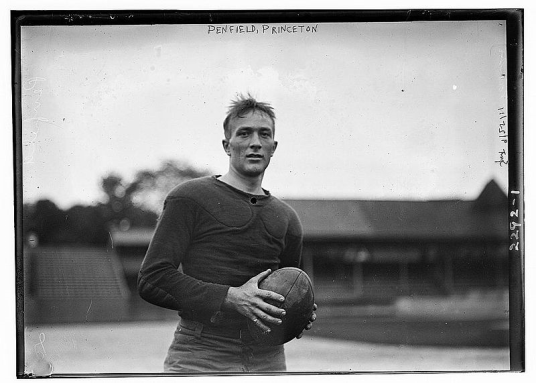
Final Exam

Bio G 1110

Spring 2010

There are 80 multiple choice questions worth 2 pts. each. No calculators or electronic handheld devices are allowed. Good luck!



1. Wilder Penfield (shown above as a college student) wrote,*“…there is no good evidence . . . that the brain alone can carry out the work that the mind does. . . . I believe that one should not pretend to draw a final scientific conclusion, in man's study of man, until the nature of the energy responsible for mind action is discovered, as in my own opinion, it will be."* This indicates that Wilder Penfield is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

A) naturalist  
B) mentalist  
C) materialist  
D) monist  
\*E) dualist

2. The relationship between liquid water and the hydrogen and oxygen gases that compose it may be similar to the relationship between the mind and the neurons in the brain. An irreducible feature of the mind that cannot be inferred directly from the features of the neurons that compose the brain is known as a(n) \_\_\_\_\_\_\_\_\_\_\_\_\_\_ property.

A) physicochemical

B) biogeoneurological

C) asymmetrical

D) elegant

\*E) emergent

3. Which of the following processes ***cannot*** take place in a test tube?

A) DNA replication  
B) fertilization  
C) digestion of meat  
D) burning of food to make ATP  
\*E) all of these processes can take place in a test tube

4. Ruth Hubbard stated in 1997 that, *“It may be a new idea for us to regard a scientist’s or physician’s recommendations as skeptically as we do those of other kinds of salespeople, but we need to do just that.”* According to the scientific method enunciated by Francis Bacon in 1620, this should not be so. Bacon stated that the misuse or abuse of words when describing scientific observations should be avoided and a failure to do so results in the worship of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

\*A) Idols of the Marketplace

B) Idols of the Tribe

C) Idols of the Cave

D) Idols of the Theatre

E) American Idols

5. James Lind discovered that scurvy could be cured and prevented by giving sailors \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

A) an expensive and well-named highfaluting antiscorbutic elixer

B) polished rice

C) brown rice

\*D) lemons

E) milk

6. Based on calorimetry alone, meat, potatoes, bread and sugar were considered to be much better foods than fruit and vegetables because they\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

A) contained fewer calories per pound

\*B) contained more calories per pound

C) contained vitamins, A, C, D, E, K

D) contained fewer acids

E) were filling

7. \_\_\_\_\_\_\_\_\_\_ , which takes place in the \_\_\_\_\_\_\_\_\_\_, is the process in which radiant energy is converted into chemical energy.

A) Respiration, mitochondrion

B) Protein synthesis, ribosome

\*C) Photosynthesis, chloroplast

D) Glycolysis, cytoplasm

E) Proteolysis, vacuole

8. Estimate the volume of blood pumped through the heart in a day using dimensional analysis assuming the volume of blood pumped through the heart in one beat is 60 ml. The heart beats 70 times/minute, there are 60 minutes in an hour and 24 hours in a day. There are 1000 ml in a liter.

A) 360 liters/day

B) 6,048,000 liters/day

\*C) 6048 liters/day

D) 6.05 liters/day

E) 3.61 liters/day

9. An oxygen molecule takes the following path from the alveoli:

A) Pulmonary vein, pulmonary artery, right atrium

B) Pulmonary vein, pulmonary artery, left atrium

\*C) Pulmonary vein, left atrium, left ventricle

D) Pulmonary artery, right atrium, right ventricle

E) Pulmonary artery, right atrium, left atrium

10. If you drink one 20 oz soda a day that contains 250 Calories from sugar, ***about*** how many pounds of fat will you put on in a year. There are 4 Calories/gram sugar, 9 Calories/gram fat, 2.2 pounds/kg, and 365 days a year.

A) 4 lb

B) 18 lb

\*C) 22 lb

D) 36 lb

E) 44 lb

11. Archimedes’ statement, *“Give me a place to stand—and I shall move the world”* implies the importance of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

\*A) an anchor to generate force against

B) tools

C) gravity

D) static electricity produced by rubbing amber

E) both electrons and protons

12. \_\_\_\_\_\_\_\_\_\_\_\_results in an increase in muscle mass due to the proliferation and fusion of satellite cells with muscle fibers.

A) Myostatin  
B) Insulin  
\*C) Insulin-like growth factor -1 (IGF-1)  
D) Glucagon  
E) Parathyroid hormone

13. Genetic tests that purport to help you “*harness your natural ability through personalized genomics*” are currently available to help you select whether you should compete as a sprinter or an endurance athlete. These tests are based on the observation that fast twitch muscles are well suited for \_\_\_\_\_\_\_\_\_\_\_\_, while slow twitch muscles are well suited for\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

A) endurance, sprinting

\*B) sprinting, endurance

C) urination, defecation

D) defecation, urination

E) none of the answers are correct

14. If a person weighs 150 lbs and the calf muscle is inserted a distance 2 times greater than the distance of the center of gravity of the body from the fulcrum, to lift the body, the calf muscle will need a force (in lbs) equal to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ lbs.

A) 300  
B) 150  
\*C) 75  
D) 50  
E) 25

15. The release of the secondary oocyte from the follicle is known as \_\_\_\_\_\_\_\_\_\_\_\_\_\_ while the sloughing off of the endometrium is known as \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

A) contraception, ovulation

B) menstruation, ovulation

C) menstruation, fertilization

D) fertilization, conception

\*E) ovulation, menstruation

16. In a male, the tissues that would become the labia majora in females fuse to become the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

A) penis

B) phallus

C) testes

\*D) scrotum

E) urethra

17. Someone with adrenal hyperplasia overproduces \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and may be considered a(n) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

A) cortisol, male or female

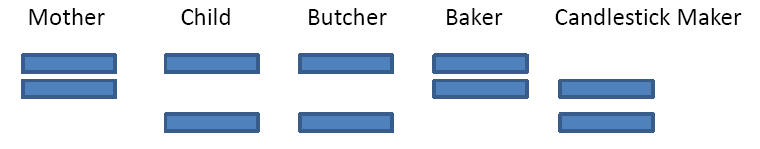
\*B) androgens, intersexual

C) estrogens, male

D) aldosterol, female

E) adrenaline, intersexual

18. Below is a paternity test that includes the alleles of the mother, the child and three putative fathers. What conclusion can you make concerning who is the father of the child?



A) The butcher, the baker and the candlestick maker are all excluded

B) The butcher and the candlestick maker are excluded, the baker is included

\*C) The butcher and the candlestick maker are included, the baker is excluded

D) The butcher and the baker are excluded, the candlestick maker is included

E) The butcher, the baker and the candlestick maker are all included

19. In order to replicate in the Helper T cells, the human immunodeficiency virus (HIV) makes DNA from RNA using an enzyme known as **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**

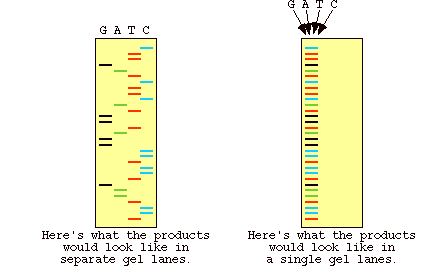
A) reverse translatase   
B) forward transcriptase  
\*C) reverse transcriptase  
D) DNA polymerase  
E) RNA polymerase

