Glioblastoma

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Super Computing Challenge
Final
Report
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Executive Summary 1.0

Brain cancer is one of the most disturbing, and traumatizing types of cancers, it also is known to be one of the most deadly types of cancer in the world. Since it's in the brain it is not only deadly in the sense of death can also can do many other issues to the brain like memory, speaking, and decision-making skills that are in many different spaces in the brain. We are focusing on gliomas/glioblastoma, it is a group of deadly cancers that target, and grow in the brain. Our project is focused on the way Gliomas grow and a way to stop it from growing, by injecting nanobots into the brain to alert the immune system of the cancer's and the danger they cause to the human body. We are using Net-Logo as our coding software for this project. We also focus on the expenses of both the nanobots to be able to compare it to other treatments specifically cyberknife, we made a graph showing the two prices and efficiency.

1. Introduction

1.1 Purpose

We based our project on this subject because both of us have had our past experiences with cancer, we have had family members who have died from cancer. So, that's what inspired us to investigate, and do this project over cancer because we didn't

want to stand around doing nothing while families were being destroyed from this horrible disease. It also comes to show the impact the loss of a love one can have in your future goals, and aspirations in life. Like, how some people are willing to change their lives around, and be inspired by who they were to you, and what they mean to you.

1.2 Significance

Cancer is directly responsible for various health issues in human's. These health issues include, but are not limited to: nausea or vomiting abnormality walking or weakness of one side of the body, inability to speak or understand language or mental confusion, double vision or visual impairment difficulty speaking, headache, personality change, seizures,

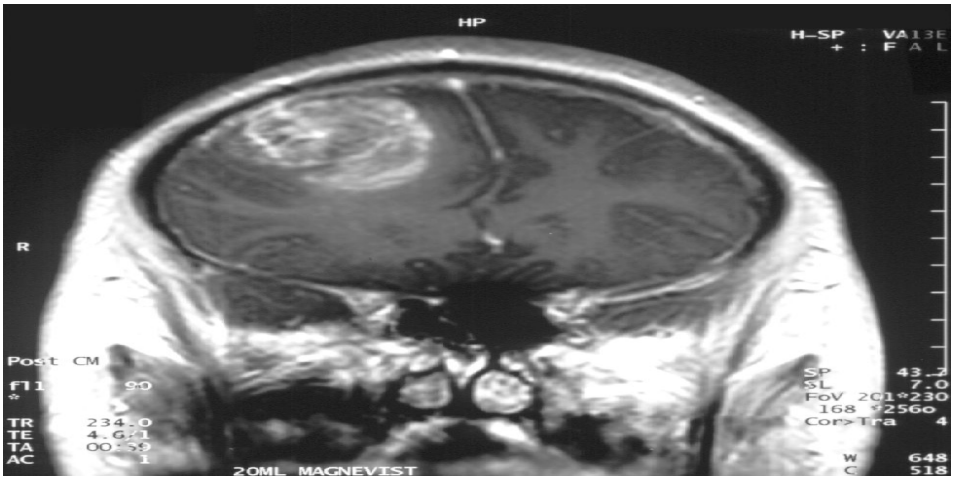

Figure 1: Glioma

sleepiness, or swelling. Though Glioblastoma is extremely fatal it's considered rare and in the united states there is less than 200,000 cases per year.

Glioblastoma also comes in levels there are a total of five, levels 1-2 is normal metastasis contrast to that levels 3-5 are rapid metastasis, and all the symptoms/side effects. The symptoms, prognosis, and treatment of a malignant glioma depend on the person's age, the exact type of tumor, and the location of the tumor within the brain. These tumors tend to grow and infiltrate into the normal brain tissue, which makes surgical removal very difficult -- or sometimes impossible -- and complicates treatment. These brain tumors are often diagnosed in the 4th through 6th decade of life, depending on the type of glioma. Low-grade versions of gliomas can occur in children. Brain tumors are slightly more likely to occur in males. Prior

radiation to the brain is a risk factor for malignant gliomas. Some genetic disorders also increase the risk of development of these tumors in children but rarely in adults. There are no lifestyle risk factors associated with malignant gliomas. This includes alcohol, cigarette smoking, or cell phone use.

