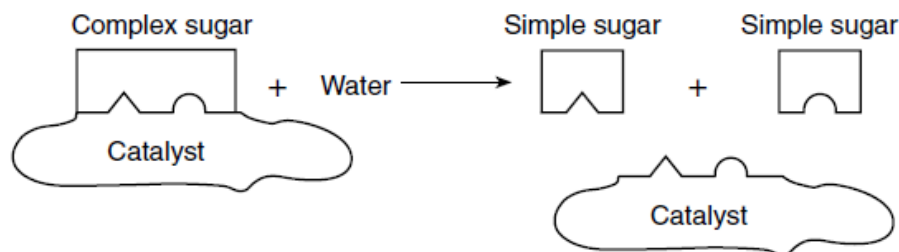


Anatomy & Physiology Review

1. The diagram below represents a process that occurs in human systems.

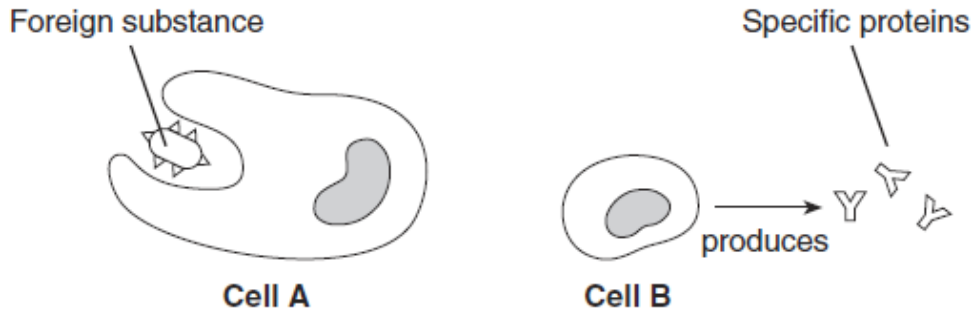


This process is known as

- A) excretion B) respiration C) circulation **D) digestion**
-
2. An individual eats a hamburger. Which two systems must interact to transfer the nutrients in the hamburger to human muscle tissue?
- A) respiratory and excretory
 B) digestive and immune
C) digestive and circulatory
 D) circulatory and respiratory
3. In response to an increasing blood glucose level, the human body will normally
- A) store the glucose in cell nuclei
B) release a hormone that lowers the blood glucose
 C) produce a hormone that destroys the glucose
 D) use the excess glucose to make proteins
4. Before starch can enter a cell, it must be
- A) absorbed by simple sugars
 B) diffused into simple sugars
C) digested to form simple sugars
 D) actively transported by simple sugars
5. The major role of carbohydrates in the human diet is to
- A) form the membranes that surround mitochondria
 B) act as a catalyst for cellular reactions
C) supply energy for the body
 D) provide building blocks for amino acids
6. The cytoplasm in a cell carries out a function similar to a function of which human system?
- A) respiratory system
 B) reproductive system
C) circulatory system
 D) nervous system
7. Although the digestive system is primarily responsible for the breakdown of food, this process can be disrupted if the circulatory system malfunctions. The best explanation for this disruption is that
- A) human body systems interact with each other to perform life functions**
 B) the circulatory system is the control center of the body
 C) the digestive system and the circulatory system have many organs in common
 D) the circulatory system is responsible for the coordination of life functions, including the breakdown of food
8. In the human body, carbon monoxide reduces the amount of oxygen that can be transported to cells. Breathing in too much carbon monoxide will most likely result in the production of
- A) less ATP** B) less glucose
 C) more DNA D) more protein
9. The failure to regulate the pH of the blood can affect the activity of
- A) enzymes that clot blood**
 B) red blood cells that make antibodies
 C) chlorophyll that carries oxygen in the blood
 D) DNA that controls starch digestion in the blood
10. An immune response is primarily due to the body's white blood cells recognizing
- A) a hormone imbalance
 B) abiotic organisms
C) foreign antigens
 D) known antibiotics

