

Curing Breast Cancer Using Sloth Fur Fungi

New Mexico
Super Computing Challenge
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Title: Breast cancer is a world-wide problem that is treated using dangerous methods such as radiation. Lately scientists discovered that the fungi growing in the Three Toed Sloth does treat breast cancer and could be a cure. We use simulations to show what could happen inside the body while the fungi is in the body using Star Logo Nova.

Summary: The problem that we are going to resolve is breast cancer. This is a big problem because in 2016 “595,690 people in the U.S.” (National Cancer Institute) died, because of this disease and it needs to be stopped. The solution to the problem is a Three Toed Sloth. The fungi in sloth fur than can cure breast cancer and other deadly diseases and if we can do this in a simulation then maybe in a few years and then maybe we can fix one of the biggest problems in the world.

Introduction: The problem is breast cancer. It is a world-wide disease that is killing millions every year. By using simulation to simulate what could go on, could potentially solve this problem. After we solve this problem maybe we can adapt it to solve other kinds of cancer like lung cancer, brain cancer, etc. Our hypothesis is, if we use simulations to simulate how the fungi works in the body, then we could potentially make a cure to breast cancer, because it demonstrates how the body will react with the fungi and how the fungi reacts with the cells. We came up with our hypothesis because our main code is the fungi interacting with the cancer cells while the natural cancer cell killers also kill the cancer cells. The purpose of our experiments is to solve breast cancer. If we can actually simulate the cells correctly we could have an actual cure for breast cancer and will help millions.

Methods and materials: Our materials would be our laptops and Star Logo Nova because we need the laptop to run the simulations and we need Star Logo Nova to make the simulations. Our methods for doing our hypothesis is create our main code based on how the fungi interacts within the body and the cancer cells with the hope of destroying the cancer cells and help maintain a balance in the cells again. First, we made a code based off of a preset Star Logo gave us and we adapted it where it was only three objects, the cancer cells, the fungi, and normal cells. A week later we decided to make another code for the growth of the fungi. A few weeks later we researched more and found out that there are more factors to the body and the cells that attack the cancer cells. Now there are 7 objects in the main code. They include the normal cells, cancer cells, fungi, cytotoxic T-cells, emergency Cytotoxic T-Cells, monocytes, and natural killer cells. We are trying to add in some regeneration and degeneration inside the code, but there are some more problems we need to figure out. With the growth of the fungi it is more complicated and we do need more time to figure out the temperature, moisture, and living conditions inside the fur which make the fungi grow more.

Results: Me and Isaiah have been working on this since September 22nd and that when we barely started talking and reading about the project but at the moment with our simulation, it is actually moving and making progress instead of making a block. But, with the fungi we have them in different counts like a 25, 50, 75, and 100 count to see which is better. We are getting results and making another one for the growing fungi. And with the fungi we also added different variables like white blood cells which can get rid of the fungi. The expected results were that the fungi will kill or cure the breast cancer cells making them disappear. With our simulation the number keep changing but so far the best is the 75 count of fungi because the

fungi get rid of the cancer cells and also transitioned back into normal cells. And maybe in a few years maybe we can simulate this in real life where we make the fungi grow naturally and make it duplicate in an artificial setting. It's like how pills are made when they put the bacteria on a big sheet and they leave that sitting there for about 2 or 3 days and then the bacteria should have been spread across all over the sheet and then they put little pieces of the sheet into the pill capsules. Then we distribute that all across the world for people to use and get their life, family, and health back from breast cancer.

Conclusion: This project is obviously in progress still because we are still finding different data. But, so far we have gotten the simulation to move and actually work and currently working on another one to show the growth of the fungi. We will for sure work on this next year and make it better, and try to get reliable results instead of the results changing.

Personal statement: Isaiah's personal statement: This project is fun putting the code in, discovering things about cancer, the fungi, and what happens inside the body while it is happening. It was also fun figuring out the code with no help and made me feel accomplished. Jaron's personal statement: This project was fun and interesting to work on because who knew that sloths have the potential cure for cancer. Also, while doing this project I got to learn a lot of different things like sloths have 2 layers of fur, I learned how to code, and also that the three toed sloths scientific name is the "Bradypus variegatus." I hope that me and Isaiah found something and help with this to move forward and hopefully change the world.

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