**Viruses**

A virus is a tiny, nonliving particle that can invade and reproduce inside any living cells. Biologists consider viruses to be non-living because viruses are not cells.  Viruses do not use energy to grow and they do not respond to their surroundings.  Viruses cannot make food, take in food, or produce waste. The only way in which viruses are like organisms is that they can multiply, but they do so differently. Viruses can only multiply when they are inside a living cell. The cells that viruses infect in order to multiply are called host cells.

All viruses have two basic parts: a protein coat that protects the virus and an inner core made of genetic material. A virus’s genetic material contains the instructions for making new viruses. The proteins on the surface of a virus play an important role during the invasion of a host cell. Each virus contains unique surface proteins that look like the proteins that the host cell normally needs. The virus attaches itself to special sites on the host that are usually reserved for these proteins. Like keys, a virus’s proteins fit only into certain “locks,” or proteins on the surface of a host’s cells. Because the lock-and-key action of a virus is specific, a certain virus can attach only to one or a few types of cells.

Once a virus attaches to the surface of a host cell, it injects its genetic material into the cell. The virus’s inner core takes over the cell functions and the cell starts to produce the virus’s proteins and genetic material. In turn, these two parts assemble into new viruses that fill the cell. When it is full of new viruses, the host cell bursts open and dies as it releases hundreds of new viruses to infect other cells and the process starts over again.

Despite their tiny size, viruses have the ability to cause a lot of damage to cells of other organisms. All living things are capable of being infected by viruses. One of the best studied viruses infects bacteria. It is called a bacteriophage, which means bacteria-eater. In humans, viruses may cause relatively harmless diseases such as cold sores and colds, or life-threatening diseases such as polio and AIDS.

**Viruses*—Memory***

1. The only way in which viruses are like organisms is that they can:
   1. Eat
   2. Multiply
   3. Create waste
   4. Defend themselves
2. The cells a virus infects are called:
   1. Support cells
   2. Lock cells
   3. Host cells
   4. Protein cells
3. The name of the virus that infects bacteria is:
   1. Bacteriophage
   2. Rhinovirus
   3. Bacterovirus
   4. Retrovirus
4. Viruses are made up of two basic parts: a protein coat and what?
   1. Bacteria
   2. Inner core
   3. Nervous system
   4. Organelles
5. Which of the following viral diseases was ***not*** listed in the text?
   1. Cold sores
   2. Polio
   3. AIDS
   4. Influenza

**Viruses—*Inference***

1. Which of the following could not be infected by a virus?
   1. A virus
   2. A house plant
   3. A fungus
   4. A dog
2. How do viruses use their host cells?
   1. Host cells provide energy for viruses
   2. Viruses fill host cells with waste
   3. Viruses use host cells to reproduce
   4. Viruses kill host cells in order to eat them
3. If a virus contains genetic material but does not have a protein coat, then
   1. The virus could infect host cells.
   2. The virus could reproduce and burst a host cell.
   3. The virus could only attach to specific host cells.
   4. The virus could not attach to any host cell.
4. What would likely happen if a virus could attach to a host cell, but did not take over the host cell’s functions?
   1. The virus would not burst the cell.
   2. The virus would live in the host cell.
   3. The host cell would produce the virus’s proteins.
   4. The host cell would produce the virus’s genetic material.

10.) What is a correct order of processes underlying the spread of a virus?

a.) A host cell bursts, a new virus attaches to a new host cell, a new virus injects genetic materialb.) A virus reproduces, a virus injects genetic material, a virus attaches to hostc.) A virus attaches to a host, a host cell bursts, a virus takes over host celld.)A virus injects genetic material, a virus attaches to host cell, a host cell bursts

**Endocrine**

The endocrine system produces chemicals that regulate many of the body’s daily activities. The endocrine system is made up of glands. A gland is an organ that produces or releases a chemical. Some glands, such as those that produce saliva and sweat, release their chemicals into tiny tubes called ducts. The ducts deliver the chemicals to a specific location within the body or to the skin’s surface. However, endocrine glands do not have delivery tubes. Endocrine glands produce and release their chemicals directly into the bloodstream, without going through ducts. The chemical product of an endocrine gland is called a hormone. The bloodstream carries hormones throughout the body.