-
11. The diagnostic test for HIV, the virus that causes AIDS, involves testing the blood for antibodies associated with this pathogen. Antibodies are produced when the body
- A) stimulates enzyme production
 - B) secretes specific hormones
 - C) detects foreign antigens**
 - D) synthesizes microbes
-
12. When people receive organ transplants, they often need to take medications that decrease immune responses because
- A) transplanted organs contain antigens that can trigger white blood cell activity**
 - B) hormones present in replacement organs prevent the synthesis of antibiotics
 - C) transplanted organs produce their own antibiotics
 - D) antigens present in these organs attack antibodies already present in the blood
13. A direct indication that the white blood cells of the body are functioning would be
- A) an increase in the number of oxygen molecules in the lungs
 - B) a decrease in the number of pathogens in the body**
 - C) a decreased secretion of hormones by certain glands
 - D) an increase of carbon dioxide in the cells of the body
14. A student received a flu shot in the fall. During the flu season, the student caught a cold. The most likely reason the vaccine he received did not prevent the cold was that
- A) his illness was not caused by a pathogen
 - B) he did not get the vaccine at the right time of year
 - C) his body produced antibiotics in response to the vaccine
 - D) the vaccine he received contained only flu virus antigens**
15. An immune response to a usually harmless environmental substance is known as
- A) an antigen
 - B) a vaccination
 - C) an allergy**
 - D) a mutation
16. Every time a child visited a cousin who has two cats, the child's eyes turned red, itched, and began to water. Then, the child began to have trouble breathing. It is most likely that the child reacted this way because
- A) normally harmless cat antigens stimulated the immune system**
 - B) it is difficult for the respiratory system to filter cat antigens out of the inhaled air
 - C) cat antigens are a health hazard, since they always cause disease
 - D) cat antigens stop the immune system from making antibodies, so bacteria cause these responses
17. An allergic reaction to certain types of natural, unprocessed foods, such as peanuts, is caused by
- A) a lack of digestive enzymes
 - B) a response to specific antigens**
 - C) microorganisms living within the food
 - D) high levels of carbon dioxide in the air
18. The kidney is an organ that collects wastes and excess water from the blood and sends them to the bladder where they are stored before being removed from the body. Which two systems work together to perform this function?
- A) immune and respiratory
 - B) circulatory and excretory**
 - C) skeletal and nervous
 - D) digestive and circulatory
19. Molecules in a certain medication attach to receptors on nerve cells. This prevents the normal chemical signal from binding to the receptor. One immediate result of taking this medication might be a disruption in the ability of
- A) the body to produce reproductive cells
 - B) cells to communicate with each other**
 - C) cells to synthesize proteins
 - D) the body to convert inorganic material into organic nutrients
-

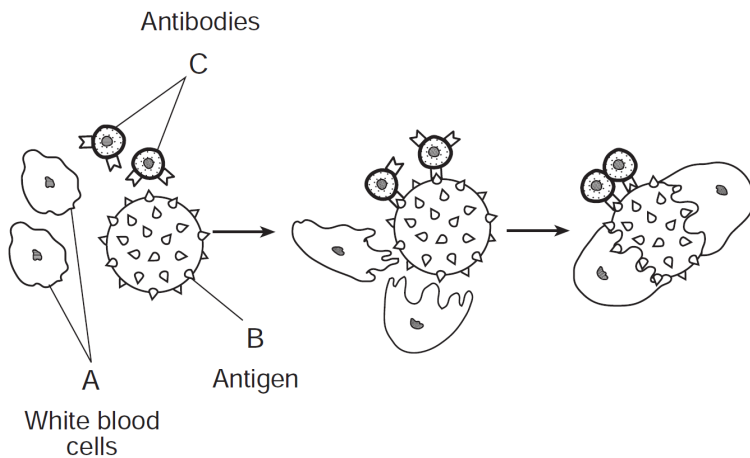
20. The two reactions illustrated in the diagrams below often occur when a foreign substance enters the body.



The cells labeled *A* and *B* are examples of cells known as

- A) guard cells
- B) reproductive cells
- C) white blood cells
- D) specialized skin cells

Base your answers to questions 21 and 22 on the diagram below and on your knowledge of biology. The diagram illustrates activities taking place in the body of a human.



