

SUCCESS NEVER COMES FROM BEING IN THE COMFORT ZONE



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INTERNATIONAL
WOMEN'S DAY
SPECIAL



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Dr Ranjana Aggarwal is Director, CSIR-National Institute of Science Communication and Policy Research (CSIR-NIScPR), New Delhi. Earlier, she was Professor of Chemistry and Director, Women's Studies Research Centre at Kurukshetra University, where she was actively engaged in capacity building programmes, promotion of gender sensitization and skill development particularly among rural women. She obtained her BSc, MSc and PhD degrees from Kurukshetra University. After two years of postdoctoral research on erythromycin biosynthesis at Cambridge University, UK, she joined her Alma mater in 1995 as a lecturer. She worked in many

well known European Labs such as Cambridge University as Commonwealth Fellow, Trinity College Dublin, Ireland and the University of Trieste, Italy.

Her research contributions have been acknowledged in the form of awards, notably Dr Basudev Banerji Memorial Award (2014) by Indian Chemical Society and Prof. S.S. Katiyar Endowment Award (2015) by Indian Science Congress. As an accomplished academician, she has been nominated as Member of the National Monitoring Committee for Minorities Education by MHRD, New Delhi. She is a visitor's Nominee for Delhi University and Central University, Assam, Silchar and Chancellor's Nominee for many Haryana State Universities.



WOMEN in India played a stellar role in the society, enjoyed personal freedom and had the right to education during the Vedic era. They were given equal status and privileges along with men and were second to none. Famous personalities of that period like Maitreyi, Gargi, Poulomi, Lopamudra, Lilavati mentioned in textual evidences, including the Vedas and Upnishadas, highlight their expertise in respective fields.

However, the onset of the late Vedic and medieval period and invasions from the North-West saw impositions of parochial ideas on women. The presence of women in social, political, educational, scientific and technical fields remained mostly marginal and the main responsibility of women was perceived to get married, bear children and carry out domestic chores.

However, towards the end of the second half of the 19th century and leading into the 20th century a significant number of women had entered the portals of formal education at all levels, but in higher education there was under representation of women in Science, Technology, Engineering and Mathematics (STEM), which is a global issue too. While we can witness a positive change in recent times, these fields are still typically dominated by men particularly at the leadership position not providing enough women as role models to inspire women and girls in the field of science and technology.

Young girls often ask me whether my journey as a woman in science has been smooth. My response is: wouldn't life be bland to have a smooth sailing without any hurdles. Success never comes easy! One has to go through hardships, struggles and challenges to achieve success. All this could well apply to anyone, irrespective of gender. But for a woman scientist one of the major obstacles is gender stereotyping where the society fixes the roles and tasks women and men have to perform. These assumptions create biases and impact career opportunities for women.

I was born and brought up in a typical middle-class family in Shahabad, a small town of Haryana. My parents prioritized academic excellence for their three children regardless of gender. I passed high school examination in Hindi medium with distinction and was awarded the National Merit Scholarship; this was my first step towards a scientific career.

Looking at my passion towards science and good performance and since there were limited opportunities for girls to pursue science at Shahabad my parents decided to shift me to Kurukshetra where I could easily get admission on the basis of merit in Kurukshetra University, one of the best Universities in north India. I had the good fortune of having some very good teachers in Chemistry who instilled in me an abiding love for the discipline. They stirred my

imagination and described the language of molecules and reactions in such glorious colours as to make it worthy of life-long pursuit. In Pre-Medical itself I decided to pursue doctorate in Chemistry (my parents wanted me to become a doctor) and be an academican in the University where one could do research along with teaching. I completed B.Sc. and M.Sc. in Chemistry with distinction and qualified CSIR-JRF Examination in the final year. I was also awarded University Research Scholarship on the basis of merit to pursue PhD.

I was highly influenced by one of the senior Professors, Dr S.P. Singh, who was nationally recognized for his book *Reaction Mechanism in Organic Chemistry*, very popular among organic chemists, published in 1984. He taught the nuances of organic chemistry in an interesting manner and had a vibrant research group. I wanted to pursue PhD under his guidance but when I approached him with a request to be my PhD mentor he desired to meet my father first. He shared his apprehension that PhD is a long-term program requiring high level of commitment and looking at the social milieu of Haryana, parents would not wait for their daughters to get married. Therefore his research group did not have any girl in its PhD program. But he said he would be happy to offer me a space as an M.Phil student. My father knew my determination and made a promise to him that my marriage would not be on the cards till I wrote my PhD thesis. I must acknowledge that once he accepted me in his group he never judged me on the basis of gender, rather entrusted me with challenging problems.

With great enthusiasm, I started working on synthesis and photodynamic studies of small natural compounds and their synthetic analogues on mosquito larvae. Photodynamic studies were a relatively new field at that time and I was the first one in his group to initiate this work.

As fate would have it, I met Dinesh, now my husband of more than three decades, who was then a young faculty in the Electronic Science Department. Since he himself was pursuing his PhD, he understood how important my professional commitments were. Our families respected our decision to marry after completion of my research.

