Chapter 1. Introduction

Cancer is one of the leading causes of death among humans and is characterized by uncontrolled growth and spread of abnormal cells. Most majority of cancer are linked to environmental factors and biological mutations. More than a 20% of tumor formations are associated with chronic inflammation. Ulcerative colitis is a chronic, recurrent Inflammatory Bowel Disease (IBD). Patients affected with ulcerative colitis more than 8 years might have a risk factor for development of colon cancer (Rutter et al., 2006; Bernstein et al., 2001).

In 19th century, Rudolf Virchow described that a possible relationship among inflammation and tumor formation. Inflammatory mediators have an important role in tumor formation and some of the important mechanisms exposed during tumor formation were identified (Karin, 2006). Malignant cells were regulated by immune cells through secretion of chemokines, growth factors, cytokines, reactive nitrogen and oxygen species. (DeNardo et al., 2009). Waldner and Neurath, 2009 described that infiltration of T cells during colitis associated cancer plays an important role in tumor promoting functions. Triggered Th1 cells produce IL-18, IL-12 and IFN-γ, which are activated to release of IL-6 and TNF-α from macrophage cells (Fuss et al., 2004; Heller et al., 2005). This secreted intermediators (Cytokines and Chemokines) may inhibit or stimulate tumor formation and progression (Lin and Karin, 2007).

Cancer is a nearly an unassailable disease that has plagued humankind for centuries and there are some effective strategical techniques available to treat cancer include surgery, chemotherapy, radiotherapy, hormonal therapy, immunotherapy and gene therapy (Basker et al., 2012). A recent survey estimated the number of cancer survivors to reach beyond 18 million by the year 2022 (Siegel et al., 2012).
There are several classes of anti-cancer drugs currently available includes: anti-metabolites (5-Fluorouracil), alkylating agents (cyclophosphamide), antibiotics (doxorubicin) and microtubule inhibitors (vincristine) (Wilson et al., 2009). Cyclophosphamide (C7H15Cl2N2O2P2; CTX) belongs to the group of the alkylating agents used to widely to treat several type of cancer and autoimmune disorders (Haque et al., 2003). The major side effects of CTX administration is due to its toxic metabolite, phosphoramid mustard. Phosphoramid mustard forms inter strand cross linkages in the DNA at guanine N-7 positions. This irreversible damage leads to cell death. (Alenzi et al., 2010).

The adverse effects due to administration of CTX include, bone marrow suppression, diarrhoea, pulmonary fibrosis, alopecia, nausea, vomiting, mucosal ulceration, nephrotoxicity, urotoxicity, cardiac toxicity, hepatic toxicity, gonadotropy, hematopoietic depression and immunosuppression. Hence, it is essential to identify and develop an anti-cancer drug with out or less side effects.

Bauhinia Linn. (Fabaceae) is pantropical genus of 300 species distributed throughout the tropical regions of the world. About 15 species of this genus occur in India (Kirtikar and Basu, 2001). Bauhinia species such as B. variegatea, B. racemosa, B. purpurea, B. monandra, showed several pharmacological properties such us immunomodulatory activity, anti-tumour, anti-oxidant, anti-inflammatory, anti-ulcer, anti-bacterial and anti-fungal activities (Ghaisas, 2009; Rajkapoor, 2006; Menezes et al., 2007: Yadava and Reddy, 2003; Muralikrishna et al., 2008).

Traditionally, Bauhinia tomentosa is one of the most used plant species as an herbal remedy to treat inflammation in India (Kirtikar and Basu, 2001). It is also known as yellow bauhinia or ball bauhinia. It is a shrub or small tree of Asia origin which adapt well in climate of India, reach in 6-8m in height, it has been reported to have rutin, quercetin and isoquercitin components.
Ethanolic extract of the leaf contain Kaempferol-3-O-rhamnoside, Kaempferol-3-o-rutinoside, Quercerin 3-O-glucoside and Quercerin 3-O-rutinoside (rutin). Kaempferol-3-O-rhamnoside, (Aderogba et al., 2008). In the present study, we evaluated the protective effect of B. tomentosa during experimental ulcerative colitis and the possible antitumor activity in both solid and ascetic tumor models. We also examined the effect of B. tomentosa against B16F-10 melanoma induced lung metastasis in C57BL/6 mice.