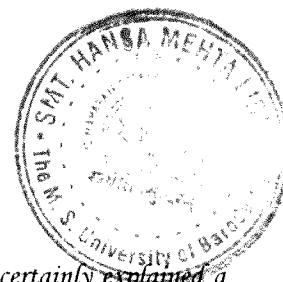


ACKNOWLEDGEMENTS



My thesis submission marks the end of a long and eventful journey which has certainly explained a vital fact of life, that "STRENGTH does not come from winning; it is your STRUGGLE which develops your strengths". When my voyage commenced; I was not sure where I would land up! But it is with the incessant efforts and support of numerous people, that I could arrive at my destination successfully and satisfactorily. With this, before I actually conclude my voyage, I would like to take the privilege of acknowledging all those who helped and supported in their own decisive ways.

I am not at all exaggerating when I admit that I am indebted to my research supervisor Prof. G. Naresh Kumar, better known as NK Sir, for his precious guidance; scientific counseling; never-ending patience, optimistic approach and powerful words of encouragement. His endless zest for science always has provided a positive thrust while the tea-time discussions with him on any-and-every topic on this earth, hardly made us feel like his students. I am extremely grateful to him for giving me an opportunity to learn, think and work in a healthy and liberal environment at Molecular Microbial Biochemistry Lab (MMBL). A practical lesson that always came from him when he said "You are not here to change the system; indeed make the most of the existing system and push ahead" had almost everything to explain if understood. With all the hurdles coming along, I would certainly not have been where I am, if NK Sir wouldn't have been the way he was, absolutely incredible. Nevertheless even after all this; if I am satisfied expressing my gratitude towards him using these mere dictionary words, I am still lacking something. Thanks a Ton Sir!

I would like to express my deep gratitude to Prof. Tara Mehta (Former Head of the Department) and Prof. G. Naresh Kumar (as the Current Head of the Department), for providing the entire basic infrastructure including library, internet and other research facilities as well as for developing a great work culture with a sense of teamwork and healthy competition in the department. I am thrilled to have worked as a part of the department in its best developing phase.

I extend my heartfelt thanks to Dr. G. Archana, Department of Microbiology and Biotechnology Centre, for her tremendously helpful critical comments and excellent analytical skills which helped adding a different meaning to my research work. Thanks a lot for always being there to support anytime; be it in the form of providing the resources or finding instant solutions to stuck-up research problems. Above all, I always relished the delicious food served with a flavor of warm hospitality. There was a lot to learn from you apart from research.

Working with hard-core enzymology was almost next to impossible if the tutor would not have been DR. S. R. Acharya. He deserves an extraordinary mention for embossing the fundas of enzymology in my mind that helped me designing; pursuing, scrutinizing and contouring my research work. After all his intense motivation helped me building up self-confidence to continue in M. Sc. (Biochemistry).

I am sincerely grateful to Dr. Rasheedunnisa Begum, for allowing me to use her lab facilities and for her constant encouragement to sincerely do good and competitive science. Thanks are due to Dr. Jayshree Pohnerkar for her timely guidance, bench-work tips to overcome the small yet troubling practical problems, for allowing me to use her lab facilities and for making me realize that sometimes the most unseen requires the maximum attention.

I am extremely grateful to all my teachers; Prof. Tara Mehta, Prof. S. S. Katyare, Prof. S. D. Telang, Dr. M. D. Jani, Dr. Rasheedunnisa Begum, Prof. Sarita Gupta, Dr. S. R. Acharya, Dr. Jayshree Pohnerkar, Dr. Pushpa Robin and Dr. C. RatnaPrabha for building a strong foundation of the subject during M. Sc. Further on, their valuable comments and encouraging words always kept my spirits high throughout the research tenure. Dr. LaxmiPriya has been a special figure during these years, whom I encountered as a research colleague (senior) as well as a lecturer later on. I will always admire and remember her for her pragmatic approach under any given situation.

Thanks are due to the office staff including Mr. Pethe, Akshitaaben, Shaileshbhai, Manishbhai and all other staff members for their standing help and guidance in all the official matters. Thanks a lot, Rameshbhai (Nare) for keeping the Store open for me any time whenever wanted. Thank You so much Bhartiben, for settling the project accounts smoothly and ensuring timely payment of the fellowship. Thanks to Kalpesh and Anilbhai for helping me out with lab maintenance and make it an organized place to work in. I specially thank Mr. Jeetendra Dave for patiently listening to our sudden but urgent demands for chemicals/fine-chemicals and trying his levels best to deliver the order in time.

I sincerely acknowledge the Department of Biotechnology (DBT), Government of India, for the JRF fellowship.

