Acknowledgement

I wish to express my most sincere gratitude to my supervisor, Dr. Robin Doley, for his expert guidance and supervision during the Ph.D. tenure.

I would like to thank the Head, Department of Molecular Biology and Biotechnology (MBBT), Tezpur University and the Doctoral Committee members – Prof. A. K. Mukherjee (Department of MBBT, Tezpur University), Dr. S. K. Ray (Department of MBBT, Tezpur University) and Dr. R. Mukhopadhyay (Department of MBBT, Tezpur University) for their critical remarks and valuable advice during the Ph.D. tenure. It is my immense pleasure to acknowledge the University, its staff and other members affiliated with the University for their help, direct or indirect, and for providing the infrastructure, facility and conducive environment to work and stay in the University.

It would be unfair if I do not mention Prabhat Chetry and Prakash Chetry, Napaam village, who helped me with tick sampling and became good friends. Though it would be less to just express my thankfulness to them, I thank them wholeheartedly and wish them the best in life. I would like to thank Dr. Arun K. Sangwan, Professor and Head, Department of Veterinary Parasitology, College of Veterinary Sciences, Lala Lajpat Rai University of Veterinary and Animal Sciences, Hisar for helping us with the morphological characterization of the tick specimens. I thank Dr. Anirban Bhunia, Bose Institute, Kolkata for his help in the *in silico* studies of the proteins. I would also like to thank Vishal Dixit for helping me with the molecular characterization of the ticks, and Kapil Goutam for providing the plasmids vectors and of course, for helping me with troubleshooting of the experiments. I thank Bhaskarjyoti Gogoi for helping me with the cell cytoxicity studies.

A major part of the Ph.D. work was done in Protein Science Laboratory, Department of Biological Sciences, National University of Singapore, Singapore. I am immensely thankful to Prof. R. M. Kini for allowing me to work in his lab and for the valuable suggestions and encouragements. I specially thank Dr. Guillaume Blanchet and Mr. Manikandan Aurumugam for helping me with the experiments. It

would have been difficult for me to complete my work without their help. Thanks also to Mr. Ben Wong for showing up in the lab once in a while and encouraging me. I would like to thank Cho Yeow Koh, Sindhuja Sridharan and Janaki Iyer for their help during the internship in NUS.

I thank all the faculty members, non-teaching staff and Ph.D. students of the MBBT department for directly or indirectly helping and supporting me. I especially thank Mr. Pranab Mudoi, Ajay Kr. Manhar and Kuldeep Gupta for their help and support. I would like to thank my lab members, Diganta Das, Maitreyee Sharma, Simran Kaur, Debabrata Phukon and Archana Deka for their help and support, during the experiments and off the experiments. I also thank all the project students and interns, especially Anoop Singh Chauhan, Jotin Gogoi, Rimpi Saikia and Sharmistha Debnath who worked with me and helped me learn in the process.

I would like to thank all my wonderful friends and well-wishers – Arjun Brahma, Kritika Basumatary, Shyamalee Gogoi, Neeharika Gogoi, Lê Kim Phuong Uyên, Milena Jakimovska, Kamalakshi Deka, Kapil Goutam, Abhinita Borah, Madhurima Das, Jayaditya Purkayastha, Dipti Das, Sumita Das, Yasir Bhat, Athokpam Ranjita, Ankumoni Lahkar, Shabiha Nudrat, Yutika Nath, Shamim Rahman and Daising Mushahary – who helped me and encouraged me in my hard times.

I wish to acknowledge the Department of Biotechnology, Govt. of India for the Junior Research Fellowship (No. DBT-JRF/10-11/311), and the Department of Biological Sciences, National University of Singapore and India Research Initiative (No. R069000006646), Singapore for providing the financial support during my stay in Singapore.

Last but not the least, I am greatly indebted to my family members, especially my father and brother, who have always supported and guided me in every walk of my life.