Name: **Date:**

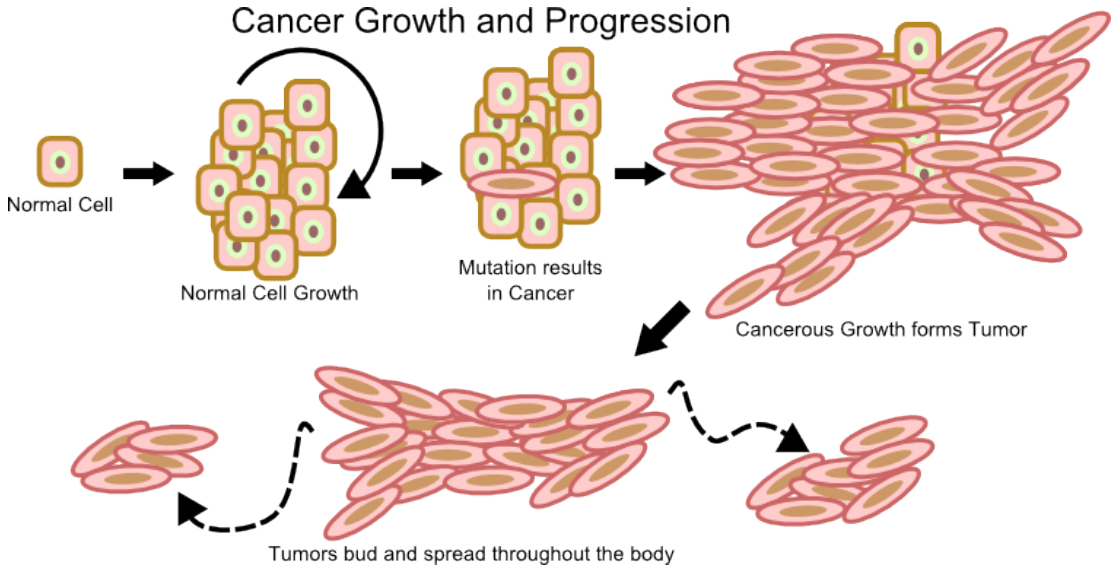
Cancer: Mitosis Gone WRONG

Amoeba Sisters: the Cell Cycle and Cancer

-
-
-
-
-

Part I: What is Cancer?

Cancer is the uncontrolled growth and division of cells. Cells will keep growing and dividing, even if your body does not necessarily need them. This means that there is a malfunction in the body in knowing when to start and stop mitosis. The cell usually spends most of its time in interphase and spends a very small amount of time in actual cell dividing phases. However, cancer cells are in a rapid state of cell division and spend much more time out of interphase.



1. Cancer is when what cell process is uncontrolled?: _____
2. Normal cells of the body spend most of their time in which phase of mitosis?: _____
3. Why is it bad if cell growth is not controlled?

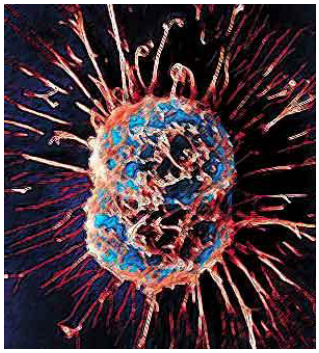
Part II: How Are Cancer Cells Different Than Regular Cells?

- Cancer cells behave differently than normal functioning cells. This also means that they likely have different physical characteristics. Cancer cells often have these traits:

- They spend less time in interphase – therefore they are dividing more!
- They have uncontrolled mitosis – the means they do not stop division after a certain point.
- They grow faster than normal cells
- They can break away from groups of cells and travel to other places in the body.
- They have a different physical structure – often with parts that allow them to grip and grab onto other cells and tissues

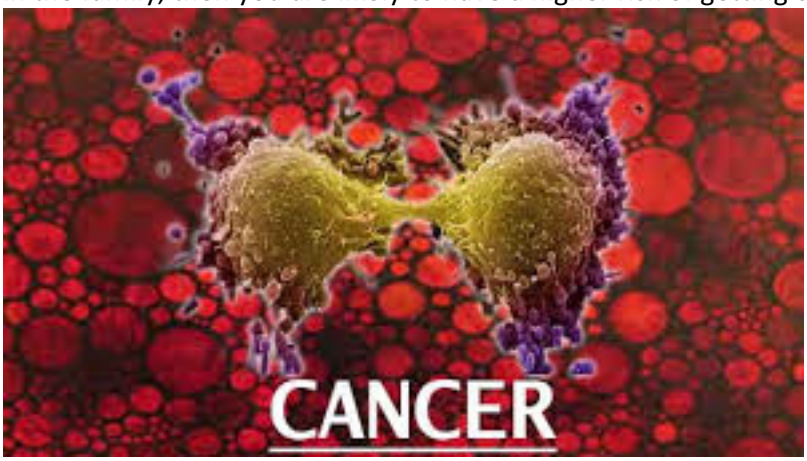
1. List the 5 ways that cancer cells are different than normal cells of the body:

2. What is one way that cancer cells are physically different than normal cells? And how would this affect surrounding cells?



Part III: What Are Some Causes of Cancer?

- There are many causes of cancer. All of these things increase the likelihood of cells becoming mutated. Mutated cells may not be normal and develop an incorrect cycle of mitosis. They will then keep reproducing at a high rate, causing the body to put lots of energy into their production and upkeep. All of this energy being devoted to these cancer cells causes other normal cells to suffer and can ultimately lead to death.
- Causes of Cancer (things likely to increase the chance of mutated cells)
  - Chemicals – many chemicals cause mutation, leading to problems with mitosis
  - Ultraviolet (UV) Radiation – When tanning or exposed to the sun, you absorb UV light. UV light causes DNA to be mutated which can alter the cell mitosis cycle in the future.
  - Viruses – an example is the HPV virus, which is known to cause cervical cancer in females if they are exposed.
  - X-rays – they radiate cells, causing mutations
  - Genetics -- some people are born with genes that are more likely to mutate over time or have cancerous properties. If cancer runs in the family, then you are likely to have a higher risk of getting cancer.



1. How do you end up dying from cancer? Explain how the body loses energy due to cancer in the space below:

2. Choose one possible cause from the reading and explain how it causes cancer. Can this cause be prevented?

3. All of these items increase the likelihood of cells becoming _____, which means that cells may not repair and follow a proper cell division cycle.

Part IV: What Is A Tumor?

A tumor is a cluster of cells going through uncontrolled mitosis.

You can have two types of tumors:

- Benign Tumors – these tumors have cells that do NOT migrate to other parts of the body and do not harm other parts of the body
- Malignant Tumors – these tumors have cells that can migrate to other parts of the body, potentially causing the cancer cells to spread in the body . When a tumor or cancer cells have spread from their original source, this is called metastasis.

Normal Mole	Melanoma	Sign	Characteristic
		Asymmetry	when half of the mole does not match the other half
		Border	when the border (edges) of the mole are ragged or irregular
		Color	when the color of the mole varies throughout
		Diameter	if the mole's diameter is larger than a pencil's eraser

Photographs Used By Permission: National Cancer Institute

1. A tumor is defined as a _____
_____

2. There are two type of tumors. They are: _____OR _____

Name each type of tumor below and state what makes it different than the other type:

Part V: If You Get Cancer, How Can It Be Treated?

Each cancer is different, so treatments may vary from person to person. Additionally, how advanced the cancer is will impact what type of treatment you get.

- Biopsy
  - First, doctors usually want to analyze the first sign of cancer. This is usually seen as a tumor. Doctors want to look at the tumor to see if it is cancerous or not. If the tumor is cancerous, doctors then want to know if it is benign or malignant. To determine these things, doctors take a biopsy. In a biopsy, the doctor removes a sample of the cells from the tumor to analyze under a microscope to determine the nature of the cells.
- Radiation Therapy
  - If the tumor is cancerous, you can direct radiation at the tumor. The radiation will kill the cells in the tumor, causing the tumor to shrink and hopefully die.
- Chemotherapy
  - To kill cancer cells in the body, doctors can inject powerful drugs into the body. This is usually done as an injection of drugs into the blood. These drugs kill cells quickly and aggressively. These drugs will also kill many normal cells in the body. So, this therapy can make people very weak and frail.
- Surgery
  - Often, the doctors will remove the tumor and attempt to remove the cancer from the body and reduce the chance of it spreading.

1. In order to determine if a tumor is cancerous, a doctor will take a _____ of it. Describe in the space below what is done during this procedure and why:

2. If a tumor is deemed cancerous, then one could do a variety of treatments. For each treatment, state what is done to treat the tumor:

o Surgery –

o Chemotherapy –

o Radiation Treatment –

Connections to Mitosis:

In 3-4 sentences, explain how cancer is related to Mitosis. What is similar? What is different: