

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

Lesson 10: Lymphatic System and Cancer

Reading and True and False

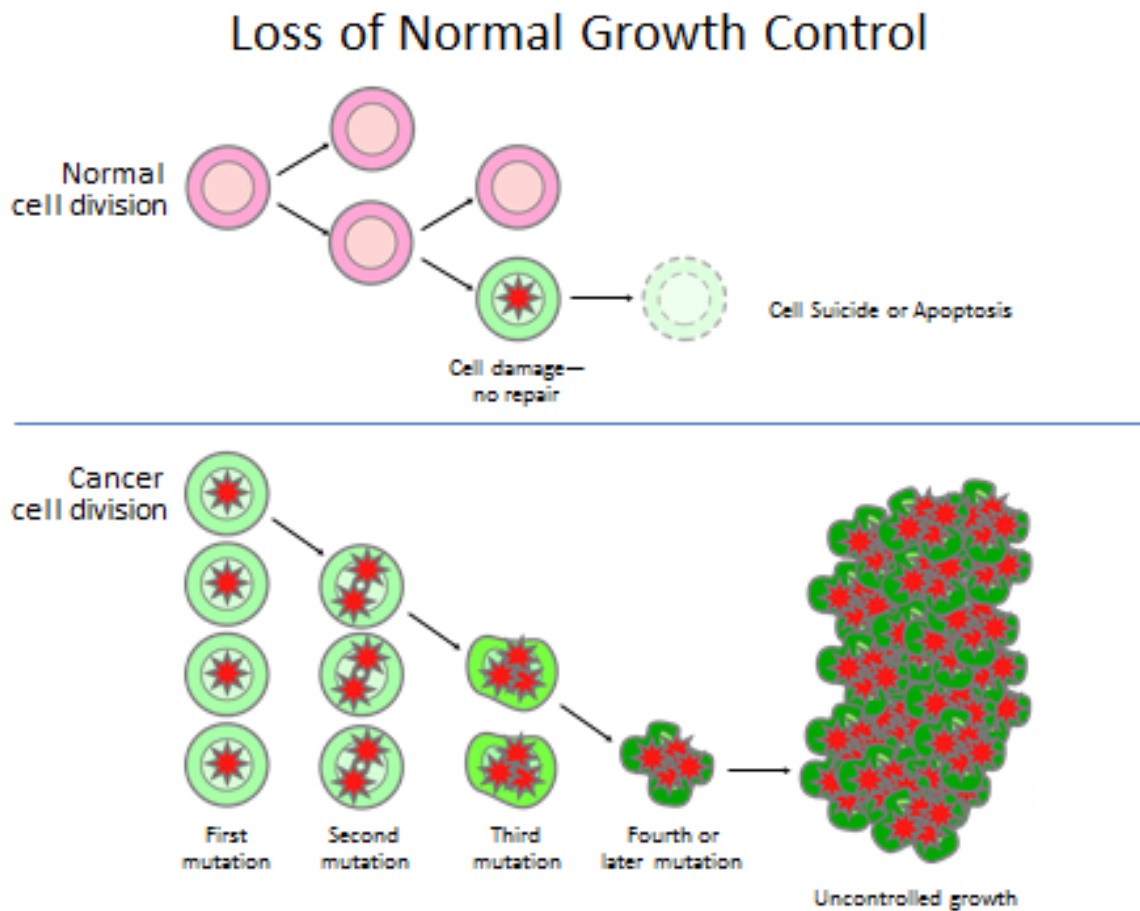
Cancer

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.