21. Which structure normally stimulates an allergic response?

- A) *A*, only
- B) *B*, only
- C) *C*, only
- D) *A*, *B*, and *C*

22. Vaccinations usually stimulate the body to produce more of

- A) structure *A*, only
- B) structure *B*, only
- C) structures *A* and *C*, only
- D) structures *A*, *B*, and *C*

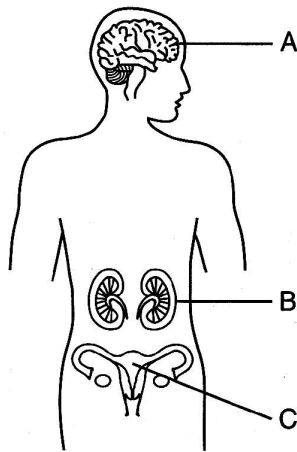
23. The human female reproductive cycle is regulated primarily by the

- A) white blood cells of the circulatory system
- B) muscle cells of the skeletal system
- C) enzymes of the digestive system
- D) hormones of the endocrine system

24. Which factor is a major cause of the changes that occur during puberty, the years when the rate of human physical growth increases and reproductive maturity occurs?

- A) changes in some hormone levels
- B) an increase in meiosis in body cells
- C) a decrease in the rate of metabolism
- D) change in the gene sequences in reproductive cells

25. Base your answer to the following question on the diagram below and on your knowledge of biology.



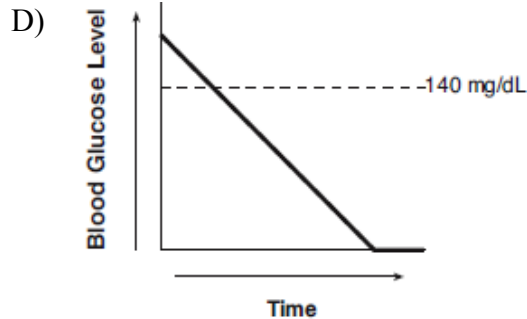
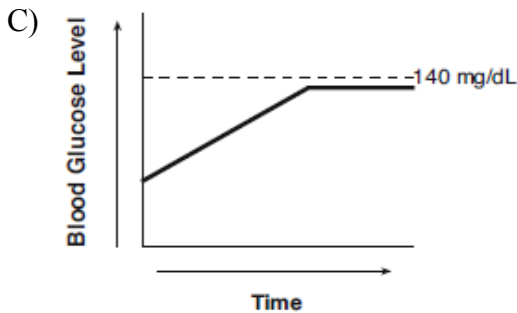
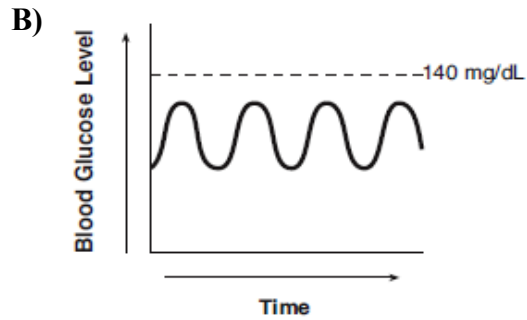
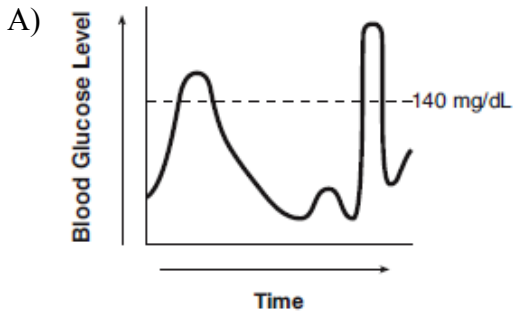
Failure of structure *A* to function properly would most directly disrupt

- A) autotrophic nutrition
 - B) chromosome replication
 - C) cellular communication**
 - D) biological evolution
26. Which statement describes a function of the hormone estrogen?
- A) It regulates the secretion of digestive enzymes.
 - B) It promotes sperm production in males.
 - C) It influences the development of adult sex characteristics.**
 - D) It maintains blood sugar levels.
27. How do cells in the ovary detect a hormone from the brain?
- A) The brain sends a nerve impulse to the ovary.
 - B) White blood cells bring the hormone to the ovary.
 - C) Receptor molecules on the cells of the ovary bind with the hormone.**
 - D) Vacuoles within the ovary bind with the hormone.
28. The reproductive structure in a female mammal that produces sex cells is the
- A) ovary**
 - B) testes
 - C) uterus
 - D) placenta

