

CANCER

GRADE 10



BIOCOMPASS

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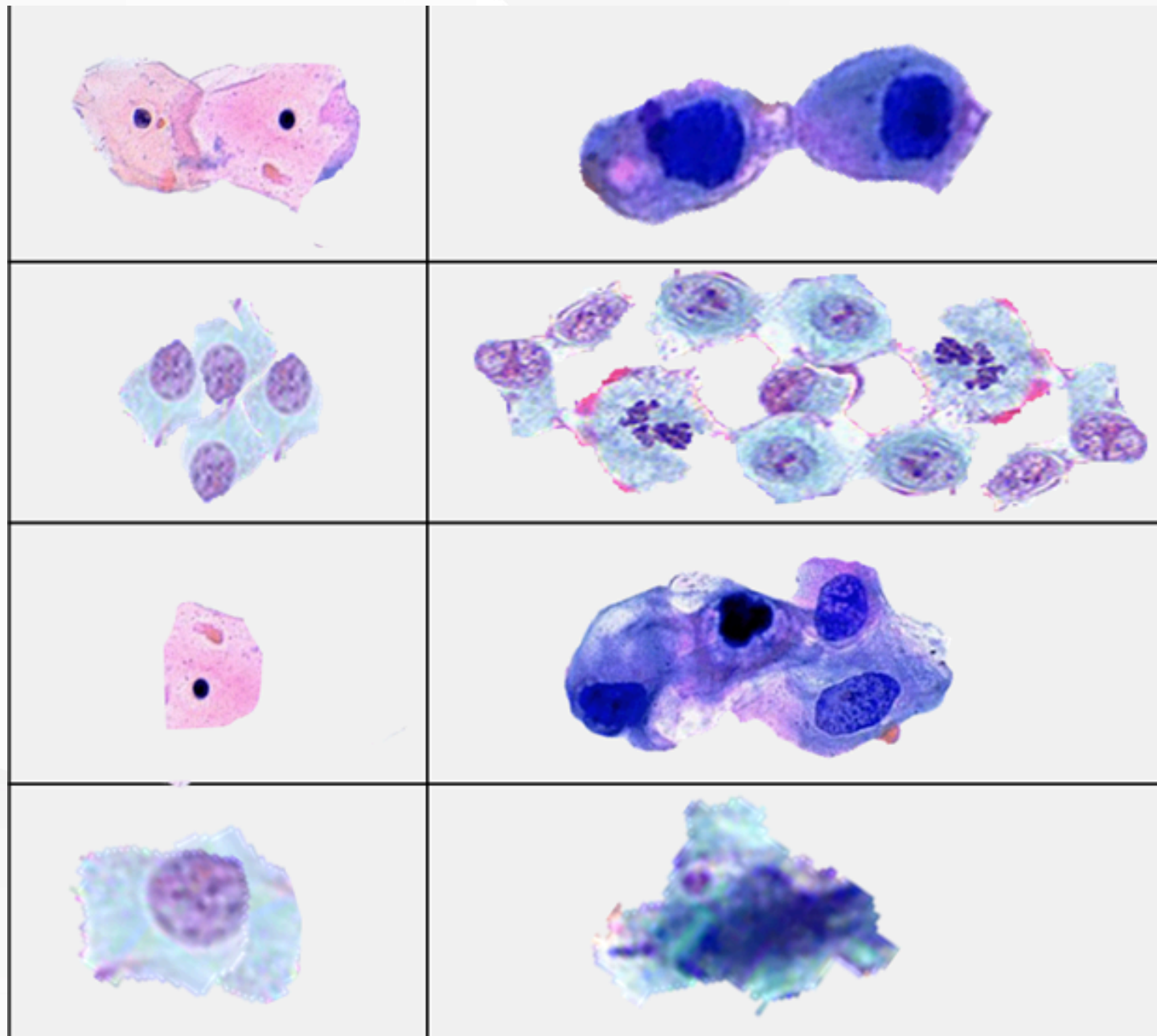


