

Acknowledgement

A high school student, while attending an interesting biology lecture at school got inspired to pursue Ph.D. in Biology. Reasons being, an exceptional teaching ability of the teacher and certainly, glitters of the subject.. and here I am, writing a note of heartfelt gratitude for all the special people, who made me reach out to my dream and achieve it.

The Maharaja Sayajirao University of Baroda- an institution of excellence, my pride, my abode of sanctity. I thank this university and His Highness Sir Sayajirao Gaekwad III, for building this home of knowledge and making Baroda a more dignified place to reside.

I sincerely thank Department of Zoology, for all the learning opportunities it provides to students like me. I owe a lot to this place, which nurtured my scientific and creative capabilities. It has seen my baby steps as a science student and has moulded me into a researcher. I thank the department for making me meet all the right people at a perfect time in my life, thus shaping the stepping stone of my career.

My dream to pursue research came to life, when Prof. B. Suresh accepted me as a Ph.D. student. He has been an inspirational teacher since always and I am still in the awe of his phenomenal teaching skills. I have his first impression deeply etched on my mind as a student, where his stoic yet lively face and impeccable language would inscribe the concepts of biology on the naive minds, which last forever. After joining lab, I got numerous other reasons to admire and thank him. He has been at the core of my scientific, linguistic and philosophical upbringing. His teachings make me ready for all the challenges life might pose. I came in the lab as a naive, meek, fragile soul but don't find these anymore in myself, all thanks to him and his prescribed 'Manjishtha'!! Sir, I want to genuinely thank you for making me understand the importance of fun at work. I never knew before, that lab dinners are equally crucial as lab meetings! I carry in my heart- an ever caring, super protective, fatherly image of yours, which only your research students get to see, and I am one of those lucky people! Submitting thesis merely means that I am taking a leap ahead, but Sir, I assure you that my roots stay by you and I will never forget your lessons in any phase of my life.

When I re-joined the department for Ph.D., Prof. P.C. Mankodi extended his warm support as then Head of the Department. He has always motivated me to stay lively even in tough times. A heartfelt thanks to you Sir, for all your support.

Prof. Dolly Kumar has been the heartthrob of this division. I sincerely thank her for her relentless support that has uplifted my scientific and artistic skills. She helped me learn the linguistic nuances and has always motivated my stage endeavours. Thanks a lot Ma'am!

Present Head of the Department, Prof. Pragna Parikh is an individual of utmost substance. Her strong personality with joyous femininity, makes me look up to her as a lady with solid and unparalleled identity. Thank you, Ma'am, for all your support and care. I specially thank you for your cabin lizards!

I want to convey my warm regards and reverences to Gowri Ma'am and all the teachers at Department of Zoology and Department of Biochemistry. I have utmost respect for you all, who shaped a scientist in me. A million thanks and warm regards!

Department of Zoology has always flourished on the research front only due to the very efficient and hardworking troop of research scholars. Guys, kudos to you for being unremittingly supportive. We have had fun times in the department and I hope this trend continues always.

I can't thank enough DBT for the fellowship during my research tenure. It not only covered my expenditure, but the project taught me a great deal of documentation.

I sincerely thank Dr. Upendra Nongthomba and his students, for allowing me to perform experiments in their prestigious lab at the Indian Institute of Sciences, Bangalore. Your support during the thin times of pandemic came as a saviour for me. Warm regards and sincere thanks for all the help.

Ph.D. for me, has been a roller coaster ride. Just like any other research student, I faced my share of difficulties and strived to conquer them. This journey had its own ups and downs but few people motivated me to keep up my spirits in all walks and only because of them, this humongous task could be achieved. These individuals are my constants - as they say, standing strong by my side through all thick and thins. I want to extend my earnest gratitude to Dr. Pranav Buch, who reintroduced me to Division of Developmental Biology and Toxicology. I recall my B.Sc. days when I used to

trouble him for every small and big subject related queries. Without him explaining the concepts, I couldn't have cracked any entrance test! On my third day in lab, he handed me a lizard and asked to hold it with confidence. I owe you big time for teaching me all correct lab practices and for maintaining your calm despite of me being a nut case sometimes. I want to thank you for always motivating the writer in me. Your positive nod on my write up gives me a lot of confidence and makes me write better. Thanks for always being there!

