**The Effects of Chitosan Nanoparticles and 5-Fluorouracil for Potential Use in Chemotherapy**

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 **Abstract**

Chemotherapy is the current essential way to fight cancer. The molecular components of chemotherapy are an important factor in eliminating cancerous tumors. The new leads towards chemotherapy involve using nanoparticles to try to fight the cancerous tumors individually. The nanoparticles that are used are altered to have anticancer agents that are targeted to destroy cancerous tumors at their cellular level. This technique includes infusing the chemotherapy drugs with those nanoparticles. Recent studies have been geared towards finding out how to eliminate and add some symptoms that patients receiving chemotherapy might have and not have for the better of the overall patient.

**Introduction**

Microbiology studies in chemotherapy have been geared towards making patients life span easier and more peaceful to endure. Chemotherapy has been known to have many negative side effects for the patients that not only have to deal with their cells in the tumor, but with everyday living side effects. These side effects may include things such as fatigue, hair loss, liver disease, and malfunctions in the patient’s bone marrow [3]. All of these side effects originate and come from the drugs and the chemicals that are used in chemotherapy. Recent studies over chemotherapy have been geared towards finding different microbes that can eliminate the side effects and create a higher life expectancy rate. 5- fluorouracil (5-FU)-hyaluronidase has been a key component in investigating the anti-cancer element of chemotherapy. Recent studies have shown that chitosan nanoparticles might be factorial in creating a more efficient chemotherapy drug. [3]

Almost 600,000 people a year in the United States are expected to die of cancer. one of the most common cancers to acquire is colon or rectum cancer. Chemotherapy has been the main treatment for all types of cancer. Cancer results in a tumor, which is an overgrowth of cells in a specific region that can spread throughout the body. Chemotherapy is a drug infused in patient for cancer treatment, which is radiated throughout the whole body to destroy cancer cells.

**Recent Progress**

5-FU is the most commonly used drug in treating patients with chemotherapy specifically with colon or rectal cancer. 5-FU is a cytotoxic agent that barricades the reaction between certain amino acids that are in relation to tumor cell buildup [1]. Although it is the most commonly used in chemotherapy, microbiologist are always looking for a way to enhance not only the quality of life for cancer patients, but even more, trying to find a cure one day.

**Discussion**

A recent study was done over the effects of 5-FU with the combination chitosan nanoparticles (5-FU Chnps) [3]. Chitosan has been theorized to relieve some of the negative effects of straight 5-FU because of its chemical and molecular properties such as molecular weight, nanoparticle size, and cytotoxicity [2]. To perform this investigation, Chitosan was added onto a drug solution including 5-FU. 5-FU Chnps was then tested on enzyme activity, characterization, drug release, and cellular uptake. The results in this experiment provided a possible positive outcome of the therapeutic effects of chitosan and 5-FU combined together[3].

**References**

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