Acknowledgements

*Trust no future, howe'er pleasant!*

*Let the dead past bury its dead!*

*Act, act in the living Present!*

*Heart within and God o'erhead.*

~Henry Wadsworth Longfellow, Psalm of Life

I would like to express with utmost sincerity, my deepest gratitude to my Ph.D. mentor, Dr. Purnananda Guptasarma, without whom, this thesis would not have become possible in its present form. His extensive discussions, novel ideas and logical thinking greatly helped me in understanding the basic concepts of this work and remarkably influenced the study. I am deeply indebted to him for not only providing me his constant guidance, encouragement, enthusiastic supervision, kind support and motivation, throughout the duration of this work but for also, helping me go through the toughest challenges, both professionally and personally. This period of association with him made me realize the significance of “Power of Now” and taught me, how to enjoy the present time with an optimistic attitude towards life without bothering about the past or the future. Special thanks to him are also due for providing me the freedom to visit my home place almost every alternate weekend, during the entire five years of my stay in imtech. He has always been a great source of inspiration for me and his simple and excellent way of teaching has really made a deep impact on me. I feel myself extremely lucky for getting this golden opportunity to work under his able guidance.

I would also like to thank our present director, Dr. Girish Sahni, and former director, Dr. Amit Ghosh, for providing us the excellent research facilities to work in the institute.

I wish to extend my warmest thanks to our collaborators, Dr. Balvinder Singh and Dr. Subramanian Karthikeyan, for their timely help and support in carrying out all the *in silico* analyses needed at any point of time in the study. I would like to specially acknowledge the contribution of Dr. Subramanian Karthikeyan in setting up crystallization trials and solving the crystal structure of our protein.
A special thanks to Dr. K. Ganesan, Dr. Alok Mondal, Dr. Jagmohan Singh and Mr. Deepak Bhatt for help with the DNA sequencing. I would also like to express my thanks to Dr. Manni Luthra Guptasarma for providing me valuable suggestions and timely help to complete my work. I greatly appreciate the help provided by Mrs. Sharanjeet Kaur and Mr. Bipan Verma with the CD and MALDI studies.

My life in lab was a very pleasant experience and I greatly enjoyed the company of all my seniors Dr. Bishwajeet, Dr. Anshuman, Dr. Sourav, Dr. Swati, Dr. Shubbir, Dr. Sanjeev and juniors Uzma, Neeraj, Satya and Prema in the lab. I am deeply indebted to all my seniors for familiarizing me with all the basic experimental techniques and instruments of our lab. I am warmly thankful to all the present members of my lab, Sharanjeet mam, Uzma, Neeraj, Satya, Prema, Gurleen, and Shweta for always maintaining a very stimulating and cheerful work environment in the lab and also, for making all our lab trips so exciting, enjoyable and memorable ones. I greatly cherish the time spent with Swati di in the lab and greatly enjoyed being in her warm and lovely company. Special thanks are due to my affable juniors Uzma and Neeraj for providing me their timely support and lovely company during late night hours of work in the lab. Thanks also to Pooja, Shaweta, Shabnam, Bhamini, Geetika for their lovely company.

I am greatful to my batchmates Rachna, Ashu, Sneha, Richa, Archana, Sushma, Swati, Lomary, Haider, Akes, Arvind, Robin, Netrapal, Nigam, Manish for their support and goodwill. I would also like to thank all my friends and batchmates in the hostel, Meghna di, Anuradha di, Sudesh di, Vandana di, Monika di, Pratima di, Amita di, Amrita di, Rachna, Pavitra, Uzma, Shweta, Jaspreet, Loveena, Sushma, Ashu, Sneha, Richa, Archana, Sandeep, Suneet and Sonia for their support and lovely company throughout the period of my stay. I specially thank Rachna for her lovely company in the hostel and cherish all the times that we spent together as good friends. A special word of appreciation goes to both my room-mates Meghna di and Sandeep for their sweet and caring nature, which always made me feel very homely. I specially thank Uzma and Pavitra for always being the softest targets of all my teasing. I also greatly enjoyed being a participant in all the ladies sangeets and birthday dance parties in the hostel.

I am also thankful to all the imtech faculty, library and administration staff members for their help and assistance, whenever needed.
I dedicate this thesis to my wonderful parents for their unconditional support, selfless love, infinite care and affection, because of which I could reach at this stage in life and without them, none of this would ever have become possible. I would like to express my deepest heartfelt thanks and appreciation to my parents who always encouraged and supported me at every step of life. Their countless sacrifices and special efforts can never be described in words. I am also thankful to my grandparents for their affection and love for me. Thanks also to my elder sister Shelley and brother-in-law Arun for all their love and care. I treasure the joyous moments provided by our little Prisha. I am also thankful to my brother Hitesh for always cheering me up by his sweet and caring ways.

The financial assistance provided by CSIR is duly acknowledged.

Above all, I wholeheartedly thank my god for always providing me with the strength and perseverance to pursue my work and showering his blessings on me.

Divya Kapoor