HOMEOSTASIS & IMMUNITY

Week Three Packet

Packet Grade:

____/__9__ Completed notes

____/__30__ Completed Class Work

____/__30__ Completed Homework

____/__10__ Packet turned in on time

____/__1__ Name and Period are filled in

_____

____/__80__ Total Grade

INVESTIGATOR: _____

CLASS: _____

LESSON 2.6

Objective:
SWBAT identify various types of pathogens and their effect on an organism's homeostasis.
SWBAT explain how the immune system and white blood cells respond to invasion of pathogens.
AIM: How does my body fight off disease?

Do Now:

CLASS WORK 2.6

White Blood Cells

Phagocytes:

B Cells:

**The shape of the antibody must match the shape of the antigen in order for binding to occur.

T Cells:

Killer T Cells:

Helper T Cells:

LESSON 2.7

Objective:
SWBAT explain immunity and how a vaccine promotes it.
SWBAT describe situations where the immune system can harm the organism including allergies, autoimmune diseases and organ transplant.
AIM: Why should I get a flu shot?
Why does my friend's throat swell up when he eats nuts?

Do Now:

CLASS WORK 2.7

Create a cartoon that illustrates one of the following:

- How the swine flu vaccine works
- An allergic reaction to kiwi
- An autoimmune disease
- Your friend's body rejecting your kidney

Be sure to include captions for all of your images.

Caption:	**Caption:**
Caption:	**Caption:**

LESSON 2.8

Objective:
SWBAT describe current research that is being used to diagnose, control and prevent cancer.
AIM: How can I get cancer?

Do Now:

The Truth About Cancer

Cancer is a terrifying and dreaded word. Even adults are scared when someone has cancer. Why is cancer so scary? Because most people don't know a lot about cancer - like how people get it, what it really is, and how it can be treated. Plus, almost everyone knows someone who got very sick or died from cancer.

What Is Cancer?

Cancer is actually a group of many related diseases that all have to do with cells. Cells are the smallest unit that make up all living things, including the human body. There are billions of cells in each person's body.

Cancer happens when cells that are **abnormal** (not normal) grow and spread very fast. Normal body cells grow and divide and know to stop growing. Over time, they also die. Unlike these normal cells, cancer cells just continue to grow and divide out of control and…they don't die. Cancer cells usually group or clump together to form masses called **tumors** (say: **too**-mers).

A growing tumor becomes a lump of cancer cells that can destroy the normal cells around the tumor and damage the body's healthy tissues. This can make someone very sick.

Sometimes cancer cells break away from the original tumor and travel to other areas of the body, where they keep growing and can go on to form new tumors. This is how cancer spreads throughout the body. The spread of a tumor to a new place in the body is called **metastasis** (say: meh-**tas**-tuh-sis).

People with cancer may feel pretty sick at times - but can usually still do lots of normal things. Unless they are very sick, kids and teens with cancer may still be able to go to school. They may be tired or bruise easily, but they can sometimes go to camp, movies, and sleepover parties. People with cancer still like the same things they did before they got sick.

Causes of Cancer

Cancer is a rare illness in children. Most of you don’t know another kid who has cancer. If you had a large football stadium packed with kids, probably **only one** child in that stadium would have cancer.

Doctors aren't sure why some people get cancer and others don't. They do know that cancer is **not contagious**. You can't catch cancer from someone else who has it. Cancer isn't caused by germs, like

colds or the flu are. So don't be afraid of other people with cancer. You can talk to, play with, and even hug someone with cancer.

Finding Out About Cancer

Usually, a patient's symptoms (clues that tell your doctor what's wrong with you) do not tell the doctor right away that a kid or teenager has cancer. Most of the time, cancer causes things like weight loss, fevers, swollen glands, or feeling overly tired or sick for a while.

Symptoms like these are also seen in many other common illnesses, especially during infections. So, at first, doctors and parents often think another illness like an infection - not cancer - is to blame for the symptoms (and this is often true). Medical tests are needed to make sure a person has cancer.

If someone is very sick, a doctor might order X-rays and blood tests. If it is then suspected that the problem is cancer, the doctor will usually recommend seeing an **oncologist** (say: on-**call**-ah-gist). An oncologist is a doctor who takes care of and treats cancer patients. The oncologist will likely run other tests to find out if someone really has cancer - including exactly what kind of cancer it is, if it has spread to other parts of the body, and the best way to treat it.

Treating Cancer Carefully

Cancer is treated with surgery, chemotherapy, or radiation - or sometimes a combination of these treatments. The choice of treatment depends on:

* The type of cancer someone has (the kind of abnormal cells causing the cancer)
* The stage of the tumor (meaning how much the cancer has spread within the body, if at all)

Surgery is the oldest form of treatment for cancer. Three out of every five people with cancer will have an operation to remove the cancer. During surgery, the doctor tries to take out as many cancer cells as possible. Some healthy cells or tissue may also be removed to make sure that all the cancer is gone.

Chemotherapy (say: **key**-moe-**thair**-ah-pee) is the use of anti-cancer medicines (drugs) to treat cancer. These medicines are sometimes taken as a pill, but are usually given through a special **intravenous** (say: in-truh-**vee**-nus) line, also called an IV. An IV is a tiny catheter (straw-like tube) that is put into a vein through someone's skin, usually on the arm. The catheter is attached to a bag that holds the medicine. The medicine flows from the bag into the kid's vein, which puts the medicine into her blood, where it can travel throughout the body and attack cancer cells.

Anti-cancer drugs are made to kill cancer cells. But many of these drugs can affect normal, healthy cells, too. Damage to healthy cells causes side effects. The most common side effects of chemotherapy are nausea and vomiting, hair loss, and tiredness. Other common side effects include an increased chance of bleeding, getting an infection, or anemia (a low blood count). Kids with cancer may lose their hair, get thin, or be really pale because of their chemotherapy.

