

# SCIENTIST AND MOMMY

*Shubha Tole*

At one point I thought of myself as a scientist who also happened to be a woman. At the end of four long-gestation projects that ran crazily overlapping with each other, two resulting in boys now aged 4 and 7, and the other two resulting in publications in *Science* and *Nature Neuroscience*, it is very clear that I've traveled a road only "women scientists" get to navigate. Among my colleagues in this roller-coaster journey were 3 outstanding women scientists: postdocs Vishakha Mangale and Nandini Gokulchandran, who joined my lab out of interest in my work, but also because they needed to be in Mumbai for 2-career reasons, and PhD student Lakshmi Subramanian, who wanted to remain close to home for family reasons. This story will highlight the many facets of a uniquely Indian support system that made it possible for me to juggle the jobs of scientist and mommy, the bumpy road to setting up a lab in India, and a fundamental scientific discovery we were privileged to make together.

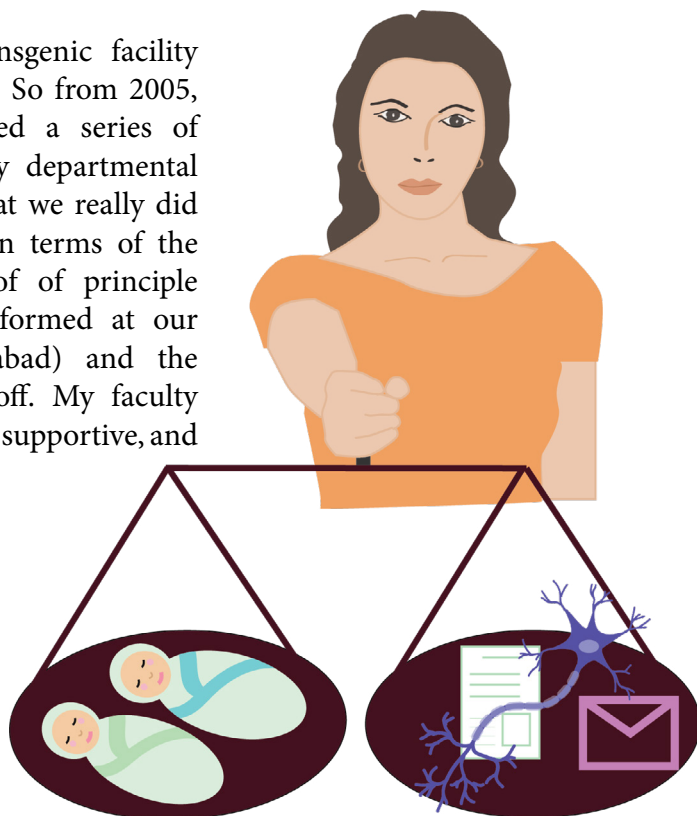
There is no single starting point to this story, but as is often the case, many intertwined strands. My own part in this story began when I returned to TIFR, Mumbai after 11 years of PhD and postdoc in the US (Caltech and University of Chicago respectively), motivated

“AS EVERY WOMAN KNOWS WHO'S DOUBLED AS SCIENTIST AND MOMMY, THERE SIMPLY ISN'T ENOUGH TIME TO DO IT ALL.”

by a desire to contribute to Indian science, to help shape improvements in the education system, and to bring science to the public. Of course, I was terrified at the prospect of setting up in a system I knew nothing of, having done all of my training in the US. Yet there was a good measure of idealism and determination—if I didn't succeed, it wouldn't be for lack of trying everything I could. I began my lab in 1999, with a couple of MSc students, and we had our first publication submitted in 2000. The following year, an unusual student joined my lab. Lakshmi, a Microbiology graduate, applied successfully to our highly competitive graduate program, and proceeded to “interview” me for the job of her advisor before she accepted (!). She was to display this same independence in her research, and make a seminal contribution that drew upon her expertise in understanding the development of the hippocampus, a structure critical for learning and memory.