When I joined, I knew less about how the lab functions or what are the Do's and Don'ts, but I was sure to learn things and no one could have been a better friend, disguised as a lab senior, other than Dr. Urja Verma. Urja and I have been friends since our B.Sc. days but after I joined the lab, she more or less adopted me! She has been a true friend, in both needs and deeds. She gets worked up when I mess around, she might sometimes come out too strong and ruthlessly honest, but I know for sure that wherever and whenever I need, she will have my back. I can't thank you enough Urja, for staying true to your name and being the eternal source of my positive energy. I am thankful to you for always being the rational scientist along with a sensible and warm friend that you are. May you reach out to all your dreams and may we always be the best friends as we are today!

What is the fun of lab work, or life for that matter, if one doesn't have some zing and verve? My stay in the lab was a lot more fun filled because of a very sassy senior, Dr. Shashikant Sharma. He ensures that no moment is dull around and that his gags and witty anecdotes keep everyone entertained, always. His charming self and creative calibre, spur the artist in me and I am always going to look up to him as a dear devil friend of mine. You never miss a chance to pull my leg or stop calling me 'Paapi Gudiya' but both of us know that we have had the best conversations! Thanks for being what you are Shashi.

Whenever I needed any advice regarding my data analysis or had any 'Prism queries', I always ran to my 'Friend of High Significance', Dr. Sonam Patel. A million thanks for patiently teaching me the nuances of drafting an article. You have crafted the scientific writer in me, who knows how to correctly present the complex data. Along with your lissom self, I also thank you sincerely, for teaching me meticulous documentation and calculations. I have benefitted by just being around you at lab.

Data representation was impossible without the 'data' and I can't thank enough Dr. Isha Ranadive, who taught me how to procure and present it. You have the credits of me knowing protein biology. Western blots are a fun task because of you. Your keen observations have helped me immensely and contributed a lion's share to my data presentation and projection abilities. Sincere thanks!

Sometimes, when I was bugged up by failing experiments, I had a warm-hearted senior Dr. Shweta Umar, who would always hold me up again! Thanks for being the cheerful individual that you are. Every time I needed to discuss macrophages or lacked moral support for that matter, you were always there. I am deeply thankful for all your backing.

Lab Seniors are the crucial corner stones of a researcher's Ph.D. fort, but life arrives with exuberant and joyous juniors, who literally keep you on your toes, always bringing out the best of you. I have been fortunate enough to share some memorable lab time with my juniors. This was a fun journey and I am reaching the destination all because of you guys!

I am immensely indebted to Ms. Vishakha Nesari, who I look up to for her utmost dedication and love for science. Thanks a lot, Vishakha di not only for my time in Bangalore but also for teaching me how to own one's decisions in life. Your impeccable scientific acumen has helped me big time and your liveliness always makes me forget all hinderances and keeps me focussed on the goal.

Ms. Bhaval Parmar, the M.Sc. student who joined during my first year of Ph.D., has now moulted into a beautiful butterfly - an enthusiastic researcher, hungry for discoveries! Your energy is contagious Bhaval and so is your creative expertise. I have learnt a lot in your company and want to thank you for keeping up with a Grammar Nazi like me. Thanks for being the cheerful self that you are. A little quirk but a lot of technical know-how entered my life with Mr. Dhanush Danes, who has been my go-to person, whenever my system ditched or MS-Word misbehaved! Thanks, Dhanush for being tolerant enough while I whined over petty computer issues. Also, your saucy punch lines have always amazed me. Stay cool eternally!