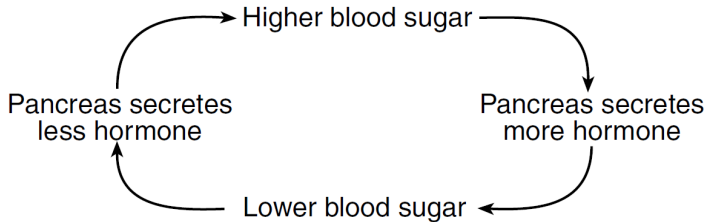
29. The nucleus of a cell coordinates processes and activities that take place in the cell. Which two systems perform a similar function in the human body?

- A) nervous and endocrine**
 - B) digestive and reproductive
 - C) circulatory and respiratory
 - D) skeletal and muscular
30. Which statement is an example of a feedback mechanism in humans?
- A) An increase in the level of blood sugar results in the pancreas increasing the amount of insulin it secretes.**
 - B) Increased exposure to pathogenic bacteria results in an increase in the number of red blood cells produced.
 - C) An increase in exercise results in a decrease in the rate of respiration.
 - D) Increased muscle activity results in a decrease in heart rate.
31. If body temperature is too high, some blood vessels increase in size and sweat glands will excrete sweat, resulting in a lower body temperature. These changes are an example of
- A) a learned behavior
 - B) feedback mechanisms**
 - C) an inherited disorder
 - D) genetic mutations
32. The human male reproductive system is adapted for the production of
- A) sperm and the delivery of these cells for internal fertilization**
 - B) gametes that transport food to the egg
 - C) zygotes and the development of these cells into a fetus
 - D) hormones that stimulate placenta formation in the male
33. The primary function of the human male reproductive system is to
- A) provide a site for fertilization
 - B) produce and transport gametes**
 - C) protect and nourish the embryo
 - D) prevent urine from leaving the body

34. The blood glucose range for a healthy adult is 65-104 mg/dL. Which graph best illustrates normal blood glucose levels in a healthy adult over the course of a day?



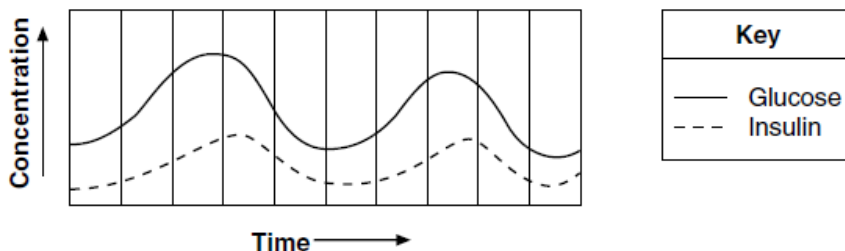
35. The diagram below represents a feedback mechanism.



The hormone referred to in this feedback mechanism is

- A) estrogen **B) insulin** C) progesterone D) testosterone

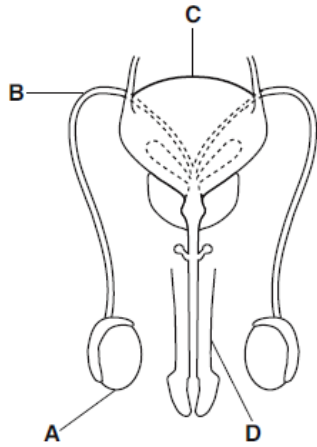
36. The diagram below represents levels of glucose and insulin found within the bloodstream of a healthy person throughout the course of the day.