1.3 Background

Glioblastoma is a group of deadly brain tumors consisting of astrocytomas, brain stem cancer, lymphoma, and ependymomas. These are all very serious and deadly disease they are also slightly more common in males and mostly develop during or after the 4th decade of a person's life. Each one of these different gliomas are located in many different places in the for example the brain stem cancer is located in the brain stem, and astrocytomas in the central nervous system. It's because of the location and growth rate of this tumor that makes it lethal, and can cause death at the very little of 6 months. To further explain glioma i will explain its growth and deadliness. Some Gliomas form from glial cells which are located in the central nervous system, and others form from other cell mutation. Once the tumor forms it starts metastasizing which is just the medical term of a traveling tumor, this is when it starts to expand and grow bigger and harder to surgically remove because it may have grown so much that it may be close to important tissue. This is exactly what we are exactly to stop in our project, to stop it from growing to big and incurable. The solution to our problem is to inject nanorobotics as if it was a regular shot it will then locate the tumor and foresay spray a chemical signature that will alert the immune system of threat and then kill it.

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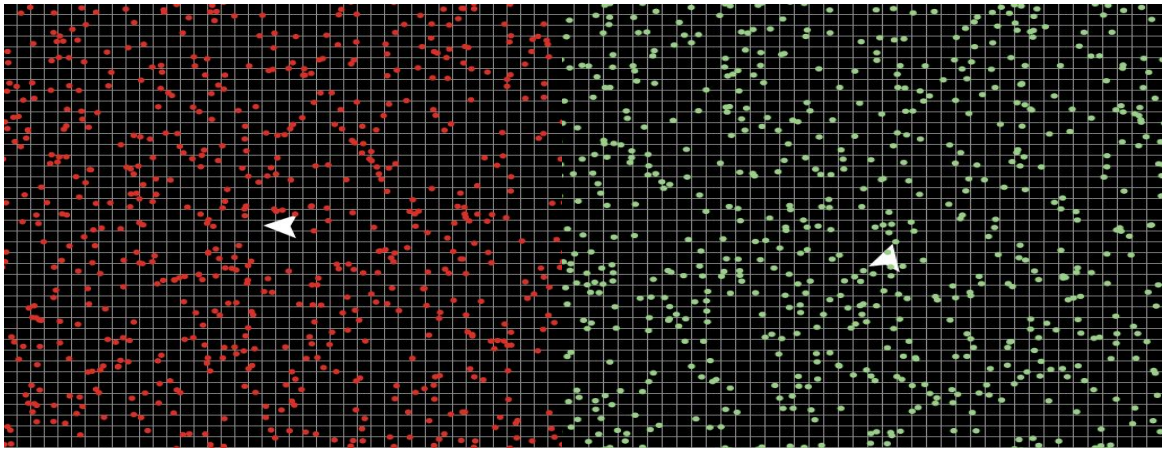
2. Description

2.1 Scope

Our model replicates the dispersal of of the cancer cells, and how one nanobot will spray the chemicals on the cancerous cells we created a code in which the big turtle(Nanobot White) will change the color of the other small turtles(Cancerous Cells Red) within the radius of the big turtle. The code uses a program that makes the nanobot move freely to find the cancerous cells on its own, and a program that lets me control the nanobot using my mouse, thus letting me explain two methods of the nanobots moving they can be control by someone or it can control itself. The code also has a feature which makes it stop once it has sprayed all of the cancerous cells which is what would happen in real-life as just a precaution if one more cell pops up, in short we don't want to take out the nanobot to soon.



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Summary 3.1

We have had many fails on our way here but i believe those fails just helped us get on the right track. Our first fail was when lost our programmer due to his own personal reasons, even though he explained to us what he wanted to do we also found out he was doing nothing but of course no pointing fingers. He still was a great teammate and contributed to the project in many ways. Then, our next bump was when we for some reason we didn't know what we were doing or we didn't have confidence in our project, and thanks to our teachers, mentors, and sponsor for helping us get back on track. Our future plans for this project our to expand more through the body, and grow our code, we think we will go next year but if i dont i will definitely miss doing it.

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