ACKNOWLEDGEMENTS

This thesis is a compilation of the research work I carried out during my tenure at Manipal University, Manipal and Indian Institute of Science, Bangalore. The work done here would not have been possible without the mentorship and help from numerous outstanding individuals. It is a pleasure to convey my heartfelt gratitude to them who made this journey possible.

First and foremost I offer my sincere gratitude to Dr. N Udupa who inspired and supported me throughout my Ph.D. life. I highly appreciate his patience whilst allowing me the liberty to work on my own passion. Above all and the most needed, he provided me unflinching encouragement and patronage in his unique cheerful way. Dual studentship may not have been possible without his encouragement. Once again I sincerely thank him for everything.

I would like to thank Dr. K Sreedhara Ranganath Pai for his enthusiastic support, interest, timely guidance and encouragement at all times. One simply could not wish for a better or friendlier supervisor.

I shall always remain indebted to Dr. Annapoorni Rangarajan, Professor, Indian Institute of Science, Bangalore, with whom I started my voyage in science. The day she said, ‘yes’ to my request to join her lab during my M. Pharm studies changed my life forever. I got the wonderful opportunity to learn science out of fruitful discussions, lab meetings, and work presentations during my tenure in her lab. I express my sincere gratitude for the valuable guidance, affectionate attitude, and keen interest at all stages of my research.

I am also grateful to Dr. C Mallikarjuana Rao, who helped and supported during my research work in the department of pharmacology. I thank him for his useful comments and advice during the course of this work as a doctoral committee member.

I am grateful to Department of Biotechnology, Govt. of India for the financial support of this research work including my fellowship during the tenure.

I would like to thank Dr. K K Sreenivasan (Manipal) for the wonderful discussions, continued interest in my work and valuable help with phytochemistry. I express my sincere gratitude to Dr. Alex Joseph and Dr. Steve Thomas (Manipal) for their valuable help with chemistry of natural products.
I would also like to thank faculty and supporting staff of Dept. of Pharmacology, Dept. of Pharmaceutical Biotechnology and Dept. of Pharmaceutics for their valuable support and help during my work at Manipal.

I would like to specially thank members of Central FACS Facility, IISc, Bangalore, Dr. William R. Surin, Alaguraj, Dr. Omana Joy, Puja Pai and Kavya for their help and support during FACS experiments. I am also thankful to Dr. Paresh Jain, Application scientist (BD-India) and Dr. H Krishnamurthy, Central Imaging & Flow Cytometry Facility, NCBS, Bangalore who were instrumental in technical support with flow cytometry.

I would like to acknowledge the enthusiastic help given by all the members of Dr. KR Prasad’s lab, organic chemistry dept., IISc, especially John during flash chromatography and isolation of biologically active compounds. I am also thankful to Prof. Mohammed Ali, Jamia Hamdard University, New Delhi for his great help with the structure decipher of compounds. I would like also to thank Swami Nirmalananda Giri for providing valuable information regarding the medicinal plants that have been used in the traditional system of medicine (Ayurveda) for the prevention and treatment of cancer.

My heartfelt gratitude to my spouse and colleague Asmy Naseer Maliyakkal for her companionship through lively moments, happiness and sorrows. I am indebted for her love and affection. I also adore her for relentless encouragement.

My sincere gratitude to Sudhir Moorkoth, Jesil Mathew and Alex Joseph, for their boundless love, care, helps and support during my stay at Manipal. I also remain thankful to my colleagues and friends especially, Gopal, Karthik, Praful, Pawan, Aravind, Atulya, Angel, Kranti, Piya, Usha, Prashanth, Omprakash, Geetha, Punit, Madhavan, Nitesh, Vijay, Faizal and Manoj with whom I shared several memorable loving and cheerful moments in Manipal. I am also thankful to my students Mihir, Harish and Sandeep for their motivation.

Words are not enough to express my heartfelt gratitude to my colleagues and friends in the lab especially, Balaji, Anurag, Manipa, Meera, Ananatha, Krusik, Ipsa Suruchi for their unconditional and timely help during my stay in IISc, Bangalore. I would like to specially thank Devaveena Dey for the fruitful discussions, suggestions and constant support. I thank Dr. Venkatesh, Dr. Vignesh, Swathi, Namratha with whom I had spent memorable moments in science during early days in IISc.
I am extremely thankful for the infrastructure, research facilities and support provided by Manipal University. My acquaintance with MU staff especially *MCOPS office*, *Accounts* and *Stores* have been most memorable. I am also grateful to *Department of MRDG, IISc*, Bangalore for the infrastructure facilities.

I sincerely thank those who sacrificed the most and been the pillar of support- my family for their boundless love, affection, inspiration, and though far away, have been always been there with me in the battle with time. *My father*, for his support in my extensive educational career, showed the spirit of intellectual pursuit and incessant encouragement ever since childhood. *My mother*, for her boundless love and care. *My sisters*, for being supportive and loving siblings. I sincerely thank my *in-laws*, for their sincere help and support.

Above all, I would like to thank the *God* without whom will this work could never have been completed.

Manipal

NASEER MALIYAKKAL

19th August, 2012