The increase in insulin levels following an increase in glucose levels in the blood can best be explained by

- A) insulin being released into the blood to digest glucose
B) a feedback mechanism that regulates blood glucose levels
 C) an excess of glucose-stimulating guard cells
 D) a response of the immune system to lower excess blood glucose levels

37. The human male reproductive system is represented below.



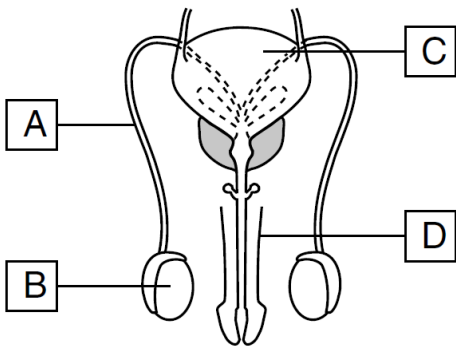
Which structure produces cells that have the potential to become gametes?

- A) *A* B) *B* C) *C* D) *D*

38. Which statement is characteristic of reproduction in humans?

- A) The reproductive cells of males and females differ in chromosome number.
 B) Males and females produce gametes in the ovaries.
 C) Males and females produce the same number of gametes.
D) The reproductive cycles of males and females are regulated by hormones.

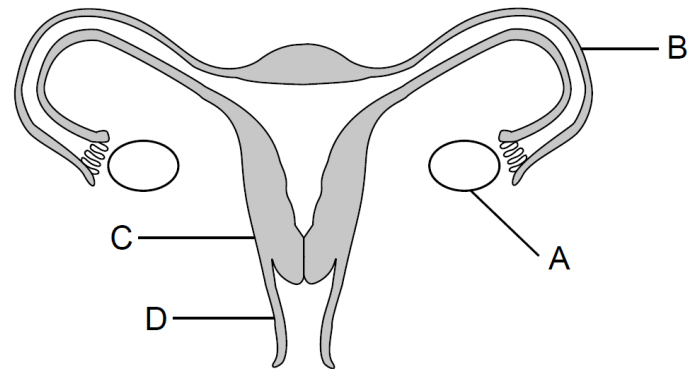
39. A reproductive system is represented in the diagram below.



Which structure is correctly paired with its reproductive function?

- A) *A* – pathway of gametes
 B) *B* – synthesis of progesterone
 C) *C* – production of sperm
 D) *D* – regulation of homeostasis

40. A diagram of the female reproductive system is shown below.



Identify the structure within which the egg cell is normally fertilized.

- A) *A* **B) *B*** C) *C* D) *D*

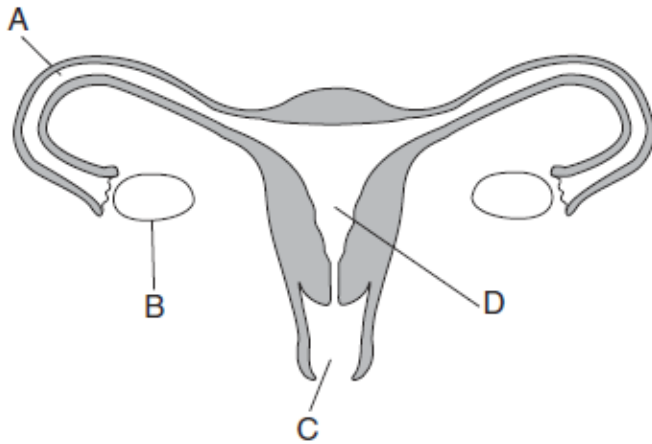
41. The reproductive cycle in females is regulated primarily by

- A) estrogen and testosterone
B) estrogen and progesterone
 C) progesterone and insulin
 D) progesterone and testosterone

42. Human reproduction usually involves

- A) internal fertilization and internal development**
 B) external fertilization and external development
 C) internal fertilization and external development
 D) external fertilization and internal development

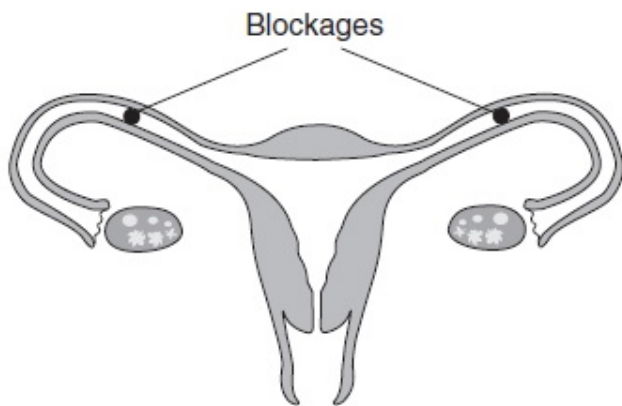
43. The human female reproductive system is represented below.