I deeply acknowledge Prof. H. Mori for recommending the NARA Institute of Science and Technology, Japan, for providing me with the required E. coli ppc strain free of cost; E. coli Genetic Stock Center, Yale University, U.S.A, for providing the E. coli cs strain; and Prof. B. N. Johri, Pantnagar University, for providing the rhizospheric pseudomonad isolates. These tools proved to be very useful during the course of my research.

Well! The MMBL ship with NK Sir as Captain was incomplete without a vast crew of research scholars. I wish to acknowledge Dr. Siddharth Srivastava, the senior-most research student when I was a freshie, who helped me get acquainted to the lab and learn to begin. Vikas Sharma, Divya Patel and Dr. Prashant Kunjadia have been great seniors, who made me realize in their own striking ways, that research is much more than just experiments. My buddies Dr. Gopit Shah and Jisha Elias have been simply rocking. Hats-Off to the party planning ability of Divya and Gopit, who set and maintained the trend of Hi-Tea parties in the lab; believe me guys it was total fun. Every colleague was distinct; Vikas's ability to develop lab relations and contacts; Divya's perfection in work; Prashant's straightforwardness; Gopit's inclination to take any undertaken work to completion and Jisha's ability to judge the right-and-wrong and find a solution out; were worth admiring, applauding and learning. Sonal madam and Praveena madam have been sources of spiritual empowerment. The aspiring neophytes Jigna, Prasant Kumar, Chanchal, Hemanta and Jitendra made a great company and I wish for the best in their future ahead. I am deeply gratified to all my labmates for patiently listening and cheering to my non-stop "ever-melodious" singing (ha ha...).

I wish to express my warm and sincere thanks to Dr. Vihas Vasu, Dr. Jyoti Maroo, Dr. Jignesh Pandya and Dr. Subhash Katewa for sparing time from their busy schedules to make the requested research articles available to me whenever asked for. In this context, Mr. Chintan Vaishnav, MIT, U.S.A, deserves a special mention for taking the pain to search and scan the very old research articles and ensuring that I obtained them in time.

It was a pleasure having seniors like Keyur Dave, Shajil Madhavan, Dr. Samir Patel, Dr. Munjal Acharya and Dr. Zainul Saiyed who taught the dos and don'ts in research. I have shared few of the most fun-filled moments with you all. Thanks a lot Keyur for clicking a dozen of gel-pictures for me whenever I asked for. Thanks are due to Dr. Namita Kumari who explained the importance of making the most during initial phase of research and to Dr. Mukta Mohan for her ever-helpful elderly advices.

I am extremely thankful to Minal, Hiren and Dr. Samir for invariably storing the cytosolic fraction from liver, isolated during their hectic experiments, for me to use in my experiments. I had to just tell once and my job was done. Research was full of sudden planning of experiments but with the next-door-neighbours like Pradeep (better known as Mishra) and Hemendra, it was not a problem. The tension that "What if I run short of any reagent/resource in the midst of the experiment?" never came to me. Thankyou both! for being so supportive and collaborative as well as for making a wonderful and enjoyable company.

I would like to applaud my dissertation students, Rupal, Priyalakshmi and Bhoomi for being a great helping hand all along and for creating a fun-filled work environment.

Thanks to my research colleagues in Department of Microbiology and Biotechnology Centre, Ruchi, Geeta, Sanket, Falguni, Murli, Kuldeep, Nandan, Subbu, Ketan and Sumant for all lively and supportive interactions. A special thanks to Arif Khan for kindly providing the most-wanted plasmid.

***"A journey is best measured in friends rather than miles"** and I traveled along these miles in the fantabulous company of my dear FRIENDS.Jisha played a multi-faceted role; a fantastic friend, a great helping hand, sink to all my problems, partner to all my failures and achievements, a rocking traveling and shopping companion and what not. Companionship of my M. Sc. buddies Hiren and Minal took no time to turn into a strong friendship when we joined in for Ph. D. in the same year. I find no words to thank you both for a terrific moral support throughout. Cheers to my lunch-tea time gang including Hiren and Niraj (patience unlimited), Iqbal (a mind-boggling personality), Chirayu (with his marvelous sense of humour and flabbergasting comments), Gopit (the food-lover), Jisha (always listening), Hina (a perfect keen observer), Jyotika and Anubha (Rajputana rifles) for the action-packed entertaining lunch and tea sessions. Guest appearances by Keyur (the master-mind), Maulik (the computer wizard) and Hemendra (happy-go-lucky) added a flavour of spice to any-and-every discussion going on. Cheers to Prakash (the only authorized singer of the department) for ending all our gatherings on a melodious note. These words are still not enough for you all, friends! I am thankful to the beginners in the department; Purva, Swapnali, Mrunal, Anubha, Nidheesh, Naresh, Mitesh, Purna and Vijay for their pleasurable company and I wish them all the very best.*

I owe my research work to my dear Parents for their unconditional love and support, constant encouragement, difficult adjustments and for instilling in me, the moral values, confidence, faith, sense of responsibility, without which this work would not have been possible. Heli and Chirayu at home played a major role in re-energizing and refreshing the exhausted mind at the end of hectic daily work schedule. Thanks are due to my near and dear ones and family members for having faith in my abilities.