When a hormone enters the bloodstream, it does not interact with all organs in the body. Hormones interact with only certain cells that recognize the hormone’s chemical structure. These are called target cells. A target cell may have several different receptor types that activate different signal transduction pathways. Hormones that do not fit the target cells of a particular organ will travel through the bloodstream until they find target cells that they fit. Target cells then respond to the hormones by turning on, turning off, speeding up, or slowing down the activities of different organs and tissues. Hormones can regulate activities in tissues and organs that are far from the glands that produce them.

One of the main functions of the endocrine system is to control the body’s response to an exciting situation. When the brain processes an exciting situation, hormones travel from the hypothalamus, to the pituitary gland, to the adrenal gland. This three-step process of the endocrine system is called the HPA axis. The HPA axis integrates physical and psychosocial influences in order to allow a person to adapt to their environment. In the first three steps of the HPA axis, a hormone attaches to a target cell and a new hormone is produced. In the final step, the adrenal gland releases the hormone adrenaline into the bloodstream.

The hormone adrenaline is carried in the bloodstream to target cells located in your heart, lungs, muscles, and stomach. The target cells in your heart and lungs respond to adrenaline by speeding up the activities of these organs. Adrenaline also releases sugars in your muscles to give you energy in case you need to either “fight” or run away from a situation (“flight”). Thus, this has been called the fight-or-flight response. At the same time, target cells in the stomach respond to adrenaline by slowing down activity, so more blood can be sent to other muscles. Adrenaline concentrations in resting adults may increase by 10-fold during exercise and by 50-fold during stress. These responses continue until the amount of adrenaline in the blood drops to a normal level.

**Endocrine-*Memory***

1. Which part of the brain releases hormones to start the fight-or-flight response?
   1. Amygdala
   2. Pituitary gland
   3. Hypothalamus
   4. Adrenal gland
2. What is one of the main functions of the endocrine system?
   1. To regulate the adrenal gland
   2. To produce target cells
   3. To control the body’s response to an exciting situation
   4. To make adrenaline
3. Where are the target cells located for the hormone adrenaline?
   1. Stomach and muscles
   2. Heart and lungs
   3. Sweat glands
   4. Stomach, muscles, heart, and lungs
4. Where in the body do the endocrine glands release their chemicals?
   1. The ducts
   2. The brain
   3. The bloodstream
   4. The nerves
5. What is the purpose of target cells?
   1. To maintain the endocrine system
   2. To respond to hormones
   3. To find glands
   4. To produce chemicals
6. Target cells in the stomach respond to adrenaline by slowing down activity, so \_\_\_\_\_\_ can be sent to other muscles.
   1. More blood
   2. Less blood
   3. More adrenaline
   4. Less adrenaline

**Endocrine—*Inference***

1. How are sweat glands and saliva glands different from endocrine glands? Sweat glands and saliva glands\_\_\_.
   1. release chemicals on demand
   2. store chemicals for longer periods of time
   3. deliver chemicals through ducts
   4. are triggered by the adrenal gland
2. How do hormones affect the function of organs?
3. They can only regulate organs that are next to them.
4. They affect all organs simultaneously .
5. They only regulate specific organs.
6. They send nerve impulses to target cells.
7. What is the correct order of processes that underlie the Fight-or-Flight response?
8. Brain activity, release of hormone, change in heart rate
9. Change in breathing rate, release of hormone, brain activity
10. Change in heart rate, activation of target cells, release of hormone
11. Brain activity, change in heart rate, activation of target cells
12. What best describes the endocrine system?
13. The endocrine system is located in our arms.
14. The endocrine system is a system of muscles.
15. The endocrine system works using chemical messages.
16. The endocrine system regulates heart rate using nerve impulses.
17. Which of the following would be true if the target cells for adrenaline in the heart did not exist?
    1. Adrenaline increases heart rate
    2. Adrenaline decreases heart rate
    3. Adrenaline increases stomach activity
    4. Adrenaline decreases stomach activity
18. Why are hormones released directly into the bloodstream?
    1. To reach the target cells of multiple organs and tissues
    2. To reach tissues as quickly as possible
    3. To reach ducts
    4. To attach to target cells in the bloodstream