Within which structure does the placenta normally develop?

- A) *A* B) *B* C) *C* **D) *D***

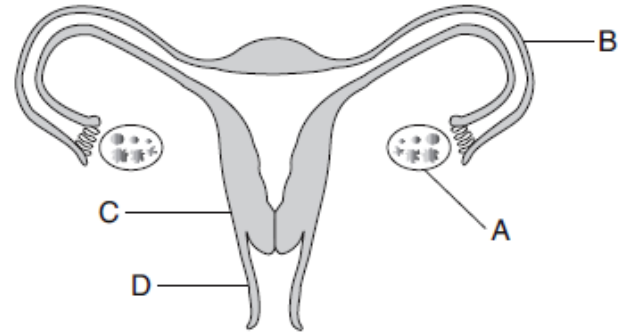
44. Blockages caused by a condition known as Pelvic Inflammatory Disease (PID) are represented in the diagram of the female reproductive system below.



If blockages of this type occur, the most likely result would be that

- A) the egg would remain in the uterus and not travel upward
B) the female gamete would not be able to unite with the male gamete
 C) hormones could not be produced by the ovaries
 D) the process of asexual reproduction would be prevented or interrupted

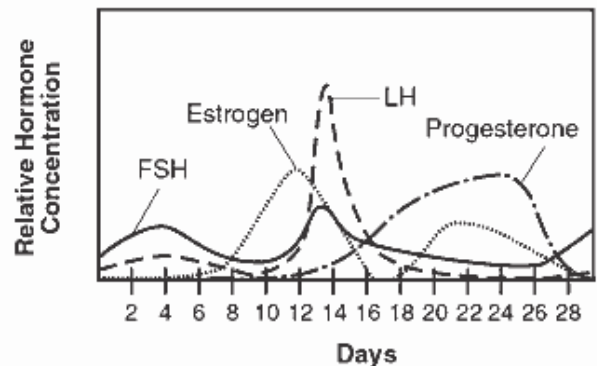
45. The human female reproductive system is represented below.



Which structure produces chemicals that regulate the reproductive cycle?

- A) *A* B) *B* C) *C* **D) *D***

46. Some chemical interactions in a human are shown in the graph below.



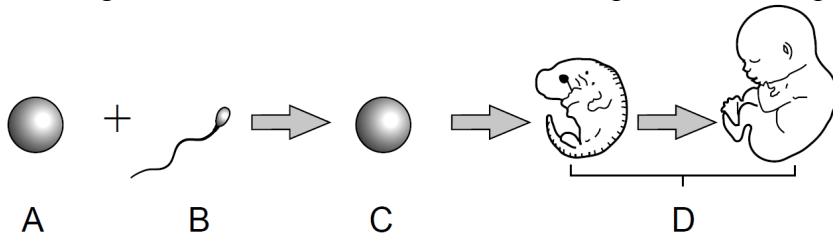
This graph represents hormones and events in the

- A) process of fetal growth and development
 B) process of meiotic cell division during sperm development
 C) reproductive cycle of males
D) reproductive cycle of females

47. For a human zygote to become an embryo, it must undergo

- A) fertilization B) recombination
 C) meiotic divisions **D) mitotic divisions**

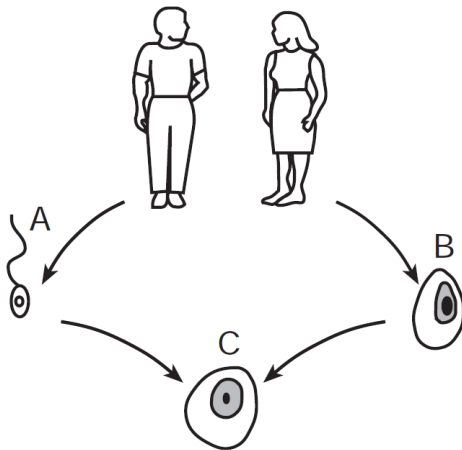
48. The diagram below summarizes some of the steps in the development of humans.



