ACKNOWLEDGEMENT

A journey is easier when you travel together. Interdependence is certainly more valuable than independence. This thesis is the result of six years of work whereby I have been accompanied and supported by many people. It is a pleasant aspect that I have now the opportunity to express my gratitude for all of them.

The first person I would like to thank is my supervisor and dean, Prof. R.N.K Bamezai. During these years I have known him as a sympathetic and principle-centered person. His overly enthusiasm and integral view on research and his mission for providing 'only high-quality work and not less', has made a deep impression on me. I owe him lots of gratitude for having me shown this way of research. He could not even realize how much I have learned from him. I am indebted to him for his guidance and freedom to realize my scientific inquisitiveness and having reposed unstinting faith in my abilities. I sincerely wish to imbibe his poise, uncompromising, humble and affable nature.

I would like to thank all the faculty members, dean (past and present) at School of Life Sciences for providing stimulating ambience and cooperation to pursue my work. I would also like to thank the faculty members of Center for Biotechnology for introducing me to this exciting field during my M.Sc study. I am fortunate to find a mentor like Prof K.J. Mukherjee whose friendly pep talks and guiding notions have always been a source of strength to carry on in life. I will always cherish the time spent with him.

I thank Mr. Saini for extending his excellent photographic skills. I sincerely thank Dr. Alexander, Dr. Sharma, Mr. Khan, Mr. Mishra and all the CIF and CCIF staff and SLS office staff for their assistance in various ways.

I greatly acknowledge Indian Council of Medical Research (ICMR) and National Center of Applied Human Genetics (NCAHG) for the financial assistance.

I express my sincere thanks to Dr. B.S.N Reddy, Former Head of Department of Dermatology and Sexually Transmitted Diseases, LNJP hospital, and his team Dr Atul, Dr Chander Grover, Dr Soni Sood, Dr Surjeet, Dr Vineet
Relhan, Dr Manmohan Lohra, Dr Monika, Dr Shail for their invaluable help in providing me with patient samples and their clinical details. I shall always remain indebted to all the leprosy patients and normal volunteers for donating their blood without which present study would have been simply impossible. I sincerely appreciate the timely help rendered by Prof. Jason P. Sinnwell, Department of Statistics, Mayo clinic, USA for providing intricate details of using HaploStats software and Prof. P. M. Kulkarni for his help in statistical analysis of the data.

I acknowledge the love and care of my M.Sc friends Yogi, Mukesh Verma (panditji), Ravi bholla, Nikhil, Naveen babbar, Mamta, Suman, Shefali, Deepika, Sonika, hariharan, Satrajit, Vijayan, Anjana, Deepa, Ravi Tandon, Nitin sabherwal, Harish who made my stay in CBT memorable. I thank all the past and present students of school of life sciences especially Anshuman, Siddharth, Divya, Nivedita, Ruchi, Sanjay, Rana, Sonal, Ishani, Himanshu, Dinesh Pal (the great pal), Anupama, Sushilji, Vikas, Parul, K.P, Bindu, Sindhu, Dilip, Manveen, Vibha, Jyoti, Anita, Nidhi, Aslam, Suchendra and Divya. All gave me the feeling of being at home at work. Many a thanks to my friends at ICGEB- Panjab, Ajay and BN. Singh and at NII- Mohan and Vicky.

I will always cherish the cordiality of all my colleagues Neelkanth, Sameer, Yash, Sridevi, Alka, Prem, Poornima and Simarjit throughout my PhD tenure. A special mention for a dear friend, Vibha Madan, whose pleasing personality and lively giggles always made me comfortable.

This journey would have never been completed without the unabiding love, affection and support of my incredible lab members. The love and guidance of my seniors Dr Anjana Saha, Dr Anand Ranjan, Dr Narendra Bairwa, Dr Anitha and Dr Reetakshi Arora has made this work possible. I am thankful for the warmth and affection of my labmates Vibhuti, Audesh, Kamal, Ashish, Madhuri, Sailesh, Irfan and Shivani. My sincere thanks to Katayoon Darvishi (Cathy) for her timely and invaluable help in completing my work. I will always cherish the incredible support and company of Ekta and Sawerkar.
I am very thankful to Sangeeta and Somnath for the timely computer assistance. The help extended by Kashif, Mr. Ganshayam and Mr. Kamta Nath their laboratory assistance is acknowledged. Words fail to express my gratitude for my dear friend Roy Jose. I cherish each and every moment spent with you. Your discussions helped me to keep the universal spirit that is essential for both religion and scientific research. Lots of thanks.

I had the pleasure to supervise and work with several students who did their project and summer training work in our project and have been somehow beneficial in their research endeavors. My sincere acknowledgement for the invaluable help provided by Deepti, Pankaj (babu), Arpana, Ritu and Meha. I will fondly remember their affection, care and and the immense sense of responsibility.

Additional energy and vitality for this research was provided externally through my involvement in several extracurricular activities. Prominently, our annual cricket competition at NII and JNU. I would like to thank all my cricket pals-Tyagi, Khurram, Mohanty, current CBT students and many others who provided an additional and joyful dimension to my stay in JNU.

I thank Gopalanjji, ajay, ashok and babua (godavari dhaba) for their love, care and service.

The wonderful company of the biggest asset of my life, my dear friends Ashu, Amardeep, Yogi, Puneet, Manoj (bhaiya), Mukesh, Mohan, Gopu, Patro and Himanshu (Tiger) is what I have earned all these years. Your Tommy will always miss you.

I feel a deep sense of gratitude for my family, my pillars of strength, who formed part of my vision and taught me the good things that really matter in life. I am grateful for my sister Shveta, Guddu, Jiju Puneet, brother sanjay and bhabhi anupam for rendering me the sense and the value of compassion. Their presence in my life makes me feel special.

Dheeraj Malhotra