Lesson objectives:

- Explain how cancer results from uncontrolled cell division
- Describe differences between normal and cancerous cells
- Identify common causes of cancer (genetic, environmental, lifestyle)
- Explore and explain methods of cancer treatment, including how it works and its effects on the body

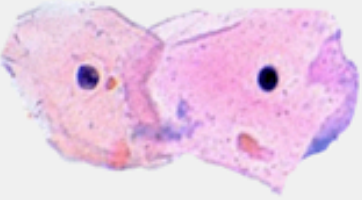

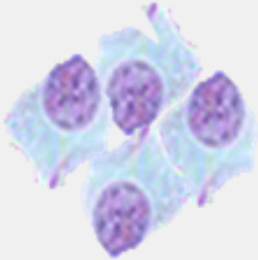
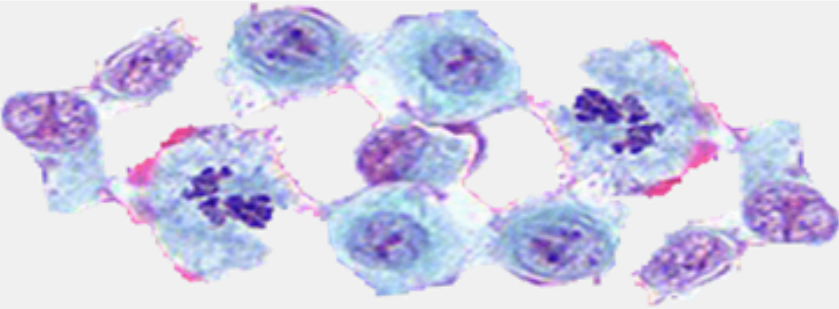
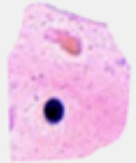
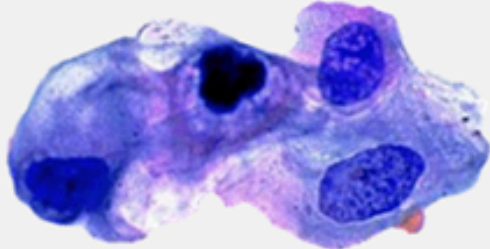
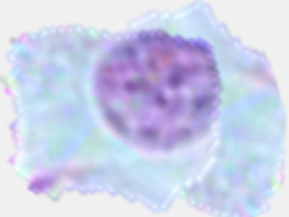
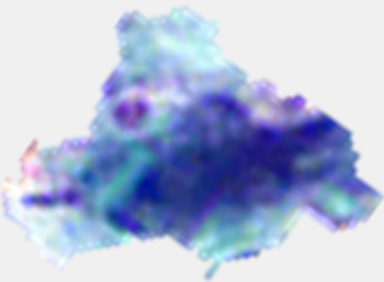


What's the Difference?



- What do you notice about how these cells look and behave?
- Why might one of these be dangerous to the body?

What's the Difference?

Normal	Cancer
	
	
	
	

- What do you notice about how these cells look and behave?
- Why might one of these be dangerous to the body?

Watch & Discuss – What is Cancer?

Amoeba sisters – "Cancer (Updated)"

- Link: <https://www.youtube.com/watch?v=QVCjdNxJreE>



Cancer

– a disease caused by abnormally dividing cells

How common is cancer?