20. Who said, *“But diabolical as Hitler was, and I don’t want to minimize the evil he perpetuated using false genetic arguments, we should not be held in hostage to his awful past. For the genetic dice will continue to inflict cruel fates on all too many individuals and their families who do not deserve this damnation. Decency demands that someone must rescue them from genetic hells. If we don’t play God, who will?”*

A) Friedrich Miescher

B) Erwin Chargaff

C) Francis Crick  
\*D) James Watson  
E) Craig Venter



21. According to the results shown in the gel above, the sequence of the ***template DNA*** is\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

A) CTTGATCTTCAT  
B) TCCTAAGTCCTC  
C) GAACTAGAAGT

\*D) AGGATTCAGGA

E) AAGATTACATT



22. By studying family members of HIV positive hemophiliacs, like the Ray brothers shown above, the CDC found that AIDS could be transmitted by:

A) sharing a towel.  
B) sharing a toilet seat.   
C) sharing a toothbrush.  
D) casual kissing and hugging.   
\*E) none of the answers are true.

23. The bending response of plants toward light is known as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

A) photoperiodism  
\*B) phototropism  
C) gravitropism  
D) thigmotropism  
E) the optogenetic response

24. The\_\_\_\_\_\_\_\_\_\_\_\_\_of the taste cells contain the taste receptors.

A) mitochondria  
B) Golgi apparatus  
C) endoplasmic reticulum   
D) nucleus  
\*E) microvilli

25. Richard Axel and Linda Buck, the recipients of the 2004 Nobel Prize in Physiology or Medicine, used reverse transcriptase PCR to find that the odorant receptors were \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

A) similar to insulin-like receptors   
\*B) G-protein coupled receptors   
C) similar to photoreceptors  
D) similar to the cardiac acetylcholine receptor  
E) similar to the cardiac noradrenaline receptor

26. The umami receptor recognizes\_\_\_\_\_\_\_\_\_\_\_, which is found in high concentrations in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

A) NaCl, seafood

B) sucrose, candy

C) quinine, tonic water

\*\*D) glutamate, soy sauce

E) citric acid, fruits

27. The \_\_\_\_\_\_\_\_\_\_\_\_ of the eye forms an image on the retina in a manner analogous to a pinhole camera.

A) iris

B) cornea

\*C) lens

\*D) pupil

E) vitreous humor

28. When Spitzka realized that nothing anatomical could be found in the brain of McKinley’s assassin Czolgosz that would condone his crime, Spitzka suggested that\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_may explain Czolgosz’s behavior.

A) bad genes  
B) bad weather  
\*C) chemical disturbances  
D) a poor diet  
E) a bacterial infection

29. Language skills are normally localized in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_, while proprioception or “self image” is normally localized in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

A) motor homunculus, sensory homunculus  
B) limbic system, cortex  
C) corpus callosum, hypothalamus  
\*D) left side of the brain, right side of the brain   
E) right side of the brain, left side of the brain

30. \_\_\_\_\_\_\_\_\_\_\_\_ concluded that under normal conditions, the electric fluid is generated in the brain (after being extracted from the blood), travels down the nerves, and stimulates the muscles.

A) Alessandro Volta

B) John Aldini

\*C) Luigi Galvani

D) Luigi Golgi

E) Andrew Ure

31. Knowing about John Aldini’s work in which he repeated his Uncle Luigi Galvani’s experiments on frogs and extended those experiments to humans and dead criminals, Mary Shelley was inspired to write the book, \_\_\_\_\_\_\_\_\_\_.

A) Dracula

B) Thunder and Lightning  
C) All in a Day’s Work   
D) The Body Snatchers  
\*E) Frankenstein

32. By noticing the pattern of his wife’s epileptic seizures, John Hughlings Jackson guessed that \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

\*A) the brain must be organized into different regions that control the motor activities  
B) the brain must act as a unified whole  
C) the corpus collosum must connect the right brain to the left brain  
D) the blood must flow clockwise in the brain  
E) none of the answers are correct

33. ln ([ion]out/[ion]in) is\_\_\_\_\_\_\_\_\_\_\_\_ when the outside concentration is less than the inside concentration of an ion and is\_\_\_\_\_\_\_\_\_\_\_\_\_when the outside concentration is greater than the inside concentration of an ion.

