AIMS AND OBJECTIVE

Chapter 2
Aims and objectives

2.1 Rationale and Hypothesis

Breast cancer is the most prevalent disease amongst women worldwide. The activation of inflammatory processes plays as important role in breast tumorigenesis. The tumor microenvironment and associated chronic inflammation stimulates several inflammatory mediators including major proinflammatory cytokine like TNF- α which induces reactive oxygen species (ROS) in narrow physiological range which may have dual role either to induce cell death or induces nuclear gene expression to induce cell proliferation and metastasis in solid tumours including breast cancer. Tumor microenvironment and tumor heterogenicity found in breast cancer plays a major role in the multi-drug resistance against the current therapies viz. chemotherapy, radiotherapy and immunotherapy for breast cancer and are associated with several side effects.

In the view of this problem, it is imperative to find alternative therapies to overcome these problems and providing holistic wellbeing to the patients. Phytomedicine provides a better alternative approach to this problem. Clinically approved, plant derived drugs like Paclitaxel, vincristine and vinblastine are found to be effective against various cancers. Many more phytochemicals or their structural derivatives are in clinical trials as anti-cancer drugs. *Bauhinia variegata* L. is one such medicinally important plant with multitude of potentials like anti-oxidative, anti-inflammatory and anti-proliferative property. Traditionally, the bark of this plant has been used against treatment of skin cancer. Some preliminary reports also, have been found on the cytotoxic effect of *B. variegata* leaves on MCF-7 and T47D breast cancer cell-lines. Hence, *Bauhinia variegata* L. leaves were selected to find out its anti-cancer potential against two different breast cancer cell lines; MCF-7 (ER/PR +ve) and MDA-MB-231(ER/PR -ve and Her2 -ve). In the present study it has been proposed to explore the effectiveness of *Bauhinia variegata* L. leaves against breast cancer cell lines and to find the active phytocomponent/s from which are accountable for the anti-cancerous activity. The specific objectives have been proposed as below:

2.2 Objectives of the study:

1) Extraction, Activity guided fractionation and characterization of the crude extract from *Bauhinia variegata* L.

2) To analyse the effect on breast cancer cell migration, invasion and TNF- α regulated cell growth in response to active extract/fraction/isolated phytocomponent/s of *Bauhinia variegata* L.

3) To analyse the effect of active extract/fraction /isolated phytocomponent/s of *Bauhinia variegata* L. on cell death parameters in breast cancer cell lines.