Radiation therapy (say: ray-dee-**ay**-shun **ther**-ah-pee) uses high-energy waves, such as X-rays (invisible waves that can pass through most parts of the body), to damage and destroy cancer cells. It can cause tumors to shrink and even go away completely. Radiation therapy is one of the most common treatments for cancer. Many people with cancer find it goes away after receiving radiation treatments.

Radiation treatment destroys cancer cells, but it can also hurt **normal** cells. This causes **side effects**. Many people have no side effects at all, but some will. Although unpleasant, most side effects from radiation are not serious and can be controlled. The most common side effects are tiredness, skin changes (like redness and burns), and loss of appetite (not feeling hungry). Some side effects happen in the area where the radiation was given. For example, after radiation treatment to the head, a kid might lose his hair.

DISCUSSION QUESTIONS:

1. What is a **tumor**?

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_____

2. If a doctor tells a patient their cancer has **metastasized**, what does that mean (CLUE: look for a word that looks similar in the passage)?

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3. Find the word **contagious** in the passage. What does it mean? How could you figure out what it means from the passage?

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4. Would you want to be an **oncologist**? Why or why not?

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5. Read the section about **surgery**. Surgery is not always successful—sometimes the cancer does not go away. Why do you think that surgery does not always work?

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HOMEWORK 2.6

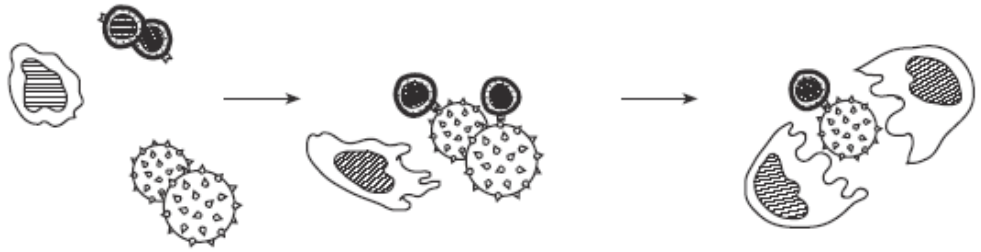
1. The immune system of humans may respond to chemicals on the surface of an invading organism by
(1) Releasing hormones that break down these chemicals
(2) Synthesizing antibodies that mark these organisms to be destroyed
(3) Secreting antibiotics that attach to these organisms
(4) Altering a DNA sequence in these organisms

2. State *one* specific way white blood cells help to protect the human body from pathogens.

3. Some human white blood cells help destroy pathogenic bacteria by
(1) Causing mutations in the bacteria
(2) Engulfing and digesting the bacteria
(3) Producing toxins that compete with bacterial toxins
(4) Inserting part of their DNA into the bacterial cells

4. Which activity is not a function of white blood cells in response to an invasion of the body by bacteria?
(1) Engulfing these bacteria
(2) Producing antibodies to act against this type of bacteria
(3) Preparing for future invasions of this type of bacteria
(4) Speeding transmissions of nerve impulses to detect these bacteria

5. The diagram below represents what can happen when homeostasis in an organism is threatened.



Which statement provides a possible explanation for these events?
(1) Antibiotics break down harmful substances by the process of digestion.
(2) Some specialized cells mark and other cells engulf microbes during immune reactions.
(3) Embryonic development of essential organs occurs during pregnancy.
(4) Cloning removes abnormal cells produced during differentiation

HOMEWORK 2.7

1. Vaccines are given to people in order to
(1) Upset their homeostasis
(2) Immunize them against certain diseases
(3) Inject T cells and B cells into them
(4) Test if they can destroy the pathogen

2. Which response usually occurs after an individual receives a vaccination for influenza virus?
(1) Hormones in the blood inhibit reproduction of the virus.
(2) Antibodies against the virus form in the blood.
(3) Enzymes released from platelets hydrolyze the virus.
(4) Antigens from the vaccine deactivate the virus.

3. Which statement best describes what will most likely happen when an individual receives a vaccination containing a weakened pathogen?
(1) The ability to fight disease will increase due to antibodies received from the pathogen.
(2) The ability to fight disease caused by the pathogen will increase due to antibody production.
(3) The ability to produce antibodies will decrease after the vaccination.
(4) The ability to resist most types of diseases will increase.

4. Which substances produced in the body are directly responsible for the rejection of a transplanted organ?
(1) Antigens
(2) Histamines
(3) Antibodies
(4) Excretions

5. Which transplant method would prevent the rejection of tissue after an organ transplant?
(1) Using organs cloned from the cells of the patient
(2) Using organs produced by genetic engineering to get rid of all proteins in the donated organs
(3) Using organs only from pigs or monkeys
(4) Using an organ donated by a close relative because the proteins will always be identical to those of the recipient

6. Substances formed by the human body in response to foreign proteins entering the body are called
(1) Antigens
(2) Antibodies
(3) Platelets
(4) Red blood cells

7. Antibody molecules and receptor molecules are similar in that they both
(1) Control transport through the cell membrane
(2) Have a specific shape related to their specific function
(3) Remove wastes from the body
(4) Speed up chemical reactions in cells

8. The use of a vaccine to stimulate the immune system to act against a specific pathogen is valuable in maintaining homeostasis because
(1) Once the body produces chemicals to combat one type of virus, it can more easily make antibiotics
(2) The body can digest the weakened microbes and use them as food
(3) The body will be able to fight invasions by the same type of microbe in the future
(4) The more the immune system is challenged, the better it performs