SUMMARY

Recent technologies are beginning to clarify important roles of immune function in the etiology of diseases. The development of an immune modifier that stimulates necessary functions and suppresses unnecessary functions is truly needed. A variety of plant products have been used traditionally to prevent and treat diseases. The immune enhancing potential of *S. megalopus* and *A. arandum* nut milk extract was evaluated by studying specific and non-specific immune response and the biochemical alterations in the lymphoid tissues of experimental mammary carcinoma induced Sprague-Dawley rats treated with the drug. The results obtained from drug treated and untreated groups were compared with their respective controls. The results of the study have been summarized below.

Body weight and tumour weight were observed in the tumour-bearing rats. There was a sharp decrease in the body weight in the mammary carcinoma bearing rats and tumour weight was increased significantly. On drug treatment, a significant increase in the body weight and tumour regression were found.

Blood cell counts and organ cell counts were observed in cancer-induced rats. In DMBA induced rats, altered blood cell counts and organ cell counts were observed. On drug treatment these levels were reverted back to normalcy.

Humoral immunity is mediated by antibodies and are responsible for specific recognition and elimination of extracellular antigens. In DMBA induced rats, an altered antibody production, immunoglobulin levels and decreased PFC
were noticed. On drug treatment these levels were reverted back to near normal levels indicating the immunomodulating potency of the drug.

Cell mediated immunity is responsible for delayed type hypersensitivity (DTH) reactions, foreign graft rejection, resistance to pathogenic microorganisms and tumour immune surveillance. A diminished DTH reaction declined leucocyte migration index, impaired proliferative response and decreased cytokine productions were observed in cancerous animals. On drug treatment these levels were reverted back nearer to their control levels which prove that the drug has the potency to boost immunity.

Macrophages play an important role in non-specific immunity. The decreased phagocytosis in tumour induced rats reverted back to its normal state upon drug treatment.

DNA damage is a sensitive indicator of carcinogenesis. The levels of cellular constituents namely, DNA, RNA and total lipid were estimated. In untreated animals, the levels of DNA, RNA and total lipids were found to be significantly increased whereas in drug treated animals, the levels of cellular constituents were brought back to near normal levels.

Lipid peroxides reduce membrane fluidity and consequently leads to decreased ability of immune cells to respond to challenges of the immune system. The level of lipid peroxides were significantly increased, enzymic and non enzymic antioxidants were significantly decreased in diseased animals. Drug treated animals showed a reversed trend in the levels of lipid peroxides and antioxidants.

Lysosomal enzymes cause a decrease in the stability of the membrane which may indirectly alter membrane proteins and glycoproteins such that there is
immune inhibition thereby enhancing tumour invasion. The enzyme activities were significantly increased in diseased animals. The activities were reverted back to near normal levels on drug treatment which testifies the cytoskeletal stabilizing property of the drug.

Carbohydrate metabolism is central to all metabolic processes. Elevated activity of glycolytic enzymes and decreased activity of gluconeogenic enzymes were observed in the tumour bearing mice. On administration of the drug, the activities of carbohydrate metabolism enzymes were reverted back to near normal levels which would inhibit prevent immune cell apoptosis.

Hyperlipidemia is an associated event that is secondary to breast cancer prognosis. The abnormal levels of lipid metabolizing enzymes in diseased animals were brought back to near normal values in the drug-treated animals which shows the hypolipidemic efficacy of the drug.

Glycoproteins pave way for the tumours to escape from immunologic defense mechanism. The level of glycoprotein components were elevated in cancerous condition and brought back to near normal levels on drug administration. This shows that the drug has the capacity to modulate immune response.

ATPases are critical for cellular viability because they control many essential cellular functions. The membrane-bound ATPase activities were decreased in diseased animals indicating the severity of membrane damage. The activities were restored to near normal levels upon drug treatment which proves the membrane stabilizing action of the drug.

DNA damage determines cancer susceptibility. The level of DNA damage in diseased condition was reverted to normal state in drug-treated animals.
This adds more evidence to the free radical quenching and antioxidative property of the drug.

Histopathological examination was carried out in the treated and diseased animals. The antineoplastic property of the drug was further supported by the histopathological studies towards the normal architecture of the organs namely, spleen, thymus, bone marrow, lymph node and breast tissues of untreated and drug treated mammary carcinoma bearing rats.

The above experimental results obtained indicate that the drug has definite immune enhancing potency and protective efficacy in preventing the immune dysfunction during experimental mammary carcinoma in rats.