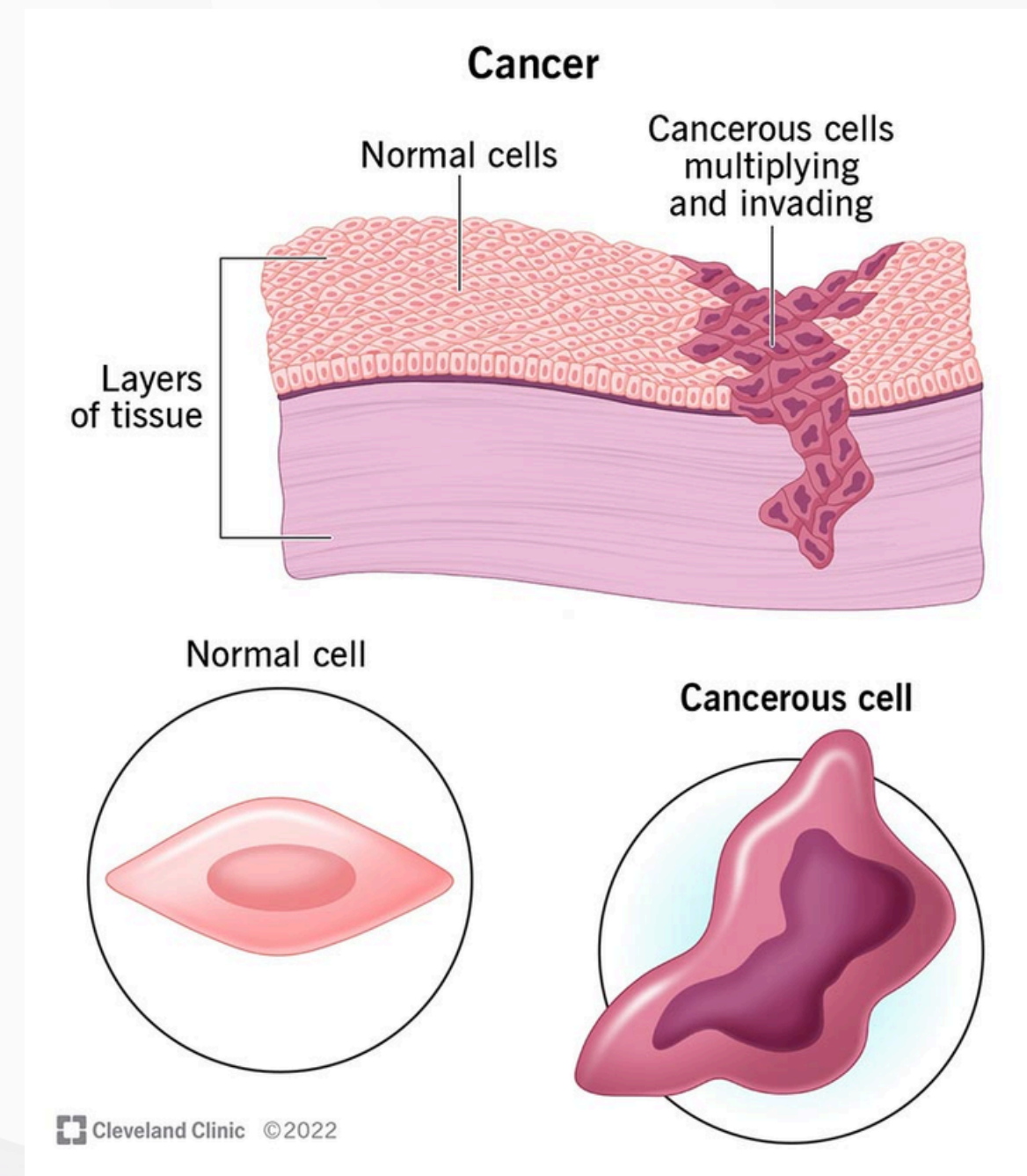
Cancer is the second most common cause of death worldwide. Researchers estimate that in 2024, over 2 million people living in the U.S. will receive a cancer diagnosis, and over 611,000 people will die from the disease.

About 1 in 4 people will develop cancer at some point during their lifetime.

Cancer. (2025, March 19). Cleveland Clinic.
<https://my.clevelandclinic.org/health/diseases/12194-cancer>

Carcinogen

– any chemical or physical factor, that causes cancer



How Does Cancer Develop?

