Acknowledgements

I would first like to thank and honour the Almighty for helping me reach so far. I would then like to thank my parents—Mr. Ashok Kumar Wangoo and Late Dr. (Mrs.) Phoola Wangoo, for their endless love, encouragement and support through all the happiness, sadness, highs and lows. I owe my Ph.D more to them than to anyone else. They made numerous sacrifices so that we could have the best of education and opportunities. It is truly my father’s faith in me and his full unconditional and selfless support which guided me through thick and thin. I am blessed to have him with me. Nothing can replace the respect and love that I have in my heart for him.

I am grateful to my research advisors, Prof. K. K. Bhasin, Dr. C. R. Suri and Prof. S. K. Mehta for their constant encouragement and unending enthusiasm to explore new fields apart from chemistry. I shall always be indebted to Prof. K. K. Bhasin, Department of Chemistry, Panjab University, Chandigarh, for the confidence that he showed in me and all the support during the course of my PhD. I am immensely thankful to Dr. C. R. Suri, Scientist, Institute of Microbial Technology, Chandigarh, for encouraging me during my most difficult times. At times, when my experiments failed, he was the one who motivated me to see my failures as the stepping stones to success. I am also thankful to Prof. S. K. Mehta, Department of Chemistry, Panjab University, Chandigarh, for guiding me at each and every step. My supervisors presented me the opportunity to work in an interdisciplinary program that allowed me to interact with researchers from diverse fields such as physics, chemistry, biology and computer science. Together we built up a pleasant and encouraging environment for scientific study. I’d like to thank them for all the discussions that we undertook which improved my understanding of the work tremendously. Working in their groups gave me an opportunity to understand a wide range of advanced topics of contemporary research interest.

I would also like to thank Prof. Vinayak Dravid, Dr. Gajendra Shekhawat, Dr. Jin Song Wu, Dr. Soo Hyun, Jonathan, Aiming, Dr. Saurabh Sharma, Dr. Arvind Shrivastava and Dr. Hrushikesh Joshi for helping me in carrying out my research experiments at Northwestern University, Evanston, USA. Thanks are also due to Prof. Subodh Mhasalkar,
Prof. Lam Yeng Ming, Sok Yee, Shripad, Iman, and Wunly at Nanyang Technological University, Singapore for their help and encouragement.

I am thankful to my loving sister, Anupama, for being a great friend in need and for giving me strengths during my difficult times. (I also thank her for the grammar corrections of my manuscripts!). I am also thankful to Mr. Raj Kumar Wangoo (my chacha ji) and Dr. Swaran Lata Verma (my bua ji) for their love, encouragement and support.

I cannot find words to thank my dear and loving husband, Dr. Rohit Kumar Sharma, for always being there for me whenever I needed him and believing in my abilities. The love and support of my mother-in-law was also instrumental in helping me stay focused on the project. I also intend to express my gratitude to my in-laws family for their cooperation.

Words fail to express my deepest thanks to Khushi and Savita for being the most special of friends and always ready to help me at all odd hours. I specially thank Khushi for helping me in getting all my official work done smoothly (and sometimes not so smoothly!). Without her, I don’t think I would have been able to reach here. She has been one of the strongest pillar of support in my life and I feel blessed to have her. Thanks are due to her family as well for considering me like their own family member. Savita has always been a source of inspiration in professional and personal life.

Robin Boro – thank you for being a great friend and research partner. The long hours spent in the lab and dealing with scientific problems would have been infinitely longer without you. I would also take this opportunity to thank Harsimran for being extremely helpful and kind to me. Life at IMTECH was fun as well as peaceful because of these two special persons.

I would then like to acknowledge my labmates who were very brilliant, intelligent, and above all, great individuals! My discussions with them have definitely improved my understanding of life in general, and science in particular. Thanks are due to all my seniors- Dr. Vikas Rana, Dr. Ganga Ram Chaudhary, Dr. Kumar Rajesh, Dr. Jasdeep, Mr. Rajeev, Mr. Harish, Mrs. Bhawna and Mrs. Shivani; my batchmates- Ekta, Rishu, Gurneet, Sanjay, Yogesh Nagpal; my labmates-Yogesh Nangia, Poonam, Nandita, Bipul, Biresh, Sanjay, Nalini, Khushboo, Dr. Kavita, Dr. Bhalla, Nisha, Priyanka, Aditi, Sonu, Parul and Vinod. A
special thanks goes to Rama for his help in the cell culture experiments. Heartfelt thanks to
Yogesh Nangia for being more like my younger brother than a labmate. I am also deeply
thankful to Dr. Jyotsna Kaushal for showing me light during the darkest times.

I am grateful to Prof. Paramjit Singh, Chairman, Department of Chemistry, Panjab
University and Dr. G. Sahni, Director, Institute of Microbial technology for providing
excellent research facilities and administrative support.

I am thankful to Dr. Neeraj Khatri for providing excellent animal facilities at
IMTECH. Expert technical help from Mr. Joginder Singh, Dr. M. L. Sharma, Mr. Desraj
Agnihotri, Mr. Ramesh Sharma, Mrs. Sarabjeet Kaur, Mr. Sachdeva and Mr. Sameer in
Chem Deptt. and IMTECH, during this course is greatly acknowledged. Things would not
have run so smooth for me without their help.

I would like to thank the scientific, library and administrative staff at IMTECH and
Panjab University for providing prompt help in anything required. The financial help provided
by UGC and CSIR, New Delhi, are duly acknowledged.

Lastly I would like to apologize to all those who I have not mentioned by name but
have asked them favours without inhibition whenever, whatsoever required. I am indebted to
them for many ways they have helped me during the course of this study.

This work is dedicated to my mother –
I know she would have been proud

(Nishima)
13-8-2010