Acknowledgements

With sincere and immense pleasure, I express my deepest sense of gratitude and special thanks to my esteemed supervisor Dr. Pawan K. Sharma, Associate Professor, Department of Chemistry, Kurukshetra University, Kurukshetra, whose excellent guidance and constant inspiration enabled me to solve the difficulties encountered during the present investigation. I owe him a lot for teaching me the intricacies of research by always encouraging me to harness my potential by working hard. His suggestions will remain with me as an inexhaustible source of scientific and social learning throughout my life.

I am extremely grateful to the Prof. Amalendu Pal, Chairman, Department of Chemistry, for providing the necessary laboratory facilities during present thesis work. I owe my sincere thanks to Dr. S. P. Singh, Professor Emeritus, Prof. Om Prakash and Dr. (Mrs.) Ranjana Aggarwal, Prof. Neera Raghav for their invaluable suggestions and enthusiastic encouragement whenever required.

I would like to thank our collaborators Late Prof. Aaron D. Mills and Prof. Richard V. Williams, Department of Chemistry, University of Idaho, Moscow, USA for providing me an opportunity to work in their laboratories as Visiting research scholar and Prof. Patrick Hrdalicka and Prof. Tom Bitterwolf for their moral support and encouragement when it needed most.

I wish to extend my sincere thanks and appreciation to all the teaching staff and non-teaching staff members for their ever helping attitude and blessings.

Special thanks goes to my seniors Dr. Surender Kumar, Assistant Professor at University College, K. U. Kurukshetra and Dr. Pawan Kumar (PDF), presently working at Nucleic Acid Center, University of Southern Denmark, Odense, Denmark and for their whole hearted cooperation and guidance during the present investigation.

I would also like to thank my groupmates Mr. Harnam Rahi, Dr. Navneet Chandak, Mr. Sita Ram, Ms. Poonam Khoya, Ms. Nisha Chandna for keeping my moral high and constant help, whenever I needed.

I would also acknowledge the invaluable support of my seniors, and colleagues Dr. Vinod Kumar, Dr. Jasbir Sangwan, Mrs. Vijay Kiran Sangwan, Dr. Manoj Kumar, Mr. Narender Singh, Dr. Nalin Chauhan, Mr. Sunil Dhillon, Mr. Virender Dhillon, Mr. Yogender Yadav, Mr. Mahender Kumar, Mr. Bhupinder, Dr. Rajiv Mittal, Dr. R. Katari, Dr. Atimukat, Mr. Jasmer, Ms. Reshmi, Ms. Pooja, Ms. Nitya, Ms. Ekta.

I am also thankful to Mr. Shymal Roy, Mr. Param Subramaniam, Mr. Najeeb Pervez, Mr. Ramvenkat Gona, Mr. Jaipal Vjrala, Mr. Sandeep Pilamari, Mr. Saswata Karmakar, and other Indian students at University of Idaho for making my stay comfortable.

I would like to place on record due thanks to our collaborators Prof. Alan S. Verkman, Department of Medicine and Physiology, University of California, San Francisco, California, CA 94143-0521, USA; Prof. Wan Namkung, College of Pharmacy, Yonsei Institute of Pharmaceutical Sciences, Yonsei University, Incheon, South Korea; Prof. Luciano Saso, Department of Physiology and Pharmacology "Vittorio Ersalmer", Sapienza University of Rome, Rome, Italy and Prof. Charles Emala, Department of Anesthesiology, Columbia University, New York, USA for providing the biological assay results.

Thanks are due to Dr. Dhirender Kaushik, Mr. Pawan Kaushik, Department of pharmaceutical sciences for providing anti-inflammatory results and Dr. Chetan Sharma and Arpana Mittal, Department of Microbiology, K. U. Kurukshetra, for providing the results of antibacterial screening.

Financial assistance from UGC, New Delhi in the form of Junior as well as Senior research Fellowship and SAIF, CDRI, Lucknow, for carrying out various analysis required for present work are gratefully acknowledged.

One cannot forget the strength, support that one gets from ones family. With gratitude and reverence, I acknowledge and admire the love, confidence and moral support bestowed on me by my grandmother, parents, sisters, brothers and other family members for their, patience, constant inspiration, support and encouragement during critical phases of this academic endeavour.

At last thanks are due to all well-wishers who directly or indirectly helped me in compiling this research work, and to Almighty with whom divine grace all things become possible.

(Satish Kumar)