# STEAM Project

As shown in the picture the creative component of my STEAM project is a board game called Immunopoly because it a person’s health journey through an Alaskan year.

The purpose of the game is to educate people about the immune system and how different healthy habits play into improving overall immune health.

The player travels through an Alaskan year (around the board) trying to collect healthy habits. Just like in regular monopoly when you land on a place you can buy it but instead of buying park place you can buy “Regular Exercise Routine” or other heathy activities. If you get all the healthy habits in that block, you can get a Immunopoly which starts producing health units which can protect you from sickness and boost your overall health. The goal is to get to 20 health units.

As you travel around the board collecting healthy habits there are two major cards you can land on, Immunity or Infection. Immunity is a stack of cards that depict the body’s immune defense such as Eosinophil white blood cells. The card gives a brief description of what the body defense is and how it protects the body and what specific pathogen it kills.

Infection cards are the opposite, they give a short funny scenario of how the person got an infection such as eating bad sushi and getting parasites then it tells you how much health it will cost you if you do not have the proper defense such as a Eosinophil Immunity. If you do have this card, you can defeat it without any penalty. The goal is to get health credits by good health habits and to overcome infections with immunity cards.

In the picture it shows a player landing on an Infection tile and having to draw an infection card, the card says that he ate bad sushi and now has a parasite. The next picture shows him defeating this disease with the Eosinophil Immunity card the player possessed. This was my creativity portion of my project.

Since this project also includes a research component that is difficult to depict without playing the game, I have chosen to include for my research a brief description of what cancer is and how a healthy immune system is designed to seek out and destroy abnormal cells in your body.

Cancer and the Immune System

Cancer is not a foreign pathogen that certain people are exposed to an get but instead cancer is simply an overabundance of abnormal dysfunctional cells that the body has not destroyed. Every day the body produces abnormal cells but the body has quality control that go around and eliminate any abnormal cells. This is the job of Natural Killer (NK) cells in the innate immune response. Every healthy cell produces a small antigen flag called major histocompatibility complex 1 which signals the cell is in good health if the cell becomes compromised by a virus or cancer it does not produce this MHC1 flag signaling for it to be destroyed by NK cells. This goes on every day so those mutated cells don’t turn into the diagnosable disease of cancer.

So if your body has this safeguard how or why do people still get cancer*?* In the article *Paradoxical Roles of the Immune System during Cancer Development*, “individuals with chronic inflammatory disorders have a increased chance of cancer.” This could indicate that there could be a correlation of chronic illnesses weakening the immune system and cancer being allowed to proliferate because of the weakened immune response.

According to a second article *The Immune System and Cancer* the second way abnormal cells are allowed to prolificate is that “malignant cells develop mechanisms to evade the effective immunosurveillance [by producing] immunosuppressive cytokines” this acts as a smoke screen trying to help the cancer cells hide from detection. According to the article *Immune oncology: understanding the function and dysfunction of the immune system in cancer* “in many cancers, malignant progression is accompanied by profound immune suppression that interferes with an effective antitumor response and tumor elimination.” This explains why cancers are allowed to grow in the prolificate when the body has a system designed to destroy cancer cells. It explains why cancer is such a difficult and deadly foe to defeat.

Before I conclude this research section of my project I would like to share some interesting information that I found in this last article about research being done that discusses methods of how to stimulate the natural immune response to fight cancer.

The article explains there is a new area of research “Immunotherapy, which involves strengthening the cancer patient's immune system by improving its ability to recognize the tumor” to help the patient fight cancer.

The article says that “the immune system has the greatest potential for the specific destruction of tumors with no toxicity to normal tissue…” this is indicating that the body is designed to detect, attack, and destroy cancerous cells in the body. This make logical sense since the body contains many defenses such as NK cells that are designed to kill cancer cells. If this research pans out it would be very interesting since cancer has been such a large goliath in the medical field. If true, it would offer many a glimmer of hope and could help many people walk in health and healing. It would be interesting to study.

Bibliography

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