Lesson 10: Lymphatic System and Cancer

Glossary

1. **Antibodies**: the body makes these germ-fighters in response to the presence of antigens in the body
2. **Antigens**: unknown agents (active materials) in the body whose presence causes the production of antibodies
3. **Benign tumors**: tumors that are not cancerous
4. **Biopsy**: a sample of tissue from the body
5. **Cancerous tumors**: tumors that have the ability to spread to other parts of the body and are life-threatening
6. **Cell**: cells, which can only be seen with a microscope, are called “the building blocks of life”; groups of cells form all the structures in your body
7. **Germs**: tiny living things that cause disease
8. **Imaging tests**: a doctor takes pictures of your body, using a special machine (for example, x-ray or MRI)
9. **Immunity**: the ability of the body to remember a specific germ and how to fight it off effectively
10. **Leukemia**: cancer of the blood
11. **Lymph**: clear fluid that carries antibodies and white blood cells to different parts of the body
12. **Lymph nodes**: small organs throughout the body that filter out and identify unknown cells
13. **Metastasize**: spread to other parts of the body
14. **Tumor**: when cells grow too quickly, they can create a lump of cells called a tumor; a tumor may be malignant (cancerous) or benign (not cancer)
15. **White blood cells**: eat up and destroy unknown materials in the body
Cancer

Biological Background

The cells (“building blocks”) in your body go through a normal cell cycle. Cells die and new cells are created to replace the old and damaged cells. New cells are created when a single cell divides into more cells. Cell division is important to keeping the body healthy. Sometimes there are problems with the process of cell division.

What is cancer?

Sometimes during cell division, cells mutate (change) and grow out of control. The body ends up with cells that do not die when they should and extra cells that the body does not need.¹ The mutated cells can cause problems with normal cell functions. For example, the mutated cells might take food and oxygen away from normal cells.

Abnormal cell growth can lead to a lump of cells, called a tumor. Some tumors are cancerous (malignant). Others are not cancerous (benign).

Benign tumors: Benign tumors are NOT cancerous. They are “local” tumors that grow slowly and do not spread to other parts of the body (metastasize). Once removed, they usually do not come back. They can still cause problems. If a benign tumor is in the brain, it can be difficult to remove and can cause damage. Benign tumors should be removed if possible.

Cancerous (malignant) tumors: Cancerous tumors have the ability to spread to other parts of the body. Cancerous tumors can be life threatening and usually need strong treatment to be healed.

There are over 100 different types of cancer. Not all cancers cause tumors. For example, leukemia is cancer of the blood. Leukemia is abnormal production of white blood cells. The cells do not usually form tumors.

Why is cancer prevention so important?
Cancer can affect anyone. It is life-threatening. It is easier to treat if doctors find the cancer early. People whose cancer is found early can often recover and live for many years. Cancer that is found late may not be treatable, and may cause death.
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Reading and True and False

You can be tested or screened for many types of cancer, such as skin cancer, colorectal cancer, breast cancer and cervical cancer.

- Ask your doctor for recommended screenings.
- See the doctor for an annual check-up.
- Ask your doctor about vaccinations for viruses that may lead to cancer: HPV and Hepatitis B
- Talk to your doctor if you are concerned about cancer.

What are some common types of cancer?

Among women, the most commonly diagnosed cancers are the following:\(^2\):
1. Breast Cancer
2. Lung Cancer
3. Colorectal Cancer

Among men, the most commonly diagnosed cancers are the following:
1. Prostate Cancer
2. Lung Cancer
3. Colorectal Cancer

\(^2\) [http://www.cdc.gov/cancer/dcpc/data/women.htm](http://www.cdc.gov/cancer/dcpc/data/women.htm)
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Reading and True and False

How do I learn more about cancer?
- Talk to your doctor
- Additional websites:
  - www.cancer.org/index
  - www.health.state.mn.us/divs/hpcd/cdee/mcss/
  - www.cdc.gov/cancer/
  - www.mncanceralliance.org/

3 http://www.cdc.gov/features/dsmentop10cancers/index.html
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Reading and True and False

Lymphatic System & Immunity

What is the importance of the lymphatic system and immunity?

