Topic: Cancer

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Group - A

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- **How Do They Start?**
- Cancer cells appear through a series of genetic and epigenetic changes. Some of these changes may be either inherited or more often, caused by carcinogens in our environment, general , solid tumors, contain.

- multiple mutations. Interestingly, the metastatic process that is the main culprit for the high mortality of advanced cancers is thought to be caused mostly by epigenetic changes as no specific genetic alterations have been found in metastases. It also helps explain a genetic predisposition to cancer.
- A genetic predisposition does not mean they will get cancer, but, simplistically, if a few mutations are already in place, it will likely take fewer acquired mutations for a cell to become cancerous.

- The process of normal cells becoming cancer often goes through stages in which the cell becomes progressively more abnormal appearing. These stages may include hyperplasia, dysplasia, and finally cancer. It may also hear this described as differentiation. Early on a cell may look much like normal cells of that organ or tissue, but as progression occurs, the cell becomes increasingly undifferentiated.

- **Cancer Cells vs. Normal Cells**
- There are many important differences between cancer cells and normal cells. Some of these include:
- **Growth**: Normal cells grow as a part of growth and development such as during childhood, or to repair injured tissue.
- Cancer cells continue to grow (reproduce) even when further cells are not needed. Cancer cells also fail to listen to signals that tell them to stop growing or commit cell suicide when the cells become old or damaged.

- **Ability to invade nearby tissues**: Normal cells respond to signals from other cells which tell them they have reached a boundary. Cancer cells do not respond to these signals and extend into nearby tissues often with finger-like projections. This is one reason why it is difficult at times to surgically remove a cancerous tumor.

- **Ability to spread (metastasize) to other regions of the body**: Normal cells make substances called adhesion molecules that cause them to stick to nearby cells.
- Cancer cells, lacking the stickiness caused by these adhesion molecules, can break free and float to other regions of the body. They may travel to nearby tissue, or through the bloodstream and lymphatic system to areas of the body far from the original cancer cell—for example, a lung cancer cell may travel to the lymph nodes, brain, liver, or the bones.

- **Immortality: Normal cells, like humans, have a lifespan. When they reach a certain age, they die. Cancer cells, in contrast, have developed a way to "defy" death. On the end of our chromosomes is a structure known as a telomere. Every time a cell divides, its telomeres become shorter. When the telomeres become short enough, the cells die. Cancer cells have figured out a way to restore their telomeres so that they don't continue to shorten as the cell divides, thus, in a way, making them immortal.**
- **The ability to invade and metastasize is very important in differentiating a cancer cell from a normal healthy cell, but there are many other important distinctions as well.**

- **Cancer Cell**
- May keep growing
- May invade nearby tissues
- May spread to other regions of the body
- Can be immortal

- **Normal Cell**
- Grows when needed
- Stays within tissue boundaries
- Sticks to nearby cells
- Has defined lifespan
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