Acknowledgement

At the onset, I would like to extend my sincere gratitude and cordial regards to my revered supervisor Prof. Sankar Kumar Ghosh for his frequent suggestions and constant encouragement. Whether it was in his courses or in the pursuit of this thesis, his invaluable lessons and advice constantly kept me moving forward. The countless interesting projects and workshops that he let me to participate have enriched my skill and boosted my confidence. In spite of my nature as a worrier, he kept me on even ground. Though I am going to leave his corridor of research but I shall always remember what he taught me. Thank you for everything you have done for me in my education, my research, and my life. I believe, the coming generations will surely echo my sentiment. I also want to express my utmost appreciation to Dr Yashmin Choudhury for her role as my co-supervisor. In the same way she helped me to develop a core component of positive attitude.

I convey my sincere gratitude to the Honorable vice chancellor, Assam University, Silchar for granting me the valuable resources and facilities for smooth conduct of research. I express my appreciation to the dean of the Hargobind Khurana school of life sciences, who has been very encouraging and supportive. I would like to give special acknowledgement to the Head of the Department of Biotechnology for his constant encouragement in my research work. All the faculty members of the Department of Biotechnology. Assam University have been very kind enough to extend their help at various phases of this research. This research has come to a successful completion with the help received from the non-teaching staff of the Department and Academic staff of the Assam University.

I would like to thank everyone in the Genomic and Molecular Medicine Lab for their help, encouragement, and friendship during my journey through the doctoral degree. I thank Dr. Boni Amin Laskar, for his brotherly attachment and scientific suggestion to enlighten my thinking in a good shape. My thanks are always due to my formidable friends in the genomic lab Shantanu Kundu, Pradosh Mahadani and M. Joyraj Bhattacharjee. I feel fortunate to have learned and grown as a researcher with you all. I thank

Shilpee Srivastava, Kshetrimayum Miranda Devi, Rajeev Kumar, Rosy Mondal, Monika Ahenthem, Bijoya Khomdram, Fazlur Rehman, Ruhina Shirin, Mohua Chakraborty, Bishal Dhar, Anil Seram and Javed Choudhury for passing down their wisdom as experimentalists.

I have been honored by an incredible group of seniors, friends, and juniors during my time at Assam University. From the first day of research to my thesis submission, I am thankful to have shared this journey and formed such fond memories with these special individuals: Dr. Kulendra Chandra Das, Dr. Biswajit Chakraborty, Dr. Sneha Gang, Udaya Kumar Vendana, Ramkrishna Pal, Nilantika Paul, Moriom Begum, Romila Yumnam, Hemanta Saikia, Manash Pratim Kashyap, Sambudhha Das, Aditi Bhowmik, Sayantan Nath, Padmalochan Bora, W. Memton Singha, Arindam Parichha. Sabyasachi Mishra and Balarko Chakraborty.

I am indebted to oncologist Ravi Kannan, his colleagues and his staff, for their continued co-operation and help to pursue my research work.

I have been fortunate enough to share my passion for science with Mampi Baidya and she continues to be the biggest champion of my work. I am blessed with an amazing and loving sister, Suravi Hansa, who continually supports me in all my pursuits. Finally, I am grateful for the unwavering love and support of my parents, Tikeshwar Hansa and Binata Hansa, whose clear vision for their children laid the groundwork for me to excel academically and seeded my scientific curiosity at the young age.

Last but not the least, I sincerely acknowledge the Rajiv Gandhi National fellowship scheme, for which I could endeavor my research work. Special thanks go to those friends whose names are not listed here, who helped me directly or indirectly to complete this thesis. Thank you all for your continued love and support. Thank you Almighty. Tagadish Hansa)

Date: 30th July 2013

Place: Silchar