

Acknowledgements

"सफलता उनको मिलती है जिनके सपनों में जान होती है
पंखों से कुछ नहीं होता होंसलौ से उड़ान होती है"

Embarking on a Ph.D. program is akin to embarking on a journey - a journey that requires a well-defined plan, a great deal of patience, and the perseverance to overcome numerous obstacles. Despite the many challenges, however, the journey is ultimately rewarding, leading to a beautiful destination. Yet, as with any journey, the company you keep is just as important as the destination itself. I recognize that without the invaluable support, encouragement, and assistance of my guide, family, and friends, I would not have made it to this destination. While words cannot fully express my gratitude to these individuals, I wish to extend my heartfelt thanks to each and every one of them.

First, I would like to express my heartfelt gratitude to my Ph.D. guide Prof. Rasheedunnisa Begum, whose unwavering support and guidance made this research possible. Your wealth of knowledge, expertise, and dedication have been instrumental in shaping me as a researcher and helping me achieve my academic goals. I am grateful for your patience, encouragement, and invaluable insights throughout this journey. Your constructive feedback and critical analysis have been instrumental in inspiring me to pursue excellence, and I consider myself fortunate to have had you as my mentor. Your steadfast support and guidance have been a source of motivation and inspiration for me, and I am grateful for the contribution you have made to my academic growth. I hold Prof. Rasheedunnisa Begum in high regard for her dedication and sincerity towards work. Her principles have been a source of inspiration for me, and I aim to integrate them into my life to enhance my personal and professional growth. I am grateful to Madam for placing her trust in me and continuing to have confidence in my abilities to complete this research. I will always be indebted to her for the guidance, support, and encouragement she has provided throughout this journey.

I would like to express my deepest gratitude to my parents and sister, whose love, support, and encouragement have been the driving force behind my academic success. Throughout this journey, they have stood by me, offering words of encouragement during challenging times and providing me with the necessary resources to achieve my goals. Their unending patience and understanding have been an endless source of inspiration for me, and I am forever grateful for their guidance

and unwavering support. I owe them an immense debt of gratitude for instilling in me the importance of education and providing me with the tools to pursue my academic aspirations. Their unwavering faith in my abilities has been a constant source of motivation and has given me the confidence to overcome the most challenging obstacles. This achievement is as much theirs as it is mine, and I dedicate this thesis to them with all my heart. I would like to express my deepest gratitude and appreciation to my loving fiancée, Dr. Vidhi, for her support and understanding throughout my Ph.D. journey. Her presence has been an endless source of encouragement, comfort, and inspiration.

I wish to extend my sincere gratitude to my senior, **Dr. Shahnawaz Jadeja**, for his invaluable guidance and support throughout my vitiligo research. His expertise, insightful brainstorming sessions, and thorough examination of the research problem from all angles have been instrumental in shaping my approach to the study. Moreover, he encouraged me to engage with fellow scientists and scholars during conferences and share knowledge and ideas with them.

I express my gratitude to Prof. C. Ratnaprabha, who currently heads the department, and Prof. Sarita Gupta, the former head, for their support and for making all research facilities available to me. I also extend my thanks to the entire teaching faculty for their valuable insights and assistance, which greatly contributed to the significance of my thesis. The Department of Biochemistry has been instrumental in providing the necessary resources and equipment that I needed to produce and successfully complete my thesis. I would also like to thank my Doctoral committee members Prof. Rajesh Singh, Prof. Vihas Vasu and Dr. Ratika Srivastava for their constant positive evaluation during all my annual R&D presentations, valuable scientific suggestions and enriching my understanding.