Cancer is a genetic disease—that is, it is caused by changes to genes that control the way our cells function, especially how they grow and divide.

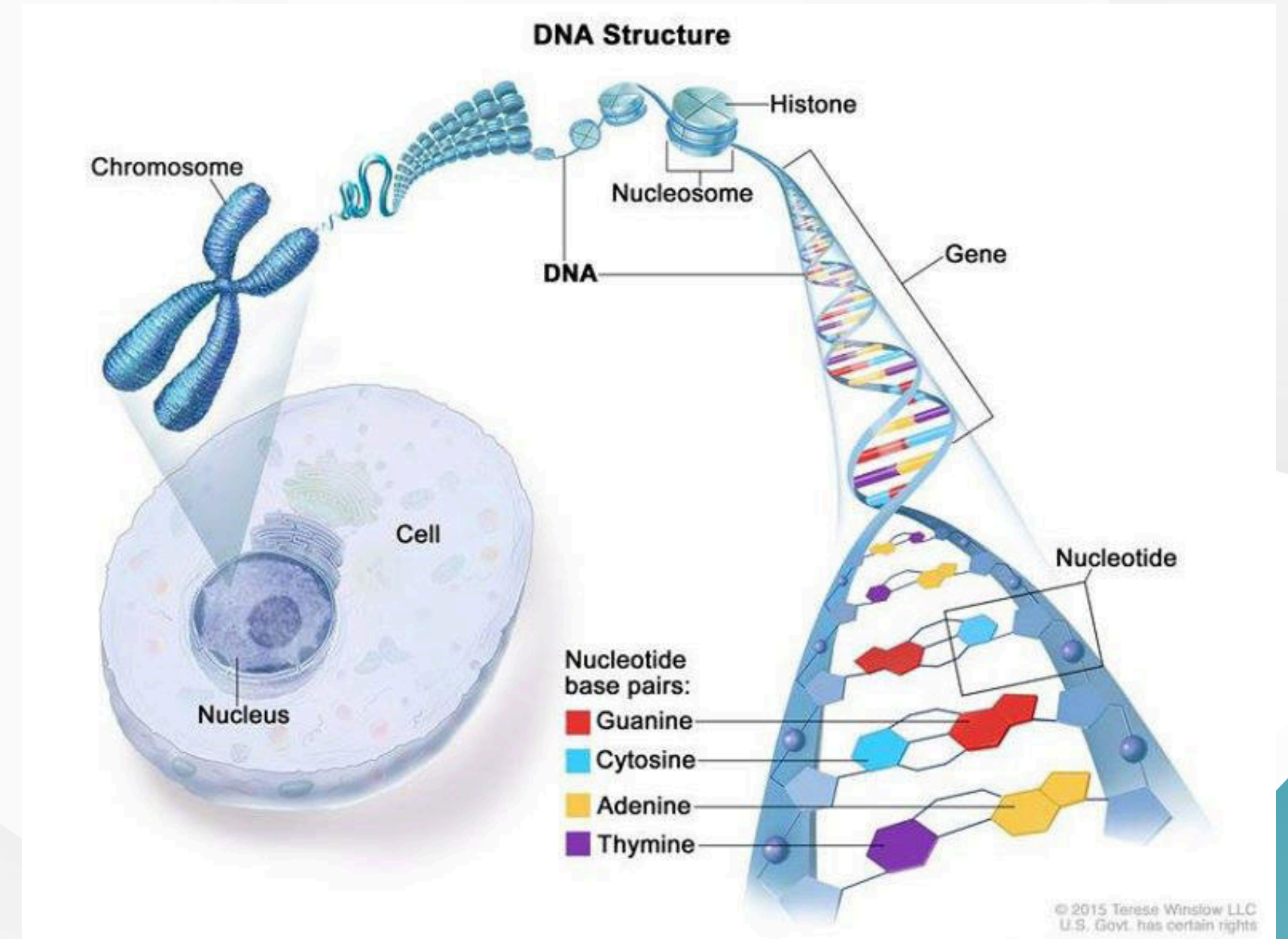
Genetic changes that cause cancer can happen because:

- of errors that occur as cells divide.
- of damage to DNA caused by harmful substances in the environment, such as the chemicals in tobacco smoke and ultraviolet rays from the sun. (Our Cancer Causes and Prevention section has more information.)
- they were inherited from our parents.

