

Lung Cancer Risk

(Smoking)

New Mexico

Super Computing Challenge

Final Report

April 2nd, 2014

Team 93

Mesa Middle School

Liah Guerrero

Selena Ibarra

Jada Martinez

Tracie Mikesell

Table Of Contents

Pg.2~Table of Contents

Pg.3~Extensive Summary

Pg.4~Introduction

Pg.3-4~Description

Pg.4~Results

Pg.5~Conclusion

Pg.5-6~Recommendations

For our project we decided to study if you would end up having a larger risk of forming cancer tumors by either smoking daily, or smoking irregularly. So we researched lung cancer, and causes of cancer tumors in your lungs and found out that the nicotine in the cigarettes is one, is very addicting and two, “causes”. By causes we mean that it will damage the cilia, which in turn, means that the cilia is unable to protect your lungs from any diseases and push up excess mucus. We were also able to find out that lung cancer is the unrestrained growth of peculiar cells in the lung(s). We were also able to find out that due to the unrestrained growth of said cells, the cells would start to form tumors, which can possibly block airways and damage the cilia. If you do start to develop lung cancer, it would take a really long time for doctors to see the tumors starting to develop, so lung cancer can take from months to years to fully develop. For our program, we had one where we would show you how your lungs will normally function without any smoking or lung cancer tumors. So it shows the cilia (white grass), pushing the mucus (lime spheres) upwards and out of the lungs with no sign of abnormal cells or tumors. Our second program is how the cells in your lung(s) would act with the abnormal cells in your lungs. So for example it would show the cancer cells starting to damage the cilia, letting the mucus to multiply, since the cilia is unable to push up the excess mucus, and pass through the cilia clogging up you airways (not in program).

The purpose of the project was also to see the risks of getting lung cancer and the effects of getting lung cancer. The significance of this problem to us is that all three of us have at least one relative who does smoke, and we wanted to do some research on smoking and its probability of getting lung cancer. So, by doing this research we should be able to learn the risks, and consequences of smoking. We were able to learn in our research that there are two different types of tumors that can form in your body, benign tumors, which aren't necessarily life threatening in most cases, and don't need to be removed. The second type of tumor that can grow in your body would be the malignant tumors, which are very life threatening, and if you do remove them, there's a possibility that the tumor would grow back. Whenever a malignant, or cancer tumor is originally broken, the cancerous cells start to spread into your blood vessels and into your tissues.

A description of our project was that smoking is a very bad thing to do. So by doing this project we have discovered that by smoking, you have a very high possibility of your cells mutating into cancer cells, forming cancer tumors in your lungs, and possibly obtaining lung cancer. For our project, we used a computer to build a program from scratch to show the multiplication of the mucus, which is one

of the affects of the cancer cells attacking the cilia. We also used paper and boards to show the process of our project. The steps our program was required us to do were

Pg.4

to one, have our cilia in the “piece” of lung that we showed in our program. From there we added cancer cells that once they collided with cilia, changed the color, which shows the cilia hardening due to the nicotine in cigarettes, and from there, the mucus that was seen leaving the “lung”, can be seen multiplying since the cilia is unable to do anything and push up excess mucus, clogging up your lungs and causing a an excessive amount of coughing.

The results of the project we did were that nicotine in cigars can damage your cilia (as seen in program) rendering it from its usual duties in protecting your lungs from diseases, so smokers are most likely to catch flus and colds then non-smokers. We also learned that a tumor is the abnormal growth of mutated cells in your organs that can both be either deadly or harmless. We discovered that electronic cigarettes do include nicotine in them, so no, they aren't safer to the user, only to the people around since the nicotine is what hardens the cilia, which doesn't cause cancer, but stops it from fighting back and defending itself. Though the cilium does it's best to fight back and does occasionally end up recovering, but not in most cases, considering nicotine can kill off your cilia. We also discovered that lung cancer isn't necessarily a cancer that stays in the lungs, it's where the cancerous cells start to form at first, even if they start to spread toward other places, like your bones, brains, or bones.

Based on our results, we were able to find out that smoking is one of the greatest causes of lung cancer, but it can also be caused by many things like air pollution. We were able to conclude that having a tumor is the rapid growth of mutated cells, that once the original tumor is broken, the mutated cells start spreading rapidly everywhere. Our results state that cancerous cells and cilia “fight” for control, but adding nicotine to the mix makes it harder with less and less cilia being able to fight back. It also showed that lung cancer caused by smoking could produce an excessive amount of mucus in your lungs. For our results, it was not exactly what we expected, the last thing we expected was for the cilia to fight back the cancerous cells and try its best to be able to recover. That being a difficult job since you can kill off your cilia by smoking, becoming less immune to illnesses.

For our project, we hope to research further into what chemicals in the cigarettes can damage or lose the genes in the cells starting the mutation, or if it has nothing to do with it at all. We also hope to figure out how bad smoking is for your body and health in general and what it damages and how. However, we don't expect to get accurate or complete results in our project. The reason why is because we believe that, for us, we can only get what we are able to find on the world wide web,

and what we can get through our teachers/mentors. We believe we'll be able to find more accurate information if we can find either a very accurate website on lung

Pg.6

cancer facts, or contact someone who has studied cancer in depth and/or has personnel experience with cancer.

Citations

pg. 7

We would like to thank the following websites for helping us in our project:

http://www.lungcancer.org/find_information/publications/163-lung_cancer_101/265-what_is_lung_cancer (pg.1)

<http://www.nlm.nih.gov/medlineplus/tutorials/lungcancer/oc079105.pdf>

<http://smokefree.gov/health-effects>