Acknowledgements

The research work embodied in this thesis is the result of sincere support of many people. It is my pleasure to express my gratitude towards all of them. Foremost, I would like to thank my Mentor, Dr. Jagmohan Singh, who shared his expertise and research insights with me. Whose thoughtful advice often served to give me a sense of direction during my PhD studies. This work would not have been possible without his support and encouragement. I am thankful for his patience, understanding, constructive criticism, valuable advice and mentoring, which helped me throughout in completing this research work. I am especially thankful to him for his tolerance and for strictly preventing me from taking impulsive decisions.

I take this opportunity to thank and acknowledge Dr. Amit Ghosh, former director, IMTECH, and Dr. Girish Sahni, present director, IMTECH for constructing such an excellent research environment and providing outstanding research facility. I thank the entire staff of Bioinformatics center of IMTECH especially Dr. Raghava for providing such an efficient beautiful bioinformatics facility. I am thankful to Dr. Dibyendu Sarkar for his personal advice and help, Dr. Pradeep Chakrabarti for efficiently coordinating the PhD program and Dr. Majumdar for timely distribution of radio-isotopes. I would also like to thank Mr. Deepak Bhatt for running my DNA sequencing reaction even in odd hours. I am very much thankful to administrative and library staff of IMTECH, especially Mr. R. N. Bansal, Mr. Anil Sharma, Mr. Bhimi Ram, Mr. Maman Chand and Dr. K. P. S. Sanger for providing facilities and technical support in an informal and familial atmosphere.

I would like to thank all my Friends, batchmates, seniors and juniors. I would specially like to thank my close friend Amin-ul-maman for his constructive criticism and support; during entire PhD we shared both, happiness and sadness together. I would always cherish the caring nature of Ashu. I am extremely thankful to my lab mate Ashok for making a constructive atmosphere in the lab. Special thanks to Swati, Hemant and Nupur for their support and making easy availability of reagents, chemical and strains all the time. I would like to appreciate their supporting nature for making nice working environment in the lab. Thanks to Gaurav, Priya and Pooja for helping me throughout the SNP project, Balveer for his helping nature and valuable comments, Ashok Saini for constructive discussions, Poonam for the respect and support she lends, Jugnu for his unconditional love, admiration and tolerance. I am highly obliged to my lab seniors Sharan, Sumit, Raj-Kumar ji, Rupinder and Nandini for their help and support.

I would like express my sincere gratitude to my Bhabhi for her help and support during hard days of my life. Last but not the least I am extremely thankful to my wife Sneh for her endless love, support and encouragement throughout this journey. Without her I would have struggled to find the inspiration and motivation needed to complete this dissertation.

In the end the financial help from council of scientific and industrial research in form of research fellowship is duly acknowledged.

(Kamlesh Kumar Bisht)