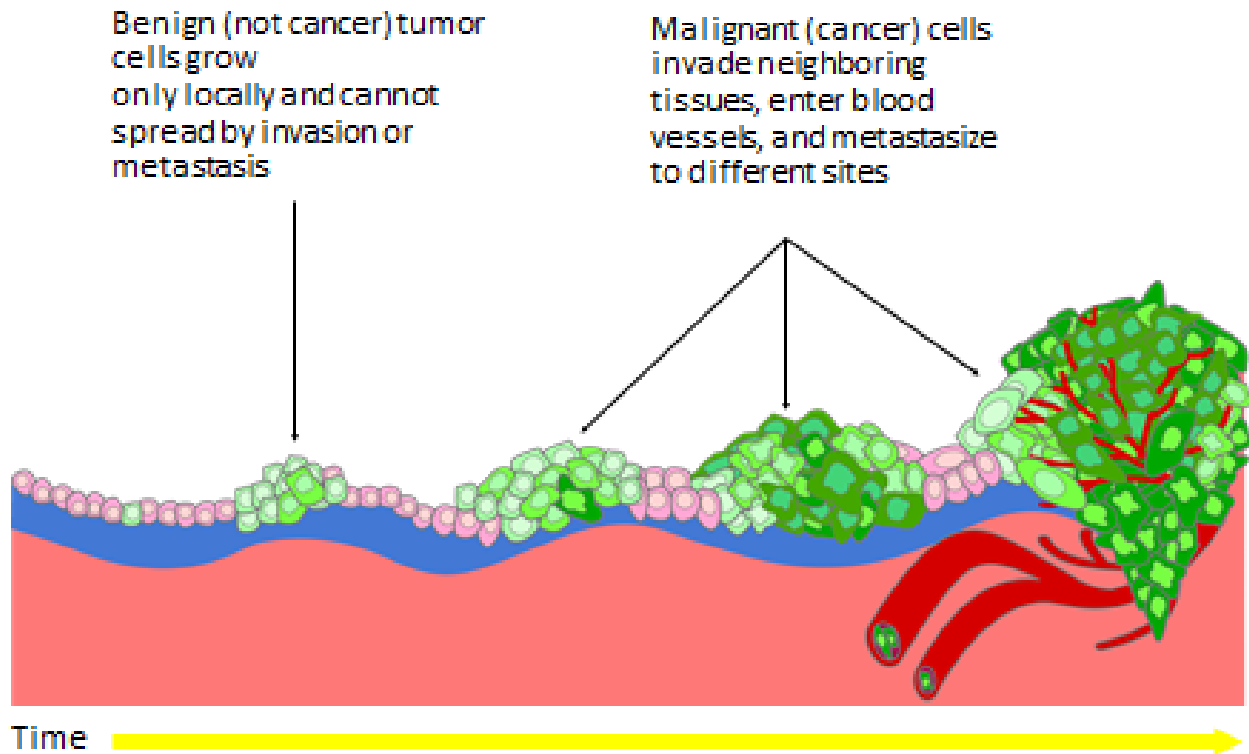
Abnormal cell growth can lead to a lump of cells, called a tumor. Some tumors are cancerous (malignant). Others are not cancerous (benign).

¹ <http://www.cancer.gov/cancertopics/cancerlibrary/what-is-cancer>

Lesson 10: Lymphatic System and Cancer

Reading and True and False

Malignant versus Benign Tumors



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.

