

**GOLD NANOPARTICLE MEDIATED MEMBRANE
PERMEABILIZATION OF PHYTOCHEMICALS INTO
BREAST CANCER CELLS**

Feifei Chen

Dr. John A. Viator, Thesis supervisor

ABSTRACT

Breast cancer is one of the most common cancers in women with a very high incident rate, especially for those women who are between 40-60 years old. Most drugs are large or non-polar macromolecules, which cannot get into cancer cells autonomously, so a method that can deliver those drugs is very important. Optoporation method has been facilitated with gold nanoparticles, which are bound to breast cancer cells, and then absorb the optical energy to improve the membrane permeabilization. Long-term dietary consumption of fruits and vegetables high in β -carotene and other phytochemicals has been shown beneficial in terms of anti-cancer, anti-aging, preventing cardiovascular disease and cataract. However they are large non-polar molecules that are difficult to enter the cancer cells. Here in this study, we applied optoporation method by using β -carotene, and tetracycline as anti-cancer drugs in various concentrations to optimize highest selective cell death/best potential for T47D breast cancer cell lines.