A) positive, negative  
\*B) negative, positive  
C) neutral, positive  
D) negative, neutral  
E) negative, negative

34. Which of the following is ***false*** concerning an axon in a resting state?

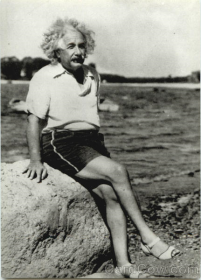
\*A) the membrane is highly permeable to sodium ions  
B) the membrane has a negative charge on the inside  
C) the membrane is impermeable to large organic ions  
D) potassium ion concentration is higher inside than outside  
E) sodium ion concentration is higher outside than inside

35. When a ***large number of inhibitory*** post-synaptic potentials (IPSP) and a ***small number of excitory*** post-synaptic potentials (EPSP) are evoked, the post-synaptic membrane will become \_\_\_\_\_\_\_\_\_\_\_\_ and the post-synaptic neuron becomes \_\_\_\_\_\_\_ an action potential.

A) depolarized, more likely to initiate  
B) depolarized, less likely to initiate  
C) hyperpolarized, more likely to initiate  
\*D) hyperpolarized, less likely to initiate  
E) none of the answers are correct

36. While we know that Ritalin blocks the re-uptake of dopamine and noradrenaline in pre-synaptic neurons, according to Novartis, the manufacturer of Ritalin, \_\_\_\_\_\_\_\_\_\_\_\_.

A)*“the mode of therapeutic action in Attention Deficit Hyperactivity Disorder (ADHD) is better known than the mode of action of vitamin A.”*  
B) *“the mode of therapeutic action in Attention Deficit Hyperactivity Disorder (ADHD) is well known.”*  
\*C)*“the mode of therapeutic action in Attention Deficit Hyperactivity Disorder (ADHD) is not known.”*  
D)*“the mode of therapeutic action in Attention Deficit Hyperactivity Disorder (ADHD) is very well known.”*  
E) *“the mode of therapeutic action in Attention Deficit Hyperactivity Disorder (ADHD) is better known than that of vitamin C.”*



37. According to Einstein’s random walk equation, the time it takes for a chemical to diffuse across a synapse is\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

A) inversely proportional to the distance  
B) inversely proportional to the log of the distance  
\*C) proportional to the square of the distance  
D) proportional to the distance  
E) proportional to the cube of the distance

38. Approximately \_\_\_\_\_\_\_\_\_ people over the age of 18 suffer with a mental illness in a given year.

\*A) 1 in 4  
B) 1 in 20  
C) 1 in 100  
D) 1 in 1000  
E) 1 in 1,000,000

39. Some anti-depressants work by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

A) decreasing the concentration of monoamines in the synapse   
\*B) increasing the concentration of monoamines in the synapse  
C) inhibiting acetylcholine esterase  
D) stimulating acetylcholine esterase  
E) stimulating respiration in the pre-synaptic neuron

40. Michael Gershon considers the nerves that innervate the intestines to be the “second brain” because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

A) the stomach churns food much like the brain churns information  
B) the pyloric valve separates the stomach from the small intestine  
C) absorption takes place primarily in the small intestine  
D) the stomach is acid while the small intestine, like the brain, is neutral  
\*E) many of the same informational molecules are found in both the brain and the gut

41. The mast cells damaged by a puncture wound secrete \_\_\_\_\_\_\_\_\_\_, which causes capillaries to become leaky so that the white blood cells can enter the interstitial fluid surrounding the wound.

A) serotonin  
B) glycine  
\*C) histamine  
D) aspartate  
E) acetylcholine

42. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_cells live for 4-5 days, while\_\_\_\_\_\_\_\_\_\_cells live for at least decades.

A) memory, plasma  
\*B) plasma, memory  
C) antigen, interferon  
D) interleukin, interferon  
E) interferon, interleukin

43. \_\_\_\_\_\_\_\_\_\_\_are an overreaction of the immune system to common environmental\_\_\_\_\_\_\_\_\_\_\_\_.

