Acknowledgements

This thesis has been a great learning experience for me and efforts of several people have contributed in not only completion of this work but also in my growth as a researcher. First of all, I would like to thank my supervisor **Dr. Prakash P. Pillai** for his guidance and motivation. His supervision, regular feedback and thoughtful discussions have really helped in improving the quality of the work.

I would like to express my sincere gratitude to **Prof. P.C Mankodi**, Head of Department of Zoology for allowing me to access the facilities of this department and extending the help whenever required.

I take this opportunity to thank all the faculties of this department, **Prof. Dolly Kumar, Prof. Kauresh D Vachrajani, Prof. Pragna Parikh, Prof. Geeta Padte, Prof. B. Suresh Balakrishnan, Dr. Sunita Salunke and Dr. Gowri** who have been very kind and supportive at times whenever I approached them. I thank all the teaching and non-teaching staff of Dept of Zoology for their cooperation during my entire PhD period. I would like to thank **Dr. R.V Devkar** for his support and allowing me to use his lab facilities. I would like to extend my gratitude to **Dr. Vihas T. Vasu** for providing suggestions and answers to my queries. I would also like to thank **Dr. Hetal Roy** for her motivating words whenever needed.

I would also like to thank to **Prof. A.V Ramachandran Menon**, for his guidance and support. I also would to extend my gratitude to **Dr. M.S. Mustak** for providing the generous support.

I am very grateful to **Dr. Emma E. Frost** for her precious suggestions and critically analyzing my research work.

I would also like to express special thanks to **Prof. Phillippe Lenormand,** Institute of Research on Cancer and Aging, Nice, France for his kind favour in appreciating this study by providing ERK1 plasmid.

I am thankful to the research scholars of the department and especially my lab members for all the lovely time spent in and outside lab. My heartfelt thanks to lab members who not only provided necessary support but also kept the scientific spirit high in the lab which also helped me directly or indirectly to complete my Ph.D. study. I specially thank my lab partner **Kedar** for listening to all my success and failure stories and for being source of positivity throughout these days. Thanks to **Lipi** and **Jaldeep** for all the love and support during those difficult times and making these years a memorable one. I am also thankful to **Arpita** for helping me in improving my technical knowledge and developing the personal skills. I am also thankful to **Zalak** and **Ashutosh** for their support and excellent advice in scientific work.

I am also thankful to fellow lab mates, **Parth, Jaymesh, Bhavya, Sarmita, Shweta, Kapil, Kavita, Apeksha, Aliasgar, Ankit, Himadri, Kangkan** for their co-operation during work as well as creating a stimulating and fun environment to make my stay here memorable. I would like to extend my thanks to for their support and wish you all the best for future endeavours. I appreciate the help of dissertation students **Dhanush, Hiral, Vidhi, Zalak and Tarlin** and wish them all the best in their future endeavours. I will always remember **Foram** for keeping lively environment during her dissertation period.

I am also thankful to **Prof. Sarita Gupta** for allowing me to use Animal house facility of Biochemistry department and Vikram Sarabhai Central Instrument facilities. I specially thank **Nitesh bhai** for helping me with administrative work.

I also acknowledge the University Grant Commission (UGC) and Council of Scientific and Industrial Research (CSIR) for providing me the Project fellowship.

More than my own efforts, this thesis is a result of hard work and sacrifices of my **father and mother.** They have provided me with the best opportunities one could have or want. I would like to thank my parents, my grandparents and entire family for their unconditional love and support, constant encouragement and difficult adjustments. Special thanks to my sister, **Gunjan** and brother, **Mayank** for being pillars of support of every kind. I cant't think of my future without you both. And lastly, **Shreyas** for showing fun side to every problem in life.

- Juhi