Cancer is the most mystifying disease and still remains unconquered inspite of the fact that a very large number of studies are being carried out all over the world. Within the area of cancer treatment one exploits the knowledge of neither differences between normal and malignant cells, i.e. malignant cells lack of certain functions. Cancer drug therapy is undergoing a major transition from the pre-genomic era to the post genomic era. New technologies particularly high throughput screening, combinational chemotherapy, gene expression micro array and computer aided drug designing are increasing the speed and efficiency of drug development. Improved systemic drug therapy is particularly important for the treatment of leukaemia, where surgery and radiation can no longer be curative.

The development of microbial enzymes for cancer therapy, has added to the choice of anti-leukaemic drugs which promises prospects for better treatment. The use of microbial enzymes in leukemia therapy makes it important that the enzyme should be produced in large quantities and are usually required to be in their pure forms. If such a difficulty is circumvented, the potential use of enzymes in clinical medicine, in general and cancer chemotherapy in particular, would be extended. L-Asparaginase is one such enzyme finding great potential for treatment of acute lymphoblastic leukaemia. This is predominantly a disease of childhood and is the most common childhood cancer, accounting for 85% of childhood leukaemias. With modern chemotherapy 60%-70% of all children with acute lymphoblastic leukemia can be long-term survivors and are potentially cured.
L-asparaginase exploits the unusually high requirement tumor cells have, for the amino acid asparagin. The enzyme L-asparaginase has been a clinically acceptable anti tumor agent. This therapy brought a major breakthrough in modern oncology. With the development of its new functions, a great demand for L-asparaginase is expected in the coming years.

Keeping in mind the potentiality of the drug for cancer treatment, the present work has been carried out to come up with more information with production strategies and comparison of the wild one with the cloned for better production of the enzyme. The thesis is presented in four chapters; the first chapter contains introduction and scope of study with the comprehensive literature relating to the present investigation. The second chapter deals with materials used and the methods adopted for the present study. The results obtained in the present study are incorporated in the third chapter followed by summary and conclusion in the fourth chapter. The results presented in various chapters are summarized for providing comprehensive information on optimization of various factors involved in production of the enzyme from the native host Pectobacterium carotovorum as well as the enhancement in the enzyme production in the recombinant one from E.coli when compared with the wild one. The present investigation has yielded fruitful information on many lines of applicability.

V.P.B. Rekha
(V.P.B. Rekha)