A) Epitopes, antigens  
B) Epitopes, allergens  
C) Antigens, epitopes  
D) Antigens, allergens  
\*E) Allergies, allergens

44. The sudden and drastic reduction in blood pressure in response to an allergen is known as\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and it can be thwarted by injection of \_\_\_\_\_\_\_\_\_\_\_\_.

A) prophylactic shock, acetylcholine  
\*B) anaphylactic shock, adrenaline  
C) lactose intolerance, sucrose  
D) a stroke, acetylcholine  
E) anaphylactic shock, acetylcholine

45. Home pregnancy tests contain \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to determine if you are secreting \_\_\_\_\_\_\_\_\_\_\_\_.

\*A) monoclonal antibodies, human chorionic gonadotropin  
B) androgens, estrogen,   
C) allergens, estrogen  
D) epitopes, progesterone  
E) stem cells, human chorionic gonadotropin

46. Type-1 diabetes mellitus occurs when the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_are the targets of Cytotoxic T cells.

A) glial cells that produce the myelin sheath  
B) amylase producing cells of the salivary gland cells  
\*C) insulin producing cells of the pancreas  
D) amylase producing cells of the pancreas  
E) pepsinogen producing cells of the stomach

47. Sebaceous glands are stimulated during puberty by\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

\*A) androgens  
B) estrogen  
C) progesterone  
D) cholesterol  
E) oil-inducing factor-3

48. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_resets the temperature set-point in the hypothalamus.

A) Reverse transcriptase  
B) Adenosine deaminase  
C) Invertase  
D) Integrase  
\*E) Interleukin-1

49. Antibodies obtained from the \_\_\_\_\_\_\_\_can protect an infant from the polio virus.

A) brain  
B) motor neurons  
C) spinal cord  
\*D) mother  
E) father



50. Oliver Wendell Holmes could not convince doctors to wash their hands before delivering babies because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

\*A)“*Doctors are gentlemen, and gentlemen's hands are clean."*

B) indoor plumbing had not yet been invented

C) wash basins often tipped over and got the physican’s clothes all wet.  
D) the water was too hot  
E) the water was too cold

51. In the 1950s in the United States, washing hands, cleaning houses and ensuring a safe water supply resulted in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

A) a decline in lupus  
B) a decline in type 1 diabetes  
C) a decline in pellagra  
D) a decline in beriberi  
\*E) an increase in polio

52. The Royal Society of London did not publish Jenner’s work because\_\_\_\_\_\_\_\_\_\_\_\_.

A) he did not use the scientific method  
B) he did not perform the right controls  
C) he did not extend his research to tuberculosis  
D) he did not perform statistical analysis  
\*E) his work was so much at variance with established knowledge

53. After the assassination attempt of President Garfield in 1881, he died because \_\_\_\_.

A) his doctors took him to a seaside place in New Jersey where the air was too heavy

B) his doctors tried to revive him by performing the first heart transplant, but they could not find a donor  
C) his doctors tried to save him by performing the first angioplasty, but it failed  
\*D) his doctors did not wash their hands before they poked around inside him and gave him an infection  
E) his doctors were unable to get a sufficient supply of digitalis to keep his heart going

54. Alexander Fleming discovered penicillin; the cure for pneumonia \_\_\_\_\_\_\_\_\_\_\_\_and Selman Waksman discovered streptomycin; the cure for tuberculosis \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

A) using a systematic research program, by accident  
\*B) by accident, using a systematic research program,  
C) using a systematic research program, using a systematic research program,  
D) by accident, by accident  
E) while he had tuberculosis, while he had pneumonia

55. Which of the following responses is caused by cortisol?

\*A) breakdown of muscle and nerve tissue for energy  
B) conversion of glucose to glycogen  
C) increase in the heart rate  
D) enhancement of the retention of salt and water by the kidneys  
E) enhancement of the inflammation and immune reactions making it easier to fight infection.