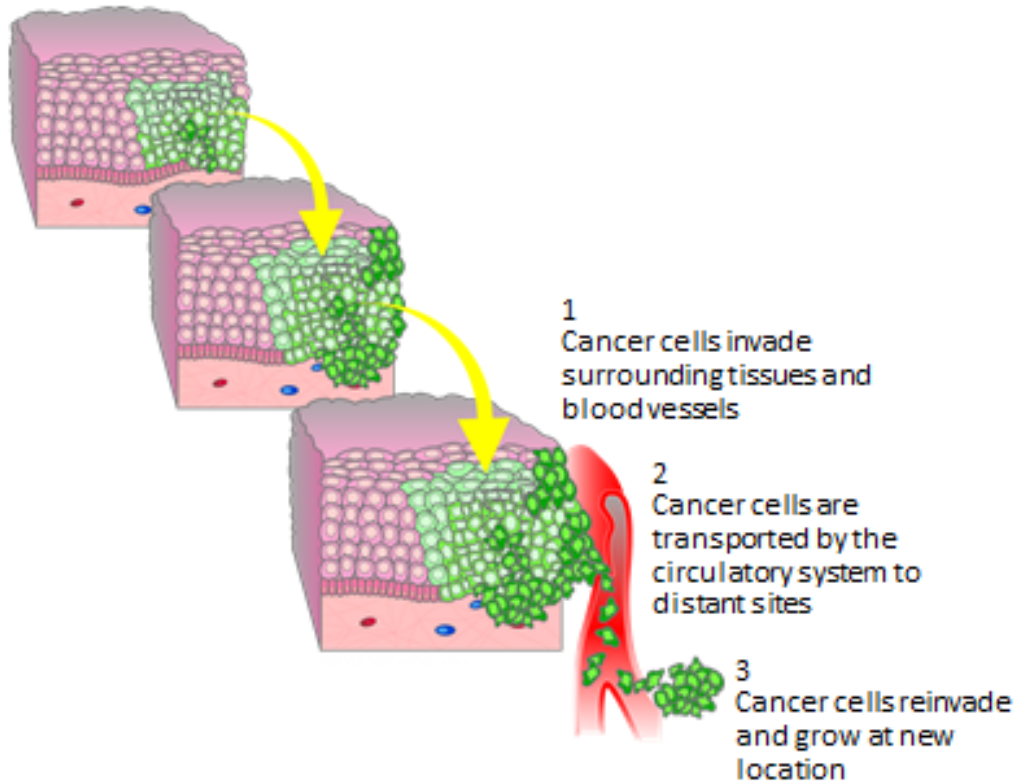
Why is cancer prevention so important?

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.

Lesson 10: Lymphatic System and Cancer

Reading and True and False

Invasion and Metastasis



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 following³:

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

3

² <http://www.cdc.gov/cancer/dcpc/data/women.htm>

Lesson 10: Lymphatic System and Cancer

Reading and True and False

How do I learn more about cancer?

- *Talk to your doctor*
- Additional websites:
 - o www.cancer.org/index
 - o www.health.state.mn.us/divs/hpcd/cdee/mcss/
 - o www.cdc.gov/cancer/
 - o www.mncanceralliance.org/

³ <http://www.cdc.gov/features/dsmentop10cancers/index.html>

Lesson 10: Lymphatic System and Cancer

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.

¹

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

- **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?

² www.nlm.nih.gov/medlineplus/ency/article/002247.htm

³ www.nlm.nih.gov/medlineplus/ency/article/002247.htm

Lesson 10: Lymphatic System and Cancer

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

Lesson 10: Lymphatic System and Cancer

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
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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.

Lesson 10: Lymphatic System and Cancer

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. _____

Lesson 10: Lymphatic System and Cancer

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.

Lesson 10: Lymphatic System and Cancer

Quiz

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

- | | |
|---|---|
| <p>1. What is immunity?</p> <ul style="list-style-type: none">A. feeling sickB. the ability of the body to remember a specific germ and how to fight it off effectivelyC. part of the circulatory systemD. none of the above <p>2. What are lymph nodes?</p> <ul style="list-style-type: none">A. part of the digestive systemB. part of the skeletal systemC. stops along the nervous systemD. stops along the lymphatic system that filter out and identify unknown cells <p>3. Why is cancer prevention so important?</p> <ul style="list-style-type: none">A. because anyone can get cancerB. it is life-threateningC. it is easier to treat if it is caught earlyD. all of the above <p>4. What is not considered a symptom of cancer?</p> <ul style="list-style-type: none">A. painB. weight gainC. fatigueD. skin changes | <p>5. What is an antigen?</p> <ul style="list-style-type: none">A. lymphB. antibodiesC. an unknown agent in the bodyD. germ-fighting molecules <p>6. How many different types of cancer exist?</p> <ul style="list-style-type: none">A. more than 10B. more than 20C. more than 50D. more than 100 <p>7. What is not a cause of cancer?</p> <ul style="list-style-type: none">A. exerciseB. tobacco useC. diet and obesityD. contact with certain chemicals <p>8. How can you find more information about cancer?</p> <p>1. _____</p> <p>2. _____</p> <p>3. _____</p> |
|---|---|

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!