At this point fate intervened. Dinesh got the prestigious Commonwealth Scholarship to pursue PhD in the Cavendish Laboratory at Cambridge University UK. It was his dream come true but he was not sure how I would react to this news. But more than that, his family did not agree to send him to UK without getting married – so marriage happened! He left after a couple of months but I decided to stay back in India to continue my research.

Often a turning point of women's personal and professional life is motherhood. When I realized that I was carrying my daughter and it would be difficult to disguise my growing girth, I wrapped up my research work, put in my resignation from SRF and joined my husband at Cambridge. My daughter, Meenal, was born there. I enjoyed motherhood in a way I had not imagined. Though one part of me was thrilled to have a treasure in the form of our daughter, the other was yearning for my unfulfilled professional life. I am grateful to my husband for never letting me give up. It was important to him that we both had equal opportunities for professional growth.

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When my daughter was six months old, he motivated me to go back to India and finish my research work. I was fortunate to submit my thesis in thirteen months due to a conducive environment in the form of a loving family to take care of my daughter and an encouraging mentor at work place. My *viva-voce* exam was taken by Prof. James Staunton at Cambridge University and immediately after the exam he offered me a post-doctoral position to work on Erythromycin biosynthesis in his group. These three years at Cambridge were an enriching experience to bring synergy in synthetic chemistry and molecular biology.

We had almost decided to settle down in UK when the then Vice-Chancellor of Kurukshetra University visited us at Cambridge. He was impressed with our research endeavours and offered us positions in the University. On his inspiration we came back. I joined my Alma Mater as the first woman faculty member in chemical sciences of its 40-year history.

Though there were ample opportunities to fulfil my passion of teaching, carrying out quality research in a State University was challenging due to miniscule funding for research, lack of sophisticated instrumentation, etc. I realized the importance of raising own research funds and collaboration with international/national research groups early in my career. I was fortunate to receive research grants and could develop international linkages through different programs/schemes offered by UGC, CSIR and DST. My PhD students, many of them women, have been a great source of strength for me, motivating me to think of new and interesting problems in the field of azaheterocycles of therapeutic interest, computational studies and 2D NMR spectroscopy. This led to more than 100 publications in International Journals.

I always supported my female research students' decision to marry and start a family during PhD with the advice to keep the passion to do science alive. It has given me great satisfaction that my work has been acknowledged in the form of awards and honours notably Commonwealth Fellowship, Dr Basudev Banerji Memorial Award by Indian Chemical Society, Prof. S.S. Katiyar Endowment Award and President, Chemical Sciences Section, Indian Science Congress.

Besides Chemistry, gender issues have been very close to my heart. For more than two decades I have been associated with the Management Committee, in different capacities, of Gita Girls Senior Secondary School, Kurukshetra, serving all deserving girl students without any discrimination of caste, creed or social status. It provided me an opportunity to establish an Atal Tinkering Lab and science stream for 11th class students. It gives me a sense of accomplishment to see those girls becoming engineers, doctors, teachers and researchers.

'Sensitization, Awareness and Motivational (SAM) workshop on Capacity Building of Women Managers in Higher Education', a flagship program of UGC for women empowerment, gave me a new perspective about the need for women to be in leadership positions. I learnt that as an administrator one has the power to bring about change. Therefore, the prospect of becoming Director of Women's Studies Research Centre at my university, all of a sudden, became very bright and beckoning. As Director not only I could execute various programmes concerning issues of women's equality and development but also emphasize on

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the importance of science and technology to address various social issues.

This enriching experience motivated me to lead a national institute of high repute — the CSIR-National Institute of Science, Technology and Development Studies (CSIR-NISTADS), New Delhi as Director. (The Institute recently has been renamed as CSIR-National Institute of Science Communication and Policy Research after merger with CSIR-NISCAIR). The present position offers several opportunities to communicate authentic scientific information to all strata of society through print, electronic and digital media and formulate evidence-based policies on Techno-Socio-Economic issues.

Reflecting back, it has been an interesting journey. Balancing personal and professional life was challenging at times but with the support of a galaxy of loving and caring people around me it became enjoyable. While interacting with young girls I felt a pleasant change in their attitudes towards their own potential and capabilities. They have new aspirations and hopes. At the societal level, socio-cultural expectations, which are internalised by women since their childhood and which affect their goals and aspirations later on, are weakening.

More importantly, to create a better scientific ecosystem for women, the Government of India is taking proactive steps. In order to enhance their representation, a Standard Committee for Promoting Women in Science was constituted to identify and correct any imbalances that persist and restrict women in S&T. Several schemes, which reflect empathy, have been launched to retain and encourage women in scientific professions such as Women Scientist Scheme, Mobility Scheme, Vigyan Jyoti Program, SERB-POWER, GATI, BioCARE, CURIE to name a few.

The Science Technology and Innovation Policy (STIP) 2020 has a separate chapter "Equity and Inclusion" and suggests measures such as 30% representation in decision-making bodies, promotion to leadership positions, consideration of academic age rather than physical, crèche facility at workplace, etc.

On the occasion of International Women's Day, a few words to young aspiring scientists — conquer the intrinsic and extrinsic factors that restrict your scientific journey. Come out of your comfort zone and make efforts to create, or if necessary, demand your rightful place to serve science. It is your relentless endeavours that will pave the way to the zenith!