The body normally eliminates cells with damaged DNA before they turn cancerous. But the body's ability to do so goes down as we age. This is part of the reason why there is a higher risk of cancer later in life.

Each person's cancer has a unique combination of genetic changes. As the cancer continues to grow, additional changes will occur. Even within the same tumor, different cells may have different genetic changes.

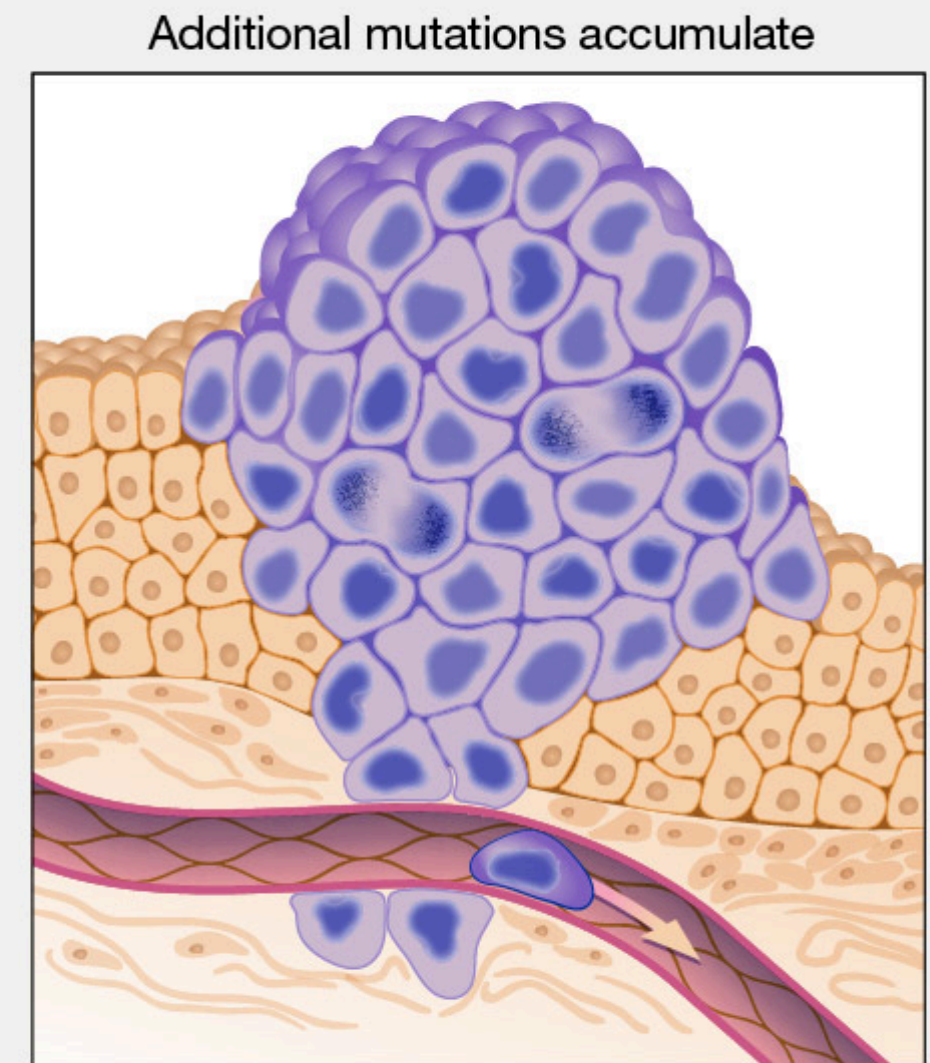
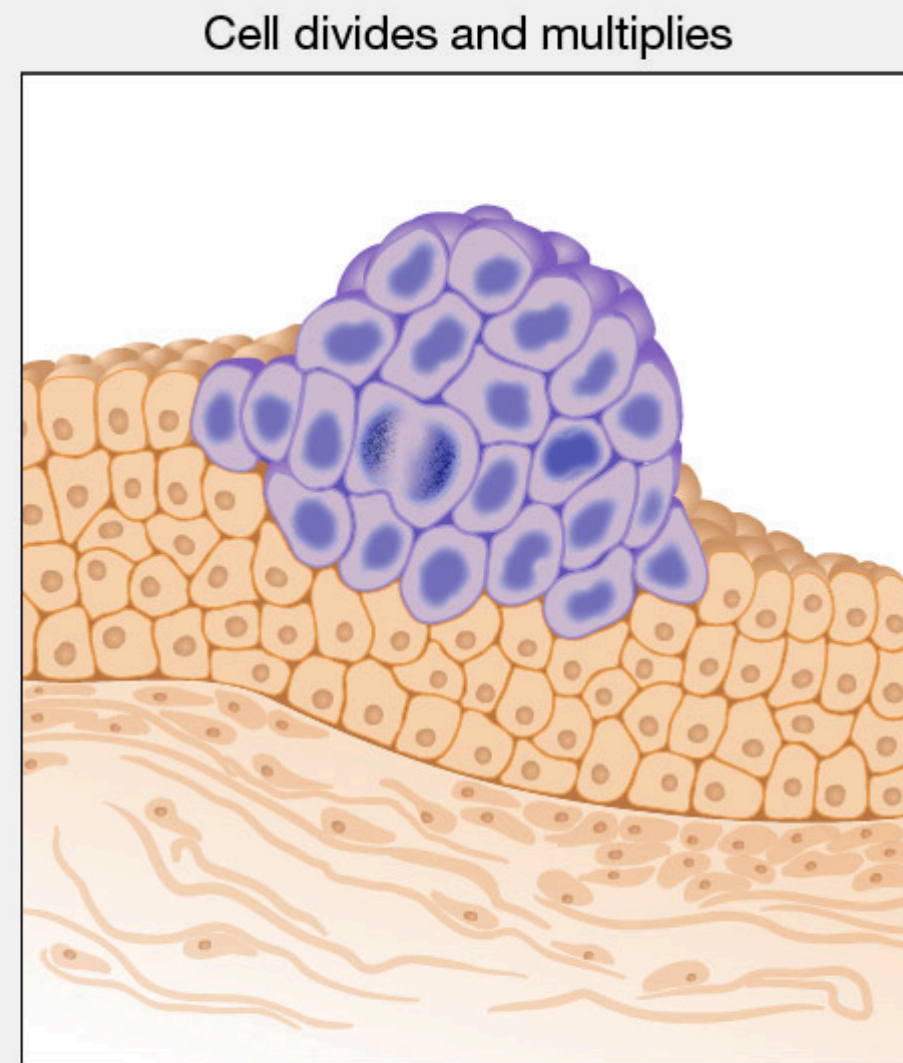
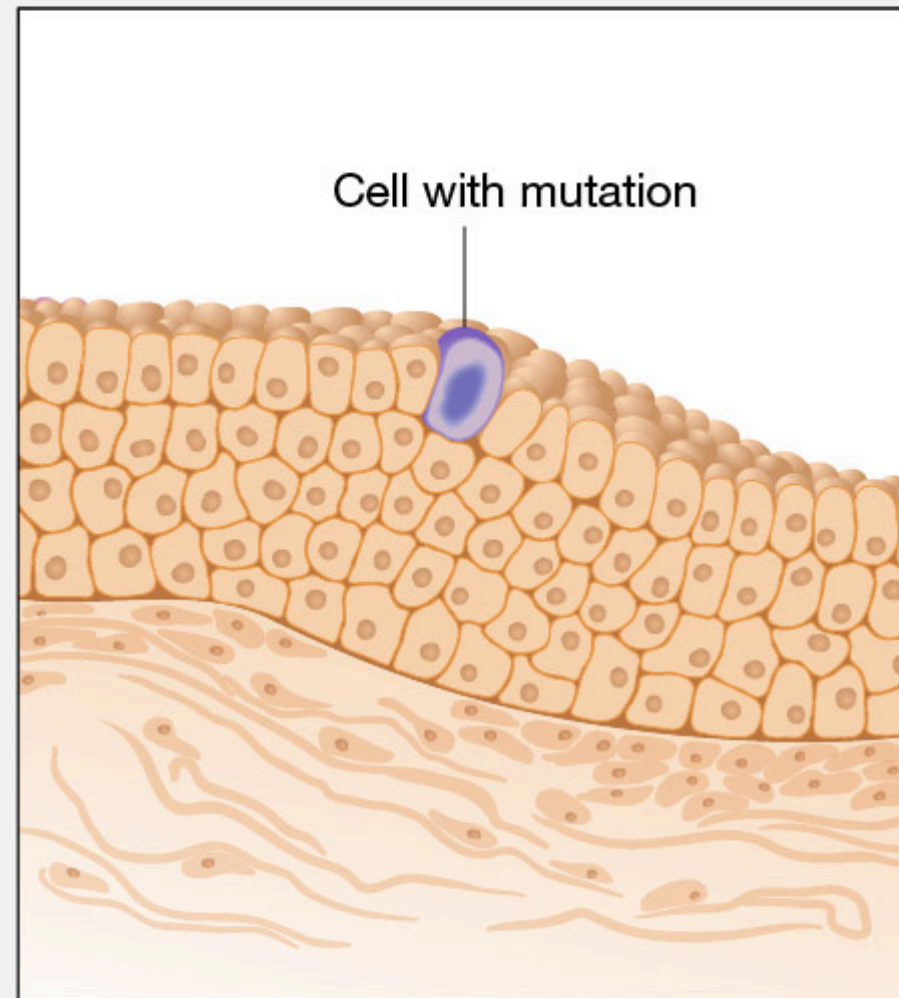
What is cancer? (2021, October 11). Cancer.gov.
<https://www.cancer.gov/about-cancer/understanding/what-is-cancer>