All the genetic information needed for the organism to develop is first present at

- A) *A*
- B) *B*
- C) *C*
- D) *D*

49. The diagram below represents events that occur during sexual reproduction.



The stages labeled *A*, *B*, and *C* are necessary to ensure that the offspring will inherit

- A) **half of their chromosomes from each parent**
- B) double the amount of chromosomes from each parent
- C) pairs of chromosomes from each parent
- D) double the amount of chromosomes from one parent

50. Base your answer to the following question on the passage below and on your knowledge of biology.

Here, Eat This Vaccine

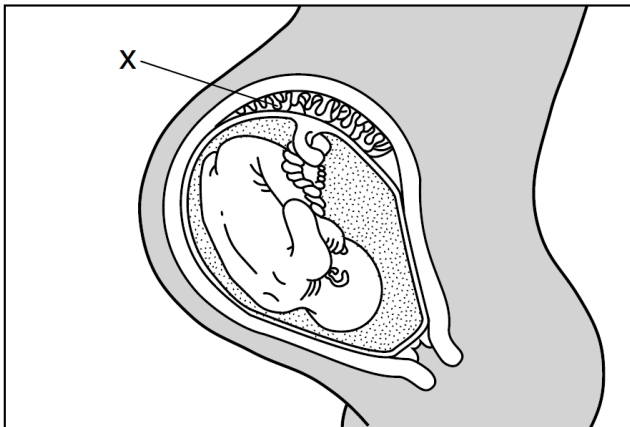
Munching on bacteria could be a good way to stimulate your immune system. Biologist Simon Cutting of the Royal Holloway University of London has transformed bacterial spores into an edible vaccine. He and his collaborators genetically altered the common bacterium *Bacillus subtilis* so that it produced harmless fragments of the toxin produced by tetanus. Then his team starved the bacterium so that it turned into a spore - a desiccated [dehydrated] packet tough enough to survive a trip through the digestive tract and into the bloodstream. Most of the mice that inhaled or ate the modified spores were then able to survive a lethal dose of tetanus.

"We selected tetanus because the immunology regarding this disease is well understood," Cutting says. But engineered bacteria could be similarly tailored to train the immune system to fight anthrax, traveler's diarrhea, and other illnesses. Edible vaccines would eliminate the need for needles and sterilizing equipment. Moreover, spores can withstand extreme heat and dryness, remaining viable [alive] for thousands of years. Cutting plans to start clinical trials in about two years. If the results measure up, spore vaccines could slash the cost of immunization programs, especially in poor countries where refrigeration is unreliable and transportation can be slow.

Source: [http://discovermagazine.com/2003/aug/breakat/ Here, Eat This Vaccine](http://discovermagazine.com/2003/aug/breakat/Here, Eat This Vaccine), by Zara Hershkovits August 1, 2003

Describe one way the immune system could respond when it is exposed to the genetically altered *Bacillus subtilis*.

51. Which statement best describes an important process carried out by structure X?



- A) Milk passes from the mother to the fetus.
- B) Materials are exchanged between fetal and maternal blood.**
- C) Maternal blood is converted into fetal blood.
- D) Oxygen diffuses from fetal blood to maternal blood.

Base your answers to questions 52 through 54 on the information and data table below and on your knowledge of biology.

