ADIPONECTIN AND SELENIUM RICH DIET CAN ACT AS A COMPLIMENTARY
MEDICINE IN THE TREATMENT OF INTESTINAL AND CHRONIC
INFLAMMATION INDUCED COLON CANCER.

by

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ABSTRACT

Colon cancer is the second largest cause of cancer death in United States. Chronic inflammation and obesity predispose patients to colon cancer. Adipose tissue is a source of bioactive substances called adipokines. Adiponectin (APN), an adipokine has anti-inflammatory property and found at lower levels in obese patients. Our preliminary data has shown that APN knockout (KO) mice had severe clinical manifestation associated with chemically induced colon cancer. Selenium (Se), a trace mineral and a dietary supplement, is inversely associated with cancer risk and possess anti-inflammatory and anti-carcinogenic properties. Furthermore, Se deficiency is associated with immune dysfunction, impaired resistance to microbial and viral infections, inadequate phagocytosis and antibody production. Colon insults by toxins and gut permeability also induce chronic inflammation caused by gut flora that activates the body’s immune system, leading to the vicious cycle of chronic inflammation, which culminates into colorectal cancer. The overall purpose of this dissertation is to determine if chronic inflammation leading to colon and intestinal cancer are regulated by APN or Se rich diet or both. The working hypothesis is that APN deficiency will decrease goblet cell mucous production in colon leading to greater chronic inflammation and exacerbate the clinical symptoms and tumor load related to colon cancer. Se rich diet alone or in combination with APN administration will increase goblet cell production and apoptosis of cancer cells leading to reduced clinical symptoms, tumor load and inflammation. The primary objectives and the aims of this study are to: 1) determine whether chronic inflammation induced colon cancer (CICC) is effected by APN deficiency, 2) study how Se rich diet could interact with APN deficiency to modulate CICC and 3) determine how APN administration or Se rich diet or the combination of both could have a protective effect on intestinal cancer. The novelty of this dissertation lies in studying the effect and the different mechanism of Se rich diet and APN
deficiency on CICC, chronic inflammation and colon cancer. In addition, we will also be studying the role of APN administration either alone or in conjugation with Se rich diet on APC\textsuperscript{Min/+} mice model of intestinal cancer.