Introduction
According to the World Health Organization (WHO) report, 80% of the people living in developing countries would be relying on plant based medicines for their health care needs by the start of the 21st century (1). There is a growing resistance worldwide to the use of allopathic medicines because of their side effects. The holistic approach to health as practiced by the traditional systems of medicine is making them more and more popular with people.

Plants produce a vast array of natural products that have antimicrobial, anticancerous and immunomodulatory properties. These include alkaloids, terpenoids, isoflavanoids, indoles, phytosterols, polysaccharides, quinones, sesquiterpenes, glucagons, glycoproteins, nucleotides, tannins and a variety of vitamins (2). Some compounds act as antioxidants and prevent tissue damage by reacting with free radicals and thus interrupting the propagation of new free radical species and others chelate metal ions such as Fe$^{2+}$, which catalyses lipid peroxidation (3,4). Various antioxidants may prevent or correct immune dysfunction. These include the intracellular superoxide dismutase, catalase, glutathione peroxidase besides the dietary or oral supplements in the form of vitamin C, vitamin E, β-carotene, zinc and selenium (5).

Bioactive compounds isolated from the plants are also reported to have antibiotic and anti-inflammatory activities and inhibit prostaglandin synthesis (6). In many cases, plant components have also been used as starting material for making semi-synthetic drugs. A good example is taxol (anticancerous drug), obtained from the bark of Taxus baccata. (7). Plant based clinical research has made remarkable progress in the important fields of anti-cancer (e.g., taxol and
camptothecins) and anti-malarial (e.g., artemisin compounds) therapies (8). *Withania somnifera*, known as Ashwagandha in India has been used for centuries in traditional medicine. It has anti-cancer activity which has raised the hope for better cure of cancer (9). *Rauvolfia serpentina*, commonly known as sarpagandha, has been widely used in India as an antidote to insect and snakebites, as a febrifuge, as a stimulant to uterine contraction and as a sedative. Active principle isolated from this plant such as reserpine is reported to reduce hypertension (10). Curcumin (diferuloylmethane) has been isolated from *Curcuma longa*, which gives yellow colour to turmeric rhizome. This is one of the active ingredients responsible for the biological activity of turmeric. Curcumin has also been studied as a chemopreventive agent against cancer (11). The anticancer property of curcumin may be due to inhibition of inducible form of nitric oxide synthase. As an immunomodulator, turmeric has been reported to increase mitogenic response of splenic lymphocytes (12). Curcumin is a potent scavenger of reactive oxygen species like superoxide anions and hydroxyl radicals. It inhibits nitric oxide synthase production in activated macrophages (13). Polysaccharides have been isolated from *Curcuma* which are similar to bacterial lipopolysaccharides and act as immunostimulant (14). NIM-96 has been isolated from a volatile fraction of *Azadirachta indica* oil. It has been reported for its immunomodulatory properties. Pretreatment of rats with a single intraperitoneal injection of NIM-96 was reported to result in the increase in polymorphonuclear (PMN) leukocytes with concomitant decrease in lymphocyte counts in blood. NIM-76 at higher concentration (300mg/kg body weight) is reported
to act as a mitogen and induces lymphocyte proliferation, while macrophage activation remained unaffected (15). A fraction of *A. indica* extract has been reported to stimulate production of IL-1, IFN-γ and TNF-α that help in induction of Th-1 type of responses (16). Since Th-1 type of response has been implicated to be protective in nature in most infections, the therapeutic effect of Neem as reported in the traditional system of medicine is probably mediated by activation of cellular immune responses (17).

Acemannan is a major carbohydrate fraction obtained from the gel of *Aloe vera*, which has been shown to enhance production of IL-1 and TNF-α from the peripheral macrophages (18). It induces release of NO and expression of surface molecules which results in morphologic changes in a mouse macrophage cell line RAW 264.7 (19, 20). It is also reported to have anti-tumor activity in experimental animals *in-vivo* (21).

The organo-sulfer compounds found in garlic have been shown to inhibit growth of tumors in animals and modulate activity of diverse chemical carcinogens (22). This effect may be mediated through activation of NK cells, stimulation of T-lymphocytes and enhanced production of IL-2 (23). From this brief introduction it is clear that products derived from medicinal plants have diverse biological activity and have immense potential for treatment of various diseases. Although the use of plant products in the prevention and cure of chronic diseases is based upon the experience of traditional system of medicine acquired over past centuries and practiced by different ethnic societies, their use in
modern medicine is hindered due to lack of scientific evidences of how they bring about the cure. The basic principle of all these systems is based upon the natural tuning of the physiological response of the body. But it is necessary to understand how they do this, so that we can develop better therapeutic agents from them.