I had written a couple of ambitious proposals, first for a Wellcome Trust Senior Fellowship just before starting my lab, and a few years later, a DST Swarnajayanti Fellowship, both of which got funded. The aim was to create a chimeric brain in which wildtype and Lhx2 null cells would be intermingled, to test for a cell autonomous role for Lhx2 in the development of the cerebral cortex. Two postdocs, Nandini and Vishakha, took on different aspects of this challenging project. Nandini, an MD who wanted to work with stem cells and displayed seemingly unlimited amounts of energy and resilience in a tricky project- she derived Lhx2-/- ES cells from matings of +/- mice. Finally there was Vishakha, with an intuition that allowed her to see far down the road in terms of her project, an uncanny ability to make good decisions each step of the way, one of which was spending several months in another lab in Hyderabad to bring back a key technique (ES cell-morula aggregations) that nucleated what we called the “chimera project”. A young student Satyaki Prasad joined our Master’s program, and a postdoc Ben Martynoga from the UK joined us in 2006 and brought in the entire range of transplantation and surgical skills required to produce Chimeras. But this is getting ahead of the story.

Our Institute had no transgenic facility for a project of this nature. So from 2005, my lab members presented a series of work seminars at a Friday departmental forum to make the case that we really did have everything together in terms of the technique (successful proof of principle experiments Vishakha performed at our colleague’s lab in Hyderabad) and the background to start this off. My faculty colleagues were fantastically supportive, and emptied out an underused electrophysiology room that we were allowed to renovate to create a tissue culture room for the chimeric blastocysts, with an anteroom for the transplantation surgeries. A couple of years of heroic



efforts at chimera making, after which we began to see the first results. And we were amazed at a double bonus: not only was Lhx2 a fundamental player in creating the cerebral cortex, but also, we were able to establish the identity of an organizing center for the hippocampus. We had actually created a mouse embryo with 7 hippocampi instead of the normal 2! We reported these findings in Science (January 2008)

This high point came after a bumpy few years getting things off the ground. I was 32 years old when I started my lab, and starting a family was something my husband and I wanted to do sooner rather than later. One look at the uphill task of setting up the first vertebrate lab at my Institute, and I panicked: I could only grow one thing at a time! By the time I was pregnant with my first son, Abhay, at 35, our small animal house could no longer meet the needs of the two labs in the department that used rodents for their work. We requested permission to build an annex, and I remember waddling all over the proposed site with the engineer, marking the boundaries of the structure.

“WE ALSO DISCOVERED ANOTHER POSITIVE ASPECT OF LIFE AS AN ACADEMIC IN INDIA: THE SUPPORTIVE MIND-SET OF COLLEAGUES AND THE ABILITY OF THE SYSTEM TO ADAPT TO ISSUES AS THEY ARE RAISED.”

My lab had its first publication, and the next two were written and submitted during the generous maternity leave my Institute allows- 4 months, during which teams of students would visit me at home, and I would look at the data and write in between the competing demands of training the new nanny, setting up baby things, reorganizing the apartment. Three

years later, I had my second son Nikhil at 38, by which time my lab was used to my middle-of-the-night emails that I'd send because Nikhil would wake me up at 3 am and I couldn't sleep right away! In fact, this particular 3 am slot worked beautifully for corresponding with our collaborator in California when writing our Science paper - it's a good bet that Nikhil saved us a month of manuscript preparation time because I could respond to my collaborator's emails the same day he sent them instead of a 12 hour delay. We even mentioned this important contribution in the acknowledgements, by thanking Nikhil for "timely assistance in manuscript preparation" (!).

As every woman knows who's doubled as scientist and mommy, there simply isn't enough time to do it all; we were fortunate in many ways. First, my husband Sandip, also a scientist (a theoretical physicist at the same Institute I work at) took

on his fair share of the workload, so that I could slip off to the lab after dinner, or sleep late into the mornings after a series of middle of the night feedings. I could also travel to meetings as soon as my kids switched to bottle feeding. It simply doesn't "do" to be out of circulation for too long, which brings me to two awesome women without whom I could simply not have juggled it all.

