Chapter-2

Objectives and Plan of Work

2 Aim and objectives

The current work is focused on the plant *A. cunninghamii*. The proposed study focused on the two parts 1) gum-resin and 2) leaves. In our initial cytotoxic evaluation of several plant extracts. The *A. cunninghamii* gums-resin and leaves extract had shown significant cytotoxicity hence we intended to explore these matrices for their phytochemical potential. Literature search revealed that leaves of the *A. cunninghamii* is a rich source of biflavanoids while the gum resin is a source of terpenoids (diterpenoids). Gum-resin has not been explored much for it phytochemistry, hence we have taken leaves and gum resin for detailed investigation.

2.1 LC-MS-based dereplication and cytotoxic evaluation of *A. cunninghamii* Gum-resin

2.1.1 LC-MS-based dereplication study of *A. cunninghamii* gum-resin

2.1.2 In-vitro cytotoxic activity of *A. cunninghamii* gum-resin

2.1.3 In-silico study of compounds *A. cunninghamii* gum-resin

2.2 LC-MS-based phytochemical investigation combined network pharmacology to evaluate the cytotoxic potential of *A. cunninghami* leaves

2.2.1 LC-MS-based phytochemical study of *A. cunninghamii* leaves

2.2.2 Network pharmacology approach to identify the potential cytotoxicity target

2.2.3 *In-silico* study of compound *A. Cunninghamii* leaves

2.2.4 *In-vitro* cytotoxic activity of *A. cunninghamii* leaves

2.3 Plan of work

2.3.1 LC-MS based dereplication and cytotoxic activity evaluation of *A. cunninghami* gum-resin. In the study of *A. cunninghamii* gum resins. The small fraction of extract has investigated for bioassay, followed by purification of compounds by repeated column chromatography. Isolated compounds were planned for *in-vitro* cytotoxicity study and *in-silico* study of compounds **(Figure 2. 1).**

