ACKNOWLEDGEMENT

The recognition of **The Almighty God** as the ruling and leading power in the universe and the grateful acknowledgment of His favours and blessings are necessary which I need forever. This piece of work has been accomplished with His blessings and His power that work within me and also with the people behind my life for inspiring, guiding and accompanying me through thick and thin. I bow before you with a sense of gratitude.

It is a pleasant moment to express my heartfelt gratitude to all. I dedicate this page to each and everyone who have helped me to explore the expanses of knowledge.

I take immense pleasure to express my sincere and deep sense of gratitude to my supervising guide and mentor, **Dr. C. S. Paulose**, Director, Centre for Neuroscience, Professor, Dept. of Biotechnology, Cochin University of Science and Technology for his sustained enthusiasm, creative suggestions, motivation and exemplary guidance throughout the course of my doctoral research. I am deeply grateful to him for providing me necessary facilities and excellent supervision to complete this work. His passion for work and zeal for scientific excellence has exceptionally inspired and enriched my growth as a student and a researcher as well. I am short of words to express my sincere appreciation for his patience and tolerance to me throughout this period. His understanding, encouragement and personal guidance have provided a good basis for the present thesis. I am solemnly indebted to him more than he knows or words can ever convey.

I offer my profound gratitude to Dr. E. Vijayan, ICMR Emeritus Professor, Centre for Neuroscience, Dept. of Biotechnology, Cochin University of Science and Technology and Dr. Ommen V Ommen, Department of Zoology, Kerala University for their help and encouragement during the period of my research. Also, I wish to extend my
gratitude to Dr. Babu Philip, Dept. of Marine Biology, Microbiology and Biochemistry, CUSAT for his help, encouragement and advice.

I would like to acknowledge Prof. M. Chandrasekaran, Dr. Sarita G. Bhat, Dr. Padma Nambisan, faculties of the Department of Biotechnology, CUSAT, and Dr. Elyas K. K, former lecturer of the Department of Biotechnology for their advice and support throughout my work.

I take this opportunity to thank Prof. R. Muraleedharan Nair, Dean and Faculty of Science, Cochin University of Science & Technology for his help extended to me.

I thank all the teachers of my school days, graduation and post-graduation for laying my foundations. Especially, I thank Dr. Soulochana, Dr. Chandrakanth Kelmani, Dr. G R Naik and Dr. Ramesh Londenker who greatly motivated me in the pursuit of my dreams.

I sincerely acknowledge my senior colleagues Dr. Balarama Kaimal S, Dr. Akash K. George, Dr. Santhosh K Thomas, Dr. Gireesh G, Dr. Finla Chathu, Dr. Ramya Robinson, Dr. Reas Khan S. and Dr. Savitha Balakrishnan for their support and encouragement in my research work. I also extend my thanks to Dr. Nair Amee Krishnakumar and Dr. Anu Joseph for their valuable suggestions and help. I extend my deep gratitude to Dr. Binoy Joseph for his encouragement, valuable suggestions and unconditional help offered to me right from the beginning of my doctoral research.

It is with immense pleasure I express my thankfulness to my friends Dr. Pretty Mary Abraham and Mr. Jobin Mathew for all the support, love and motivation in all my efforts during the course of my work. I am deeply indebted to my friends Mr. Peeyush Kumar and Ms. Sherin Antony for lending me helping hand on all needs and being on my side in all the times which gave me strength and courage to move on and successfully accomplish this piece of work.
My special thanks to my friends Mr. Jes Paul and Mr. Nandhu M. S for their unconditional help, support and care. I remember with affection and gratitude the jovial and wonderful moments shared with my friends Mr. Korah P Kuruvilla, Mr. Smijin Soman, Mrs. Anitha Malat, Ms. Chinthu Romeo, Mr. Jayanarayanan S, Mrs. Shilpa Joy, Mr. Natjil George and Ms. Roshni Baby Thomas in CNS. I thank them all for the affection, love, friendship and support showered on me.

I thank, Dr. Jissa G. Krishna, Dr. Jasmin C., Dr. Soorej M. Basheer, Ms. Beena P. S., Mr. P. Karthikeyan, Mr. Cikesh P. C., Mr. Ajith M Thomas, Ms. Jina Augustine, Ms. Helvin Vincent, Ms. Smitha S., Mr. Satheesh Kumar M. K., Mr. Manzur Ali P. P., Ms. Sapna K., Mr. Abraham Mathew, Ms. Jasmine Koshy, Ms. Jikky Jose, Ms. Sudha Hariharan, Ms. Ummu Habeeba, Ms. Thresia Regimol T. T, Mr. Ramesh Kumar S, Mr. Raghul Subin S, and M.Sc. students of this Department for their friendship, help and co-operation.

I wish to thank, my friends, Mrs. Navya B S, Mrs. Arshiya Begum, Mr. Raghawendra Kumar, Mr. Shrinivas, Mr. Ravi Ranjan, Ms. Lekshmi and Mrs. Surekha Gokhale for their friendship and love.

I acknowledge, Council of Scientific and Industrial Research, Govt. of India for providing me fellowship for the research. I thank all the present and past non-teaching office staff of our department for their timely help and co-operation. My special thanks to the authorities and staff of Cochin University of Science & Technology for their help and co-operation.
The tender notes of love and untiring support from my beloved husband Mr. Arun Chandran helped me to overcome all the impediments and move ahead to achieve my goals. I hardly find words to jot down a word of appraisal for him. Also, I acknowledge my father in law, Mr. P.N. Chandran and mother in law, Mrs. Subhashini Chandran for lightening the path of my life through their constant encouragement, affection and support. I express my loving thanks to my brother in law Mr. Anup Chandran and sister in law Dr. Anima Anup for their support, love and caring. There is no limit for my gratitude for God's biggest blessing on me- my dear son Akhilesh P A- whose presence in my life lighten the hard times in my life.

My joy knew no bounds in expressing the heartfelt thanks to my beloved parents. I can barely find words to express all the wisdom, unconditional love and support given to me by my beloved parents, Mr. T. N. Raveendran and Mrs. Laila Raveendran. They have been selfless in giving me the best of every thing and I express my deep gratitude for their love without which this work would not have been completed. I am deeply indebted to my dear brother Mr. Anoop TR and My sister in law, Mrs. Surya Anoop for motivating me in effectively working and accomplishing my goal. I acknowledge all my dear cousins for their assurance and good-will in every way. I remember thankfully the love and blessings showered upon me by my grandmother Mrs. V. Leela and wish and pray for the blessings of my eternal grandparents.

Finally, I would like to thank everybody who stood by me for the realization of this thesis.

Anju TR