The lymphatic system allows cells that fight germs to be delivered throughout the body. Cells with germ-fighting abilities are produced by different body systems, such as the lymphatic and circulatory systems. Some of these germ-fighting cells help the body to develop immunity. Immunity refers to the body's ability to remember a specific germ and how to fight it off effectively. That way, when the body encounters a germ a second time, the body can get ready to fight it more quickly, using the germ-fighting cells that work best against that specific germ.

How do the lymphatic system and immunity work?1

The body has a general security system that protects the body against all unknown cells. For example, phagocytes are white blood cells that eat cells that do not belong to the body. However, unknown cells sometimes get past the general security system—by disguising themselves and hiding from phagocytes, for example. When this happens, the body has specific ways to eliminate these germs. The specific defense is sometimes known as the immune system. This is the body's way of recognizing, remembering and fighting against germs. Here are the key players:

- **Antibodies**: The body makes these germ-fighters in response to the presence of antigens (unknown agents) in the body.

- **Antigens**: Antigens are unknown agents (active materials) in the body. Their presence causes the production of antibodies. An antibody and an antigen fit together like a lock and key.

- **White blood cells**: White blood cells eat up and destroy unknown agents.

- **Lymph**: Lymph, a clear fluid, circulates throughout the body.2 It carries antibodies and white blood cells to different parts of the body to eliminate germs.

- **Lymph nodes**: Lymph nodes are small organs that are present throughout the body (in the armpits, stomach, neck, etc.). Lymph nodes filter out and identify unknown cells. Lymph nodes also house white blood cells. When the body is ill, lymph nodes swell up because they are busy fighting the disease. This is why the doctor will feel your neck or stomach when you’re ill3.

Overview of the lymphatic system and immunity

- Antibodies (germ-fighters) are made in response to antigens (germs).

- Antibodies stop antigens from doing harm to the body. Antibodies signal to other cell structures that unknown invaders are in the body. These signals recruit cells that destroy the germs.

- After the body fights off an infection, it makes memory cells that help the body remember the antigen. This memory makes a faster disease-fighting response possible the next time the body encounters this germ. These memory cells can last for many years, even for a lifetime, giving the body immunity against the specific illness.

Talk with a partner. How do the lymphatic system and immunity work?

1 http://rwjhamilton.org/Pages/ShowHealthTopic.aspx?categoryid=16

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Definitions Match and Complete the Sentence

Cancer

Read the passage about cancer. Then read each item. Match the definition to each of the vocabulary words.

1. ______ benign tumors
   a. spread to other parts of the body
2. ______ leukemia
   b. tumors that have the ability to spread to other parts of the body and are life-threatening
3. ______ cancerous tumors
   c. cancer of the blood
4. ______ metastasize
   d. tumors that are not cancerous

Read each sentence. Then circle True or False. If the statement is false, replace the underlined word with a new word to make the statement true.

1. Coughing up blood can be a symptom of lung cancer.     True  False
2. Rectal bleeding and abdominal pain can be symptoms of colorectal cancer.  True  False
3. Discomfort in the pelvic area is a symptom of breast cancer.    True  False
4. Blood in urine and/or semen is a symptom of lung cancer.    True   False
5. A breast lump and changes to breast tissue are symptoms of breast cancer.  True  False
6. Unexplained weight loss may be a symptom of cancer.     True  False
7. A biopsy is a sample of your blood.       True  False
8. Visual tests are pictures of your body using special machines.    True   False
9. Benign tumors are not cancerous.               True   False
10. Talk to your mechanic if you are concerned about cancer.    True  False
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Definitions Match and Complete the Sentence

Lymphatic System

Read each item. As a class, write the letter from the column on the right that provides the correct definition for the word on the left.

