All praise to Almighty who always bestowed me with ample patience and perseverance that paved the path to keep me going through thick and thin for the accomplishment of this Endeavour...

I take this opportunity to express my sincere and profound gratitude to my supervisor Prof. Najmul Islam, Department of Biochemistry, Faculty of Medicine, Jawaharlal Nehru Medical College, AMU, Aligarh, India, for his immensely valuable suggestions and constant encouragement throughout the study. My association with him also taught me to appreciate the value of patience, sustained efforts and humility in the development of healthy scientific temperament. His broad knowledge, critical thinking and hard working are of most value for me. I am indebted to him more than he knows.

I would like to thank Prof. Khursheed Alam, Chairman, Department of Biochemistry, Faculty of Medicine, J N Medical College, AMU, Aligarh, India, for his valuable support and encouragement.

I would like to thank Prof. Asif Ali, Prof. Mashiat U Siddiqui, Dr. Khushtar A Salman, Dr. Abul Faiz Faizy, Dr. Shugufa Moin and Dr. Moinuddin of Department of Biochemistry, Faculty of Medicine, J N Medical College, AMU, Aligarh, India, for their valuable support and encouragement.

I extend my sincere thanks to Dr. Mazhar Abbas, Department of Orthopedic Surgery, Faculty of Medicine, J N Medical College, AMU, Aligarh, India, for providing me the blood samples of osteoporotic patients and healthy individuals.

I am highly grateful to Dr. Jawed Iqbal, Dr. Sohail Hussain, Dr. Hamida Thakur, Dr. Irfan Ahmad Ansari and Dr. Saba Ahmad for being very helpful and supportive seniors. I am cordially grateful to my lab-mates and really short of words to thank my colleagues, Mr. Mohd Azhar Imran, Dr. Reena Singh, Mrs. Faiza Ismail, Ms. Shireen and Mrs. Nishat Fatima for being ever ready to help. It was a treasured pleasure to work with them.
My heartfelt thanks go to the Senior Resident of department Dr. Manzoor Ahmad Gatoo and other Senior Researchers Dr. Zarina Arif, Dr. J M Ashraf and Dr. Shazia Aman.

My heartfelt thanks go to all the Research Scholars of the department Mr. Mir Yasir Arfat, Mr. Abdul Rouf Mir, Mr. Parvez Ahmad, Mr. Badarul Islam, Ms. Sarah Ashraf, Ms. Sidra Islam, Mr. Asif Zaman, Mr. Irfan Qadir Tantry, Mr. Mohd. Adnan Khan, Ms. Naureen Fatima, Ms. Shireen Naaz Islam, Ms. Somaiya Matten, Ms. Minhal Abidi and Ms. Heena Imtiaz Malik.

My heartfelt thanks go to the MD Students of the department Dr. Ricky Mittal, Dr. Jyoti, Dr. Shaziya Allarakha, Dr. Md. Shamim Ahmad, Dr. Mohd. Arif Iqubal.

I am also very much thankful to all the non teaching staff members of the department for their support and encouragement throughout the study.

I am indeed thankful to my friends Dr. Kausar Neyaz, Dr. Neesar Ahmad, Dr. Arif Ahmad, Dr. Ejaz Ahmad, Dr. Shafeeque Ahmad, Dr. Javed M Khan, Dr. Gulam Rabbani, Mr. Mohd Adil, Mr. Faheem Ansari, Mr. Mohsin Vahid Khan and Mr. Bakhteyar Ghazee with whom I have shared nice moments of my research life. Their advices and suggestions are deeply appreciated. I express my heartiest thanks to Faizan for always being with me and solving my problems.

I also want to take this time out to pay homage to Sir Syed Ahmad Khan who founded the Muhammedan Anglo-Oriental College (today Aligarh Muslim University) in 1875 with the aim of promoting social and economic development of Indian Muslims.

Most importantly, I would like to express my heartfelt and loving gratitude to my parents. Their love, care, and support did not let me down not only even in the difficult phases of my research work. No word can express my feeling for them. It’s their hard work, sacrifice, prayers which is bound in this thesis. I certainly owe a great debt of gratitude.

I extend my thanks to my brother Mr. Mohsin Hasan and my sisters Dr. Azma Maqsood and Dr. Huma Maqsood for always being understanding and
very supportive. I am in short of words to thank my wife Mrs. Mumtaz Abida for always being helpful, appreciating and also critical wherever required and for all the times when he had to take up my share of responsibilities without any complaints. Last but not least, I want to express my love and sincere blessings to my son Muhammad Abdullah Hadi whom I have not given enough time because of my busy schedule. I am also very thankful to all my relatives for their support and encouragement.

Lastly, Indian Council for Medical Research (ICMR), vide project file no.59/14/2008/BMS/TRM and University Grants Commission (UGC), New Delhi is gratefully acknowledged for providing financial assistance during my research work. I am also very much thankful to Aligarh Muslim University, Aligarh for providing me the support in carrying out this piece of work. Furthermore, I would like to thank everybody who was important to the successful realization of this thesis, as well as expressing my apology that I could not mention personally one by one.

(Wasil Hasan)