

Therapeutic aid for cancer treatment through phytochemical study: Novel composition and its characterization

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Abstract

Cancer is a genetic disease indicating the sudden alteration within cellular system leading uncontrolled cell proliferation. They grow exponentially even with the enhancement of cellular resistance. Over the decades, the world has witnessed a dramatic cancerous death and at the same time innumerable research milestones for the therapeutic sustenance. This research concentrates on the phytochemical study in order to enhance the potential of cellular system to fight against the deadly disease. In general, it is observed that the bioavailability of the therapeutic drugs for cancer therapy are not site specific thus resulting in damaging the healthy cells. There are several treatment modalities such as chemotherapy and radiation which depict adverse side effects resulting in secondary cancers. An abundance of herbal plants have been widely used as therapeutic agents for numerous diseases and disorders all over the world for centuries. Natural products derived from plants specifically are being looked into for alternative methods for cancer treatment. Black cumin seeds and its essential oil have been used globally in cooking and also for treatment of several diseases and disorders including fever, paralysis, skin diseases, jaundice and dyspepsia among many others. Researches have also proven its potential benefit as an anti-cancer agent and attribute its therapeutic potential to its constituent Thymoquinone (TQ). Owing to enhanced properties of materials in the nanometer range, the chemical route nanoformulations of several plant extracts have proven to offer a higher cytotoxic potential than their bulk counterparts. This research aims to summarize how nanotechnology can help in providing more efficient cancer treatment and diagnosis possibilities and the anti-tumor potential of black seeds. The role of TQ in cancer prevention through different mechanisms is also analyzed. 70 nm size of particles were obtained by the synthesis mechanism of the plant extract. Significant SEM and AFM results were published with good stability.

Cancer is still one of the major causes of mortality in both developing and developed countries. At present, in spite of intensive interventions, a large number of patients suffer from poor prognosis. Therefore, the effort for finding new anticancer agents with better efficacy and lesser side effects has

been continued. According to the traditional recommendations and experimental studies, numerous medicinal plants have been reported to have anticancer effect. Also antiproliferative, pro-apoptotic, anti-metastatic and anti-angiogenic effects of several phytochemicals have been shown in *in vitro* experiments or animal studies. However, only a small number have been tested in cancerous patients and limited evidence exists for their clinical effectiveness. Also, regarding some phytochemicals, only beneficial effects on cancer-related symptoms or on quality of life have been reported and no positive results exist for their antitumor actions. This review was focused on the phytochemicals whose beneficial effects on various types of cancer have been supported by clinical trials. Based on the literature review, curcumin, green tea, resveratrol and *Viscum album* were the satisfactory instances of clinical evidence for supporting their anticancer effects. The main findings of these phytochemicals were also summarized and discussed.

Biography

Reshmi S Nair is a Faculty in the Department of Engineering at Amity University Dubai since 2015 specialized in the field of Nanotechnology. Her credential as an Academician has played a significant role in developing the interest, involvement and creativity of students on a widespread platform. Besides academics, she is keen into cancer research as she is an active Member of Research Wing at International Association of Nanotechnology. Prior to Amity, she was working as Research Scientist at BIOCON, leading pharmaceutical industry in India and also as Faculty in Nanoscience Department of Amrita University. Currently, she is pursuing her Doctoral research in "Receptor mediated anti-cancer drug delivery through therapeutic aid" at Indian Institute of Technology Madras. She has authored many research papers both in international and national journals and has presented papers in various conferences.

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