

**New Jersey State Commission on Cancer Research
LAY ABSTRACT OF RESEARCH PROJECT**

NAME OF PRINCIPAL INVESTIGATOR/PROGRAM DIRECTOR: **Mohamed Rafi**

Project Title: **In Vivo Efficacy and Proteomics study using a new compound**

Description: **To identify the in vivo efficacy of the new anticancer compound in prostate cancer xenograft model and identify the biomarkers (proteins) upregulated during treatment with cancer drugs/novel drugs.**

More than 230,000 men in US will be diagnosed for prostate cancer this year, and more than 30, 000 will die of the disease. Treating prostate cancer patients with chemotherapy often produces unsatisfactory results. Even the most commonly used drugs produce meaningful responses in less than 50 % of the patients. This is due to lack of specific biomarkers and endpoint validation of chemotherapeutic treatments in cancer patients. Hormone refractory prostate cancer patients are treated with chemotherapeutic drugs based on their Prostate specific antigens (PSA) levels. PSA is not a specific marker and therefore we need specific markers to see the efficacy of chemo drugs. One type of common chemotherapy drug is Taxol, which is highly toxic drug with side effects (e.g. Loss of hair, diarrhea etc.). We have recently identified 4 major proteins which are upregulated during cell death with chemotherapeutic drug. Our goal is to develop novel agents from herbal products with less toxicity and side effects to usurp chemotherapy treatment. Herbs and medicinal plants have been used for centuries to treat many diseases throughout the world, especially Asia and Europe. An estimated 25% of all modern pharmaceutical drugs are derived from herbs, including aspirin (from white willow bark); the heart medication digitalis (foxglove); and the cancer treatment drug, Taxol (pacific yew tree). Therefore, a new anticancer compound with less toxicity and mechanism of action very similar to Taxol will be an ideal molecule for the treatment of a cancer. In addition, we need biomarkers to see the efficacy, toxicity in response to chemo drugs.

The overall goal of this proposal is to evaluate a new anticancer molecule Sesquiterpenelactone, which is present in the flowers of a medicinal plant (*Inula Britannica*), for its *in vivo* efficacy and anticarcinogenic activity. *Inula Britannica* is widely used in China for inflammation and bronchitis. We have isolated and identified a Sesquiterpenelactone, which kills the cells like Taxol, and whose mechanism of action is very similar to known chemotherapeutic drug Taxol. The following objective will be undertaken to test our hypothesis.

1. To determine the *in vivo* efficacy of this molecule (Sesquiterpenelactones) in prostate tumor models and to study the molecular mechanism of action.

Identification of the functionality of 4 upregulated proteins during apoptosis (cell death) using the cutting edge technology of Proteomics (e.g. proteins chip reader).

