ACKNOWLEDGEMENT

It would not have been possible to write this doctoral thesis without the help and support of all the very kind people around me who believed in me and lived my dream for all these years to witness the completion of my doctoral research work. It's a matter of immense pleasure in getting an opportunity to thank and acknowledge the contribution of each and everyone who made this research work possible. In the course of expressing my gratitude, I may inevitably miss some, the minimum I can do is to apologise.

It was a great privilege for me to carry out my research study in one of India's best and well-equipped laboratory at Molecular Biology Unit, National Centre for Cell Science (NCCS), Pune. I express my heartfelt gratitude to Padmashree Dr. G.C. Mishra, Ex-Director, NCCS and Dr. Shekhar C Mande, Director, NCCS, for providing me this unique opportunity to carry out my research work amidst eminent scholars of this country. I am indebted to Council of Scientific and Industrial Research (CSIR), India for providing me with fellowship to carry out my research work.

This thesis would not have been possible without the help, support and patience of my principal supervisor, Dr. Yogesh S Shouche, not to mention his advice and unsurpassed knowledge of diverse scientific fields. My sincere thanks to my Ph.D. guide Dr. Ramesh R. Bhonde for granting me the opportunity to carry out Ph.D. under his valuable guidance. I am extremely grateful to Dr. Bhonde for his continuous guidance and supports throughout my research tenure. I take this opportunity to thank Dr. Patole for his support and scientific inputs when most needed.

I would like to acknowledge everyone in the academic and technical support unit of NCCS. Mr. Basutkar and his team at the sterilization department deserve special mention who helped me manage the logistics of the numerous glassware that I needed for my experiments. I also would like to thank Mr. Solanki and his team at the computer facility for downloading the many open source software I tried and tested during my work. Mr. Nema helped me a lot with documentation and library searches useful to gain insight into the subject. I would like to thank Mr. Sarang Satoor (sequencing facility) for timely help in carrying out some important computational work and sequencing related back up of data and Mr. Hitendra Munot for ordering and providing all the lab-wares and chemicals. All my gratitude is reserved for Mr. A. D. Patil of Adminstration staff and Mr. K. Rajendra Prasad Academic Cell.

A very special mention to all my research collaborators in India and abroad who have actively supported and guided me in my research work. Thank you Dr. Manfred Rohde
My acknowledgement would be incomplete without the mention of my dearest friends Prashant, Arvind, Antony, Avinash, Shakti, Girish, Shailendra, Ashraf, Rasesh, Dhiraaj, Shrikant Pawar, Snehit, Sajad, Himanshu, Sandeep, Gulab, Rahul, Shailesh, Mangesh, Sashikant, Viduthalai, Amit, Nachiket, Mandar, Swapnil, Archana, Arpita, Sweta, Ashwini Atre, Sunil Banskar, Sunil Dhar, Kiran Pawar, Shrikant Bhute and Mahesh Sonavane. Life at NCCS was truly special because of the love, affection and care of friends who never hesitated to point out mistakes and celebrate success at different phases of my Ph.D.

My friends of National Institute of Oceanography, National Chemical Laboratory, Pune University Microbiology Department, other labs in NCCS and IIT Mumbai - Ashutosh, Purnima, Swaraj, Sanjay, Mishra, Jyoti, Neha, Pooja, Jay, Gupta, Prabhakar, Yashvant, Purde, Atul, Nishant, Atul Thakur, Sushim, Sameer, Rodu, Dhara, Karishma, Sharvari, Smita, Vivekanand, Kalayani, Reeti, Akhilesh, Jeetendra, Sijo, Ankur, Manju, Alka, Manjeet have had immense impact in my life and the suggestion and advice given by them during the course of my work has enabled me to develop critical gaze and sharpen my scientific knowledge and skills.

I owe sincere thanks to all my senior colleagues Dr. Mahesh Dharne, Dr. Kamlesh Jangid, Dr. Gurdeep Rastogi, Dr. Jay Siddharth, Kaustubh Ghokale, Vijay Musande, Dr. Rajinikant Dixit, Dr. Aijaz Wani, Dr. Kaushal Sharma, Dr. KM Dayananda, Lokesh Sharma sir, Dr. Bipin Chandra Salunke, Dr. Parag Vaishampayan, Dr. Uma Shankar, Dr. Sachin Surve and Dr. Chandresh Thakker for useful comments, guidance, support and their friendship.

I owe my sincere gratitude especially towards Manju, Ashutosh, Arvind Gupta and Sutapa for helping me immensely during thesis writing.

Above all, I would like to thank my parents, brothers, sister-in-laws and my two little niece and nephew who stood by me and gave me their unequivocal support throughout, as always, for which my mere expression of thanks likewise does not suffice.

Pankaj Verma