Lizard work would not have been this fun without a supportive hand as extended by Ms. Pooja Raval. Thanks for making a worthy addition to lab. Your presence in lab lightens up the atmosphere and you make difficult roads seem easy with that beautiful

smile of yours. I am grateful to you for all your help in the lizard experiments and thesis compilation too. Lots of cheers on your way!

While I was about to add finishing textures to my Ph.D. venture, in came two super vivifying members of the lab, Ms. Lakshmi Pillai and Ms. Anjali Singh. Owing to your jubilant and invigorating presence, I can envisage you guys going places ahead. All the best to you both, as you step in this super thrilling world of scientific research, where every day will teach you a lot! I wish all the very best to all my juniors. May you guys perform loads of successful experiments, outstanding outcomes and plentiful publications! Cheers!!!

Routine, monotonous life of a researcher, most certainly needs a spark of enthusiasm. At all such moments, I received appreciation, warmth and unconditional support from Dr. Isha Desai. Isha Ma'am, I aspire to be like you some day. I wish I can be as devoted and dutiful as you are. You live every moment for your 'bacchas', who by grace of God are us all, the DSL members and TWF kids. You have bound us all in the thread of love and we will grow with your teachings in our heart. A small word like thanks can never do justice to the reverence I hold for you, but still thanks a lot ma'am!

I want to thank my 'lizard gang' -as Dr. Pranav Buch calls it. Pranav, Pratyush Sir, Gosai Sir, Urja, Shashi, Pooja, and Dhanush, along with Sherwin (from Ahmedabad) have made this work plausible. Catching lizards has been our favourite adventure. I want to especially thank Urja, Shashi, Pooja, Bhaval and Dhanush for accompanying me in lab during my nocturnal experiments. I will always be deeply grateful to you guys for all that you have done for me.

And can I be anymore indebted to anyone else other than my crawling friends, My Lizards? You guys have always amazed me and the feeling grows every time I see you around! Thanks to my cute crawler pals who made this endeavour possible in the first place. I owe my Ph.D. to you.

Friends keep the fun alive, they say and I cannot agree more. My friends from the B.Sc. and M.Sc. classes, seniors and juniors of both Zoology and Biochemistry departments have stood by my side and extended warm support, whenever I needed. A special thanks to Dr. Lakshmipriya Ma'am and all the members of Neuroendocrinology lab, who made my conceptual base strong. I would like to acknowledge Mr. Aaditya Puranik of Department of Chemistry for his gracious help

with emulsions. Thanks a lot, you wonderful people. You made my journey happy and memorable.

A special mention to my Biology teacher from high school, yes, the one who brought it in me, Mrs. Tarangini Zaveri. Thanks a lot Ma'am for sowing that dream in me! I am truly indebted.

Ph.D. is almost like a renunciation expedition, where the world confines in lab and everyone else gets the shorter end of the stick. My journey was no different but my family has always provided me the much-needed understanding and support. To all the members of Rajeshirke and Khaire family, Thanks a lot guys! Your encouragement has made this possible.

I want to thank Mr. Bhaskar Khaire (my first ever formal address to him), for being the chilled out yet very bright younger brother of mine! I cannot imagine my life without you. Thanks for keeping me sane and being the irritating yet loving baby brother! Lots of love to you!

When talking of unconditional love and support, no one comes close to my parents. I owe my entire existence to them and hereby dedicate my Ph.D. thesis to my role models, my parents, Mr. Satish Chandrarao Khaire and Mrs. Neha Satish Khaire. Since nothing can beat Marathi, when it comes to emotions,

आई-बाबा,

हा प्रबंध, हि पि.एच.डी, तुमच्या निखळ प्रेम आणि पाठिंब्या मुळे शक्य झाले. तुमच्या लाडक्या लेकी कडून हि सप्रेम भेट स्वीकार करा.

तुमच्या मुळे,

तुमच्या साठी,

I thank the Almighty for making it happen through me and for bestowing me with the best of everything in my life.

Kashmira Satish Khaire