Dedicated
To
My Research Guide
and Family
Acknowledgement

I would like to take this opportunity to offer my heartfelt thanks to a number of people without whose help and support, this work would never have been possible.

In the first place I would like to express my deepest gratitude to my esteemed Supervisor, Prof. Ambikanandan Misra for his supervision, advice, and guidance from the very early stage of this research as well as giving me extraordinary experiences throughout the work. Above all and the most needed, he provided me unflinching encouragement and support in various ways. His truly scientific intuition has made him as a constant oasis of ideas and passions in science, which exceptionally inspire and enrich my growth as a student, a researcher and a scientist. I am indebted to him more than he knows.

I express my sincere thanks to Prof. M. R. Yadav, Head, Pharmacy Department, and Prof. (Mrs.) S. J. Rajput and Prof. (Mrs.) K. K. Sawant Coordinator, G.H. Patel Pharmacy Building, Pharmacy Department, for having provided me with the necessary laboratory facilities and congenial ambience. I owe my deepest gratitude to Prof. (Mrs.) Rajani Giridhar, Dr. Rajashree Mashru, Dr. Prashant Murumkar, Dr. Manisha Lalan, Mrs. Hemal Tandel, Dr. Hetal Thakkar, Dr. Neeraj Sethiya, Dr. P. Nagar, Mr. S.P. Rathod, for their valuable suggestions and help whenever sought for. I take this opportunity to express my thanks to non-teaching staff members at Pharmacy department, Kalabhavan and Pharmacy department, G. H. Patel Building for their kind cooperation.

I would like to express gratitude to Dr. Gregory Adams, Dr. Heidi Simmons and Dr. Reema Railkar, Fox Chase Cancer Center, Pennsylvania, USA for providing me the gift samples of pCYN2 B10 scFv plasmid as well as for sharing their experience about scFv purification and FACS analysis. I also express my special thanks to Prof. Sarita Gupta, co-ordinator, DBT-ILSPARE for providing all the equipments and facilities to carry out cell culture studies. I take a special note of thanks to Dr. Jagat Rathod, Akhilesh Prajapati and Komal Rawal for their untoward help to carry out cell line studies. I would thank Dr. Manika Pal Bhadra and Indira Bag, IICT Hyderabad and Director NCCS for providing Breast cancer cell lines. I am thankful to Director, SICART, Vallabh Vidhyanagar for carrying out TEM studies. I am thankful to the Head, Metallurgy Department, Dr. Bharati Rehani and Dr. Vandana Rao, Lecturer,
Department of Metallurgy, The M. S. University of Baroda for carrying out SEM and XRD studies.

I would also like to extend my appreciation to my colleagues and friends, especially Dipesh Baradia, Girish Kore, Nirav Khatri, Mohan Rathi, Atul Kolte, Imran Vhora, Priyanka Bhatt, Ajanta Kore and Jitendra Amrutiya for their advice and their willingness to share their bright thoughts with me, which were very fruitful for shaping up my ideas and research.

Special thanks to Sushilkumar Patil, Ravi Gandhi, and Hinal Patel for their valuable support during thesis writing. I wish to express my heartiest thanks to my dear friend Hardik Gandhi for the help provided by him during all in vivo experiments. I wholeheartedly thank him for his tireless efforts in all these studies without any constraint.

I take great pleasure in thanking my dear friends Praveenkumar, Rahul, Piyush, Jagruti, Aditi, Abhishek Pathak, Karan, Chintan, Riddhish, Mohit, Reshma, Ashish, Mahesh, Mahesh, Neetesh, Atul and all others, whose name I might be missing, for their support and encouragement, the moment with whom cannot be forgotten. I thank all those for every one of effort they contributed.

I take this opportunity to sincerely thank the Indian Council for Medical Research (ICMR), New Delhi for the financial support in term of Senior Research Fellowship during this course.

Where would I be without my family? My family deserves special mention for their inseparable support and prayers. Whatever Endeavour I have put to complete this work, would not have been possible without their support. I deeply thank my parents, brothers, sister-in-laws, my sweet nephew and all family members for their never-ending love and support throughout the years and their encouragement and confidence in me. Words fail me to express my gratitude to all my family members, theirs dedication, love and persistent confidence in me. I owe for their patience until completion of my dissertation.

Finally, I would like to thank everybody who was important to the successful realization of thesis, as well as express my apology that I could not mention personally one by one.

Chetan Yewale