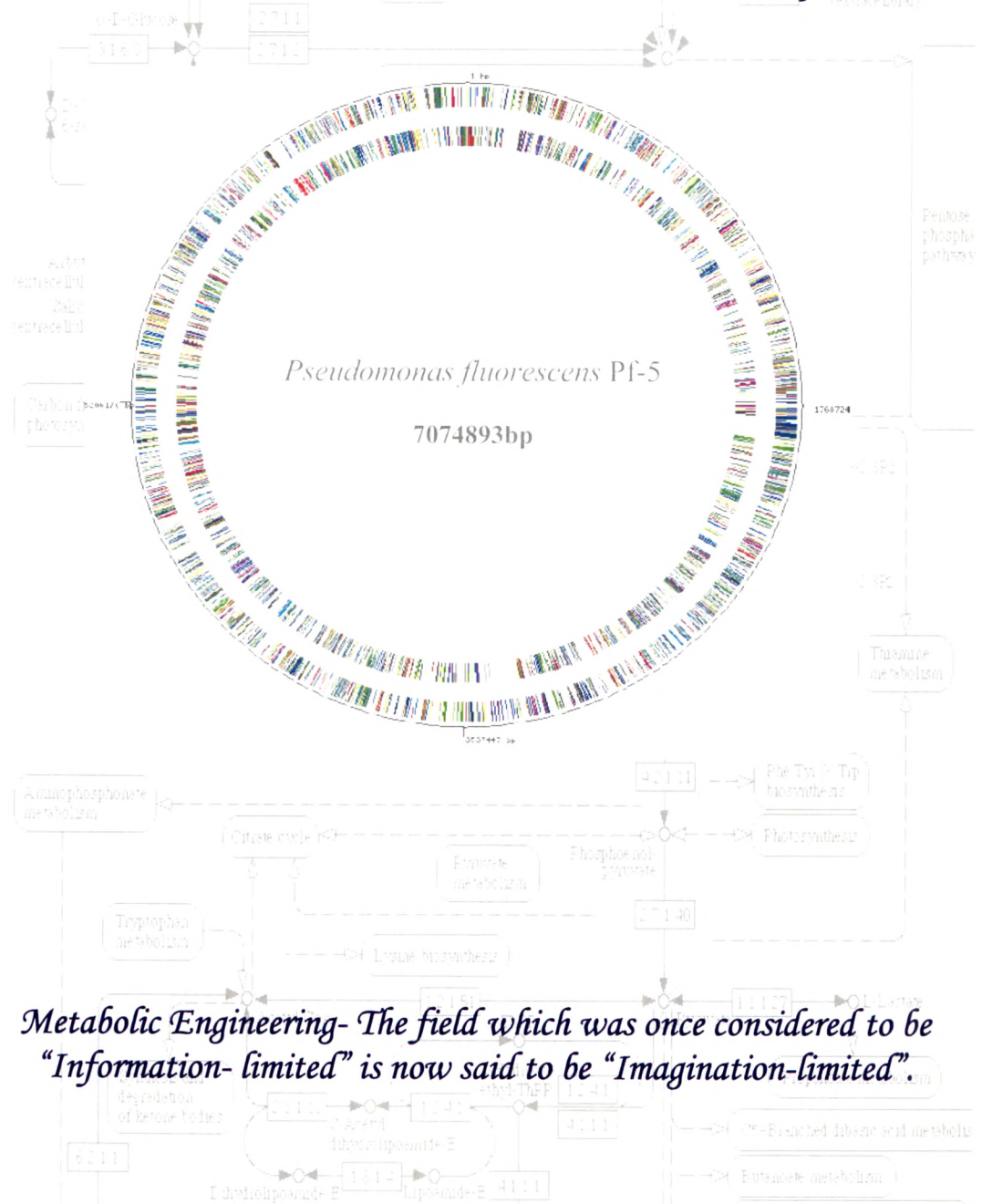
Ultimately, I bow down to God! The Almighty who bestowed me with a healthy mind and body as well as the strength to stand up to the expectations of my parents, teachers, family and friends.



Aditi D. Buch

with their background that not even the inhabitants notice they are strangers; in other words they achieve the highest accomplishment possible.'

Emily Post (1922)



Metabolic Engineering- The field which was once considered to be "Information- limited" is now said to be "Imagination-limited".