Acknowledgement

"Though gratification comes deep from the heart, if left unexpressed losses its memory, charm, and above all the biggest asset, its beauty"

Always Indian heritage has paid rich tribute to its teacher, in whom it has seen the future of nation. Thus I too had an opportunity to relish this great heritage and feel proud in being a student of respected Dr. Kuldeep Singh, guide and Assistant Professor of Jaypee University of Information Technology, Wakfhnaghat, Himachal Pradesh, who stands as a symbol for all encouragement and motivation.

I express my deep sense of gratitude, immense respect and record my debt of gratitude to my research co-guide Dr. Sayeed Ahmad, Assistant Professor, Department of Pharmacognosy and Phytochemistry, Jamia Hamdard, New Delhi for allowing me to share the wealth of his knowledge, invaluable advices, untiring guidance, and constant encouragement during the course of my research. I will continue to value him in my life, a thought provoking philosopher and guiding light in my carrier.

I am also grateful to Dr. R. S. Chauhan, Professor and Head, Dept. of Biotechnology of Bioinformatics for his kind support, making valuable suggestions whenever needed.

It is a pleasure to acknowledge the invaluable help I received from Vice Chancellor Prof. (Dr.) S. K. Kak, Director Brig. (Retd.) Balbir Singh, and Dean (A & R) Prof. (Dr.) T. S. Lamba & Prof. Medury, Jaypee University of Information Technology, for their vital remarks during the research and providing all the necessary research facilities to carry out this work.

I would like to thank all my Doctoral committee members Dr. Harinder Singh, Dr. Gopal Singh Bisht, Dr. Rahul Srivastava for their guidance and warm encouragement throughout the advancement of my Ph.D. program.

It is a pleasure to acknowledge the invaluable help I received from Dr. Lokesh Deb, Scientist (Pharmacology), Pharmacology Laboratory, IERD, Department of Biotechnology, Government of India, Imphal, Manipur, India during the entire course of my project work.

I record my heartfelt gratitude to my teacher Dr. Biplab De for his keen interest, learned counsel, unstinted attention.

I am grateful to my all colleagues Dr. G. L. Gupta, Dr. Poonam Sharma, Dr. Manu Sharma, Mr. A. N. Khan for their appreciation. Special thanks to Dr. Udaybhanu for giving me his precious time and co-operation for successful completion of my project work.
I am thankful to all the faculty members of Department of BT & BI for their kind suggestions to improve my work.

I am thankful to Mrs. Sonika gupta, Mr. Ismail Siddiqui, Mr. Ravikant, Mr. Baleshwar, Kamlesh ji for their support and helps in the routine function of the lab.

I am thankful to JUIT, Wakhanaghat, Himachalpradesh for providing the facility, infrastructure and freedom to work, overall and also for providing the financial support. I also thanks heartily all the JUIT members who have directly or indirectly helped me in the completion of my dissertation.

I thank librarian Sriram ji and all other library staff of JUIT for their help throughout the study at my research tenure.

I thank to Mr. Yunis Karisha, Rhishika, Mr. Mahaveer, Jamia Hamdard, New Delhi for their timely help and valuable support.

I am blessed indeed to have such caring loving parents, and fortunate enough to have the affection of my husband & in- laws and bhaiya-bhavi and it is to them I dedicated this thesis. The real source of inspiration comes due to their blessings only without which it would have been impossible for me to complete this study.

Last in the list but first in my heart I bend my head to almighty God. The feelings of his continued presence surrounding me help to lead the life and showing me the path of life.

SILPI CHANDA