

Acknowledgements

My journey in Department of Biochemistry as master's student and then as Ph. D. student has been like a roller coaster ride. Coming to the end of Ph. D is really a great feeling but joining as Ph. D student was also better. The time I joined for Ph. D., my supervisor Prof. G Naresh kumar was Director, Institute of Science, Ahmedabad and that was real beginning of Ph. D.. It was possible because of many supporting hands and today I would like to take privilege of acknowledging all those who have been part of this journey. First, I would like to give big thanks to my supervisor for many-many reasons. To mention few of them: First; As mentioned earlier when I joined department as Ph. D student my supervisor was not here but throughout that period he use to come to lab on weekend and holiday to make sure that we are not facing any problem, Second; I am really thankful to you for supporting me every time for different fellowships and going to U.K, Third; discussions (science, FIFA world cup, daily news, NAMO, Cricket) every day during morning and evening tea time is something which I feel only lucky ones can get, fourth; of course for his precious guidance; scientific counseling; never-ending patience, optimistic approach and words of encouragement. Once again thank you very much sir! I would also like to extend my heartfelt thanks to Dr. G. Archana, Department of Microbiology and Biotechnology Centre, mostly for great hospitality, delicious food and for always being available when needed. Thank you mam for your kind support! Coming to Department of Biochemistry again, I would like to extend my warm thanks to my master's dissertation project guide Dr. Laxmi Priya Mam. Mam, you are the one who actually taught me many small-small expertise of animal experimentation, biochemical and enzyme assay. I still remember the day

when I told you that I won't be working on rats for sure in my Ph. D but I ended up doing my entire Ph. D work on the rat system☺. I would also like to thanks Prof. Rasheedunnisa Begum Mam as my master's teacher and always for supporting me as our own student of Department of Biochemistry. Dr. Sarita gupta for the ILSPARE facility and many more things. Dr. Acharaya sir for couple of things: First, I must say that he is the one who made this Ph. D to come to an end (Sorry, I cannot revel secrets here in words☺). Secondly; for making many of us realize how we "Hindustani" are hahaha. Thirdly for N number of lunch and dinner, thank you very much sir. I would also like to extend my thanks to Dr. Puspa mam, Dr. JP mam, Dr. CRP mam and all the newly joined faculties at Department of Biochemistry.

My big part of this work would not have been possible without *E. coli* Nissle 1917 provided by Dr Ulrich sonnenborn, Ardeypharm, Germany. Big thanks to you for providing this stain of probiotic *E. coli* and today all the lab members working in the area of probiotic are working on *E. coli* Nissle 1917. One more person who has played big role in during these years is Dr. Holm Uhlig (Translational Gastroenterology Unit, Experimental Medicine Division, John Radcliffe Hospital, University of Oxford, United Kingdome. Dr. Uhlig has been like second mentor throughout my Ph. D and he was also an intermediate person in bringing *E. coli* Nissle to our lab. No words will fully define Dr Uhlig as he has helped me in many-many things including supporting me for U.K Commonwealth scholarship twice, providing me place in his lab twice for almost 5-6 months, supporting for German foundation scholarship, providing me technical expertise on human system, cell culture and next generation technologies. Thank you sir!

During my experiments I have taken help from many other very nice individuals including Dr. Laxmi, Department of Pathology, S.S.G.H. Vadodara in technical expertise and analyzing histological slides, Hardik, Department of Pharmacy for HPLC of SCFAs, Dr, Niraj Singh, S.P. University for proving plasmids.

All the non-teaching staff of Department of Biochemistry including animal house members (Ramesh Bhai, Vijay Bhai and Narayan Bhai) have played crucial role in small but necessary things. I would like to thank all of them for their helps.

Coming to buddies who have been part of Ph. D, first I would like to thanks Ashish Singh for constant support, help, overnight working in the department, taking care of everything when I am not around. There are endless talks and moments which I remember as part of our Ph. D. I would like to keep all those things secret rather than writing them in words here. Nirja Chaudhari for helping in neurotransmitter estimation and also for being my Masters Junior. Many thanks Ashish. Dr. Prashant kumar, Dr. Hemanta Adhikari has been like big brother rite from the beginning of Ph. D. I feel they are the real seniors and very good human being. I would also like to thanks all the MMBLites (Archana, Ruma, Parini, Riddhi, Ujjawal.....) for being part of my Ph. D in some or the other way. Many thanks to all the past and present research scholars of the department of Biochemistry.

Special thanks to dissertation students (Gopal, Dhaval, Priyankana) who worked with me during my Ph. D. Thank you very much! Some best buddies out the academic world have really supported me when ever needed. Big thank you to "Chunnu" for always being there and sharing

small-small things. I hope time will change soon and we can again see the old days coming true. Hardik, Varsha, Darshana, Sneha, Mahadev Ji are few people who are always there for me unconditionally. Many thanks to all of them and wishing you all great future.

Special thanks to funding agencies; UGC-DRS for fellowship at Department of Biochemistry, Association of Indian Universities, New Delhi for Cash prize at "ANVESHAN", Department of Biotechnology for International travel support, United European Gastroenterology Foundation for travel award and National Scholar Award at UEG-Berlin and UEG-Vienna, German foundation and University of Oxford for supporting research stay of 5-6 month at Translational Gastroenterology Unit, Experimental Medicine Division, John Radcliffe Hospital, University of Oxford, United Kingdom

As I mentioned in the beginning of my acknowledgement that my Ph. D has been like as roller coaster ride, of course this was also not possible without some key players. I would like to thanks all those who has been inspiration for me to do better when they wanted to make it worst.

At the end I would like to thank my whole family for unconditional support thought out this journey. New member to our family "Bhabhi" is also a great addition and I hope we will be happy family.