1. ______ antibodies
   a. eat up and destroy unknown invaders

2. ______ lymph
   b. unknown agents in the body whose presence causes the production of antibodies

3. ______ white blood cells
   c. the body’s ability to remember a specific germ and how to fight it off effectively

4. ______ antigens
   d. made in response to the presence of antigens (unknown agents in the body)

5. ______ lymph nodes
   e. small organs throughout the body that filter out and identify unknown cells

6. ______ immunity
   f. clear fluid that circulates throughout the body, carrying white blood cells to different parts of the body to eliminate germs

Use the words in the box to complete each sentence in the following passage about the lymphatic system and immunity.

| infection | unknown | antigens | immunity |

Antibodies are made in response to _________________. Antibodies signal to other cell structures that ________________ invaders are in the body.

After the body fights off a new ________________ it makes memory cells that help the body remember the antigen. These long-lasting memory cells give ________________ against the specific illness.
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Partner Dictation

Partner A

Read these sentences to your partner.

1. 1 out of 2 American men and 1 out of 3 women will have cancer sometime in their lifetime.

2. Smoking or chewing tobacco causes cancer. Quit smoking or chewing tobacco to decrease your chance of getting cancer.

3. An unhealthy diet and obesity are linked to cancer. Maintain a healthy weight by eating a balanced, healthy diet. This can help reduce your risk of cancer.

4. Get active! Health officials suggest exercising 30 minutes a day, 5 days a week. You could go for a 15-minute walk in the morning and a 15-minute bike ride in the evening, for example.

Now listen to your partner read. You write the sentences.

5. _________________________________________________________________________

6. _________________________________________________________________________

7. _________________________________________________________________________

8. _________________________________________________________________________
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Partner Dictation

Partner B

Listen to your partner read. You write the sentences.

1. _________________________________________________________________________
2. _________________________________________________________________________
3. _________________________________________________________________________
4. _________________________________________________________________________

Now read these sentences to your partner.

1. Some jobs expose people to chemicals that increase risk of cancers. It is important to wear safety equipment to protect your health.

2. Ask your doctor about vaccination against HPV and hepatitis B, two viruses that can lead to cancer.

3. Men should drink fewer than 2 drinks a day. Women should aim for 1 or fewer drinks a day.

4. Ask your doctor about cancer screening. Cancer is usually easier to treat if it is found early.
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Quiz

Read the questions. Then circle A, B, C or D.

1. What is immunity?
   A. feeling sick
   B. the ability of the body to remember a specific germ and how to fight it off effectively
   C. part of the circulatory system
   D. none of the above

2. What are lymph nodes?
   A. part of the digestive system
   B. part of the skeletal system
   C. stops along the nervous system
   D. stops along the lymphatic system that filter out and identify unknown cells

3. Why is cancer prevention so important?
   A. because anyone can get cancer
   B. it is life-threatening
   C. it is easier to treat if it is caught early
   D. all of the above

4. What is not considered a symptom of cancer?
   A. pain
   B. weight gain
   C. fatigue
   D. skin changes

5. What is an antigen?
   A. lymph
   B. antibodies
   C. an unknown agent in the body
   D. germ-fighting molecules

6. How many different types of cancer exist?
   A. more than 10
   B. more than 20
   C. more than 50
   D. more than 100

7. What is not a cause of cancer?
   A. exercise
   B. tobacco use
   C. diet and obesity
   D. contact with certain chemicals

8. How can you find more information about cancer?
   1. ______________________
      ______________________
   2. ______________________
      ______________________
   3. ______________________
      ______________________

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Student Survey: Lymphatic System / Cancer Unit

1. Did you learn more information about cancer and the lymphatic system from studying this lesson?
   1  2  3  4  5
   no          some          yes

2. Would you share this information with family and friends?
   1  2  3  4  5
   no          maybe          yes

3. After studying this lesson, are you more likely to ask your health care provider about cancer?
   1  2  3  4  5
   no          somewhat        yes

4. Do you know where to find more information about cancer and the lymphatic system if you have more questions?
   1  2  3  4  5
   no          somewhat        yes

5. Did you like the class activities?
   1  2  3  4  5
   no          somewhat        yes

We value your opinions! Could you tell us what you liked or give us some suggestions on how to improve this lesson?

Thank you!