56. Which of the following is ***not*** one of Koch’s postulates?

A) The bacteria must be present in every case where you find the disease.

B) The bacteria must be isolated from the host and grown in pure culture.

\*C) The bacterial gene must be sequenced.

D) The specific disease must be induced into a healthy host when a pure culture of the bacterium is inoculated into it.

E) The bacteria must be correlated with the disease.

57. Pasteur showed that bacteria were \_\_\_\_\_\_\_\_\_\_childbed fever but he did not show that they \_\_\_\_\_\_\_\_\_\_\_\_\_ it.

A) stained blue in people with, arose spontaneously in people with   
B) stained green in people with, stained red in people with  
C) absent in cases of, present in caretakers associated with people that had  
D) the causal agent of, correlated

\*E) correlated with, caused

58. According to the advertisement, more educators and scientists smoke \_\_\_\_\_\_\_\_\_with the Micronite (i.e. asbestos) filter and according to Allen Ginsberg’s poem, “\_\_\_\_\_\_\_\_\_\_\_\_\_.”

A) Camels, don’t smoke  
B) Lucky Strike, don’t smoke   
C) Chesterfield, don’t smoke  
\*D) Kent, don’t smoke  
E) marijuana, don’t smoke

59. Colon cancer can result from a mutation in a \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

A) gene that regulates the conversion of phenylalanine to tyrosine  
B) RNA polymerase gene  
C) in a monoamine oxidase gene  
D) adenosine deaminase gene  
\*E) tumor suppression gene

60. If you have the allele for ***chronic myelogenous leukemia*** you still might not get this kind of cancer because it is the \_\_\_\_\_\_\_\_\_\_that determines whether or not a person gets cancer.

A) copy number of the allele  
B) fact that this allele lacks pyrimidines (C, T)  
C) fact that this allele lacks purines (A, G)  
D) amino acid sequence of the protein  
\*E) position of the allele

61. \_\_\_\_\_\_\_\_\_\_\_\_was discovered following the observation that artificial insemination sometimes induced violent uterine contractions.

A) Progesterone  
B) Estrogen  
C) Cortisol   
\*D) Prostaglandin  
E) Androgens

62. Aspirin prevents the synthesis of \_\_\_\_\_\_\_\_\_\_\_\_.

A) progesterone  
B) estrogen  
C) cortisol   
\*D) prostaglandin  
E) androgens

63. Malaria is caused by a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ carried in the salivary glands of mosquitoes and it can be treated with \_\_\_\_\_\_\_\_\_\_\_isolated from the fever bark tree.

A) virus, AZT

B) bacterium, aspirin

C) fungus, streptomycin

\*D) protozoan, quinine

E) mammal, Lariam

64. Anticancer drugs typically interfere with \_\_\_\_\_\_\_\_\_\_\_\_.

A) mitochondria

\*B) microtubules

C) actin and myosin

D) ion channels

E) second messengers

65. Taxol and vincristine are used to treat\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

A) diabetes

B) psychosis

C) pellagra

\*D) cancer

E) beriberi

66. Curare prevents muscle movement by\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ while Botox prevents muscle movement by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

A) inhibiting acetylcholine esterase, inhibiting the reuptake of serotonin  
B) preventing the release of acetylcholine, preventing the secretion of acetylcholine  
C) inhibiting acetylcholine release, preventing the secretion of noradrenaline  
D) inhibiting the noradrenaline receptor, inhibiting the acetylcholine receptor  
\*E) inhibiting the acetylcholine receptor, inhibiting acetylcholine release

67. Capsaicin binds to the \_\_\_\_\_\_\_\_\_\_\_\_\_ receptor and reduces acute muscle pain by stimulating the\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_sensation.

\*A) hot, “it’s hot”  
B) hot, “it’s cold”  
C) pressure, “it’s copasetic”   
D) pain, “it’s all good”  
E) light touch, “it’s not a problem”



68. Cleopatra used \_\_\_\_\_\_\_\_\_\_\_\_\_-containing extracts of the Egyptian henbane (*Hyoscyamus niger*) to dilate her pupils by inhibiting the parasympathetic response, in the hope that she would appear more alluring.

