Pursuing a Ph.D. is both a painful and an enjoyable experience. It's just like climbing a high peak, step by step, accompanied by bitterness, hardships, frustration, encouragement and trust and with so many people's kind help. When I found myself at the top enjoying the beautiful scenery, I realized that it was in fact, teamwork that got me there. During this time, I have worked with a great number of people whose contribution in assorted ways to the research and the making of the thesis deserves a special mention. It is a pleasure to convey my gratitude to them all in my humble acknowledgment. I would like to thank everybody who has been important to the successful realization of thesis, as well as expressing my apology that I could not mention personally one by one.

In the first place I would like to record my gratitude to Professor Datta Madamwar. I am extraordinarily fortunate in having him as my guide. I could never have embarked and started all of this without his prior teachings, supervision, advice and guidance from the very early stage of this research as well as giving me extraordinary experiences throughout the work. I am indebted to him for his keen interest and brightening my ideas and dreams of research during the tenure of my Ph.D. His exemplary guidance, inspiring encouragement and timely advice will always be remembered with deep sense of gratitude. I solemnly submit my honest and humble thanks to him for bringing my dreams into reality. A special thanks to Shraddha mam and Shreyafpr all the love, care, concern and support throughout.

It's a matter of affection to work with amazing Cyanobacteria which gave me immense working opportunities in exploring their abilities. I am also indebted to Charles foster rats for sacrificing their lives for the development of science.

I consider it an honour to work with Prof. T. P. Singh, AIIMS, New Delhi. His truly scientific intuition has made him a constant oasis of ideas and passions in science, which has exceptionally inspired and enriched my growth as a student, a researcher and a scientist want to be. I am indebted to him more than he knows.

The financial support from DBT for Junior Research Fellowship, UGC for the Meritorious Fellowship and CSIR for the Senior Research Fellowship are gratefully acknowledged.

I sincerely thank Dr. Amita Shah for her enthusiastic support and advices whenever it was needed. I would like to take this opportunity to thank the HOD and all faculty members of Department of Biosciences, the University teaching and non-teaching staff and USIC for their support.
I owe my deepest gratitude to **Dr. Kaledona Minkova** from Bulgaria whom I have never met, but she has never failed in fulfilling her duties towards science by supporting and helping me unconditionally whenever required.

I greatly acknowledge **Dr. Sarita Gupta**, MSU, Vadodara for carrying out the animal studies in her laboratory and I thank **Dr. K.V.R. Murthy**, MSU, Vadodara for helping in fluorescence studies.

I convey my special acknowledgement to **Dr. Sujata Sharma** and her team, Biophysics Department, AIIMS, New Delhi for helping me in the structural analyses with a special mention to **Dr. Nagendra, Dr. Mau and Avinash** for solving the complex structure and making beautiful figures for my thesis. I am also thankful to **Dr. Imtiyaz, Shafique and Khalid** from Jamia Milliya Islamia, New Delhi for helping me in doing the folding-unfolding studies of my protein. I thank **Tushar**, MSU, Vadodara for all the help in animal studies.

It gives me a great pleasure in acknowledging **Varun** for everything... Words are insufficient to thank him enough...I am really lucky to have a friend like him....He has helped me scientifically, practically and even emotionally to pass through all the years of Ph.D. work....his advice, supervision, and crucial contribution, has made him one of the strong pillars of this research and so to this thesis. His involvement with his originality has triggered and nourished my intellectual maturity that I will benefit from for a long time to come. He has tolerated my anger and always kept quiet whenever we fought and this made things very easy... Varun, I am grateful to you in every possible way.

I would like to convey my heartfelt thanks to **Khushboo**, my little sis, who has always supported me emotionally and morally... She has always listened untiringly to my complaints and frustrations in past three years...and tolerated my mood swings ever...! Thanks a lot Khushboo for your unconditional love and support.

I would like to thank **Niraj**...more of a friend than a colleague...thanks for a great time, lots of discussions at several scientific issues, good tips, good advice and encouragement when I needed it. Thanks for listening to my dilemmas and giving my solutions at once. I would also like to thank **Ritu** for giving me the support and advices whenever I required them.

I am thankful to my seniors - **Dr. Rachana Dave, Dr. Badrish Soni, Dr. Chirayu Desai, Dr. Sarayu Mohana, Dr. Bhavik Acharye, and Dr. Hilor Pathak** for their visionary advices and support with a special thanks to **Dr. Vrushali Dandavate** who was always patient in listening to me always and giving me timely advices. I would like to give a special thanks to my lab brother and my senior **Dr. Eltayib Hassan Ali** and his family for...
all the love and support. He was always there to help me in my tough times and giving me appropriate advices. I would also like to thank all my colleagues – Kunal, Sneha di, Tripti, Sananda, Zeenat, Binal, Avinash, Sagar, Harshvadan and Vrutika for making a pleasant working atmosphere in lab, especially Digant and Vilas for their unstinting cooperation, encouragement and all the laughter. I would specially thank Avani, dissertation student and now my colleague......who never failed in asking me if I ever needed any help. She has always been a good support by listening to me unwearingly whenever required.

I am also thankful to all students – Prapti, Sagar, Reema, Ragitha and Ashutosh who have worked with me for their dissertation. Their jovial nature, hilarious talks and laughter have always kept me buoyant.

It gives me immense pleasure to thank my School teacher Mrs. Alka Banerjee for introducing me to scientific thinking. It will be a great injustice if I do not thank Ms. Madhu Banerjee, my teacher during graduation, who instilled in me many virtues and interest in Microbiology. She taught me to live with principles in life...... I would also like to thank all my school and college friends for the support and love given by them in their own ways.

Where would I be without my family? This thesis would have remained a dream had it not been for my ever supportive parents. My parents deserve special mention for their inseparable support and prayers. My Father, Mahendra Parmar, in the first place is the person who showed me the joy of intellectual pursuit ever since I was a child. My Mother, Bhawna Parmar, is the one who sincerely raised me with her caring and gentle love. They have been selfless in giving me the very best of everything and I express my deep gratitude for their love, sacrifice and support without which this work would not have been complete. I thank my supportive and caring siblings, Kajal, my loving sis and Chintan, my loving bro, for their love, prayers and constant motivation throughout my life. I would like to thank Pankaj jiju for his timely advices and fatherly care. I would also like to thank my Mother-in-law, Father-in-law and Sister-in law for their wonderful support and love which they gave me in past few years especially last 8 months......they have been with me mentally and morally during the most crucial time of my thesis writing. Thanks a lot.....!

Words fail me to express my appreciation to my best friend and now my husband, Sushil who has always been by my side and a source of inspiration during the difficult times...... His dedication, love and persistent confidence in me have taken the load off my shoulders. He has always been a wonderful companion......his support, love, encouragement, sacrifices and
understanding has made him the backbone of my research and this thesis. All that without asking for anything in return makes me owe him a lot! 

Last but not the least, I would like to thank God. In the process of pursuing Ph.D and writing this thesis I realized how true this gift of research is for me. You have given me the power to believe in my passion and pursue my dreams. I could never have done this without the faith I have in you, the Almighty.

Asha Parmar