
ACKNOWLEDGEMENTS

I would like to express my sincere respect and heartfelt gratitude to my supervisor Dr. Ranadhir Chakraborty, Associate Professor, Department of Biotechnology, University of North Bengal, Darjeeling-734 013, West Bengal, India, for his excellent guidance, constant encouragement and valuable suggestions throughout the course of my research work. His perpetual inspiration and philosophy give me an enjoyable experience not only in journey of research but it will also be memorable in future. He was the one, who gave me the strength to fight in every harsh situation that often created hindrances throughout the journey of my life...

I express my sincere thanks to the Hon'ble Vice-Chancellor and Registrar, North Bengal University, for granting me the privilege to carry out my research work in my beloved University.

I express my warm regards and deepest gratitude to all the faculty members of our Department, Dr. Dipanwita Saha, Dr. Shilpi Ghosh, Dr. Anoop Kumar for their constant motivation during my research work.

I am thankful to all the non-teaching staff members of this Department for their co-operation and support especially Dipak Da, Raja Da, Biswajit Kaku and Papai Da.

I record my special thanks to all my seniors' research scholars and friends of my laboratory: Dr. Shriparna Mukherjee, Dr. Suparna Saha Bhowal, Dr. Arvind Kumar, Dr. Krishna Kant Yadav, Mr. Bipranch Kumar Tiwary, Mr. Subhonil Chakraborty, and Mr. Vivek Kumar for their kind help and co-operation.

I am also thankful to Mr. Ipsita Kumar Sen, Dr. Soumyananda Chakraborti, Ms. Shamila Sarwar and Mr. Dilip Kumar Manna, for their active co-operation during the research work.

It's a great pleasure to express my sincere thanks to Prof. Syed Sirajul Islam, Department of Chemistry and Chemical Technology, Vidyasagar University, Midnapore-721 102, Prof. Pinak Chakrabarti, Professor, Department of Biochemistry, Bose Institute, Kolkata-700 054, West Bengal, India and Dr. Pradipta Saha,

Department of Microbiology, Burdwan University for their co-operation and helpful suggestions.

I am extremely thankful to Mr. Barun Majumder, Bose Institute, Kolkata-700 054, West Bengal, India, for preparing NMR spectra.

I express my profound regards to my beloved parents (Shri Deepak Kumar Mandal and Smt. Rekha Mandal), my brother (Samit Kumar Mandal), and my best friend (Srijana Darnal), for their inspiration and encouragement throughout the whole course of my work. It is very difficult to mention every individual name and his/her contribution in my life. I thank all of them.

I greatly acknowledge the University of North Bengal for providing financial assistance.

Amit Kr. Mandal ,
(Amit Kumar Mandal)

Department of Biotechnology,
University of North Bengal-734 013,
Darjeeling, West Bengal, India.