RESEARCH ARTICLE

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In Vivo Anti Cancer Potential of Pyrogallol in Murine Model of Colon Cancer

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Abstract

Background: Colon cancer is aggressive and it causes 0.5 million deaths per year. Practicing natural medicines for cancer treatment is safer than conventional drugs. World health organization emphasizes on the importance of practicing natural medicines and developing natural product based drugs for cancer treatment. Recently we reported an anti colon cancer activity associated with pyrogallol isolated from medicinal plant *Acacia nilotica* in HT-29 cells in vitro. To extend our observation in this study we evaluated *in vivo* colon tumor remission property of acetone extract of *A. nilotica* (ACE) and pyrogallol. **Materials and Methods:** *In vivo* toxicity of ACE and pyrogallol was assessed and *In vivo* tumor remission activity of ACE and pyrogallol was determined in murine model. **Results:** Mice were tolerated different doses of ACE and pyrogallol. Tumor size was considerably reduced in pyrogallol treated mice similar to doxorubicin. Tumor bearing mice treated with ACE and pyrogallol showed mild decline in body weight. **Conclusion:** Pyrogallol was found to be an effective anti colon cancer agent with less toxicity.

Keywords: Colon cancer- *Acacia nilotica*- Pyrogallol- *Helicobacter pylori*- toxicity

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Introduction

Colon cancer is the third most common type of cancer worldwide and a leading cause of cancer death. As per the American Cancer Society, there will be an estimated 145,600 new cases of colon cancer and 51,020 will die from colon cancer in 2019 (American Cancer Society, 2019). The evolution of colon cancer seems to follow a predictable pattern of histologic changes and concurrent genetic and epigenetic changes, which ultimately provide a growth advantage resulting in the clonal expansion of transformed cells (Schlussel et al., 2014). At least three forms of genomic instability contribute to colon cancer, including microsatellite instability, chromosome instability, and chromosomal translocations (Grady, 2004). A complex cellular community exists within a malignant tumor. This community was constituted by oncogenically transformed cells, non-neoplastic cells such as stromal and immune cells, and microbes such as bacteria and viruses in some cases (Kostic et al., 2012). This cellular heterogeneity is highly complex to understand and treat accordingly. Surgical resection and chemotherapy elicit significant side effects and toxicities which affects patient's quality of life and survival. The toxicities such as hair loss, nausea, vomiting etc., drug resistance and inter-individual differences in response to any treatment are major limitations associated with current chemotherapeutic drugs (Pullarkat et al., 2001).

In a healthy gut, the normal bacterial flora maintains homeostasis with the host (Ley et al., 2006). However, changes in bacterial populations and their metabolic products have been linked to several diseases including ulcerative colitis, crohn's disease and colon cancer (Kaur et al., 2011; Marchesi et al., 2011; Sasaki and Klapproth, 2012). Studies suggest that the presence of certain bacteria may contribute to both the induction of inflammation in inflammatory bowel disease (IBD) and the progression of inflammation to neoplasia (Erdman et al., 2003a; Chu

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