Cancer is caused by certain changes to genes, the basic physical units of inheritance. Genes are arranged in long strands of tightly packed DNA called chromosomes.

Credit: © Terese Winslow

How Does Cancer Develop?



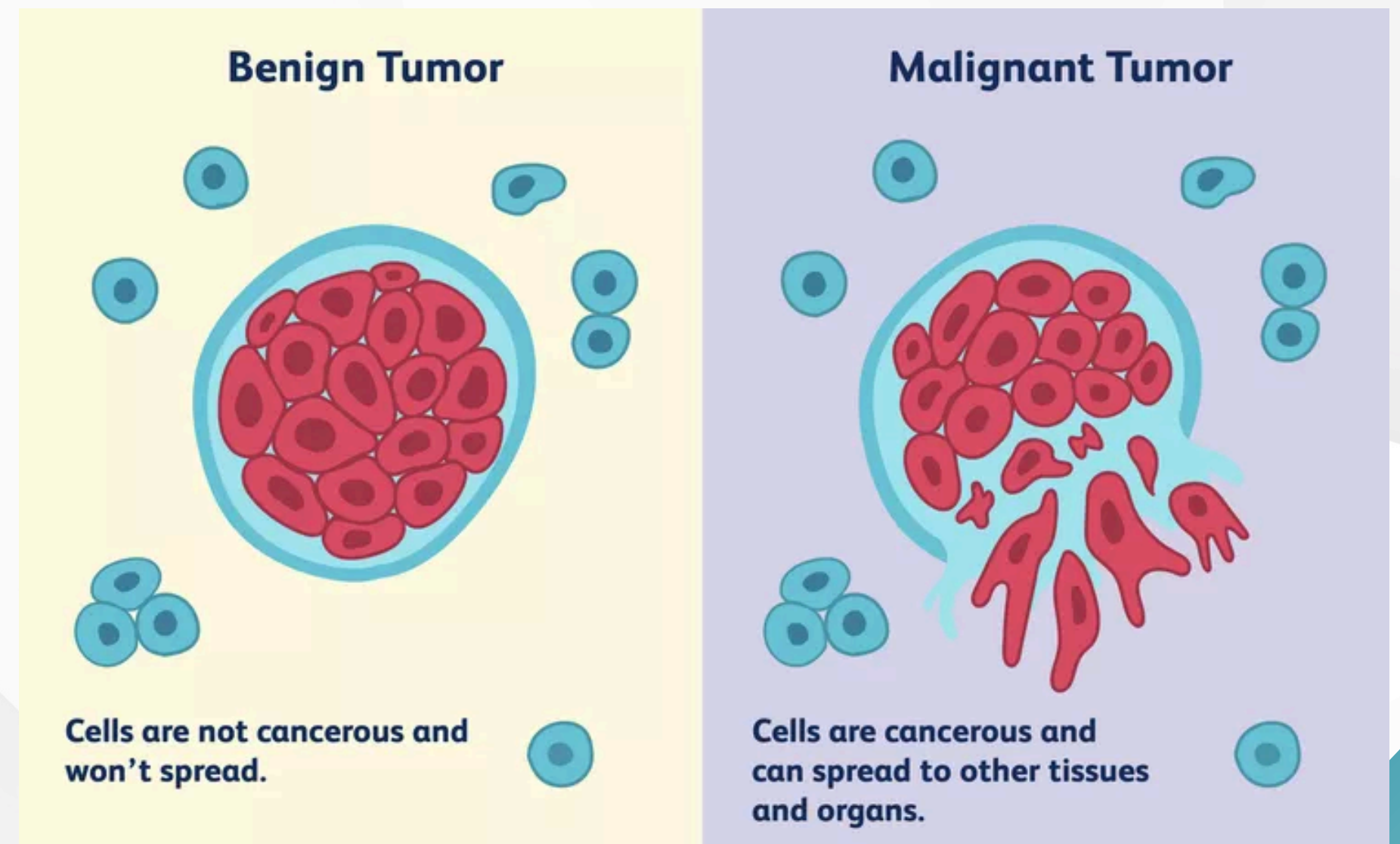
Cancer cells can travel to other sites

Malignant vs. Benign Tumors

A **benign tumor** is made up of cells that don't threaten to invade other tissues. The tumor cells are contained within the tumor and aren't abnormal or very different from surrounding cells.

Malignant tumors are made of cancer cells that can grow uncontrollably and invade nearby tissues. The cancer cells in a malignant tumor tend to be abnormal and very different from the normal surrounding tissue.

Splane, B. (2023, May 2). Malignant vs. Benign Tumors: What Are the Differences? Verywell Health. <https://www.verywellhealth.com/what-does-malignant-and-benign-mean-514240>



Causes

- Smoking
- radiation
- viruses
- cancer-causing chemicals
- obesity
- hormones
- chronic inflammation
- a lack of exercise.





Group work

Cancer Treatment Investigator – Group Mini Project

- What is it and how does it work?
- What cancer(s) is it used for?
- Pros and cons?
- Effect on healthy vs. cancer cells?

Reflect & Apply

Choose one question to answer:

- Explain how cancer starts and spreads
- Which treatment did you find most interesting and why?
- How can this knowledge help you or others?

THANK YOU FOR YOUR ATTENTION



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