Cancer Inheritance Patterns

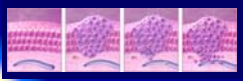
By: Elyse

Introduction

- Cancer is the leading cause of death for people under the age of 85.
- This year alone, cancer will kill 570,280 Americans; more than 1,500 people a day.
- Cancer is caused by a malignant tumor. Each tumor embodies a clone of cells capable of reproduction in an unregulated manner.
- Cancer is hereditary (passed down through genes) as well as acquired through cigarette smoking, dietary imbalances (lack of fruit, vegetables, fiber, calcium, and excess fat) and chronic infections which lead to chronic inflammation. These infections include the hepatitis B virus and *helicobacter pylori* infection, amongst others.
- Amongst women, breast cancer is one of the most common types. It is the second leading cause of death for women diagnosed with cancer. In the United States alone, more than 204,000 women are diagnosed with breast every year.
- 5% of women who are diagnosed with breast cancer also carry a gene called the "Breast Cancer Gene" AKA BRCA. This is a genetic mutation in two genes, BRCA 1 and BRCA 2, that is inherited and can increase a woman's risk for developing breast and ovarian cancer.

Introduction cont'd

- Women who possess the BRCA mutations are 7 times more likely to be diagnosed with breast cancer than a woman who does not have the BRCA mutations.
- Men can also possess this gene.
- Lung cancer is the leading cause of cancer death amongst both men and women; it kills more women every year than breast cancer. However, 90% of women diagnosed with lung cancer were smokers.
- There are two types of lung cancers, non-small cell lung cancer and small cell lung cancer. 87% of all people diagnosed with lung cancer have non-small cell lung cancer, while 13% have small cell type.
- Non-small cell lung cancer spreads more slowly and is more common than small cell lung cancer. There are 3 main types of non-small cell lung cancer, squamous cell carcinoma, adenocarcinoma, and large cell carcinoma. Small cell lung cancer, also known as oat cell cancer, is less common and grows more quickly than non-small cell lung cancer.



The cells multiply as time goes by

Lung cancer is the yellow part

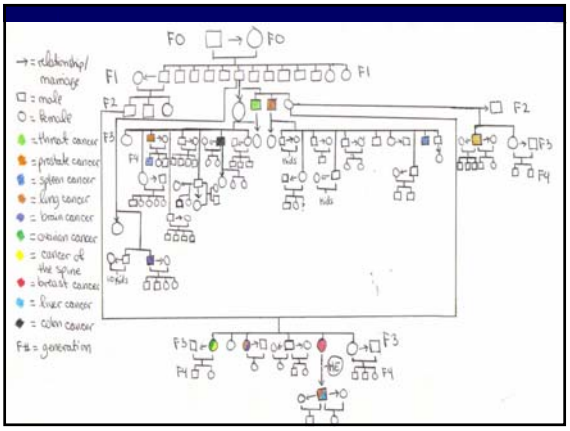
This shows the different stages of breast cancer, before it spreads to the rest of the body (IV)

Hypothesis

- I hypothesize that after creating a pedigree chart and analyzing it, I will be able to express a cancer pattern and predict the possibility a member of my family being diagnosed with cancer.

Methods

- I met with two members of my family, my mother and my great-uncle.
- I asked them questions about their siblings and cousins.
- The questions included information about their medical histories and the medical histories of the other family members diagnosed with cancer.
- I then created a pedigree chart with the information given to me and analyzed it.



Chart

Generation	Name	Age deceased/ diagnosed	Type	Status
F2	Hypolite	40's	Throat	Deceased
F2	Joseph	70's	Lung	Deceased
F3	Andre	75	Prostate	Alive
F3	Hypolite	60's	Brain	Deceased
F3	Camille	67	Colon	Alive
F3	Unknown	50's	Brain	Deceased
F3	Gerard	70's	Prostate	Alive
F3	Yolande	60	Ovarian/Spinal	Deceased
F3	Marlaine	55ish	Lung/Breast	Deceased
F3	Cecile	48 and 52	Breast	Alive
	Dieter	60's	Lung/Liver	Deceased

Conclusion and Interpretation

- So far, the only clear patterns are that most of the people who have been diagnosed with cancer are from the 4th generation (F3), and were older- 40's, 50's, 60's, and 70's. The 6th generation (F5) was not included because if I follow the pattern, they are too young to have cancer.
- I predict that the members of my generation, who will be diagnosed with cancer, will be between the ages of 40 and 80, like their parents, and I expect the number of Stines with cancer to increase.

C and I 2

- There were probably more people from the older generations (F0 and F1) who had cancer, but it was never reported or talked about. This is because looking at the pedigree chart, it does not add up. It seems as if the cancer just popped up in the 3rd generation (F2).
- The reason why my mom and her siblings had more cancer cases than my mom's cousins, is because my grandfather and my grandmother were cousins (they did not know this when they met). So, because our family already possessed the genes for cancer, they multiplied when my grandparents reproduced.

Future Studies

- This study could help families detect certain disease patterns (not only cancer). They would be able to prepare themselves and live healthier lives.
- This study could be extended if groups of scientists and historians were to get together and generate patterns for people.
- However, this could be dangerous, because it's "not letting nature take its course." If people started finding out the age at which they would be diagnosed with certain diseases, they would try to avoid this. This would lead to less people dieing and overpopulation.