

Acknowledgement

It gives me great pleasure to express my earnest gratitude to my research supervisor Prof. Prasanna Ghalsasi for his astute guidance, invaluable suggestions and perceptive criticism while carrying out the present work. Although any acclamation is insufficient, but I take this opportunity to express my respect to him for his scholarly guidance, meticulous support and excellent work ethics. His humanitarianism is an attribute that I wish to take forward with me along with the subject knowledge that I got from him.

I know him from the days of my graduation and it has been a great opportunity for having completed my Ph.D. work under his guidance. I am also very grateful for his constant motivation and enthusiasm that makes him a great mentor. He is a person with a positive outlook, which has always motivated me to not shy away from trying out new things in research. Also his patience, flexibility and his care for genuine concerns have made the tenure of five years as a research student, a comfortable and pleasant experience.

I am thankful to Professor (Dr.) N. D. Kulkarni, Head, Department of Chemistry, for allowing me to use the infrastructural facilities. Special thanks to Professor B.V.Kamath, former head, Department of Chemistry, for his support and guidance. It is he who encouraged and motivated me to pursue PhD.

The financial support, obtained in the form of a fellowship from the University Grant Commission (UGC) and Department of Science and Technology (DST) New Delhi is gratefully acknowledged.

I am also thankful to all the faculties of our department. I would like to start with my lab teachers who in some or the other way constantly motivated me throughout my journey, Dr. Sujit Baran Kumar, Dr. Amar Ballabh, Dr. Vinay Singh, Dr. Jadeja and a special thanks to Dr. Ajmeri Sir, for lending me his table for corrections when needed. Prof. S. R. Shah for being a nice person and allowing me to learn and understand NMR. Prof Ashutosh Bedekar and Prof P. Padmaja for having faith in me and allowing me to handle GC-MS. Prof. P. Padmaja, Prof. Bhavna Trivedi and Prof Prakash Samani for their kind guidance and support in course work. Dr. Arun L. Patel, Dr. Hemant P. Soni, Prof Shubhangi Soman, Prof. Anjali Patel, Prof Debjani Chakroborty and Prof A K Prajapati for their valuable guidance whenever needed.

I would also like to thank my collaborators. Firstly, from biochemistry, MSU, Prof Rasheeda Begum and Ms. Mala Singh for helping me with the MTT assay. Prof Archana and Mr. Jitendra Gosai for helping me with protein isolation studies. I would like to thank Prof Hannudata Athreya, Indian institute of Sciences(IISc), Bangalore, for allowing me to work in his lab for a short period of time.

I would like to extend my sincere acknowledgment to the office staff of chemistry department, especially Mr. K. J. Rane, Ms. Revathi Ganesh, Bhavsar bhai, Ninad Mehta and Kalpeshbhai. I convey special acknowledgement for their help in all matters pertaining to official activities, related directly or indirectly to my work. Amongst the non-teaching staff members I would like to thank Late. Nagakardada, Kirtiben, Makwanabhai, Deepak bhai, Raju bhai, Mahesh bhai, Lokhande bhai, Vasant bhai, Dinesh bhai, Rathawa bhai, Dhiru bhai and all others for extending basic help for my research.

I am deeply grateful to my lab colleagues Dr. Hemant Mande and Dr. Ashok Vishwakarma for their kind guidance, my junior Khushboo Patel for helping me in all aspects of lab activities. Special thanks to Ms. Khushboo Bhanderi for keeping the lab atmosphere friendly and helping me with all the aspects of personal and professional work. I also thank Ms. Tasleem Makrani, Ms. Christine Gonsalves, Ms. Sharon and all other students for their association with me during their stay in lab. I thank all of them for their help, co-operation, fruitful discussions and friendly associations during my Ph.D. work.

My thanks to Dr. Mehul Sadhu for helping me in all aspects and for giving me special guidance for X-ray single crystal analysis. One more thanks goes to Mayuri Shaiwal for helping me by recording X-ray single crystal. Aditya Khanvilkar, Nilesh Jain and Gaurav Upadhyay for recording NMR. Special thanks to Aditya Khanvilkar and Vinay Kadam for always bringing a smile on my face during stressful days of PhD. A big thanks to my labmates for making the place worth working: Dr Rahul Kadu, Dr. Sanjay Verma, Dr. Ankita Solanki and Chirag Savani. My neighbor labmates; Dr. Varsha, Dr. Shoyeb, Dr. Sukriti, Priyanka, Rajesh, Pravya. I would like to thank my departmental friends and colleagues Dr. Harish R. Talele, Dr. Akeel Saiyed, Dr. Anju Chaudhary, Dr. Nilesh Jain, Dr. M. Shyam Sundar, Riddhi Gupta, Gourav Upadhyay, BlessyRajan, Hiten Rawa, Dr. Sanjay Yadav, Varsha Bharadwaj, Nilam Gupta, Dr. Sucheta De, Dr. Radhika Baloni, Dr. Jigar, Dr. Rina Soni, Sunil, Rudra, Kanu Kataria, Shardul, Priyanka, Harsha, Namrata, Ruchita, Heta, Rinky, Ankita, Harnish, Kushan, and all other research students of the department for their generous help and cooperation. A special mention for my friends Ramadevi, Krupa, Vishwanath and Indravadan for

being the constant source of inspiration, moral support and for everything they did for me, I sincerely thank all of them.

Special thanks to non-departmental friends for their constant scientific help; Dr. Pranav Buch, Dr. Prashant Gautam, Niddhi (for helping me with graphs), Nishant (for teaching me PXRD).

Most importantly, none of this would have been possible without the love and support of my family. I express my sincere gratitude to my parents Ms. Surabhi Sahay and Mr. Indranath Sahay, who always believed in me and guided me. I thank them for inculcating the values of education which, I think, makes me a better person and a better researcher. I thank my sister, Ms. Shubhani Sahay and brother Mr. Shrey Sahay for always being beside me with their care and concern and for being my strength all these years. I also thank my nephew Adwait for spreading happiness and liveliness in my life. I specially thank my brother in law Vrajesh Dave for silently standing beside me always. Special thanks to Dr. Aditya Garai for supporting me in all aspect of my life.

Above all, I owe it all to Almighty God for granting me the wisdom, health and strength to undertake this research task and enabling me to its completion.

Ms. Ishani I Sahay