A) adrenaline  
B) noradrenaline  
C) serotonin  
D) curare  
\*E) atropine

69. The push to produce Lariam to fight malaria came from the discovery that\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

A) psychotic people did not get malaria  
B) people with suicidal tendencies did not get malaria  
\*C) *Plasmodium* had become resistant to chloroquine  
D) prostaglandins were no longer effective in curing malaria  
E) all of the answers are correct

70. Which of the following are not ***side effects*** of the anti-malarial drug, Lariam?

A) hallucinations  
B) suicidal ideation  
C) suicide  
\*D) cervical cancer  
E) psychotic behavior

71. Salicylic acid is no longer isolated from plants but is produced from \_\_\_\_\_\_\_\_\_\_.

A) animal sweat  
B) bacteria  
C) fungi  
D) protists  
\*E ) coal tar

72. All of the essential amino acids can be obtained by eating \_\_\_\_\_\_\_\_\_\_\_\_.

A) a little junk food every day  
\*B) grains and legumes  
C) 3-4 milligrams of dirt a day  
D) corn  
E ) beans

73. An \_\_\_\_\_\_\_\_\_\_ reduces pain, an \_\_\_\_\_\_\_\_\_\_\_\_\_\_reduces fever, and an \_\_\_\_\_\_\_\_\_\_\_\_\_ substance reduces suppuration.

\*A) analgesic, antipyretic, anti-inflammatory  
B) anti-inflammatory, antipyretic, analgesic   
C) antipyretic, analgesic, anti-inflammatory  
D) analgesic, anti-inflammatory, antipyretic  
E) antipyretic, anti-inflammatory, analgesic

74. Coffee is made by brewing the\_\_\_\_\_\_\_\_\_\_\_\_\_\_ , which when roasted attain color and aroma due to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

A) stems, differential gene expression  
B) roots, protein synthesis  
C) leaves, the Maillard Reaction  
\*D) seeds, the Maillard reaction  
E) fruits, differential gene expression

75. Caffeine keeps you awake by \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

A) binding to the serotonin receptor  
\*B) binding to the adenosine receptor  
C) binding to the noradrenaline receptor

D) binding to the dopamine receptor  
E) all of the answers are true

76. Nerve growth factor (NGF) is a \_\_\_\_\_\_\_\_\_\_\_\_ factor produced in small quantities by some embryonic cells and found in large quantities in \_\_\_\_\_\_\_\_\_\_\_\_.

A) toxic, willow bark  
B) paracrine, urine  
\*C) paracrine, snake venom  
D) medicinal, muscles  
E) light-sensitive, nerves

77. Therapeutic cloning is when\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

A) a sperm fertilized the oocyte and the inner cell mass is isolated and cultured  
\*B) a nucleus from a somatic cell is put in an activated enucleated oocyte and the inner cell mass is isolated and cultured  
C) an embryo is aspirated from the oviduct and the inner cell mass is isolated and cultured.  
D) the ooctye is cultured on a plate and the cells develop into stem cells  
E) none of the answers are correct

78. Who said, *"I did not follow the procedures that a scientist should follow and I was driven by greed."*

A) Walter B. Cannon  
B) William Harvey  
\*C) Hwang Woo-Suk

D) Henry Dale  
E) Albert Szent-Györgyi

79. Human reproductive cloning would be like *in vitro* fertilization (IVF), except a diploid \_\_\_\_\_\_\_\_\_\_\_ would be transplanted into an activated enucleated oocyte instead of a \_\_\_\_\_\_\_\_\_\_being injected into a nucleated oocyte.

\*A) somatic nucleus, sperm  
B) sperm, haploid nucleus  
C) sperm, diploid somatic cell  
D) human nucleus, mouse nucleus  
E) none of the answers are correct

80. “*Chance Favors a Prepared Mind”* is a translation of a famous statement made by\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

A) Walter B. Cannon

B) Erico Fermi

C) Hans Bethe

\*D) Louis Pasteur

E) Oskar Minkowski

Have a great summer!