Acknowledgements

I would like to take this opportunity to thank all those people, who have supported me in one way or other through all these years of my PhD, without whom I would not have been where I find myself today.

Firstly, I would like to thank my guide, Prof. C. Ratna Prabha, who has constantly guided me throughout my PhD, and whose deep knowledge has time after time helped me solve the problems and cross the barriers one inevitably faces in their PhD journey. The skills I have learned under her mentorship, be they laboratory skills, writing/editing skills, or critical thinking, will continue to benefit me beyond PhD in my future endeavours, for the rest of my life.

I would like to thank my doctoral committee members Prof. Sarita Gupta (Dept. of Biochemistry), Prof. Pushpa Robin (Department of Biochemistry), and Prof. Anuradha Nerurkar (Department of Microbiology), for annually evaluating my progress and helping me stay on course with their valuable advice.

I would also like to thank Prof. Rasheedunnisa Begum, Prof. Jayashree Pohnerkar, Prof. Pushpa Robin, Dr. Shashikant Acharya, Dr. Laxmi Priya, Dr. Rajesh Singh, Dr. Devesh Suthar, Dr. Sanjeev Kumar and Dr. Ravi Vijayvargia, for their encouraging words, criticism, valuable suggestions and support, over the years.

I sincerely thank all the office staff of the Department of Biochemistry, including Pethe sir, Akshitaben, Vyasbhai, Manishbhai, Shaileshbhai, Rameshbhai and all non- teaching staff members, for the various ways in which they helped throughout the years in all the official matters, as well as their friendliness and cordial nature. I am grateful to Milind Bhai, Kaushik Bhai and Mayur Bhai for the vital help and assistance they provided in all the matters regarding the university protocols, without which the bureaucratic procedures would have been very hard to navigate over the years.

I am grateful to UGC for providing me with fellowship, and to CSIR for providing me with funding for my project. Without the financial assistance from these two organisations, this work would not have been possible. I also thank R. Haguenauer-Tsapis, Daniel Finley, and Scott Emr, for generously providing me with the plasmids and strains that I needed for my experiments.

I extend my heartfelt gratitude to all my labmates, including Mrinal sir, Himendra sir, Swapnali madam, Rushikesh sir, Ankita, Varsha, Brinda, Hemang, Mohsin, Jinal, Sandeep, Megha. These people not only provided me with valuable advice on matters ranging from trouble shooting in experiments to how to stay in high spirits in face of inevitable failures during my PhD, but also made life during PhD a pleasant

experience. Being in the same station in life, we understood each other's problems better than anyone else.

I especially thank Hemang and Brinda for helping me after my eye injury in the laboratory. I also particularly thank Hemang, Ankita, Varsha, Brinda, Rushikesh sir and Mohsin, for assisting me with my experiments, and Mrinal sir for mentoring me during my MSc dissertation, which built a solid intellectual foundation for my PhD later. I thank all the MSc dissertation students in our laboratory, and in particular the ones I mentored, namely Mithla, Pooja and Nivya, for being of assistance in the laboratory whenever needed, and creating a fun atmosphere to work in.

I also thank all the research scholars of the Department of Biochemistry, and the Department of Microbiology, for lending help and assistance with my experiments whenever required, be it in the form of necessary chemicals and instruments, or advice on the experimental strategies. Without them my journey would have been much harder.

Finally, I thank my family for being an irreplaceable source of support in my life in general and my PhD in particular. These include my father, Dr. Pradeep Kumar Yadav, my mother Dr. Nandita Yadav, my brother Shubhanshu Yadav, and my fiancée Rinku Yadav. They gave me a sense of structure in life, even during confusing and chaotic moments in my PhD.

And lastly, I thank The Almighty for giving me the necessary strength to stay undaunted in face of all adversities, to handle crises with grace, and reach this place I find myself in today.

Prranshu Yadav