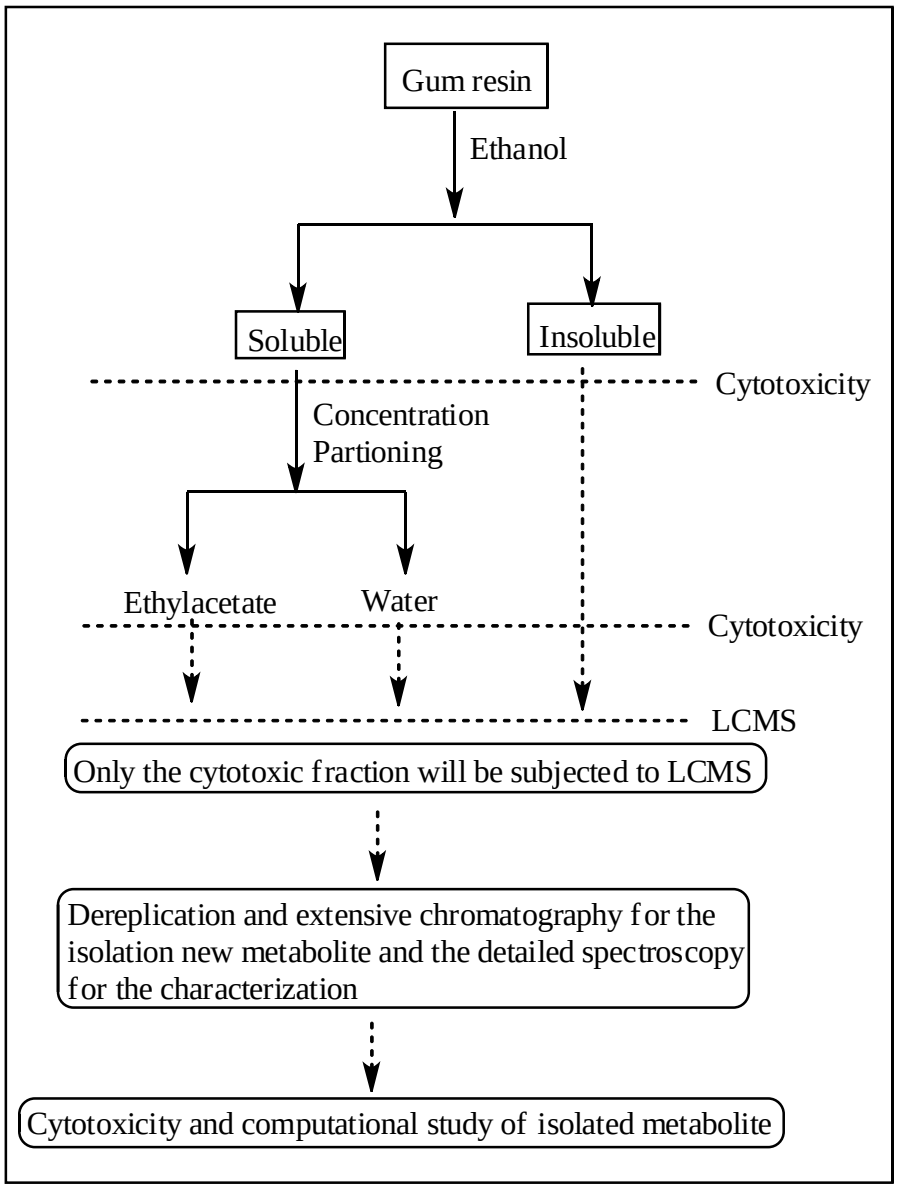

Figure 2. 1 Flow chart showing plan of *A. cunninghamii* gum-resin

2.3.2 LC-MS based phytochemical investigation combined network pharmacology to evaluate the cytotoxic potential of *A. cunninghamii* leaves

The authentic plant material (leaves) will be subjected to the extraction in methanol. Extract will be screened for cytotoxic potential. Simultaneously, extract will be analysed by LC-MS and it will be subjected to chromatographic purification for the isolation of the metabolites. The identified compounds (by LC-MS) will be mapped with isolated compounds and the selected will be subjected to network pharmacology for identification of potential targets and isolated will tested for cytotoxicity to validate the mechanism. (**Figure 2. 2**).

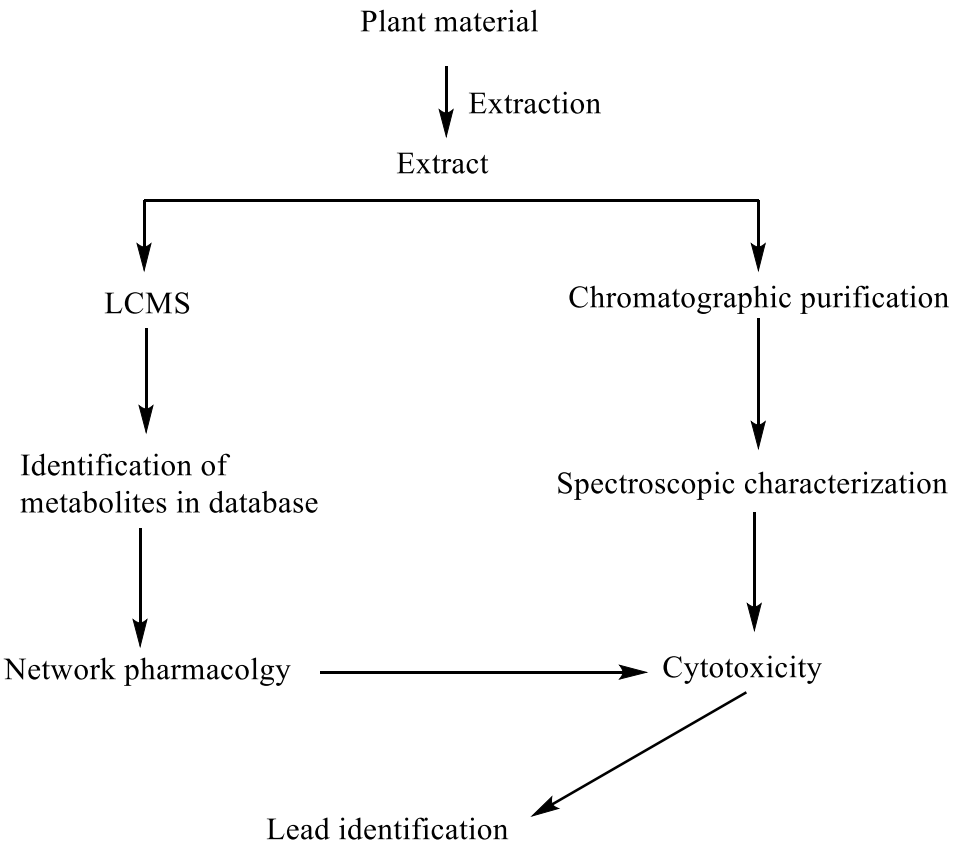

Figure 2. **2** Flow chart showing plan of *A. cunninghamii* leaves