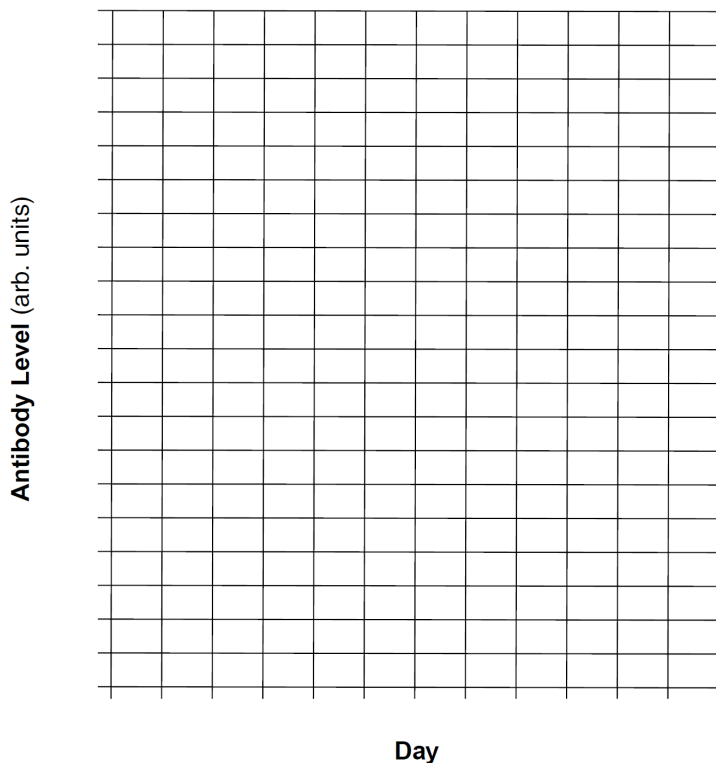
The concentration of a specific antibody in the blood of an individual was measured at various times over a period of 50 days. The results obtained are shown in the data table below.

Antibody Concentration in an Individual

Day	Antibody Concentration in Arbitrary Units (arb. units)
5	0
10	110
16	120
25	10
35	200
45	390
50	200



Antibody Concentration in an Individual



- 52. State *one* reason for the change in antibody production during the first 10 days.
- 53. Plot the data on the grid. Connect the points and surround each point with a small circle.

54. Mark an appropriate scale, without any breaks in the data, on each labeled axis.

55. A child became ill with the measles. Measles is a disease that is highly contagious. The child's mother did not get sick, even though she and the child were close while the child was ill. State *one* reason why the mother did not get sick with the measles.

Base your answers to questions **56** through **58** on the information below and on your knowledge of biology.

A typical human liver cell can have over 90,000 insulin receptors. Due to a genetic difference, some people have liver cells that contain only about 1000 insulin receptors.

56. Identify *one* effect a reduced number of insulin receptors might have on an individual.

57. Describe the importance of the shape of receptor molecules for carrying out their function.

58. Describe the importance of receptors in cellular communication.

Base your answers to questions **59** through **61** on the information below and on your knowledge of biology.

Placental mammals - as opposed to the kind that lay eggs, such as the platypus, or carry young in pouches, such as the kangaroo - are an extraordinarily diverse group of animals with more than 5000 species today. They [placental mammals] include examples that fly, swim, and run, and range in weight from a couple of grams to hundreds of tons

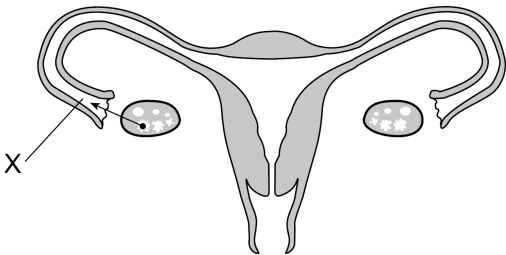
Source: "Earliest Placental Mammal Ancestor Pinpointed," BBC News, February 7, 2013.

59. Identify *one* factor, besides genetics, that could influence the development of human offspring.

60. Describe *one* advantage for an offspring to develop internally as opposed to developing externally.

61. Describe *one* function of the placenta during the internal development of an offspring.

62. The diagram below represents the human female reproductive system.



State *one* way a complete blockage at location *X* would affect the reproductive process.

Base your answers to questions **63** and **64** on the information below and on your knowledge of biology.

The testes of a human male produce gametes. The process that produces these gametes differs from the process that produces new skin cells in the same individual.

63. How does the genetic makeup of the skin cells differ from the genetic makeup of the gametes?

64. Identify the type of cell division involved in each process.

Skin cells:

Gametes:

65. Scientists have learned that when a pregnant woman smokes, one of the chemicals absorbed, nicotine, can narrow the diameter of her blood vessels that lead to the placenta. Explain why narrowing the diameter of these blood vessels can result in low birth weight babies.