CHAPTER 3

3.1. Hypothesis

Earlier, the *in-vitro* assays on various cell lines had led to the selection of promising compounds that have entered into preclinical and clinical studies. Hence, AG, a natural plant derived phytochemical, which have already been shown to have wide range of anti-proliferative activity on a variety cancer of cancer cell lines including colon cancer, breast cancer, cervical cancer, leukemia etc may have interesting prospects in HNSCC too which can present a lead for novel anti-cancer agent against HNSCC. In light of the findings, it is reasonable to hypothesize that the compound will exhibit anticancer effect against HNSCC by inducing inhibitory effect on head and neck cancer either through inhibition of cell proliferation, enhancing apoptosis or regulation of CDKs and CDKIs. The main objectives of the study are outlined below.

3.2. Objectives

To investigate the effect of AG on:

1. Cell growth and cell cycle progression of head and neck cancer cells.
2. Cell cycle regulators like cyclins, cyclin dependant kinases, cyclin dependent kinase inhibitors, Rb-E2F and their interactions.
3. Cell death, apoptosis and associated mechanisms.
4. Cell invasion, migration and epithelial mesenchymal transition, and associated mechanisms.