My dear aunt Ushamavashi, wonderful granny and retired doctor, who moved in with us for a few months when I had each of my sons, to provide support, advice, and baby care, who always had a calm assessment of every situation and kept us from panicking at every minor fever or rash or tummy ache. I have had many treasured conversations, and learned many Marathi lullabies. And she would also take a genuine interest in my work, and periodically ask me how one or another student's paper was doing, and I would share with her some of the excitement or frustration or some little detail that we were trying to fix. Even today the kids and I look forward to her visits and she holds a special place in our lives and hearts.

And finally, there is our kids' nanny, Rajkumari, genuinely loving, utterly reliable, and resolutely loyal. Perhaps the most amazing part of this story is that Rajkumari comes from a family that observes very traditional rules for women, requiring them to cover their faces behind a "ghungat" in the presence of men, and does not permit them to work outside the home. Rajkumari never went to school. This only served to fuel her determination that her two daughters should not have to grow up illiterate as she did- she wanted to earn so that she could send them to school. So she braved the ire of her in-laws and husband and broke the rule about being house-bound, to take up a job- the only one she was qualified for being that of a domestic helper or nanny. I paid her well enough to make it worth her while, considerably more than going rates for such a job, but Rajkumari turned out to be invaluable, or at the very least, worth her weight in gold. Barely a sick day or two each year, and she loved my kids as if they were her own. She would call on her day off just to speak to them because she missed them so much!

“ THOUGH THE SYSTEM MAY NOT BE PARTICULARLY SET UP IN TERMS OF REGULATIONS AND CODES AND RIGHTS, IT'S ALWAYS OK TO RAISE AN ISSUE. ”

She determinedly learned everything I trained her to do, from sterilizing bottles to

preparing the baby for an outing, organizing snacks, schedules, shopping for small necessities as needed. As the kids grew, she also doubled as a housekeeper, managing household expenses, groceries, laundry, and other household chores. Rajkumari quickly learned how to pack the “doctor’s bag” to meet us at the car for a doctor’s visit, to dispense medication in the middle of the day if required, and how to keep us informed via phone updates. Because of her, I could begin to travel to meetings, or work straight through a long day without worrying about school pickups or snacks or the myriad little things that need doing when there are young kids at home. Without her I would’ve not only stressed about everything – an unavoidable feature of mommydom – but I would’ve had to parallel so many tasks that my science would’ve suffered.

Another fortunate turn of events occurred just after Abhay was born. A new government regulation required all Institutions to provide childcare, and so our new Child Care Center (CCC) was set up just in time for both my kids to spend a few hours a day there to play with friends, do activities with the wonderfully creative teachers, or just play about in a different environment from home. I served on the Executive Committee of the CCC for its first 6 years, as did several other colleagues and friends, helping to plan everything from teacher/helper interviews, workday

“ I LIKE TO BELIEVE THAT EACH TIME I PUSHED THE ENVELOPE, IT CONTRIBUTED POSITIVELY TO THE SYSTEM TOO, MAKING IT EASIER FOR THE NEXT WOMAN SCIENTIST BY INCREASING AWARENESS OF OUR PRESENCE AND NEEDS. ”

schedules, menus, services, even shopping for toys, putting in place medical emergency procedures etc.

Our collective efforts paid off, and our CCC has now become more than a daycare center - it’s a social center, organizing cultural programs, taking charge of ferrying the children to their evening activities (music, gymnastics, soccer, kathak- all available within our campus itself), and even provides

Saturday childcare. Both my kids wait for Saturdays when they can spend at least half the day at the CCC because that’s where all their friends are! Saturday afternoons are when my husband and I have a weekly “lunch date” by ourselves, since our kids are only too happy to eat at the CCC. The center’s hot lunches and delicious snacks- cuisine from all over India- are part of the attraction. And it’s all at affordable rates, so we could keep the nanny on full time as a housekeeper and

send first the older, then both sons to the CCC for a part of the day as they grew.

Does all this wonderful support help or add to the guilt that every working mother seems to bear as part of the job? I like to think it has allowed me to manage my professional responsibilities and yet keep the best parts of being a mommy for myself. For example, thanks to Rajkumari, we didn't have to do laundry or fold clothes- but the joy of bathing the kids every evening and letting them splash us, then chasing a wet, shrieking, giggling toddler around the bedroom to persuade him to towel off- all mine or Sandip's! We could come home for lunch, which is how I managed to breastfeed both kids for nearly a year each, and even when they were weaned, a half hour of cuddling or play before their afternoon nap was something they and I looked forward to.