I would like to express my heartfelt gratitude to the esteemed members of the vitiligo team who have been source of support and solace during challenging times. My deepest appreciation goes to Prof. Mitesh Dwivedi, Dr. Naresh Laddha, Dr. Shoaib Mansuri, Dr. Mala Singh, and Dr. Shahnawaz Jadeja for their constant presence and invaluable guidance. Their support has been the backbone of our team. I am immensely grateful to my fellow lab mates, Dr. Ashlesha Kadam, Dr. Roma Patel, Dr. Nirali Rathwa, Dr. Sayantani Pramanik, Nishant Parmar, Darshan Mehta, Jay Mayatra, and Dhairya Rajguru. Their camaraderie and enthusiasm have created a joyful lab environment, making our work more enjoyable and productive. The memories we have shared together, from lively conversations and celebrations to

house parties, movie nights, and memorable trips, will forever be cherished. I am grateful to each and every one of them for making this journey truly wonderful. I would also like to extend my special thanks to the M.Sc. dissertation students and intern students, namely Farheen Khan, Madhu Yadav, Jyoti Parmar, Shruti Rane, Chandrakala Maheshwari, and Sabila Shekh. Their contributions and hard work in this study have been invaluable.

I thank all the research scholars in the department, especially, Raju Dabhi, Dr. Gurprit, Sejal Ma'am, Dr. Dhruv, Aakash sir, Tanvi Ma'am, Dhruvi, Kishan Purohit, Prashant Sudra, Minal Mane, Ananya Mahapatra, Gautami, Kanchan, Saif and Sandeep, for making the working environment enjoyable. Special thanks to Raju Dabhi for encouraging me to pursue Ph.D.

I am also gratified to all the non-teaching staff members, especially, Sandeep bhai, Manish bhai, Shailesh bhai, Balavant bhai, and Anil bhai for the proper functioning of the office work. Also, I wish to express my gratitude to Bhartiben for taking care of the project funding-related work. Special thanks to Vijay bhai from our animal house for making the office environment joyful. I also thank Milind dada and Mayurbhai, at the University office for helping me with the academic-related work.

I am indebted to all Vitiligo patients and Control subjects who voluntarily helped me and participated in this study. I am thankful to our clinical collaborator Prof. Y.S. Marfatiya, ex-Head of the Skin, and V. D. department, S.S.G. Hospital, Vadodara, without his help and support the work would have not been possible. I am thankful to him, for his help in arranging vitiligo camps and sample collection of vitiligo patients. Many thanks to an energetic young dermatologist, Dr. Ankit Bharti (Govt. Hospital, Vyara) for vitiligo patients' sample collection from vyara.

I wish to thank my hostel warden Dr. Sanjay Solanki for all his support throughout my hostel life. I am obliged to my hostel friends Sandeep Dantusalia, Akash Gujarati, Pavanda, Puneetbhai, Naru bhai, Pankaj Sharma, Dhaval Bhatt, Pravin Patil, Vishwajit Chavda, Naresh Degda, Atul Tiwari, Narrotam, Parikshit, Hemil and Brijesh Patel for sharing each and every hostel moment, beautiful memories and awesome food.

I would like to acknowledge Gujarat government for awarding me the SHODH fellowship.

A great thanks to the most amazing friends I have and my constants...Sandip Surti, Drupal Sudani, Pooja Tabiyar, Nishant Parmar, Raju Dabhi, Darshan Mehta, Prashant Sudra, Dhaval Mungra, Dhaval Nirmal (Bhaibandh), Disha Patel, Prarthi Sagar and my friends at the University who are always there to share all sorts of good and bad moments, consoled me in my bad times, listened to my silly complaints tranquilly, understood me, helped me regain healthy mind and healthy body, supported & encouraged me...for all kinda fun we had together, Birthday parties, surprises, entertaining me with a huge repertoire of anecdotes and stories, for random treats, and bearing the brunt of my frustration and rages. Thanks a lot!!! Without you all I am incomplete...

Finally, I would like to express my profound gratitude to the divine presence of God Almighty, whose abundant blessings and unwavering guidance have enabled me to successfully complete this thesis. Throughout this journey, I have been humbled by the countless instances where I felt the grace of God, as unexpected opportunities arose and divine inspiration uplifted me during moments of adversity. In every step of this endeavor, I have witnessed the hand of God, illuminating my path and instilling within me the strength and resilience to persevere. It is through His divine intervention that doors were opened, leading me towards unexplored avenues and empowering me to overcome moments of doubt and desolation.

Thanks to one and all who directly or indirectly, lent their helping hand in this endeavour.

"Imagination is more important than knowledge"

-Albert Einstein