Acknowledgements

I am thankful to almighty God for the gift of life and endowing it with wonderful opportunities and beautiful people, who are always present with me & provides immense strength & patience. I have joined CDRI in July 2004 and finally the time has come to take a stroll in the memory lane of last five years before moving ahead and leave a note of gratitude for them who have been involved in successful completion of this scientific endeavour directly or indirectly by their love, help and support.

I express my immense appreciation, reverence, sagacious sense of gratitude & cordial appreciation to my supervisor, Dr Madhu Dikshit, head cardiovascular unit, Pharmacology division, Central Drug Research Institute (CDRI) for her precious ideas, suggestions & continuous support during my present research activities. She was a continuous source of inspiration and encouragement at times most needed and provided constant supervision and precise direction to complete this work in time. Besides her scientific guidance I will always thankful to her for development of scientific attitude in me.

I wish to express my sincere gratitude to Dr. T. K. Chakroborty; Director, Dr C.M. Gupta, Dr R.K. Tuli; Ex Directors and Dr. Ram Raghubir, Head Pharmacology division, CDRI for providing me all required facilities inside & outside the institute during the tenure of my dissertation.

I also wish to extend my thanks to Dr. V. K. Bajpai, Head EM unit, for his valuable help whenever I required during the work, specifically related to confocal analysis and Electron microscopy studies, and Dr. M.K. Barthwal for his critical suggestions and trouble shootings. I admire him for his great data analysis ability.

The present research had work started with collection of blood and Bone marrow samples, so I sincerely wish to thank Dr. S. Nityananda (Head, Hematology division), Dr Anupam Verma, Dr. N. Tripathi and Dr. Gaurav Srivastava, SGPGI, Lucknow, UP For providing me those precious samples.

I wish to thank Dr D. K. Dikshit, Dr. C. Nath, Dr. R. Sukhla, Dr. G. Palit, Dr. S. K. Rath, Dr M.P. Singh, Dr. P. S. R. Murty, Dr S. A. V. Raghvan, Dr. Prashant Sharma, Dr. A. A. Sahasrabuddhe, Dr. B.N. Singh, Dr. A.K. Misra, Dr. K. Mitra, Dr. Prem P Yadev, Dr. Arun K Triwedi, Dr. Saman Habib and Dr K. Hanif for their kind help whenever required.

I would like to express my thanks to Dr. Krishnamurthy (NCBS, Bangalore) for helping in confocal imaging and teaching the basics of cytometry and Dr. M. K. Bhat (NCCS, pune) for helping and guiding me during my visit to NCCS, Pune. That experience was very valuable in my research work. This work was incomplete without the help of Dr. A. K. Jain (Scientist In-charge EM Facility, Institute of pathology, New Delhi), who help in TEM image acquisition when I short of time.
I also like to acknowledge the Dr. Paresh Jain, Mr. Dinesh Chandra, Mr. T. Nagarjuna and staffs of BD, India for help me in flowcytometry and cell sorting which was not possible without their help.

I owe my particular heartfelt thanks to some of my altruistic, caring & supportive friends, who created a friendly niche for me, to work in a pleasant manner in my laboratory. My special thanks goes to Dr. satyananda patel (for providing help in lab works, guidance as an readers of between lines), and Dr. William R. Surin for my management skills in lab, Dr. Rashmi Saini, Dr. Sarika Singh, Dr. Rohit Saluja and Dr. M. chatterjee for their help and guidance. I would never forget the cooperation and the moment spent with my collegues Rajeev, Anupam, Ravi, Ankita (for maintaining fresh environment & management in lab), Manish, Vishal, Prem, Vivek, Kanishka, Prasad Admane, Salini Kishore, Santosh, Richa, Sushmita, Sheshu, Divya, Juhi, Dr Pari, Dr Saxena, Dr Shankar Narayanan, Dr Heera Bhalla, and Brajesh for the entire period & finally Mr. Shahid (cool and honest lab attendant for the steaming hot cup of tea in the afternoon) who helped the lab as a regular visitor of store & for every essential need and for continuing tea club in evening.

I would also like to thank my seniors and friends colleagues from pharmacology division—Anirudh Singh, Dr. Sudipti Gupta, Dr Manish Gupta, Dr. Puja Garg, Dr. Upasana Sharma, Sharwan K. Mishra , Dr. Rishi Sharma, C.S. Blesson, Mrs Sheeba, Shawon, Anchal, Rahul, Ethika, Supriya, Rituraj, Pradeep, Vikas, Abhishek, Neelendra, Manavi, Ausaf, Pratibha and Neetu for providing amiable atmosphere. And Dr. D.C. Nainwal, Dr. Shirish, Srikant from SGPGI, Lucknow.

I am pleased to extend my thanks to my cricket ground friends (Colleagues and scientist of CDRI) with whom I use to forget all my worries and able to relax my mind and soul. They help me to take right decision, give me right advice & experimental help during my research work; Dr. Suresh L. Mehta, Dr. Sanjeev Noel, V. Prasuja Nakka, Rajkumar Verma, Jitendra Madan, Vikas Jain, Dr. Prasoon Kumar Gupta, Naseeb Singh, Prabhat Singh.

When emotions are involved words cease to men. There are no words to pay my thanks to my friend Dr. Kulbhushan Sharma, Swapnil Gupta for all time help, support and love. It’s my pleasure to write about Dr. Akash Tomar and Dr. Avinash Mishra (my Pantnagar seniors), people of pleasant personality with wisdom, inspirational abilities and great sense of humour.

A warm thanks to Mrs Maduli Srivastava and Mrs Abha Arya for their patience during processing of samples of electron microscopy. I am also thankful to Dr Kavita Singh and Manish for help in analysing of sample under confocal microscopy. I would like to thanks to Mr AL Vishvakarma and Mrs Madhu Chaturvedi for flow cytometry experiments. Most importantly for the trust they all have shown on me.

I am grateful to be in the association of Mrs U Sharma, Mrs M Bhatnagar, Mrs TL Seth, Mr VS Nigam, Mr GP Singh, Mrs S Sengupta, Ms. Sachi, Mr
Ramesh, Mr S Mohan, Mr Mr B Bhusan and Mr RM Saxena in my working environment.

My special thanks go to Mr. CP Pandey for his support and continuous help regarding basics of instruments. Thanks to Mr. M S Ansari, Dr Surendra Singh, Mrs Jharna Arun and Mrs Kanta Bhutani for their concern and cooperation.

I would like to express my deepest and devoted thanks towards my roommate Dr. Ashok Singh and his wife Dr. Anupama Singh for their brotherly love that make my stay cozy and memorable. I specially miss their cute and loving daughter Astha. I shall always cherish the good times that we have spent together. My sincere thanks to my landlord Mr. Rajni kant and aunty ji for their kind concern and love.

The strong, confidant mental support & blessings towards me is from my late dada ji, parlised dadi ji, encouraging & passionate parents, Mr. Ram Niwas Verma & Mrs. Kaushalya for giving me affection, love, care and support. The love & affection of my brother Vipin Kumar, Bhabhi Sarla and niece Khushi is always with me during every moment of my life. To move the tempo of my life & research in a smoothly, speedy & uninterrupted way, the loving appreciation & love of my wife Rupali is admirable who always provide me strong motivation & energy to fulfil my dreams.

I would like to acknowledge CSIR for the financial support in form of Junior and senior research fellowships. Financial assistance of CSIR network project MLP0008B is duly acknowledged.

Last but not the least; I am obliged to all the people who donated their valuable blood and bone marrow samples for this work. The sacrifice of all the animals used for present work is also unforgettable.

(Sachin Kumar)