“ INDIA, THEN, IS A PLACE FOR PEOPLE- MEN AND WOMEN- WHO WANT TO INITIATE CHANGE, AND FIND FULFILMENT IN BEING PART OF THIS PROCESS. ”

Finally, because I had waited till I was a PI before I became a mommy, this meant that my schedule could be quite flexible since I didn't have to do benchwork. My students knew to reach me by phone if I was at home in the mornings, and lab meetings could happen at home when I was on maternity leave. If a child was sick, Sandip and I could stagger

our lunch breaks so that mostly, a parent was at home when the sick child woke up from a nap. In summary, being a PI –mommy meant that even though I was working hard, I could really do it whenever and wherever possible- middle of the night manuscript writing, or handling other departmental duties by email. As an example, in one of my 4AM emails, I came up with the structure for an entirely new course, “Research Methodology” to introduce new students to the nuts and bolts of science, so that they would understand seminars in a wide range of biological topics. This course was largely taught by our senior students and postdocs, and supervised/coordinated by me, and grew to be our most popular introductory course. So I was actually doing multiple things in parallel, quite successfully, and could make the time to be a mommy by prioritizing things properly.

We also discovered another positive aspect of life as an academic in India: the supportive mind-set of colleagues and the ability of the system to adapt to issues as they are raised. Just before our first child was born, Sandip and I met a senior,

eminent physicist colleague when we were walking home in the evening. He said he had some firm advice for us: that at this juncture in our lives, we should take all the possible leave we were entitled to- and particularly encouraged Sandip to stay at home and enjoy the baby! “These years will never come again, work will keep going on,” he said. My own department willingly excused me from duties that entailed travel (such as our 4-day PhD interview process which used to happen in Bangalore together with that of NCBS), for several years.

Outside my Institution too I found that people would accommodate my needs. When I was still nursing my 2 month old infant, I was invited to be on a committee that entailed a meeting in Bangalore, and an interview for the Swarnajayanti fellowship, in Delhi. Though each visit could be done in a day trip (i.e. I didn't have to take the baby along), there were other problems- restrooms in India don't have the space or facilities nursing mothers require. So I informed the person in charge that I had just had a baby and would need access to a private room, preferably with an electric outlet, to operate a breast pump (I had to add the detail, because this is just not something one expects others to know- that it is impossible for a nursing mother to hold off nursing or pumping if she is used to providing 3 hourly feeds!). Yes, this took some courage to declare in an email (I didn't know these people - one being a very senior well respected scientist), but I thought, this is something a professional woman needs so I should simply ask, rather than make excuses and not attend. Reassuringly, both times I was easily accommodated – which told me that though the system may not be particularly set up in terms of regulations and codes and rights, it's always ok to raise an issue, and a reasonable request is at least considered, if not granted.

I like to believe that each time I pushed the envelope, it contributed positively to the system too, making it easier for the next woman scientist by increasing awareness of our presence and needs. India, then, is a place for people- men and women- who want to initiate change, and find fulfilment in being part of this process.

After 10 years of joining TIFR, my husband and I we were each able to arrange sabbaticals at Stanford University, a center of excellence in both our fields. We moved with the family, the kids went to school in the US for a year, and we got to see first-hand how mommies and daddies in the US manage the scientist-and-parent jobs. Anyone who pulls this off in the US deserves a medal, no, two or three. My husband and I have had our most productive scientific years after returning to India, and had two children during these years, so I'll end this story with a grateful

acknowledgement of the wonderful support system we have, that draws from modern-day India's many contrasting faces: a supportive Institution and colleagues, a fantastic child care center, and the two women who don't get authorship on my papers, but who have nevertheless been an integral part of my success as a scientist, and to my being able to juggle mommydom and lab at the same time: my retired aunt Ushamavashi, and the determined and loyal Rajkumari, an illiterate but forward thinking mother who dreamed of sending her daughters to school.

This article was first published on [indiabioscience.org](http://indiabioscience.org) on Oct 09, 2009