**Cancer & the Cell Cycle Project DUE: November 14**

This is a 2 part take home project focused on the principles of cellular division (specifically mitosis) and how it relates to cancer. Cancer is a prevalent disease in our world. The American Cancer Society estimates that 1 in 3 females and 1 in 2 males will develop some type of cancer over the course of their lifetime. Doctors, medical professionals, and research hospitals are daily working to find a cure for different types of cancer. In order to fight cancer, you must understand what the root cause of cancer is. The answer lies in cell division. This project allows you to explore HOW cell division causes cancer.

Your TASK: Read the provided packet titled “Cell Biology and Cancer” and combine what you learn from the reading with what you learn from the lesson taught in class. Use your new knowledge to do ***1 of the items in section A and the item in Section B.***

Section A

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| **OPTION 1: Answer the Questions** Answer the discussion questions (SEE BACK!) on cancer. These must be **typed** responses using supporting details from your notes AND the reading. Be specific and thorough. Do not rush these questions - I will be able to tell.  | **50 points** |
| OR |
| **OPTION 2: Type a one page letter** to a cancer patient explaining how cell division and mitosis have “caused” their cancer. Be specific in your writing to this patient and make it understandable to the common person. Make sure you highlight the major factors of cell division as they relate to cancer using supporting details from the reading and your notes. Make sure you personalize the letter as well in terms of writing *TO* the patient explaining their cancer. Use all appropriate vocabulary when necessary and do not copy word for word from your notes and/or reading. Put the information in your own words, in a way that any person reading could understand. | **50 points** |

**Section B**

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| 1. Create a handmade, neat, and crafty card for a children’s cancer patient at Levine Children’s Hospital or Hemby Children’s Hospital. Send them an uplifting message - encouraging them to keep fighting, admiring their long journey. Be sincere, be kind. Create something that will make them smile. MAKE THEIR DAY! We will be sending these cards to them soon as a part of AK High Schools “BE BOLD, BE BALD” campaign.
 | **50 points** |

Section A, Option 1“Cell Biology & Cancer” Reading Questions

1. In general, cells are meant to grow and divide in living organisms. However, it is when this cell division goes awry that cancer cells form in the body. Explain how the normal process of cell division is altered in a cancerous cells.

2. It is widely accepted that cancerous cells have “bad” DNA, or DNA that is genetically damaged in some way. How do the following types of genes (when they become mutated) cause cancerous cells to develop? Be SPECIFIC for each.

• Proto-oncogenes/Oncogenes:

• Tumor Suppressor Genes:

• DNA Repair Genes:

3. Discuss the 3 checkpoints involved in regulating the cell cycle in normal cells.

4. Discuss the different stages of tumor growth.

5. What is angiogenesis and how does it aid in tumor growth and dispersal in the body?

6. How do environmental factors like overexposure to UV radiation, cigarette smoke, etc. affect cells to make them cancerous?

7. Explain how the following three cancer treatments work to “kill” cancer cells:

a. Surgery

b. Radiation

c. Chemotherapy