On paper ‘five years’ sounds like such a long time….half a decade….but today as I stand at the threshold of the beginning of the end, five years seems like something that passed by so quickly, it was over before it even began!...and now as it’s time to move on and move away, I would like to express my heartfelt thanks towards all those who made this journey such an astonishing and extraordinary experience.

Above everything and everyone, I would like to thank my thesis supervisor Dr. R P Roy. It was my good fortune to have worked under his tutelage and what I owe him cannot be demonstrated through deed or words. His insight and encouragement have been the guiding light in my endeavors for these last five years. His optimism and enthusiasm has always encouraged me to try that little bit harder, go that extra mile, to strive for nothing short of excellence. I thank you Sir, for guiding me throughout, while giving me the autonomy to pursue my own ideas so I could test myself. I will consider myself fortunate if I can carry forward even a fraction of your scientific vision and acumen.

I will always be indebted to Dr. Vinay Nandicoori for taking out time from his busy schedule to instruct me. His endless optimism, infectious enthusiasm and firm belief that everything will work out when it looks like nothing will, were instrumental in the completion of this work. Thank you Sir for always making time to clear the smallest of my doubts and for listening to all my absurd ideas and opinions with a lot more patience and respect than they might have deserved.

I would like to express my deepest gratitude towards my Doctoral Committee members: Dr. Devapriya Choudhury, Dr. Sudhanshu Vrati, Dr. Devinder Sehgal and Dr. Ayub Qadri for their review, constructive criticism and excellent advice in the evolution of this thesis.

My sincere thanks to our ex-Director, Dr. Sandip Basu and our present Director, Dr. Avadesha Surolia, for ensuring that every opportunity and facility was made available for the successful completion this work.

The help rendered by the non-scientific staff is gratefully acknowledged. Mr. Akhilesh, Mr. Rana and Sanju ma’am deserve special thanks for liberating me of the nitty-gritty’s of academic paperwork. I would also like to take this opportunity to express my gratitude...
towards Mr. Dahra and Mr. Dey for the innumerable occasions where they have gone out of their way to render help. Thank you Satish ji for ensuring the thesis got bound and submitted on time.

A degree is immense hard work, but it gets simplified when your colleagues are your friends. I consider myself fortunate in having had some of the best people around as lab mates. It was a pleasure to work alongside seniors like Lavanya and Srijita; their friendship made the lab atmosphere so much fun that work ceased to feel like work at all! I will always be indebted to them (and also to Pramod) for guiding my baby steps during the initial few days in the lab. Uttara, I treasure memories of our legendary ‘HPLC wars’ as much as I value our newfound friendship. I will never forget how your crazy sense of humor had everyone rolling in the aisles......and will always associate home-delivery from ‘Rainbows’ with you!! Sayani, words are inadequate for expressing how much you mean to me. Thanks for the innumerable occasions where you have covered up for me, made my excuses, picked up the slack....your friendship is something I will treasure forever. Kanchan, Tora and Charu, thank you for always being ready with help and sound advice. Special thanks to Amit, Divya, Shazia, Kalpana, Rajneesh, Devanand and Kasturi for welcoming me so graciously into their lab. Rohit, Priti, Soma, Jayita, Beena, Divya....I will always remember the times we have spent together...fun-filled moments with you have been the perfect antidote to the PhD stress and tension. All the trips, treats, the all-night-chats will be part of my most fond memories for a long time to come. Harshita, Arush, Tarun and Smriti, words are not enough to express what you guys mean to me....not a day goes by when I don’t thank my stars for blessing me with such wonderful friends....just the knowledge of my friends beside me has made every disappointment bearable and magnified every joy ten-fold . This camaraderie will be one of the most valuable things I will take with me from NII.

Lastly, and most importantly, I would like to thank my family for their unconditional love and support. My father, for always leading by example; his code of behavior, values and principles have been a constant source of inspiration and courage for me. I cannot thank my mother enough for her warm and caring nature, and for putting up with my erratic schedule and uncertain temperament with a loving smile; and my little sister, for being ever-willing in lending a helping hand and a ready shoulder to lean on.
This thesis would have been unimaginable had it not been for the unequivocal support of all these people and many others whom I might not have been able to name here, but feel deeply indebted towards.

(SHARMISHTHA SAMANTARAY)